

REPORTS OF THE
DEPARTMENT OF
CONSERVATION AND DEVELOPMENT
STATE OF NEW JERSEY

HENRY B. KÜMMEL, State Geologist and Director

BULLETIN 40

Geologic Series

**THE MINERAL INDUSTRY
OF NEW JERSEY
FOR 1931**

Compiled by

MEREDITH E. JOHNSON

Assistant State Geologist



Published 1933

Division of Geology and Topography

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Board of Conservation and Development

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THE MINERAL INDUSTRY OF NEW JERSEY FOR 1931

By MEREDITH E. JOHNSON

Assistant State Geologist

INTRODUCTION.

Statistics of the production of New Jersey's mineral industries in 1931 were collected, as in previous years, in cooperation with the Bureau of Mines and the Bureau of the Census of the United States Department of Commerce. This bulletin presents the compiled statistics in a form that is concise and comparable to similar material presented in previous bulletins of this series.

SUMMARY OF THE MINERAL PRODUCTION IN 1931.

The continued decline of industrial output in 1931 is now a matter of history. It remains only to record the actual output in terms of tons and dollars. In New Jersey the value of the output of raw materials, and such of the basic manufactured products as are recorded herein, was 24.1 per cent less than in 1930. Expressed in dollars the decline was from \$66,209,037 to \$50,293,431. The iron industry, which in the previous year had reversed its trend and made an impressive gain in output, was one of the hardest hit in 1931. Shipments of ore declined 38.8 per cent, and the value of shipments nearly 40 per cent. The brick and tile industry was also hard hit, the value of production declining 40.8 per cent. The sand and gravel and the stone industries both suffered heavily, although of the two the latter fared the best. Details of the production of each of the mineral industries in 1931 and 1930 are given in the following table and the ensuing text.

MINERAL PRODUCTION IN NEW JERSEY IN 1931 AND 1930

Products	Number of operations ^a	Quantity Short or long tons		Value-dollars		Percent increase or decrease Tonnage	Value
		1931	1930	1931	1930		
Zinc ore	1	640,560 s. t.	1,690,348 s. t.	(c)	(c)	-7.2	-13.2
Iron ore (shipped)	5	239,722 l. t.	391,528 l. t.	984,021	1,632,827	-38.8	-39.7
Stone	43	2,431,252 s. t.	2,702,560 s. t.	3,107,497	3,909,281	-9.3	-20.5
Sand and Gravel	97	4,329,994 s. t.	5,969,479 s. t.	3,433,176	5,009,866	-27.5	-31.1
Clay (sold raw)	32	135,537 s. t.	170,286 s. t.	515,821	713,136	-20.4	-27.7
Brick and tile				5,102,906	15,363,183		-40.8
Pottery				11,257,406	14,456,246		-22.1
Greensand marl	5	8,252 s. t.	12,761 s. t.	196,327	224,871	-35.4	-12.7
Other products:							
Lime	1						
Portland cement (shipped)	2						
Pulverized sand	4						
Zinc ore	1			21,696,277	424,899,627		-12.9
Non-clay refractories and refractory cements							
By-product coke ^e	2						
Total value				50,293,431	166,209,037		-24.1

a. Number of mines, quarries, pits or plants as the case may be.

b. Corrected figure.

c. Value included in "Other products."

d. Includes tale.

e. Raw material from other states.

f. Does not include value of feldspar ground (but not quarried) in this State.

ZINC ORE.

The continued decline in the consumption and price of zinc in this country was reflected in operations of the New Jersey Zinc Company. But whereas the ore production of the whole country declined 33 per cent, the production of the mines at Franklin Furnace and Ogdensburg was maintained at a rate only 7.2 per cent below that of 1930. The primary reason for this better-than-average performance can probably be attributed chiefly to the fact that much of the production of the New Jersey mines is converted into zinc white—a material widely used in white paints—rather than into spelter, the consumption of which would naturally be more affected in periods of depression. Credit should also be given, however, for the effort the New Jersey Zinc Company has made to maintain employment (and hence production) at the highest possible level.

Corrected figures for the production of ore in recent years are as follows:

<i>Year</i>	<i>Production</i>
1929	705,630 short tons
1930	690,348 short tons
1931	640,560 short tons

IRON ORE.

