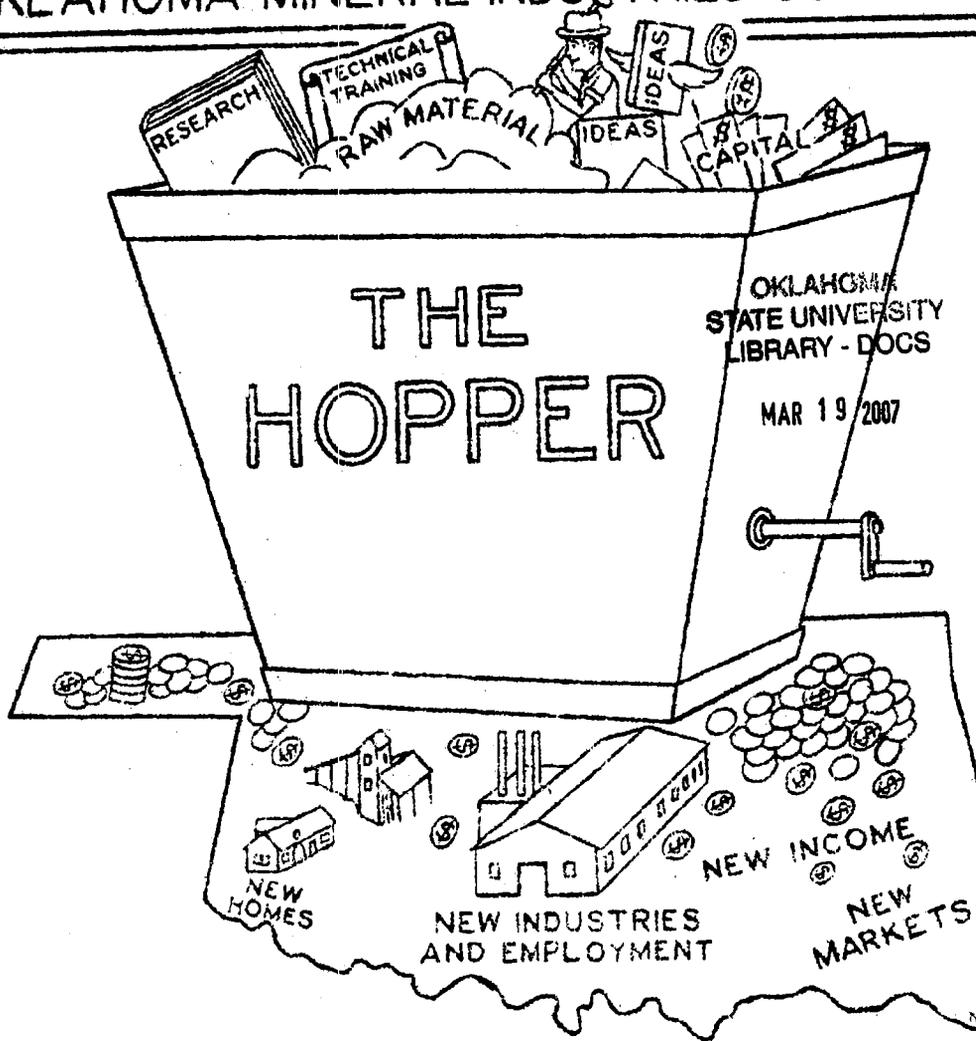


OKLAHOMA MINERAL INDUSTRIES CONFERENCE



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MINERAL RAW MATERIALS ARE BASIS FOR MANY INDUSTRIES

That the greatest contribution of minerals to the national economy is in processing rather than in the production of crude ores is revealed in some of the statistical facts regarding the steel industry. For example, data compiled by the United States Department of Commerce were used in a study reported in Steel Facts, February 1948, which indicate that 39.2 percent of all factory wages in 1946 were paid by the iron and steel industry and its principal customers who use these products in further processing.

According to this study, wage payments totaling 14.1 billion dollars were made by producers of iron and steel and by fabricating plants using iron and steel in manufacturing. These figures loom large when compared with the total value of crude iron ore of \$243,760,986 (1945). Even after adding in the crude ore value of limestone, dolomite, and other materials used in steel making, and the value of coke, a semi-processed material, the total raw material value of all these items is very small compared with the wages paid in making steel and in the manufacturing plants that use steel.

