MINERAL PRODUCTION IN IOWA FOR THE YEARS 1933-1938

by

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Foreword

This report on the mineral production of Iowa from 1933 to 1938 continues the series of statistical summaries published by the Iowa Geological Survey. It is the first such report since the statistics for 1932 were published and has been somewhat delayed because of various changes in personnel and alterations in policy of the Survey to meet increasing public demands for service and information.

The primary function of these reports is to provide in convenient form an accurate record of economic developments and trends in the mineral industries of Iowa for the information and use of the producers and the public.

The form of previous reports is followed as closely as possible in order to facilitate comparison with earlier statistics and, as in the past, the figures on the last year reported (1932) are repeated for comparative purposes. It was found necessary, however, to make certain changes in the presentation of data, which are discussed under their proper headings.

Introduction

All minerals produced in Iowa during the period 1933-1938 were of the nonmetallic type. Of these, coal was the most valuable. It had an average annual value of approximately 8.6 millions of dollars and was followed by cement which averaged about 7.1 millions of dollars for 1936-1938. These two maintained their respective ranks throughout the period of this report. Limestone, gypsum, clay products, and sand and gravel, the other leading mineral products, changed ranking positions almost yearly.

From a national viewpoint gypsum is the most important Iowa mineral produced. In 1935 approximately 14 per cent of the total production of the United States was from Iowa, which again placed her third in rank by production and value, superceded only by New

York and Michigan. Normally these three leading states yield slightly more than 50 per cent of the total domestic output.

In addition to the minerals already mentioned, Iowa produced small amounts of sandstone, peat, and stone listed as miscellaneous. There were few producers of any one of these and, to avoid revealing confidental figures, no individual statistics are presented for them.

No data are available on wool rock utilized by the one plant in the state which began operations in 1937. It is known, however, that only a small amount of raw material from Iowa is utilized.

Lists of operators in each industry except coal are included under the discussion of individual minerals. These lists are the most recent available and include operators producing in 1939, although some nonproducers are also included. They do not include all operators producing during the period of this report. No up-to-date list of coal producers was available when this report went to press.

Acknowledgments

Statistics on the production of most minerals are collected by the United States Bureau of Mines cooperating with the various state geological surveys. Each year the Bureau of Mines publishes the results of their canvasses in a Minerals Yearbook. Most of the data appearing in the report on mineral production in Iowa from 1933 to 1938 were obtained through the cooperative agreement between the Bureau of Mines and the Iowa Geological Survey and from the Minerals Yearbooks covering the period.

The canvass for clay products is made by the United States Bureau of Census and statistics for this industry appearing in the following report were furnished by the Bureau of Census.

The collection of production statistics of the bituminous-coal industry previously conducted by the Bureau of Mines was relinquished on July 1, 1937 to the National Bituminous Coal Commission which has contributed the chapter on bituminous coal to the subsequent Minerals Yearbooks. Statistics on coal for this report for 1936-1938 are taken entirely from the Minerals Yearbooks.

In addition to acknowledging the cooperation of the Federal agencies it is a pleasure to express appreciation to the various mineral producers, particularly in Iowa, for their reports which make the following statistics available.

Tabulation of production figures for this period — begun by Dr.

A. C. Tester in 1934 — was taken over in 1937 by the writer who is responsible for the statements to follow. The tables presenting sand and gravel data by counties were prepared by Mr. Walter C. Schuldt, similar tables on limestone were prepared by Mr. Maxim M. Elias, and Miss Kathryn T. Neuzil assisted in checking all figures.

General Statement

The years 1933-1938 represent a particularly interesting period in the history of mineral production in that they include the latter part of the depression which began in 1929, the recovery period from 1934 to early 1937 and a so-called recession which was believed ended in the last half of 1938.

The year 1934 was a turning point for mineral industries in Iowa. From 1929 until 1933 the total value of mineral products had decreased yearly and in 1933 was $15,154,652, the lowest since 1905. In 1934 an upswing started which resulted in increases each succeeding year including 1937. The recession began too late in 1937 to affect greatly the mineral industries in that year, but its effect was felt in 1938 when there was a decline in total value. Iowa, however, did not suffer as greatly during this period as did the United States as a whole. Conditions improved during the last half of 1938 and at the end of the year the outlook was favorable.

The quantity and value of mineral products in Iowa from 1932 to 1938 are shown in Table I. It should be noted that in 1937 and 1938 a new method of reporting the value of gypsum was instituted which makes it appear that the value dropped sharply in 1937, when as a matter of fact the value of gypsum in Iowa increased in that year (see explanation under Gypsum). This should also be remembered when comparing total state values for 1937 and 1938 with those of earlier years.

Mineral production in the United States which had shown a decrease in value each year since 1929 began an upward trend in 1933. The total value increased yearly until 1937 when it was greater than for 1928 and only slightly less than 1929. Metallics were particularly strong during the 1933-37 period and increased in value each year while the nonmetallics showed an increase each year except for the fuels in 1933 and other nonmetals in 1934. In 1938 the value of both metallics and nonmetallics dropped off sharply because of the recession. In spite of declines in production during late 1937 and early 1938,

TABLE I

Mineral Production in Iowa from 1932 to 1938

	Cement	Clay[a]	Coal	Gypsum	Limestone	Sand and gravel	Miscellaneous	Total value[b]
1932								
Unit	bbls.		tons	tons	tons			
Quantity	4,373,642		3,862,435	178,087	1,591,240[c]	5,230,562		
Value	$3,907,427	805,799	9,254,000	1,468,414	1,389,465	1,706,874	387,064[d]	18,522,625
Producers	5		212	7	53	87[e]		
1933								
Quantity	2,770,656		3,194,983	172,555	1,050,190[f]	4,343,781		
Value	$3,651,921	917,548	7,217,000	1,357,407	920,532	1,165,066	900,203[d]	15,154,652
Producers	5		242	8	60	60		
1934								
Quantity	3,340,049		3,366,992	180,271	2,276,443[c]	4,349,362[c]		
Value	$5,094,922	1,374,469	7,862,000	1,670,356	1,934,364	1,394,000[c]	1,320,509[d, h]	19,326,181
Producers	5		243[g]	8	101	45		
1935								
Quantity	3,203,301		3,650,163	230,203	1,840,080	5,732,742		
Value	$5,072,098	2,039,568	9,002,000	2,215,770	1,645,937	1,756,851	1,714,363[d, h]	21,709,817
Producers	5		263[g]	7	105	49		
1936								
Quantity	4,407,624		3,960,700[i]	344,221[j]	4,003,550	6,293,984		
Value	$6,908,225	2,774,833	9,940,000[i]	3,261,388[j]	3,397,356	2,048,282	1,762,575[d, h]	28,359,140
Producers	5		361[g]	8	130	51		
1937								
Quantity	4,598,453		3,637,054[i]	387,255[k]	4,294,310[l]	6,397,154		
Value	$7,046,021	3,301,548	9,529,000[i, m]	533,162[k]	4,276,891	2,235,103	2,163,370[d, h]	26,941,350[n, p]
Producers	5		340[g]	8	174	107[e]		
1938								
Quantity	4,759,390		3,250,000[m]	364,920	3,369,750[l]	6,994,286[c]		
Value	$7,327,048	2,913,992	8,340,000[m]	495,856	3,782,480	2,299,732[c]		25,159,058[n, p]
Producers	5		300[m]	8	85	107[e]		

a Includes products (other than pottery and refractories) and raw clay sold by producers.
b With duplications eliminated. Value of raw clay excluded 1932-1935 inclusive. Includes peat, sandstone, and miscellaneous stone.
c Revised.
d Includes ferro-alloys and pig iron, value not included in total value for state.
e Includes noncommercial producers.
f Includes sandstone.
g Not comparable with years prior to 1934.
h Includes peat.
i According to National Bituminous Coal Commission.
j Gypsum mined; value as sold (crude and calcined) comparable value for 1937 not available.
k Gypsum mined; value of crude at mine as reported by producers. Comparable value for earlier years not available.
l Includes sandstone and miscellaneous stone.
m Estimated.
n Note change in method of reporting gypsum.
p Total value for 1937-1938 not comparable with earlier years.

the mineral industries enjoyed better conditions than did business in general. Table II shows statistically the mineral production in the United States for the period of this report.

TABLE II

Mineral Production in the United States from 1932 to 1938

Year	Metallic	Nonmetallic			Grand Total
		Fuels[1]	Other	Total	
1932	$ 285,875,000	$1,743,400,000	$432,425,000	$2,175,825,000	$2,461,700,000
1933	417,065,000	1,683,400,000	454,635,000	2,138,035,000	2,555,100,000
1934	548,934,000	2,233,300,000	543,166,000	2,776,466,000	3,325,400,000
1935	733,130,000	2,330,000,000	586,870,000	2,916,870,000	3,650,000,000
1936	1,081,600,000	2,759,200,000	716,000,000	3,475,200,000	4,556,800,000
1937	1,468,200,000	3,200,500,000	744,900,000	3,945,400,000	5,413,600,000
1938[2]	891,800,000	2,804,700,000	657,500,000	3,462,200,000	4,354,000,000

1 Coal, natural gas, natural gasoline, petroleum.
2 Subject to revision.

Cement

The cement industry depends for markets directly upon construction. Concrete highway paving and building, the two principal outlets, consume more than half of the output of portland cement manufactured in an average year. The remainder is consumed by other forms of construction such as sidewalks, bridges, dams, sewage and waterworks, railway maintenance, miscellaneous jobs on farms, and river and harbor improvements.

In Iowa, cement followed the general pattern of recovery from the depression, although recovery was somewhat slower than for some other mineral products. It continued a downward trend through 1933 but in that year suggestions of the recovery to follow were in evidence. The average price per barrel at the plant increased more than 48 per cent in 1933, 15.9 additional per cent in 1934 and since then has maintained a fairly steady level. The peak price of $1.58 was reached in 1935. Shipments, after a decrease in 1933 caused in part by advanced price, increased in quantity and value each year except 1935. In 1934 and 1936 the quantity of Iowa cement shipped, represented increases of 21 per cent and 38 per cent respectively over shipments of the previous year. Production, after 1933, increased each year with the largest quantity advances in 1935 (11 per cent), 1936 (16 per cent) and 1937 (15 per cent).

The condition of the industry in Iowa for the period 1935-1938 was better than for the country as a whole. A comparison of the statistics for Iowa (Table III) and for the United States (Table IV) shows that

TABLE III

Production of Cement in Iowa from 1932 to 1938

Year	Production		Shipments				Stock at Mills Dec. 31		Annual capacity	Plants active
	Barrels	Per cent change over previous year	Barrels	Value	Average price per barrel	Per cent change in quantity over previous year	Barrels	Per cent change over previous year		
1932	4,270,739	—26	4,373,642	$3,907,427	$0.89	—23	1,311,583[a]	—7	10,293,900	5
1933	3,044,008	—29	2,770,656	3,651,921	1.32	—37	1,605,116[a]	+22		5
1934	3,180,546	+4	3,340,049	5,094,922	1.53	+21	1,445,613[a]	—10	10,006,710	5
1935	3,519,558	+11	3,203,301	5,072,098	1.58	—4	1,761,870	+22	10,066,710	5
1936	4,099,121	+16	4,407,624	6,908,225	1.57	+38	1,462,146	—17		5
1937	4,706,094	+15	4,598,453	7,046,021	1.53	+4	1,569,787	+7		5
1938	4,726,517	+0.4	4,759,390	7,327,048	1.54	+3	1,536,914	—2		5

a Revised.

TABLE IV

Production of Cement in the United States from 1932 to 1938

Year	Production		Shipments				Stock at Mills, December 31	
	Barrels	Per cent change over previous year	Barrels	Value	Average factory value per barrel	Per cent change in quantity over previous year	Barrels	Per cent change over previous year
1932	76,740,945	—39	80,843,187	$ 82,021,723	$1.01	—36	20,351,058[a]	—12
1933	63,473,189	—17	64,282,756	85,583,916	1.33	—20	19,605,323[a]	—4
1934	77,747,765	+22	75,901,279	116,921,084	1.54	+18	21,440,594[a]	+9
1935	76,741,570	—1	75,232,917	113,372,182	1.51	—1	22,949,247[a]	+7
1936	112,649,782	+47	112,849,979	170,415,302	1.51	+50	22,568,685	—2
1937	116,174,708	+3	113,804,782	168,835,208	1.48	+1	24,938,612	+11
1938	105,357,000	—9	106,324,127	153,977,226	1.45	—7	23,946,118	—4

a Revised.

Iowa productions, shipments and prices were below average for 1933 and 1934. In the years following, however, Iowa cement had a more steady advancement than cement in the United States in general. It is notable that the price was from 5 to 9 cents per barrel above the United States figures and that there was no reduction in the quantity or value of Iowa shipments, production or price in 1938 when all of these decreased for the country as a whole.

Production of cement in the United States was highly variable during the period of this report. It was far below the general level of business in 1932 and 1933, and in 1933 shipments reached the lowest level in twenty-five years, although in that year there was a marked general increase in price.

The decline in United States cement production in 1933 was caused by the sharp drop in concrete paving contract awards and the continued slump in building construction. The increases in construction contract awards, due largely to Public Works Administration activity, arrived too late in the year to prevent the decline. They are reflected, however, in the advance in shipments in 1934 in spite of the fact that residential building remained at a low level. Production and shipments fell off in 1935 and in that year two new plants were put into operation, the first new plants since 1929.

In 1936 there were increases of 47 per cent in quantity and 50 per cent in value. These advances were brought about by extensive highway building, large Federal Public Works projects and renewed activity in private construction. There was a slight increase in production and quantity shipped in 1937, but the value of shipments declined because of the 2-per cent drop in price. The average price per barrel increased almost 32 per cent in 1933, 16 per cent in 1934 and decreased 2 per cent each year in 1935, 1937 and 1938. In the last named year, production and shipments also fell off although during the last quarter of 1938 figures were above those for the same period in 1937 and the outlook appeared bright.

Manufacturers of Portland Cement in Iowa

Cerro Gordo County

Lehigh Portland Cement Co., B. L. Swett, Vice President, Young Building, Allentown, Pa. Plant at Mason City, Iowa.

Northwestern States Portland Cement Co., Peter Andersen, Secre-

tary, First National Bank Building, Mason City, Iowa. Plant at Mason City, Iowa.

Pocahontas County

Northwestern States Portland Cement Co., First National Bank Building, Mason City, Iowa. Plant at Gilmore City, Iowa.

Polk County

Hawkeye Portland Cement Co., B. E. Manley, General Manager, Hubbell Building, Des Moines, Iowa. Plant at Des Moines, Iowa.

Pennsylvania-Dixie Cement Corp., R. A. Bechtold, Superintendent, 208 Old Colony Building, N. E. Corner 10th & Grand Avenue, Des Moines, Iowa. Plant at West Des Moines, Iowa.

Scott County

Dewey Portland Cement Co., F. E. Tyler, President, 101 West 11th Street, Kansas City, Missouri. Plant at Davenport, Iowa.

Clay

Clay, which suffered more serious declines than any other Iowa mineral product during the early part of the depression, rallied more strongly than any other product except limestone during the period 1933-1938. Total value increased over the previous year in 1933 and in each of the succeeding years except 1938. The greatest advances as shown by Table V were attained in 1934 and 1935 when they amounted to 49.8 per cent and 48.4 per cent respectively, and were never less than the 13.8 per cent gain in 1933, while the decline in 1938 amounted to only 11.7 per cent. The value in 1937 was more than four times that in 1932.

Statistics for most mineral products are collected by the Bureau of Mines cooperating with the state geological surveys. These agencies obtain data concerning the amount of clay sold either raw or prepared, but not made into wares. For clay wares the canvasses are made without the cooperation of the state surveys by the Bureau of Census, which reports clay products by class, quantity, and value. It is not known if the same producers are reached by both canvasses.

Sales of the various raw and prepared clays in Iowa followed a strong upward trend in total quantity and total value, but individually were extremely erratic during the period of this report. For example, fire clay in 1933 increased more than 730 per cent in quantity and more than 850 per cent in value, in 1934 decreased 82 per cent in

TABLE V

Value of Clay Products and Raw Clay in Iowa from 1932 to 1938

	1932	1933	1934	1935	1936	1937	1938
Clay products	$796,445	$842,726	$1,352,227	$2,006,021	$2,728,810	$3,250,677	$2,868,233
Clay, raw	9,354	74,822	22,242	33,547	46,023	50,871	45,759
Total	805,799	917,548	1,374,469	2,039,568	2,774,833	3,301,548	2,913,992

TABLE VI

Sales of Clay in Iowa from 1932 to 1938

	1932	1933	1934	1935	1936	1937	1938
Fire Clay							
Short tons	858	7,158	1,255	2,143	1,094	(a)	773
Value	$7,255	$69,169	$11,651	$20,726	$12,635	(a)	$ 9,034
Active producers	5	6	6	6	3	2	3
Miscellaneous Clay							
Short tons	2,575	2,221	1,017	1,132	3,317[b]	(a)	6,055
Value	$2,099	$ 5,653	$10,591	$12,821	$33,388	(a)	$36,725
Active producers	2	5	5	3	7	7	8
Total							
Short tons	3,433	9,379[c]	2,272	3,275	4,411	4,600	6,828
Value	$9,354	$74,822	$22,242	$33,547	$46,023	$50,871	$45,759
Active producers	6	10	10	9	10	8	10

a Withheld to avoid disclosing, exactly or approximately, data reported by individual establishments.
b Includes shale.
c Includes ground clay, modeling clay and shale.

quantity and 83 per cent in value, in 1935 increased 71 per cent in quantity and 78 per cent in value and again decreased in 1936 and 1938. Clays listed as "miscellaneous" also varied, but not as greatly as did the fire clay. The apparent discrepancy between the annual quantities and values of miscellaneous clays is due to difference in price of the various clays included under this general heading. Table VI presents the salient features of this portion of the clay industry.