In every industrial depression the so-called "heavy industries"—which includes the iron industry—have been among the worst sufferers. The depression of 1930-1932 has been no exception in that respect and it is not surprising therefore to find that the production of iron ore for the whole country in 1931 declined 47 per cent as compared with 1930.¹ By comparison the New Jersey producers fared well since production in this State declined only 39 per cent. Nevertheless, the promising spurt of production in the previous year gave rise to hopes which have died hard. Production in 1931 came from five mines, three of which, the Mount Hope, Scrub Oaks and Richard, are located within five miles of Wharton; and the other two, the Washington Mine and the Peters Mine, at Oxford and Ringwood respectively. The production from all of these mines is magnetite ore, no limonite or hematite having been mined in New Jersey for many years.

The average grade of ore shipped in 1931 ranged from 59.42 per cent iron (dried sample) for low-phosphorus ore, to 65.73 per cent iron in ore containing approximately one-half of one per cent phosphorus.

At the end of the year the Mount Hope Mine was the only one believed to be in operation.

¹Source: Commerce Yearbook—1932.

STONE.

Sales of stone in any year are largely determined by the volume of construction. In 1931 the value of construction contracts awarded in metropolitan New York and vicinity declined 22.8 per cent from the amount for the previous year.¹ In New Jersey the value of all sales of stone declined 20.5 per cent. The relatively good showing of the stone industry as compared with some of the other raw-material industries was undoubtedly due in part to the large expenditures for public works undertaken by all governmental agencies to ease the unemployment situation.

The year 1931 witnessed a continued decline in the production of all kinds of stone save granite. The production of trap rock declined 8.5 per cent, and the production of limestone declined 22.1 per cent. Values declined even more. Details of the production of stone are given in the following table.

TOTAL PRODUCTION OF STONE IN 1931 AND 1930

Kind	No. of quarries		Production-short tons		Value-dollars	
	1931	1930	1931	1930	1931	1930
Trap rock	31	32	2,207,762	2,412,970	2,641,524	3,313,917
Limestone	4	5	137,820	176,920	329,456	386,451
Other stone	8	8	105,670	112,670	136,517	208,913
Totals	43	45	2,451,252	2,702,560	3,107,497	3,909,281

Trap rock. For the first time since 1924 the value of the trap rock produced in New Jersey declined below three million dollars. The total decline from the peak year of 1928 is now \$1,384,113, or 34.4 per cent. Present indications are that the decline has continued into 1932, and it seems probable that the final figures for that year will be comparable to those for 1921.

The number of operators who reported production in 1931 is exactly the same as in 1921; the output per quarry, however, has increased approximately 21 per cent in the ten-year period.

No production was reported by the Dyer-Kane Company, the Luckenbach Trap Rock Corporation or the Preen Crushed Stone, Sand and Gravel Company. The assets of the first-named company were sold in June, 1931.

The old Kingston quarry, located between Kingston and Rocky Hill, was re-opened early in 1931 by the Kingston Quarry Co., Inc.

Detailed statistics of the production of trap rock are given in the following table.

¹Source: F. W. Dodge Corporation.

PRODUCTION OF TRAP ROCK IN 1931 AND 1930

Use	Quantity-short tons		Value-dollars	
	1931	1930	1931	1930
Concrete	1,782,148	1,774,790	2,092,577	2,437,208
Road metal	324,414	554,680	434,443	764,266
Railroad ballast	100,560	81,410	113,981	100,143
Other uses	640	2,090	523	12,300
Totals.....	2,207,762	2,412,970	2,641,524	3,313,917

Limestone. Aside from a 22 per cent reduction in reported output, very little change occurred in this industry in 1931. Only the limestone quarry of the Edison Cement Corporation at Oxford was operated at all steadily, the others being idle much of the year.

In recent years the demand for limestone as a fluxing agent in furnace operations has dwindled almost to the vanishing point. There is still a fair demand for crushed stone and a small amount of stone is still used in the manufacture of agricultural lime, but the chief salvation of the remaining producers is the special uses for which limestone is now sold. Some of these are: for poultry grit; for use in stucco; as a filler in rubber and asphalt; and in the manufacture of the finely-spun rock wool which is used for insulation purposes.

