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EARLY QUARTZ MINING IN ANGELS CAMP

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The Gold Veins

During the upper Jurassic period, some 130,000,000 or more years ago, a great geological uprise occurred, resulting in folding, crushing and faulting of the rocks and mineralization. Along one mineralized fault zone in the Angels area, about one-half mile east of the main line of the Mother Lode zone, was formed the Davis-Winter vein of gold-bearing quartz ore. There was much less gold deposited in the Boulder vein, in the Mother Lode zone itself.

The Davis-Winter vein extends southeasterly from Altaville down to Angels Creek, and paying mines on the lode* included at the northwest end the Sultana, then the Angels, the Lightner, the Utica, and the Stickle mine on the southeast.

The name of the person who first discovered the Davis-Winter vein is lost to history. A local legend, set down many years later by Edna Bryan Buckbee in her book, **Pioneer Days of Angels Camp**, has it that Benneger Rasberry was the discoverer, finding a rich high-grade pocket in the vein when he fired his muzzle-loader with the stuck ramrod into the ground. But there is nothing to substantiate this quaint story. It is probable that the myth emerged many years later. C. A. Logan, in his **Mother Lode Gold Belt of California**, says, "Winters Brothers found it in 1852, and worked by open cut, sorting the rock and crushing the best in an arrastre." It is certain that the gold-bearing vein was discovered at the northwest end of the lode where Davis & Co. and the Winters brothers were ground-sluicing in 1854, but it seems unlikely that the quartz vein was found much earlier than that.

Over the next three years, the vein was developed all the way down to Angels Creek, for a total length of nearly 4700 feet. Then the low tenor of the ore, coupled

*Lode, lead, ledge or vein refer to the quartz zone that carried the gold values. Hence quartz mining is vein mining, in the bedrock, as contrasted to stream placering or drift mining of Tertiary gravel channels.



OPEN CUT - SULTANA MINE

Part of the original open cut along the Davis-Winter vein at the Sultana shaft on the Dr. Hill claim. This cut extends from School Street down to Utica Park. The discovery was made on either the Saunders or Mitchell claims just to the northwest of this view.

with the problem of processing the sulphurets encountered in the ore, collapsed the boom. Intermittent activity, especially in the middle sixties, occurred at a few of the mines. Another boom, in the seventies, stimulated by activity elsewhere in the county, soon faded out. Except for the Angels (Maltman, Potter) mine, there was little sustained mining until the '80s. Then followed more than a quarter of a century of large scale mining and extensive production, still remembered by many residents of the area.

We are concerned here, however, only with the early development of these mines, from the first staking of the individual claims to the consolidations and emergence of the larger operations. Although a great many mining claims were located in the Angels district, only eleven of these eventually became profitable producers.

The First Claim Locations

The first three important quartz locations were made prior to January 20, 1855; they were either not recorded, or the recordings were destroyed by fire. Often claim stakers would neglect to record their locations, but by studying the descriptions of successive claims as they were staked from Altaville down the lode to Angels Creek, it is possible to identify the individual claims and their probable order of location. These are listed in the following table:

Date	Locators	Early Claim Name	Present Name
Prior to Jan. 20, '55	Wm. Saunders Wallis Gardiner		Fritz
"	R. Mitchell & Co.		Fritz
"	E. and A. Winter	Winter Bros.	Bovey

Date	Locators	Early Claim Name	Present Name
Jan. 20, '55	C. D. Gibbs James M. Hill F. B. Reid Gilbert Clairborne	Dr. Hill	Dr. Hill
Feb. 12, '55	James Madison James Jeanette	Gold Cliff	Gold Cliff
Apr. 2, '55	A. H. Brooks T. T. Bouldin Wm. Baker	Potter	Angels
Apr. 22, '55	Ephraim Bush Irwin Howard A. C. Blaine C. H. Beslor H. Rishbigen		Confidence
Not recorded	John Cameron W. H. Wood Wm. Maltman	Maltman	Angels
Oct. '55 but not recorded till Feb. '57	John Cameron Wm. Powell A. M. Wood C. G. Lake	Lightner	Lightner
Located in '55 or '56	Peter Cameron A. M. Wood	Calaveras later	Utica
Not recorded	C. G. Lake	Invincible	
Not Recorded	Parnell, Brier & Co.	Brier, then Union	Stickle
Apr. 28, '56	John Coleman James Egan Charles Egan	Egan or Brown	Egan
July 5, '56	R. Mitchell W. C. Drake John Beck Levy Ayres I. O. Wilson A. Higgins W. Hinkle Wm. Stephens	Ross Coon, and Hinkle worked it before Mitchell & Co. filed on it.	Crystal
Sept. 16, '56	B. Raspberry Wm. Dougherty	Raspberry was working here before Egans located.	Raspberry
Mar. 30, '57	J. Russell Wm. Stoddard A. A. Pollard I. Dickson Heath D. Boone Chas. Schofield John Patton	Specimen Hill	Madison
May 19, '57	Jackson Duffy Foster	Loc. notice says Wendler, Kanberg, Hammer-smith and Raney sank 3 shafts about 4 years ago.	Jackson

