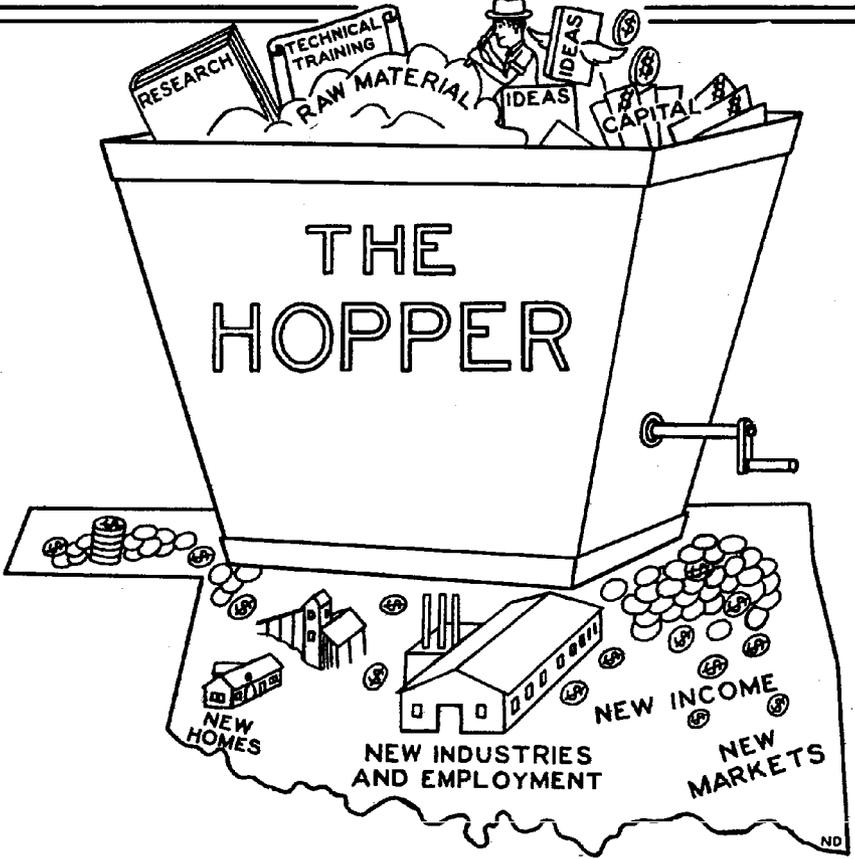


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MINERAL INDUSTRY OF OKLAHOMA 1952*

BY

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INTRODUCTION

Oklahoma, the 17th largest State in the Union with 69,919 square miles of area distributed among 77 counties, was the sixth ranking State in the production of mineral wealth in the nation in 1952. Oklahoma was the third largest producer of natural gas and LP-gases and the fourth largest producer of natural gasoline, asphalt, crude petroleum, and zinc. The State also produced substantial tonnages of cement, coal, sand and gravel, stone, and gypsum. Metal mining (zinc-lead) centered around Ottawa County in the northeast corner of the State. Non-metallic mining was distributed, but was concentrated principally in central, north-central, and north-eastern Oklahoma, and the Arbuckle and Wichita Mountains. All non-metallic materials except granite were produced from sedimentary deposits, mostly from limestones, sandstones, and shales of Paleozoic and Mesozoic age, or from unconsolidated sands and clays of Tertiary and Quaternary age. Oil and gas production exceeded that of any other mineral in value, and was approximately equal in value to agricultural products and to manufacturing products. Oil, together with some gas, was produced

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from about 1,050 pools in 55 Oklahoma counties, distributed principally in northeastern, north-central, central, south-central, and southwestern parts of the State. The most productive counties in 1952 were Stephens, Carter, Garvin, Oklahoma, and Seminole. More oil has been produced per unit of area in Oklahoma than in any other State in the nation. Gas alone was produced in seven additional counties, chiefly in east-central Oklahoma and the Panhandle. Oil and gas trunk pipeline mileage increased in 1952 as did the mileage of the gathering lines.

In 1952 the value of mineral production in Oklahoma was \$621,351,000, which compared with a value of \$613,000,000 for agriculture and \$583,000,000 for manufacturing.

TRENDS AND NEW DEVELOPMENTS

Owing to rising freight costs there was a continued trend toward decentralized production and processing of such bulk commodities as crushed stone and sand and gravel.