Granite. It was reported last year that several of the iron mining companies were adding to their income by selling the rock waste from their mining operations as aggregate for concrete work, for road metal, and for other purposes. The companies reporting such sales in 1931 are: the Ringwood Company, the Alan Wood Mining Company, and the Thomas Iron Company (through Charles F. Heigold). The Trimmer Stone Company is also utilizing the waste product of another operation, it having established a crushing and screening plant adjacent to the tracks of the Lehigh Valley Railroad at Pattenburg where most of the rock from the Musconetcong tunnel was dumped.

The Pompton Crushed Stone Company continued the operation of its quarry near Bloomingdale but reported lessened activity.

The total production of granite in 1931 amounted to 101,611 tons, valued at \$126,656.

Other stone. The continued, drastic decline in building operations has taken its toll from the producers of building stone. In New Jersey only three sandstone quarries were operated in 1931 and two of these, the de Flesco quarry at Wilburtha, Mercer County, and the Raven Rock quarry, formerly operated by Charles T. Eastburn, have now been idle for many months. Reduced sales of tale and verde antique marble were reported by the Rock Products Company of Easton, and the argillite quarry of Prince-

ton Quarries, Inc., was idle throughout the year. Lawrenceville Quarries, Inc., reported a greatly reduced demand.

Including the production of talc in both years, production of "Other stone" in 1931 declined 6.9 per cent as compared with 1930, and the value of sales declined 35.2 per cent.

SAND AND GRAVEL

Production and sales of sand and gravel in 1931 declined 27.5 and 31 per cent respectively as compared with 1930 figures. This was in accord with expectations. A reduction of only 10 per cent in the number of active pits provided the surprise. Sales of sand and gravel for construction purposes, which had held up very well in 1930, showed a comparative loss of \$625,387, or 26.7 per cent, in 1931. Sales of paving sand and gravel declined \$527,455 or nearly 37 per cent. The greatest percentage of loss was in sales of "fire or furnace" sand and amounted to 63.7 per cent. Details of the production of sand and gravel are given in the following table.

PRODUCTION OF SAND AND GRAVEL IN 1931 AND 1930

Products	No. of pits		Quantity-short tons		Value-dollars	
	1931	1930	1931	1930	1931	1930
Glass sand	5	4	115,076	119,410	154,708	209,607
Molding sand	33	36	326,492	477,738	370,112	626,522
Structural sand	49	54	1,507,036	1,888,009	896,780	1,181,358
Paving and road-making sand	31	43	924,568	1,606,815	494,944	875,188
Cutting, grinding and blast sand	6	5	31,343	47,716	64,790	113,556
Fire or furnace sand	7	9	14,001	39,072	19,836	54,584
Engine sand	8	8	26,215	45,035	11,782	15,096
Filter sand	4	3	24,717	28,237	54,118	74,150
Other sand	7	5	62,101	64,208	100,760	77,846
Total sand			3,031,549	4,316,240	2,167,830	3,227,907
Structural gravel	32	36	667,811	900,755	826,949	1,167,758
Paving and road-making gravel	22	26	544,345	655,143	406,348	553,559
Other gravel	3	6	86,289	97,341	32,049	60,642
Total gravel			1,298,445	1,653,239	1,265,346	1,781,956
Total sand and gravel			4,329,994	5,969,479	3,433,176	5,009,866

The detailed statistics reveal the same story as the summarized figures—namely, that although production of some classes of sand and gravel was greatly curtailed, the smaller amount of business was divided among almost as many pits as in the previous year. Such conditions cannot continue long. It is felt that the statistics for 1932 will see a great decline therefore in the number of active pits.

A tabulation of the statistics by counties reveals that Burlington County still holds first place both in the amount and the value of production. Cumberland County takes second place in point of value but is sixth in point of volume. This is because the glass sand produced in the Vineland-Millville district possesses far greater unit value than the ordinary washed sand used in construction and industry. The relative rankings of the six leading counties are as follows:

<i>County</i>	<i>Production in short tons</i>	<i>Ranking</i>	<i>Value in dollars</i>	<i>Ranking</i>
Burlington	851,208	(1)	831,882	(1)
Cumberland	382,670	(6)	473,286	(2)
Morris	676,440	(2)	398,352	(3)
Middlesex	482,580	(4)	390,644	(4)
Camden	576,170	(3)	357,994	(5)
Monmouth	452,671	(5)	350,194	(6)

In 1929 Middlesex County was second in volume of production with a total of 963,829 tons. The decline in production in that county therefore has been 481,249 tons in two years or almost exactly 50 per cent.