The Sultana Mine

The Sultana group comprises three original locations, the claims of Wm. Saunders & Co., R. Mitchell & Co., and the brothers Winter, all located prior to January 20, 1855. In '54, the Saunders and Mitchell claims were being worked by Davis & Co., who later sold out to John Fritz. The two claims were then (December, '57) consolidated as the Fritz mine.

The Winter Brothers was one of the more active mines in the early period in the Angels district. They operated eight arrastres as well as a stamp mill. In '65, the Winter Bros. was sold to Bovee, and the operation re-activated. The claim was subsequently patented as the Bovee by the new owner who also took over the Fritz mine. In 1883 this consolidation became known as the Marshall mine, and then later, when purchased by the Mohawk Company, was renamed Sultana. The Sultana shaft reached a depth of 700 feet, and at the time it was closed down in 1905, the property was equipped with a 40-stamp mill. Total production was less than \$1,000,000; accurate figures are not available.

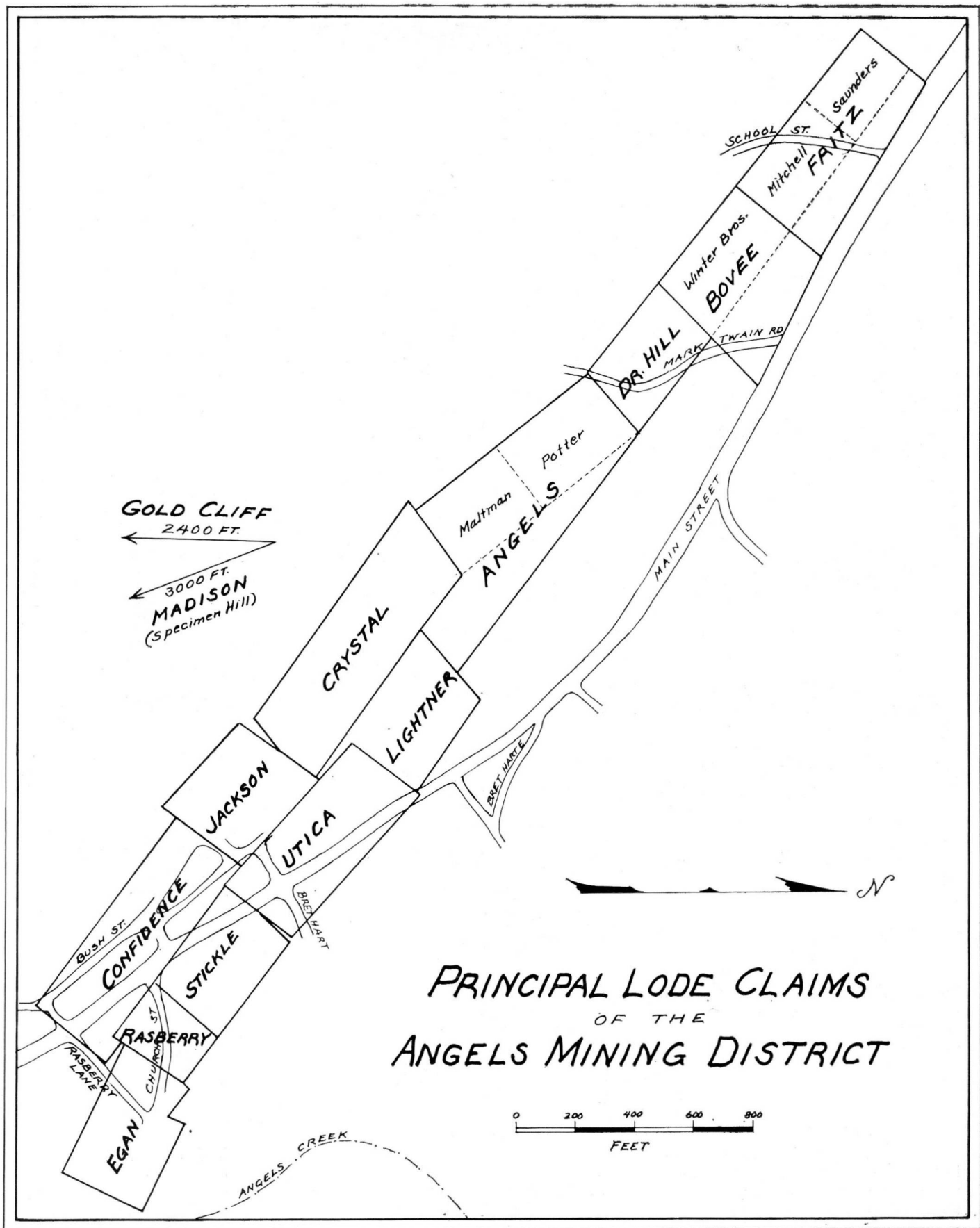
The Angels Mine

There are three claims on the Davis-Winter vein in the Angels group, and a fourth, the Crystal, on a footwall vein. Farther south on the lode than the Sultana group, these were located after the Saunders, Mitchell and Winters claims in early '55, and consisted of the Dr. Hill, Potter and Maltman lodes. At that time, it was believed that the Davis-Winter vein swung westerly into the Crystal claim, but this was later found to be a non-productive footwall vein. It was reported that the early production of the Dr. Hill mine (to '67) amounted to as much as \$250,000. Maltman began deep mining on the Angels about 1866, but it was not known as the Angels mine until purchased by James V. Coleman, nephew of W. S. O'Brien, one of the "Big Four" of the Comstock, in '84. When operations were terminated in March, 1918, the Angels had reached a depth of 1050 feet, was milling ore in a 40-stamp mill, and had achieved the record of the longest operation of any mine in the camp, having been in continuous operation from 1866 till 1918. Total production reached \$3,200,000.

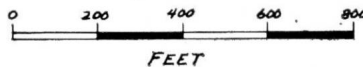
The Lightner Mine

This mine was first located in October, 1855, but apparently was not recorded. It was relocated on February 1st, 1857. After a brief period of operation, the first mill erected on the property was sold in 1863, and we hear nothing further of the Lightner until "jumped" (relocated by other people, after the claim had lapsed) in 1885. The Lightner Mining Co. did not begin operating on a large scale until 1896.