The newly constructed crushing and blending plant of the Dolese Bros. at Richards Spur, north of Lawton, was in its first full year of operation. Described as the nation's outstanding new crushed stone plant, 1/ it was erected to replace an older plant that was destroyed by fire in 1949. The quarry is in the Arbuckle limestone and has a length of about 1,000 feet; the height of the face ranges from 100 to 200 feet.

1/ Nordberg, Bror, Nation's Outstanding New Crushed Stone Plant: Rock Products, vol. 56, No. 1, 1953, pp. 108, 125, 180.

The capacity of the Dewey Portland Cement Co. plant was increased 40 percent by the installation of a new 375 foot rotary kiln. ^{2/} Also included in the company's expansion program was the modernization of its power plant and electrical distribution system.

A new granite quarry for monumental stone and exterior trim was opened near Mill Creek, in the central part of the Arbuckle Mountains, by the Century Granite Co. of Snyder, Oklahoma.

Bentonite production from near Camargo, Dewey County, was reported in 1952 for the first time since 1946.

Interest in the possibilities of mining ilmenite for use in making pigments and titanium metal was increased by the publication of a report ^{3/} in which alluvial sands in Comanche County were shown to contain free ilmenite that is amenable to concentration. Test drilling of one deposit on the north shore of Lake Lawtonka indicated a reserve of 370,000 short tons of ilmenite concentrates containing 44.12 percent TiO_2 . The ilmenite constitutes 3.4 to 6.8 percent of the alluvial deposit.

A comprehensive program of drilling for zinc ore by the American Zinc, Lead, and Smelting Co. in the old Davis zinc field was completed in 1952. This area, in the Arbuckle Mountains, about 9 miles southwest of Davis, Murray County, had previously been worked for sphalerite and smithsonite between about 1912-1914, and again during World War II.

^{2/} Avery, William M., Dewey Portland's New Kiln Jumps Output 40 Percent at Dewey, Oklahoma: Pit and Quarry, vol. 45, No. 2, 1952, pp. 114, 116, 120.

^{3/} Chase, Gerald W., Ilmenite in Alluvial Sands of the Wichita Mountain System, Oklahoma Geological Survey, Circ. 30, 1952, 44 pp.

TABLE __. Mineral Production

Mineral	
Clays (except for cement)	-----
Coal	-----
Lead (recoverable content of ores, etc.)	-----
Natural gas	-----thousand cubic feet--
Natural gas liquids:	
Natural gasoline	-----42-gallon barrels--
LP-gases	-----do-----
Petroleum (crude)	-----do-----
Sand and gravel	-----
Stone (except limestone for cement and lime)	-----
Zinc (recoverable content of ores, etc.)	-----
Undistributed: Native asphalt, cement, gypsum, lime, pumice and pumicite (1952), salt, <u>ground</u> sand and sandstone, and stone (dimension limestone, 1952)-	
Total Oklahoma	-----

1/ Production as measured by mine shipments or mine sales (including consumption by producers, except that fuels and gypsum are strictly production.

2/ Final figure. Supercedes preliminary figure given in commodity chapter.

3/ Excludes certain stone included with "Undistributed."

in Oklahoma, 1951-52 1/

1951		1952	
Short tons (unless other- wise stated)	Value	Short tons (unless other- wise stated)	Value
345,566	\$356,207	249,819	\$307,189
2,223,229	13,873,424	2,193,409	12,687,855
16,575	5,734,950	15,137	4,874,114
538,756,000	28,554,000	554,033,000	29,918,000
9,458,000	27,498,000	9,660,000	29,459,000
8,084,000	12,436,000	8,953,000	14,090,000
186,869,000	480,250,000	<u>2/</u> 190,435,000	<u>2/</u> 487,510,000
3,183,251	2,321,653	3,769,663	2,911,845
6,966,676	6,917,548	<u>3/</u> 9,636,475	<u>3/</u> 8,974,334
53,450	19,455,800	54,916	18,232,112
-----	10,088,324	-----	12,387,022
-----	607,486,000	-----	621,351,000

American Zinc began detailed mapping April, 1951, and by August, 1952, had completed the drilling of 20,000 feet.