Clay products after disastrous reversals, particularly in 1932, began a recovery in 1933 which resulted in a material increase in total value each year until 1938. The decline in 1938 was not serious and the total value for that year was higher than for 1936.

The production of clay products by classes in 1935 and 1936 is shown by Table VII. Hollow partition building tile leads all other

TABLE VII

Production of Clay Products in Iowa by Class, Quantity and Value, 1935-1936

	1935		1936	
	Quantity (thousands)	Value	Quantity (thousands)	Value
Common brick	30,187	$330,585	39,660	$424,066
Face brick	10,047	144,385	16,404	225,064
Vitrified brick	(a)	(a)	(a)	(a)
	Short tons		Short tons	
Hollow building tile				
Partition	130,671	762,519	177,088	1,064,123
Floor arch	16,827	119,497	29,254	203,893
Drain tile				
Vitrified	13,896	109,326	19,518	148,796
Unvitrified	22,134	161,156	24,336	182,765
Sewer pipe	21,061	295,429	31,561	423,018
Flue lining	3,457	43,169	3,376	37,711
Wall coping	405	6,229	499	8,388
	Square feet		Square feet	
Floor tile	(a)	(a)	(a)	(a)
Total		1,972,568		2,717,824

a Concealed to avoid revealing confidential information.

classes by a considerable margin and was followed in value by common brick, sewer pipe, face brick, and unvitrified drain tile in the order named. Detailed figures for clay production during 1933-1934 and 1937-1938 were not available when this report went to press.

The domestic potteries industries in the United States were relatively inactive in 1933. There was a sharp decline in sales of clay for stoneware, but recoveries in paper making and refractories manufacture reflected in clay sales for those uses. Fire clay and bentonite increased about 50 per cent. In 1934 shipments in virtually all kinds of clay began or continued to recover, and except for stoneware, con-

tinued this trend in 1935. Advances were even more marked for 1936 when production and sales of domestic kaolin broke all previous records. In 1937 china clay production and sales and ball clay shipments broke all previous records and fire clay sales were greater than for any earlier year, except 1929. Heavy clay products likewise improved further in 1937, but the recession made itself felt during the last quarter of 1937 and in early 1938 there were drastic reversals of the progress which the clay industry had made during the previous few years, although heavy clay products fell off only slightly. Building-contract awards increased substantially during the latter part of 1938 and there appeared to be every indication that clay production would again advance in 1939.

Clay Operators in Iowa

Cerro Gordo County

Lehigh Portland Cement Co., Young Building, Allentown, Pa. Mine at Mason City, Iowa.

Mason City Brick and Tile Co., 19 West State Street, Mason City, Iowa.

Dallas County

Adel Clay Products Co., Adel, Iowa. Mine at Redfield, Iowa.

Floyd County

Rockford Brick & Tile Co., Rockford, Iowa.

Keokuk County

What Cheer Clay Products Co., What Cheer, Iowa.

Mahaska County

Maria Hansel, Oskaloosa, Iowa.

Polk County

Goodwin Tile & Brick Co., Box 283, S. E. 18th & Hartford Avenue, Des Moines, Iowa.

Wapello County

Morey Clay Products Co., Ottumwa, Iowa.

Webster County

Johnston Clay Works, Inc., 214 First National Bank Building, Fort Dodge, Iowa. Clay works near Fort Dodge, Iowa.

Kalo Brick & Tile Co., 603 Snell Building, Fort Dodge, Iowa. Mine at Coalville, Iowa.

George F. Drain, Lehigh, Iowa.

TABLE VIII

Summary of the Bituminous-coal Industry in Iowa from 1932 to 1938

	Production in net tons	Value		Number of Employees			Average number of days mine operated	Average tons per man per day
		Total	Average per ton	Underground	Surface	Total		
1932	3,862,435	$9,254,000	$2.40	7,183	903	8,086	151	3.17
1933	3,194,983	7,217,000	2.26	6,591	1,104	7,695	138	3.01
1934	3,366,992	7,862,000	2.34	6,687	1,034	7,721	156	2.80
1935	3,650,163	9,002,000	2.47	6,998	1,040	8,038	162	2.80
1936	3,960,700[c]	9,940,000[cd]	2.51[cd]	7,575[c]	1,166[c]	8,741[c]	163[c]	2.78[c]
1937	3,637,054[a]	9,529,000[cd]	2.62[cd]	(f)	(f)	8,720[bc]	146[c]	2.87[c]
1938	3,250,000[ce]	8,340,000[de]	2.56[de]	(f)	(f)	(f)	(f)	(f)

a Total production including inventory change and coal unaccounted for.
b Average number of employees.
c According to National Bituminous Coal Commission.
d Estimated from various sources, includes selling expenses, and is not comparable with values of earlier years.
e Estimated.
f Not available.

Lehigh Sewer Pipe & Tile Co., Fort Dodge, Iowa. Mine at Lehigh, Iowa.

Vincent Clay Products Co., 617 State Bank Building, Fort Dodge, Iowa.

Coal

Coal is the most valuable mineral resource of Iowa on which statistics are available. Normally coal production represents over 40 per cent of the total annual mineral output of the State and because of the markets which it supplies, it is usually one of the most stable of mineral products. For the period of this report it did not react as favorably in general as did some of the other minerals in Iowa. It reached the bottom of the depression low in 1933, one year later than coal over the country as a whole, recovered in 1934, 1935 and 1936, and fell off in 1937 a year before the recession was felt in United States production. However, during the period of this report the price per ton was from $1.01 to $0.69 above the United States average.

Statistics on the general condition of the industry in Iowa may be found in Table VIII and for the United States in Table IX. The data

TABLE IX

Summary of Bituminous-coal Industry in the United States from 1932 to 1938

	Production	Value at mines	Average value per ton	Stocks[a]		Consumption (calculated)
				January 1	December 31	
1932	309,709,872	$406,677,000	$1.31	35,500,000	29,666,000	306,917,000
1933	333,630,533	445,788,000	1.34	29,666,000	32,840,000	321,748,000
1934	359,368,022	628,112,000	1.75[b]	32,840,000	34,476,000	347,043,000
1935	372,373,122	658,063,000	1.77	34,476,000	37,017,000	360,291,563
1936	439,087,903	772,794,709[c]	1.76	37,017,000	42,926,000	422,795,741
1937	445,531,449	868,786,325[c]	1.95[d]	42,926,000	47,074,000	428,496,767[e]
1938	344,630,000[f]			47,074,000	40,720,000[f]	340,735,036[f, e]

a Commercial consumers and retail yards.
b F. O. B. mine.
c Arrived at by multiplying figure for "production" by figure for "average value per ton."
d Average gross realization including selling price. Not comparable with years prior to 1937.
e Production plus imports minus exports plus or minus changes in consumers stock.
f Preliminary.

used in coal reports for all years pertain only to commercial mines with an annual output of 1,000 tons or more. No figures comparable to earlier years are available after 1935 for total value and price per ton except as noted.

In 1933 the total quantity of Iowa coal declined 667,452 net tons or about 17 per cent from the 1932 figure, the price fell 14 cents per ton to a depression low of $2.26, and the total value decreased over

two millions of dollars while the number of men employed decreased 5 per cent.

Recovery began in 1934 when production, total value, price, number of men employed, and average number of days mines operated increased over the preceding year. In 1935 there were further increases in all phases of the industry which carried over through 1936 when production, value and the number of men employed were all greater than for 1932 and the ensuing years. The recession made itself felt in 1937 when there was a decrease in production, operating time, and men employed. Production and other detailed statistics by counties for 1938 were not available when this report went to press.

More detailed information on production by counties may be found in Tables X to XIV. By way of general summary of these tables, the leading counties in production and value are listed below in the order of rank.

1933 Total quantity:	Polk, Lucas, Boone, Marion, Appanoose, Dallas
Total value:	Polk, Boone, Lucas, Dallas, Appanoose, Marion
1934 Total quantity:	Lucas, Polk, Appanoose, Boone, Dallas, Monroe
Total value:	Polk, Lucas, Boone, Appanoose, Dallas, Monroe
1935 Total quantity:	Appanoose, Polk, Lucas, Boone, Dallas, Marion
Total value:	Appanoose, Polk, Boone, Lucas, Dallas, Marion
1936 Total quantity:	Appanoose, Lucas, Polk, Boone, Dallas, Marion
1937 Total quantity:	Appanoose, Marion, Polk, Lucas, Dallas, Boone

The bituminous-coal industry in the United States, a summary of which appears in Table IX, started an upswing in 1933 which carried through 1937. Total production increased about 22 millions of tons in 1933, over 26 millions in 1934, about 13 millions in 1935 and almost 67 millions in 1936, but dropped almost 101 millions of tons in 1938 according to the preliminary data for that year. The average value per ton increased from $1.31 in 1932 to $1.77 in 1935, which represents an advance of 35 per cent. The greatest annual increase in price came in 1934 when the average value reached $1.75 per ton as compared to $1.34 for 1933. For a more complete review of coal production by states for the period 1933-1937 see Tables XV-XIX.

The advance in price and improvement in the employment situation was at least partly due to National Recovery Administration activities

TABLE X

Production, Value, Men Employed, Days Operated, and Output PerMan Per Day at Bituminous-coal Mines in Iowa in 1933

County	Net Tons					Value		Number of Employees			Average number of days mines operated	Average tons per man per day
	Loaded at mines for shipment	Commercial sales by truck or wagon	Sold to local trade or used by employees or taken by locomotives at tipple	Used at mines for power and heat	Total quantity	Total	Average per ton	Underground	Surface	Total		
Adams	.....	16,901	1,612	65	18,578	$ 51,000	$2.75	84	10	94	162	1.22
Appanoose	249,050	65,320	5,135	509	320,014	684,000	2.14	1,399	173	1,572	79	2.59
Boone	316,711	95,947	3,216	2,157	418,031	1,044,000	2.50	912	94	1,006	156	2.66
Dallas	212,135	76,264	12,979	1,476	302,854	709,000	2.34	491	37	528	178	3.23
Davis	.....	3,350	.....	60	3,410	7,000	2.05	4	11	15	74	3.09
Greene	.....	45,396	.....	.....	45,396	115,000	2.53	58	20	78	116	5.02
Guthrie	.....	9,835	.....	22	9,857	36,000	3.65	76	10	86	105	1.09
Jasper	.....	50,554	.....	1,921	52,475	122,000	2.32	129	23	152	108	3.19
Keokuk	.....	16,549	.....	5	16,554	34,000	2.05	18	37	55	163	1.84
Lucas	420,466	6,148	2,077	7,582	436,273	976,000	2.24	595	58	653	177	3.78
Mahaska	1,300	53,695	2,386	814	58,195	124,000	2.13	105	62	167	144	2.41
Marion	291,417	66,705	2,634	5,668	366,424	627,000	1.71	649	198	847	116	3.74
Monroe	210,572	20,703	3,394	1,852	236,521	488,000	2.06	491	52	543	132	3.31
Page	.....	30,827	1,238	.....	32,065	110,000	3.43	100	10	110	172	1.69
Polk	75,891	379,929	71,742	4,845	532,407	1,215,000	2.28	894	76	970	179	3.07
Taylor	202	10,800	1,200	24	12,226	39,000	3.19	36	5	41	132	2.26
Van Buren	.....	6,587	.....	842	7,429	14,000	1.88	22	6	28	137	1.94
Wapello	5,407	74,998	715	1,529	82,649	185,000	2.24	175	40	215	170	2.26
Warren	16,492	155,489	280	4,066	176,327	437,000	2.48	198	105	303	159	3.65
Wayne	2,085	17,095	268	419	19,867	41,000	2.06	88	12	100	116	1.71
Webster	1,466	34,553	.....	.....	36,019	133,000	3.69	54	37	91	182	2.17
Other counties, Hamilton, Jefferson, and Scott	.....	11,382	.....	30	11,412	26,000	2.28	13	28	41	111	2.50
Total 1933	1,803,194	1,249,027	108,876	33,886	3,194,983	7,217,000	2.26	6,591	1,104	7,695	138	3.01
Total 1932	2,651,754	(1)	(1)	32,252	3,862,435	9,254,000	2.40	7,183	903	8,086	151	3.17

(1) In 1932 there were 248,225 tons reported by the operator as "trucked 10 miles or more from mine" (including 20,848 tons, a part of which went less than 10 miles, separation not possible) and 930,204 tons reported as "sales to local trade, used by employees, or taken by locomotives at tipple (including sales by truck within 10 miles of mine)." The sum of these two items in 1932, which amounted to 1,178,429 tons, is exactly comparable with the sum of columns (2) and (3) in 1933 — namely, 1,357,903 tons.

TABLE XI

Production, Value, Men Employed, Days Operated and Output Per Man Per Day at Bituminous-coal Mines in Iowa in 1934

County	Net Tons					Value		Number of Employees			Average number of days mines operated	Average tons per man per day
	Loaded at mines for shipment	Commercial sales by truck or wagon	Sold to local trade or used by employees or taken by locomotives at tipple	Used at mines for power and heat	Total quantity	Total	Average per ton	Underground	Surface	Total		
Adams	.....	20,271	548	45	20,864	$ 59,000	$2.83	101	11	112	151	1.23
Appanoose	378,103	70,115	8,407	713	457,338	1,033,000	2.26	1,429	155	1,548	119	2.42
Boone	330,982	91,674	4,005	4,309	430,970	1,097,000	2.55	966	78	1,044	172	2.40
Dallas	268,274	58,858	3,995	780	331,907	820,000	2.47	539	38	577	196	2.94
Greene	.....	62,345	.....	286	62,631	160,000	2.55	68	24	92	136	5.00
Guthrie	.....	16,468	.....	55	16,523	58,000	3.51	73	11	84	153	1.29
Jasper	.....	53,806	.....	2,913	56,719	130,000	2.29	149	19	168	124	2.73
Keokuk	.....	19,842	.....	.....	19,842	44,000	2.22	16	28	44	160	2.82
Lucas	485,464	10,619	1,887	8,514	506,484	1,114,000	2.20	657	42	699	196	3.70
Mahaska	27,425	61,200	110	1,422	90,157	170,000	1.89	109	69	178	145	3.49
Marion	173,415	73,824	16,391	4,864	268,494	520,000	1.94	455	184	639	148	2.85
Monroe	244,005	24,101	8,807	1,677	278,590	580,000	2.08	516	72	588	149	3.18
Page	.....	37,168	1,660	31	38,859	120,000	3.09	123	9	132	173	1.70
Polk	78,488	380,441	2,191	7,646	468,766	1,144,000	2.44	909	84	993	161	2.92
Taylor	739	9,443	440	47	10,669	37,000	3.47	47	4	51	194	1.08
Van Buren	.....	8,845	124	310	9,279	20,000	2.16	26	6	32	160	1.82
Wapello	1,500	66,016	427	2,184	70,127	152,000	2.17	166	31	197	152	2.35
Warren	23,254	140,374	1,029	3,790	168,447	430,000	2.55	201	102	303	169	3.30
Wayne	100	9,884	322	5	10,311	25,000	2.42	53	11	64	90	1.80
Webster	.....	42,649	41	1,785	44,475	136,000	3.06	70	43	113	185	2.13
Other counties, Hamilton, Jefferson, and Scott	.....	5,540	.....	.....	5,540	13,000	2.35	14	13	27	93	2.20
Total 1934	2,011,749	1,263,483	50,384	41,376	3,366,992	7,862,000	2.34	6,687	1,034	7,721	156	2.80
Total 1933	1,803,194	1,249,027	108,876	33,886	3,194,983	7,217,000	2.26	6,591	1,104	7,695	138	3.01

TABLE XII

Production, Value, Men Employed, Days Operated, and Output Per Man Per Day at Bituminous-coal Mines in Iowa in 1935

County	Net Tons					Value		Number of Employees			Average number of days mines operated	Average tons per man per day
	Loaded at mines for shipment	Commercial sales by truck or wagon	Sold to local trade or used by employees or taken by locomotives at tipple	Used at mines for power and heat	Total quantity	Total	Average per ton	Underground	Surface	Total		
Adams	.....	23,136	.....	20	23,156	$ 76,000	$3.28	128	25	153	119	1.27
Appanoose	467,738	116,034	14,343	396	598,511	1,423,000	2.38	1,596	155	1,751	142	2.41
Boone	308,770	115,107	9,665	4,573	438,115	1,180,000	2.69	947	79	1,026	183	2.33
Dallas	287,718	72,873	6,565	1,331	368,487	887,000	2.41	602	37	639	198	3.07
Davis and Jefferson	.....	6,950	.....	30	6,980	19,000	2.72	20	4	24	130	2.24
Greene	.....	54,341	80	35	54,456	152,000	2.79	84	30	114	118	4.07
Guthrie	.....	23,143	20	69	23,232	79,000	3.40	76	10	86	180	1.50
Jasper	.....	43,797	989	1,188	45,974	120,000	2.61	151	20	171	98	2.74
Keokuk	.....	8,324	100	.....	8,424	17,000	2.02	14	15	29	135	2.14
Lucas	466,182	7,926	3,337	4,643	482,088	1,060,000	2.20	664	67	731	175	3.77
Mahaska	44,664	63,582	60	1,097	109,403	219,000	2.00	92	72	164	158	4.23
Marion	122,878	194,927	6,900	6,420	331,125	795,000	2.40	605	195	800	163	2.54
Monroe	240,313	30,270	.....	2,558	273,141	580,000	2.12	526	52	578	147	3.22
Page	3,640	42,803	3,350	.....	49,793	174,000	3.49	107	12	119	193	2.17
Polk	77,201	413,873	4,593	5,716	501,383	1,270,000	2.53	827	87	914	181	3.02
Van Buren	.....	13,196	64	537	13,797	36,000	2.61	36	8	44	193	1.63
Wapello	2,750	78,878	475	680	82,783	226,000	2.73	203	40	243	141	2.42
Warren	36,744	120,025	790	4,400	161,959	447,000	2.76	162	78	240	161	4.19
Wayne	.....	9,832	207	2	10,041	23,000	2.29	36	5	41	115	2.12
Webster	.....	46,893	31	1,397	48,321	151,000	3.12	75	37	112	208	2.08
Other counties, Hamilton, Scott, and Taylor	551	16,358	2,085	.....	18,994	68,000	3.58	47	12	59	207	1.55
Total 1935	2,059,149	1,502,268	53,654	35,092	3,650,163	9,002,000	2.47	6,998	1,040	8,038	162	2.80
Total 1934	2,011,749	1,263,483	50,384	41,376	3,366,992	7,862,000	2.34	6,687	1,034	7,721	156	2.80

