California Quarries from the American Era Through 1914

The History of Quarrying in California
Presentation for the International Stonework Symposium 2011
January 13, 2011

Brief Historical Timeline California (1826 – ca. 1914)

1826	**Jedediah Smith reached San Gabriel from the Mojave River in 1826. (Smith was the first to complete the overland journey by any American to California. After that, many people followed.)**
1834	**Secularization of the Spanish Missions by the Mexican Congress. (An Act for the Secularization of the Missions of California on August 17, 1833.)**
1836	**Alvarado's "revolution" makes California autonomous.[3]**
1841	**The first emigrant home seekers from the United States arrived in 1841, and larger migrations crossed the Sierra Nevada beginning in 1843.**
1842	**First gold rush in California in 1842 on one of the San Fernando Rey de España Mission ranchos in northern Los Angeles. Lasted four years. (See account of the San Fernando Rey de España Mission for more information.)**
1847	**Commodore John D. Sloat took possession of California for the United States; and "John Charles Fremont …Marched a battalion to Los Angeles to secure the province. By January 1847, the conquest was complete." [1]**
1848	**James Marshall discovered gold at Sutter's Mill in Coloma. (In January 1848, James Marshall, who was constructing a saw mill for John Sutter at Coloma, discovered gold beginning a wave of migration from the eastern part of the United States and other countries. The 1848 discovery of gold caused great population shifts both in the U.S. and other countries.)**
1849	**California state government was organized in late 1849.**
1850	**Congress granted statehood in 1850.**
1856-1876	**In 1856 the Sacramento Valley line to Folsom, the first railroad in California, was built. Between 1865 and 1868, the Central Pacific worked to construct a road across the Sierra Nevadas so the line could meet the Union Pacific in Utah. The rails of the "First Transcontinental Railroad" were joined on May 10, 1869, although it was not considered official completed until November 6, 1869.[2] In 1876, the Southern Pacific later built south to Los Angeles and then onto Texas.[1] & 2**
1869	**University of California chartered[3]**
	Depression in California[3]
1891	**Stanford University opened[3]**

1. *Rand McNally's Pioneer Atlas of The American West*, Rand McNally & Co., 1969 ed., pp. 16.
2. "Transcontinental Railroad," on Wikipedia http://en.wikipedia.org/wiki/Transcontinental_railroad
3. *California: An Interpretive History*, James J. Rawls and Walton Bean, 7th ed., 1998.
4. "Mission San Diego de Alcalá," on Wikipedia http://en.wikipedia.org/wiki/Mission_San_Diego_de_Alcal%C3%A1
5. *The California Missions: A complete pictorial history and visitor's guide*, Elizabeth L. Hogan, Ed., Sunset Publishing Corp., Menlo Park, California, 7th ed., 1993, pp. 178.

Dimension Stone in California

According to Mineral Resources of California,1 the dimension stone is defined as:

"The term "**dimension stone**" is applied to natural stone that is cut to definite size and shape and includes cut, carved, and roughhewn blocks of building stone, paving blocks, curbing, flagging, and cut and polished monumental stone.1 p. 400

Dimension stone is divided by usage: Building stone, monumental stone, paving stone, curbing, and flagging.

Several of our historical California stone quarries began as dimension stone quarries while today only aggregate of industrial minerals are quarried. For example, the historical Inyo Marble Company dolomite quarries near Lone pine only produces aggregate, and the historical marble quarries near Columbia only produce industrial minerals.

Today's presentation will mainly focus on California's historical stone quarries.

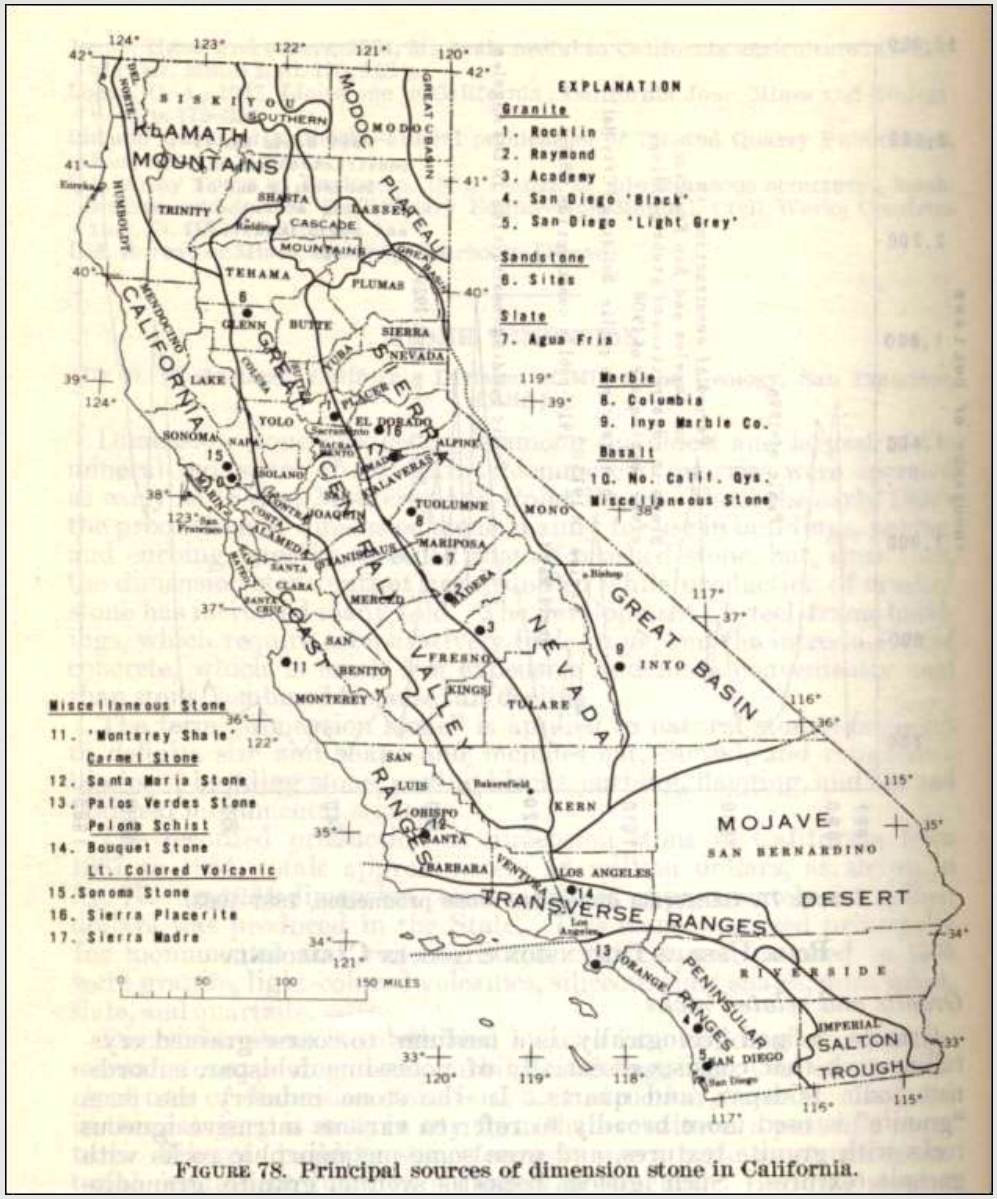


FIGURE 78. Principal sources of dimension stone in California.

Map of Principal Sources of Dimension stone in California

Mineral Resources of California, Bulletin 191, State of California Division of Mines and Geology, San Francisco, 1966, pp. 402.

Brief History of Stone Quarrying in California

Before 1850 very little stone was used for construction purposes in California.

Due to many buildings damaged or destroyed by fires and the great increase in population in California led by the 1848 gold rush and people coming to California from other parts of the United States and other countries, stone became more desirable to use for permanent bridges, public buildings, and all-weather streets.[3]

The mass migration of men who converged on the gold fields cam from all over the world, and each of these nationalities left marks in the names, the architecture, the food, and their way of life that they brought with them. "Mexicans came early and South Americans followed. Chinese and Australians cross the Pacific. Argonauts hastened westward from England, Wales, Scotland, Ireland. Cornishmen and Frenchmen jostled Germans and Italians in the rush for the diggings."[7 p. 16] The gold rush opened the era of modern mining.[7 p. 17]

The 1848 California gold rush was the first modern international gold rush, it caused a redistribution of populations produced not only in the United States but in many other parts of the world. Colonization of the West was hastened due to the expansion of the agricultural frontier brought on by the need for a stable food supply in the gold area. The increased colonization brought about the partial elimination of the Indians as the desire for western lands increased. The primary significance to the world of George Marshall's discovery of gold at Sutter's Mill was the redistribution of population with the resulting problems and the general increase of money that was put into circulation.[7 p. 17]

Exploration of California's Gold Rush Area in search for gold also led to discoveries of other mineral resources: Silver, some platinum and even a few diamonds, tungsten, copper, lead, zinc, manganese, chromite, iron, limestone, dolomite, clay, lignite, sand, graven, slate, and building stone.[7 p. 21]

Dimension stone quarry in California occurred early in California's history. While people always used stone from local rock outcrops, early commercial quarries were operating as early as 1854 in Monterey, in Monterey County, and at Point Reyes in Marin County.

Brief History of Stone Quarrying in California (Contd.)

In 1856 the granite quarries at Folsom in the foothills of the Sierra Nevada were the first recorded development of stone resources in California following the Gold Rush.[5] The heaviest producer of granite was at Folsom State Prison where they quarried granite for dimension stone, riprap, and crushed granite – all produced by prison labor for many years.[5] Between 1888 and 1890, much of the granite at Folsom Prison was used for prison construction. Folsom Prison granite was also used to build the dam, canal, and the first electric-power plant in central California. The Southern pacific Railroad used the Folsom Prison granite for ballast.[5]

"The first marble worked in the state was by E. R. Roberts of Stockton, who established a marble yard at Columbia, in Tuolumne co., in 1857. A block of this stone was taken out and dressed for the (interior of the) Washington monument in that year.(See next slide.) The material for Broderick's monument came from Columbia. These works, probably on account of the cost of transportation at that period, were closed; but there was a rediscovery of marble in the same locality in 1865, and again in 1868, according to the "History of California" section of *The Works of Hubert Howe Bancroft*, 1890.[8]

Present-day Photo of the Washington Monument Located in Washington, D.C.

from Wikipedia.
http://en.wikipedia.org/wiki/Washington_Monument

Brief History of Stone Quarrying in California (Contd.)

(* **Donations of the 193 Commemorative Stones for the Interior Walls of the Washington Monument:** (Below is an excerpt from the Wikipedia article, "Washington Monument," describing the 193 commemorative stones donated for use on the interior wall of the National Monument as a fund raiser which began in 1849. You can read about and view the individual stones in the "Washington Monument Stones" album or slideshow. *The Washington Monument: A Technical History and Catalog of the Commemorative* Stones is also available in pdf on the National Park Service web site.)

> "Construction continued until 1854, when donations ran out. The next year, Congress voted to appropriate $200,000 to continue the work but rescinded before the money could be spent. This reversal came because of a new policy the society had adopted in 1849. It had agreed, after a request from some Alabamians, to encourage all states and territories to donate commemorative stones that could be fitted into the interior walls. Members of the society believed this practice would make citizens feel they had a part in building the monument, and it would cut costs by limiting the amount of stone that had to be bought. Blocks of Maryland marble, granite and sandstone steadily appeared at the site. American Indian tribes, professional organizations, societies, businesses and foreign nations donated stones that were 4 feet by 2 feet by 12–18 inches (1.2 m by 0.6 m by 0.3 – 0.5 m). One stone was donated by the Ryukyu Kingdom and brought back by Commodore Matthew C. Perry, but never arrived in Washington (it was replaced in 1989). Many of the stones donated for the monument, however, carried inscriptions which did not commemorate George Washington. For example, one from the Templars of Honor and Temperance stated 'We will not buy, sell, or use as a beverage, any spiritous or malt liquors, Wine, Cider, or any other Alcoholic Liquor.' It was just one commemorative stone that started the events that stopped the Congressional appropriation and ultimately construction altogether. In the early 1850s, Pope Pius IX contributed a block of marble. In March 1854, members of the anti-Catholic, nativist American Party – better known as the 'Know-Nothings' – stole the Pope's stone as a protest and supposedly threw it into the Potomac (it was replaced in 1982). Then, in order to make sure the monument fit the definition of 'American' at that time, the Know-Nothings conducted an election so they could take over the entire society. Congress immediately rescinded its $200,000 contribution."

In the 1860s, quarries were opened on Angel Island in the San Francisco Bay where they quarried a bluish sandstone; and basalt was being quarried and produced near Petaluma in Sonoma County.[5]

During the 1880s and 1890s a light brown sandstone was quarried at Benicia in Solano County and near San Jose in Santa Clara County. Quarries located near Alameda, Livermore, and Hayward in Alameda County produced sandstone in colors other than the light brown produced at Benicia.[5]

Brief History of Stone Quarrying in California (Contd.)

By 1882, many quarries in California were producing stone in competition with stone from the east coast of the U.S. and from other countries. The cost of transportation tended to prevent a larger use of the California product. At that time, the cost of transporting stone from almost any one of the quarries in California to San Francisco was greater than the cost transport the stone from Italy to the same point. About 1882, large amounts of granite was used for curbing the sidewalks and street-crossings in San Francisco and some of the other large towns. During this time, granite was extensively quarried at Folsom and Natoma in Placer County, and at Rocklin and Penryn in Placer County.[4]

During the early 1900s, stone was used in substructures, such as foundations and basements, almost universally, although wood, brick, and iron was frequently being substituted for stone in superstructures. Also during this time period, stone was still widely used for breakwaters, bridge abutments, culverts, curbing, fences, flagstone, hitching posts, macadamizing, paving blocks, piers, retaining walls, reservoirs, sewers, and sluiceways. Stone for monuments was generally obtained from states in New England, Indiana, Georgia, or Europe, although the transportation was costly. This book was published in order to educate people as to the many active stone quarries located throughout California.[3 p. 14]

By 1906 when *The Structural and Industrial Materials of California* was published by the California State Mining Bureau, government and businesses wanted to encourage the use of California stone. In this book Lewis Aubury, State Mineralogist wrote that there had been a rapid increase in the building operations in California within the few years prior to 1904/1906 that caused a great demand for building stone, marble, clay products, etc. [3]

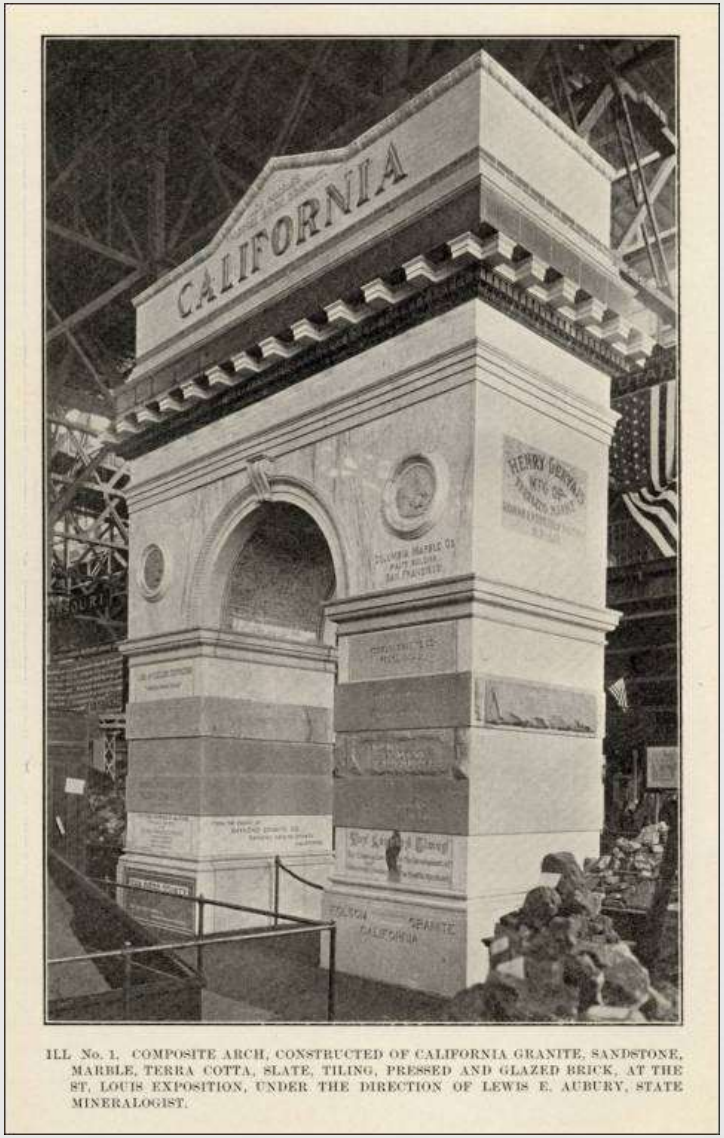
List of the Stones Quarried in California as of 1906

Stone	California Counties	
Granite	Los Angeles	Sacramento
	Madera	San Bernardino
	Nevada	San Diego
	Placer	Tuolumne
	Riverside	Tulare
Limestone	Amador	Monterey
	Calaveras	Placer
	Colusa	Riverside
	Napa	San Bernardino
	Santa Barbara	Inyo
	Butte	Santa Cruz
	El Dorado	Santa Clara
	Contra Costa	Shasta
	Los Angeles	Sonoma
	Kern	Tuolumne
	Mono	
Marble	Amador	Inyo
	Riverside	Tuolumne
	San Bernardino	
Sandstone	Colusa	Santa Clara
	Los Angeles	Ventura
	Santa Barbara	Yolo
Slate	El Dorado County	
Serpentine	Santa Catalina Island	San Bernardino County (as Verde Antique)
Porphyry	San Luis Obispo	
Volcanic Tuff	Calaveras	San Luis Obispo
	Napa	Sonoma

Brief History of Stone Quarrying in California (Contd.)

The 1906 *The Structural and Industrial Materials of California* also continued the photograph of a composite arch that had been shipped to the St. Louis Exposition held in St. Louis, Missouri. The arch was constructed from representative state stones and clay products. I have not been able to track down much information on this arch, but the engravings on the blocks of stone that I can read are as follows:

Columbia Marble Co., Rialto Building, San Francisco
Folsom Granite, California
From the quarry of Raymond Granite Co., Madera County, California
Henry Gervais, Manufacturer of Terrazzo Marble
Los Angeles Times….
Rocklin Granite Co., Rockland, Cal.
San Diego County….



ILL. No. 1. COMPOSITE ARCH, CONSTRUCTED OF CALIFORNIA GRANITE, SANDSTONE, MARBLE, TERRA COTTA, SLATE, TILING, PRESSED AND GLAZED BRICK, AT THE ST. LOUIS EXPOSITION, UNDER THE DIRECTION OF LEWIS E. AUBURY, STATE MINERALOGIST.

"**Composite Arch**, constructed of California granite, sandstone, marble, terra cotta, slate, tiling, pressed and glazed brick, at the St. Louis Exposition, under the direction of Lewis E. Aubury, State Mineralogist." (frontispiece)

Granite Quarries in California

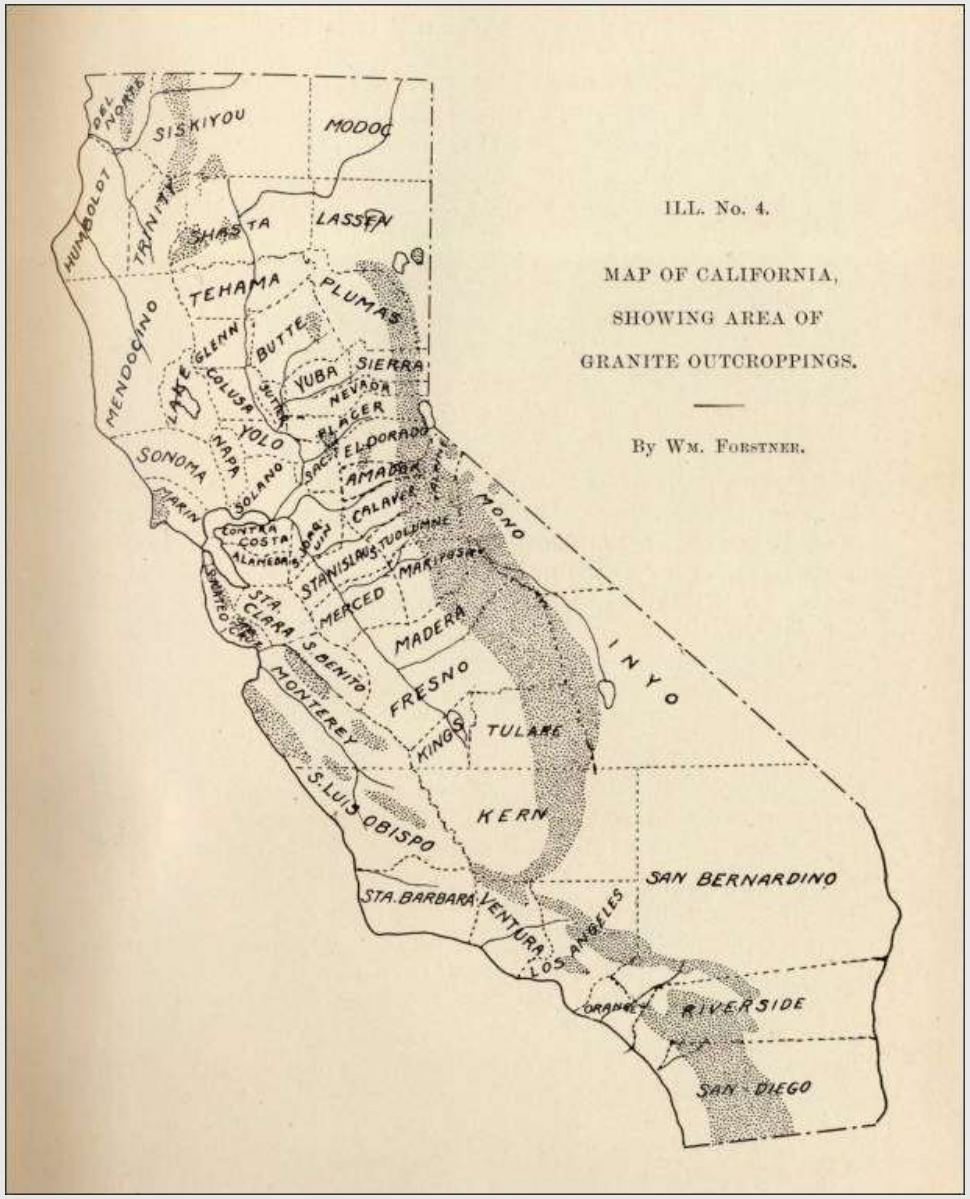
Granite Quarries in California

In this presentation, I will cover just a few of the most productive or historically noteworthy granite quarries in California, although there are many more. (If you are interested in learning more about the California granite quarries, you will find many of the California quarries listed on our web site in the California counties portion of our Stone Quarries and Beyond web site.)

In *The Structural and Industrial Materials of California* published in 1906, the term "granite" was defined in the "stone trade" to include all the massive crystalline igneous rights. Sometimes the following igneous rocks were described by that term: Syenite, diorite, diabase, gabbro, and peridotite. California granites are mostly considered true granites. In 1902 California was sixth in the list of granite-producing states.[3, p. 23]

Below is the description of the granite quarries and quarry districts in California circa 1906:

> "Granite and the closely associated granitic rocks (granolites) form part of the Gavilan and Santa Lucia ranges of the coast south of San Francisco bay; farther south they form the principal part of the mountain ranges in the western part of southern California, connecting with the large exposure of granitic rocks of the Sierra Nevada range, which runs from Tehachapi northward to the recent volcanics, in Lassen County. Considerable exposures of granitic rocks are also found in northwestern California in the eastern portion of the Klamath mountain region.



Map of California Showing Area of Granite Outcropings.

“Academy Black” Granite Quarry, Northwest of Clovis, Fresno County, California

Academy Granite Quarry,
Northwest of Clovis, Fresno County, California

(1903-Present Day)
Quarry operations continue producing
"Black Academy" granite; Owned by Cold Spring Granite

The Academy Granite Quarry is located northwest of Clovis. The quarry was opened in 1903,[13] and today it is owned and operated by Cold Spring Granite Company of Minnesota, a company that has been in business over 100 years. When Pat and I visited the Raymond Granite Quarry in Madera County in 1998, we learned that the "Black Academy" Granite was sent to the Raymond Granite Quarry facilities to be processed.