Deposits of kaolin and montmorillonite clays of the Wichita Mountains were briefly described. ^{4/} Deposits in Comanche and Kiowa Counties occurring as alteration products of anorthosite were investigated by test drilling, which indicated that 7-25 percent kaolin can be recovered by elutriation. The elutriated product is relatively non-plastic and light-firing, and contains 34-36 percent Al_2O_3 . Drilled depth of the altered material was about 30 feet. The montmorillonite group of clays contains 13-25 percent Al_2O_3 and occurs as alteration products of pre-Cambrian gabbro. Drill tests indicate a large volume of these materials.

REVIEW BY MINERAL COMMODITIES

MINERAL FUELS

Coal.--Oklahoma coal production in 1952 declined for the 5th consecutive year when 2,193,400 tons, valued at \$12,687,900, were produced. There were 12 counties reporting production, the largest being Okmulgee, followed by Rogers, Le Flore, Haskell, Sequoyah, McIntosh, Pittsburg, Coal, Latimer, Craig, Wagoner, and Tulsa.

Petroleum.--Oklahoma continued as the nation's 4th largest producer of petroleum in 1952 with an output of 190,435,000 barrels, 2 percent more than the 186,869,000 barrels produced in 1951.

Natural gas.--Marketed production of natural gas amounted to 554,033 million cubic feet valued ^{4/} Chase, Gerald W., and Burwell, Albert L., Kaolin and Montmorillonite Clays of the Wichita Mountains, Oklahoma: Oklahoma Geological Survey, The Hopper, vol. 12, No. 1, 1952, pp. 1-10.

at \$29,918,000 in Oklahoma in 1952, an increase of 15,277 million cubic feet in quantity and \$1,364,000 in value over that produced in 1951.

Natural gas liquids.--Oklahoma ranked 4th among the States in the combined production of natural gasoline and LP-gases in 1952 when it produced 9,660,000 barrels of natural gasoline and 8,953,000 barrels of LP-gases valued at \$29,459,000 and \$14,090,000 respectively.

METALS

Cadmium, germanium, indium, and gallium.--Minerals of these elements occur as a trace or in minute quantities in many domestic zinc ores. The entire domestic production was recovered as a by-product from the flue dusts generated in the zinc smelting process. It is impossible to determine the State origin of these commodities since smelter practices co-mingle the ores from numerous sources, some of which are foreign in origin, and because no assay is made of these constituents due to their diminutive quantity. Cadmium occurs most commonly as the mineral greenockite (CdS), associated as a yellow powder or stain with the zinc mineral sphalerite (ZnS), and to a lesser extent with ores of lead and copper containing zinc mineralization.

Lead.--Oklahoma production of recoverable lead in 1952 dropped about 9 percent in quantity and 15 percent in value compared with 1951. It was the smallest production since 1947 and only 19 percent of 1925, the peak production year. During the year, 168 companies operated 118 mines, all of which were in Ottawa County. Recovery, in terms of metal content, dropped from 0.47 percent in 1951 to 0.41 percent in 1952. The ore mined in the State was predominantly zinc with a ratio of 3 parts zinc to 1 part lead. Oklahoma contributed most of the lead

produced in the Tri-State district, accounting for 55 percent.

Zinc.— Concentrate recoveries from Oklahoma zinc-lead ores declined in 1952 to 2.66 percent for zinc and 0.55 percent for lead when 3,542,213 tons of crude ore and 666,523 tons of tailings yielded 101,726 tons of zinc concentrates and 20,473 tons of lead concentrates. Production of recoverable zinc in 1952 increased 3 percent to 54,916 tons when compared with 53,450 tons in 1951, notwithstanding a decline of 36 percent in metal price. The value decreased 6 percent coincident with lower metal prices. Economic forces contributing to the fluctuations in metal prices were the prolonged steel strike which permitted zinc stocks to increase sharply; the over-supply of foreign metal stocks which eventually sought American markets; the urgent need of some foreign Governments to convert such stocks into American dollars; and the added production from new foreign sources. This combination of events induced lower metal prices with the net effect that many domestic marginal producers were obliged to curtail or discontinue operations. Many Oklahoma zinc properties were in this category.