TABLE XIII

Production, Men Employed, Days Operated and Output Per Man Per Day at Bituminous-coal Mines in Iowa in 1936

County	Net Tons					Number of Employees			Average number of days mines operated	Average tons per man per day
	Loaded at mines for shipment	Commercial sales by truck or wagon	Sold to local trade or used by employees or taken by locomotives at tipple	Used at mines for power and heat	Total quantity	Underground	Surface	Total		
Adams	.....	30,299	.....	38	30,337	181	24	205	128	1.16
Appanoose	483,876	158,059	14,689	3,312	659,936	1,762	196	1,958	138	2.44
Boone	297,451	142,030	1,646	3,822	444,949	960	84	1,044	182	2.34
Dallas	298,356	93,398	5,756	1,407	398,917	632	47	679	184	3.19
Davis and Jefferson	.....	21,525	27	10	21,562	26	17	43	168	2.98
Greene	.....	54,996	62	220	55,278	71	26	97	137	4.17
Guthrie	.....	29,887	.....	39	29,926	118	10	128	155	1.51
Jasper	.....	57,789	200	2,547	60,536	175	26	201	112	2.70
Keokuk	.....	8,244	.....	25	8,269	10	17	27	100	3.07
Lucas	531,748	20,190	4,248	4,541	560,727	676	66	742	189	4.00
Mahaska	60,163	91,209	76	1,026	152,474	167	122	289	138	3.83
Marion	103,533	241,919	15,364	5,897	366,713	583	189	772	174	2.72
Monroe	177,529	62,577	3,369	2,482	245,957	424	47	471	168	3.11
Page	.....	40,990	5,112	37	46,139	108	9	117	193	2.04
Polk	93,068	428,035	4,174	5,792	531,069	937	106	1,043	178	2.86
Taylor	1,910	13,124	595	6	15,635	56	6	62	191	1.32
Van Buren	.....	13,354	54	612	14,020	44	11	55	162	1.57
Wapello	2,400	97,445	512	2,239	102,596	267	48	315	146	2.24
Warren	21,672	109,475	448	4,332	135,927	193	69	262	154	3.37
Wayne	.....	28,884	334	425	29,643	113	16	129	148	1.55
Webster	.....	49,477	43	570	50,090	72	30	102	212	2.32
Total 1936	2,071,706	1,792,906	56,709	39,379	3,960,700	7,575	1,166	8,741	163	2.78
Total 1935	2,059,149	1,502,268	53,654	35,092	3,650,163	6,998	1,040	8,038	162	2.80

TABLE XIV

Production, Men Employed, Days Operated, and Output Per Man Per Day at Bituminous-coal Mines in Iowa in 1937

County	Net Tons					Average number of employees	Average number of days mines operated	Average tons per man per day
	Loaded at mines for shipment	Truck deliveries including local sales	Used by mine employees[2]	Mine fuel	Total production including inventory change and coal unaccounted for [1]			
Adams	.....	28,250	.....	20	28,270	180	151	1.04
Appanoose	442,498	156,388	3,871	175	602,846	1,925	131	2.39
Boone	236,592	97,507	7,918	1,913	343,930	987	142	2.45
Dallas	286,228	96,098	7,394	1,720	393,047	703	182	3.08
Greene	.....	40,392	.....	230	40,622	84	102	4.30
Guthrie	.....	22,552	.....	18	22,570	101	156	1.43
Jasper	.....	42,271	100	1,698	44,069	158	91	3.06
Keokuk	.....	10,181	.....	25	10,206	26	94	4.18
Lucas	404,974	14,602	7,576	4,766	431,918	825	133	3.94
Mahaska	91,009	136,007	1,435	1,731	230,297	282	174	4.71
Marion	72,743	392,961	2,892	2,113	470,955	916	156	3.29
Monroe	108,069	72,588	7,172	1,681	189,352	387	156	3.13
Page	.....	39,563	.....	25	39,588	143	162	1.71
Polk	65,162	360,988	4,175	5,232	435,557	1,039	153	2.74
Van Buren	64	18,121	.....	40	18,225	52	169	2.08
Wapello	12,275	120,397	100	1,627	134,414	353	140	2.73
Warren	11,189	91,473	1,711	2,668	107,019	270	116	3.41
Wayne	.....	22,530	400	30	22,960	104	150	1.47
Webster	.....	36,468	.....	190	36,658	91	164	2.45
Other counties (Davis, Jefferson and Taylor)	370	33,668	493	20	34,551	94	163	2.25
Total Iowa, 1937	1,731,173	1,833,005	45,237	25,922 [2]	3,637,054	8,720	146	2.87
Total Iowa, 1936	2,071,706	1,792,906	56,709	39,379	3,960,700	8,741	163	2.78

1 The total production differs from the sum of the items shown by the amount of the changes in inventory and of tonnage not accounted for in the distribution analysis.

2 Other sales to local trade or used by employees or taken by locomotives at tipple.

which began in 1933, carried through 1934, but on May 22, 1935 was invalidated in the courts. The price structure of coal suffered for a time, but was aided by the Guffey Act passed on August 20, 1935 and the subsequent appointment of the National Bituminous Coal Commission.

After passing the Bituminous Coal Act of 1937, Congress discontinued the appropriation for collection of bituminous coal statistics by the Bureau of Mines, since such work would thereafter center in the Bituminous Coal Commission.

The Commission changed the method of reporting "value per ton" by including selling expense, an item which was not included in the old method used by the Bureau of Mines in calculating this value. A comparison of the two series is possible for 1936. In that year the average value per ton, on the basis used by the Bureau of Mines was $1.76, while the average gross realization, as collected by the Coal Commission, was $1.83. Comparable figures are not available for later years.

In Tables XV to XIX presenting the summaries of coal production, value, men employed, days operated, and output per man per day by states, the average tons per man per day is based upon (1) the "reported" number of man-shifts where the operator keeps a record thereof; otherwise upon (2) the "calculated" number of man-shifts obtained by multiplying the average number of men employed underground and on the surface at each mine by the number of days worked by the mine and tipple, respectively.

TABLE XV

Summary of Coal Produced, Value, Men Employed, Days Operated, and Output Per Man Per Day, by States, in 1933. (Exclusive of Product of Truck and Wagon Mines Producing Less Than One Thousand Tons)

State	Total quantity	Total value	Average per ton	Number of employees	Average number of days mines operated	Average tons per man per day
Alabama	8,759,989	$ 13,758,000	$1.57	18,237	148	3.26
Alaska	96,467	481,000	4.99	100	199	4.86
Arizona	10,345	52,000	5.03	23	268	1.68
Arkansas	882,924	2,348,000	2.66	3,671	94	2.57
California, Idaho and Oregon	7,492	27,000	3.60	58	79	1.65
Colorado	5,229,767	11,350,000	2.17	7,908	148	4.46
Georgia	41,382	77,000	1.86	93	234	1.90
Illinois	37,413,145	54,578,000	1.46	44,145	141	6.00
Indiana	13,761,052	17,567,000	1.28	11,199	163	7.52
Iowa	3,194,983	7,217,000	2.26	7,695	138	3.01
Kansas	2,217,622	3,881,000	1.75	3,809	140	4.15
Kentucky	36,099,729	40,748,000	1.13	43,717	170	4.87
Maryland	1,530,748	2,134,000	1.39	2,880	172	3.09
Michigan	406,584	1,171,000	2.88	1,186	130	2.63
Missouri	3,432,212	6,175,000	1.80	5,690	150	4.02
Montana	2,152,207	3,309,000	1.54	1,324	166	9.80
New Mexico	1,226,236	3,071,000	2.50	2,340	168	3.12
North Carolina	2,014	7,000	3.48	10	175	1.15
North Dakota	1,782,272	2,248,000	1.26	1,301	173	7.93
Ohio	19,588,763	23,549,000	1.20	25,442	169	4.55
Oklahoma	1,238,244	2,616,000	2.11	2,974	128	3.26
Pennsylvania, bituminous	79,295,944	108,418,000	1.37	115,453	162	4.24
South Dakota	59,375	104,000	1.75	147	100	4.04
Tennessee	3,774,761	5,255,000	1.39	7,051	161	3.33
Texas	821,878	833,000	1.01	803	162	6.32
Utah	2,674,986	5,109,000	1.91	2,906	176	5.23
Virginia	8,178,642	10,029,000	1.23	9,761	184	4.55
Washington	1,394,068	3,916,000	2.81	2,555	168	3.25
West Virginia	94,343,535	107,124,000	1.14	92,472	196	5.20
Wyoming	4,013,167	8,636,000	2.15	3,753	170	6.29
Total, 1933	333,630,533	445,788,000	1.34	418,703	167	4.78
Total, 1932	309,709,872	406,677,000	1.31	406,380	146	5.22

TABLE XVI

Summary of Coal Produced, Value, Men Employed, Days Operated, and Output Per Man Per Day, by States, in 1934. (Exclusive of Product of Truck and Wagon Mines Producing Less Than One Thousand Tons)

State	Total quantity	Total value	Average per ton	Number of employees	Average number of days mines operated	Average tons per man per day
Alabama	9,142,117	$18,838,000	$2.06	18,851	185	2.62
Alaska	107,508	451,000	4.20	93	217	5.33
Arkansas	856,432	2,564,000	2.99	3,415	102	2.46
Oklahoma	1,208,289	2,846,000	2.36	3,225	124	3.02
Colorado	5,210,933	12,309,000	2.36	8,094	158	4.08
Illinois	41,272,384	64,238,000	1.56	46,067	160	5.62
Indiana	14,793,643	21,838,000	1.48	11,173	171	7.75
Iowa	3,366,992	7,862,000	2.34	7,721	156	2.80
Kansas	2,508,254	4,619,000	1.84	3,744	151	4.45
Missouri	3,352,283	6,278,000	1.87	5,540	141	4.29
Kentucky	38,525,235	60,548,000	1.57	49,509	180	4.33
Maryland	1,627,112	3,089,000	1.90	2,976	176	3.12
Michigan	621,741	1,940,000	3.12	1,556	157	2.54
Montana	2,565,702	3,997,000	1.56	1,590	166	9.73
New Mexico	1,259,323	3,402,000	2.70	2,342	164	3.29
North Dakota	1,753,888	2,363,000	1.35	1,518	174	6.65
South Dakota	42,407	76,000	1.79	91	152	3.07
Ohio	20,690,564	34,774,000	1.68	29,247	167	4.23
Pennsylvania	89,825,875	165,371,000	1.84	126,079	179	3.98
Tennessee	4,135,790	7,514,000	1.82	7,308	185	3.05
Georgia	32,716	80,000	2.45	113	185	1.56
North Carolina	3,140	9,000	2.87	18	221	.79
Texas	759,289	1,145,000	1.51	805	178	5.30
Utah	2,406,183	4,746,000	1.97	2,807	171	5.00
Virginia	9,376,681	16,375,000	1.75	12,207	200	3.84
Washington	1,382,991	4,002,000	2.89	2,161	193	3.32
West Virginia	98,134,393	167,104,000	1.70	105,906	196	4.73
Wyoming	4,367,961	9,591,000	2.20	3,760	188	6.17
Other States	38,196	143,000	3.74	95	189	2.13
Total, 1934	359,368,022	628,112,000	1.75	458,011	178	4.40
Total, 1933	333,630,533	445,788,000	1.34	418,703	167	4.78

TABLE XVII

Summary of Coal Produced, Value, Men Employed, Days Operated, and Output Per Man Per Day, by States, in 1935. (Exclusive of Product of Truck and Wagon Mines Producing Less Than One Thousand Tons)

State	Total quantity	Total value	Average per ton	Total number of employees	Average number of days mines operated	Average tons per man per day
Alabama	8,504,510	$ 18,251,000	$2.15	18,906	161	2.79
Alaska	119,425	502,000	4.20	95	249	5.05
Arizona, California, Idaho, and Oregon	24,844	95,000	3.82	103	140	1.72
Arkansas	1,133,279	3,448,000	3.04	3,743	123	2.47
Colorado	5,910,511	13,675,000	2.31	8,153	177	4.08
Georgia and North Carolina	22,734	58,000	2.55	109	160	1.30
Illinois	44,525,469	69,516,000	1.56	43,748	171	5.97
Indiana	15,754,214	23,722,000	1.51	11,347	176	7.91
Iowa	3,650,163	9,002,000	2.47	8,038	162	2.80
Kansas	2,686,164	4,943,000	1.84	3,896	173	4.00
Kentucky	40,760,939	65,956,000	1.62	52,339	182	4.28
Maryland	1,678,059	3,266,000	1.95	2,962	179	3.17
Michigan	628,384	2,017,000	3.21	1,467	158	2.70
Missouri	3,645,996	6,924,000	1.90	5,710	159	4.02
Montana	2,758,906	4,146,000	1.50	1,571	189	9.30
New Mexico	1,388,877	3,681,000	2.65	2,355	185	3.19
North Dakota	1,955,510	2,395,000	1.22	1,365	188	7.61
Ohio	21,153,151	35,111,000	1.66	29,524	162	4.44
Oklahoma	1,229,398	2,879,000	2.34	3,151	122	3.19
Pennsylvania	91,404,670	172,170,000	1.88	124,109	180	4.10
South Dakota	13,243	21,000	1.59	55	98	2.46
Tennessee	4,137,802	7,435,000	1.80	7,531	181	3.04
Texas	757,529	654,000	.86	792	177	5.42
Utah	2,946,918	6,091,000	2.07	2,752	188	5.70
Virginia	9,667,018	17,128,000	1.77	13,043	189	3.92
Washington	1,559,206	4,686,000	3.01	2,258	192	3.60
West Virginia	99,179,061	169,164,000	1.71	109,315	192	4.74
Wyoming	5,177,142	11,127,000	2.15	3,966	217	6.00
Total, 1935	372,373,122	658,063,000	1.77	462,403	179	4.50
Total, 1934	359,368,022	628,383,000	1.75	458,011	178	4.40

TABLE XVIII

Summary of Coal Produced, Men Employed, Days Operated, and Output Per Man Per Day, by States, in 1936. (Exclusive of Product of Truck and Wagon Mines Producing Less Than One Thousand Tons)

State	Total quantity	Total number of employees	Average number of days mines operated	Average tons per man per day
Alabama	12,229,287	20,491	206	2.90
Alaska	136,593	111	245	5.02
Arizona, Idaho, and Oregon	15,364	53	202	1.43
Arkansas	1,622,787	4,123	152	2.58
Colorado	6,811,802	8,802	191	4.06
Georgia	24,288	94	207	1.25
Illinois	50,926,599	44,347	175	6.55
Indiana	17,822,536	11,801	178	8.48
Iowa	3,960,700	8,741	163	2.78
Kansas	2,944,028	3,755	163	4.80
Kentucky	47,521,950	54,089	202	4.34
Maryland	1,703,589	2,916	186	3.14
Michigan	626,145	1,400	164	2.73
Missouri	3,984,999	5,654	171	4.13
Montana [1]	2,988,524	1,459	195	10.53
New Mexico	1,596,775	2,392	202	3.30
North Dakota [1]	2,215,335	1,408	192	8.20
Ohio	24,110,078	29,853	183	4.42
Oklahoma	1,540,303	3,153	155	3.15
Pennsylvania	109,887,470	127,211	205	4.22
South Dakota [1]	41,331	50	231	3.58
Tennessee	5,108,195	7,982	203	3.16
Texas [1]	842,624	810	192	5.42
Utah	3,246,565	3,057	186	5.70
Virginia	11,661,636	14,882	196	4.00
Washington	1,812,104	2,625	200	3.46
West Virginia	117,925,706	111,468	216	4.89
Wyoming	5,780,590	4,477	215	6.00
Total, 1936	439,087,903	477,204	199	4.62
Total, 1935	372,373,122	462,403	179	4.50

[1] Includes figures on lignite compiled by Bureau of Mines.

TABLE XIX

Summary of Coal Produced, Men Employed, Days Operated, and Output Per Man Per Day, by States, in 1937. (Exclusive of Product of Truck and Wagon Mines Producing Less Than One Thousand Tons)

State	Total quantity	Average number of employees	Average number of days mines operated	Average tons per man per day
Alabama	11,760,221	22,613	200	2.74
Alaska	128,608	123	207	5.16
Arkansas	1,465,468	4,253	136	2.61
Colorado	5,338,492	9,432	181	4.21
Illinois	42,824,674	42,449	168	7.25
Indiana	15,546,298	11,238	174	9.10
Iowa	1,731,173	8,720	146	2.87
Kansas	2,520,166	3,574	173	4.68
Kentucky	45,216,686	55,596	192	4.41
Maryland	1,283,125	2,525	189	3.25
Michigan	180,969	1,343	145	2.88
Missouri	2,950,424	6,436	152	4.18
Montana [1]	2,767,758	1,503	186	10.62
New Mexico	1,552,612	2,608	208	3.17
North Dakota [1]	1,577,216	1,475	181	8.41
Ohio	20,792,181	30,294	185	4.49
Oklahoma	1,411,648	3,147	142	3.58
Pennsylvania	96,758,008	133,897	199	4.16
South Dakota [1]	26,444	47	165	6.05
Tennessee	4,812,564	8,465	195	3.17
Texas [1]	861,793	819	199	5.59
Utah	3,500,403	3,417	189	5.88
Virginia	13,017,015	16,494	200	4.18
Washington	1,445,024	2,882	204	3.40
West Virginia	114,227,504	113,643	209	5.00
Wyoming	5,530,230	4,743	204	6.11
Other States [2]	10,871	128	165	1.15
Total, 1937	399,237,575	491,864	193	4.69
Total, 1936	439,087,903	477,204	199	4.62

[1] Includes figures on lignite from Bureau of Mines; "Loaded at mines for shipment," as published by Bureau of Mines, included under "all-rail"; "commercial sales by truck or wagon" and "other sales to local trade, etc.," as published by Bureau of Mines, included under "truck deliveries including local sales."