Only a few new plants were built in 1931 but several of these have large capacity. In addition to those mentioned in last year's report (Bulletin 37) the following should be listed:

Roxbury Washed Sand and Gravel Co. Pit at Ledge-wood, Morris County.

Van Brockhoven Sons, Inc. Pit in Preakness Valley, west of Paterson.

The Eastern Sand and Gravel Co., operating a dredge in Delaware River, is also a new addition to the list of operators.

So far as known no new plants have been constructed in 1932.

CLAY.

About the only comfort which may be derived from the present situation in the clay industry is that those who survive the present stagnation of industry will have less competition to face in the near future than in the past. Sales of clay in 1931 declined

27.7 per cent as compared with 1930, and the volume of sales declined 20.4 per cent. Thirty-two operators reported sales as against 35 in the previous year. The Bloomfield Clay Company of Metuchen has gone out of business, and Edgar Brothers Company of Metuchen report leasing their pit near Milltown to M. J. Powers and Son on September 15, 1931.

The detailed statistics of sales reported in 1931 and 1930 follow.

RAW CLAY SOLD IN 1931 AND 1930

<i>Kind of Clay</i>	<i>No. of pits</i>	<i>Production-short tons</i>		<i>Value-dollars</i>	
		1931	1930	1931	1930
Ball clay	5	5,168	7,901	26,928	45,962
Fire clay	29	100,309	157,223	432,656	646,349
Stoneware clay....	7	6,640	2,659	33,656	16,203
Miscellaneous clay.	7	23,420	2,503	22,581	4,622
Totals.....		135,537	170,286	515,821	713,136

It will be noted that although sales of stoneware clay and clay sold for miscellaneous purposes were considerably greater in 1931 than in 1930, these two classifications combined are still unimportant as compared with sales of fire-clay. The most interesting feature to be noted is that the unit price of fire-clay sold in 1931 is \$4.31 a ton as compared with \$4.11 a ton in 1930. Apparently there is a determination on the part of New Jersey's clay producers not to sell any clay at less than cost.

BRICK AND TILE.

Anyone traveling widely through New Jersey cannot fail to note the scores of idle factories which normally hum with activity and afford employment to thousands of laborers and artisans. If he is observant he may note that many of the idle plants contain kilns which are used in the burning or firing of clay products. Occasionally he may see a kiln with smoke issuing from the stack. But for every busy kiln he can count ten idle ones. Such is the state of the clay products industries in the latter part of 1932.

In 1931 the reported sales of brick and tile declined nearly 41 per cent as compared with 1930. Sales of common brick decreased from 169,714,000 to 134,784,000, a decline of 20.6 per cent, and the average price per thousand fell from \$12.80 to \$11.75, a decline of 8.2 per cent. Sales of face brick were reduced almost to the vanishing point, the total number sold amounting to only 2,065,000 as compared with 15,265,000 in 1930, and 21,937,000 in 1929. Sales of hollow building tile and terra cotta also declined greatly; but sales of floor tile, enameled tile and wall tile, were almost the same as in 1930. Other details of the production are shown in the following table.