Prices

There were 319 mines operating in the district during the year, 118 of which were in Oklahoma. Many of these mines began closing during the latter half of the year when lead prices dropped from 19 cents to 14-3/4 cents, and zinc prices from 19-1/2 cents to 12-1/2 cents. This was a 22 percent loss for lead and a 36 percent loss for zinc, which eventually resulted in the closing of 107 district mines and 5 mills.

NON-METALS

Non-metallic mineral commodities produced in Oklahoma in 1952 were clays (including bentonite), sand and gravel, stone, and miscellaneous products (native asphalt, cement, gypsum, lime, pumicite, salt, ground sand and sandstone, and dimension stone). Reported value of these commodities in 1952 was \$24,258,000, which was greater than any previous year and a 25 percent increase over 1951. Fifty percent of the 1952 value was for miscellaneous products.

Clay

Oklahoma has extensive and widely distributed clay resources, and nearly all the clay produced is used in the manufacture of cement or brick and tile. In 1952 clay was produced by 12 brick and tile plants in Creek, Custer, Garfield, Greer, Oklahoma, Pittsburg, Pontotoc, Seminole, and Tulsa Counties. One plant in Lincoln County was idle. Production of 246,474 tons valued at \$257,014 was reported.

Bentonite production was reported in 1952 from near Camargo in Dewey County. Deposits near Camargo and Woodward, Woodward County, have been worked intermittently in the past, but the 1952 production was the first reported since 1946.

Small quantities of pottery clay are produced in Pontotoc and Tillman Counties.

Sand and Gravel

Large deposits of sand and gravel, suitable for concrete aggregate and road surfacing, occur along and adjacent to most of the larger streams in Oklahoma. Construction sand and gravel was produced in 1952 in 32 counties. Ten plants were operated in Tulsa County, six in Oklahoma County, five in

Kay County, and four in Pawnee County. Other plants were well distributed through the State.

High purity silica sand was produced from sandstones of Ordovician age in Johnston, Murray, and Pontotoc Counties in the Arbuckle Mountains region of south-central Oklahoma. Most of this sand is used in manufacturing glass, but smaller quantities are used as foundry sand and for making sodium silicate.

Sand and gravel produced in Oklahoma in 1952 is reported as 3,770,000 tons valued at \$2,912,000 compared with 3,183,000 tons valued at \$2,322,000 in 1951.

Stone .

Limestone and dolomite, chat, granite, and sandstone were produced in Oklahoma in 1952. Limestone and dolomite, used principally as crushed stone, was the leading commodity. Production and value records of stone were broken in 1952 when 9,636,000 tons valued at \$8,974,000 was produced, surpassing 1951 when 6,967,000 tons valued at \$6,918,000 had set the previous record. This was a 38 percent increase in quantity and a 30 percent increase in value.

Limestone and Dolomite.--Oklahoma has abundant resources of limestone and dolomite. In 1952 limestone or dolomite was produced from 15 quarries in 11 counties, the greatest production being in the Arbuckle Mountain region of south-central Oklahoma, the Tulsa area of northeastern Oklahoma, and the Wichita Mountain region in southwestern Oklahoma.

Most of this stone is crushed for use in concrete aggregate, riprap, road surfacing, railroad ballast, metallurgical and chemical manufacturing,

and acid neutralizers for soils.

Chemical grade limestone is quarried for lime making and as flux in glass manufacturing at Marble City in Sequoyah County. Chemical grade dolomite is produced for glass manufacturing, fertilizers, and mineral feeds at Troy in Johnston County.

In 1952 Oklahoma produced 6,356,000 tons of limestone and dolomite valued at \$6,943,000 compared with 4,765,000 tons valued at \$5,279,000 in 1951. Limestone was quarried for building stone in the Arbuckle Mountains and near Eldorado in Jackson County; and limestone used in portland cement manufacture was quarried in Washington and Pontotoc Counties.

Chat.--Chat is the name used in the west-central States to denote the coarse tailings obtained in milling zinc and lead ores from Ottawa County. This material is composed mostly of chert or microcrystalline silica, together with small quantities of limestone, sphalerite, galena, marcasite, and pyrite.

Most of the chat sold was used for railroad ballast, concrete aggregate, and road surfacing. In 1952 operators reported sales of 3,274,008 tons valued at \$1,511,742 compared with 2,050,673 tons valued at \$897,112 in 1951.