In the 1906 California State Mining Bureau report, the author stated that the granite quarried from the Academy quarry was described as "a dark, medium-grained granite, and is quarried from large boulders. Its dark color makes it a pretty trimming stone for structures of other stones."[3, p. 26]
Another description of the Academy granite made about 1914 states that it "is a dark, hornblende diorite, but locally called 'black granite.'" It is also described as being harder than the lighter colored granite quarried at the Raymond Granite Quarry in Madera County making it more expensive to cut. The Academy granite is described as follows: "The color permits of a fine contrast of polished and unpolished surfaces, which makes it excellent for monumental and decorative purposes." In 1914, the quarry is described as "large, rounded boulders of disintegration, the quarry cut being as yet shallow (circa 1914). On the eastern edge of the property, the granite was found to be darker than on the western edge. In 1914 pneumatic tools were being used with the power being furnished by distillate engines. Dressing and polishing was done in the sheds at the quarry except the stone that was sent to dealers in the rough. Circa 1914, the Academy granite was hauled by wagon to Clovis. This report noted that the quarry had not been very active in 1913, although business had picked up a little in 1914. Ten men were employed at the quarry in 1914. The stone cutters were paid $5 per day and the quarrymen $3 per day. The largest block of granite that was shipped from the Academy quarry weighted 16,800 as of 1914.[13]

Photo No. 82. In the quarry of Academy Granite Company, near Academy, Fresno County.

In the quarry of Academy Granite Company, near Academy, Fresno County[13]

Block of stone (13,280 pounds) from Academy Granite Company, Fresno County[13]

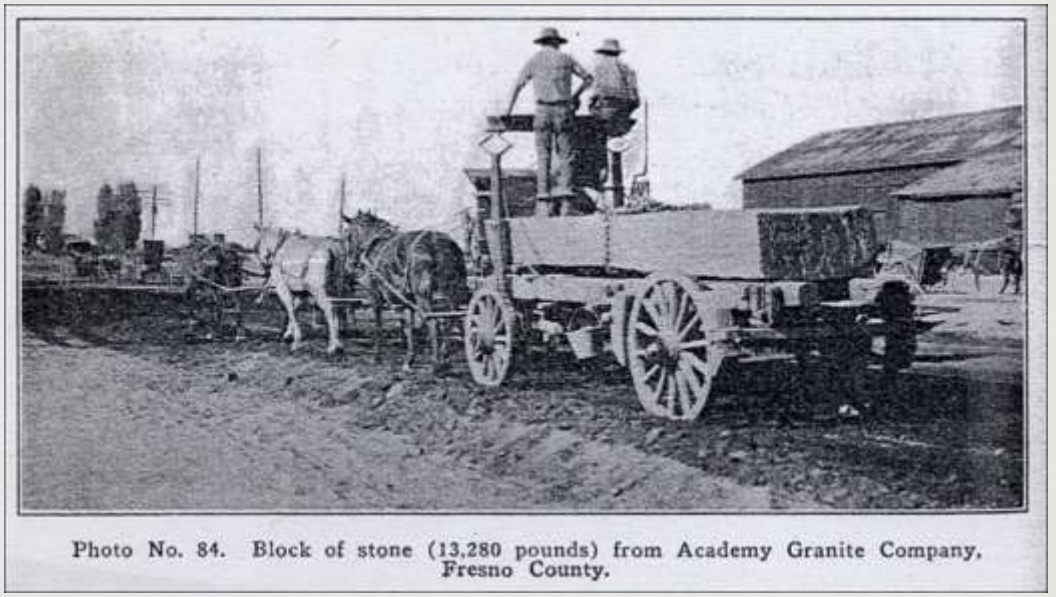


Photo No. 84. Block of stone (13,280 pounds) from Academy Granite Company, Fresno County.

The Raymond Granite Company's Knowles Granite
&
McGilvray-Raymond Granite Co. Quarries

Madera County Granite Quarries in California

In September 1904, there were only two large granite producers near Raymond in Madera County. These quarries are located about 2 miles southeast of the village of Raymond, on a spur of the Raymond branch of the Southern Pacific Railroad. These two quarries are about half a mile apart, on the east side of the valley. These two quarries employed about 300 men and at times from 400 to 500 men.[3, p. 28]

Madera County, which was created March 11, 1893 from part of Fresno County, which adjoins it on the south and west, the San Joaquin River being the boundary line between the two.

The granite quarries in this area of Madera County were described as follows in *The Structural and Industrial Materials of California* (published in 1906): [3, p. 28-29]

> "There is an extensive granite area covering many square miles in the vicinity of Raymond. Near the town is a hornblende biotite granite, but at the quarries there is almost no hornblende except an occasional crystal. In many places the granite is disintegrated to a depth of many feet, while over limited areas it outcrops firm and solid on the surface... The weathering of the granite is mainly by slow disintegration over the surface and along the joint planes. There are very few of the round residual boulders so conspicuous in many places. Most of the surface boulders are angular.
> "Among the many structures built of Raymond granite may be mentioned the new postoffice in San Francisco, which was furnished $425,000 worth, with only one small stone needing replacement; the Fairmount Hotel was furnished about 20,000 cubic feet; the Dewey Monument, in Union Square; the Mercantile Trust Company, of San Francisco, on California street, and numerous others."

By 1916, the Madera County granite quarries were described as:[13]

> "The well known Raymond granite quarries near Raymond, in Madera County, not only are and have been for a number of years the most important mineral industry of the county, but they are also an important factor in the state's production…these deposits of workable building stone are located in the western edge of the Sierra foothills. There are two quarries about 1 mile apart, on the east side of a small valley, about 2 miles east of Raymond, which is the terminus of the Berenda-Raymond branch of the Southern Pacific Railroad. Both quarries are served by spur tracks from this branch line. It is now recognized that this stone is not excelled by any other building granite found either in this state or elsewhere. It is noted for its beautiful white color, the fineness and uniformity of its texture, its weathering qualities, and its freeness in working. As to this last named feature, it lends itself readily to all classes of fine structural carving."

The Raymond Granite Company's Knowles Granite Quarry, Madera County, California (1888 – Present Day)

The Structural and Industrial Materials of California published in 1906 describes the Knowles Granite quarry as follows:[2, p. 30-32]

"**The Knowles Quarry**, operated by the Raymond Granite Company, S. E. Knowles, president, Tenth and Division streets, San Francisco, has been open for seventeen years (opened in 1888), and is well equipped with modern machinery for taking out and handling large quantities of stone. The outcrop of the granite at this point is something like a portion of the surface of a huge globe, about 300 feet or more in diameter, partly buried in the earth. Where it projects above the surface it is almost entirely bare of any soil, vegetation, or other material. It is apparently barren of seams, except the curved exfoliation seams parallel to the surface, and which are partly at least the result of weathering. In places there are remnants of these layers of exfoliation only a few inches in thickness, but the underlying layers, which are the ones worked in the quarry, vary from 1 or 2 feet to 25 feet in thickness. The quarry opening is on the northwest side of the sphere, and the quarry floor, which follows the foliation cleavage, is inclined from 20 to 30 degrees to the northwest.

"The three large cutting sheds are located below the quarry opening, and an inclined tramway is run up to the quarry floor, down which the blocks are carried into the cutting sheds.

"Hand and steam drills and the quarry bar are used in quarrying the stone. The quarry bar is used for cutting out the sides and ends of the quarry and also for drilling the large blocks in cutting dimension stone.

"The stone is easily split and has a straight, even grain. It is split from the thin layers by drilling shallow holes and driving in wedges or plugs and feathers. From large layers the blocks are split off by drilling deeper holes and using the Knox blasting system, which leaves an even surface. The thickest layer exposed is about 25 feet thick, but most of that part quarried is much thinner, from 4 to 10 feet. As the quarry opening is carried deeper the succeeding layers will probably become thicker, that is, the joints will be farther and father apart.

The Raymond Granite Company's Knowles Granite Quarry, Madera County, California (Contd.)

"Nearly all the stone is cut and dressed at the quarry for building stone, or for monuments and cemetery work. After loosening the blocks from the quarry face and splitting them to the required dimensions by plugs and feathers, they are taken to the cutting sheds, where they are handled by steam-power overhead traveling cranes, and the surfaces are finished, either tool-dressed, rock-faced, or polished, as is desired, by hand or machine. The company has two of the heavy Barre granite surfacing and polishing machines and about ten of the lighter Concord surfacing machines. There are also a dozen or more pneumatic and surfacing tools for surfacing and carving, besides a hundred or more stonecutters and finishers at work with hand tools.

"The finished stone is placed on the railway car in the cutting shed and run down the inclined track to the base of the hill, where it is taken to market over the Southern Pacific Railroad.

> "The stone is a biotite-muscovite light-gray granite, with biotite mica in excess of the muscovite, and an occasional crystal of black hornblende. It has a medium-fine grain and is remarkably uniform in color and texture throughout the mass. Over the entire quarry area only one small dark blotch was observed. Some of the biotite crystals are idiomorphic, six-sided prisms."

In the 1913-1914 *Report XIV of the State Mineralogist*, published by the California State Mining Bureau, the Raymond Granite Company's Knowles Quarry had operated by the Raymond Granite Company since 188 "with varying activity." At the time of the field work for the report,[13]

> "…175 men employed about the entire plant. The company owns some 1700 acres. About 5 or 10 acres are free of weathered overburden on a low rounded hill (see panoramic photo No. 4A). The rock breaks to extensive fractures lying nearly parallel to the ground surface and from a few inches to 15 or 20 feet apart. Cutting of these immense slabs is done principally by wedges with a little powder used occasionally. A channeling machine is also employed."

The Raymond Granite Company's Knowles Granite Quarry, Madera County, California (Contd.)

Also according to the 1913-1914 report, as of 1914:[13]

> "The largest single piece reported was 4 ft. x 4 ft. x 40 ft., but much larger blocks could doubtless be obtained. The stone is completely dressed or carved at the sheds adjoining the quarry, where air-driven machines are used. The equipment includes 6 derricks with oil-burning steam hoists, 2 sets of saws, and overhead traveling electric cranes (3 large and 2 small). Until February of this year (1914) oil has been used to generate power, since which time the San Joaquin Light and Power Company has been furnishing electricity. The steam plant is still maintained as an auxiliary. The stonecutters received $5 per day for eight hours.
>
> "Monumental and building stone has been furnished to many large structures, among which may be mentioned the San Francisco post office, Municipal Auditorium, the U. S. Sub-Treasury Building and the Fairmont Hotel; also for buildings at the University of California in Berkeley. Of the latter, the most striking example is the Campanile, or bell tower, a shaft of 34 feet square base and 305 feet in height to the top of the surmounting bronze lantern. On the front of the new U. S. Sub-Treasury Building in San Francisco are ten Doric columns about 4 ½ feet in diameter and 27 feet long, each in three sections. As originally drawn, the specifications called for these columns to be monolithic. The change was made because of the greater cost of handling. As has already been pointed out even larger monolithic pieces than that can be obtained here. We were informed that the cost of cutting would be practically the same, but that the necessity of providing heavier equipment to handle them would have increased the cost $2000 for the ten columns in question, or $200 per column. It seems to the writer that it would have been money well spent, for the beauty of the building would have been enhanced many times."

Today Raymond Granite Quarry actively produces "Sierra White" granite, and the active Raymond/Knowles quarries are owned by Cold Spring Granite located in Minnesota.

Early Photographs of the Knowles / Raymond Granite Co. Quarry

Photo No. 4A. Raymond Granite Company's quarry near Raymond, Madera County, California. Panoramic view of quarry from below.

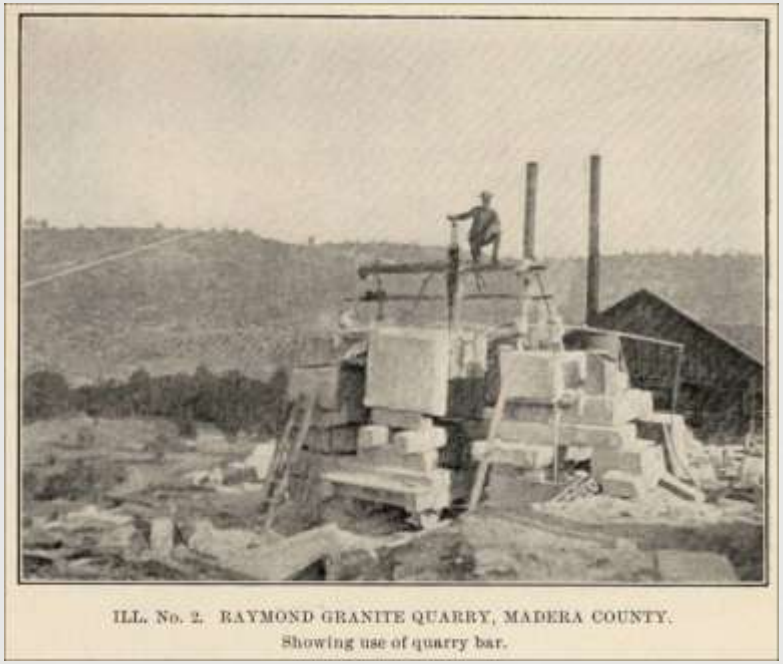
Raymond Granite Company's quarry near Raymond, Madera County, California. Panoramic view of quarry from below.[13]

Early Photographs of the Knowles / Raymond Granite Co. Quarry

ILL. No. 6. RAYMOND GRANITE QUARRY, MADERA COUNTY.

Raymond Granite Quarry, Madera County[3, p. 31]

Raymond Granite Quarry, Madera County. Showing use of quarry bar.[3, p. 25]



ILL. No. 2. RAYMOND GRANITE QUARRY, MADERA COUNTY.
Showing use of quarry bar.

Present-Day Photographs of the Raymond Granite Quarry owned by Cold Spring Granite

(Photographs by Peggy B. Perazzo, 1998)

Raymond Granite
Upper Quarry – "Sierra White" Granite

Raymond Granite
Lower Quarry – "Sierra White" Granite

Structures Constructed Using Raymond “Sierra White” Granite

ILL. No. 2. FAIRMOUNT HOTEL, SAN FRANCISCO. THREE LOWER FLOORS OF RAYMOND GRANITE.

Fairmount Hotel, San Francisco.
3 Lower Floors of Raymond Granite.[3 p. 33]

San Francisco’s New Post office.
Exterior of Raymond Granite.[3 p. 29]

ILL. No. 3. SAN FRANCISCO'S NEW POSTOFFICE. EXTERIOR OF RAYMOND GRANITE.

John D. McGilvray & the McGilvray-Raymond Granite Company's Granite Quarry, at Knowles, Madera County, California (1897 – 1938)

The McGilvray-Raymond Granite Company, owned by John D. McGilvray, operated quarries in Madera County near at Knowles and Raymond. According to a 1921 article in the *San Francisco Article*, McGilvray's five sons were also involved in the stone company, and they retained control after McGilvray's death in 1916.[14]

The McGilvray-Raymond Granite Company operates quarries at Raymond, Madera county, at Sites, Colusa county, at Greystone, Santa Clara county, and at Lakeside, San Diego county.[14]

In 1888 The McGilvray-Raymond Granite Company built the first skyscraper for Claus Spreckels in San Francisco, which remained the tallest building on the Pacific coast for many years. The company constructed various stone buildings on the Stanford University Campus, one of which was the Stanford Chapel. Some of the San Francisco buildings erected by the McGilvray company were: the United States Customhouse on Washington and Battery streets, the San Francisco City Hall and Public Library buildings, the St. Francis Hotel, the Examiner and Chronicle buildings, the American National Bank building, the Courthouses of Sacramento, Solano, Kern, and Yolo counties, and the Commercial Insurance building on Pine and Montgomery streets. The company was well known for designing and constructing some of San Francisco's most important memorials and mausoleums: the M. H. de Young memorial in Holy Cross, the I. W. Hellman memorial in the Home of Peace Cemetery, the Hitchcock and Murphy memorials in Cypress Lawn, and the Musto and DeBarnardi memorials in Holy Cross.[14]

(You can read more about John D. McGilvray and his company in the Raymond/Knowles, Madera County, California, section of our web site.)

There is an interesting story about McGilvray and A. D. Knowles told by John L. Morton, a Colusa County historian.

> McGilvray (the John McGilvray Stone Co.) owned the McGilvray sandstone quarry at sites, while A.D. Knowles owned the other sandstone quarry located just across and up the road. Because the John McGilvray Stone Co., was more aggressive and the Colusa Sandstone Quarry run by A.D. Knowles went bankrupt, Knowles decided to move south to Raymond in Madera County, where he established a granite quarry. After Knowles was running the granite quarry in Raymond for a time, he found that the John McGilvray Stone Company had purchased a quarry near his, so Knowles and McGilvray were once again in competition. (The equipment from Knowles' sandstone quarry at Sites in Colusa County had been purchased at the bankruptcy in 1916 for the Raymond granite quarry.)

Raymond Granite Quarry (left) & McGilvray Granite Quarry (right)

(Photos by Peggy B. Perazzo, September 2010)

Below are present-day photos of the 2 quarries in Madera County that were producing large amounts of granite referred to in the California Division of Mines report of 1906.

Early Photographs of the McGilvray Granite Quarry

General View of the McGilvray Granite Works at Knowles
(postcard photograph; early 1900s)

Area where the McGilvray Granite Works was once located opposite the quarry
(Photograph by Peggy B. Perazzo, September 2011)

McGilvray Raymond Granite Co., Raymond, Cal.
(postcard photograph; early 1900s)

Early Photographs of the McGilvray Granite Quarry

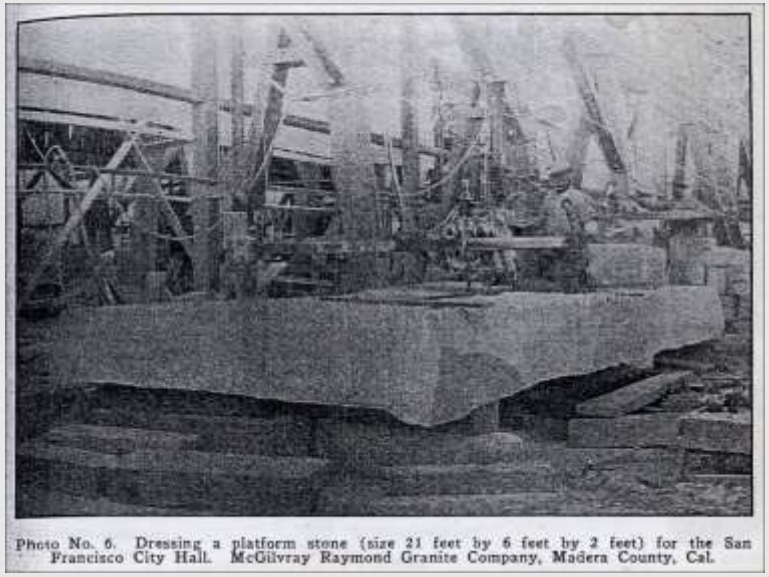


Photo No. 6. Dressing a platform stone (size 21 feet by 6 feet by 2 feet) for the San Francisco City Hall. McGilvray Raymond Granite Company, Madera County, Cal.

Dressing a platform stone (size 21 feet by 6 feet by 2 feet) for the San Francisco City Hall.

McGilvray Raymond Granite Company, Madera County, Cal.[13]

Sculptural Carving, plaster model at right for San Francisco City Hall.

McGilvray-Raymond Granite Company, Madera County, Cal.

Photo No. 8. Sculptural Carving (plaster model at right), for San Francisco City Hall. McGilvray Raymond Granite Company, Madera County, Cal.

Present-Day Photographs of the McGilvray Granite Quarry

(Photographs taken by Peggy B. Perazzo, 9/30/10)

Structures Constructed from Granite Quarried from the McGilvray Granite Quarry in Knowles

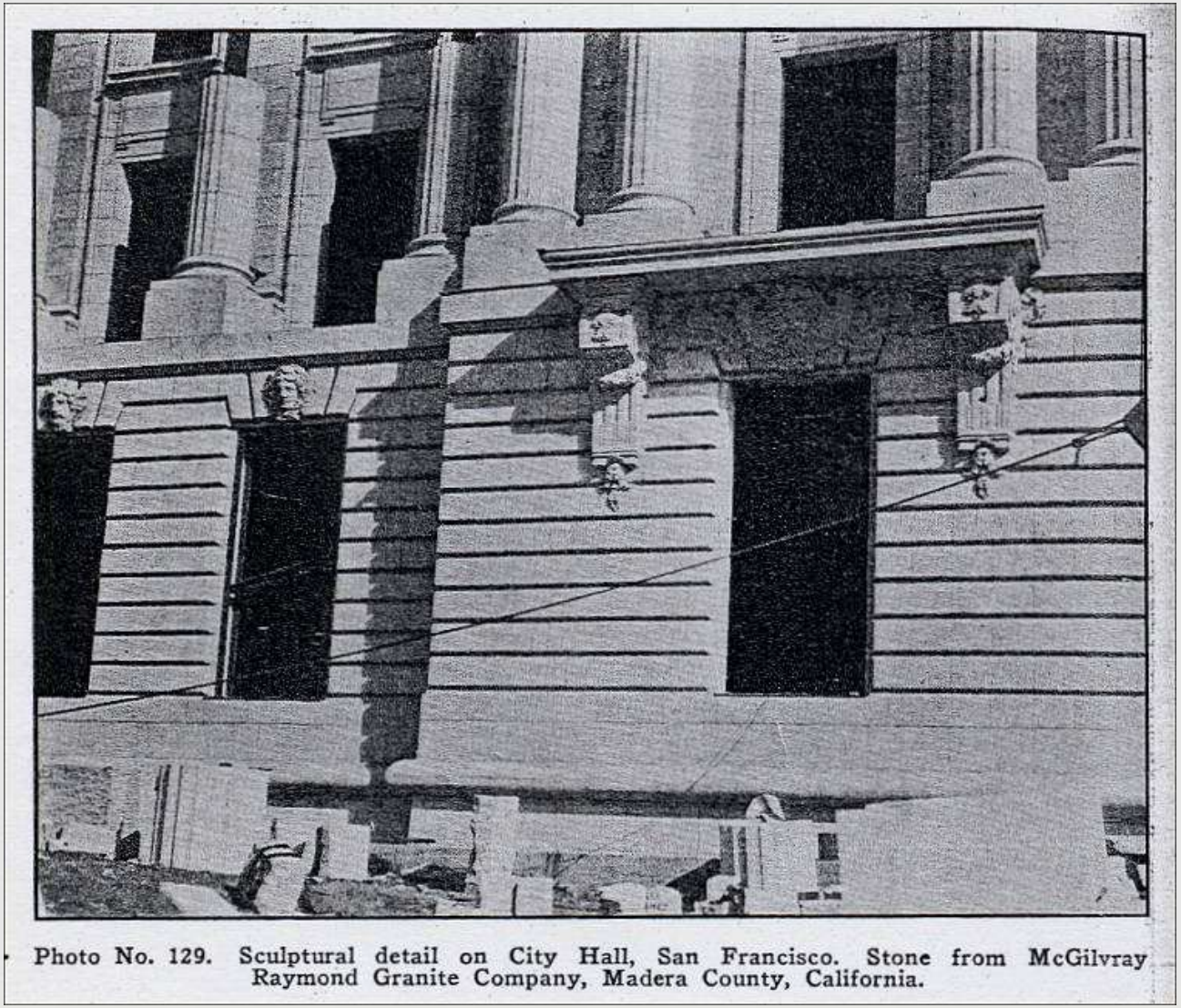


Photo No. 129. Sculptural detail on City Hall, San Francisco. Stone from McGilvray Raymond Granite Company, Madera County, California.

Vertical Stone Saw At The Raymond Museum, Madera County

Below you will find photographs of an old vertical stone saw that is now a part of the Raymond Museum collection. Lynn and Wayne Northrop, the owners, are trying to find the history of this saw, and I thought I'd show it to all of you in case you recognize it.

