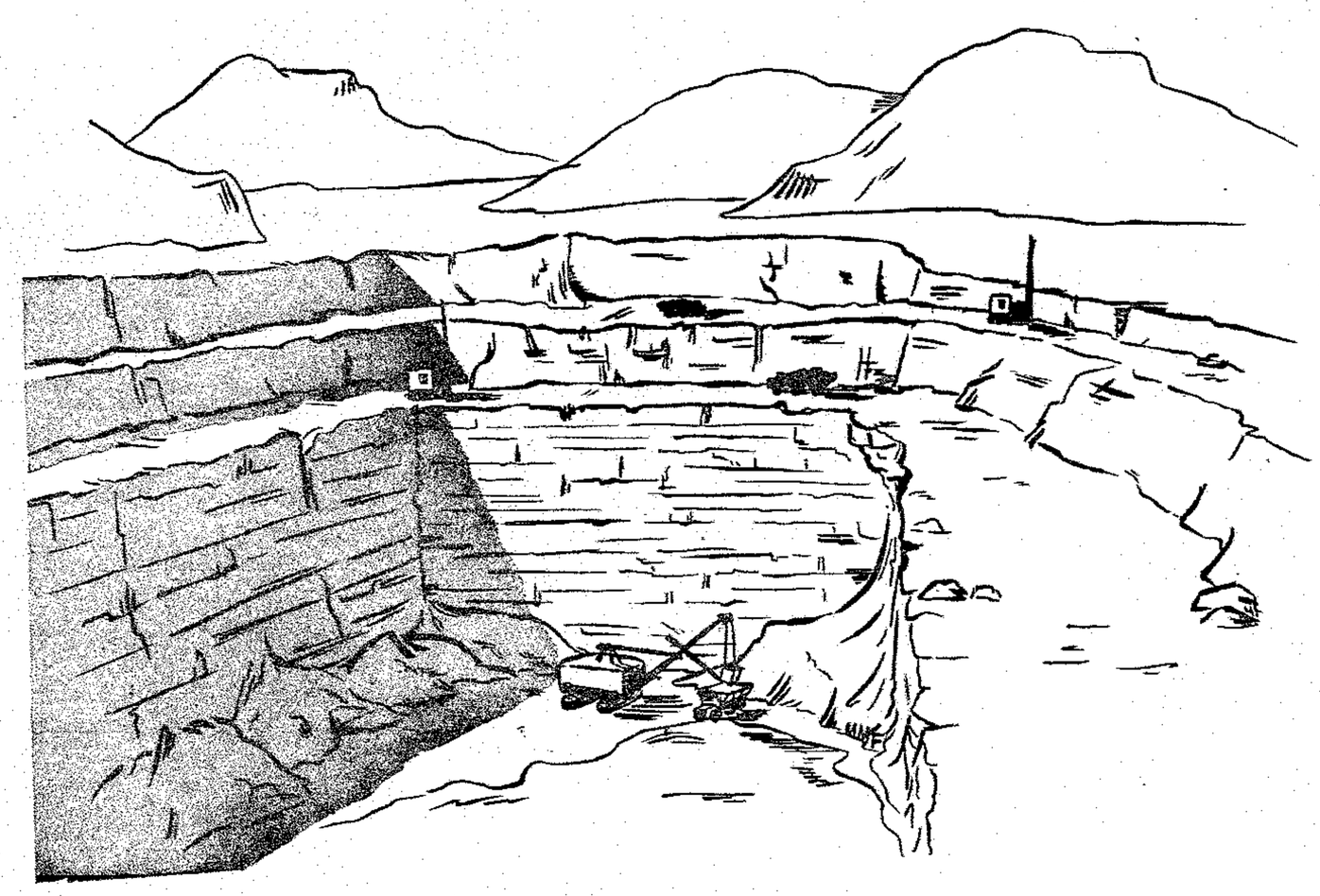
CIRCULAR 47

HIGH-PURITY DOLOMITE DEPOSITS OF SOUTH-CENTRAL NEW MEXICO

By
Frank E. Kottlowski



NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY

E. J. Workman, President

STATE BUREAU OF MINES AND MINERAL RESOURCES

Alvin J. Thompson, Director

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Pacific Railroad station of Gage, about 20 miles west of Deming. The Montoya and Fusselman dolomite crop out in the southern ridges, where they are much silicified, mineralized, and faulted. Chip samples representing the upper relatively unaltered beds of the Fusselman dolomite (V1) average 29.9 percent calcium oxide, 21.5 percent magnesium oxide, and 1.7 percent insoluble residues. The dolomite outcrops are about 4 miles south of the railroad and extend for 1½ miles east-west. They are cut by numerous mineralized quartz veins, and thus appear to be too contaminated to be high-purity dolomite deposits.

The Klondike Hills, about 11 miles south of the Victorio Mountains, are low isolated ridges several miles north of the volcanic Cedar Mountains. The Aleman dolomite appears to be the highest member of the Montoya group exposed, with the units similar in thickness and lithology to those in the Snake Hills. The dolomite outcrops are of limited extent and accessible only over seasonally passable ranch roads.

Florida Mountains

The Florida Mountains are a high rugged triangular-shaped range that rises abruptly from surrounding alluvial plains about 8 miles southeast of Deming. The structure of many parts of the range is complex, especially in the southern part, where thrust faults, high-angle reverse faults, and normal faults are numerous. The Montoya group and Fusselman dolomites near The Park (west-central side of the range) are cut by many reverse faults, some of which are quite inconspicuous. In places the faults are marked by zones of groundup and brecciated white-and-black dolomite, 60 feet wide; but in other places the breccia zones are only a few inches to a few feet wide. Although cemented by porous vuggy calcite mixed with pulverized dolomite dust, the breccia zones are relatively nonresistant to erosion and crop out in saddles or as covered slopes; therefore, when the breccias are thin, and covered by talus and slope wash, they may be easily overlooked.