Serious caving began in 1903 and by 1910 the old shaft, 1050 feet deep, had to be abandoned, and a new 900-foot shaft sunk. The Lightner Company operated a sixty-stamp mill, and had produced some \$3,000,000 prior to shutting down in 1915.



PRINCIPAL LODGE CLAIMS
OF THE
ANGELS MINING DISTRICT



The Utica Mine

The Utica group consisted of the Utica (Calaveras) claim staked after the Lightner claim, probably in late '55 or early '56, the Stickle about the same time, the Egan, located on April 28, 1856, and the Raspberry on September 16 of the same year. The Confidence had been located on April 23, 1855, in the footwall, but at that time on what was believed to be the extension of the main Davis-Winter vein. The Jackson claim was subsequently (May, 1857) staked on this same footwall vein.

In 1857, A. P. Bonton was operating a mill on the Utica, but little mining was done before he became discouraged. Later, James G. Fair (of Comstock fame) acquired the Utica claim and operated it under the name of Utica Gold & Silver Mining Co. till '65. Boyd and Lake purchased the property early in 1866, but soon abandoned it, believing that Fair had "salted" it.

The Utica was jumped on April 13th, 1866, by Wm. Keyes along with John Rieves, G. W. King, L. K. McGaffey, S. Hutchinson, A. B. Kelly, and D. Brown. Apparently little in the way of mining was done, because on January 26, 1869, it was relocated by Robert Leeper, Keyes, McGaffey, King, John Finley, and Manville Phillips, and renamed the Invincible. Leeper operated five arrastres and a ten-stamp mill. The Leeper group sold out to Charles D. Lane, Lynde, Hough and Bradley in 1884, when the mine again became known as the Utica. In December of '87, Alvinza Hayward and W. Hobart became associated with Lane.

The Stickle was first operated by Parnell, Brier & Co. and was known as the Stickle claim by October, 1857. F. K. Betchel purchased the property in September, 1884. On February 11, 1885, Betchel sold to Capt. W. A. Nevils, who renamed it the Union, and in April, '89, Nevils sold the Stickle to the Utica Mining Co. The latter had mined to a depth of 3050 feet through the Cross Shaft before the final closing in December, 1915. The combined production of the Utica-Stickles under the Utica Company was \$13,635,000.

The Boulder Vein

A second lode, situated about half a mile west of Angels Camp, considered by many as lying on the true Mother Lode fissure, was the site of two other important claims that eventually became part of the Utica's operation. These were the Gold Cliff and the Madison quartz mines.