According to Lynn: "It was possibly a marble cutting saw moved from San Francisco in the 1890s or early 1900s. It sat at a small quarry near Bates Station, an old Stagecoach stop near the Madera Quarry about 12 miles from Raymond. A man named Carl Taylor ran it in the 1930s and then walked away with the blade still stuck in a slab of granite. The iron cutting blades run vertically instead of horizontally and the screw system is still intact on top lowering the blades as the water and shot cut through the slabs. We are trying to date the saw style and find out where it may have come from and if there are others left around California or the country (USA)."

Vertical stone saw located at the Raymond Museum

Quarry / stone saw in the Bates quarry in 1993

Folsom Granite Quarry, Folsom, Sacramento County, California
(1856/1857 – 1947)

Folsom Granite Quarry, Folsom, Sacramento County, California
(1856/1857 – 1947)

Portion of Folsom Prison wall constructed
of granite from the Folsom Prison Granite Quarry
(Photo by Peggy. B. Perazzo)

Folsom Granite Quarry, Folsom, Sacramento County, California
(1856/1857 – 1947)

The Folsom Granite Quarry was an extensive quarry that was located in the foothills of the Sierra Nevada on the American River above the dam on the west side of the river. The Folsom Prison Granite Quarry were opened in 1856/1857. It was the first recorded development of the stone resources of California following the 1848 Gold Rush. The Folsom Granite Quarry produced granodiorite and diabase, a dark and medium-grained stone.[10, p. 511].

In 1890, the quarry sites were located about 50 feet above the bed of the river. The area being worked about at that time was a ledge of granite that was exposed over 1,200 feet long. From 50 to 450 were employed at the quarries, in connection with the dam, canal, and power house (which was under construction.). In 1890, the granite ledge was being worked from both the north and south ends, and three derricks were used to handle the stone. "Black Powder (was) principally used, also Nos. 1 and 2 Giant." All of the quarry work was done by prison laborers, and in 1890, about 150 men worked in the quarry. During the year, about 35,000 to 40,000 cubic yards of stone were taken out of the quarry for use in construction of the dam, canal, and power house on the prison grounds. Also about 30,000 cubic yards of rubble stone was shipped to Sacramento to use as "filling" at the Southern Pacific Railroad shops at that city, and on the line of the railroad, between Sacramento and Port Costa. About 5,000 feet of rough-dressed stone was sold during the year of 1890, which was less than usual due to the amount of stone from the Folsom Granite Quarry which was being used on the works of the canal, dam, power house, and State construction. During 1890 when the Folsom Granite Company worked with the Folsom Water Power Company to operate the Folsom Prison Granite Quarry, "The stone (was) brought down on scows from the quarry to the landing stage of the Folsom Water Power Railroad, which connects with the Sacramento Valley Railroad at Folsom. The water power (was) used for dressing and polishing the stone."[10, p. 513]

The dam that was being constructed in 1890 was constructed of masonry, granite, and Portland cement.[10, p. 511]. The current concrete gravity dam, also known as the Folsom Dam, was completed in 1955. This current dam replaced the smaller dam that had been completed in 1893. According to the Wikipedia article, "The remains of the earlier dam can be seen downstream from the Folsom Lake Crossing."[11]

Folsom Granite Quarry, Folsom, Sacramento County, California (Contd.)

From 1888 to 1890, much of the granite dimension stone was used for prison construction, the dam, canal, and the first power plant in central California. The convicts (were) taught to "quarry, cut stone, and do the masonry, and some even attempted sculptural work." Large quantities of the Folsom Granite Quarry granite was shipped to San Francisco and various other points.[9, p. 417; 5, p. 235, 10, p. 513].

In *The Structural and Industrial Materials of California, Bulletin No. 38* (published in 1906), the author states that there was a macadam quarry, which was situated farther south separate from the main quarry. The exposure of granite on the Folsom State Prison Granite Quarry extended in a northwest course from the northeast corner of Sacramento County to Rocklin, in Placer County…." In December 1904, the working face of the quarry had a north and south length of 300 feet, 65 feet vertical depth, and a width of 100 feet from the edge of the river bed. Blocks of granite dimension stone were being quarried that averaged 2 feet by 2 feet by 6 feet with the irregular shapes of small sizes graded as rubble rock. Production from the quarry in 1904 was 5,170 cubic feet of dimension stone and 7,760 tons of rubble rock. The total production in 1904 for the quarry was 63,021 tons, "a small part of which was used by the prison."[3, p. 47-48]

The 1915-1916 California State Mining Bureau report stated that "The quarry sites are about 50 feet above the bed of the river and just east of the canal. "Early work was carried on in diabase, the contact of which, with the granodiorite crosses the American River just north of the site of the old rock crusher. The farther this rock was quarried into the hill the deeper it was decomposed until 100' back from the river bank a 100'' face shows 50' of decomposed rock. Work was also carried on in granodiorite in an old quarry just below the dam, but better rock has been opened up at the quarry now being worked just east of the prison power plant. The granodiorite is dark and medium-grained and the prison buildings built of it in 1888 show no sign of weathering. All work is done by prison labor. Equipment consists of hand and hammer drills, two derricks, and a tramway to the prison grounds…." At that time riprap was being used along the canal, and about 8,000 tons were sold for railroad ballast each year.[12]

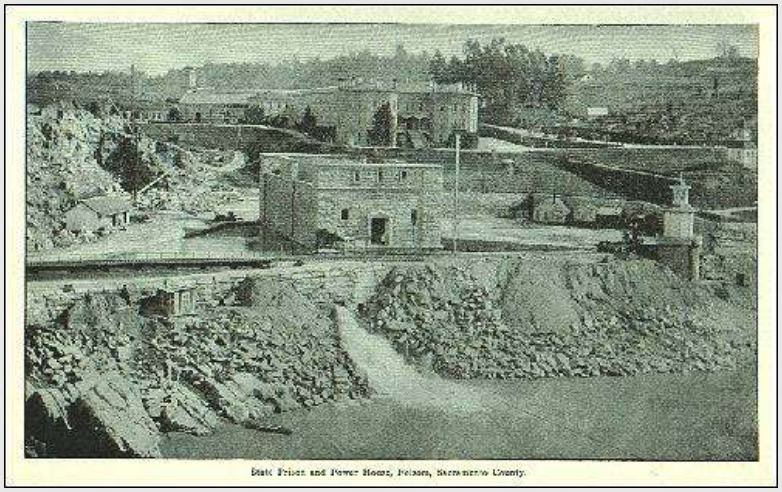
In 1915, the equipment used at the Folsom Granite Quarry consisted of hand and hammer drills, two derricks, and a tramway to the prison grounds. Granite dimension stone, riprap, and crushed granite were the products most produced by the quarry for many years.[9, p. 417]

According to *A Germ of Goodness: The California State Prison System*, 1851-1944, and a license plate factory replaced the quarry in 1950.[24]

Folsom Granite Quarry, Folsom, Sacramento County, California

Granite quarry at Folsom State Prison, Sacramento County. Worked by the convicts at the prison. (circa 1919), [9, p. 417].

View down the American river from the Folsom Prison dam, showing granite outcrops along the river bed and along cuts made for the outlet canal. The prison buildings and walls were built of granite blocks by convict labor.[9]



Folsom State Prison & Power House, Sacramento County (postcard photograph)

Dam across the American River at Folsom State Prison, built of granite blocks from the prison quarry by convict labor.[9]

Penryn and Rocklin Quarries, Placer County, Ca.

Griffith Quarry, Penryn

Rocklin Quarry, Rocklin

The Griffith Quarries & Polishing Works in Penryn, Placer County
(1864 – 1918)

The Griffith Quarries and Polishing Works opened in 1864, and it was one of the pioneer quarries in California. David Griffith, the founder of the company, originally worked in the slate quarries in Penrhyn, Wales. Griffith quarried granite at Folsom until he moved to Penryn in 1864 where he named the quarry (and now the town) after his Welsh home. He and his descendants continued to quarry the granite at Penryn at least until 1906. Granite from the Griffith quarry was used in the construction of the Central Pacific Railroad. The quarry began operating the first successful granite polishing mill in 1874 in California *The Structural and Industrial Materials of California*, published by the California State Mining Bureau in 1906, stated there were 200 or more men employed in the Penryn quarries in the past, although there were less than twenty men working there in 1904.[3] By 1915, when the California State Mining Bureau surveyed the quarries in California, the Penryn quarry was idle.[9] The Penryn quarry operated until 1918. Penryn granite was used for the foundations of the San Francisco mint, parts of the State Capitol, and other buildings.[15]

The Penryn granite is described as "a dark gray biotite granite, rather uniform in color, but varying somewhat in texture in the different quarry openings. The only variation in color is the occasional occurrence of a dark blotch where the biotite crystals have segregated into a small irregular mass in a partially glass groundmass…."[3]

Penryn Granite Quarry

(Photographs by Peggy B. Perazzo)

Penryn Granite Quarry Office & Museum

(Photographs by Peggy B. Perazzo)

Griffith Quarry Office (now the museum)

Close-up of Penryn Post Office wall showing drill marks

Plugs and Feathers in piece of Penryn Granite

Piece of Penryn Granite Outside of Museum

Granite Quarries at Rocklin, Placer County, California
(1861 – 2005)

The following information is from "History of Rocklin," by Roy Ruhkala 1974, presented on the Rocklin Historical Society web site.

> Men saw the granite boulders above the ground in the Rocklin area as a possible business venture, and the first granite quarry was opened by Mr. Hathaway about 1861 in order to supply granite for the base course of the California State Capitol. Today this old quarry "still exists along the west side of Pacific Street across from where Ruhkala Road joins Pacific Street." In the early days, oxen-drawn wagons were used to haul the first loads of granite to where the city of Roseville is located today. Once the Central Pacific Railroad arrived in Rocklin in May 1864, it provided a faster means of hauling the granite out of Rocklin. Mr. Ruhkala states, "The earliest reported quarrying of granite done in Rocklin was for Fort Mason in San Francisco in 1855…."
>
> The author writes that the Rocklin is built on a cap of granite and "…is even textured, very hard, available in large blocks, takes a high polish, and is used extensively for memorial and building work. We have quarry holes 150 feet deep and the texture remains the same. We have had 62 separate quarry operations in the Rocklin area and most of the quarries are still very readily seen."
>
> Buildings constructed of the granite quarried in the Rocklin area include: the Bank of Italy, now Bank of America; the United States Mint in San Francisco; part of the State Capitol; the California National Bank; City Hall; the City and County jails all in Sacramento; the Oakland Auditorium; Stockton Courthouse; the Solano County Courthouse; the Pearl Harbor and Mare Island Drydocks; the Placer County Court House; Rocklin City Hall; the Rocklin Butcher shop (now antique store on 1st Street), the Monterey break water; and many other buildings; and it has been used in the maintenance of the Sacramento levee.
>
> When the Central Pacific Railroad arrived in Rocklin in May, 1864, it gave the people a fast and easy method of travel and hastened the hauling of building granite to the cities where it was needed.

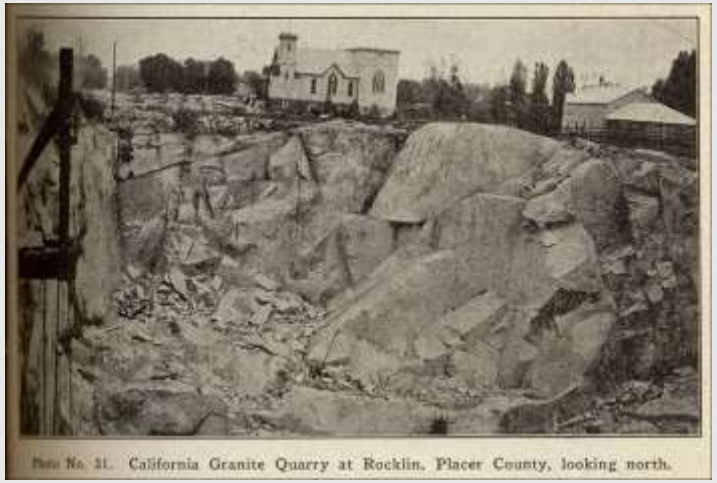
According to *A Twenty Minute Tour of Rocklin's History*, by George Day, "Recent owners gave the quarry the Big Gun name in the early 1990s but they did not extract significant amounts of stone. For countertops and monuments the light grey color of Rocklin's granite cannot compete with the more colorful shades of granite available from elsewhere in California and from overseas. Granite processing operations ceased here in 2005."[25]

Photographs of the Past Rocklin Quarry Industry

Rocklin Granite Co. Advertisement
from the San Jose City Directory – 1896-7,
F. M. Husted, Publisher, San Francisco, Cal.

Granite quarry near Rocklin, Cal. (postcard photo)

Mantyla's Granite Quarry, Rocklin, Placer County[3]



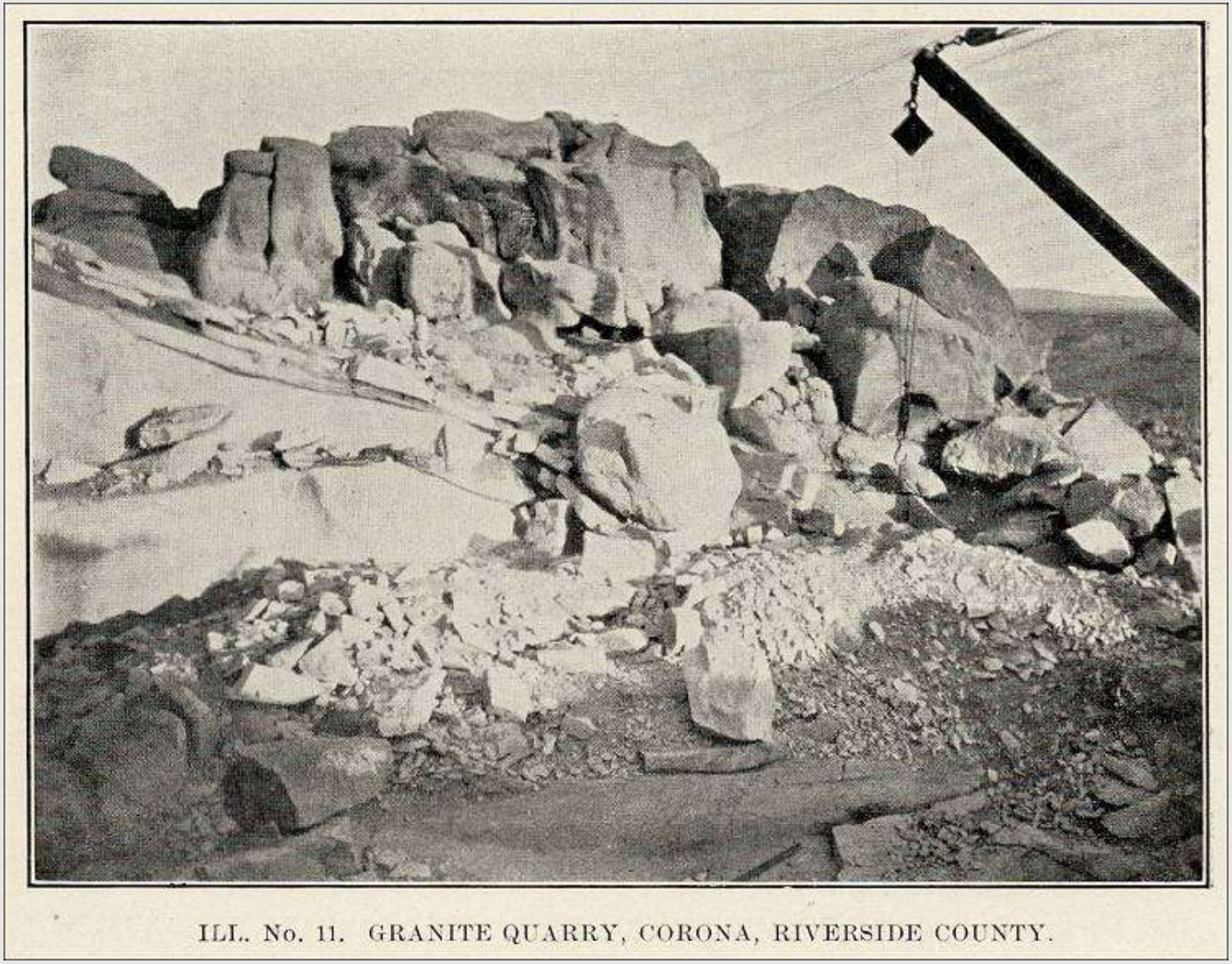
California Granite Quarry at Rocklin[3]

Riverside County Granite Quarries, California

Riverside County Granite Quarries, California

Granite is widely distributed over Riverside County, and it has been quarried on a large scale for rubble for use in the San Pedro breakwater at Casablanca and for building and ornamental purposes at Corona, Riverside, and Temecula.

Riverside County Granite Quarries, California



ILL. No. 11. GRANITE QUARRY, CORONA, RIVERSIDE COUNTY.

Granite Quarry at Corona, Riverside County (circa 1906)[3, p. 41]

Casa Blanca Granite Quarries
Southeast of the Casa Blanca Railway Station, Riverside County[3]

(Granite used in building the San Pedro Breakwater 1899 and 1911)

"Casa Blanca Quarries: "Two large granite quarries owned by the Southern Pacific Railroad Company and operated by the California Construction Company in 1906. The quarries are about half a mile apart north and south, and about a mile southeast of the Casa Blanca railway station, and located at the base of the granite buttes of the vicinity. The rock is a medium dark gray granite of rather uniform texture and color, except the occurrence of the dark blotches scattered through the mass…The stone is loosened from the bed by blasting…The rock is a biotite-hornblende granite, bordering on a granodiorite…A spur from the Santa Fe Railroad extends into both of the Casa Blanca quarries, and the stone is shipped by rail as rubble to the great San Pedro breakwater…."[3, p. 46-47]

Casa Blanca Granite Quarries
Southeast of the Casa Blanca Railway Station, Riverside County[3]

(Granite used in building the San Pedro Breakwater 1899 and 1911)

ILL. No. 14. CASA BLANCA GRANITE QUARRY, RIVERSIDE COUNTY.

Casa Blanca Granite Quarry,
Riverside County[3, p. 45]

ILL. No. 15. CASA BLANCA QUARRY No. 2 (GRANITE), RIVERSIDE COUNTY.

Casa Blanca Quarry No. 2 (Granite),
Riverside County[3, p.. 45]

Riverside County Granite Quarries
(1894? – Present Day)


ILL. No. 12. STONE-SAWING MACHINE. BLY BROS. STONE COMPANY, LOS ANGELES.

Stone-sawing machine. Bly Bros. Stone Company, Los Angeles[3, p. 42]


ILL. No. 16. H. W. HELLMAN BUILDING, LOS ANGELES. FIRST TWO STORIES CONSTRUCTED OF RIVERSIDE GRANITE.


ILL. No. 13. MACHINE SURFACING GRANITE AT BLY BROS.' STONE YARDS, LOS ANGELES.

Machine surfacing granite at Bly Bros.' stone yards, Los Angeles[3, p.43]

Machine surfacing granite at Bly Bros.' Stone Yards, Los Angeles[3, p. 46]
H. W. Hellman Building, Los Angeles, First 2 stories constructed of Riverside Granite. (Bly Bros. Stone Co)

San Bernardino County, California

San Bernardino County, California

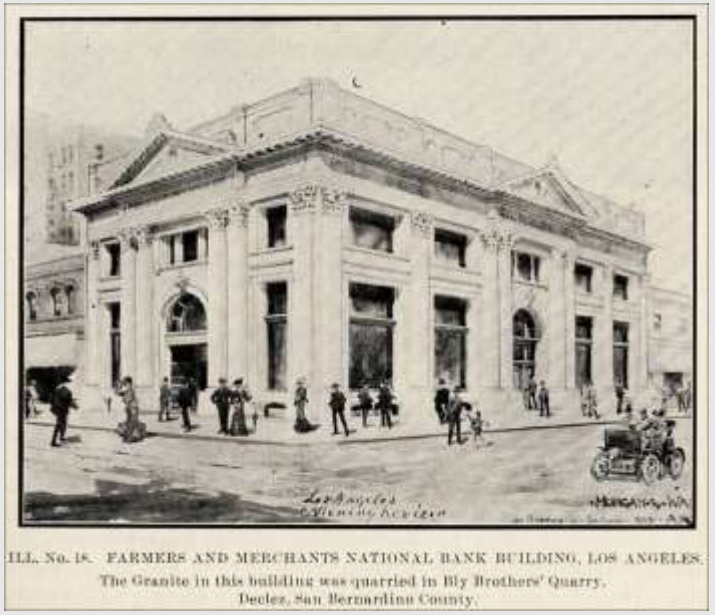
"**The Declez Quarries**, owned by the Southern Pacific Railroad Company, and leased to the California Construction Company…on a spur of the Southern Pacific Railroad, about 1 mile south of Declez station on the main line, and 9 miles west of Colton. The stone is a rather dark-colored biotite granite, which has a gneissoid structure in places. There are a number of feldspar veins from 2 to 4 inches wide, which consist principally of orthoclase feldspar, but in a few places contain large biotite crystals. The rock is partially disintegrated for a few feet from the top, but below this comparatively thin weathered portion it is bright and fresh, and below the few feet of weathered stone the rock could be quarried in blocks large enough for dimension stone, and good building and monument stone could be obtained. At present nearly the entire output is used for rubble in the Government breakwater at San Pedro. Dynamite is used to loosen the stone from the bed, and the large irregular blocks are loaded on the cars at the quarry and taken to the breakwater at San Pedro. The drilling is done with steam drills, and seven large steam-power derricks are used to handle the stone."[3, p.. 48]

"**The Declez deposits** are (located) 9 miles west of Colton, and are commercially the most important. The stone has been used for several years in building the government breakwater at San Pedro, for building stone used in Los Angeles buildings, and for curbstones used in several of the southern cities…."[9]

San Bernardino County, California

ILL. No 17. DECLEZ GRANITE QUARRY, DECLEZ, SAN BERNARDINO COUNTY.

Declez Granite Quarry, Declez,
San Bernardino County[3, p.. 49]



ILL. No. 18. FARMERS AND MERCHANTS NATIONAL BANK BUILDING, LOS ANGELES.
The Granite in this building was quarried in Bly Brothers' Quarry, Declez, San Bernardino County.

Farmers & Merchants
National Bank Building, Los Angeles.
The granite in this building was quarried in
Bly Brothers' Quarry, Declez, San Bernardino[3, p.. 49]

San Bernardino County, California (Contd.)

Transportation in San Bernardino

"The development of San Bernardino County has been greatly augmented in recent years by increased transportation facilities, and at present travel is accomplished with much greater ease and safety than heretofore. In former years the burro was the chief mode of conveyance, but of late this patient beast has been largely though not entirely replaced by railroads and highways. We now have the Santa Fe, the Salt Lake, the Southern Pacific and the Tonopah and Tidewater railroads, giving access to the entire length of the county, besides the National highway now sufficiently complete the permit the use of the automobile. Nearly every section of the county can be traversed with the automobile, the numerous branches lead from the main lines of both railroads and highways."[9]

San Bernardino County, California (Contd.)

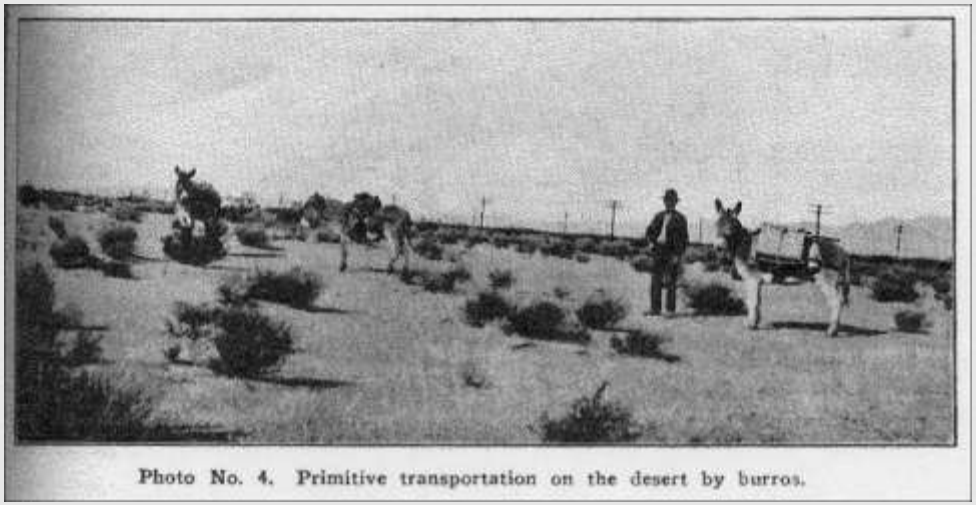


Photo No. 4. Primitive transportation on the desert by burros.