BRICK AND TILE PRODUCED IN 1931* AND 1930

Products	Quantity produced		Value in dollars	
	1930	1931	1931	1930
Common brick	134,784M	169,714M	1,508,243	2,172,417
Face brick	2,065M	15,265M	43,986	339,358
Fire brick				
(a) Brick, etc. ^b	8,071M	14,451M	411,762	722,696
(b) Special shapes	12,662 s. t.	15,374 s. t.	377,202	477,568
Hollow building tile	257,222 s. t.	383,347 s. t.	1,763,991	2,991,923
Floor tile	3,352,597 sq. ft.	2,088,194 sq. ft.	590,504	457,412
Ceramic mosaic		1,237,306 sq. ft.		236,702
Enameled tile	2,587,769 sq. ft.	2,443,761 sq. ft.	930,241	973,818
Faience tile	103,629 sq. ft.	148,167 sq. ft.	96,462	141,707
Wall tile	3,679,738 sq. ft.	3,487,264 sq. ft.	1,073,978	1,129,867
Drain tile	741 s. t.	821 s. t.	7,261	14,394
Terra cotta, etc. ^c		69,648 s. t.		4,098,135
Other brick and tile products			1,840,230	686,083
Prepared clay	6,481 s. t.		45,375	119,611
Refractory cement (clay)	7,238 s. t.		413,671	601,492
Total value			9,102,906	15,363,183

M=thousands. s. t.=short tons.

a. Figures subject to slight corrections.

b. Includes brick, block or tile (9-inch equivalent).

c. Includes terra cotta, conduit, floor arch, silo and conerib tile; radial chimney blocks, and fire-proofing tile.

d. Includes fancy, enameled and hollow brick, and glass-house tank blocks.

Although a number of the brick plants—and possibly several of the tile plants—now closed will never resume operations, we doff our hats to the Dunbar Clay Products Company of Stirling, N. J., which has recently completed a small plant literally on top of its clay supply in the Passaic Valley, and which is now producing flower-pots in considerable volume. We predict success and a long life for the new enterprise.

POTTERY.

The total value of pottery sales in 1931 amounted to \$11,257,406, a decline of \$3,198,840, or 22.1 per cent from 1930. Declines were general throughout the list of pottery products, the only exceptions being sales of red earthenware—which showed a slight increase over 1930—and sales of “Other vitreous china fixtures.” In Trenton, the most important center of the pottery trade, two-thirds of the kilns were idle most of the year—and the same proportion of idle kilns would probably hold for all the other potteries in the State. Several of the older potteries in Trenton, including the International Pottery and the Prospect Street and Crescent potteries of the Trenton Potteries Company, have been torn down in the last two years. Two or three others will probably never reopen. All of these are old and inefficient plants whose demise therefore cannot be regarded as any great loss to the industry.

POTTERY MANUFACTURED IN 1931 AND 1930

	<i>Quantity-pieces</i>		<i>Value-dollars</i>	
	^a 1931	1930	^a 1931	1930
Red earthenware			128,332	120,898
Vitreous china plumbing fixtures:				
(a) Bathroom and toilet fixtures				
Closet bowls: Siphon jets.....	89,431	102,161	767,832	1,013,024
Washdowns	175,807	248,587	770,719	1,151,852
Reverse traps	31,425	32,462	168,219	187,407
Flush tanks	184,760	241,267	1,061,743	1,354,808
Lavatories	102,914	108,915	1,375,266	1,546,380
Other bathroom and toilet fixtures			202,274	506,865
(b) Other vitreous china fixtures...			391,802	262,343
Semi-vitreous or porcelain plumbing fixtures			1,836,528	2,225,085
Porcelain electrical supplies			2,135,729	2,618,776
Art pottery and gas and electric logs.				325,226
Saggers			97,168	156,796
White ware, porcelain china and hotel china				2,090,232
Other pottery products			2,321,794	896,554
Total value			11,257,406	14,456,246

a. Preliminary figures and subject to revision.

GREENSAND MARL.

There was little change in the greensand marl industry in 1931. The same firms continued to operate, although the rate of production was necessarily curtailed to some extent. As in previous years, the principal demand for this product was for use in water-softening plants. For this purpose it is distributed widely both in this country and abroad.

OTHER PRODUCTS.

Lime. Although the reported production of lime was less than in 1930 it is a pleasure to record that one additional lime plant has been put in operation. Henry Kinkel, and his son, John H. Kinkel, of Stewartville, have constructed two kilns for the production of agricultural lime. Though not in operation in 1931, this production will be reflected in figures for 1932.

Portland cement. The great decline in construction activities necessarily had its effect upon cement producers. The plants of both the Edison Cement Corporation and the Vulcanite Portland Cement Company were operated only as needs demanded in order not to accumulate unnecessarily large surpluses. The decline in shipments, though large, was, in percentage, far less than the decline for the cement industry as a whole.