[2] Arizona, California, Georgia, Idaho, and Oregon.

Gypsum

Gypsum depends for markets almost entirely upon building construction and particularly residential building. It is natural, therefore, that when building construction activities dropped off after 1929 one result was a decline in production and value of gypsum.

Most of the calcined gypsum produced is used to make building materials such as plasters, wallboards, partition tile, and insulating materials, and smaller quantities are sold to manufacturing companies for special purposes. Uncalcined or raw gypsum is used chiefly by the cement industry as a retarder, although land plaster and other outlets are important at times.

Raw or crude gypsum is not and has never been a high-priced product and in recent years there has been a tendency among the producers of raw gypsum to manufacture and attempt to increase the markets for gypsum products rather than to increase sales of the crude material.

Nationally, Iowa ranks third in the value and production of gypsum and is outranked only by New York and Michigan in the order named. The entire industry in the State has been centered in the immediate vicinity of Fort Dodge, Webster county since 1934. Prior to that time a minor percentage of the total production was obtained from Appanoose county.

Gypsum followed the general trend of mineral production in Iowa, but was somewhat above the average during the period of this report. The tonnage of crude gypsum mined dropped off in 1933 but increased each year since then except during 1938. The largest increase came in 1936 when it amounted to approximately 50 per cent over 1935 and was greater than any year since the beginning of the depression.

Sales of uncalcined gypsum decreased in tonnage and total value in 1933 and in 1935, recovered in 1934 and increased greatly in 1936, the last year on which data were collected. The value and tonnage of "calcined gypsum sold" fell off in 1933 but showed increases in 1934, 1935 and 1936.

Table XX shows production figures for Iowa for the period 1932-1938. A revised method of canvassing the gypsum industry was begun in 1937 by the Bureau of Mines at the request of the producing companies. By this revision no data were collected by states after 1936 on gypsum "sold calcined" and "sold uncalcined". This has a bearing

TABLE XX

Production of Gypsum in Iowa from 1932 to 1938

Year	Active mines	Crude gypsum mined		Sold uncalcined		Sold calcined		Total value
		Short tons	Value	Short tons	Value	Short tons	Value	
1932	7	178,087		63,931	$ 91,267	105,788	$1,377,147	$1,468,414
1933	8	172,555		58,863	75,083	104,371	1,282,324	1,357,407
1934	8	180,271		63,510	97,626	115,282	1,572,730	1,670,356
1935	7	230,203	$233,926	54,150	74,914	151,366	2,109,010	2,215,770[a]
1936	8	344,221	352,834	97,511	146,233	217,088	3,115,155	3,261,388
1937	8	387,255	533,162	(b)	(b)	(b)	(b)	(b)
1938	8	364,920	495,856	(b)	(b)	(b)	(b)	(b)

a Revised.
b Data not collected.

on "total value" recorded in the tables including gypsum in Iowa, in that the value of crude gypsum is substituted for total value of the calcined and uncalcined products. The total value of crude is much less than the combined value of calcined and uncalcined gypsum, and in Table I this makes it appear that total values in 1937 and 1938 were far below average, whereas these two years were actually well above the average of the period of this report. Other changes affect the figures for the United States "total value" and "calcined gypsum products sold".

The drastic decrease in production of gypsum in the United States which began in 1930 continued until 1933 and the amount produced in 1933 was less than in any year since 1905. The price dropped an additional 6 per cent in 1933, but late in that year the market started an upswing. In 1934 the total production increased 15 per cent, but was still below the general recovery level because of the lag of residential building. Increases in production of both raw and calcined gypsum continued through 1935, and in 1936 the crude product increased an additional 42 per cent and the sales of gypsum products increased 29 per cent over 1935. The advance was due principally to increase in privately financed building construction. Further increases continued through the early months of 1937 and the total value of uncalcined and calcined gypsum for 1937 exceeded that for 1936, but production fell off during the last half of the year. Activity continued to be slower through much of 1938 but in the last quarter improvement was definitely under way.

Table XXI shows production of gypsum in the United States for the period of this report.

During 1937 products derived from byproduct gypsum (first util-

TABLE XXI

Production of Gypsum in the United States from 1932 to 1938

Year	No. of active establishments [a]	Crude gypsum mined		Sold or Used by Producers				
				Uncalcined		Calcined		
		Short tons	Value	Short tons	Value	Short tons	Value	Total value
1932	57	1,416,274		444,816	$ 929,567	890,495	$11,976,719	$12,906,286
1933	61	1,335,192		420,935	806,325	821,738	11,121,153	11,927,478
1934	64	1,536,170		512,317	970,828	902,539	12,791,149	13,761,977
1935	57	1,903,880		520,594	1,089,979	1,233,816	17,820,369	18,860,348
1936	59	2,712,510		752,625	1,458,123	1,730,687	24,764,254	26,222,377
1937	58	3,058,166	$4,782,503	860,825[b]	1,920,706[b]	2,643,075[b]	36,879,814[b]	38,800,520[b]
1938	56	2,684,205	4,271,674	756,565[b]	1,681,371[b]	2,556,296[b]	34,574,937[b]	36,256,308[b]

a Each mine, plant or combination mine plant is counted as one establishment; beginning in 1937 plants utilizing by-product gypsum are included.

b Includes gypsum products made from domestic, imported, and by-product crude gypsum sold or used in the United States.

ized about 1925) comprised an appreciable part of the total sales value, and the process for a new product, hydraulic gypsum was patented. In 1938 two new processing plants were opened, one in Georgia and one in Florida.

Gypsum Producers in Iowa

Webster County

Cardiff Gypsum Co., 903 Central Avenue, Fort Dodge, Iowa. Mine and mill at Gypsum, Iowa.

Certain-teed Products Corporation, Att: E. H. Laney, Assistant Auditor, 100 E. 42nd Street, New York, New York. Mill and mine at Fort Dodge.

A. R. Eno, Fort Dodge, Iowa.

Fort Dodge Plaster Co., J. M. Norton, Manager, 1420 Seventh Avenue, North, Fort Dodge, Iowa. Mine at Fort Dodge.

Hawkeye Gypsum Products Co., John E. Gustin, Manager, Fort Dodge, Iowa. Mine at Fort Dodge.

Johnston Clay Works, Inc., 214 First National Bank Building, Fort Dodge, Iowa. Mine at Fort Dodge.

National Gypsum Co., F. E. Davis, Treasurer, 192 Deleware Avenue, Buffalo, New York. Mill and mine at Fort Dodge.

United States Gypsum Co., 300 West Adams Street, Chicago, Illinois. Mill and mine at Fort Dodge.

Wasem Plaster Co., H. W. Wasem, President, Warden Building, Fort Dodge, Iowa. Mill and mine at Fort Dodge.

Limestone

Limestone is utilized chiefly for road metal and concrete and these

uses generally govern the trends of production. Important secondary uses in Iowa are for agricultural purposes and riprap, and during the past few years an increasing amount has been consumed by sugar factories.

The limestone industry had a remarkable history in Iowa during the period 1933-1938. The low of 1933 was well above the average of total production from 1895 to 1925. In 1934 all previous records were broken and although there was a decline in 1935, that year was sixth in rank for the years after 1895. All records were again broken in 1936 when total quantity and total value more than doubled the figures of the previous year. The peak was reached in 1937 when the total quantity produced was 4,272,670 tons valued at $4,261,184 which was more than four times greater than for 1933. Production declined in 1938, but exceeded that of any earlier year except 1937 and the average price per ton was higher than for any year during the period of this report.

Production of limestone for road metal and concrete after a drop in 1933, rallied strongly in 1934 and decreased slightly in 1935. In 1936 there was an increase of more than 100 per cent. Records in total tonnage and value were established in 1937, and in 1938 the advance in prices permitted only a slight decline in value in spite of a sharp drop in quantity produced.

Limestone used for agriculture followed approximately the same trends as that used for road metal and concrete. Riprap had a similar history although the variations in productions and values were more spectacular. Building stone, rubble and flux varied greatly; building stone showed exceptionally high production in 1937, while rubble production was considerably above average in 1933.

It is significant that the number of producers in Iowa increased steadily from 60 in 1933 to 174 in 1937. and that the noncommercial operators and production became proportionally larger each year. The drop in the number of producers in 1938 was due to the increased activity of W. P. A., considered as one operator, which reported an output of 1,739,625 tons valued at $2,392,875, representing 52 per cent of total production and 64 per cent of total value for the year.

Statistics of limestone production in Iowa may be found in Table XXII and more detailed data by counties in Tables XXIV to XXIX. In the latter tables it was necessary to combine counties in order to avoid revealing confidential information.

TABLE XXII

Production of Limestone in Iowa from 1932 to 1938

	Building stone [a]	Rubble	Flux	Rip rap	Road metal and concrete	Railroad ballast	Agriculture	Other limestone	Total
1932									
Short tons	1,672	2,329[b]		23,686	1,475,718[c]		67,663	20,167	1,591,235
Value	$1,929	3,088[b]		19,069	1,283,713[c]		50,983	30,683	1,389,465
Producers	4	2	1	9	47[c]	1	24	4	53[j]
1933									
Short tons	4,270	11,620	3,476	9,690	861,550	46,640	63,610	30,440[d]	1,031,290[k]
Value	$4,402	9,484	3,889	8,830	781,750	21,485	44,649	34,703[d]	909,192
Producers	3	3	2	9	51	5	27	4	60[j]
1934									
Short tons		1,870		67,220	2,035,900[c]		143,386	22,560[e]	2,276,440[k]
Value		$1,752		48,285	1,734,123[c]		96,164	49,086[e]	1,934,364
Producers	2	3	2	14	95	2	24	7[e]	101[j]
1935									
Short tons	4,070	1,790		53,220	1,642,080[c]		104,080	33,840[f]	1,840,080[k]
Value	$3,685	1,623		44,267	1,447,993[c]		82,107	67,763[f]	1,645,937
Producers	3	4	2	12	103[c]	1	20	7[f]	105[j]
1936									
Short tons		1,916	11,457	120,230	3,521,170	107,122	222,700	18,950[g]	4,003,550[k]
Value		$1,887	12,070	139,774	2,943,060	48,233	197,688	54,543[g]	3,397,356
Producers	4	3	2	11	118	3	27	7[g]	130[j]
1937									
Short tons	13,830		16,790	260,290	3,621,540	39,690	304,690	8,870[h]	4,272,670
Value	$12,570		17,279	193,392	3,662,185	20,881	301,845	41,298[h]	4,261,184
Producers	4	1	3	31	173	4	58	6[h]	174[j]
1938									
Short tons	2,410			182,180	2,853,890[c]		236,300	34,000[i]	3,323,750
Value	$1,935			113,089	3,313,323[c]		207,883	78,013[i]	3,742,580
Producers	4	3	2	18	69	2	46	17[i]	85[j]

a Chiefly rough construction.
b Includes flux.
c Includes railroad ballast.
d Includes that sold to sugar factories.
e Includes building stone, curbing and flux.
f Includes curbing, flux.
g Includes building stone, curbing and that sold to sugar factories.
h Includes curbing and rubble.
i Includes curbing, rubble and flux.
j From U. S. Mineral Yearbooks, includes some non-operating plants.
k Revised.

In the United States as a whole, as in Iowa, the most important uses of limestone are for road metal and concrete. Following in the order of importance are uses for fluxing, argriculture, railroad ballast and riprap. Their relative importance and other details of production in the United States may be found in Table XXIII in which limestone utilized for cement manufacture is not included. The table shows that total production and total value of limestone decreased in 1933, increased in 1934, decreased slightly in 1935, increased materially in 1936 and 1937 and again decreased in 1938.

In 1933 the value of limestone for all uses increased over the nation except for concrete and road metal which fell off about 6.4 millions of dollars, but in 1934 the values for all uses increased; that for road metal and concrete advanced approximately 8.5 millions of dollars. All values again increased in 1935 except for road metal and concrete, riprap and railroad ballast. In 1936 decreases occured only in limestone used for building stone and rubble, and these decreases were easily offset by increases in other fields which brought about an advance of approximately 60 per cent in total value of all limestone produced. Further increase in 1937 in all items except rubble, riprap and railroad ballast resulted in the largest total production and total value for the period of this report. As in other mineral industries production of limestone in the United States fell off in 1938 except that used for road metal and concrete, rubble, and riprap.

TABLE XXIII

Production of Limestone in the United States from 1932 to 1938

	Building stone [a]	Rubble	Flux	Rip rap	Concrete and road metal	Railroad ballast	Agriculture	Total [b]
1932								
Short tons	50,580	84,570	3,945,170	1,448,040	32,612,550	2,450,970	909,470	46,913,520
Value	$ 77,872	84,308	2,902,847	1,421,024	28,650,198	1,748,412	1,229,107	48,015,748
1933								
Short tons	78,790	79,060	7,982,560	1,566,560	25,820,640	2,786,050	994,540	45,922,280
Value	$108,100	94,046	5,510,445	1,767,541	22,239,698	1,896,308	1,239,724	44,499,311
1934								
Short tons	156,000	190,080	9,230,880	2,490,760	33,209,910	3,614,430	1,612,380	57,501,510
Value	$179,000	179,791	6,297,579	2,668,215	30,749,136	2,549,091	1,788,142	53,790,846
1935								
Short tons	293,050	185,790	12,191,660	1,982,250	30,151,790	3,623,500	2,140,370	57,492,760
Value	$310,878	276,569	7,902,717	1,890,625	26,354,559	2,525,949	2,656,728	50,668,765
1936								
Short tons	156,970	204,700	17,724,880	2,205,700	49,751,570	5,101,580	3,907,710	87,735,740
Value	$272,164	181,415	11,576,156	3,275,193	46,058,424	3,632,649	4,512,703	81,559,984
1937								
Short tons	191,660	107,550	21,311,250	2,769,640	51,108,620	5,033,180	5,004,930	94,577,270
Value	$380,324	136,028	14,685,215	2,891,936	49,547,350	3,588,974	6,454,695	90,901,877
1938								
Short tons	166,260	155,370	9,692,130	2,590,770	54,357,130	3,187,770	4,367,410	81,679,690
Value	$316,772	194,621	6,933,621	3,107,511	52,387,376	2,210,881	5,637,485	82,286,555

[a] Rough construction except as noted.
[b] Including rough architectural, finished building stone, curbing, flagging, paving, stone used in sugar factories, glass factories and paper mills and other uses.

TABLE XXIV

Production of Limestone in Iowa in 1933

Counties	Number of producers [a]	Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value
Allamakee (1), Clayton (1), Delaware (2)	4	45,771	$ 33,054	(c)	(c)	45,771	$ 33,054
Black Hawk (3), Bremer (1), Cerro Gordo (1), Floyd (1)	6	62,787	84,462	22,965	$32,708	85,752	117,170
Buchanan (1), Johnson (2), Linn (5)	8	122,875	115,742	7,600	6,807	130,475	122,549
Dubuque (3), Jackson (2), Jones (5)	10	164,815	166,179	30,542	22,900	195,357	189,079
Cedar (1), Clinton (4)	5	63,620	64,275	(c)	(c)	63,620	64,275
Scott (3), Louisa (1)	4	135,020	96,552	17,514	12,696	152,534	109,248
Davis (2), Keokuk (1), Lee (3), Mahaska (1), Van Buren (2), Wapello (1), Wayne (1)	11	128,277	106,425	(c)	(c)	128,277	106,425
Grundy (1), Hardin (1), Madison (3), Marshall (2), Tama (1)	8	161,488	125,313	24,909	17,189	186,397	142,502
Fremont (1), Montgomery (1), Woodbury (2)	4	43,099	24,890	(c)	(c)	43,099	24,890
Total, 1933	60	927,752	$816,892	103,530	$92,300	1,031,290[d]	$ 909,192
Total, 1932	54	1,491,861	1,295,039	89,005	83,583	1,591,235	1,389,465

a Commercial and noncommercial.
b Other uses includes: Agricultural, sugar factories, building stone, rubble, riprap, flux, poultry grit.
c Included under road metal, concrete and railroad ballast for purposes of concealment.
d Adjusted.