The Lower Paleozoic formations crop out on the west side of Capitol Dome at the northwest tip of the range and in a belt of shattered fault blocks that crosses the south-central part of the range from the west side of The Park to the eastern slopes of Gym Peak. On the west side of Capitol Dome the Aleman cherty dolomite and lower beds are overlain with pronounced erosional unconformity by Permian rocks whose basal beds are limestone boulder-conglomerates in a reddish clay silt matrix (Christina Balk, personal communication), strikingly similar to the basal Powwow conglomerate of the Lower Permian Hueco formation in the southern Sacramento and Hueco Mountains. The two northwest-trending ridges northwest of The Park are composed mostly of Fusselman dolomite, with beds of the Montoya and El Paso groups on the lower western slopes. As pointed out by Kelley and Bogart (1952) the beds attributed to the "Gym limestone" by Darton (1917) are, in most areas of the Florida Mountains, actually the Fusselman dolomite. However, the Montoya and Fusselman dolomites west and northwest of The Park are cut by numerous brecciated fault zones and are so over-ridden by Precambrian granites from the south that it may be impossible to obtain true thicknesses of the formations. The Fusselman outcrops on the southwestern of the two ridges are interrupted by at least 5 breccia zones, and at several outcrops large wedge-shaped masses of Upham, Aleman, and Fusselman dolomites are jumbled together and bordered by only thin breccia zones. No continuous unfaulted section of the Fusselman dolomite was found on this ridge.

The Lower Paleozoic dolomites also crop out on the crest of the range east of The Park and on the east slope of Gym Peak. In both areas the dolomites are broken by many

faults. Silicified and mineralized zones are common, and the outcrops are relatively inaccessible.