Reflecting its confidence in the ultimate revival of the cement industry, the Edison Cement Corporation is going ahead with plans for the construction of a new plant at Piscataway, about three miles east of New Brunswick. The plant will be operated by a subsidiary, the Metropolitan Cement Corporation, and will be housed within the buildings erected by the Eastern Potash Corporation in the latter part of the war. Much of the machinery which that corporation expected to use in the extraction of potash from greensand marl will be utilized in the manufacture of cement. The raw materials for the cement will be obtained locally and from a quarry adjacent to the Hudson River near Catskill, New York. Since the plant site is adjacent to tide water in Raritan River it will be possible to ship the needed stone from Catskill by barge and to distribute the finished product by the same economical method of transportation. A spur of the Lehigh Valley Railroad also serves the plant.

Pulverized sand. The production of pulverized sand for use in the manufacture of pottery, sodium silicate (water glass), scouring soaps, polishes, and other products has waned with the general decline of industrial activity. The plant of the New Jersey Pulverizing Company, at Pinewald, is reported closed and there appears to be little prospect of its reopening in the near future.

By-product coke. The by-product coke industry of New Jersey passed through another year with very little change. The vol-

ume of sales increased slightly and the value of sales decreased by a fraction of one per cent. In a year when nearly all of the major industries of the state were experiencing sharp declines in both the volume and the value of sales, such a record is by comparison an excellent one. That 1932 may not provide quite such smooth sailing for New Jersey's two producers of coke is a possible corollary to the appearance in Trenton of big, new trucks retailing coke from Pennsylvania.

NEW DEVELOPMENTS.

The greater part of New Jersey's population lives in a region of Triassic rocks known as the Piedmont physiographic province. The rocks are predominantly red shale and sandstone with a good deal of intruded and extruded hard, gray trap. As shown in a foregoing part of this report the trap is quarried extensively and for many years has been one of the most valuable of New Jersey's mineral resources. Years ago, the red sandstone, or brownstone, was also regarded as a valuable resource, for many quarries were opened in it and thousands of tons of stone were removed for use in buildings, dams, bridges and other permanent structures. But cheaper building materials—particularly concrete—have replaced brownstone as a building material and now it can no longer be considered as having much value. As for the red shale, it is usually regarded only as a nuisance, the despair of country road-builders and a just cause for Edison's famous epithet. Nevertheless the red shale has been a utilized natural resource for some time. The A. M. Krantz Company of Kingsland, Hudson County, has used it for years in the manufacture of both face and common brick. Now we learn that another brick plant will soon be built to utilize this same material in the manufacture of face brick alone. The location of the new plant will be determined by the results of burning tests on samples collected from many localities. These tests have already shown that much of the shale is unsuited for the purpose in mind because of excessive shrinkage in burning, but a few of the samples have proven so satisfactory that the location of the new plant is practically settled now.

Another use for the red shale may develop from experiments of the Edison Cement Corporation. The company has found that in proper combination with other materials it can be made into a thoroughly satisfactory cement.

WATER SUPPLY.

Although no value has been given the utilized water resources of the State in the summary of mineral production, the sales value of the water delivered to consumers by public water com-

panies alone in 1931 was probably close to \$30,000,000. The value of the water consumed from privately-owned sources was probably a third as much. The total annual sales value of the utilized water resources of the State is therefore a sum approximating \$40,000,000—an amount greater than that of any other natural resource and even exceeding the combined value of all the clay products made in New Jersey.

A large majority of all the water supplies—accounting for probably a third of all the water consumed—are from underground sources. The location of such sources is a matter which, because of their training, geologists are best qualified to undertake. For that reason geologists of the State Department of Conservation and Development have always considered it an essential part of their work to give advice concerning the ground-water supply of any part of the State when requested. The advice given is based not only upon the particular geologist's personal experience, but upon all the fund of geological data and all the well records that have been collected in a period of fifty years and more. From such information they are frequently able to predict before drilling the depth to a water-bearing horizon (this applies particularly to the southern part of the State; the amount of water that can be obtained; and in many cases, the quality of the available water. The growing population, and the mild winters and dry summers of recent years have combined to cause a greatly increased demand for this type of information.