TABLE XXV

Production of Limestone in Iowa in 1934

Counties	Number of producers [a]	Building stone, curbing, rubble, riprap		Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Bremer (2), Buchanan (2), Chickasaw (2), Fayette (1), Howard (1), Winneshiek (2)	10			128,369	$119,597	801	$ 760	129,170	$120,357
Butler (2), Cerro Gordo (3), Floyd (1), Mitchell (1)	7			53,703	45,574			53,703	45,574
Worth (2)	2			135,146	135,146			135,146	135,146
Clayton (3), Dubuque (4)	7	20,430	$15,566	295,292	253,600	28,727	20,920	344,449	290,086
Benton (2), Blackhawk (2), Grundy (1), Hardin (1), Tama (1)	7			125,428	76,162	20,606	40,275	146,034	116,437
Delaware (4)	4			68,878	51,928	2,000	1,000	70,878	52,928
Johnson (2), Linn (5)	7			182,467	185,497	42,158	34,249	224,625	219,746
Cedar (1), Jones (5), Muscatine (2), Scott (3)	11	20,810	14,952	314,729	190,989	36,808	26,598	372,347	232,539
Clinton (6), Jackson (5)	11	(c)	(c)	109,610	97,047	1,700	1,490	111,310	98,537
Henry (1), Keokuk (2), Washington (1)	4			79,219	76,964			79,219	76,964
Lee (2), Van Buren (2)	4			92,103	89,785	(c)	(c)	92,103	89,785
Davis (1), Jefferson (1), Wapello (1)	3			112,803	99,548			112,803	99,548
Appanoose (2), Lucas (1), Mahaska (2)	5			92,227	83,221			92,227	83,221
Madison (4), Marshall (4)	8	3,009	2,941	148,237	117,373	31,169	18,959	182,415	139,273
Clarke (2), Decatur (3), Wayne (1)	6			64,814	55,023			64,814	55,023
Adams (1), Fremont (1), Montgomery (2), Pottawattamie (1)	5			65,200	79,200			65,200	79,200
Total, 1934	101	44,249	$33,459	2,068,225	$1,756,654	163,969	$144,251	2,276,440[d]	$1,934,364
Total, 1933	60			927,752	816,892	103,530	92,300	1,031,290[d]	909,192

a Commercial and noncommercial.
b Includes limestone for agriculture, flux, and other uses.
c Included in road metal, concrete and railroad ballast column for purpose of concealment.
d Adjusted.

TABLE XXVI

Production of Limestone in Iowa in 1935

Counties	Number of producers [a]	Building stone, curbing, rubble, riprap		Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Allamakee (3), Clayton (6), Dubuque (5)	14	16,824	$14,411	353,371	$284,765	28,299	$27,397	398,494	$326,573
Chickasaw (1), Fayette (3), Floyd (1), Mitchell (1), Winneshiek (4)	10			126,410	122,904			126,410	122,904
Black Hawk (4), Bremer (2), Buchanan (2), Delaware (3)	11			148,827	134,136	3,846	3,541	152,673	137,677
Cerro Gordo (1), Franklin (1), Hardin (1), Marshall (3)	6			63,557	56,196	29,835	57,905	93,392	114,101
Benton (1), Butler (2), Grundy (1), Tama (2)	6			54,316	45,297			54,316	45,297
Jackson (2), Johnson (3), Jones (5), Linn (7)	17	20,474	14,804	134,214	123,143	29,270	22,619	183,958	160,566
Cedar (1), Clinton (1), Louisa (1), Muscatine (2), Scott (3)	8	20,809	16,988	124,903	94,264	32,610	25,024	178,322	136,276
Des Moines (1), Henry (1), Keokuk (2), Washington (1)	5			112,830	109,356			112,830	109,356
Jefferson (1), Mahaska (2), Wapello (1)	4			102,786	100,764			102,786	100,764
Appanoose (1), Davis (1), Lee (3), Van Buren (3)	8			131,870	121,888	(c)	(c)	131,870	121,888
Clarke (1), Decatur (2), Madison (4), Wayne (2)	9	(c)	(c)	179,959	149,026	9,623	7,263	189,582	156,289
Adair (2), Cass (1), Pottawattamie (1)	4			83,792	82,599			83,792	82,599
Fremont (2), Montgomery (1)	3			31,647	31,647			31,647	31,647
Total, 1935	105	58,107	$46,203	1,648,482	$1,455,985	133,483	$143,749	1,840,080[d]	$1,645,937
Total, 1934	101	44,249	33,459	2,068,225	1,756,654	163,969	144,251	2,276,440[d]	1,934,364

a Commercial and noncommercial.
b Includes limestone for agriculture, flux, sugar factories, and other uses.
c Included in road metal, concrete and railroad ballast column for purpose of concealment.
d Adjusted.

TABLE XXVII

Production of Limestone in Iowa in 1936

Counties	Number of producers [a]	Building stone, curbing, rubble, riprap		Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Allamakee (6), Bremer (1), Chickasaw (1), Fayette (3), Howard (1), Mitchell (1), Winneshiek (1)	14			451,074	$360,146	6,982	$6,982	458,056	$367,128
Butler (1), Floyd (1), Grundy (1), Worth (1)	4			66,382	41,457			66,382	41,457
Cerro Gordo (2), Hardin (1), Marshall (3)	6	(c)	(c)	330,460	244,812	48,452	84,234	378,912	329,046
Benton (2), Black Hawk (6), Buchanan (4)	12			212,190	175,691	17,321	13,464	229,511	189,155
Clayton (6), Delaware (3), Linn (5)	14	9,635	$ 9,024	281,521	241,942	9,295	9,091	300,451	260,057
Clinton (2), Dubuque (4), Jackson (1), Jones (6)	13	12,464	10,554	245,211	214,415	45,787	35,659	303,462	260,628
Iowa (1), Keokuk (2), Poweshiek (2), Tama (2)	7			269,913	235,303			269,913	235,303
Henry (2), Johnson (3), Lee (1), Van Buren (4), Washington (2)	12			468,133	364,303	(c)	(c)	468,133	364,303
Cedar (2), Des Moines (3), Louisa (1), Muscatine (1), Scott (4)	11	89,222	110,394	408,013	318,443	80,957	74,794	578,192	503,631
Davis (1), Jefferson (2), Mahaska (1), Wapello (1)	5			267,824	237,634			267,824	237,634
Lucas (1), Marion (2), Warren (1)	4			39,516	37,819	5,364	5,364	44,880	43,183
Appanoose (1), Monroe (1), Wayne (1)	3			92,400	108,500			92,400	108,500
Clarke (1), Decatur (3), Madison (5)	9	(c)	(c)	283,698	227,693	15,868	12,603	299,566	240,296
Adair (1), Cass (1), Guthrie (1)	3			33,134	26,393	500	500	33,634	26,893
Ringgold (1), Taylor (1), Union (1)	3			29,734	27,993			29,734	27,993
Adams (2), Montgomery (1), Page (2)	5			42,909	38,349			42,909	38,349
Fremont (2), Mills (2), Pottawattamie (1)	5			139,577	123,800			139,577	123,800
Total, 1936	130	111,321	$129,972	3,661,689	$3,024,693	230,526	$242,691	4,003,550[d]	$3,397,356
Total, 1935	105	58,107	46,203	1,648.482	1,455,985	133,483	143,749	1,840,080[d]	1,645,937

a Commercial and noncommercial.
b Includes limestone for agriculture, flux, sugar factories, and other uses.
c Included in road metal, concrete and railroad ballast column for purpose of concealment.
d Adjusted.

TABLE XXVIII

Production of Limestone in Iowa in 1937

Counties	Number of producers [a]	Building stone, curbing, rubble, riprap		Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Allamakee (5), Clayton (6), Dubuque (4)	15	188,701	$127,792	295,702	$295,906	12,322	$12,422	496,725	$436,120
Chickasaw (1), Howard (1), Winneshiek (3)	5			88,206	102,175	5,072	3,297	93,278	105,472
Cerro Gordo (1), Hardin (3), Mitchell (3)	7	130	15	50,065	47,456	29,114	65,317	79,309	112,788
Kossuth (1), Palo Alto (1)	2	1,750	938					1,750	938
Bremer (3), Butler (2), Fayette (4), Floyd (4)	13			187,690	176,621	12,586	13,087	200,276	189,708
Black Hawk (5), Grundy (2), Marshall (5)	12	(c)	(c)	321,667	325,776	18,159	14,532	339,826	340,308
Benton (3), Buchanan (2), Delaware (2), Linn (7)	14	98	75	353,372	306,994	51,956	51,419	405,426	358,488
Cedar (3), Johnson (4), Jones (6)	13	14,744	12,349	268,985	249,124	26,577	19,632	310,306	281,105
Clinton (2), Jackson (4), Muscatine (5), Scott (4)	15	58,683	58,253	303,763	269,208	89,878	91,101	452,324	418,562
Des Moines (4), Henry (2), Lee (2), Louisa (1), Van Buren (3), Washington (3)	15	4,760	3,161	451,071	474,244	273	245	456,104	477,650
Jefferson (3), Keokuk (3)	6	3,112	1,756	178,982	196,745	1,630	1,467	183,724	199,968
Mahaska (4), Poweshiek (1), Tama (1)	6	500	500	225,230	241,973	1,000	850	226,730	243,323
Appanoose (3), Davis (2), Wapello (3)	8			215,121	232,195	991	754	216,112	232,949
Lucas (2), Monroe (2), Wayne (1)	5			184,155	188,950			184,155	188,950
Clarke (2), Decatur (4), Madison (7), Marion (2), Warren (1)	16	(c)	(c)	283,942	254,751	86,175	96,345	370,117	351,096
Adair (2), Dallas (1), Guthrie (1)	4			31,335	37,300	1,000	1,250	32,335	38,550
Adams (3), Ringgold (1), Union (2)	6	420	225	104,670	133,183	360	300	105,450	133,708
Montgomery (3), Page (1), Taylor (1)	5	840	450	11,039	24,213			11,879	24,663
Fremont (2), Mills (2), Pottawattamie (2)	6			105,681	125,338			105,681	125,338
Undistributed (noncommercial)	1			1,150	1,500			1,150	1,500
Total, 1937	174	273,734[d]	$205,514	3,661,826	$3,683,652	337,110[d]	$372,018	4,272,670[d]	$4,261,184
Total, 1936	130	111,321	129,972	3,661,689	3,024,693	230,526	242,691	4,003,550[d]	3,397,356

a Commercial and noncommercial.
b Includes limestone for agriculture, flux, sugar factories, and other uses.
c Included in road metal, concrete and railroad ballast column for purpose of concealment.
d Adjusted.

TABLE XXIX

Production of Limestone in Iowa in 1938

Counties	Number of producers [a]	Building stone, curbing, rubble, riprap		Road metal, concrete, railroad ballast		Other uses [b]		Total	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
Allamakee (2), Clayton (4), Dubuque (2), Jackson (3)	11	75,026	$39,516	73,818	$57,971	14,328	$13,612	163,172	$111,099
Cerro Gordo (1), Floyd (2), Howard (2), Mitchell (1)	6	(c)	(c)	31,834	22,152	18,165	31,537	49,999	53,689
Black Hawk (3), Bremer (2), Butler (1), Fayette (2)	8	750	1,000	91,893	67,812	13,075	11,465	105,718	80,277
Delaware (1), Jones (6)	7	6,851	5,579	119,080	80,771	22,969	16,177	148,900	102,527
Clinton (3), Muscatine (3), Scott (2)	8	41,297	30,588	179,112	136,798	88,867	70,260	309,276	237,646
Johnson (2), Linn (5), Washington (1)	8	4,785	3,742	151,844	145,842	13,312	13,012	169,941	162,596
Hardin (2), Marion (1), Marshall (2), Story (1)	6			92,920	82,288	36,396	86,616	129,316	168,904
Des Moines (1), Lee (1), Louisa (1), Van Buren (5)	8	(c)	(c)	106,068	85,751	29,767	24,925	135,835	110,676
Keokuk (1), Mahaska (1), Wapello (1)	3			77,284	69,044			77,284	69,044
Appanoose (1), Lucas (2), Warren (1)	4	300	225	42,240	51,940	7,000	7,000	49,540	59,165
Decatur (1), Guthrie (2), Harrison (1), Madison (2), Ringgold (2)	8	(c)	(c)	140,255	94,976	11,891	10,320	152,146	105,146
Adams (1), Fremont (1), Montgomery (1)	3			23,250	20,000	1,715	2,373	24,965	22,373
Undistributed (noncommercial)	5	54,370	32,750	1,726,343	2,400,674	26,945	25,864	1,807,652	2,459,280
Total, 1938	85	183,379	113,400	2,855,941	3,316,019	284,430	313,161	3,323,750	3,742,580
Total, 1937	174	273,734[d]	205,514	3,661,826	3,683,652	337,110[d]	372,018	4,272,670[d]	4,261,184

a Commercial and noncommercial.
b Includes limestone for agriculture, flux, sugar factories, and other uses.
c Included in road metal, concrete and railroad ballast column for purpose of concealment.
d Adjusted.

Limestone Operators in Iowa

Noncommercial

Adair County

Adair County Highway Department, County Engineer, Greenfield, Iowa.

Adams County

Adams County Highway Department, Corning, Iowa.

City of Corning, Highway Department, Corning, Iowa.

Allamakee County

Allamakee County Highway Department, Waukon, Iowa.

Appanoose County

Appanoose County Highway Department, County Engineer, Centerville, Iowa.

C. C. C. Camp 14, Drakesville, Iowa.

Benton County

Benton County Highway Department, Vinton, Iowa.

Blackhawk County

Blackhawk County Highway Department, Waterloo, Iowa.

City of Cedar Falls, Cedar Falls, Iowa.

City of Waterloo, Waterloo, Iowa.

Bremer County

Bremer County Highway Department, Waverly, Iowa.

Buchanan County

Buchanan County, County Engineer, Independence, Iowa.

Butler County

Butler County, County Engineer, Allison, Iowa.

Cass County

Cass County Highway Department, Atlantic, Iowa.

Cedar County

Cedar County Highway Department, Tipton, Iowa.

Cerro Gordo County

Cerro Gordo County Highway Department, Mason City, Iowa.

Chickasaw County

Chickasaw County, County Engineer, New Hampton, Iowa.

Clarke County

Clarke County, County Engineer, Osceola, Iowa.

Clayton County

Clayton County, County Engineer, Elkader, Iowa.

Clinton County
Clinton County Highway Department, Clinton, Iowa.
Davis County
Davis County Highway Department, Bloomfield, Iowa.
Decatur County
Decatur County Highway Department, Leon, Iowa.
Soil Conservation Committee, Grand River, Iowa.
Delaware County
Delaware County, County Engineer, Manchester, Iowa.
Des Moines County
City of Burlington, Burlington, Iowa.
Des Moines County, County Engineer, Burlington, Iowa.
Dubuque County
Dubuque County Highway Department, County Engineer, Dubuque, Iowa.
Fayette County
Fayette County Highway Department, West Union, Iowa.
Floyd County
Floyd County Highway Department, Charles City, Iowa.
Franklin County
Franklin County, County Engineer, Hamilton, Iowa.
Fremont County
Fremont County, County Engineer, Sidney, Iowa.
Fremont County Soil Association, Farragut, Iowa.
Grundy County
Grundy County Highway Department, Grundy Center, Iowa.
Guthrie County
County Agricultural Agent, Guthrie, Iowa.
Henry County
Henry County, County Engineer, Mt. Pleasant, Iowa.
Supervisor W. P. A., Mt. Pleasant, Iowa.
Howard County
Howard County, County Engineer, Cresco, Iowa.
Humboldt County
City of Humboldt Highway Department, Humboldt, Iowa.
Jackson County
Jackson County Highway Department, Maquoketa, Iowa.

Jefferson County

Jefferson County Highway Department, County Engineer, Fairfield, Iowa.

Johnson County

Johnson County Highway Department, County Engineer, Iowa City, Iowa.

Jones County

Jones County, County Engineer, Anamosa, Iowa.

Men's Reformatory, Anamosa, Iowa.

Keokuk County

Keokuk County, County Engineer, Sigourney, Iowa.

Lee County

Lee County Highway Department, Fort Madison, Iowa.

Linn County

City of Cedar Rapids Street Department, Cedar Rapids, Iowa.

Linn County, County Engineer, Cedar Rapids, Iowa.

Louisa County

Louisa County, County Engineer, Wapello, Iowa.

Lucas County

Lucas County, County Engineer, Chariton, Iowa.

Lucas County Farm Bureau, County Board of Supervisors, Chariton, Iowa.

Madison County

Madison County Highway Department, Winterset, Iowa.

Mahaska County

Mahaska County, County Engineer, Oskaloosa, Iowa.

Marion County

Soil Conservation Service, Knoxville, Iowa.

Marshall County

Marshall County, County Engineer, Marshalltown, Iowa.

Mills County

Mills County, County Engineer, Glenwood, Iowa.

Mitchell County

Mitchell County, County Highway Engineer, Osage, Iowa.

Monroe County

Monroe County, County Engineer, Albia, Iowa.

Montgomery County

Montgomery County Highway Department, Red Oak, Iowa.

U. S. Department of Agriculture, Soil Conservation Association, C. C. C., Red Oak, Iowa.

Muscatine County

Muscatine County Highway Department, Muscatine, Iowa.

Works Progress Administration, Supervisor, Conesville, Iowa.

Page County

Soil Conservation Service, Experiment Station, Box 341, Clarinda, Iowa.

Pottawattamie County

Pottawattamie County Highway Department, Council Bluffs, Iowa.

Poweshiek County

Poweshiek County Highway Department, Montezuma, Iowa.

Ringgold County

Ringgold County, County Enginer, Mt. Ayr, Iowa.

Scott County

Scott County Highway Department, Davenport, Iowa.

Tama County

Tama County Highway Department, Toledo, Iowa.

Taylor County

Taylor County Highway Department, Bedford, Iowa.

Union County

Union County, Board of County Supervisors, Creston, Iowa.

Van Buren County

Farm Bureau Soils Committee, Keosauqua, Iowa.

Van Buren County Highway Department, Keosauqua, Iowa.

Wapello County

Wapello County Highway Department, Ottumwa, Iowa.

Warren County

Warren County Highway Department, Indianola, Iowa.

Washington County

Washington County Highway Department, Washington, Iowa.

Wayne County

Wayne County Highway Department, Corydon, Iowa.

Winneshiek County

Winneshiek County Highway Department, Decorah, Iowa.

Worth County

Worth County Highway Department, Northwood, Iowa.