Primitive transportation on the desert by burros[9]

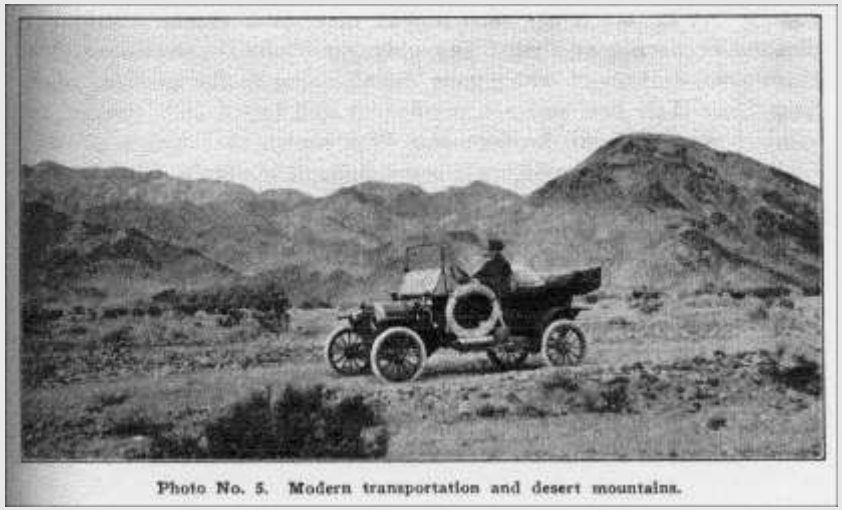
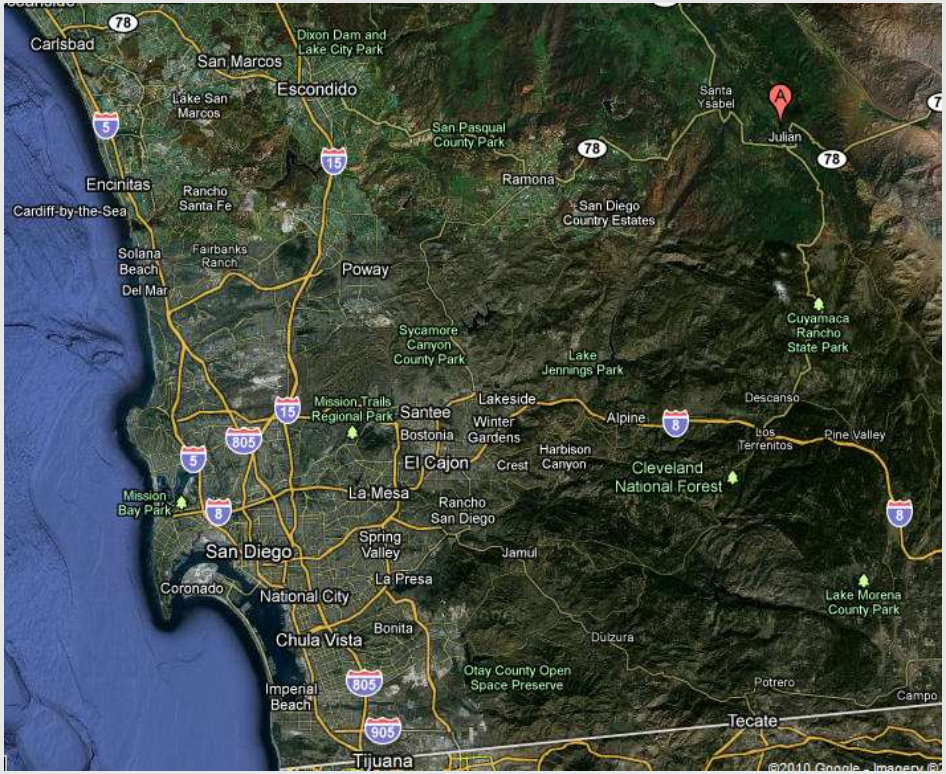


Photo No. 5. Modern transportation and desert mountains.

Modern transportation for desert & mountains.
(circa 1919?) [9]

San Diego County, California



San Diego County, California
(1898 – Present Day)

The following information is from *Commercial 'Black Granite' of San Diego County, California, Special Report 3*, by Richard A. Hoppin and L. A. Norman, Jr., State of California, Department of Natural Resources, Division of Mines, San Francisco, December 1950.[23]

The granite quarries of San Diego County lie within the Peninsular Range province. The Peninsular Range province includes those parts of Baja California and Southern California that lie south of the San Gabriel and San Bernardino Mountains, west of the Salton Imperial depression, and east of the Pacific coastal plain. Most of the province is hilly or mountainous, and many of the individual mountain masses along the eastern boundary of the province are 5,000 to 10,000 feet high. In the lower granite-producing areas farther west, the general relief is approximately 1,500 feet.

"Except where recently burned over, the hills are covered with a thick growth of brush. Where underlain by gabbroic rocks, or 'black granite,' these hills are mantled with reddish-brown soil. Many of the more silicic rocks, in contrast, form rough, boulder-strewn ridges and slopes.

"The rainfall in the lower, westerly parts of the province averages about 15 inches, and occurs mainly during the period December-April. The winters are mild and the summers characteristically hot and dry; the climate ordinarily permits operation of the quarries on a year-round basis

.

"A large part of the Peninsular Range country is underlain by intrusive igneous rocks of probably Upper Cretaceous age. (1) These rocks represent a great, complex batholith, and were intruded into Mesozoic schists, quartzites, and volcanic rocks along the eastern border of the province. Like the province as a whole, the batholith is elongated in a southeasterly direction. The intrusive rocks are exposed continuously from Riverside, California, to points many miles south of the Mexican border, a distance of more than 100 miles within the state of California. The average width of the batholith is about 60 miles. Its western margin is in part overlapped by the younger sedimentary rocks.

San Diego County, California (Cont'd)
(1898 – Present Day)

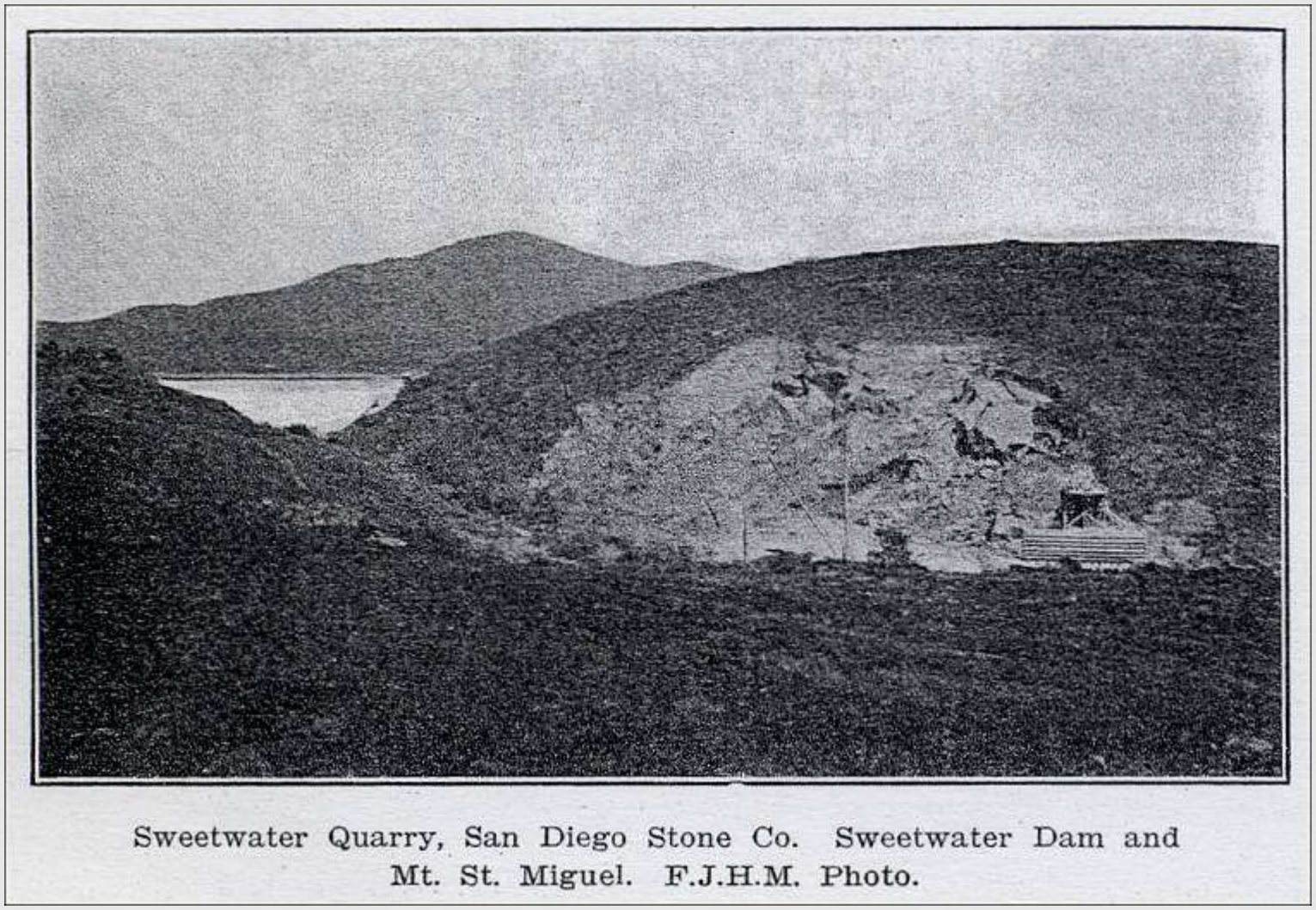
"The black granite' quarries in San Diego County are in large intrusive masses of San Marcos gabbro, which is the oldest of the major rock types in the batholith. (2) This gabbro, or black granite, forms numerous stock-like bodies that in many places are entirely or partly surrounded by larger, younger masses of tonalite and granodiorite. The largest exposure of black granite in the area extends over about 11 square miles; others cover 5 square miles or less.

(1) Page 6, footnote 1: Larsen, E. S., Jr., Batholith and associated rocks of Corona, Elsinore and San Luis Rey quadrangles, Southern California; Geol. Soc. America Mem. 29, 182 pp., 1948.
(2) Page 6, footnote 2: Miller, F. S., Petrology of the San Marcos gabbro, southern California: *Geol. Soc. Am. Bull.*, vol. 48, pp. 1397-1426, 1937.

Historical Sketch (of the San Diego County Granite Industry)

"The granite industry in San Diego County evolved from local use of the stone by early settlers. Recorded production of granite as a dimension stone dates from 1898, although granite quarries were operated several years earlier. Large tonnages of rubble and riprap were produced for breakwater and dam construction during the years near the turn of the century. This bulk us of granite has continued to the present, but during recent years has become distinct from dimension stone uses.

San Diego County, California (Cont'd)
(1898 – Present Day)



Sweetwater Quarry, San Diego Stone Co. Sweetwater Dam and Mt. St. Miguel. F.J.H.M. Photo.

Santee Granite Quarry, San Diego County.[13]

San Diego County, California (Cont'd)
(1898 – Present Day)

"Production of paving blocks cut from granite was first reported in 1910, and during succeeding years a small but flourishing industry was supported by the demands of railroads for rail-lining material in urban areas. Proficient stonecutters, many of them trained in the European countries of their birth, produced blocks by hand methods at numerous quarries in the Grossmont, Santee, and Foster areas. Some of these old quarries are visible in the low hills half a mile south of Santee and along the west side of the lake-side Ramona highway, a few miles north of Lakeside. An important factor in these quarrying activities was the proximity of the San Diego, Cuyamaca and Eastern Railway, now abandoned.

"Dimension stone for building and memorial purposes found a gradually increasing market, partly as a result of wider recognition of the quality of the stone, and partly because of sales efforts by quarrymen, who were in search of a new market to replace declining demands for riprap and paving stone. James Simpson of the Simpson-Pirnie Granite Company, San Diego, was one of the pioneers in the stone business, operating quarries at Santee and Foster from 1888 to 1932. The company reported sales of building stone, monumental stone, paving blocks, rubble and riprap. This diversified production probably accounts in large part for their 46-year period of operation, longest of any in the county. Dimension stone for use in the construction of government buildings at Fort Rosecrans, on Point Loma near San Diego, was quarried in the Foster area by the Waterman Granite Company in 1903-04. (3)

(3) Page 6, footnote 3: Aubury, Lewis E., *The structural and industrial materials of California: California Min. Bur. Bull. 38*, p. 52, 1906.

"All of this early work was done in a region of predominantly light-gray granodioritic rock; it was not until 1921 that the currently important black granite (gabbro) was exploited extensively, although Jose Cova produced small amounts of the stone before 1921 from a quarry near Santee. In 1921 the Blye Stone Company, Los Angeles, and W. E. Van Deventer reported sales of such material from two quarries near Bernardo. In 1922 Robert J. Magee reported black granite production from his quarry northeast of Pala, in the northern part of the county. About the same time, the area southwest of Escondido was opened up; it is now a major source of stone. First production from the San Marcos-Vista area was in 1938. John Stridsburg, present operator of the Crystal Black granite quarry, has been active in the Escondido area since 1923, and has reported continuous production under his own name since 1926.

San Diego County, California (Cont'd)
(1898 – Present Day)

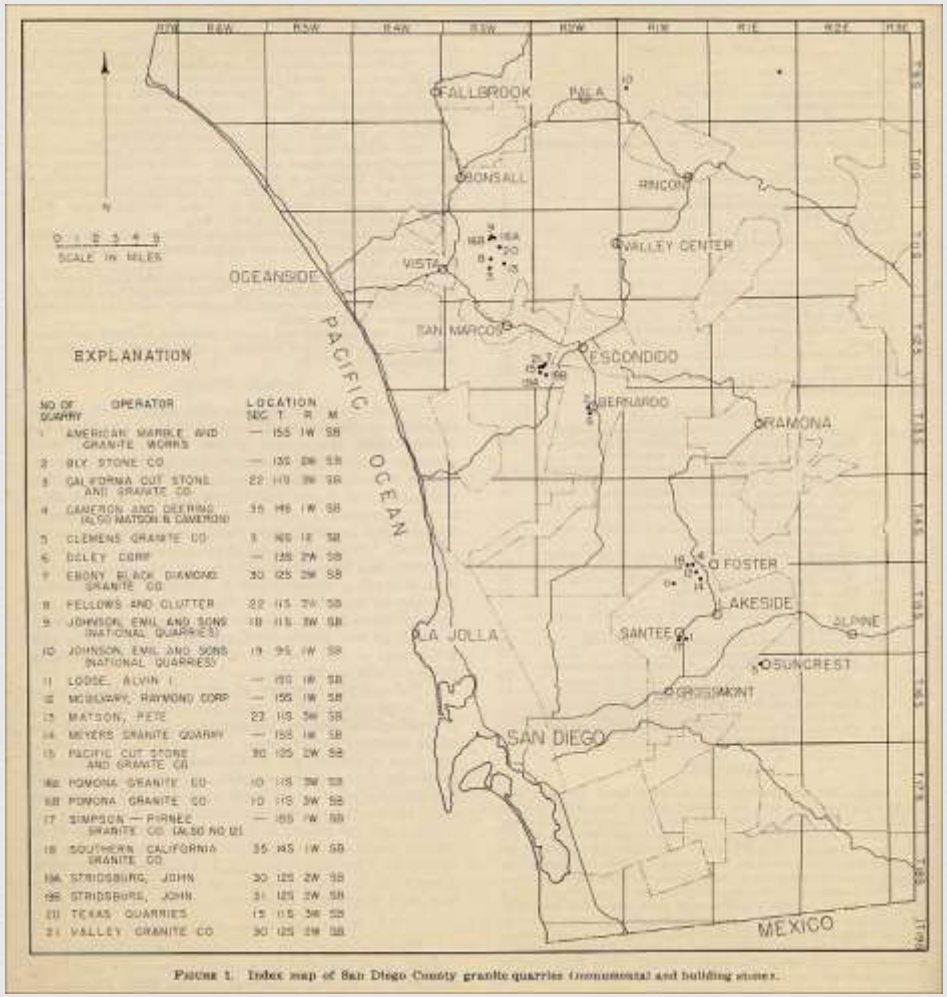
"All quarries and producers listed in the records of the State Division of Mines are shown in table 1. Many other companies and individuals, including those failing to submit production records, those producing granite products other than monumental and building stone, and the many stone workers, are not listed but nevertheless played an important part in the development of the county's granite industry.

Location of Quarries and Producers (in San Diego County)

"The granite quarries of San Diego county are shown in figure 1. There are three principal centers of production, all in the western half of the county. Light-gray granodiorite is obtained from an area within a 5-mile radius of Lakeside, whereas most of the black granite is obtained from two areas, one within a 5-mile radius of Escondido and the other within a 3-mile strip that lies 4 miles east of Vista. The confinement of quarrying activity to these areas probably is due partly to their position with respect to transportation, as well as to the wise tendency to continue operations in a known area of good stone. Undoubtedly there are other deposits of satisfactory stone that could be exploited if the demand were sufficient.

"The list of producers in table 1 shows clearly the high mortality rate of producers in terms of length of operations. Of the seven 1948 producers, only two reported production prior to 1937. Also of interest are the numerous trade names applied to the stone that has been marketed. One of them, 'Black Diamond Granite,' is registered and copyrighted with the U. S. Patent Office. The 16 different names noted in table 1 form only a part of the complete list, no accurate record of which is available.

San Diego County, California (Cont'd) **(1898 – Present Day)**



Index map of San Diego County granite quarries (monumental and building stone).[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

Technology (Quarrying Technology in San Diego County)

"Hardness, texture, and other properties that substantially affect the suitability of granite as a dimension stone also creates many problems in quarrying and preparation. Techniques developed for quarrying softer types of dimension stone are not always applicable to operations in granitic rocks, where production costs are often relatively high. Quarrying and finishing methods have been well described by Bowles (4) in his comprehensive study of the stone industries.

(4) Page 7, footnote 1: Bowles, Oliver, *The stone industries*, McGraw-Hill Book Company, 2d ed., pp. 143-167, 1939.
"The granite quarries of San Diego County are small to moderate in size, and are of two distinct types. In general, the black granite quarries have been in deposits of residual boulders, whereas most granodiorite quarries have been operated in ledge, or massive rock. Both types of quarries are commonly started as shelf excavations, with the development of an opening horizontally into the hillside. Black granite quarries ordinarily have been continued as 'shelf quarries,' but some of them and most of the granodiorite quarries have been deepened into 'pit quarries,' in which the rock is obtained from points below the original quarry floor.

"After exposure in the quarries, boulders are split by drilling and blasting. the split portions of the boulders then are worked into smaller blocks by the 'plug and feather' method (fig. 2). In granodiorite quarries, maximum advantage is taken from the joint sets to obtain large sized quarry blocks from which smaller ones are made.

San Diego County, California (Cont'd)
(1898 – Present Day)

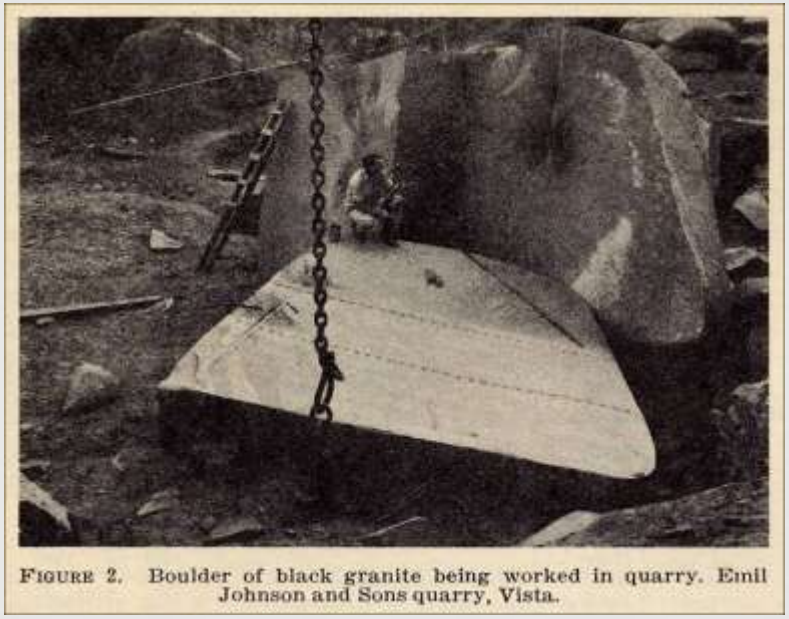


FIGURE 2. Boulder of black granite being worked in quarry. Emil Johnson and Sons quarry, Vista.

Boulder of black granite being worked in quarry. Emil Johnson and Sons quarry, Vista.[23]

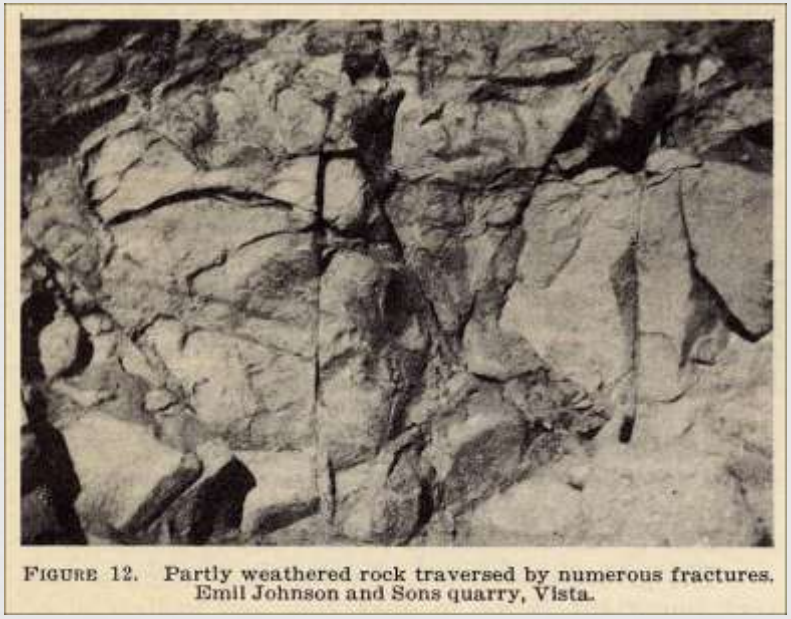


FIGURE 12. Partly weathered rock traversed by numerous fractures. Emil Johnson and Sons quarry, Vista.

Partly weathered rock traversed by numerous fractures. Emil Johnson and Sons quarry, Vista.[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

"Equipment used in the quarries consists of the usual stoneworkers' hand tools, pneumatic hand drills, portable compressors, single derricks, and in some places, a bulldozer to move waste material. Only one quarry is equipped with an electrically-powered steel derrick and gang saw. The saw is used to produce slabs of various thicknesses (figs. 3 and 4).

