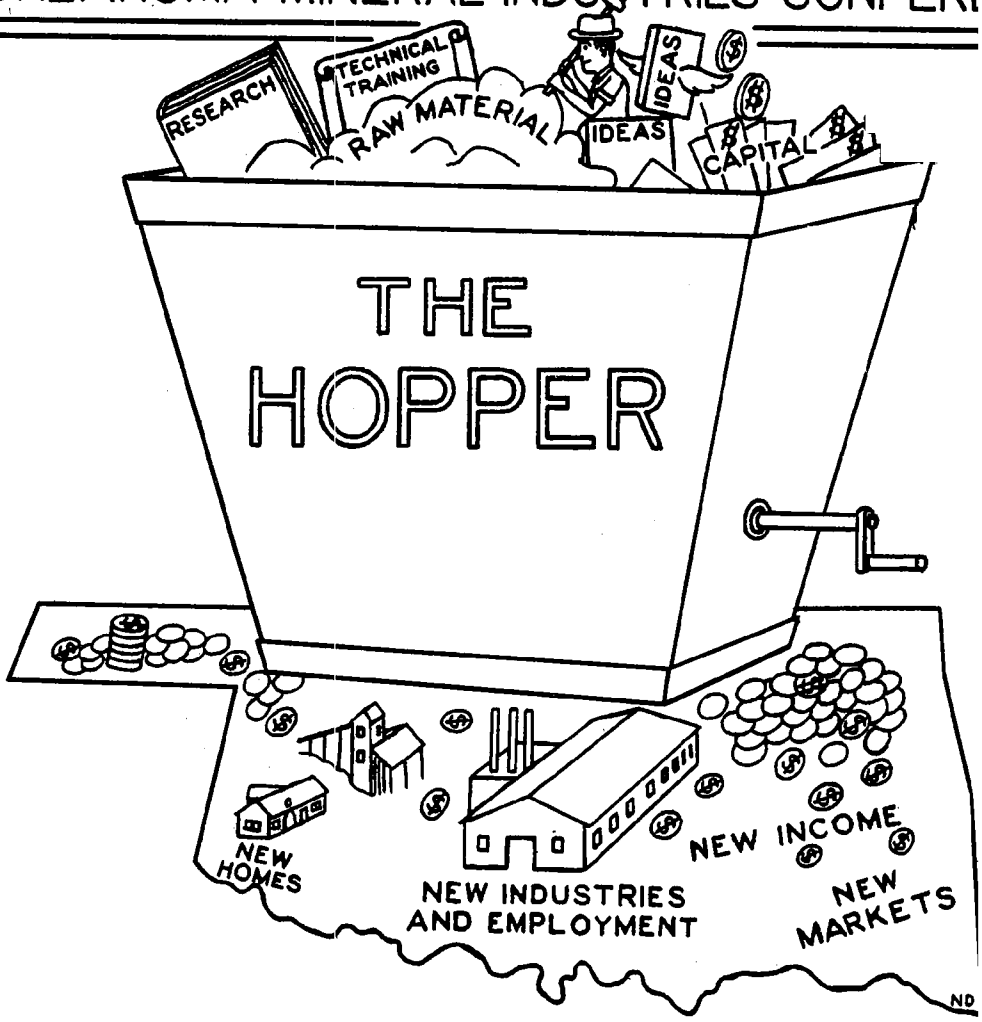
OKLAHOMA MINERAL INDUSTRIES CONFERE



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DOLOMITE RESOURCES DISCUSSED IN NEW SURVEY PUBLICATION

Among the industrial minerals that Oklahoma has in abundance is dolomite, a calcium-magnesium carbonate rock. High grade dolomite is important to certain basic industries, although the raw material value of the crude rock may not be very high. It is important, therefore, that producers and users of dolomite have access to sources of supply where good quality stone can be quarried and delivered at reasonable costs.

A report by the Oklahoma Geological Survey dealing chiefly with the occurrence, character, and quality of dolomite in the area west of Mill Creek, Troy, and Ravia is now in press, as Oklahoma Geological Survey Circular 26, by W. E. Ham. Title of the publication is Geology and Dolomite Resources of the Mill Creek-Ravia Area, Johnston County, Oklahoma. The geology is discussed in detail, together with discussions of the characteristics of the stone, and tables of chemical analyses are included. The report is accompanied by a geologic map of the area. The report should be available within a few weeks.