State of Iowa

Property & Epuipment Division, Ames, Iowa.

Administrator, Iowa Works Progress Administration, Royal Union Life Building, Des Moines, Iowa.

Limestone Operators in Iowa

Commercial

Allamakee County

Halvorson Bros., Rochester, Minnesota. Quarry at Lansing.

Roverud Bros., Spring Grove, Minnesota. Pool Hill Quarry at New Albin.

E. C. Schroeder, McGregor, Iowa. Martin Manton Quarry at Harpers Ferry.

Hess Bros., Lansing, Iowa. Johnson Quarry.

Edward Anderson, Lansing, Iowa.

Appanoose County

Centerville Limestone Co., Centerville, Iowa.

Dixon Construction Co., Centerville, Iowa.

Benton County

Say Raymond, Garrison, Iowa.

Black Hawk County

A. C. Newton, LaPorte, Iowa.

Concrete Materials Co., Box 790, Cedar Rapids, Iowa. Portable Plants.

Gill & Mullen, LaPorte City, Iowa.

R. G. Holm, Waterloo, Iowa.

Harold E. Pint, Raymond, Iowa.

Frank Frost, Jesup, Iowa.

Bremer County

Joseph Alcock, New Hampton, Iowa. Fredrika Quarry, Fredrika, Iowa.

Schield Bros., Waverly, Iowa. Colburn Quarry.

Buchanan County

Lewis V. T. Francis, Fairbank, Iowa. Quarry at Jesup.

Butler County

R. W. Phillips, Rockwell, Iowa. Portables.

Carroll County

Emery Construction Co., Coon Rapids, Iowa.

Cedar County

Donald P. Thomson, Mt. Vernon, Iowa. Quarry at Mechanicsville.

Cerro Gordo County

N. W. States Portland Cement Co., Mason City, Iowa.

Stoddard Stone Products Co., 500 14th Street, N. E., Mason City, Iowa.

Clarke County

W. C. Busick, Osceola, Iowa.

Willis Busick, Osceola, Iowa.

Clayton County

Eberhard Construction Co., Guttenberg, Iowa.

H. L. Leas, Monona, Iowa.

E. C. Schroeder, McGregor, Iowa.

Clinton County

Harry Belby, Charlotte, Iowa.

C. T. Hanrahan, Charlotte, Iowa.

Adolf Thiessen, Charlotte, Iowa.

George T. Smith, 715 Sixth Avenue, South, Clinton, Iowa. Nagel's Quarry at Lyons.

Decatur County

Sargent Bros., Inc., 411 E. Grand Avenue, Des Moines, Iowa. Quarry at Decatur.

Des Moines County

Henry Roscum, Burlington, Iowa.

Dubuque County

Dubuque Stone Products Co., 2900 Rhomberg Avenue, Dubuque, Iowa.

John Rider Wallis, Dubuque, Iowa. Horseshoe Bluff Quarries.

M. F. Simon, Farley, Iowa.

Fayette County

L. H. Stranahan, Fayette, Iowa.

Floyd County

Clyde Stevens, Floyd, Iowa. Knowlton Quarry.

E. J. Wilcox and Sons, Floyd, Iowa.

Fremont County

Hartsell & Evans, Thurman, Iowa.

Guthrie County

Boyd Crandall, Guthrie Center, Iowa.

Fred B. Owen, Guthrie Center, Iowa. Quarry at Redfield.

Hardin County

Pearce Limestone Corp., Gifford, Iowa.

Iowa Limestone Co., 907 Bankers Trust Building, Des Moines, Iowa. Quarry at Alden.

M. B. Musgrave, Woodbine, Iowa.

Henry County

Hamill Limestone Co., Lockridge, Iowa.

Paul Niemann, West Union, Iowa.

Iowa County

E. D. Wahl, Victor, Iowa.

Jackson County

C. C. Putnam, Hager City, Wisconsin. Riching & Keeney Quarry.

H. C. Roberts, Maquoketa, Iowa.

Hurst Stone Co., R. R. No. 3, Maquoketa, Iowa.

Johnson County

River Products Co., 20-21 Schneider Building, Iowa City, Iowa. Quarry at Coralville.

Jones County

Myron Baker Contractor, Independence, Iowa. Portable crushers all over Iowa.

Charles W. Zimmer, Anamosa, Iowa. Quarry in Cass township.

Columbia Quarry, G. J. Albright, 612 C Avenue, N. W., Cedar Rapids, Iowa. Columbia Quarry, Stone City.

Merle Ballou, Olin, Iowa.

Willis Johnson, Stone City, Iowa.

Fall Brothers, Olin, Iowa.

H. Dearborn Sons, Stone City, Iowa. Stone City Quarry.

Malcolm Vernon, Olin, Iowa.

Theodore Patnode, Stone City, Iowa.

Lee County

McManus Quarries Co., Inc., 112 Masonic Building, Keokuk, Iowa.

Driscoll & Hayes, Farmington, Iowa. Quarry at Belfast.

Fred Osborne, Denmark, Iowa.

Keokuk Quarry & Construction Co., 1325 Main Street, Keokuk, Iowa.

Oral France, Martinsburg, Iowa. Quarry at Ollie, Iowa.

Linn County

Larimer & Shafer, Inc., E. Moore, Recorder, First Avenue and Second Street, Cedar Rapids, Iowa.

Art Lanning, Alburnett, Iowa. Lafayette Quarry.

J. G. Vernon, Marion, Iowa.

Lanning & Fulkerson, Marion, Iowa.
G. W. Gaines, Lisbon, Iowa.
Dewees & Whitney, Marion, Iowa.
Dewees & Smith, R. F. D. No. 1, Springville, Iowa.
I. H. Whitman, Lisbon, Iowa.
John Vernon, Springville, Iowa.
Dan Thompson, Mt. Vernon, Iowa.
A. R. Gaines, Mt. Vernon, Iowa.

Madison County

Hawkeye Portland Cement Co., 802 Hubbell Building, Des Moines, Iowa. Quarry at Earlham.
Sargent Bros., Inc., 411 E. Grand Avenue, Des Moines, Iowa. Quarry at Winterset.
Winterset Limestone Co., Winterset, Iowa.
Madison County Limestone Co., Winterset, Iowa.

Mahaska County

John P. Abramson Construction Co., Des Moines, Iowa.

Marion County

Pella Limestone Co., Knoxville, Iowa. Quarry at Pella.
A. K. Verrifs, Pella, Iowa.
E. Groenendyke, Tracy, Iowa.

Marshall County

Chicago & N. W. Ry. Co., Quarry at Marshalltown, Iowa.
LeGrand Limestone Co., 105 W. Madison Street, Chicago, Illinois. Quarry at Lake View, Iowa.

Mitchell County

Falk & Litzelman, Osage, Iowa. Quarry at Rudolph Nitardy at St. Ansgar. Quarry of Gaylord Snyder at Osage, Iowa.
Kollman Bros., Osage, Iowa. Quarry at New Haven.
H. L. Wilson Estate, Osage, Iowa. Osage Stone Quarry.

Montgomery County

Albert Mulvenna, Red Oak, Iowa.

Muscatine County

C. C. Putnam, Hager City, Wisconsin. Schroder Quarry at Montpelier or Princeton.
Otto Wendling, 1549 Washington Street, Muscatine, Iowa. Quarry at Moscow.

Pocahontas County

N. W. States Portland Cement Co., Gilmore Portland Cement Corp., Mason City, Iowa.

Pottawattamie County

Kelley Construction Co., 532 46th Street, Des Moines, Iowa. Quarry at Macedonia.

Ringgold County

Harco Construction Co., Mount Ayr, Iowa. Watterson Quarry.

Scott County

Dewey Portland Cement Co., 409 Scarrett Building, Kansas City, Missouri.

Falk & Litzelman, Osage, Iowa. Quarry at Bettendorf.

Linwood Stone Products Co., 928 Davenport Bank Building., Davenport, Iowa. Quarry at Linwood.

Story County

Maudlin Construction Co., Box 134, Webster City, Iowa.

Nelson & Malone, Nevada, Iowa.

Ray Cook, Nevada, Iowa. Quarry at Ames.

Tama County

B. L. Anderson, Toledo, Iowa.

Lake Park Holding Corp., Gladbrook, Iowa.

Van Buren County

Roberts Willits, Bonaparte, Iowa. Mud Creek Quarry.

Douds Quarries, Inc., Douds, Iowa.

Washington County

J. C. Smay, Nevada, Iowa. Grace Hill Quarry.

Webster County

Fort Dodge Lime Stone Co., Fort Dodge, Iowa.

Winneshiek County

Decorah Stone Products Co., Decorah, Iowa.

Cremer Construction Co., Decorah, Iowa.

T. D. Jeglum, Decorah, Iowa.

Sand and Gravel

Principal uses of sand and gravel in Iowa are for paving and roads, and for structural purposes. The chief secondary use is for railroad ballast. Normally the total value of gravel is approximately four times that of sand. Table XXX summarizes the outstanding features of this industry in Iowa from 1933 to 1938, and reports by counties may

TABLE XXX

Summary of Sand and Gravel Production in Iowa from 1932 to 1938

	Molding sand	Structural sand	Paving and road sand	Cutting, grinding, polishing, and blast sand	Engine sand	Filter sand	Railroad ballast sand	Other uses	Total sand	Structural gravel	Paving and road gravel	Railroad ballast gravel	Other gravel	Total gravel	Grand total sand and gravel
1932															
Short tons	(a)	288,719	827,883	6,111	22,277	(a)	45,054	14,124	1,204,168	289,349	3,422,195	308,059	6,791	4,026,394	5,230,562
Value	(a)	$118,866	204,192	8,315	10,449	(a)	14,933	11,896	368,651	219,651	1,063,008	52,806	2,758	1,338,223	1,706,874
1933															
Short tons	(a)	228,170b	420,607b	(a)	26,896	1,336	(a)	59,703	136,712	156,520	3,233,422	208,842	8,285	3,607,069	4,343,781
Value	(a)	$115,182b	117,451b	(a)	12,735	4,302	(a)	32,278	281,948	126,591	703,859	45,260	7,408	883,118	1,165,066
1934															
Short tons	(a)	369,720	459,031	(a)	25,143	1,951	17,318	48,795	921,958	266,272	3,011,978	(c)	148,654	3,426,904	4,349,362
Value	(a)	$169,441	151,145	(a)	9,716	6,122	3,944	35,516	375,884	216,733	776,670	(c)	25,513	1,017,916	1,394,000
1935															
Short tons	(a)	368,416	463,189	(a)	27,234	(a)	15,249	116,375	990,463	278,041	4,238,618	(c)	(c)	4,742,270	5,732,742
Value	(a)	$176,530	132,652	(a)	11,425	(a)	4,538	88,518	413,663	223,840	1,041,962	(c)	(c)	1,343,188	1,756,851
1936															
Short tons	(a)	545,410	511,852	(a)	25,956	(a)	4,705	82,428	1,170,351	423,669	4,258,146	436,639	5,179	5,123,633	6,293,984
Value	(a)	$263,076	207,704	(a)	11,287	(a)	2,506	67,141	551,714	337,561	1,086,483	56,531	15,993	1,496,568	2,048,282
1937															
Short tons	(a)	562,244	629,155	(a)	40,232	(a)	(a)	110,173	1,341,804	570,874	4,347,826	(d)	136,650	5,055,350	6,397,154
Value	(a)	$324,733	266,745	(a)	19,815	(a)	(a)	91,502	702,795	414,162	1,091,044	(d)	27,102	1,532,308	2,235,103
1938															
Short tons	(a)	415,613	623,569	10,095	37,885	(a)	18,594	45,476	1,151,232	812,465	4,818,859	152,600	59,090	5,373,761	6,994,286e
Value	(a)	$236,557	279,629	9,759	20,282	(a)	11,308	41,452	598,987	356,426	1,275,485	31,062	37,722	1,637,684	2,299,732

(a) Included under others.
(b) Includes noncommercial.
(c) Included under total.
(d) Included under others.
(e) Revised.

be found in Tables XXXII to XLIII. In the latter tables it was found necessary to combine counties to avoid revealing confidential data.

Total quantity and total value of all sand and gravel produced in the state, after a decrease in 1933, increased in each of the ensuing years including 1938. The greatest advance in value came in 1935 when the total was $363,051 greater than in 1934 while the largest increase in quantity was attained in 1936 when the figures for 1935 were exceeded by 1,383,880 tons.

The 1938 figures of 6,994,286 ton valued at $2,299,682 represent the greatest quantity and the highest total annual value of production in the history of the sand and gravel industry in Iowa.

Paving and road gravel after a decrease in 1933 advanced in total value each year including 1938 and sand for the same use had a similar history except for a decrease in value in 1935. Sand and gravel used for structural purposes decreased in 1933 in tonnage and total value, but increased each year thereafter until 1937, and in 1938 gravel production for this use broke all previous records.

In the United States the grand total of sand and gravel production and value dropped in 1933, increased each year from 1934 to 1937 inclusive and decreased slightly in 1938 as shown by Table XXXI.

The 1933 decreases of commercial sand and gravel amounted to 22 per cent in quantity and 17 per cent in value from 1932. Commercial increases in 1934 amounted to 13.9 per cent in quantity and 6.7 per cent in value while the increases in 1935 were of somewhat smaller magnitude. The greatest increase in production was attained in 1936 when there were apparent advances of 39 per cent in tonnage and 43 per cent in value. The factors responsible for this upward trend were greater activity in building and highway construction and the resulting demand for commercial sand and gravel. Increases of 6 per cent in quantity and 8 per cent in value were effective in 1937 while in 1938 commercial production dropped 16 per cent and total quantity of sand and gravel "sold or used" dropped 4 per cent.

An important feature of the sand gravel industry in 1938 was the further tendency toward increasing use of noncommercial operations for supplies of aggregates. It is reported that the domestic output of plants operated by states, counties, municipalities and other Government agencies was 17 per cent higher in 1938 than in 1937 and represented 42 per cent of the total tonnage produced.

TABLE XXXI

Sand and Gravel Industry in the United States from 1932 to 1938

	Glass sand	Molding sand	Building sand	Paving sand	Grinding, polishing, and blast sand	Fire or furnace sand	Engine sand	Filter sand	Railroad ballast	Other sand	Total sand	Building gravel	Paving gravel	Railroad ballast	Other gravel	Total gravel	Grand total sand and gravel
1932																	
Short tons	1,370,255	1,118,146	14,745,267	19,399,117	419,691	36,698	1,151,011	68,035		4,486,655	42,794,875	14,065,070	56,533,460	6,644,483		77,243,022	120,037,897
Value	$2,266,564	1,051,702	7,604,983	8,635,934	638,556	54,371	688,563	92,751		1,463,650	22,497,074	9,803,629	23,397,380	1,823,993		35,025,002	57,522,076
1933																	
Short tons	1,781,423	1,718,251	13,187,431	12,876,139	572,735	106,133	1,051,695	24,387		1,842,652	33,160,846	12,584,953	56,581,914	5,427,636		74,594,503	107,755,349
Value	$3,011,023	1,558,738	6,580,311	6,295,569	739,222	121,149	623,285	52,186		695,189	19,676,672	8,338,524	22,992,172	2,065,542		33,396,238	53,072,910
1934																	
Short tons	1,923,614	2,167,731	14,869,511	15,917,663	571,191	137,000	1,211,033	35,750	607,380	959,217	38,400,090	14,899,930	56,133,881	6,422,166	755,622	78,211,599	116,611,689
Value	$3,326,538	2,169,254	8,342,007	8,165,589	1,039,614	169,424	795,648	85,567	166,918	620,512	24,881,071	10,276,219	23,812,375	1,873,563	403,945	36,366,102	61,247,173
1935																	
Short tons	2,125,761	2,980,879	16,540,324	13,484,723	816,540	172,847	1,389,877	49,301	997,499	1,875,808	40,433,559	15,641,576	54,929,553	7,546,489	5,372,746	83,490,364	123,923,923
Value	$3,735,343	2,915,173	8,819,712	6,900,996	1,198,653	204,477	881,910	93,470	256,922	860,557	25,867,222	10,332,709	21,639,090	2,143,275	1,995,083	36,110,157	61,977,379
1936																	
Short tons	2,394,710	4,210,017	28,533,156	20,025,606	934,059	183,667	1,576,432	126,248	300,102	815,714	35,926,994	18,768,415	32,031,124	3,169,961	411,258	54,380,758	90,307,752
Value	$4,050,749	4,072,387	15,378,912	8,684,096	1,306,871	201,099	990,816	72,381	1,177,843	1,195,523	60,303,394	27,102,886	78,461,576	11,723,535	738,423	118,026,420	178,329,814
1937																	
Short tons	2,799,230	4,953,873	27,590,739	22,099,777	1,067,178	258,287	1,802,869	99,383	1,418,316	1,295,419	63,385,071	27,838,317	85,267,855	12,318,575	850,605	126,275,352	189,660,423
Value	$4,746,629	5,239,435	15,405,031	10,644,979	1,440,736	268,355	1,092,171	182,414	334,585	1,058,162	40,412,497	19,526,213	33,201,326	3,757,068	575,893	57,060,500	97,472,997
1938																	
Short tons	2,109,462	2,319,902	25,097,184	23,378,707	502,328	108,093	1,378,450	93,711	786,435	1,399,556	57,113,828	26,314,759	88,660,248	8,194,244	1,037,154	124,206,405	181,320,233
Value	$3,601,734	2,651,779	13,779,047	10,762,421	754,805	124,343	786,639	137,283	212,935	1,124,739	33,935,725	15,737,827	33,579,665	2,255,355	414,275	51,987,122	85,922,847

TABLE XXXII

Total Production of Sand and Gravel in Iowa in 1933 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand [a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Appanoose (1), Mahaska (1), Wapello (1)	3	24,756	$ 13,310	22,849	$ 8,085	1,886	$ 581	49,491	$21,976
Black Hawk (4), Clayton (2)	6	9,910	7,305	14,352	4,147	(b)	(b)	24,262	11,452
Boone (1), Emmet (1), Humboldt (1), Webster (3)	6	16,163	6,870	60,910	22,824	(c)	(c)	77,073	29,694
Harrison (1), Plymouth (1), Sioux (3)	5	42,013	16,726	46,695	10,504			88,708	27,230
Butler (3), Cerro Gordo (2)	5	23,223	11,271	66,560	20,925	3,500	1,725	93,283	33,921
Cherokee (2), Crawford (1), Sac (3)	6	(d)	(d)	17,727	7,930	43,755	14,660	61,482	22,590
Clay (2), Lyon (1)	3	(b)	(b)	17,623	8,585	(b)	(b)	17,623	8,585
Clinton (2), Dubuque (2), Jackson (1)	5	14,578	6,392	14,502	2,454	(b)	(b)	29,080	8,846
Johnson (1), Linn (2)	3	13,108	10,652	4,572	2,051	(b)	(b)	17,680	12,703
Lee (1), Des Moines (3)	4	1,241	1,130	5,932	1,793	(c)	(c)	7,173	2,923
Marion (1), Story (1), Tama (1)	3	5,124	3,045	(c)	(c)	(c)	(c)	5,124	3,045
Muscatine (4), Scott (1)	5	8,885	4,930	28,703	10,657	28,757	29,050	66,345	44,637
Polk (6)	6	59,401	32,080	39,644	12,218	2,640	1,156	101,685	45,454
Total commercial, 1933	60	218,402	113,711	340,069	112,173	80,538	47,172	639,009	273,056
Total noncommercial, 1933		1,154	907	96,550	6,985			97,704	7,892
Grand Total, 1933		219,556	114,618	436,619	119,158	80,538	47,172	736,713	280,948
Grand Total, 1932	78	233,734	114,525	805,467	198,891			1,039,201	313,316

a Includes molding, blast, engine, filter, and railroad ballast sand.
b Included with paving sand.
c Included with structural sand.
d Included with other sand.