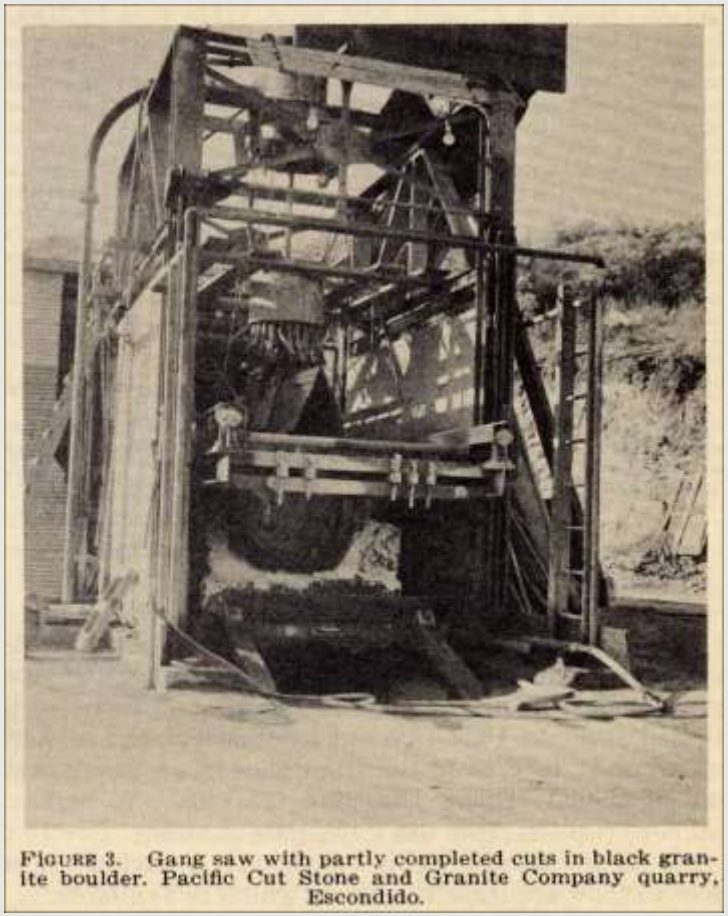


FIGURE 3. Gang saw with partly completed cuts in black granite boulder. Pacific Cut Stone and Granite Company quarry, Escondido.

Gang saw with partly completed cuts in black granite boulder. Pacific Cut Stone and Granite Company quarry, Escondido.[23]

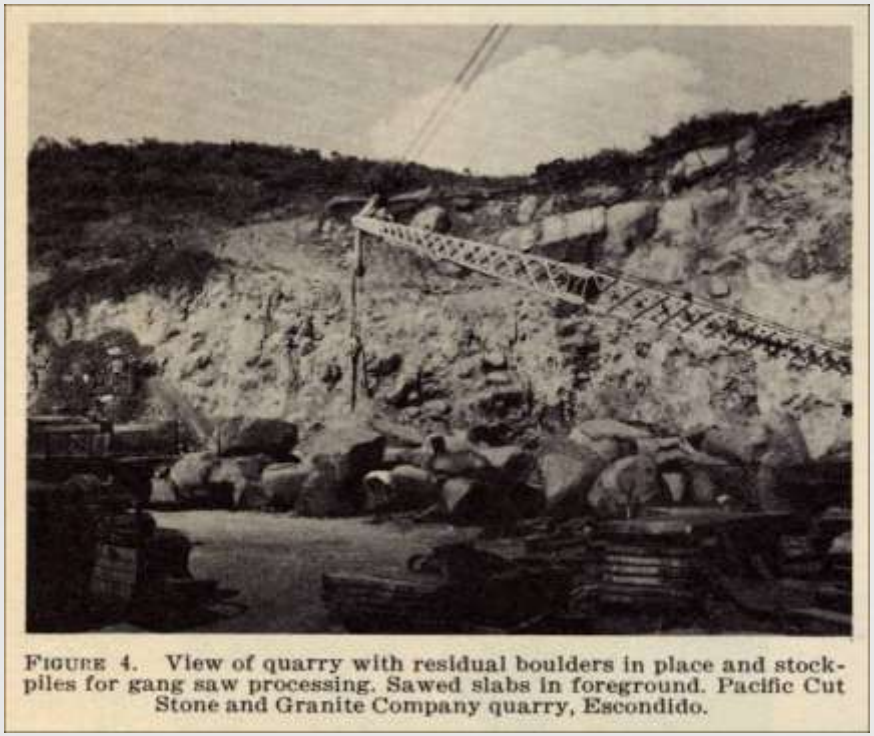


FIGURE 4. View of quarry with residual boulders in place and stockpiles for gang saw processing. Sawed slabs in foreground. Pacific Cut Stone and Granite Company quarry, Escondido.

View of quarry with residual boulders in place and stockpiles for gang saw processing. Sawed slabs in foreground. Pacific Cut Stone & Granite Company quarry, Escondido.[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

"Disposition of waste in quarry operations in quarrying operations is always an important problem. Operators of quarries in black granite must handle both waste rock and the disintegrated material that surrounds the boulders. The latter is used to maintain quarry floors, and at one place is also sold as surfacing material for driveways and roads. Many of the older granodiorite quarries, as judged from present appearance, were literally 'worked into a hole,' with poorly planned development of steep or overhanging walls on one or more sides, excavations of awkward shape, and with rapid accumulation of waste for which satisfactory disposition was not provided.

"The quarrying methods typically used in San Diego County appear crude and inefficient as compared with those of other areas, particularly the important granite centers of the eastern United States. The local quarries, however, present difficult and unusual problems. Many excellent techniques ordinarily used in the quarrying of massive rock are not feasible for residual boulder deposits. All known techniques should be studied and considered, however, as many of these might be useful, and might lead to reduction of operating costs.

"The physical characteristics of granite contribute to problems of finishing, as well as quarrying the stone. No finishing shops are located on quarry premises in the county, although two of the producers active in 1948 maintain such shops elsewhere. These and other finishing shops in the county use essentially standard methods and equipment as described by Bowles. (5) Location of shops at or near quarries, adoption of improved methods and equipment and attention to the possibilities of production-line methods might contribute to lower costs.

(5) Page 8, footnote 1: Bowles, Oliver, **The stone industries**, McGraw-Hill Book Company, 2d ed., pp. 156-167, 1939.

San Diego County, California (Cont'd)
(1898 – Present Day)

Production and Economic Conditions (of Granite in San Diego County)

"Production of building and monumental granite in San Diego County during the 51-year period 1898-1948 has amounted to 577,276 cubic feet valued at $1,344,273, or 5.8 percent of the total California production for that period. In 1948 the county production constituted about 30 percent of the total state production. The output of the county's industry has fluctuated greatly, with trends generally parallel with those of the state's industry. California' greatest output, in terms of value, was reached in the years 1921-30, an active period for the San Diego County industry as well. This was due mainly to the accelerated building activity of the period. The record year in state production, 1925, was second highest for the county, whose maximum output was reached in 1947.

"As shown in tables 1 and 2, general business conditions are reflected in the granite production figures for both California and San Diego County. Financial depressions, labor troubles, building booms, and periods of prosperity have shown their effects during the years. (6) The panic of 1907, for example, had little effect upon state production, but a marked effect upon county production which dropped sharply in 1908. The financial depression before World War I, in contrast, resulted in a lowering of both state and county production. Although the county production improved in 1915 over the 1914 low, the state production did not owing in part to a strike of stonecutters. (7)

(6) Page 8, footnote 2: Bowles, Oliver, and Hatmaker, Paul, Trends in the production and uses of granite as dimension stone: U. S. Bur. Mines Rept,. of Inv. 3065, 1935. Data on national economic conditions as related to the granite industry, as well summarized in this paper, have been used by the authors for comparison with California and San Diego County Production.

(7) Page 8, footnote 3: Bradley, Walter W., *California mineral production for 1915, California Min. Bur. Bull. 71*, p. 58, 1916.

San Diego County, California (Cont'd)
(1898 – Present Day)

"The period 1916-18, with its labor troubles, short labor supply, higher operating costs, and other wartime conditions, was a serious one for both the national and the California stone industry. The state's 1918 production of $139,861 was its lowest since 1888. County production during the same period was at a low level. The years 1921 and 1922, in which many post-war economic adjustments were made, marked the start of California's most important years of production, and likewise a corresponding period of prosperity for the industry in San Diego County. Increased building activity, particularly the construction of public buildings in the Los Angeles area, was directly responsible for the high output of dimension granite in 1924-25. (8) Monumental use, which normally requires that a stone take a smooth polish, demands rock of the highest quality, as texture, color, and physical defects are easily seen in the polished stone.

(8) Page 9, footnote 1: Bradley, Walter W., *California mineral production for 1925: California Min. Bur. Bull. 97*, p. 70, 1926.

"Both Granodiorite and black granite are in constant demand for monumental purposes. The popularity of black granite is indicated by production figures from 1921, when the rock was first extensively quarried. From 1921 to 1948 the output of this rock constituted 51 percent of the total production of dimension stone in the county. For the entire 51-year period, 1898-1948, it constituted 43 percent of the total, and for the last five years, 1944-48, it amounted to about 90 percent. Monuments made from this stone are sold not only throughout California, but in many other states, Canada, Mexico, and the Hawaiian Islands.

"The recently completed Flagpole Memorial, at the Nevada entrance to Hoover Dam, is made from the black granite. As a building stone, this rock is used extensively in veneers and facings, alone or incorporated with other natural stone, or with manufactured synthetic building materials, Its dark color and uniform texture provide a pleasing accent, and harmonize well with other materials. Moreover, the stone is easily maintained after installation.

San Diego County, California (Cont'd)
(1898 – Present Day)

Table 2. Production of building and monumental granite 1898-1948 [1]

Year	California	San Diego County		
	Value (in dollars)	Cu. ft.	Value (in dollars)	Unit value per cubic foot (in dollars)
1898	147,732	6,588	4,875	0.74 (est.)
1899	141,070	11,000	8,150	0.74
1900	295,772	7,300	9,900	1.36
1901	519,285	13,900	22,400	1.61
1902	255,239	20,590	13,175	0.64
1903	678,670	10,800	13,548	1.25
1904	467,472	7,760	7,851	1.01
1905	353,837	9,500	10,250	1.08
1906	344,083	9,500	10,250	1.08
1907	373,376	19,900	23,650	1.19
1908	512,923	9,000	10,000	1.11
1909	376,834			
1910	417,898			
1911	355,742			
1912	362,975	2,200	2,200	1.00
1913	981,277	18,311	21,708	1.19
1914	628,786	5,425	6,425	1.18
1915	227,928	6,900	8,300	1.20
1916	535,339	6,900	8,300	1.20
1917	221,997	5,500	6,150	1.11
1918	139,861	5,600	9,200	1.64
1919	220,743	6,690	15,215	2.27
1920	495,732	[2]	[2]	
1921	725,901	8,499	22,444	2.64
1922	676,643	15,931	35,673	2.24
1923	760,081	19,715	40,600	2.05
1924	1,211,046	26,809	76,532	2.85
1925	1,853,859	28,506	108,703	3.81
1926	655,332	16,273	45,327	2.79
1927	1,398,443	18,858	63,142	3.35
1928	763,996	14,239	47,572	3.34
1929	1,169,271	15,835	28,864	1.82
1930	855,477	9,986	27,411	2.74
1931	636,741	4,704	11,402	2.42
1932	398,676	6,232	9,700	1.56
1933	183,706	5,342	10,097	1.89
1934	249,083	6,333	11,167	1.76
1935	339,917	6,189	10,614	1.71
1936	244,243	14,065	28,000	1.99
1937	207,738	10,863	29,017	2.67
1938	131,386	[2]	[2]	
1939	145,194	[2]	[2]	
1940	198,896	6,030	14,233	2.36
1941	261,661	7,183	15,391	2.14
1942	186,872	[2]	[2]	
1943	148,160	[2]	[2]	
1944	222,843	12,638	43,922	3.48
1945	220,411	28,257	85,892	3.04
1946	275,367	29,489	92,791	3.11
1947	305,303	31,062	115,135	3.71
1948	285,214	25,263	94,958	3.76
Total	$23,766,031	577,276	$1,344,273	

[1] Tabulated from records of the California Division of Mines. Certain figures not in agreement with published records represent inclusion of returns not received in time for use in earlier reports or reclassification of returns.

[2] Omitted to conceal output of individual producers; included in total.

Production of building and monumental granite 1898-1948.[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

"The recently completed General Petroleum Building in Los Angeles (fig. 5) illustrates the use of San Diego black granite in combination with terra cotta. A few of the many other buildings in which this stone has been used are the Mirror Building, Western Union Building, Broadway Crenshaw, Saks 5th Avenue, and Bullock's Pasadena in the Los Angeles area, and the Appraisers Building and Hastings Building in San Francisco. Its use in the Minnesota Mining and Manufacturing Company Building, St. Paul, Minnesota, Salvation Army Building, Detroit, Michigan, and in the United States Embassy Building, Havana, Cuba, reflects its widespread distribution outside the state.

San Diego County, California (Cont'd)
(1898 – Present Day)

FIGURE 5. General Petroleum Building, Los Angeles. San Diego County black granite used on lower part of building and terra cotta on upper section.
Art Streib Studio photo, courtesy of General Petroleum Corporation.

General Petroleum Building, Los Angeles. San Diego County black granite used on lower part of building and terra cotta on upper section.[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

"Light-gray granite of the county, used so extensively in earlier years for construction purposes, also has found great favor as a monumental stone. Its even texture and 'silver-gray' color make it suitable for many purposes. Unfortunately, production of this rock has dropped to a negligible amount during recent years, and its once well-established position is threatened by lack of supply. Both producers and finishing shops have indicated that there has not been sufficient available stock to fill recent demands...."

San Diego County, California (Cont'd)
(1898 – Present Day)

FIGURE 6. Monument made of San Diego County granodiorite.

Monument made of San Diego County granodiorite.[23]

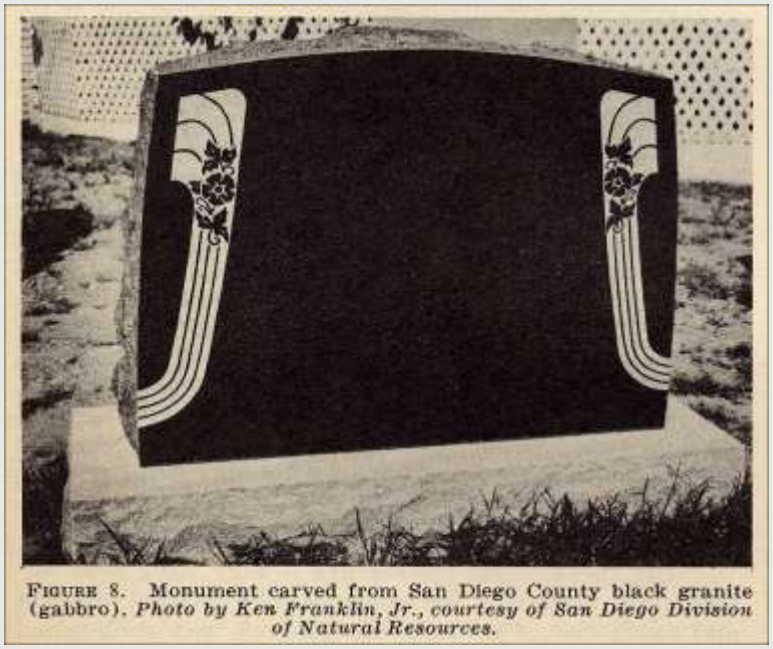


FIGURE 8. Monument carved from San Diego County black granite (gabbro). *Photo by Ken Franklin, Jr., courtesy of San Diego Division of Natural Resources.*

Monument carved from San Diego black granite (gabbro) .[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

"Residual boulders are being worked in all the black granite quarries except the Stridsburg. These boulders are remnants of fresh rock surrounded by crumbly, decomposed material. The massive granite is traversed by a network of joint, fracture, and sheeting surfaces that divides the rock into blocks of various sizes. The water descending through the narrow openings along these surfaces contains a small amount of carbonic and sulphuric acids. Because the minerals of the granite crystallized at higher temperatures than exist in this surface environment, they are susceptible to alteration by these cold, dilute acidic solutions. Decomposition and disintegration take place, moving inward from all sides of each fracture-bounded block and gradually rounding its corners until only a boulder is left. This results in a concentric laying that has been called onionskin structure (fig. 9). The remaining boulders range from a few inches to 30 feet in diameter...."

San Diego County, California (Cont'd)
(1898 – Present Day)

Santee Granite Quarry, San Diego County.
3, p. 52

Sheet structure at Simpson quarry, Santee.[23]

View into Cameron-Deering quarry, Lakeside. Distribution of the many fractures in the rock is such that uniform blocks are difficult to obtain.[23]

Perfect joint plane. Cameron-Deering quarry, Lakeside.[23]

San Diego County, California (Cont'd)
(1898 – Present Day)

FIGURE 15. Valley Granite Company quarry, Escondido. General view of quarry workings.

Valley Granite Company quarry, Escondido. General view of quarry workings.[23]

FIGURE 16. Vertical west face of McGee quarry, near Pala, as it appeared in July 1947. Note large boulders in upper part of thick, well-defined "creep" layer, which also contains smaller boulders that show some exfoliation. The underlying residual material, with its large, spheroidally weathered boulders, is well exposed to the right of the man. Its sharp upper contact is elsewhere concealed by slumped debris and quarry waste. *Prepared from a sketch by R. H. Jahns.*

Vertical west face of McGee quarry, near Pala, as it appeared in July 1947.

Note large boulders in upper part of thick-well-defined "creep" layer, which also contains smaller boulders that show some exfoliation. The underlying residual material, with its large, spheroidally weathered boulders, is well exposed to the right of the man. Its sharp upper contact is elsewhere concealed by slumped debris and quarry waste. *Prepared from a sketch by R. H. Jahn*.[23]

Tulare County Granite Quarries, California

(Prior to 1892 – Present Day)

Tulare County Granite Quarries, California
(Prior to 1892 – Present Day)

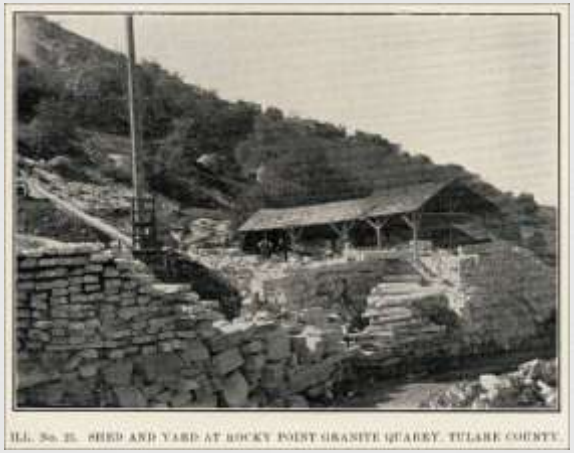
"In the foothills east of Porterville and Exeter there are extensive deposits of biotite-granite, which are suitable for building purposes. Up to the present time (circa 1916) only a small amount of development has been done on these deposits.[3, p. 54]

Tulare County Granite Quarries, California
(Prior to 1892 – Present Day)

Quarry of the California Granite Company, situated 4 miles east of Porterville. [9]

Number 2 Quarry of California Granite Company[9]

The R. Johnson Granite Quarry, Porterville, Cal. (postcard photo)



Shed and Yard at Rocky Point Granite Quarry, Tulare County[3, p. 55]

Limestone Quarries in California

Limestone Quarries in California

"Limestone or dolomite occur in all but a few of the counties in California, but only about 10 counties are important producers (circa 1947). The complexity of the geologic structure of the state, together with the discontinuity and local variation of the magnesia-lime ratio, cause many problems in both exploration and operation. In the Sierra Nevada, the limestones from Calaveras County to the south are likely to contain considerable magnesia. From Amador County to the north, the limestone is largely of the high-calcium variety…San Bernardino County and the Coast Range counties south of San Francisco are large producers of both limestone and dolomite. Shasta County is very abundantely (sic) supplied with limestone of three different geologic ages, but little is being done with it in 1947, although formerly large tonnages were used as flux at copper smelters."[18]

"**Distribution of Limestone in California**. – Limestone is pretty well distrusted over the State of California; no very large area is entirely without it, yet the deposits are not continuous over large areas. The stone is in some places several hundred feet thick, but, as a rule, it extends only a short distance on the surface.[3, p. 61]

Limestone Quarries in California

ILL. No. 25. LIMESTONE QUARRY OF HENRY COWELL LIME AND CEMENT COMPANY, CONCORD, CONTRA COSTA COUNTY.

Limestone Quarry of Henry Cowell Lime & Cement Company,
Concord, Contra Costa County. [3, p. 67]

PHOTO 1. Cowell limestone quarry.

Cowell limestone quarry in Contra Costa County

ILL. No. 26. I. X. L. LIMESTONE QUARRY, FELTON, SANTA CRUZ COUNTY.

I. X. L. Limestone Quarry, Felton,
Santa Cruz County[3, p. 85]

Fall Creek - I. X. L. / Henry Cowell Kilns & Quarry Area
(Photo by Peggy B. Perazzo)

Limestone Quarries in California

ILL. No. 34. SANTA CRUZ LIMESTONE QUARRY, 18 MILES N. W. OF SANTA CRUZ.

Santa Cruz Limestone Quarry,
18 miles N. W. of Santa Cruz[3, p. 34]

ILL. No. 32. H. COWELL & CO.'S LIMESTONE QUARRY, 3½ MILES NORTHWEST OF SANTA CRUZ.

H. Cowell & Co.'s Limestone Quarry,
3 ½ miles northwest of Santa Cruz. [3, p. 84]

Henry Cowell Ranch Buildings & Kilns, University of California, Santa Cruz Campus, Santa Cruz

(Photographs by Peggy B. Perazzo)

Upper Quarry & Kilns, University of California, Santa Cruz Campus, Santa Cruz

(Photographs by Peggy B. Perazzo)

Limestone/Marble Samples Examples from Cowell Quarries, University of California, Santa Cruz Campus, Santa Cruz

(Photographs by Peggy B. Perazzo)

Close-up of Marble from the Upper Quarry

Marble Quarries in California

Marble Quarries in California

"Marble is a metamorphic, crystalline limestone, distinguished from other limestones principally by its adaptability to receive a polish. It is used as an ornamental building stone, also for decorative and monument purposes. The Bureau believed that California could start producing supplies of white, clouded, and colored marbles and onyx marble to supply the demand for marble in California in the future. [3]

"The production of marble in California (circa 1906 was) not large…." but the State Mining Bureau felt that more deposits would be opened. About 1906, large quantities of marble were shipped into California from Vermont, Georgia, Tennessee, and Italy. [3]

"…There are numerous large deposits of excellent marble in the state. Marble production began in the (1860s) and was carried on until 1942, when it may be said, for practical purposes, to have been suspended with the closing of the Columbia marble quarry in Tuolumne County, although there has been a very small output of crushed stone for terrazzo, and a little onyx and serpentine has been sold. California marbles have been widely used locally for interior work with excellent satisfaction. Marble has shared the same fate as sandstone and granite, both of which were once produced here in substantial quantities. These natural building stones, which require skilled labor at good wages, especially for cutting to finished size and polishing, have not been able to compete with cheaper products made and erected with a minimum of unskilled labor. In addition, marble must compete with that brought from other states or from outside the country."[18]

The following photographs are of some of the California marble quarries that were active and listed in the 1906 *The Structural and Industrial Materials of California* published by the California State Mining Bureau.

California Marble Quarries (circa 1906)

(1888 or earlier – early- to mid-1900s – but prior to 1947)

ILL. No. 38. OLETA MARBLE QUARRY, PLYMOUTH, AMADOR COUNTY.

Oleta Marble Quarry, Plymouth, Amador County[3, p. 97]

The Oleta Marble Quarry as it appeared in 2003

California Marble Quarries (Contd.)

The Inyo Dolomite (Marble) Quarries in near Lone Pine in Inyo County
(1888 to Present Day)

According to Chris Langley's article, "Inyo Marble Works Products Grace The West and Contributed To Our Economy," the original deposit of dolomitic marble was discovered in 1863,[17] "probably by miners looking for gold and silver. Israel Luce (a Sacramento monument company owner and discoverer of the Indian Diggings marble quarry in El Dorado County) helped in the assessment of the quarry in the early years and was the superintendent for a time operating a marble works located north of Keeler, according to Chris Langley's article.

In 1906, the Inyo Marble Company owned and operated the Inyo quarries which are located at the base of the Inyo range between Keeler and Lone Pine. "They are scattered along the base of the range for several miles, but the point at which most of the work has been done is about 5 miles north of Keeler. The marble from these quarries is a dolomite…A little south of the original quarry face a bed of fancy and variegated marble was opened. It is mottled (white, yellow, gray, and black) and is penetrated by beautiful dendritic markings of manganese. The white quarries (furnished) any size of blocks; pieces of from 16 to 18 tons weight have been obtained. There is a quarry of beautiful yellow marble about half a mile north of the main workings. A deposit of black marble is utilized for floor tiling. The company ships the rough-dressed marble to its mills on the Truckee River, 18 miles west of Reno, where it is sawed and dressed ready for shipment. This company furnished the stone for the Mills Building, both inside and out, and many other buildings in San Francisco."[3] The Inyo County dolomite was also used in the construction of several of the buildings in the area and for their cemetery stones, and several large pieces of dolomite were donated by Carlos Manuel, the superintendent of F. W. Aggregates, for use as memorials in the area.