For an Oklahoma example of the economic importance of processing over raw material production, the lime and cement industries may be cited. Although production figures for these industries can not be revealed because of the small number of operators, the combined value of cement and lime produced in Oklahoma exceeds the raw material value of all the crude stone produced in the state.

The mineral fuels, coal, petroleum, natural gas, natural gasoline and allied products account for well over half the money value of raw minerals produced in the United States. The greatest economic value of the industrial minerals and the

metals is in their industrial utilization. With the iron and steel industries and the industries that use these products in further processing accounting for over 39 percent of factory wages, it is safe to assume that well over half the factory wages in the United States are paid by industries based chiefly on mineral raw materials. A few of the mineral processing industries in addition to those using iron and steel will include the heavy chemicals, oil refining and coke industries, glass and clay industries, and many of the synthetic products now being made from mineral materials.

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VERMICULITE FOUND IN OKLAHOMA

By

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Vermiculite has not been reported from Oklahoma in any of the literature, although there have been suggestions that deposits existed in the Wichita Mountains in the southwestern part of the State. In the course of field work in the western part of the mountains, vermiculite in large crystals was noted in an old prospect pit southeast of Roosevelt in Kiowa County.

Extent of this deposit has not been determined, but in general, the vermiculite is associated with feldspar in a granite pegmatite dike. The feldspar is the most abundant mineral, with the vermiculite occurring between the feldspar crystals. Crystal quartz is a minor constituent of the dike. No definite determinations have been made, but the vermiculite appears to make up about a fourth of the vein material. Part of the micaceous material is not of the vermiculite type. In the absence of exploratory drilling and testing, it is not possible to estimate the quantity.

The vermiculite type of material was noted at two places in sec. 14, T. 4 N., R. 17 W., and at one other place some one-half mile to the south-east. The intervening areas are covered so that test holes would be necessary to determine whether the dike is continuous, and its width from place to place.

According to Dana, the vermiculite group includes several micaceous minerals, all of which are hydrated silicates. These are regarded as alteration products derived chiefly from the mica minerals such as biotite, phlogopite, etc.

Vermiculite has become of economic importance in comparatively recent years, following discovery of its value as an insulating material. When heated at proper temperature, vermiculite expands to produce a light-weight product with good insulating properties.

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ROOM FOR GROWTH

"A chart of the industrial workers of the counties reveals some facts that should cause us to get busy if we ever expect to catch the southern states further east. In an area beginning at Washington, D. C., and stretching south and west, we find a majority of the counties have from 1,000 to 10,000 industrial workers. Almost none of the counties in that area has fewer than 1,000 workers. In Oklahoma, we have only two counties, Oklahoma and Tulsa, with more than 10,000 industrial workers. Those having between 1,000 and 5,000 are Pontotoc, Stephens, McCurtain, Pittsburg, Okmulgee, Muskogee, Creek, Ottawa, Washington, Kay, and Garfield. All the others have fewer than 1,000. So we have plenty of room for growth."

--From the Ada News

MINERAL PRODUCTION OF OKLAHOMA, 1946

(Collected by U. S. Bureau of Mines and Oklahoma Geological Survey)

PRODUCT	QUANTITY	VALUE
Asphalt (native).short tons	(1)	(1)
Cementbarrels	(1)	(1)
Clay:		
Products (other than pottery and refractories)		
Rawshort tons	37/ 488,973	2/1,557,000 2/ 358,922
Coal	" " 2,510,000	9,497,000
Gypsum (crude) ..	" " (1)	(1)
Lead	" " 13,697	2,985,946
Lime	" " (1)	(1)
Mineral waters.gallons sold	(4)	(4)
Natural gas....M cubic feet	380,000,000	76,000,000
Natural gasoline and allied products:		
Natural gasoline..gallons	285,021,000	12,919,000
Liquefied petroleum gasesgallons	133,942,000	3,081,000
Ores (crude), etc.:		
Lead.....short tons	2,236	(5)
Zinc....." "	9,067,673	(5)
Zinc-lead....." "	3,139,744	(5)
Petroleum.....barrels	134,497,000	193,600,000
Salt.....short tons	(1)	(1)
Sand and gravel.. " "	1,577,138	947,283
Stone....." "	3,413,430	2,624,579
Sulfuric acid ^{6/} ... " "	(1,7)	(1,7)
Zinc....." "	69,552	16,970,688
Miscellaneous ^{8/}	6,359,531
Total value, eliminating duplications	326,148,000

Footnotes on next page.