The following general summary is taken from the manuscript:

The reserves of high purity dolomite within the Mill Creek-Ravia area are contained largely in the Royer. The Royer formation is consistently about 550 feet thick and is composed of high purity, light-colored, coarse-to medium-crystalline dolomite. Chert is lacking and arkosic sand is rare except around granite inliers. Insoluble residue study reveals that silt aggregates and authigenic, euhedral adularia are common impurities.

Physical Properties

The stone is easily sawed and takes a high polish. One common lithologic type of the Royer dolomite in particular bears a very close resemblance to commercial marbles. A 100-pound block of typical, coarse-crystalline dolomite from the outcrop (not a freshly quarried specimen), tested in 1942 for the Lone Star Steel Co., Daingerfield, Texas, was found to have a compressive strength of 27,100 pounds per square inch.

Chemical Properties

Detailed chemical analyses of carefully sampled outcrops invariably show that the Royer dolomite in the mapped area is a high grade stone suitable for the most exacting specifications of many chemical industries. The combined magnesium and calcium carbonates in 9 samples representing 791 stratigraphic feet average more than 99 percent, and in the best stone analyzed these carbonates total 99.51 percent Dolomite from the quarry contains 98.98 percent theoretical dolomite.

Comparison of Royer with Ohio Dolomites

In order to show the high quality of the Royer dolomite from the Mill Creek-Ravia area, a comparison was made with the Silurian dolomites of western Ohio, which have long been used in large quantity and are recognized as a standard of excellence. From a table of about 300 analyses of Ohio carbonate rocks made by the Ohio Geological Survey, 25 were selected as representative of the best grade of Silurian dolomite. The analyses selected were made from quarry face samples of operating companies that use the stone for calcining or other chemical purposes. The average of the 25 analyses are compared in the table to follow, with the average of 9 analyses of Royer dolomite.

Most striking of the comparisons is the close similarity in chemical composition between Oklahoma and Ohio dolomites, both containing 0.41 percent silica and more than 98.6 percent Ca and Mg carbonates. Considered in detail, the Oklahoma dolomites contain less iron, sulphur, and phosphorus than Ohio dolomites; and the Ohio dolomites are superior in containing less alumina and alkalies. In the outcrop samples of Royer dolomite from Oklahoma the percentage of theoretical dolomite is less than expected because free calcite present in surface cavities reduces the MgO-CaO ratio. Dolomite from the quarry of the Rock Products Manufacturing Corporation, which probably is representative of subsurface stone throughout the Mill Creek-Ravia area, contains no free calcite, it corresponds closely to the theoretical MgO-CaO ratio, and the total dolomite content is 98.98 percent. This is slightly higher than the average for Ohio dolomites.

It may be said in conclusion that the very best of the Ohio dolomites are without question of very high quality and justly deserve their long-standing reputation for use as lime, refractories, fluxing stone, and in glass making. It is also true that the Royer dolomite in the Arbuckle Mountains likewise is of high quality and suitable for these same uses.

Commercial Production

The field mapping of 1943, 1944, and 1945, together with the chemical analyses of outcrop samples, enabled the Geological Survey to recommend to prospective operators the most favorable dolomite quarry sites in the Mill Creek-Ravia area. A quarry site was selected in high purity dolomite of the Royer formation, and construction of a crushing mill and 3-mile narrow-gauge rail line began in 1946. The project was completed, the quarry opened, and shipments of stone were first made in June, 1948.

The quarry, owned and operated by the Rock Products Manufacturing Corporation of Ada, Oklahoma, is in the central part of the N½ SW¼ sec. 36, T.2 S., R. 4 E. Stone is hauled from the quarry over the narrow-gauge railroad 3 miles east to the crusher and shipping point on the Frisco railroad 1 mile north of Troy.

The principal use of the dolomite at the time of this writing is for flux in iron ore smelting. About 300 to 500 tons of 1-to 6-inch stone is shipped per day for this use, all shipments being made to the Lone Star Steel Company at Daingerfield Texas, where East Texas brown iron ore is smelted to pig iron. Another product is minus ten mesh stone for glass-making, for which there is considerable market in the glass plants of Oklahoma and neighboring states. Crushed and ground products for prepared fertilizers, construction stone, and agstone also will be marketed.