The Gold Cliff was located in 1855. On October 17th, '57, the **San Andreas Independent** reported that "The Nightingale, Davis Co. mill is now going up. It is on the same ledge as the Specimen Hill." Rock was mined in an open cut for many years at this mine and was low in grade. Deep mining was begun about 1899 under the management of the Utica Mining Co. The Gold Cliff is credited with a production of \$2,800,000.

The Madison was located on March 30, 1857. The **Independent** stated on October 17th of that year that, "Below town on Angels Creek, the Specimen Hill quartz mill was being built by the Altaville Foundry.* The mill

*This foundry was erected by blacksmiths Andy Gardiner and J. M. Wooster in 1854, at the beginning of the quartz mining boom in Angels. The successors are still operating this business establishment today!

will cost \$8000. The water wheel is 30 feet in diameter and 8 feet broad, will lift 500-pound stamps and work all other machinery. A 30-foot ledge with rock full of sulphurets will pay to work. Rock was obtained by means of a tunnel into the hill."

Claim Staking in Angels

The earliest mining locations in the Angels district were placers and these were staked according to the local customs. Upon the discovery of a gold-bearing ledge or lode like the Davis-Winter vein, a whole new set of local mining regulations had to be formulated. The first such lode mining regulations, together with the earliest claim recordings under it, were destroyed in the big fire of '55 at Angels. Consequently, on July 20th, 1855, a new set, "The Quartz Mining Laws of Angels District," were set down under the guidance of Joel Higgins, President, and Sam P. Crane, Secretary, and duly notarized by Wm. Tait, Justice of the peace of the 8th Township, Calaveras County.

Article II of these laws provided that 100 feet in length (along the lode-line) by 300 feet in width could be claimed by each man. This accounts for the short length of most of the claims, which had two or more locators.

Another article (IV) provided that miners must perform one day's bona fide work on the claim every 30 days. This was amended on March 24, 1860, to performing at least 10 days work during the year. At this time Frank Mason was Chairman of the Angels District, and P. W. Scribner, Secretary. If a miner did not perform his work, his right to his claim was forfeited, and the ground thus was open to location by others.

In any new mining district, one of the early requirements is a survey to determine the boundaries of the various claims. Thus it was that W. R. Boucher, county surveyor of Calaveras, was called in during December of '57 to establish a survey of the new quartz claims along the Davis-Winter vein at Angels. Beginning at a square Chinese monument (not far south of the new Altaville post office), Boucher laid out a lode line in a direction South 51 degrees East along the vein and recorded the following measurements:

Survey No.	Name	From	to	Length
386	Fritz	0	692 ft.	692 ft.
387	Winter Bros.	692	1157	465
388	Hill, Reid & Co.	1157	1569	412
389	G. Slocum	1569	1870	301
390	Wm. Maltman	1870	2270	400
.....	Space	2270	2482	212
391	Cameron-Lightner	2482	2888	406

At the date of the survey, it was still thought that the main lode went out through the Crystal, Jackson and Confidence claims, and as these were not producing, it was considered worthwhile only to survey the Lightner in the lower group. The ledge here was becoming known as the Utica or Stickle vein. Later surveys indicated the following lengths along the lode to these claims:

Utica	634
Stickle	400
Raspberry	250
Egan	450

Early Day Mining and Milling

It is noteworthy that the mines on this vein have not produced any large dumps of waste rock. There are several reasons for this. The ore-bearing ground often ran from 10 to as much as 90 feet in width, and most of the workings being in this ore zone, essentially all such material removed was milled. As the mines became deeper, and it was found difficult to hold the stopes open, waste and even rock quarried from the surface were used to backfill the gaping holes.

Mining operations during the first quartz boom in the Angels district were confined to small open cuts along the vein or shallow shafts to depths of 70 to 100 feet. As soon as the miners got below the overburden, they built arrastres to reduce the ore. These were soon supplanted by small stamp mills. The ore at this period ran in value from about \$2.00 to \$10.00 a ton. The oxidized zone was surprisingly shallow, and sulphurets were soon encountered and created the first big problem. Another allied problem was the actual sinking of shafts and developing these mines in hard rock with only hand drilling methods and relatively ineffectual explosives. For these reasons, in spite of great enthusiasm and effort, development of the lode proceeded slowly, and repeatedly the small, poorly financed "companies" were discouraged and sold out or abandoned their operations.