TABLE XXXIII

Total Production of Sand and Gravel in Iowa in 1933 — Gravel

Counties	Producers	Structural gravel		Paving and other gravel [a]		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Appanoose (1), Mahaska (1), Wapello (1)	3	(b)	(b)	27,388	$29,035	76,879	$51,011	76,689	$50,941
Black Hawk (4), Clayton (2)	6	(b)	(b)	12,373	16,058	36,635	28,510	36,414	28,393
Boone (1), Emmet (1), Humboldt (1), Webster (1)	4	8,344	7,909	99,053	72,439	184,470	110,042	161,299	107,440
Harrison (1), Plymouth (1), Sioux (1)	3	11,351	10,102	25,063	22,206	125,122	59,538	115,575	57,638
Butler (3), Cerro Gordo (2)	5	15,417	15,417	54,316	43,453	163,016	92,791	162,016	92,391
Cherokee (2), Crawford (1), Sac (3), Woodbury (0)	6	10,909	11,477	77,524	31,812	149,915	65,879	72,342	41,689
Clay (2), Lyon (1)	3	(b)	(b)	19,195	20,083	36,818	28,668	36,818	28,668
Clinton (2), Dubuque (2), Jackson (1)	5	19,439	8,673	27,184	7,937	75,703	25,456	49,010	21,257
Johnson (1), Linn (2), State (1)	4	3,411	3,893	105,096	39,140	126,187	55,736	126,184	55,736
Lee (1), Des Moines (3)	4	(b)	(b)	4,285	4,430	11,458	7,353	9,035	6,458
Marion (1), Story (1), Tama (1), Wright (1)	4	(b)	(b)	13,142	5,259	18,266	8,304	11,142	7,679
Muscatine (4), Scott (1)	5	38,372	26,812	32,469	22,245	137,186	93,694	137,186	93,694
Polk (6)	6	27,256	30,048	50,672	34,848	179,613	110,350	179,613	110,350
Total commercial, 1933	61	134,499	115,331	547,760	348,945	1,321,268	737,332	1,173,323	702,334
Total noncommercial,[c] 1933		11,040	2,455	2,913,769	417,387	3,022,513	427,734	50,045	27,113
Grand Total, 1933		145,539	117,786	3,461,529	766,332	4,343,781	1,165,066	1,223,368	729,447
Grand Total, 1932		346,588	228,878	3,844,733	1,164,780	5,230,562	1,706,874	2,465,145	1,047,524

a Including railroad ballast gravel.
b Included with paving and other gravel.
c Includes railroad ballast gravel.

TABLE XXXIV

Total Production of Sand and Gravel in Iowa in 1934 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand [a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Appanoose (1), Lee (1), Des Moines (1), State (0)	3	5,908	$2,574	5,356	$2,302	(b)	(b)	11,264	$4,876
Black Hawk (3), Butler (2)	5	8,758	3,755	30,701	15,746	7,340	$4,468	46,799	23,969
Boone (1), Emmet (1), Humboldt (1), Webster (1)	4	23,297	11,759	22,049	7,680	(c)	(c)	45,346	19,439
Clayton (2), Dubuque (2), Jackson (1)	5	69,655	24,728	34,773	8,446	18,873	10,497	123,301	43,671
Clinton (2), Scott (1)	3	25,428	13,615	14,259	4,785	(c)	(c)	39,687	18,400
Linn (1), Mahaska (1), Tama (1)	3	26,241	17,510	10,960	4,675	(c)	(c)	37,201	22,185
Lyon (2), Clay (1), Sioux (2)	5	44,349	12,231	79,267	29,500	(b)	(b)	123,616	41,731
Muscatine (3)	3	41,455	21,579	42,005	21,799	32,903	30,377	116,363	73,755
Polk (6)	6	64,471	26,441	50,249	14,072	9,496	4,629	124,216	45,142
Sac (3), Cherokee (1), Plymouth (1)	5	20,480	7,367	45,085	20,352	2,060	964	67,625	28,683
Wapello (1), Cerro Gordo (2)	3	41,409	24,104	25,617	10,300	3,261	1,264	70,287	35,668
Total commercial, 1934	45	371,451	165,663	360,321	139,657	73,933	52,199	805,705	357,519
Total noncommercial,[d] 1934		11,565	5,742	102,579	12,698	2,109	125	116,253	18,565
Grand Total, 1934		383,016	171,405	462,900	152,355	76,042	52,324	921,958	376,084
Grand Total, 1933		219,556	114,618	436,619	119,158	80,538	47,172	736,713	280,948

a Includes molding, blast, engine, filter, and railroad ballast sand.
b Included with structural sand.
c Included with paving sand.
d Includes railroad ballast sand.

TABLE XXXV

Total Production of Sand and Gravel in Iowa in 1934 — Gravel

Counties	Producers	Structural gravel		Paving and other gravel		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Appanoose (0), Lee (1), Des Moines (1), State (2)	4	8,841	$ 6,221	133,150	$ 28,600	153,255	$39,697	98,695	$ 33,597
Black Hawk (3), Butler (1)	4	9,754	7,806	12,086	11,951	68,639	43,726	67,764	43,376
Boone (1), Emmet (1), Humboldt (1), Webster (2)	5	11,764	11,640	31,786	24,001	88,896	55,080	83,284	54,486
Clayton (2), Dubuque (2), Jackson (1)	5	53,777	43,119	40,864	26,843	217,942	113,633	165,827	104,037
Clinton (2), Scott (1)	3	47,178	25,688	(a)	(a)	86,865	44,088	82,093	43,577
Linn (0), Mahaska (1), Tama (1), Van Buren (1)	3	(b)	(b)	29,164	20,356	65,365	42,541	57,465	41,341
Lyon (2), Clay (1), Sioux (2)	5	26,132	20,576	68,694	56,600	218,442	118,907	207,621	117,560
Muscatine (4)	4	16,965	13,894	41,740	34,545	175,068	122,194	175,068	122,194
Polk (6)	6	37,574	47,494	69,840	44,845	231,630	137,481	231,630	137,481
Sac (3), Cherokee (1), Plymouth (1)	5	33,532	23,969	82,120	46,463	183,277	99,115	179,899	98,115
Wapello (1), Cerro Gordo (2)	3	16,604	18,306	15,022	15,397	101,913	69,371	101,913	69,371
Wright (1), Buena Vista (1), Harrison (2), Mitchell (1), O'Brien (1)	6	4,178	1,595	39,260	8,345	43,438	9,940	2,380	1,340
Total commercial, 1934	49	266,299	220,308	563,726	317,946	1,635,730	895,773	1,453,639	866,475
Total noncommercial[c], 1934		15,918	4,443	2,581,461	475,219	2,713,632	498,227	141,520	61,991
Grand Total, 1934		282,217	224,751	3,145,187	793,165	4,349,362	1,394,000	1,595,159	928,466
Grand Total, 1933		145,539	117,878	3,461,529	766,332	4,343,781	1,165,066	1,223,368	729,447

a Included with structural gravel.
b Included with paving gravel.
c Includes railroad ballast gravel.

TABLE XXXVI

Total Production of Sand and Gravel in Iowa in 1935 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand [a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (4), Linn (1)	5	58,779	$38,215	(b)	(b)	(b)	(b)	58,779	$ 38,215
Cherokee (1), Clay (1), Emmet (1)	3	18,488	8,045	40,131	$ 14,734	(b)	(b)	58,619	22,779
Clayton (1), Dubuque (2), Jackson (1), Clinton (1)	5	48,412	21,211	74,766	42,685	(c)	(c)	123,178	63,896
Des Moines (1), Mahaska (1), Wapello (1), Lee (2)	5	52,145	27,209	28,165	10,608	(b)	(b)	79,310	37,817
Humboldt (1), Webster (1), Boone (1), Wright (0)	3	35,873	17,288	(b)	(b)			35,873	17,288
Lyon (2), Sioux (2)	4	45,200	13,100	76,516	26,455	(b)	(b)	121,716	39,555
Mitchell (0), Butler (1), Tama (1), Cerro Gordo (2)	4	46,656	23,946	23,650	11,200	(c)	(c)	70,306	35,146
Muscatine (3), Scott (1)	4	33,151	16,659	29,392	12,688	61,724	50,052	124,267	79,399
Polk (5)	5	66,584	31,544	49,886	18,374	(c)	(c)	116,470	49,918
Sac (3), Harrison (0), State (0)	3	6,625	1,746	16,625	4,723	(c)	(c)	23,250	6,469
Total commercial, 1935	41	410,913	198,963	339,131	141,467	61,724	50,052	811,768	390,482
Total noncommercial, 1935		11,400	1,440	167,295	21,740			178,695	23,180
Grand Total, 1935		422,313	200,403	506,426	163,207	61,724	50,052	990,463	413,662
Grand Total, 1934		383,016	171,405	462,900	152,355	76,042	52,324	921,958	376,084

a Includes molding, cutting and grinding, engine, filter, and railroad ballast sand.
b Included under structural sand.
c Included under paving sand.

TABLE XXXVII

Total Production of Sand and Gravel in Iowa in 1935 — Gravel

Counties	Producers	Structural gravel [a]		Paving and other gravel		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (4), Linn (0)	4	10,277	$10,945	(b)	(b)	60,056	$49,160	51,556	$34,436
Cherokee (1), Clay (1), Emmet (1)	3	(c)	(c)	66,745	56,638	125,364	79,417	125,364	79,417
Clayton (0), Dubuque (2); Jackson (1), Clinton (1)	4	110,346	57,540	(b)	(b)	233,524	121,436	2,335,240	1,214,360
Des Moines (1), Mahaska (1), Wapello (1), Lee (0)	3	(c)	(c)	33,902	33,667	113,212	71,484	106,852	69,254
Humboldt (1), Webster (1), Boone (1), Wright (1)	4	11,724	8,134	31,913	24,994	79,510	50,416	73,680	49,802
Lyon (2), Sioux (2)	4	25,800	20,720	70,595	55,105	218,111	115,380	205,111	112,240
Mitchell (2), Butler (1), Tama (1), Cerro Gordo (2)	6	24,793	25,160	140,356	47,329	235,455	107,635	223,180	105,565
Muscatine (3), Scott (0)	3	(c)	(c)	133,430	93,019	257,697	172,418	215,358	150,778
Polk (5)	5	50,720	59,967	59,120	45,041	226,310	154,926	226,310	154,925
Sac (3), Harrison (1), State (3)	7	19,197	6,569	455,635	149,699	498,082	162.737	339,182	136,237
Total commercial, 1935	43	252,857	189,035	991,696	505,492	2,056,321	1,085,009	3,901,833	2,107,014
Total noncommercial,[d] 1935		1,260	425	3,496,466	648,237	3,676,421	671,842	63,324	24,896
Grand Total, 1935		254,117	189,460	4,488,162	1,153,729	5,732,742	1,756,851	3,965,157	2,131,906
Grand Total, 1934		282,217	224,751	3,145,187	793,165	4,349,362	1,394,000	1,595,159	928,466

a Structural gravel includes some paving gravel and paving gravel includes some structural gravel.
b Included under structural gravel.
c Included under paving gravel.
d Includes railroad ballast gravel.

TABLE XXXVIII

Total Production of Sand and Gravel in Iowa in 1936 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand[a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (4), Linn (1)	5	31,296	$ 19,821	13,551	$ 5,873	16,269	$ 8,962	61,116	$ 34,656
Boone (1), Dallas (0), Polk (4)	5	86,539	50,633	56,918	19,252	(c)	(c)	143,457	69,885
Cerro Gordo (2), Wright (0), Humboldt (1), Webster (0)	3	63,347	34,864	81,859	40,503	(c)	(c)	145,206	75,367
Clayton (1), Dubuque (2), Clinton (1), Jackson (2)	6	30,568	12,734	66,210	38,753	(c)	(c)	96,778	51,487
Emmet (1), O'Brien (0), Clay (1), Cherokee (1)	3	114,325	44,340	(b)	(b)	(b)	(b)	114,325	44,340
Lyon (2), Sioux (1), State (1)	4	(c)	(c)	118,312	56,100			118,312	56,100
Mahaska (1), Wapello (1), Lee (2)	4	48,090	29,763	47,943	19,922	(c)	(c)	96,033	49,685
Mitchell (0), Butler (2), Tama (1)	3	17,252	11,926	(b)	(b)			17,252	11,926
Sac (2), Harrison (1)	3	63,615	20,286	(b)	(b)	(b)	(b)	63,615	20,286
Scott (1), Muscatine (3), Des Moines (1)	5	119,933	53,665	69,536	26,395	46,635	40,325	236,104	120,385
Total commercial, 1936	41	574,965	278,032	454,329	206,798	62,904	49,287	1,092,198	534,117
Total noncommercial, 1936		7,988	2,113	70,165	15,484			78,153	17,597
Grand Total, 1936		582,953	280,145	524,494	222,282	62,904	49,287	1,170,351	551,714
Grand Total, 1935		422,313	200,403	506,426	163,207	61,724	50,052	990,463	413,662

a Includes molding, cutting and grinding, engine, filter, and railroad ballast sand.
b Included under structural sand.
c Included under paving sand.

TABLE XXXIX

Total Production of Sand and Gravel in Iowa in 1936 — Gravel

Counties	Producers	Structural gravel [a]		Paving and other gravel		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (4), Linn (0)	4	16,175	$18,710	(b)	(b)	77,291	$53,366	77,291	$17,366
Boone (1), Dallas (1), Polk (4)	6	62,867	77,192	189,313	79,281	395,637	226,358	395,637	226,358
Cerro Gordo (2), Wright (2), Humboldt (1), Webster (3)	8	37,952	53,611	114,356	97,702	297,514	226,680	261,820	222,893
Clayton (0), Dubuque (2), Jackson (1), Clinton (2)	5	101,782	53,734	(b)	(b)	198,560	105,221	198,560	105,221
Emmet (1), O'Brien (1), Clay (1), Cherokee (1)	4	(c)	(c)	169,867	136,068	284,192	180,408	256,303	178,409
Lyon (1), Sioux (1), State (2)	4	(c)	(c)	395,714	109,364	514,026	165,464	232,826	144,114
Mahaska (1), Wapello (1), Lee (2)	4	38,143	41,195	(b)	(b)	134,176	90,880	134,176	90,880
Mitchell (1), Butler (1), Tama (1)	3	(c)	(c)	16,798	14,128	34,050	26,054	30,930	24,512
Sac (2), Harrison (2)	4	(c)	(c)	325,521	139,888	389,136	160,174	386,896	160,014
Scott (0), Muscatine (3), Des Moines (1)	4	(c)	(c)	177,623	134,817	413,727	255,202	395,926	322,322
Total commercial, 1936	46	256,919	244,442	1,389,192	711,248	2,738,309	1,489,807	2,370,365	1,492,089
Total noncommercial,[d] 1936		32,906	5,460	3,444,616	535,418	3,555,675	558,475	77,697	29,372
Grand Total, 1936		289,825	249,902	4,833,808	1,246,666	6,293,984	2,048,282	2,448,062	1,521,461
Grand Total, 1935		254,117	189,460	4,488,162	1,153,729	5,732,742	1,756,851	3,965,157	2,131,906

[a] Structural gravel includes some paving gravel and paving gravel includes some structural gravel.
[b] Included under structural gravel.
[c] Included under paving gravel.
[d] Includes railroad ballast gravel.