Dolomite in Other Parts of Oklahoma

Although the Royer in the Mill Creek-Ravia area apparently represents the largest and most accessible deposit of high grade dolomite in Oklahoma, other deposits that are less extensive, of lower grade, or less convenient to railroad transportation are known in the state. Outcrops of Royer in other parts of the Arbuckle Mountains are more extensive than in the area mapped for the present report, but most of these outcrops are located at much greater distances from existing railroads and they have not been investigated in detail.

One outcrop area of Royer dolomite deserves special consideration because a relatively large though definitely limited tonnage of high-grade stone is located adjacent to a railroad. Three miles south of Wapanucka, chiefly in sec. 36, T.2S., R. 8 E. and sec. 1, T. 3 S., R. 8 E., Johnston County. The Kansas, Oklahoma, and Gulf Railroad

crosses the eastern edge of the Royer outcrop, and parallel with the railroad is Oklahoma Highway 48, a graveled road. The Chicago, Rock Island, and Pacific Railroad formerly operated a line across the central part of the outcrop but it is now abandoned and the rails and ties have been removed. A quarry formerly was worked in the Royer dolomite from the Rock Island railroad northwestward to the faulted limit of outcrop.

A chemical analysis of a sample consisting of about 75 chips taken from the eastern part of the abandoned quarry and from outcrops on the hill shows a high percentage of total calcium and magnesium carbonates (98.89 percent), and relatively low silica, iron oxide, and alumina.

The Strange dolomite, probably of Lower Ordovician age, crops out in 4 small hills south of the Wichita Mountains, Comanche County, in southwestern Oklahoma. Analyses of the Strange show that the average silica content is less than 1 percent and magnesia in excess of 21 percent, thus comparing favorably with the average of high grade Royer.

In sec. 21, T. 22 N., R. 10 E. the Wildhorse dolomite is 18 feet thick and contains about 2.5 percent silica and 18 percent magnesia. The Cotter dolomite, probably equivalent to beds in the upper part of the Arbuckle limestone in the Arbuckle Mountains, crops out in northeastern Oklahoma in widely scattered exposures, most of which are not accessible to railroads. Preliminary analyses indicate about 6 percent insoluble residue and about 20 percent MgO.

	Royer Dolomite from Mill Creek-Ravia area.		High Grade Dolomite from Western Ohio*	
	Average	Range	Average	Range
SiO_2	0.41	0.26 -0.71	0.41	0.06-1.70
Al_2O_3	0.177	0.10 -0.25	0.07	0.02-0.25
Fe_2O_3			0.057	0.02-0.25
FeO			0.155	0.09-0.23
Total Fe as Fe_2O_3	0.157	0.12 -0.18	0.229	
CaO	30.71	30.50-30.79	30.02	29.00-30.33
MgO	21.18	20.91-21.34	21.53	20.79-21.77
K_2O	0.051	0.028-0.075	low	0.01-0.06
Na_2O	0.029	0.011-0.044	low	0.01-0.03
SO_3	0.031	0.019-0.050	0.218	0.01-1.70
P_2O_5	0.004	0.002-0.008	0.042	0.01-0.09
H_2O at 105°C.	0.11	0.04 -0.20	0.133	0.02-0.40
Loss on Ignition(105°-950°C)	47.26	47.09-47.37	47.09**	45.49-47.60**
$CaMg(CO_3)_2$ (dolomite)	96.86	95.64-97.61	98.47	95.09-99.57
excess $CaCO_3$ (calcite)	2.24	1.78- 2.99	0.13	0.08-0.15

Footnote to Table on Page 76

* Stout, Wilbur, "Dolomites and Limestones of Western Ohio": Geol. Survey of Ohio, (4th ser.) Bull 42, 1941. Analyses from table facing page 424, sample numbers 45, 46, 51, 52, 53, 54, 107, 108, 115 114, 111, 112, 113, 193, 195, 182, 179, 177, 178 180, 176, 89, 310, 309, and 311. The samples ar from the Niagara-Cedarville (6), Niagara (10), Monroe (6), and Niagara-Guelph (3).
** CO_2

U. S. GEOLOGICAL SURVEY ESTABLISHES MAP CENTER IN DENVER

Director W. E. Wrather has announced that th U. S. Geological Survey has completed the establishment of a map distribution center in Denver.

Dr. Wrather explained that this center ha been established primarily to bring better servic to the people in the western part of the Unite States. Topographic and geologic maps of area west of the Mississippi River may now be obtaine by addressing requests to the U. S. Geological Survey, Denver Federal Center, Denver, Colorado. Map of areas east of the Mississippi River should stil be ordered from the Director, U. S. Geological Survey, Washington 25, D. C.