The **San Andreas Independent** said, on April 24th, 1855, "On the southern bank of Indian Creek at Campo de los Muertos stands the smelting works of Messrs. Freeborn & Co. In a curious oven or furnace built by David Strosberger it is proposed to subject quartz rock to great heat to melt the sulphurets and subsequently pass them through the arrastre."

These early attempts to treat the gold-bearing sulphide minerals failed, and it wasn't until another two decades passed that the chlorination process was developed. The first such successful installation in the Angels area was built by P. S. Buckminster in 1887 and operated by Bowland and Greyson. It was later purchased and greatly expanded by the Utica Mining Co.

On October 17th, 1857, the **Independent** printed a comprehensive article on the state of affairs at Angels, entitled "Angels Camp Quartz Mines," as follows:

"This celebrated and flourishing town is about 50 miles from Stockton. It derives its importance from the richness of the quartz mines in its vicinity. We believe that it is hardly one year since the brothers Winter made the discovery of the vein so famous for its richness and bearing their name.

"Quartz mills — between Wintertown (Altaville) and Angels is the extensive lode which has given such impetus to trade and enterprise in the vicinity.

"Proceeding down the gulch towards Angels, the first mill is that of Fritz & Co. built . . . at a cost of \$21,000. It is a steam mill of 10 stampers (sic) of 500 pounds each. A revolving blanket saves the sulphates (sic) and pyrites.

"No. 2 — The next claim is the Winter Brothers. This mill is water power and has 12 stampers of 500 pounds each. The water wheel is 30 feet in diameter. This is the first quartz mill erected in Angels.

"No. 3 on the same ledge belongs to Dr. Hill & Co. The mill is water power. The diameter of the wheel 40 feet and has 24 stampers. The doctor is experimenting with

machinery to save the quicksilver and sulphates.

"No. 4 is the water power mill of Slocum, Baker & Co. The red-painted water wheel is 36 feet in diameter with sheet iron buckets. It has 12 stampers. (Potter mine.)

"No. 5 is a steam mill of Messrs. Brodie, Cameron, Lightner, & Co. This is the first mill to introduce the roasting process to burn the sulphides. (Lightner).

"No. 6 is the steam mill belonging to Bonton & Co. running six stampers out of twelve. (Utica or then the Calaveras).

"No. 7 — The most perfect of all these mills is the one owned by Benjamin & Co., proprietors of the Crystal claim. The mill has 12 stampers. Revolving blankets catch all fine particles of tailings. These particles are washed out in a bin underneath. They are getting out rock from shafts, some of which are already 100 feet deep. Sulphurets of iron are abundantly intermixed in the rock and gold is found in connection with these sulphates.

"No. 8 — Arrastres worked on the Mexican plan are crushing rock from 2 levels on the south hill by Messrs. Rasberry & Co.

(Nos. 9 and 10 were the Specimen Hill and Gold Cliff mills, quoted earlier.)

"No. 11 — Messrs. Egan & Coleman are erecting a new mill, water power. The stampers, six in number weighing 500 pounds are worked by cogs attached to the main shaft of the wheel. (Egan claim.)

"No. 12 — Messrs. Brier, Smith & Co. is a new mill more advanced of larger size and greater strength than the one just mentioned. It is water power. Twelve stampers of 500 pounds each raised by cogs attached to the main shaft. The wheel is 30 feet in diameter. The rock is taken from the Brier claim. (Later the Stickle.)

"No. 13 — Water mill (the second built in camp) is owned by Wm. Maltman. It is located on China Gulch just below Dr. Hill's. The wheel is 30 feet in diameter and works 12 stampers."

It is worthy of comment that most of these mills were powered with water. Extremely large overshot wheels were located below the ditch of the Union Water Co. that had been used for placer mining. Mills above this ditch, such as that of Fritz & Co., had to use steam power. And at this time steam engines were scarce in California. Arrastres were used extensively in the early days, especially by the smaller operators. However, their use in the Angels district persisted for many years. They were generally operated by horse or mule.

During the first period of development there were many changes in ownership or management. Some of these ownership changes were made simply by other groups jumping claims when the necessary labor was not performed under the mining laws, and others, of course, by agreement and purchase. (Continued next page)

New Members

Mr. and Mrs. Ernest Stegman, Angels Camp
Mr. and Mrs. Gordon Middleton, Morro Bay
Mrs. Robert Beardslee, Stockton
Mrs. Geraldine Wells, Rail Road Flat
Mr. William Armstrong, Laverne
Mr. and Mrs. Charles Hale, Angels Camp
Mr. and Mrs. Edward Howard, Mokelumne Hill
Mr. and Mrs. Ira Shank, Hathaway Pines
Mr. J. C. Kempvane, Sacramento

