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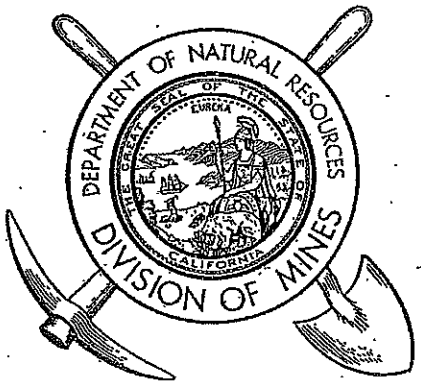

The occurrence of small limestone lenses in sedimentary rocks of Tertiary age have been noted by Crittenden (1951) and Gilbert (1943). These lenses are found on the east side of the Santa Clara Valley. No commercial production has been reported.

A deposit of travertine of Recent age in the southwestern part of the county has been described by Allen (1946, pp. 47, 72) who stated:

> A tributary to Hatfield Canyon has built up its bed for over half a mile with travertine terraces. The lime-rich waters are derived from a series of small springs which are aligned in a northwesterly direction in the headwaters of the tributary. The terraces consist of cemented boulders and blocks of sandstone at at the base, overlain by alternating pools and falls whose lips are made up of buff to gray travertine.

Allen also mentions the production of a small tonnage of Franciscan limestone from the area north of La Brea creek.

Bernal Marl and Limestone Deposit. Location: On the southeast side of the Santa Teresa Hills, 3½ miles southeast of Edenvale on Highway 101, and 1½ miles southwest of the highway; in sec. 19, T. 8 S., R. 2 E., M. D., projected.

A hard, fine-grained, gray limestone with a low easterly dip crops out over a vertical distance of about 200 feet at this locality. A typical exposure shows 2 feet of soil and 4 feet of soft marl overlying hard limestone. The thickness of the marl varies in the quarry workings where it is exposed in a number of irregular benches 20 to 30 feet high.

Marl for agricultural use has been produced here intermittently since 1915. The last reported production was made in 1938 and a California Department of Agriculture analysis of the product tested a 79.2 percent calcium carbonate equivalent. Some production of hard limestone for use in the beet sugar industry was made about 30 years ago.

Douglass Ranch Limestone Deposit. Location: About 2½ miles southeast of Los Gatos on Quarry Road at an elevation of about 1,000 feet; in SW¼ NW¼ sec. 27, T. 8 S., R. 1 W., M. D.

Light-gray, fine-grained limestone is exposed over a vertical distance of 100 feet and a horizontal distance of about 200 feet. The quarry consists of two benches, each about 35 feet high. A 12-foot bed of limestone is exposed in the lower face near road level. This bed contains some secondary layers and lenses of brown and white calcite. Black chert is also present. The limestone is in contact with Franciscan sandstone near the top of the quarry and dips from 22° to 35° S.

Lyndon Limestone Deposit. Location: About 1 mile due south of Los Gatos on the north side of Limekiln Canyon in sec. 28, T. 8 S., R. 1 W., M. D.

Old quarry workings now overgrown with brush extend over a small area. Calera-type limestone is exposed in one face about 10 feet high. It consists of alternating beds of light-colored limestone and black chert ranging from half an inch to 3 inches in thickness.

Permanente Limestone Deposit (Black Mountain Limestone Deposits, Santa Clara Holding Company, El Dorado Sugar Company Quarry, Alameda Sugar Company Quarry). Location: The quarry is about 4 miles west of Monta Vista on the north side of Permanente Creek in

SE¼ sec. 18 and the SW¼ sec. 17, T. 7 S., R. 2 W., M. D. The company holdings also include property in secs. 16 to 21, T. 7 S., R. 2 W., and in sec. 24, T. 8 S., R. 3 W., M. D. Ownership: Permanente Cement Company, Permanente.

The presence of limestone deposits on the slopes of Black Mountain has been known for many years and the production of high-grade selectively mined limestone for use in the sugar industry began about 1902 (Aubury, 1906). Early production was at the rate of 30 to 60 tons per day during the dry season. It was stated that the limestone contained black chert, shale, and clay, and that the waste from these impurities caused extra expense in quarrying the rock. Production for this usage continued intermittently until 1934.

The Permanente Cement Company began working the deposits in 1939 and gradually increased the production of limestone to about 6,500 tons per day in 1952. The cement company continued to supply the sugar industry with high-lime rock for a number of years and a low-level quarry was opened for this purpose in 1941. Low-grade rock from this quarry was sold as crushed stone. This practice was discontinued as the output of the cement plant expanded and its requirements for limestone increased.

The geology at the Permanente quarry and other quarries to the northwest has been described in a recent report by C. W. Walker (1950), as follows:

> The limestone apparently is in one stratigraphic zone which is divided lithologically into at least two units. The upper unit is light buff to gray and locally has been named the "Upper Light" limestone. The unit stratigraphically beneath the light limestone is dark blue gray to black and is referred to locally as the "Blue" limestone.
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> The "Upper Light" limestone is light gray and contains numerous well-defined chert lenses and beds which form darker bands on weathered surfaces. Most of the limestone between the layers of chert is very finely crystalline and contains some foraminiferal remains. The beds, which range in thickness from 3 to 18 inches, have not been deformed as intensely as those of the "Blue" limestone; however, near faults the "Upper Light" limestone has been considerably drag-folded and crumpled. Average $CaCO_3$ content of "Upper Light" limestone at Permanente is 70.8 percent.
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> The "Blue" limestone has beds ranging in thickness from 1 inch to 8 inches, and the unit varies in lithology from the base to the top. Near the base finely crystalline limestone beds are intercalated with abundant chert lenses and layers. Upward the number of chert lenses diminish, and locally the top 15 or 20 feet is relatively free of siliceous material. The upper limestone beds in this sequence are medium to coarsely crystalline. Interbedded in the "Blue" limestone are layers of laminated tuffaceous debris a few inches to a few feet thick, and at many outcrops bedding-plane shearing has caused complex intermingling of tuffaceous fragments with fragments of oxidized and altered greenstone and sandstone. Weathered surfaces throughout the sequence are gray, whereas freshly broken surfaces are dark gray to black. A distinct petroleum-like odor is noticeable on freshly fractured surfaces, particularly in the upper part of the "Blue" limestone sequence. Locally, along bedding planes and near cross faults, the limestone is brecciated and the fragments are recemented by caliches and other carbonate material. In some places, incomplete recementation of the breccia has resulted in porous, spongelike masses of limestone. The "Blue" limestone is highly deformed and fractured and prominent drag folds occur near all but the smaller faults.
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> Locally solutions have filled cavities with large calcite crystals and have introduced finely crystalline carbonate material into numerous fractures and joints. Solutions have also introduced silica which has replaced the limestone near larger chert lenses.
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> The "Upper Light" limestone and the "Blue" limestone are very similar in chemical composition. Silica, in the form of chert lenses, is the most important