- 1/ Value included with "Miscellaneous."
- 2/ Figures obtained through cooperation with Bureau of the Census.
- 3/ Sold or used; value of clay used in cement and heavy clay products not included in total value.
- 4/ No canvass.
- 5/ Not valued as ore; value of recoverable metal content included with the metals.
- 6/ From zinc smelting.
- 7/ Value not included in total value for State.
- 8/ Includes minerals indicated by "1" above.

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CHINA TABLEWARE PRODUCTION

Shipments of china tableware during the period October through December, 1947, from 25 manufacturing plants in the United States reveal that over 93 percent of the total number of pieces were hotel commercial ware, according to figures prepared by the Bureau of the Census, Industry Division, Minerals Section. Total value of these products for the three-month period was given as about \$10,800,000, indicating an annual value of about \$40,000,000.

Of the 25 plants reporting, 15 reported hotel or commercial ware only; 6 reported household china tableware; and 4 reported shipments of both types.

Although the hotel or commercial tableware, representing the lower price heavier types of tableware, accounted for 2,794,000 dozen pieces, or about 93 percent, the value was only 79 percent of the total. Because of the lower unit value and the general heavier weight per unit, transportation costs of the lower priced tableware products from distant factories to the Southwest doubtless is a much bigger item than for the finer grades of china ware.

MANY AREAS FACED WITH
WATER SUPPLY PROBLEMS

That other states and regions are being forced to give serious consideration to sources of water supply is revealed in numerous articles dealing with the subject. The Oklahoma Geological Survey and the U. S. Geological Survey cooperative ground water investigation program in Oklahoma was started several years ago for the purpose of studying the problems in Oklahoma and gathering information that would be helpful in solving special problems of ground water supplies as they arise in this state.

Something of the importance of adequate information and steps that are being taken to meet problems of water supply is revealed in the following discussion, quoted from the March-April, 1948, issue of the Johnson National Drillers' Journal:

"Little importance, economic or otherwise, is placed on water supplies until they fail. People as a whole regard water as they do air -- something there is plenty of, so why worry.

"That water can be important is being brought home to the people of the Southwest, northern Illinois, and several other parts of the country right now. In California, where water is vital to maintain irrigated crops and power plants, a shortage of major proportions is at hand due to a long drought. Where necessary, power companies are being restricted in their use of water. Less electricity is available to the people served, all of which is having its economic repercussions in all lines of business, stock is being marketed before ready, milk prices are going up due to shortages in feed.

In Arizona the same thing is true as the whole state faces a water shortage. Both California and Arizona are trying to solve their problems by turn-

ing to the Colorado River, experts are being consulted, wells are being drilled, even rainmakers are using dry ice into the clouds to produce rain.

"In Illinois, there is a shortage of ground water in the areas of Chicago, Joliet, Peoria, Champaign, and East St. Louis. At Joliet the water table dropped over 40 feet in one year and has been going down since. In Peoria the water table has been dropping steadily for years and the pumpage has been so great that total exhaustion is a possibility unless future withdrawals are regulated. The Illinois Water Survey is aware of the situation and the State of Illinois is helping solve the problem at Peoria by spending over \$200,000 to recharge their slowly but surely emptying reservoir.

"When we have shortages of water such as California and Illinois are now having, it makes little difference whether the supplies affected are surface or underground, the economic loss follows just the same. The only answer is the regulation of use to the annual recharge either natural or artificial. There is only so much water available and the amount depends on rainfall. The sooner users of water realize that water cannot be used at a rate greater than Nature can supply it, the sooner we will have regulations covering the proper use and conservation of our water supplies."

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MANGANESE MINE OPENED IN MCCURTAIN COUNTY

An open cut mine has been started at the site of an old prospect in northern McCurtain County for the purpose of getting out manganese ore, according to Messrs. Thompson and W. T. Harrell, who are operating the mine. The operation is in sec. 33, T. 2 S., R. 26 E., where the manganese minerals occur in fractured beds of novaculite.