Through the years there the quarries have undergone changes in management. In 1959 the works was purchased by Premiere Marble Products, and in 1992 F.W. Aggregates purchased all of the quarries on the site.

Pat and I visited the area around the quarries and found that the stone is not referred to in the area as "marble" but only as "dolomite." What was once a dimension quarry is not operated as an aggregate quarry. The following photographs are from our trip in September 2010.

Inyo County, Ca

The Inyo Dolomite (Marble) Quarries in near Lone Pine in Inyo County (Contd.)

F. W. Aggregates Quarries at a Distance

One of the White F. W. Aggregates Quarries

Other F. W. Aggregates Quarry Sites

Other F. W. Aggregates Quarry Sites

The Inyo Dolomite (Marble) Quarries in near Lone Pine in Inyo County (Contd.)

Two Main White F. W. Aggregates Dolomite Quarries

The Inyo Dolomite Quarries Looking from the Ghost Town of Dolomite

Looking towards the F.W. Dolomite Quarry

Looking towards the F.W. Dolomite Quarry

Old Meeting Hall in Dolomite

Base of meeting hall in Dolomite exhibiting all of the colors of dolomite quarried on the property

Constructed from Inyo Dolomite

Business Sign on Piece of Dolomite from the Nearby Quarries

Cemetery stone made from one of the colors of the locally quarried dolomite

California Marble Quarries (circa 1906) (Contd.)

Lower Quarry - Vaughan Marble Company, Cadiz, San Bernardino County[3, p. 210]

Marble Mountain - Site of upper quarry of Vaughan Marble Company near Cadiz, San Bernardino County[3, p. 210]

ILL. No. 38. MARBLE MILL AND YARD, COLTON, SAN BERNARDINO COUNTY.

Marble Mill & Yard, Colton, San Bernardino County[3, p. 103]

ILL. No. 42. MOJAVE CONSOLIDATED DEVELOPMENT COMPANY'S VERDE ANTIQUE MARBLE QUARRY, SAN BERNARDINO COUNTY. (FROM 1½ MILES DISTANT.)

Mojave Consolidated Development Company's Verde Antique Marble Quarry, San Bernardino County. From 1 ½ miles distant.[3, p.106]

California Marble Quarries (circa 1906) (Contd.)

ILL. No. 41. MOJAVE CONSOLIDATED DEVELOPMENT COMPANY'S VERDE ANTIQUE MARBLE QUARRY, VICTORVILLE, SAN BERNARDINO COUNTY.

Mojave Consolidated Development Company's Verde Antique Marble Quarry, Victorville, San Bernardino County[3, p. 105]

ILL. No. 46. ARAGONITE QUARRY (KESSELER'S ONYX MARBLE), SAN LUIS OBISPO CO.

Aragonite Quarry (Kesseler's Onyx Marble), San Luis Obispo Co. [3, p.113]

Columbia, Tuolumne County, Marble Quarries

(Prior to 1868 – Present time - industrial minerals quarrying)

In 1906 the main marble quarry near Columbia was the Columbia Marble Company's quarry about 800 feet above the Stanislaus River. At that time the river has uncovered the marble ledge that extended to a depth of 800 feet below the quarry level in 1906, and the marble strip was judged to be 150 feet wide. At that time the marble was being quarried by channeling three sides of a block, and breaking the bottom by the plug-and-feather method. The channeling machines and drills were drive by compressed air. The stone was loaded by a derrick onto car trucks, which transported the marble to the mill where six gang-saws cut it into slabs and panels. Electric power was used, although a steam boiler and engine were available for emergencies. "The marble (was) hauled 7 ½ miles to Sonoma by traction engine when the road (permitted), otherwise by wagon…About 800 tons of this stone was used in the Merchants' Exchange Building on California Street in San Francisco. The pavements and stairways of the Palace Hotel are of the Columbia marble."[3]

Tuolumne County, CA

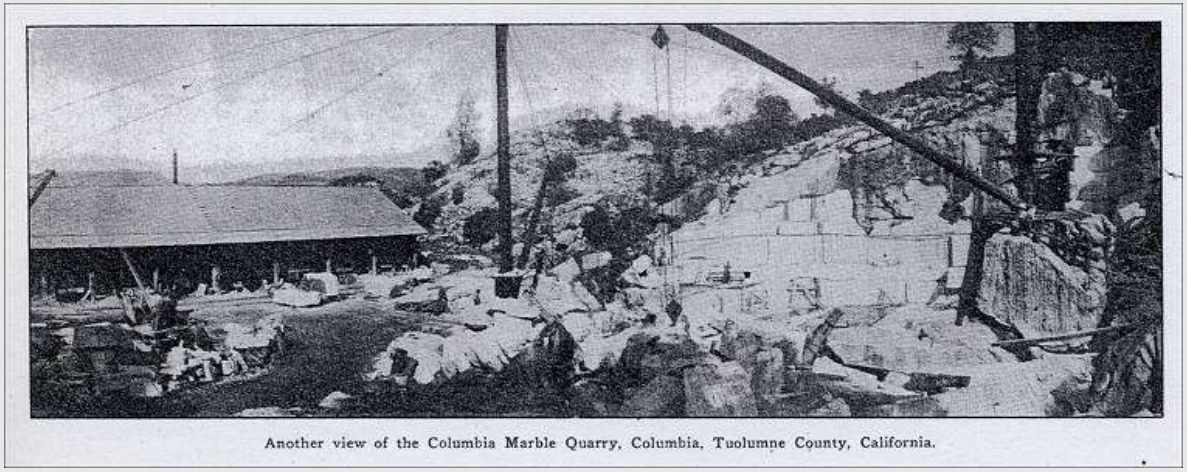
Columbia, Tuolumne County, Marble Quarries

(Prior to 1868 – Present time - industrial minerals quarrying)

ILL. No. 45. COLUMBIA MARBLE COMPANY'S QUARRY, TUOLUMNE COUNTY.

Columbia Marble Company's Quarry, Tuolumne County[3]

Columbia Marble Quarry, Columbia[13]



Another view of the Columbia Marble Quarry, Columbia, Tuolumne County, California.

Another view of the Columbia Marble Quarry[13]

Columbia, Tuolumne County, Marble Quarries (1998) (Contd.)

Part of one of the old Columbia Marble Quarries (1998)

The Bell Marble Works Quarry, located on the Marble Quarry R.V. Park in Columbia (1998)

Marble Quarried at Indian Diggings, Tuolumne County
(1857 – closed between 1919 and 1947)

The Indian Diggings marble quarry was opened in 1857, and was reportedly the first marble quarry ever worked in California.[4] As of 1882, it was being used for monuments and cemetery work. At that time this bed of marble was described as being over 100 feet thick.

The Indian Diggings quarry was discovered by Israel Luce, the partner of Andrew Aitken who operated the Pioneer Works located across from the old Sacramento City Cemetery in Sacramento. The Indian Diggings marble is very distinctive, and is used through many of the central California cemeteries.[4] In 1882, the Indian Diggings marble was described as being of the "clouded variety." Many of the stones in our cemeteries constructed from this marble are heavily veined and suffering from disintegration.

Pat and I joined the El Dorado Mineral and Gem Club in 2003 in an attempt to locate the Indian Diggings quarry. While we found a hill with many pieces of the marble and we felt we were near the site, although we were not able to find the exact site. (You can read my account and view the photographs from this trip on our web site.)

Marble Quarried at Indian Diggings, Tuolumne County

Indian Diggings Limestone Deposit, El Dorado County[18]

Pile of Indian Diggings Marble (2003)

Cemetery stone of Indian Diggings Marble in the Indian Diggings Cemetery (2003)

Close-up of one of the cemetery stones made from Indian Diggings Marble (2003)

California Sandstone Quarries

California Sandstone Quarries***

In 1882, the following sandstone quarries supplied stone:[4]

- **Angel Island** in the San Francisco Bay (a greenish-gray color)
- **Near Hayward** in Alameda County (a brown sandstone used for bases for monuments, vaults, etc.)
- **Near the Merced River** in Mariposa County (a pinkish color, streaked with wavy lines of brown and purple)

"Most of the sandstones that are strong enough for a good building stone and at the same time soft enough to be economically quarried and dressed, have as cementing substances either iron oxide – the yellow, red, and brown sandstones – or clay with a little calcite or silica in addition – the gray, blue, and buff sandstones."[3, p. 116]

In 1904, the sandstone producers areas of California that were listed in *The Structural and Industrial Materials of California* are listed in the following table, which shows Colusa County listed first.[3, p. 116]

SANDSTONE PRODUCTION IN CALIFORNIA FOR 1904.

Colusa County	$290,000
Los Angeles County	13,145
Orange County	200
San Bernardino County	2,000
San Luis Obispo County	45,000
Santa Barbara County	3,600
Ventura County	3,500
Yolo County	720
Unapportioned	209,106
Total	$567,181

California Sandstone – Colusa County Sandstone Quarries

"A great belt of sandstone and shale extends from the northern boundary of the county for 20 miles to the south; in this belt occur massive ledges of building stone character for a distance of 8 miles north and south, from Sec. 17, T. 16 N., R. 4 W., to Sec. 8, T. 17 N., R. 4 W., with a width of three fourths of a mile. The first extensive use of this sandstone for the construction of large buildings was in the Union Depot and Ferry Building at the foot of Market street, San Francisco. The most recent is the James Flood Building, at Market and Powell streets, San Francisco.

"These ledges of sandstone have an average dip of about 50 degrees to the northeast. The beds vary from 18 inches to 18 feet, and average 4 to 6 feet in thickness. In the **Colusa Sandstone Company's quarry**, one bed measures 35 feet in thickness, which in its southern extension in the **McGilvray quarry** is 45 feet thick. It is difficult to ascertain the precise length of these ledges, but they have been exposed by the quarrying operations for an unbroken length of 230 feet in each of the two quarries. As to their thickness, they vary from 125 to 225 feet, measuring from the apex to the floor of the narrow valley that skirts the westerly side of the series. The quarries are being operated (circa 1906) from the easterly side of the series of ledges, driving westerly and northerly. Measured by observations taken through Stone Corral ravine, the operations may extend from one fourth to one half mile westward on the valley floor level, and still be within the series of massive ledges. The stone is blue-gray and buff in color, weathering to light brown; compact, and measures 12 cubic feet to the ton, and has an even rift. The blocks are quarried to any desired length and width. Holes are drilled by hand or machine, from 2 to 3 feet apart, 1 ½ inches in diameter, with a V-shaped half-inch ream on two sides. They are shot by battery. Wadding is placed in each hole 2 or 3 feet below the collar and the space above tamped with soil. The air in the chamber between the wadding and the bottom of the hole when compressed by the explosion of the powder serves as a force in splitting the rock. Both quarries are operated with steam-power hoists and derricks, and masses measuring 20 feet long, 10 feet wide, and 6 feet thick are handled with ease and quickness. The stone is shipped over the Colusa Lake Railroad, a narrow-gauge system that connects with the Southern Pacific at Colusa Junction, and extends from the town of Sites to Colusa. At Colusa Junction the stone must be transferred to the standard-gauge cars of the Southern Pacific. The market has been so far confined to the California coast and the Hawaiian Islands."

California Sandstone – Colusa County Sandstone Quarries

Colusa Sandstone Co. Quarry (aka the Knowles Quarry & today known as the "Brownstone Quarry,"

Colusa County

Colusa Sandstone Quarry. View from south end of quarry

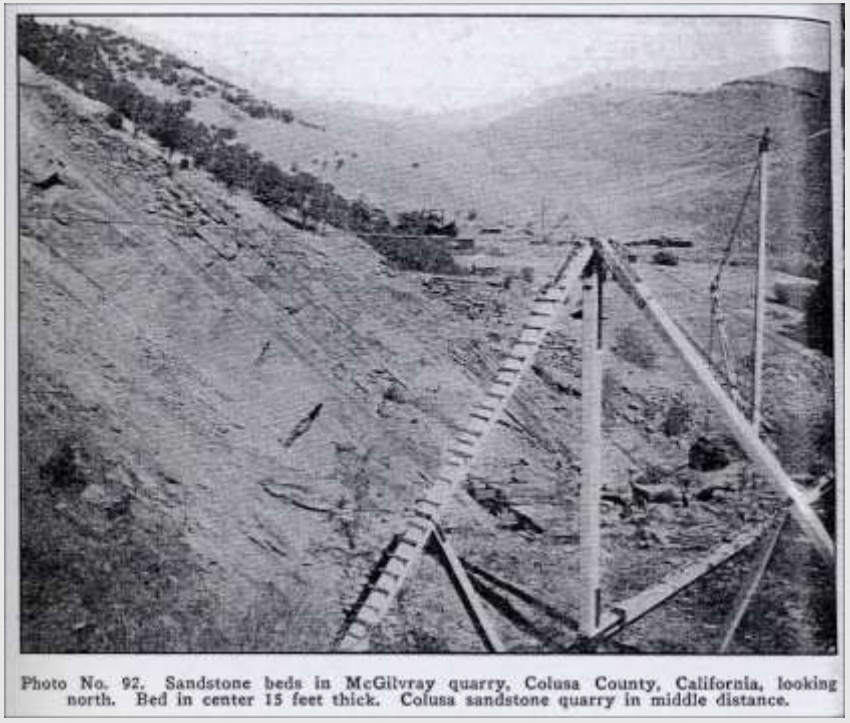


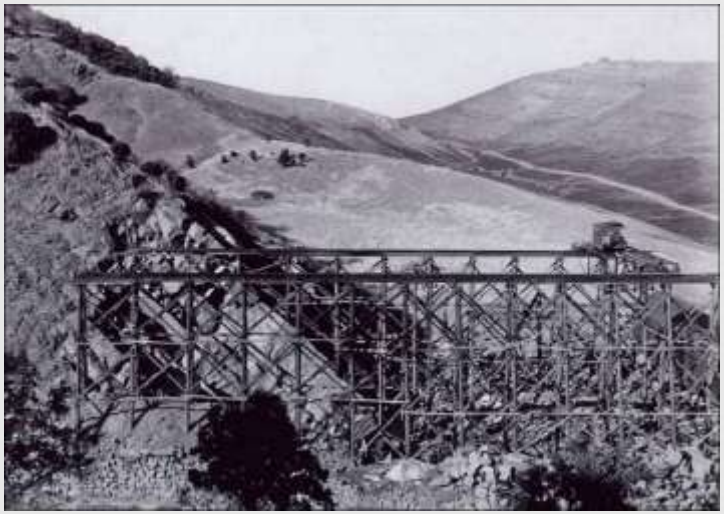
Photo No. 92. Sandstone beds in McGilvray quarry, Colusa County, California, looking north. Bed in center 15 feet thick. Colusa sandstone quarry in middle distance.

Sandstone beds in McGilvray quarry, Colusa County,

California, looking north. Bed in center 15 feet thick. Colusa sandstone quarry in middle distance. [13]

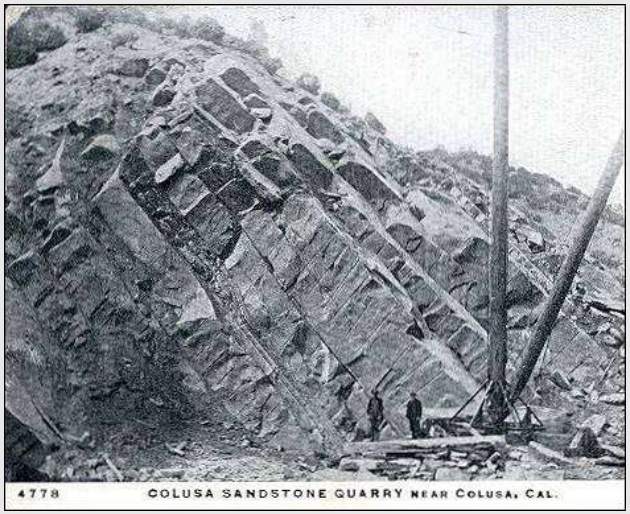
Colusa Sandstone Co. Quarry (aka the Knowles Quarry & today known as the "Brownstone Quarry,"

Colusa County (Contd.)



Quarry of Colusa Stone Company in upper part of Chico sandstone beds.

One-half mile east of Sites, Colusa County, California. September 16, 1900." (Used with permission, U. S. Geological Survey Photographic Library.)



In quarry of Colusa Sandstone Company, Colusa County, California. (circa 1913)

Colusa Sandstone Co. Quarry (aka the Knowles Quarry & today known as the "Brownstone Quarry,"
Colusa County (Contd.)

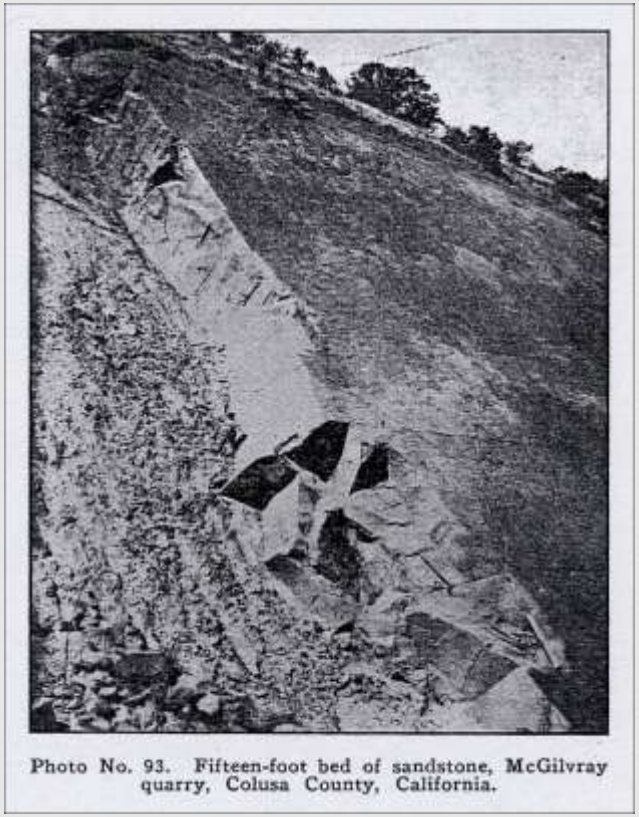
The Colusa Sandstone Co./Knowles/Brownstone Quarry
(2006)

The Colusa Sandstone Co./Knowles/Brownstone Quarry
(2010)

McGilvray Sandstone, Colusa County – Inactive Today

A portion of the face of the McGilvray Sandstone Quarry, Colusa County.[3, p. 125]

The McGilvray Quarry
(inactive; Photo taken 2006)

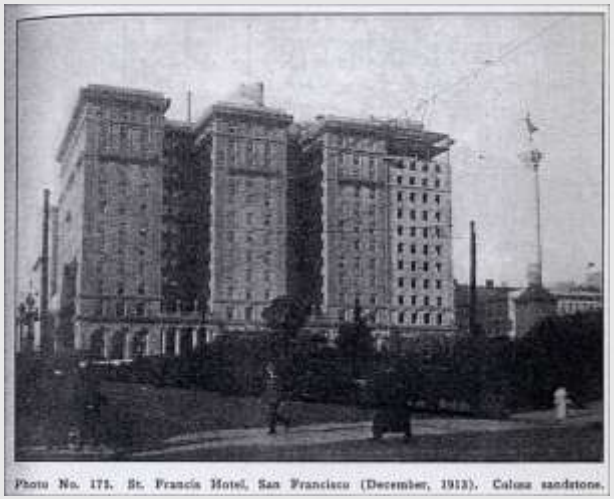


Fifteen-foot bed of sandstone, McGilvray quarry, Colusa County, California (circa 1913).[13]

Buildings Constructed from Colusa County Sandstone

Kohl Building, corner of California & Montgomery streets, San Francisco. Built of Colusa Sandstone. [3, p. 118]

St. Frances Hotel, San Francisco. Colusa Sandstone.[3, p. 121]



St. Francis Hotel, San Francisco (December, 1913). Colusa sandstone.[13]

Fort McDowell Sandstone Quarry on Angel Island, Marin County (prior to 1868 – after 1916)

The following information is from the *Report XIV of the State Mineralogist - Mines and Mineral Resources of Portions of California, Chapters of State Mineralogist's Report - Biennial Period 1913-1914*, Part II. "The Counties of Colusa, Glenn, Lake, Marin, Napa, Solano, Sonoma, Yolo," by Walter W. Bradley, Field Assistant (field work in November, 1913), California State Mining Bureau, San Francisco, California, 1916, pp. 173-370.)

"**Fort McDowell Quarry (formerly called Angel Island quarry)**. U. S. Government, owner; under supervision of the constructing quartermaster, U. S. Army, Fort McDowell. As the earlier name implies, this quarry is on Angel Island. It is on a rocky point on the east side of the island and was first opened up about 1890 by the engineering corps. The old crushing plant, steam driven, had a capacity of 40 tons per day. This has been displaced in 1913 by a new plant using electric power and having a capacity of 40 tons per hour. The new bunkers, with a storage capacity of 800 tons, load direct to barges.

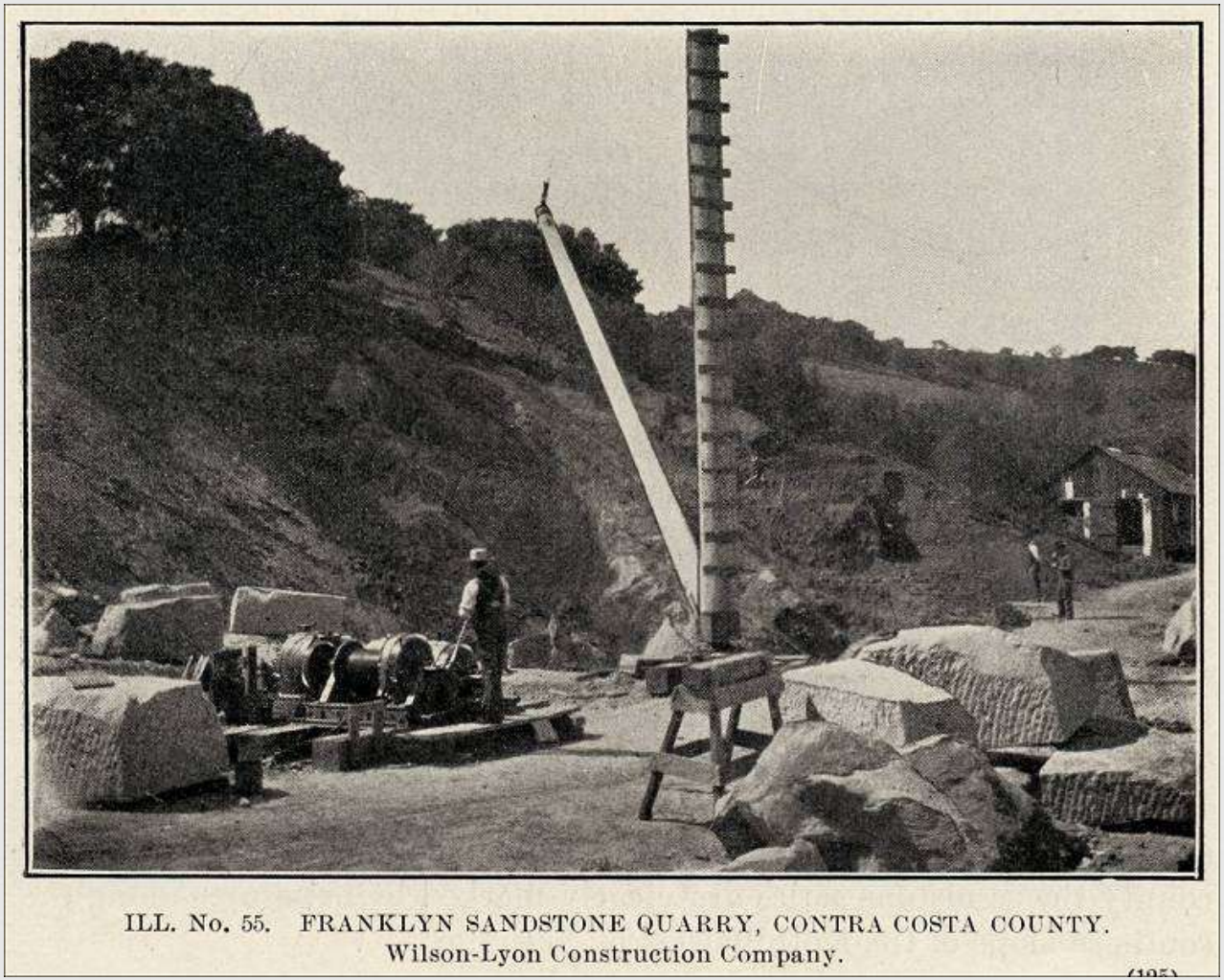
"Electric power is brought to the island by submarine cable from Sausalito. The equipment includes a No. 5 Symons gyratory crusher bucket elevator, and a trommel. Three sizes of product are made: screenings, ¾ inch and 1 ½-inch. The new plant cost $15,000, but it is estimated that it will save the government $60,000.