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CEMENT PLANT BEGINS EXPANSION

Dewey Portland Cement Company has announce plans for spending nearly one and a half millio dollars on improvements at the Dewey plant. Amon the improvements to be made are new shipping facilities, generating and coal grinding equipment, dus collectors, and new quarry building.

INDUSTRIAL AND MINERALS CONFERENCE PROGRAM COMPLETED FOR FALL MEETING

Program and plans for the 1949 Oklahoma Industrial and Mineral Industries Conference to be held in Norman September 30 and October 1 are about completed. Among the speakers are three from out of state and two from Oklahoma who will discuss various phases of resources and the location and development of industries.

Additional features include a tour of the University of Oklahoma, banquet, barbecue, business session, and the Oklahoma-Texas A. and M. football game.

The program will feature the following speakers:

Friday, Sept. 30, Luncheon. "Welcome," by President George L. Cross of the University.

"Inventory of Additional Manufacturing Possibilities from Oklahoma Minerals," by Richard W. Smith, Assistant Manager, Natural Resources Department, Chamber of Commerce of the United States, Washington, D.C. Mr. Smith formerly was connected with the U. S. Bureau of Mines, and was State Geologist of Georgia from 1933 to 1938. He is very active in the Industrial Minerals Division of the American Institute of Mining Engineers.

Friday afternoon. Session on Industrial Location. Presiding: Horace B. Brown, new Dean of the University of Oklahoma School of Business Administration.

"Factors Affecting the Location of Industries," by William A. Galloway, Regional Director, Bureau of Foreign and Domestic Commerce, U.S. Department of Commerce, Kansas City, Mo. Mr. Galloway and his staff have devoted a great deal of study to the

subjects of locations of industries and unfavorable factors in the territory served by the Kansas City Regional office.

"Why We Came to Oklahoma", by R. B. Tucker, Vice President, Pittsburgh Plate Glass Company, Pittsburgh, Penna. The Pittsburgh Plate Glass Company established a window glass plant at Henryetta about 20 years ago, and is one of the large processors of mineral materials in Oklahoma.

"Unfavorable Factors in Oklahoma and Their Remedies," to be discussed by a panel led by Senator James C. Nance, and consisting of the three preceding speakers, and Steve Stahl, Executive Vice Presidnet, Oklahoma Public Expenditures Council. It is hoped that this will bring forth spirited participation by the audience, and result in some constructive ideas and proposals for improving Oklahoma's industrial economy.

The proceedings of the Conference will be recorded on wire records, from which a brochure will be prepared for use by civic groups, chambers of commerce and similar organizations in the job of selling Industrial Development to the people of the state.

ADDITIONAL WORKERS ADDED

Four new workers have joined the technical and scientific staff of the Survey. W. R. Reed has been employed for the summer in the chemical laboratory. M. E. McKinley is working as field assistant with W. E. Ham in the Arbuckle Mountains.

Charles L. Fair has been assigned to the Groundwater Division as a geologist by the U. S. Geological Survey, and will work in the southeastern counties. Joseph E. Barclay, geological field assistant, also with the Federal Survey, will take over much of the well observation work.

NEW LIMESTONE QUARRY IN McCURTAIN COUNTY

The McCurtain Limestone Company, Idabel, Oklahoma, is getting into production at its quarry site near Garvin in McCurtain County. Stone is being obtained from the Goodland limestone which crops out across the area north of Garvin. From the quarry the stone is hauled to the crusher on the Frisco railroad. A short spur track from the main line serves the crusher.

Location for the quarry was made more than a year ago, and the problem of obtaining and assembling machinery and equipment started. Robert C. Honea, operator of the company, stated that initial production at least will be chiefly for agricultural stone and that equipment was set up that would give an initial capacity of 150 to 200 tons of agricultural limestone a day, but that with the installation of a primary crusher this capacity will be doubled or tripled.

At present the top 20 feet of the Goodland limestone is being quarried.

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FORT GIBSON QUARRY SAMPLED

The quarry near Fort Gibson dam which is supplying limestone for use in construction of the dam has made available a fresh exposure of the limestones in the lower part of the Morrow series in that area. Although this quarry is considered as a temporary operation that will close upon completion of the dam, a complete sampling has been made of the quarry face for possible future reference. Sampling was by John H. Warren, assistant geologist of the Oklahoma Geological Survey. The samples are in the Survey's sample files, and are available for future examination and analysis.