GOVERNMENT ENCOURAGING URANIUM PRODUCTION

A recent press release from the U. S. Atomic Energy Commission discusses a program of encouraging production of uranium at guaranteed prices, and bonus payments for discovery and production of high-grade uranium from new deposits. According to the news release, the essential features of the program are as follows:

1. The government will guarantee to purchase for a ten-year period refined uranium products at a minimum price of \$3.50 per pound of uranium oxide; and for high-grade uranium ores and concentrates, a minimum price of \$3.50 per pound of recoverable uranium oxide, less the cost to refine to necessary purity.

2. For the discovery of new deposits of high-grade domestic uranium deposits, the commission will pay \$10,000 in addition to the prices established under the purchase schedule. Payment will be made upon delivery to the commission of the first 20 short tons of uranium ore or concentrates assaying 20 percent or more uranium oxide from any single lode or placer mining location not previously worked for uranium.

3. A special schedule of minimum prices for a period of three years has been made for the low-grade carnotite- and roscoelite-type uranium-vanadium ores of the Colorado plateau and government operation of two vanadium-uranium plants in that area.

No commercial grade uranium ores have come to the attention of the Oklahoma Geological Survey from Oklahoma. However, traces of uranium and thorium have been found in some of the zircon crystals from the old zircon mine in the Wichita Mountains. Claim was staked for this mine in 1905 by Mr. H. G. Southard. The old shaft, now filled with

water, is reported to be about 90 feet deep. The zircon crystals are disseminated in a pegmatite dike and are not of gem variety. Samples of the rock material in which the zircon occurs, and many of the zircon crystals, did not contain uranium.

An analysis of the uranium-bearing zircon crystals gave 0.03 percent uranium oxide and 0.47 percent thorium; far too low to be considered for commercial production.

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OKLAHOMA COKE LOWER IN ASH THAN AVERAGE OF NATION

Higher ash and sulfur content in the average coke now available to the nation's blast furnaces is contributing to higher costs of production, according to an article in the February, 1948, issue of Steel Facts. In 1947, the average coke used in blast furnaces contained 10.8 percent ash, an increase since 1944 of 5.5 percent in the amount of ash. Average sulfur content of coke also is greater than for earlier years.

Analyses of metallurgical coke made from blends of Oklahoma low-volatile and Oklahoma high-volatile coals were made by the U. S. Bureau of Mines in 1942, and published in Oklahoma Geological Survey Mineral Report No. 15. Ash content of the Oklahoma coke reported in these analyses was 7.1 to 7.2 percent, and sulfur 0.7 to 0.8 percent. Thus, these objectionable impurities are considerably lower in the coke made from Oklahoma coals than in the average metallurgical coke now available in this country.

In 1944, blast furnaces are reported to have used 1,810 pounds of coke for each ton of pig iron produced, but in 1946 the industry was using an

average of 1,368 pounds of coke for each ton of pig iron; an increase of 3.2 percent.

Another item of increased costs to the pig iron industry as a result of greater ash and sulfur in coke is in the greater quantity of limestone required to flux off the impurities. In 1944, for example, an average of 778 pounds of limestone was used by blast furnaces for each ton of pig iron. In 1946, the average was 812 pounds of limestone for each ton of pig iron, an increase of 4.3 percent. Two reasons are given for the increase in limestone requirements; one being the greater amount of impurities in the coke, and the other being the fact that the average iron ore available in 1946 contained 0.5 to 1.0 percent more silica than the average in 1944.

According to Steel Facts, these factors not only increased the quantity of coke and limestone required for a ton of pig iron, but also tend to reduce the total output of pig iron. The drop in output from 1944 to 1947, as reported by six of the major companies, ranged from 0.04 to 0.33 net tons per square foot of earth area per day.

As a result of the cooperative work several years ago between the Oklahoma Geological Survey and the U. S. Bureau of Mines, it has been demonstrated that suitable metallurgical coke can be made from blends of Oklahoma coals. Analyses of this coke shows a lower ash content than the present national average, an important factor in costs of blast furnace operations.

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