"The rock is a blue-gray metamorphic sandstone in massive beds, with some partly oxidized material at the surface. Up to October, 1913, a total of 45,000 cubic yards of clean rock and 40,000 cubic yards of oxidized have been produced, the latter being used on roads and fills. It is estimated that there are 150,000 cubic yards yet available for quarrying, of which 70,000 cubic yards will be used for road work.

"This quarry has furnished rock for concrete and other construction at several of the Bay posts, including Fort Mason, the Presidio and Alcatraz Island. With sand also obtained on the island this rock was employed in constructing the new buildings of the enlarged recruit depot of Fort McDowell, just above the quarry. These reenforced concrete structures represent an expenditure of $600,000 for materials alone, as the labor, except skilled civilian foremen, was furnished entirely by military prisoners. There is a barracks building and a mess hall with a normal capacity for 2000 men each. The upper floor of the mess hall is a drill hall. There is also a guardhouse, hospital, post exchange, administration building, and quarters for both commissioned and non-commissioned staff, all of concrete."

Fort McDowell Sandstone Quarry on Angel Island, Marin County
(prior to 1868 – after 1916)

Franklyn Sandstone Quarry, Contra Costa County



ILL. No. 55. FRANKLYN SANDSTONE QUARRY, CONTRA COSTA COUNTY.
Wilson-Lyon Construction Company.

Franklyn Sandstone Quarry, Contra Costa County.
Wilson-Lyon Construction Company.[3, p. 115]

The Stanford / Goodrich Sandstone Quarry, Santa Clara County
(before 1876 - ?)

"… Graystone station (is located) 9 miles south of San Jose, on the spur of the Narrow Gauge Railroad running from San Jose to Santa Cruz. An extensive body of buff-colored sandstone, which has been quarried in this locality for many years by different parties.

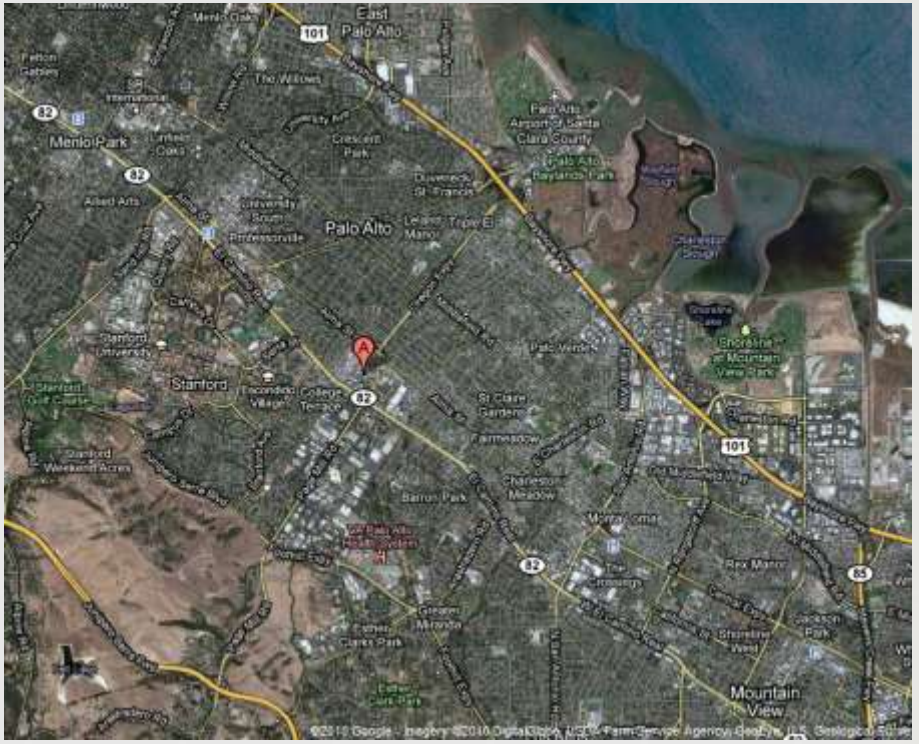
"Like many sandstones, it is quit soft when first quarried, but indurates on exposure until it has a quite firm, hard surface. In grain, color, and texture the stone is fairly uniform…In some of the abandoned quarry openings the stone contains iron oxide concretions, which disfigure the stone, but none of these are visible in the present working.

"The freestone character of the rock adapts it to carved work, as is so well shown in the elaborate and intricate carving on and in the costly chapel at Stanford University, Palo Alto.

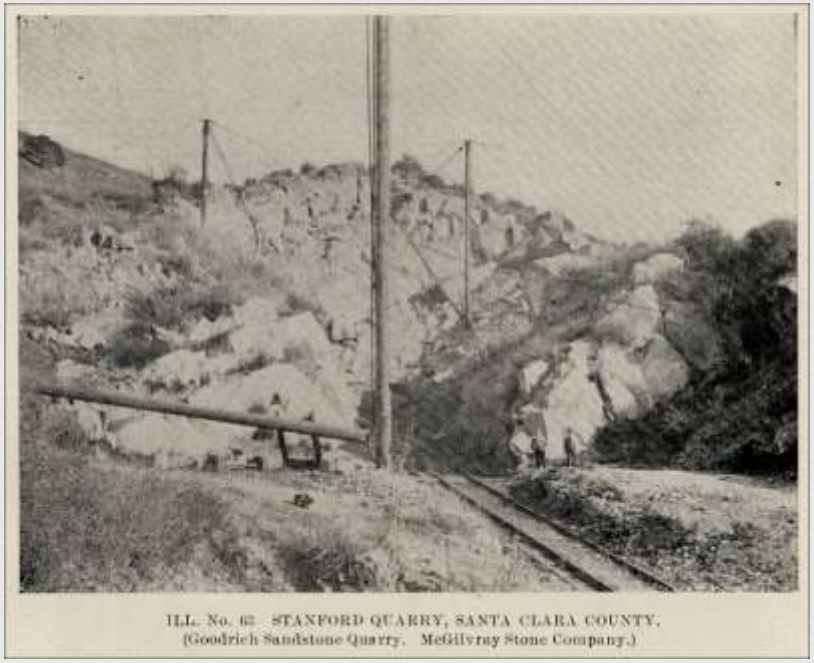
"The stone is quarried by hand, loaded with steam-power derrick on small tram-cars, and sent down an inclined track about 800 feet to the stone mill and cutting yard near the railway track. The mill is supplied with two gang-saws for cutting dimension stone, and a large crew of stonecutters is at work finishing the stone.

"The stone has been used for building purposes in San Jose and nearby towns for many years, but the greatest and most elaborate monument to the architectural value of this stone is to be found in the many costly buildings of Leland Stanford Junior University, which, with the exception of one or two cement and one or two brick buildings, are constructed of this buff sandstone." [3, p. 134]

The Stanford / Goodrich Sandstone Quarry, Santa Clara County
(before 1876 - ?)

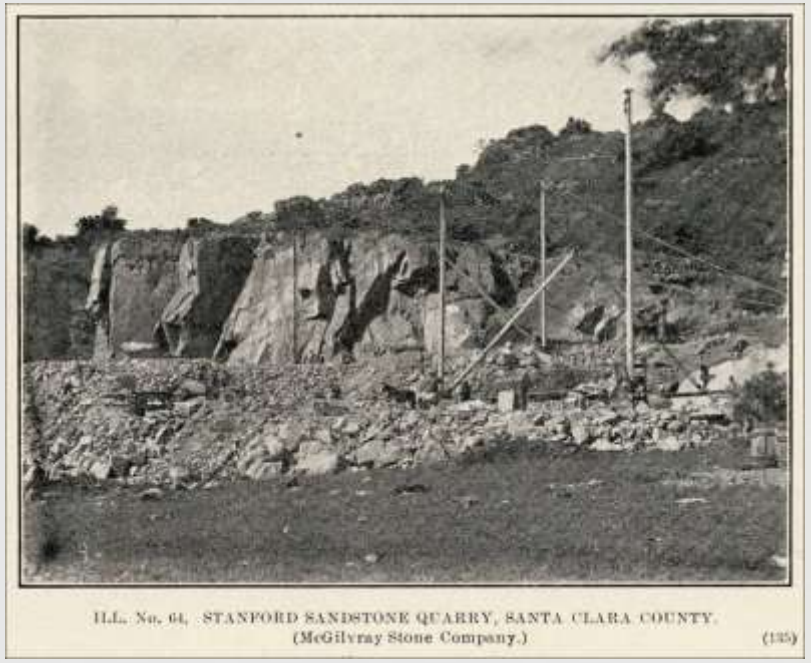


The Stanford / Goodrich Sandstone Quarry, Santa Clara County



ILL. No. 63. STANFORD QUARRY, SANTA CLARA COUNTY.
(Goodrich Sandstone Quarry. McGilvray Stone Company.)

Stanford Quarry, Santa Clara County. (**Goodrich Sandstone Quarry. McGilvray Stone Company**.)[3, p. 135]



ILL. No. 64. STANFORD SANDSTONE QUARRY, SANTA CLARA COUNTY.
(McGilvray Stone Company.)
(135)

Stanford Sandstone quarry, Santa Clara County. (**McGilvray Stone Company**.)[3, p. 135]

Structures made from Sandstone from the Goodrich / Stanford / Graystone Quarry

General view of quadrangle buildings, Stanford University, constructed of sandstone from Graystone Quarry.[3, p. 137]

Memorial Arch, with church in background, Stanford University, showing types of carved work with the sandstone.[3, p. 136]

Benicia Sandstone Quarries, Solano County
(about 1852 – about 1854 ?)

"The United States Arsenal at Benicia is built of a yellowish brown sandstone said to have been quarried close by and within the limits of the Government grounds. This sandstone itself is rather soft, but the ground on which the arsenal is built is hard and solid, and the foundations of the building were well laid and the whole structure well built. As a consequence, it has suffered very little from earthquakes. A good many blocks, indeed, have been cracked through here and there, but the stones have not been displaced, and the building has not been really damaged to any noticeable extent...."

"In 1851, Captain Charles P. Stone was appointed to the head of ordnance for the Pacific Coast and ordered to select a site for an arsenal. He found Benicia to be ideal both due to its excellent climate and its protected position on the strait….The first permanent arsenal structures that were built were the two storage buildings with the small engine house between them, which now houses the Benicia Historical Museum."[25]

Today you can visit the arsenal grounds and the Benicia Historical Museum and web site.

Benicia Sandstone Quarries, Solano County

(about 1852 – about 1854 ?)

Benicia Arsenal Sandstone Quarries, Benicia, California

Close-up of site of old sandstone quarry, Benicia Arsenal

Site of old quarry next to Benicia Arsenal Powder Magazine #10

Site of quarry at a distance across freeway, once a part of the Benicia Arsenal grounds

Structures Built from Sandstone Quarries on the Arsenal Grounds

The previous unassuming quarry holes produced the sandstone for the Benicia Arsenal buildings.

Benicia Clock Tower

Detail of wall of Benicia Clock Tower

Camel Barn 7 (on left) & **Office** (on right)

Benicia Powder Magazine 10

Benicia Sandstone Quarries in the Town of Benicia, Solano County

Old quarry location along Semple Crossing from right side of quarry.

Old quarry location along Hospital Road from left to right side of quarry

Patrick Dillon's Sandstone Quarry, Benicia, Solano County
(1851 - ?)

The following information is from the ***History of Solano County***, San Francisco, Cal., Wood, Alley & Co., East Oakland, 1879, pp. 438-439.

"DILLON, PATRICK W. farmer and stone cutter, Section 28, Benicia Township, Post-office Benicia, was born in County Tipperary, Ireland, February 3, 1820, where he resided till May, 1840, when he sailed for America arriving in New York City in June of that year. He at once proceeded to Troy, N. Y., and resided three months; thence to Lockport, N. Y., and remained one year. He then proceed to Youngstown, on fourth Niagara, where he worked at his trade during the summer of 1842, and from there he went to Toronto, Canada, where he spent the winter of 1842, and '43. In March, 1844, he went to New York City, and worked till 1846, when in the fall of that year he went to St. John, New Brunswick, where he was employed till May, 1847. He again returned to New York and carried on his trade till January 1849, when he sailed for California arriving in San Francisco July 8, 1849, and remaining in the city for a few weeks helping unload vessels at eight dollars a day. He then proceeded to the southern mines, on Wood's creek and worked two months at mining with good success. He then went to Mogason's Creek, and from there to Mariposa, Mariposa county, but meeting with poor success he returned to Mogason's Creek with a colony of Texans, who settled there for a short time, and continued mining in different places till May, 1851, during which time he endured many hardships. The stories told by Mr. D., during his life spent in the mines, are very interesting, but for want of space we will have to omit them. In May, 1851, he came to Benicia, bringing with him eighteen hundred dollars, which he invested in the wharf built at Vallejo while the Capitol of the State was situated at that place.

In 1851, he opened a stone quarry on his fruit farm, and in connection with the other, started the Pioneer Stone Business in San Francisco, and among the contracts taken by him, is the St. Mary's Cathedral, at San Francisco, and many other buildings. In 1856, he purchased his present farm, now consisting of four hundred acres of land, an seventy-six acres of tule. He married, at St. Mary's Cathedral, San Francisco, Bertha G. Jordan, January 6, 1856, she having been born in Hanover, Germany, January 29, 1830."

Patrick Dillon's Sandstone Quarry, Benicia, Solano County (Contd.)

I have not taken photographs of Patrick Dillon's quarry site yet at Benicia, but we will on our next visit. Below is a piece of sandstone from his quarry that was taken from his house built of that stone which is now a part of the Benicia Historical Museum located on the Benicia Arsenal grounds.

Patrick Dillon's Sandstone Quarry, Benicia, Solano County

Location of Patrick Dillon's Sandstone Quarry

"This is part of Patrick Dillon's Sandstone House, 1856-1969. Benicia State Park."

Sandstone Monuments & Coping in the Benicia Cemetery, Benicia, Solano County

Benicia Sandstone monument and coping

Family plot wall of Benicia sandstone

Base of monument and coping of Benicia sandstone

Benicia sandstone monument

Sespe Canyon Sandstone Quarries, Ventura County

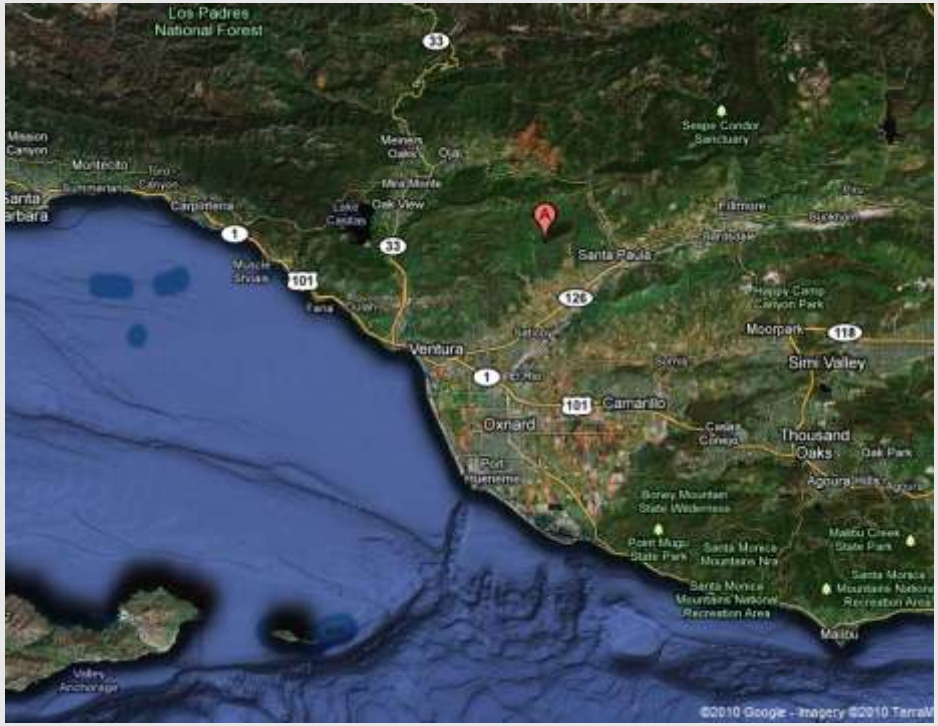
(1888 – early 1900s)

"**Sespe Cañon Brownstone Quarry**, in Sec. 35, T. 5 N., R. 20 W., and Secs. 1 and 2, T. 4 N., R. 20 W., S. B. M.; George J. Henley, Sespe, owner. This is the only quarry at present in operation (circa 1906); it is located from 5 to 6 miles from Brownstone, a station on the Southern Pacific Railroad. Most of the stone is loaded for shipment at Brownstone. It was used in the State Insane Hospital at Patton. Four men are employed.

"In this locality the Sespe River cuts across the 'Coldwater Anticline,' with its axis nearly east and west, dipping toward the east. The brown sandstone is exposed on the crown and on both sides of the axis on both sides of the river. It is also exposed in the several small tributary cañons, such as Coldwater Cañon, east of the river. In places, as at the 'Devil's Gate,' and below, the shearing planes developed by the folding are more prominent than the bedding planes and in places cut the stone into small dimensions. On the north side of the axis the stone does not appear to be at all shattered, and occurs in heavy massive beds, with two sets of nearly rectangular joint planes, so that it lies in huge cubical blocks which have a gentle dip to the north and east."[3, p. 142]

Sespe Canyon Sandstone Quarries, Ventura County

(1888 – early 1900s)



Sespe Canyon Sandstone Quarries, Ventura County

View of Sespe Cañon, Ventura County, showing "Coldwater Anticline."

Sample of Ventura County Sandstone
(photograph by Labe Kopelov of Kopelov Cut Stone, Inc., Bernalillo, New Mexico)

Close-up of Ventura Sandstone
(photograph by Labe Kopelov of Kopelov Cut Stone, Inc., Bernalillo, New Mexico)

Sespe Canyon Sandstone Quarries, Ventura County

Stone wall of purplish-brown Ventura County Sandstone (photograph by Labe Kopelov of Kopelov Cut Stone, Bernalillo, New Mexico)

Top of tunnel built of Ventura County Sandstone (photograph by Labe Kopelov of Kopelov Cut Stone, Bernalillo, New Mexico)

Digg's Building (on right) in Woodland, Yolo Co., California constructed of Ventura County Sandstone (early 1890s)

Upper story of the Digg's Building in Woodland, Yolo Co., California, constructed of Ventura County Sandstone (early 1890s)

Putah Stone Quarry (aka Winters Sandstone), Yolo County
(mid-1880s – circa 1910 ?)

(circa 1890) "The only quarry that is worked to any extent in Yolo County is situated at the Devil's Gate, in Putah Cañon, about nine miles west of Winters, on the north side of Putah Creek. The formation in which the quarry has been opened appears to extend from a southeasterly to a northwesterly direction. The stone is a compact sandstone of various shades of blue and gray; it is of smooth grain, and occasionally shows particles of carbonaceous matter. Where the rock has been quarried, near the road at Devil's Gate, it appears to be free from pebbles. It splits with a true fracture, and slabs fourteen feet by sixteen inches by ten inches have frequently been taken out. This stone has been used for many years for cemetery and building work, and it appears to wear well. It is said that it was originally intended to build the Capitol at Sacramento of this stone. The strata exposed at the Devil's Gate quarry are, many of them, twelve or fifteen feet in thickness, and dip to the northeast at an angle of about 65 degrees. In the part of the cañon where the quarry is situated, the Putah Creek has cut through the upturned strata almost at right angles with the formation."[10]

(circa 1906) "**Putah Stone Quarry**, in Sec. 29, T. 8 N., R. 2 W.; E. F. Searles, San Francisco, owner, B. Berthelot, Winters, Lessee. In the extreme southwest corner of Yolo County, 9 miles by wagon road from Winters; 15 miles by wagon road from Vacaville, Solano County. This deposit of sandstone is situate on the north bank of Putah Creek, and is exposed in heights varying from 50 to 200 feet for a width of one quarter to one half mile. The formation extends east to south across Putah Creek into Solano County. The exposed material at the Putah quarry is shattered but massive. It is blue and gray in color, takes a fine finish, and averages 174 pounds to the cubic foot."[3, p. 146]

We have made a few trips to Devil's Gate, today the Yolo County side of Monticello Dam; but so far we have not been able to ascertain the original location of the quarry. It's possible it now lies under the dam. (More information on Benoit Bertholet and the Winters Sandstone quarry and photographs of the sandstone are available on our web site.)

Putah Stone Quarry (aka Winters Sandstone), Yolo County

(mid-1880s – circa 1910 ?)

Putah Stone Quarry (aka Winters Sandstone), at Devil's Gate, Yolo County

(located about 9 miles from Winters)

Michael's Building, constructed in 1893, of sandstone quarried at the Putah Creek quarry[19] (Woodland, Yolo Co., California)

Area adjacent to Monticello Dam where we believe the quarry was located. (David Wilkinson, Tom Potters, Pat, & I went on this field trip.)

Curbstone in Winters Cemetery Winters Sandstone, Winters, Yolo Co.

David Wilkinson, author of *Crafting a Valley Jewel,* next to Winters Sandstone monument in the Winters Cemetery, Yolo Co., California

Serpentine Quarries in California

"**Serpentine** is a hydrous silicate of magnesia…that occurs in rock masses, and is sometimes used as a building or ornamental stone. It usually has a green color – sometimes dark, sometimes light, and sometimes yellowish green…The most common minerals which are known to change to serpentine are chrysolite, hornblende, and augite.