TABLE XL

Total Production of Sand and Gravel in Iowa in 1937 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand[a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (5), Winneshiek (1), Clayton (2)	8	48,504	$ 33,270	(b)	(b)	74,403	$ 51,409	122,907	$ 84,679
Cerro Gordo (2), Mitchell (0), Butler (2)	4	50,392	36,871	49,309	34,601	(c)	(c)	99,701	71,472
Crawford (0), Sac (2), Carroll (1), Harrison (0)	3	73,738	30,986	(b)	(b)			73,738	30,986
Dallas (0), Polk (3), State (1)	4	102,862	46,830	65,377	30,774	(c)	(c)	168,239	77,604
Dubuque (2), Jackson (1), Clinton (2)	5	33,405	22,332	55,910	17,427	(c)	(c)	89,315	39,759
Emmet (1), Cherokee (2), Buena Vista (1)	4	32,393	13,976	97,578	34,663	(c)	(c)	129,971	48,639
Humboldt (1), Wright (0), Webster (0), Boone (2)	3	78,111	38,575	(b)	(b)	(b)	(b)	78,111	38,575
Lee (2), Mahaska (1), Wapello (1)	4	54,674	32,733	40,526	20,273	(b)	(b)	95,200	53,006
Lyon (3), Sioux (1), O'Brien (0)	4	191,727	71,254	(b)	(b)	(b)	(b)	191,727	71,254
Muscatine (3), Des Moines (1), Scott (1)	5	81,327	72,614	79,012	35,418	(b)	(b)	160,339	108,032
Tama (2), Linn (1), Johnson (1)	4	62,900	55,727	36,061	14,742	(b)	(b)	98,961	70,469
Total commercial, 1937	48	810,033	455,168	423,773	187,898	74,403	51,409	1,308,209	694,475
Total noncommercial, 1937	7	20,204	2,419	13,391	5,901			33,595	8,320
Grand Total, 1937	55	830,237	457,587	437,164	193,799	74,403	51,409	1,341,804	702,795
Grand Total, 1936		582,953	280,145	524,494	222,282	62,904	49,287	1,170,351	551,714

a Includes molding, cutting and grinding, engine, filter, and railroad ballast sand.
b Included under structural sand.
c Included under paving sand.

TABLE XLI

Total Production of Sand and Gravel in Iowa in 1937 — Gravel

Counties	Producers	Structural gravel[a]		Paving and other gravel		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Black Hawk (4), Winneshiek (0), Clayton (0)	4	19,515	$ 22,402	(b)	(b)	142,422	$ 107,081	139,203	$105,150
Cerro Gordo (2), Mitchell (1), Butler (1)	4	(c)	(c)	97,161	81,082	196,862	152,554	193,610	152,178
Crawford (1), Sac (2), Carroll (0), Harrison (4)	7	55,752	57,771	116,000	35,312	245,490	124,069	165,312	111,589
Dallas (1), Polk (3), State (2)	6	54,817	59,401	578,220	180,504	801,276	317,509	521,276	297,509
Dubuque (1), Jackson (1), Clinton (2)	4	102,843	79,272	(b)	(b)	192,158	119,031	184,038	117,001
Emmet (1), Cherokee (2), Buena Vista (1)	4	24,208	20,963	131,242	109,657	285,421	179,259	276,207	175,709
Humboldt (1), Wright (1), Webster (1), Boone (2)	5	18,363	17,747	76,568	55,399	173,042	111,721	140,937	109,064
Lee (1), Mahaska (1), Wapello (1)	3	34,404	35,069	(b)	(b)	129,604	88,075	129,604	88,075
Lyon (3), Sioux (1), O'Brien (1)	5	108,120	52,564	103,489	89,322	403,336	213,140	336,336	205,015
Muscatine (3), Des Moines (1), Scott (1)	5	(c)	(c)	197,914	127,674	358,253	235,706	313,453	229,306
Tama (2), Linn (1), Johnson (1)	4	22,984	20,182	25,277	28,132	147,222	118,783	147,222	118,783
Total commercial, 1937	51	441,006	365,371	1,325,871	707,082	3,075,086	1,766,928	2,547,198	1,709,379
Total noncommercial[d], 1937	40	80,425	9,696	3,208,048	450,159	3,322,068	468,175	6,667	4,659
Grand Total, 1937	91	521,431	375,067	4,533,919	1,157,241	6,397,154	2,235,103	2,553,865	1,714,038
Grand Total, 1936		289,825	249,902	4,833,808	1,246,666	6,293,984	2,048,282	2,448,062	2,131,906

a Structural gravel includes some paving gravel and paving gravel includes some structural gravel.
b Included under structural gravel.
c Included under paving gravel.
d Includes railroad ballast gravel.

TABLE XLII

Total Production of Sand and Gravel in Iowa in 1938 — Sand

Counties	Producers	Structural sand		Paving sand		Other sand[a]		Total sand	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Buena Vista (1), Sac (3), Harrison (1)	5	36,283	$ 21,499	112,332	$ 44,280			148,615	$ 65,779
Butler (2), Black Hawk (3)	5	(c)	(c)	55,171	31,697	(c)	(c)	55,171	31,697
Cerro Gordo (2), Humboldt (1), Wright (0)	3	71,099	46,351	40,408	18,021	2,386	1,281	113,893	65,653
Clinton (2), Jackson (1)	3	(c)	(c)	47,626	33,435			47,626	33,435
Dallas (0), Polk (5), Adams (1)	6	91,651	46,140	124,694	49,356	(c)	(c)	216,345	95,496
Emmet (1), O'Brien (0), Cherokee (2)	3	(c)	(c)	66,214	30,599	(c)	(c)	66,214	30,599
Grundy (1), Marshall (0), Tama (1), Linn (1)	3	44,548	31,519	(b)	(b)	(b)	(b)	44,548	31,519
Lee (2), Des Moines (1)	3	20,402	11,184	(b)	(b)	(b)	(b)	20,402	11,184
Lyon (3), Sioux (1)	4	(c)	(c)	77,962	40,703	(c)	(c)	77,962	40,703
Marion (0), Mahaska (1), Wapello (1), Johnson (1)	3	(c)	(c)	111,440	71,461	(c)	(c)	111,440	71,461
Mitchell (0), Winneshiek (1), Clayton (1), Dubuque (2)	4	(c)	(c)	45,234	30,846	(c)	(c)	45,234	30,846
Muscatine (3), Scott (2)	5	42,690	21,914	135,283	63,892	(c)	(c)	177,973	85,806
Webster (0), Hamilton (0), Boone (1)	1	(d)	(d)						
Total commercial, 1938	48	306,673	178,607	816,364	414,290	2,386	1,281	1,125,423	594,178
Total noncommercial[e], 1938	4	17,588	2,289	1,400	500	4,459	371	23,447	3,160
Grand Total, 1938	52	324,261	180,896	817,764	414,790	6,845	1,652	1,148,870	597,338
Grand Total, 1937	55	830,237	457,587	437,164	193,799	74,403	51,409	1,341,804	702,795

a Includes molding, cutting and grinding, engine, filter, and railroad ballast sand.
b Included under structural sand.
c Included under paving sand.
d Included under paving and other gravel.
e Includes railroad ballast sand.

TABLE XLIII

Total Production of Sand and Gravel in Iowa in 1938 — Gravel

Counties	Producers	Structural gravel [a]		Paving and other gravel		Total sand and gravel		Total quantity washed	
		Tons	Value	Tons	Value	Tons	Value	Tons	Value
Buena Vista (1), Sac (3), Harrison (2)	6	61,486	$48,037	119,317	$90,618	329,418	$204,434	329,098	$204,184
Butler (1), Black Hawk (2)	3	(c)	(c)	15,515	18,927	70,686	50,624	63,903	47,954
Cerro Gordo (2), Humboldt (2), Wright (3)	7	34,559	41,664	80,303	48,504	228,755	155,821	191,886	152,010
Clinton (2), Jackson (1)	3	(c)	(c)	84,982	44,173	132,608	77,608	132,608	77,608
Dallas (1), Polk (4), Adams (1)	6	69,353	56,242	682,910	189,526	968,608	341,264	595,508	313,714
Emmet (1), O'Brien (1), Cherokee (2)	4	(c)	(c)	107,379	64,280	173,593	94,879	149,793	93,179
Grundy (1), Marshall (1), Tama (1), Linn (1)	4	62,252	22,082	(b)	(b)	106,800	53,601	54,042	43,731
Lee (2), Des Moines (1)	3	9,740	9,065	(b)	(b)	30,142	20,249	30,142	20,249
Lyon (3), Sioux (1)	4	(c)	(c)	104,648	78,986	182,610	119,689	182,610	119,689
Marion (1), Mahaska (1), Wapello (1), Johnson (1)	4	74,359	62,828	(b)	(b)	185,799	134,289	185,799	134,289
Mitchell (1), Winneshiek (1), Clayton (0), Dubuque (1)	3	(c)	(c)	25,277	7,687	70,511	38,533	103,707	79,452
Muscatine (3), Scott (1)	4	(c)	(c)	187,778	131,959	365,751	217,765	365,751	217,765
Webster (1), Hamilton (1), Boone (2)	4	(c)	(c)	18,345	9,350	18,345	9,350	10,501	8,790
Total commercial, 1938	55	311,749	239,918	1,426,454	684,010	2,863,626	1,518,106	2,395,348	1,512,614
Total noncommercial [d], 1938	42	1,731,401	520,195	2,375,812	258,271	4,130,660	781,626	70,516	37,002
Grand Total, 1938	97	2,043,150	760,113	3,802,266	942,281	6,994,286	2,299,732	2,465,864	1,549,616
Grand Total, 1937	91	521,431	375,067	4,533,919	1,157,241	6,397,154	2,235,103	2,553,865	1,714,038

a Structural gravel includes some paving gravel and paving gravel includes some structural gravel.
b Included under structural gravel.
c Included under paving gravel.
d Includes railroad ballast gravel.

Sand and Gravel Producers in Iowa

Adams County

Maudlin Construction Co., 629 Ohio Street, Webster City, Iowa.
Robert E. Devereux, Route 3, Corning, Iowa.

Allamakee County

Northeastern Iowa Sand and Gravel Co., Harpers Ferry, Iowa.

Blackhawk County

Jay B. Bagenstos, LaPorte City, Iowa.
Concrete Materials Corp., 504 Lafayette Building, Waterloo, Iowa.
Martin Hanson & Son, 1901 Commercial Street, Waterloo, Iowa.
Waterloo Dredging Co., 85 W. Mullen, Waterloo, Iowa.
Waterloo Sand and Gravel Co., C. H. Werner, 335 Sheridan Road, Waterloo, Iowa.

Boone County

Munson & Sons, Boone, Iowa.
Fraser Sand Company, c/o Otis Lumber Co., Boone, Iowa. Quarry at Fraser.
Markey River Sand Co., R. B. Markey, Boone, Iowa.

Buchanan County

Myron Baker, 1102 Fifth Avenue, N. E., Independence, Iowa.

Buena Vista County

LeGrand Limestone Co., 105 W. Madison Street, Chicago, Illinois, Quarry at Sioux Rapids.
L. L. Walton, Linn Grove, Iowa.

Butler County

Chas. Willeke & Sons, Aplington, Iowa.
Waverly Gravel & Tile Co., Shell Rock, Iowa.

Carroll County

Matt Lappe, Carroll, Iowa.

Cerro Gordo County

Clear Lake Sand & Gravel Co., Clear Lake, Iowa.
Ideal Sand & Gravel Co., Mason City, Iowa.

Cherokee County

Harris & Loucks Gravel Co., Cherokee, Iowa.
Northwestern Gravel Co., Lake View, Iowa.
Shea Sand & Gravel Co., Cherokee, Iowa.

Clayton County

The Korite Corporation, 329 N. Milwaukee Street, Milwaukee, Wisconsin.

Langworthy Silica Co., 705 Federal Bank Building, Dubuque, Iowa.

Clinton County

Camanche Sand & Gravel Co., Box 854, Davenport, Iowa.

Schneider Sand & Gravel Co., Clinton, Iowa.

Crawford County

James Ballantine, Arion, Iowa.

Hannah Carlson, Kiron, Iowa.

Rogers Bros., Dunlap, Iowa.

Dallas County

Kaser Construction Co., Adel, Iowa.

Des Moines County

R. J. Dietlien, Burlington, Iowa.

Kelley Sand & Materials Co., Mark E. Smith, Secretary-Treasurer, Burlington, Iowa.

Dubuque County

Lillie Coal Co., 510 Garfield Avenue, Dubuque, Iowa.

Molo Sand & Gravel Co., 135 W. Fifth Street, Dubuque, Iowa.

Emmett County

Concrete Materials Corp., Lafayette Building, Waterloo, Iowa.

Fayette County

Clermont Brick & Sand Co., Clermont, Iowa.

Grundy County

Ben Ankes, Wellsburg, Iowa.

Guthrie County

Ada Johnson, Guthrie Center, Iowa.

Hamilton County

James B. Weaver, National Bank & Trust Co., Des Moines, Iowa.

Hardin County

Iowa Falls Sand & Gravel Co., Iowa Falls, Iowa.

Harrison County

M. B. Musgrave, Woodbine, Iowa.

John Schumacher, Bancroft, Iowa.

Humboldt County

Concrete Materials Corporation, Waterloo, Iowa.

J. H. Tanck, Renwick, Iowa.

Jackson County

Bellevue Sand & Gravel Co., Att: A. C. Schneider, Bellevue, Iowa.

Johnson County

Central Sand & Gravel Co., Iowa City, Iowa.

Hawkeye Material Co., Box 104, Iowa City, Iowa.

W. Stock, River Junction, Iowa.

Lee County

Joseph Jaeger, Fort Madison, Iowa.

Keokuk Sand Co., Foot of Bank Street, Keokuk, Iowa.

Linn County

Kings Crown Plaster Co., 98 First Avenue, W., Cedar Rapids, Iowa.

Lyon County

L. G. Everist, Inc., 2100 E. Fourth Street, Sioux City, Iowa. Pit at Klondike.

LeGrand Limestone Co., 105 W. Madison Street, Chicago, Illinois. Quarry at Rock Rapids.

Miller Sand & Gravel Co., Box 101, Doon, Iowa.

Mahaska County

Concrete Materials Corp., Eddyville, Iowa.

Marion County

Harvey Sand & Gravel Co., Harvey, Iowa.

Wilson Sand & Gravel Co., Harvey, Iowa. Pit at Tracy.

Marshall County

Empire Sand & Material Co., Lock Box 467, Marshalltown, Iowa. Pit at Keller.

LeGrand Limestone Co., Chicago, Illinois.

Sam Wright, New Providence, Iowa. Pit at Zearing.

Mitchell County

Falk & Litzelman, St. Ansgar, Iowa. Pit at Osage.

Irvin C. Wheeler, McIntire, Iowa.

Muscatine County

Automatic Gravel Products Co., Box 34, Muscatine, Iowa.

Hahn Brothers Sand and Gravel Co., 207 W. Front Street, Muscatine, Iowa.

Northern Gravel Co., Muscatine, Iowa.

Plymouth County

Albert A. Wenzel, Kingsley, Iowa.

Polk County

Builders Cooperative Sand Co., S. E. 3rd & Jackson Avenue, Des Moines, Iowa.

Capital City Cooperative Sand & Gravel Co., Box 864, Des Moines, Iowa.

The Des Moines Sand & Fuel Coop. Ass'n., Box 1334, Des Moines, Iowa.

Flint Crushed Gravel Co., 907 Bankers Trust Building, Des Moines, Iowa. Pit at West Des Moines.

N. Leon Harris, R. R. No. 4, Des Moines, Iowa.

Keefner Sand & Gravel Co., 822 W. Ninth Street, Des Moines, Iowa.

Sac County

Wm. Brauer, R. F. D. No. 1, Lake View, Iowa.

Lake View Concrete Tile Co., Lake View, Iowa.

Northwestern Gravel Co., Lake View, Iowa.

LeGrand Limestone Co., 105 W. Madison Street, Chicago, Illinois. Quarry at Lake View.

W. H. Schnirring, Sac City, Iowa.

Mrs. W. H. Townsend, Sac City, Iowa.

Scott County

Builders Sand & Gravel Co., 104 Western Avenue, Davenport, Iowa.

Sioux County

L. G. Everist, Inc., 2100 Fourth Street, Sioux City, Iowa.

Hawarden Gravel Co., Hawarden, Iowa.

Story County

R. E. Carr Sand & Gravel Co., E. 16th Street, Ames, Iowa.

Roy Templeton, Ames, Iowa.

Tama County

Flint Crushed Gravel Co., 907 Bankers Trust Building, Des Moines, Iowa.

Van Buren County

J. C. Edvenson, Fort Dodge, Iowa. Pit at Stratford.

Wapello County

Ottumwa Sand Co., Ottumwa, Iowa.

Webster County

James Casey, Lehigh, Iowa.

Johnston Clay Works, Inc., Fort Dodge, Iowa.

Earl Richardson, Stratford, Iowa.
James B. Weaver, National Bank & Trust Co., Des Moines, Iowa.
Welch Bros., Fort Dodge, Iowa.

Winneshiek County

Decorah Concrete Products Co., 906 South Mill Street, Decorah, Iowa.

Wright County

Luick Gravel Co., Belmond, Iowa.
A. A. McCurry, Renwick, Iowa.
Mrs. Etta Middleton, Eagle Grove, Iowa.

Miscellaneous Stone Producers in Iowa

Commercial

Harrison County

M. O. Weaver, Inc., 539 Fifth Street, Des Moines, Iowa.

Noncommercial

Marshall County

City of Des Moines Highway Department, Des Moines, Iowa.

Peat Producers in Iowa

Noncommercial

Story County

Iowa State Highway Commission, John M. Hall, Roadside Improvement Engineer, Ames, Iowa.

Commercial

Worth County

Colby Pioneer Peat Co., Inc., Hanlontown, Iowa.

Sandstone Producers in Iowa

Commercial

Lucas County

W. T. Kelly, Des Moines, Iowa.

Noncommercial

Marion County

Marion County Highway Department, Knoxville, Iowa.

Lime Producers in Iowa

Marion County

A. K. Verrifs, Pella, Iowa.