The dolomites that crop out on the ridge west of The Park in sec. 34, T. 25 S., R. 8 W., were sampled and analyzed. The ridge, cut by many brecciated fault zones, does represent a thick pile of relatively pure dolomite, although the beds cannot be assigned to a continuous stratigraphic section. The breccia zones are as much as 60 feet wide, and spot checking in the field indicated they consist principally of shattered dolomite fragments and dust with less than 10 percent calcite cement. There are a few lenses, 3-14 inches thick, of coarse-crystalline calcite, but no quartz veins or silicified zones were seen except near the base of the ridge. The chip samples were collected from units measured perpendicular to the bedding, which dips 10-20 degrees to the east-southeast. The "section" is as follows, from top down:

Unit No.	Description	Thickness (feet)
F8	light-gray fine-crystalline massive-bedded Fusselman dolomite with scattered tiny silicified, chain corals near top; breccia zone at top, above which is perhaps 75 feet of similar dolomite but which is shattered and veined below a thrust plate of Precambrian granite	65
F6 and F7	each 100 feet thick, of light- to medium-gray fine-crystalline massive-bedded Fusselman dolomite; a few thin interbeds of black aphanitic dolomite	200
F5	gray fine- to medium-crystalline Fusselman dolomite with scattered thin chert flakes; 35 feet thick; overlain by wedge-shaped breccia zone about 30 feet thick, composed chiefly of fragments of Upham and Aleman dolomites	65
F4	light-gray brownish-weathering fine-crystalline massive-bedded Fusselman dolomite with a few chert flakes; basal beds form sole-shaped plates above breccia zone	100
F3	gray fine-crystalline massive-bedded Fusselman dolomite with irregular breccia zone at top	100
F2	gray to dark-gray massive-bedded fine-crystalline Fusselman dolomite, 80 feet thick; overlain by 20 feet of crinoidal dark-gray medium-crystalline Upham dolomite, separated from Fusselman below by thin (1-4 inches) breccia zone.	100
F1	light-gray tan-weathering fine-crystalline Fusselman dolomite with scattered chert flakes and a few calcite veinlets. Overlain by thick breccia zone composed of large and small fragments of Fusselman and various Montoya group dolomites. Base is a fault zone along which the Fusselman dolomite is successively in contact with the formations of the Montoya group	100

Unit No.	Description	Thickness (feet)
F9	Upham dolomite, about 40 feet thick; dark-gray medium-crystalline massive-bedded crinoidal dolomite with lower arenaceous laminae; partly silicified and shattered	40
	Total measured dolomites	770

Analyses of the chip samples are as follows:

Sample	CaO	MgO	Residue	$CaCO_3$*	$MgCO_3$*	Total
			(In percent)			
F9	30.3	21.7	0.2	54.1	45.3	99.6
F8	30.3	21.7	0.3	54.1	45.3	99.7
F7	30.3	21.8	0.2	54.1	45.5	99.8
F6	30.3	21.7	0.6	54.1	45.3	100.0
F5	30.4	21.7	0.3	54.3	45.3	99.9
F4	30.3	21.7	0.3	54.1	45.3	99.7
F3	30.3	21.8	0.4	54.1	45.5	100.0
F2	30.0	21.5	1.6	53.5	44.9	100.0
F1	30.1	21.6	1.0	53.7	45.1	99.8

* Calculated from the oxides

The mass of dolomite fault blocks represented by the above analyses is more than 700 feet thick and occupies at least 0.6 square mile. It should contain more than a billion tons of dolomite averaging 21.7 percent magnesium oxide and 0.6 percent microscopic insoluble residues. The outcrops are 14 miles south-southwest of the Southern Pacific Railroad at Deming. Two east-west natural gas pipelines of the El Paso Natural Gas Company serve Deming and the surrounding area. Ample underground water is available, especially in the area east of Deming.

Pennsylvanian Carbonate Rocks in the Oscura Mountains

The Lower Paleozoic dolomites pinch out beneath Devonian beds at the south end of the Oscura Mountains. In the central and northern parts of the range, Pennsylvanian sedimentary rocks, chiefly limestones, overlie the Precambrian granites. Several of the limestones were analyzed for the following three reasons: (1) to find out if they were dolomitic; (2) to determine the amounts of impurities and magnesium oxide in the limestones, as a check on their suitability for making cement; and (3) to see if favorable ore-bearing horizons of the Hansonburg mining district