"Serpentine forms extensive rock masses in the Coast Mountains and occurs in numerous small areas in the Sierras, but in most places it lacks sufficient brightness of color to be a desirable ornamental stone, and has too many cracks, fissures, and mineral impurities to make a good building stone. It has been quarried for both building and ornamental stone in small quantities in California….Large dimensions are scarce in all serpentine quarries."[3, p. 146]

"**Verde Antique**. – When serpentine is mixed irregularly with considerable quantities of calcite, it is called verde antique marble, or ophiocalcite, and is highly prized as an ornamental stone. One large deposit of verde antique marble (on Santa Catalina Island), has been quarried in California."[3, p. 147]

Serpentine Quarries in California

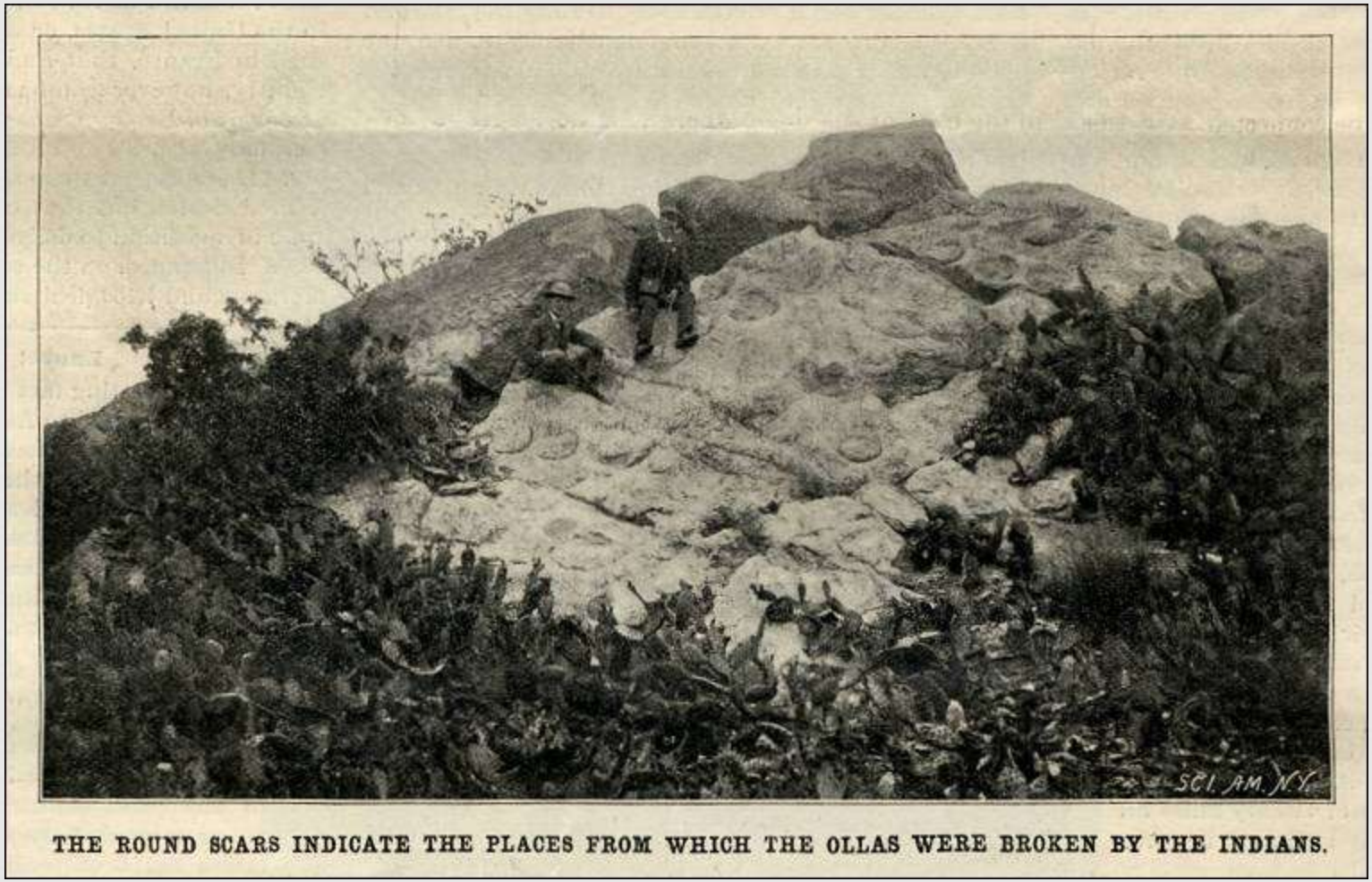
Serpentine Quarries in California

Serpentine / Soapstone Quarry on Santa Catalina Island, Los Angeles County (from the time of the California Indians – in operation in 1954)

The following information is from: "A California Verde Antique Quarry," by Prof. Charles F. Holder, in *Scientific American*, Vol. LXXXI, No. 25, December 16, 1899 , pp. 393-394.

> "…Prof. Schumacher's attention was attracted at Pott's Valley by the remarkable rock shown in the accompanying illustration, where the scars of ollas that have been broken off by the islanders are plainly seen. The rock is a lofty mass of steatite that rises in the center of Pott's Valley, now called Empire Landing. It is a land-mark from a long distance at sea, and is overgrown and surrounded with cactus and various kinds of vegetation; indeed, the cactus hides a large portion of it – an almost impregnable chevaux de fries. The scars are circular and are the marks where the round ollas were broken off. The method of work was very primitive, the natives having only slate and quartz knives to work with. With these rude implements they carved out an object the shape of a cannon ball and as a large as a football. Gradually this was picked away until, finally, it hung by a narrow stem, which was broken off. The inside was then slowly dug out with the same rude tools, and in time the olla acquired the smooth and often artistic form so familiar in all the museum collections. The common shape is round, but fine mortar shapes three feet in height are not unusual.

Serpentine / Soapstone Quarry on Santa Catalina Island, Los Angeles County (from the time of the California Indians – in operation in 1954)



THE ROUND SCARS INDICATE THE PLACES FROM WHICH THE OLLAS WERE BROKEN BY THE INDIANS.

Serpentine / Soapstone Quarry on Santa Catalina Island, Los Angeles County (from the time of the California Indians – in operation in 1954)

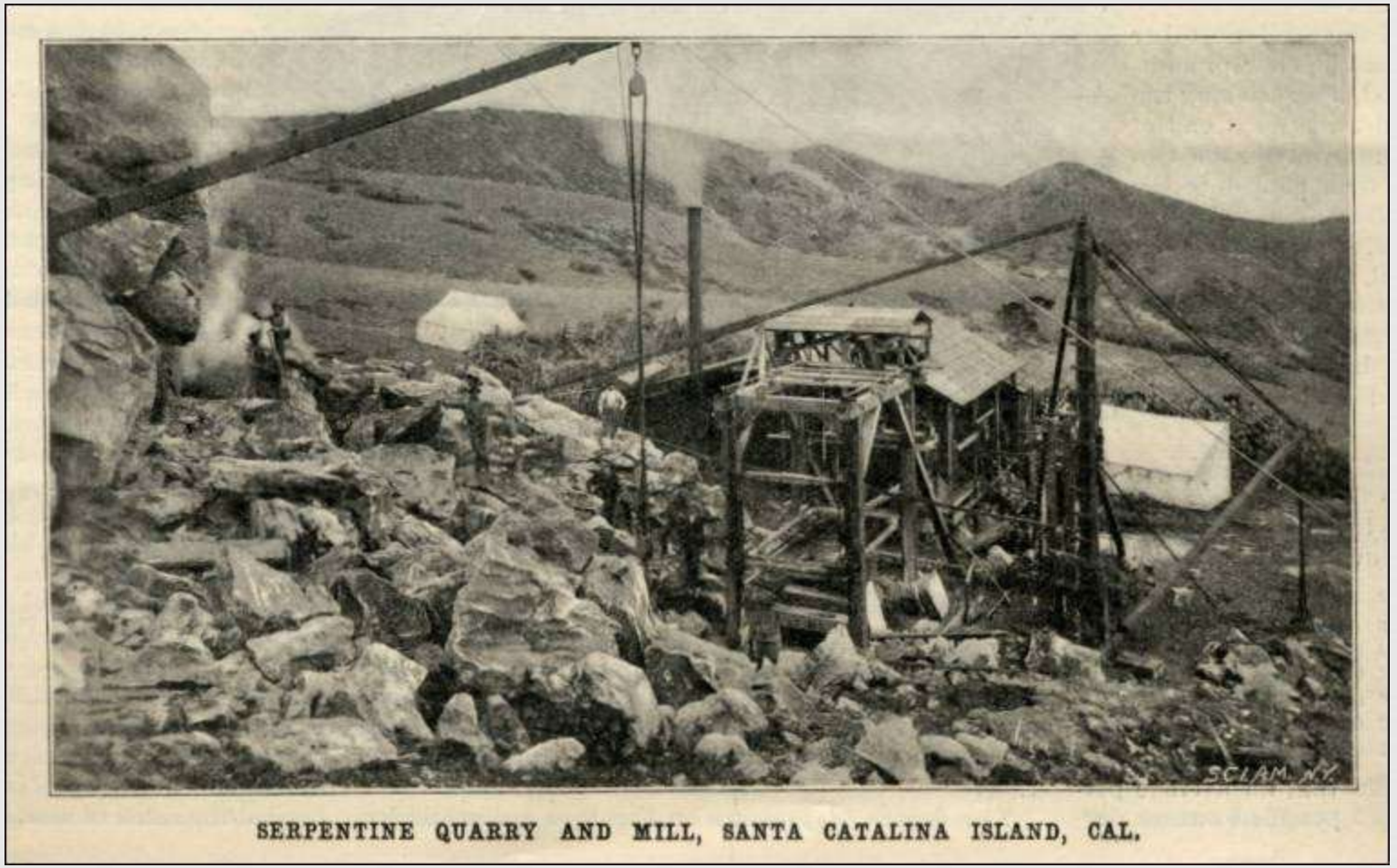
(Contd.)

"The writer some weeks ago went over this old manufactory very carefully and found it most interesting. Here was an aboriginal manufactory – an out-door workshop – in the immediate vicinity of which were found verde antique implements in various stages from the olla just outlined to the one that had been broken off leaving the scars in the rock. In a word, the complete evolution of the olla could be traced here, especially at the head of Cottonwood Cañon, back of Pott's Valley, where verde antique crops out in ledges in every direction. On many of these can be seen the work of the native carvers, while beneath are the piles and heaps of chips as they were left centuries ago.

"The early Spanish Navigators, Cabrillo and Viscaino, who discovered the island three hundred years ago, described the fine canoes of the natives. These, laden with ollas, crossed the Santa Catalina channel, and the natives exchanged them for game and skins not found here. The present owners of the island, recognizing the value of the stone for commercial purposes, have followed out the mute suggestion of the ancients by establishing at Empire Landing a sawing plant, opening up a valuable quarry and one that is unique, it is believed, having no prototype at least in this country. The verde antique resembles soapstone in the crude rock and would easily escape observation. If is of different degrees of hardness and while so soft that it can be readily worked, it has great tensile strength, its chief value being in the remarkable manner in which it can be worked. Almost every possible object can be made from it from a boat to a screw. A great value lies in its imitation when polished of the darker grades of marble; and owing to its cheapness and durability it is in demand among architects for mantles, lining, electrical slabs, and where a perfectly polished surface is required with the strength of marble. The new city hall of Los Angeles and many of the fine buildings in that city and San Francisco are finished in it, the stone taking a rich polish, abounding in greens and yellows, grays and black.

Serpentine / Soapstone Quarry on Santa Catalina Island, Los Angeles County (from the time of the California Indians – in operation in 1954)

(Contd.)



SERPENTINE QUARRY AND MILL, SANTA CATALINA ISLAND, CAL.

Serpentine / Soapstone Quarry on Santa Catalina Island, Los Angeles County (from the time of the California Indians – in operation in 1954)

(Contd.)

"A visit to this quarry is most interesting. Here, eight or nine hundred feet above the sea, is an elaborate plant and a series of saws that are capable of cutting out hundreds of feet of verde antique a week. The rock is first bored into with a steam rock drill, a modern improvement on the flint chips of the ancient owners of the soil. A series of borings make it an easy matter to break off the slab, which is then by means of a huge crane lowered upon a car and run under the saws and blocked for cutting. The term saw would be misleading to the layman, as it is really a gang saw with blunt surface, and worked by the steam engine moves back and forth on the edge of the stone, not touching it, but cutting by the grinding into it of a mass of steel shot which are really the teeth of the saw. The rapidity with which this is accomplished is marvelous, and large slabs are cut out with ease – huge slabs for the side of a wall, fronts for fireplaces, aquarium sides or plates, tiles for flooring, etc. All the tanks of the Geological Station here were made from this stone, which apparently solves the question of producing a cheap but attractive aquarium one so far as the tanks are concerned that can be built rapidly. The stone is cut into the proper shape and shipped to Los Angeles , where it is polished and applied to many purposes, and its development has become one of the valuable industries of Southern California."

Banning Company Serpentine Quarry on Santa Catalina Island, Los Angeles County

"**Banning Company (Serpentine Quarry),** 593 Pacific Electric Building, Los Angeles, owns a quarry in a belt of serpentine, at Empire Landing, Santa Catalina Island, on the east coast, about 12 miles from Avalon. The serpentine is very dark green and occurs in that part of the island in bunches, in conjunction with soapstone and steatite,* from which a very good material for ornamental, sanitary, and electrical purposes is obtained. It can be worked out into very thin slabs and even used for open work, and takes a very fine polish. (See XIIth Report, California State Mining Bureau, p. 402; also XIIIth *ibid*., p. 639.)[3, p. 147]

In *Mines and Mineral Deposits of Los Angeles County* published in 1954, the author wrote about the Banning Company quarry:

> "Santa Catalina Island, about 1 mile south of Empire Landing, about 9 airline miles northwest of Avalon. Fibrous green serpentine rock bearing tremolite-actinolite in part altered to talc, suitable for polishing. Quarry yields both hard and soft commercial stone. The soft material was sawed into slabs 1-inch thick but the hard material was worked with stonecutter's tools. Used for ornamental, sanitary, and electrical purposes. Eighty employees reported in 1896. Inactive since 1913...."[20]

(* "Soapstone (also known as steatite or soaprock) is a metamorphic rock, a talc-schist. It is largely composed of the mineral talc and is thus rich in magnesium. It is produced by dynamothermal metamorphism and metasomatism, which occurs in the areas where tectonic plates are subducted, changing rocks by heat and pressure, with influx of fluids, but without melting. It has been a medium for carving for thousands of years." (From Wikipedia)

Slate Quarrying in California

Slate Quarrying in California

In 1882, slate was being quarried in only a few localities, although it is a very common stone on the Pacific coast. The only place of note for slate quarry in California about 1882 was near Cooperopolis in Calaveras County.[4]

"Running through El Dorado and Amador counties is a great belt of black slate that has been exploited in a small way in a score or more places…The belt forms part of the Mariposa slate belt, which is of Jurassic or early Cretaceous age…."[3, p. 149]

Slate Quarrying in California

Eureka Slate Quarry, Slatington, El Dorado County.[3, p. 151]

View in yard near quarry of the Eureka Slate Company, El Dorado County.[3, p. 153]

Volcanic & Intrusive Rock Quarrying in California

Volcanic & Intrusive Rock Quarrying in California

Volcanic tuff and trachytic tuff have quarried in several areas of California.[3, p. 154-164] Most of the time it was used for local purposes, although in Glenn County the tuff was used to manufacture ollas (water jars). (Information on individual tuff quarries can be obtained by going to the California county sections in our web site.)

Photos of Volcanic & Intrusive Rock Quarries

Newman's Trachyte Quarry,
2 miles south of Napa.[3, p. 156]

ILL. No. 73. WING'S TRACHYTE QUARRY, NAPA.

Wing's Trachyte Quarry, Napa.[3, p. 157]

Photos of Volcanic & Intrusive Rock Quarries & Structures
(Contd.)

Whylie's Rhyolite Quarry, San Luis Obispo County.[3, p. 159]

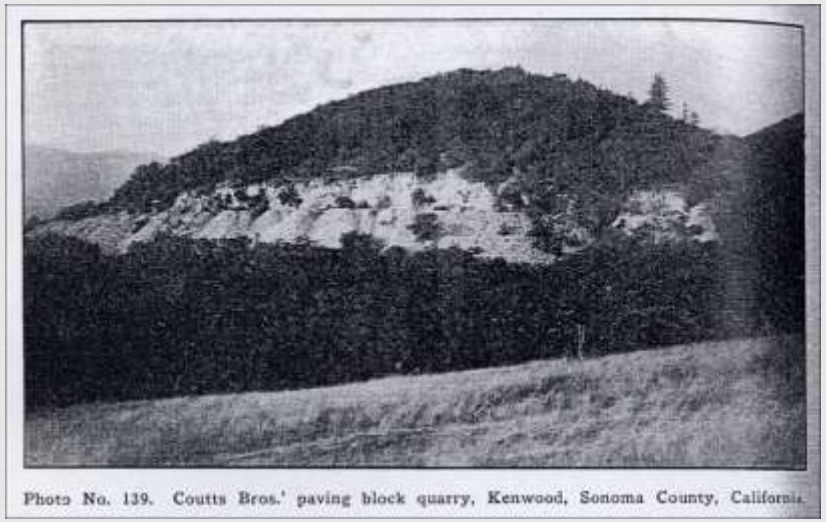
Volcanic tuff quarry, Los Berros, San Luis Obispo County.[3, p.

St. Helena Public School. Constructed of Trachytic Tuff from Moffat Quarry, near St. Helena, Napa County.[3, p. 155]

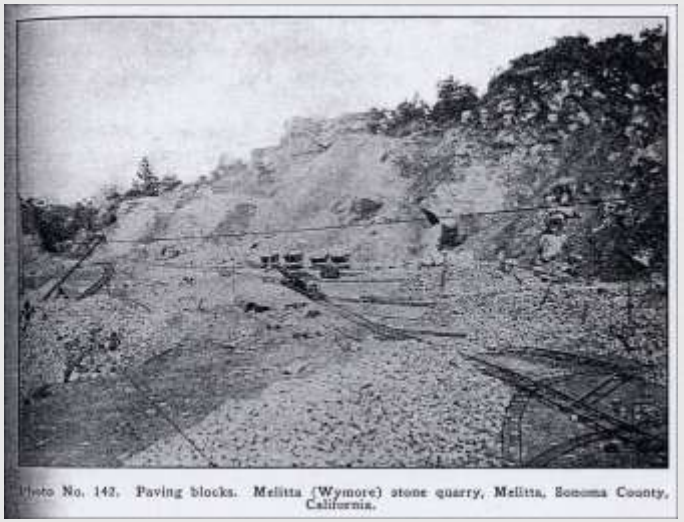
Carnegie Library, Petaluma. Constructed of Trachytic Tuff from Stony Point Quarry.[3, p. 163]

Paving Block Quarries in California

Paving Block Quarries in California



Coutts Bros.' paving block quarry, Kenwood, Sonoma County, California.[13]



Paving blocks. Melitta (Wymore) stone quarry, Melitta, Sonoma County, California.[13]

Paving Blocks in Old Sacramento, California

Paving Block Street in Old Sacramento

Flagstone Quarries in California

Flagstone Quarries in California

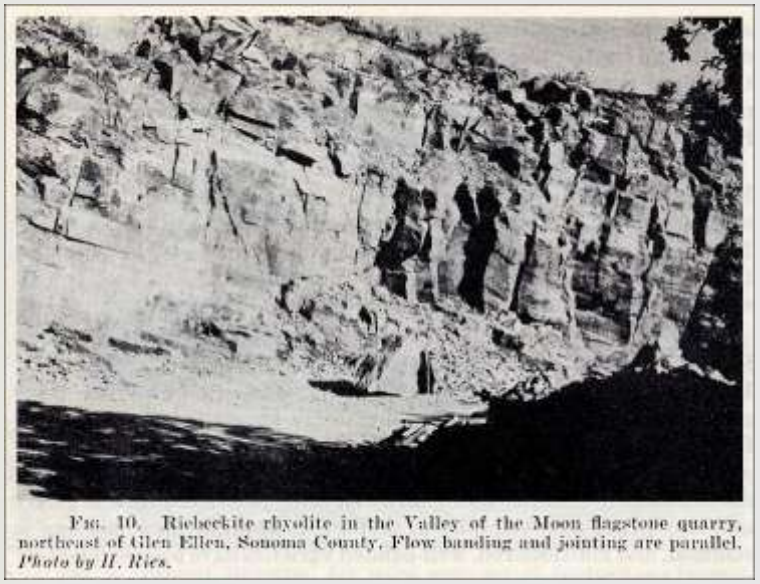


Fig. 10. Riebeckite rhyolite in the Valley of the Moon flagstone quarry, northeast of Glen Ellen, Sonoma County. Flow banding and jointing are parallel. *Photo by H. Ries.*

Riebeckite rhyolite in the Valley of the Moon flagstone quarry, northeast of Glen Ellen, Sonoma County. Flow banding and jointing are parallel.

Nun's Canyon Quarry, Glen Ellen, Sonoma County Located in the vicinity of the Valley of the Moon flagstone quarry. (Photo by Hal Weise of Nun's Canyon Quarry)

Sources

1. *Mineral Resources of California*, Bulletin 191, State of California Division of Mines and Geology, San Francisco, 1966.
2. *Geologic Guidebook of the San Francisco Bay Counties*, California Dept. of Mines Bulletin 154, San Francisco, December 1951.
3. *The Structural and Industrial Materials of California*, Bulletin No. 38, California State Mining Bureau, San Francisco, 1906.
4. "Structural Materials," in *Mineral Resources of the United States, 1882***,** J. S. Powell, Director, Department of the Interior, United States Geological Survey, Government Printing Office, Washington, D. C., 1883. http://quarriesandbeyond.org/states/ca/stone_industry/ca-stone_indus_1882.html
5. *Geologic Guidebook of the San Francisco Bay Counties*, California Dept. of Mines Bulletin 154, San Francisco, December 1951, pp. 238.
6. "The Mineral Wealth of California," in *California: Its Products, Resources, and Industries and Attractions, What it offers the immigrant, homeseeker, investor and tourist*, published by the California Louisiana Purchase Exposition Commission in 1904, pp. 32, 33, 40, 32-40. http://books.google.com/books?id=CAQNAAAAIAAJ&dq=California:+Its+products,+resources,+industries,+%26+attractions:+what+it+offers+the+immigrant,+homeseeker,&source=gbs_navlinks_s pp. 193 of this book includes a **very good photo** of the **Ferry Bldg**. in SF
7. *Geologic Guidebook Along Highway 49 – Sierran Gold Belt*, (Centennial Edition), California Dept. of Mines Bulletin 141, San Francisco, September 1948
8. "History of California," footnote 31, pp. 663 and 664 footnotes, *The Works of Hubert Howe Bancroft*, Vol. 7: 1860-1890, **1890**"History of California," pp. 663 and 664 footnotes, *The Works of Hubert Howe Bancroft*, Vol. 7: 1860-1890, 1890.
9. *Report XV of the State Mineralogist, Mines and Mineral Resources of Portions of California, Chapters of State Mineralogist's Report Biennial Period 1915-1916*, Part III, 1919.
10. *Tenth Annual Report of The State Mineralogist For The Year Ending December 1, 1890*, California State Mining Bureau, Sacramento: State Printing Office, 1890.
11. "Folsom Dam," on Wikipedia. http://en.wikipedia.org/wiki/Folsom_Dam
12. *Report XV of the State Mineralogist, Mines and Mineral Resources of Portions of California, Chapters of State Mineralogist's Report Biennial Period 1915-1916*, Part III. The Counties of El Dorado, Placer, Sacramento, Yuba, California State Mining Bureau, 1919. http://www.beniciahistoricalmuseum.org/arsenalhit_1849.htm

Sources (Contd.)

13. *Report XIV of the State Mineralogist - Mines and Mineral Resources of Portions of California, Chapters of State Mineralogist's Report - Biennial Period 1913-1914*, Part IV. "The Counties of Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus," by Walter W. Bradley, Field Assistant (field work in August and September, 1914), California State Mining Bureau, San Francisco, California, 1916.
14. "The Who What and Why of Industrial San Francisco" section of the *San Francisco Chronicle*, June 7, 1921, pp. 12.
15. *A Guidebook to Mining In America*: Volume 1: West (The Dakotas, Nebraska, Kansas, Oklahoma, Texas, and farther West)," by John R. Park, Stonerose Publishing Co., Miami, Florida, April, 2000," available at Stone Publishing Company.
16. History of Rocklin, by Roy Ruhkala 1974 http://www.rocklinhistory.org/written_history/written_roy-1974.asp
17. "Inyo Marble Works Products Grace The West and Contributed To Our Economy," by Chris Langley, Executive Director, Lone Pine Film History Museum, 2008.
18. "Limestone in California," by Clarence A. Logan, *California Journal of Mines and Geology*, Vol. 43, No. 3, July 1947, California Division of Mines, San Francisco, California.
19. *Crafting a Valley Jewel: Architects and Builders of Woodland*, by David L. Wilkinson, Yolo County Historical Society, 2003.
20. Mines and Mineral Deposits of Los Angeles County," by Thomas E. Gay, Jr., Assistant Mining Geologist, California State Division of Mines, *California Journal of Mines and Geology*, Vol. 50, Nos. 3 and 4, July - October 1954, pp. 467-709.
21. "A California Verde Antique Quarry," by Prof. Charles F. Holder, in *Scientific American*, Vol. LXXXI, No. 25, December 16, 1899 , pp. 393-394.
22. "Dimension Stone," on Wikipedia. http://en.wikipedia.org/wiki/Dimension_stone
23. *Commercial 'Black Granite' of San Diego County, California, Special Report 3*, by Richard A. Hoppin and L. A. Norman, Jr., State of California, Department of Natural Resources, Division of Mines, San Francisco, December 1950.
24. *A Germ of Goodness: The California State Prison System, 1851-1944*, Vol. 3 of Law in the American West, by Shelley Bookspan, University of Nebraska Press, 1991.
25. Benicia Historical Museum and web site – "1949 – the Army Arrives"