Granite.--The granite industry of Oklahoma is centered in the Wichita Mountain district, in the southwestern part of the State, where production in 1952 was reported from six operators in Comanche, Greer, and Kiowa Counties. During the year a new quarry was opened near Mill Creek, Murray County, in the central part of the Arbuckle Mountains. It is the first granite quarry to be operated in the Arbuckle Mountains in about 35 years.

Production is from pre-Cambrian granites that are predominantly pink and red. The granite is used mostly for monumental stones and partly for exterior trim. Much of the stone is finished in plants of the Wichita Mountain district, but some is exported as rough stock to other States. In 1952 granite production was 5,300 tons with a value of \$511,000.

Sandstone.--Sandstone produced in Oklahoma is used chiefly for building and veneer stone in construction of residence and business buildings. The stone is worked as slabs 1-1/2 to 6 inches thick from shallow, open-face quarries in Choctaw, Mayes, Okmulgee, and Pushmataha Counties. One mechanized trimming plant operates near Henryetta, Okmulgee County. Incomplete returns for 1952 show a production of 950 tons valued at \$10,900.

Crushed Stone (Non-commercial).--Stone crushed by municipal, county, and State agencies included limestone, sandstone, and granite obtained from local quarries throughout the State. Production in Oklahoma in 1952 was 200,153 tons valued at \$147,209

Miscellaneous Minerals

Minerals produced in Oklahoma in 1952, for which statistics cannot be revealed because there are less than three producers or because one company produces a large percentage of the total, are native asphalt, cement, gypsum, lime, pumicite (volcanic ash), salt, ground sand and sandstone, and dimension limestone. The value of these commodities, together with bentonite produced by one operator in Dewey County, was a record high of \$12,387,000. The value of miscellaneous minerals in Oklahoma, included in previous tables as "Undistributed", has been increasing from a low in 1944 of \$3,606,000 to new records beginning in 1947 and continuing each year through 1952. Values for these years are as

follows: (1947) \$7,149,000; (1948) \$8,106,000; (1949) \$8,706,000; (1950) \$9,512,000; and (1951) \$10,088,000. The increase in value for 1952 was 23 percent over 1951.

Cement.--Cement is produced at Dewey in Washington County and at Ada in Pontotoc County. Both plants have expanded their capacity in recent years. Cement had the largest value of the miscellaneous minerals in Oklahoma.

Gypsum.--In 1952 three operators continued to produce gypsum in Blaine County. Quarries formerly worked in other parts of western Oklahoma were inactive during the year.

The largest producer is the United States Gypsum Co., which operates quarries and a modern calcining plant at Southard, making wallboard and many kinds of plaster. Gypsum was quarried by the Universal Atlas Cement Co. near Watonga and by S.A. Walton near Southard principally for use as a retarder in the manufacture of portland cement.

Lime.--High-purity limestone of the St. Clair formation at Marble City continued to be burned in shaft kilns at Sallisaw, Sequoyah County, by the St. Clair Lime Co. The lime is sold chiefly for chemical use in water purification and steel metallurgy.

Perlite.--Perlite is expanded for use chiefly in concrete and plaster at two plants, one each at Oklahoma City and Tulsa. All crude perlite is imported, as there are no deposits in Oklahoma.

Pumicite.--Pumicite or volcanic ash was produced from deposits near Gate in eastern Beaver County. It is used mostly for cleansing and scouring compounds and as a concrete admixture.

Salt.--Salt was produced in three counties in 1952. The major producer was Oklahoma Salt Industries at Sayre, Beckham County, where salt continued to be produced by injecting fresh water through wells into a salt bed and recovering the brine for surface evaporation. In Woods County, salt was produced from surface encrustations on the Big Salt Plain of Cimarron River; and in Harmon County salt was recovered by solar evaporation of salt springs.

Ground Sand.--Ground sand is produced by the Pennsylvania Glass Sand Corp. of Oklahoma at Mill Creek, Johnston County, by grinding high-purity glass sand obtained from quarries in loosely consolidated sandstone. It is used mostly in cleansing and scouring compounds, as a filler, and for pottery, porcelain, and tile.

Tripoli.--Tripoli continued to be mined in 1952 in eastern Ottawa County, which long has been the main source of this commodity. All tripoli mined in Oklahoma was transported to Seneca, Missouri, where it was processed by the American Tripoli Corp. and sold chiefly for buffing compounds and foundry use.