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THE GWIN MINE AT PALOMA

By W. P. FULLER, JR.

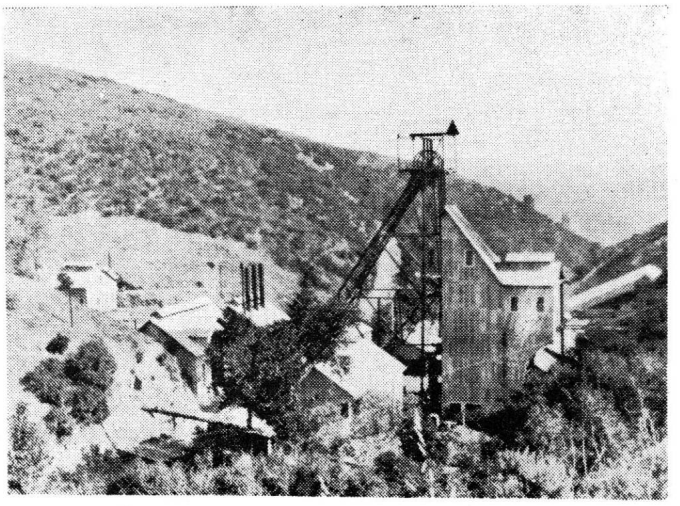
(From a Paper Presented to the Society on November 16, 1967)

The casual automobilist, traveling over the Paloma-Middle Bar road, must find it difficult to visualize the frenetic activity centered in this narrow ravine in years past. A more practiced eye will pick out a number of foundations, walled terraces, excavations, dumps, and even a few rusty bits of equipment, half-hidden by the encroaching vegetation. These are but inconspicuous and inadequate markers of the renowned Gwin Mine, officially commemorated on the historical monument at Paloma.

The gold-bearing Paloma quartz ledge was discovered as early as 1850 on the steep slopes of Lower Rich Gulch and staked the following January. It is reported that a certain Dr. Toland was mining on the ledge in 1853, and that in these early years some rich quartz was found close to the surface. An inclined shaft was sunk on the vein at this time. J. H. Alexander & Company somewhat later put down another 200-foot incline, as well as driving an adit, to develop the Paloma ledge north of the earlier workings. The results of this work were promising enough to justify erection of a 24-stamp mill in the early '60s at the Alexander. But at depth the gold values seemed to diminish.

It should be remembered that mining methods then were crude by today's standards. Blast holes were slowly drilled with "single" or "double-jack" and hand steel, and blasted with relatively ineffectual explosives. Hoisting machinery was slow and ore-milling techniques were of the simplest sort. Nevertheless, the early work at the Paloma and Alexander mines was extensive and productive enough to attract the attention of the prominent Californian, Senator William M. Gwin, and his son, William Jr.

In 1867 the Gwins acquired the Paloma mine and equipped it with a more substantial water-powered hoist and constructed a 36-stamp mill. In 1872 the Alexander was purchased, and the mill on that property was also used by the Gwins when sufficient ore was being hoisted to justify running it. The inclined South shaft was steadily deepened and ore mined from each successive level thus developed. After penetrating the low-grade zone at about 300 feet, the ore improved and frequent high-grade enrichments were found. By 1874 the 800-foot level had been opened, and in '77, stoping was proceeding off the 1300. Sinking continued to a depth of 1530 feet,



THE GWIN MINE

Looking northwesterly down Lower Rich Gulch, this view was taken shortly before the mine closed down.—Courtesy of Jack Ludwig.

and the 1400 level was driven north in a new orebody. "According to the old foreman, J. Oneta, the vein was there about eight feet wide, with quartz milling eight dollars a ton, and a level 1040 feet long in good ore. . ."[1] The 1500 level was then driven 100 feet to the south and 370 feet to the north, all in good ore. There was very little ore mined from this level, however, because the mine was making more water from these deep workings. It was not possible to keep the mine dewatered with the hoisting buckets and the pump (a 5-inch piston with a 30-inch stroke set at 8 strokes a minute), and the crooked shaft made it impractical to increase the speed of the pump. Accordingly, in October, 1879, stoping operations were restricted to the levels above 900 and to areas of relatively higher-grade ore. By 1882 this better ore had been exhausted and it became necessary to decide whether or not to make the extensive improvements to the shaft, pumping plant, and mill in order to handle larger quantities of lower grade ore. William Gwin, Jr., apparently felt that the ore developed below the 1400 level was not of sufficient value to justify such expenditures. Subsequent events, however, were to prove that he made an unfortunate decision.

Many factual details on the Gwins' operation are lacking, although after they incorporated as the Gwin Mining Company in 1872, more information became available. The total production of gold from the earliest days to the close of the Gwin regime is estimated at between $2,000,000 and $3,000,000, the smaller figure probably being closer to the truth. Essentially no operating records of the Gwins prior to April, 1871, were preserved or made public, but from that date until 1882 a total of $1,400,000 was produced. It is believed that this figure may not include gold recovered from sulphurets (sulphides) by roasting and chlorinating. The average grade of the ore was said to have been about $8 a ton, and the concentrates to have run $100 to the ton. At times, however, much richer ore was being taken out. For instance, the Calaveras Chronicle reported on March 15, 1873, that the mine was producing about $1000 a day, and in June of

the following year, Judge Norman, who was visiting at the mine, wrote to a friend in San Andreas that "It pays at the rate of . . . over thirty dollars per ton" or as much as $1250 a day at the tonnage of ore being milled at that time.[2] Three years later, the Calaveras correspondent for the Mining & Scientific Press reported a story that "a single blast exposed $100,000 worth of specimen quartz. But I have been there recently, and William M. Gwin, Jr., made no blow of any such occurence, and although very hospitable, seemed less inclined to talk of rock than the topics of the day."[3] The Gwins did not encourage publicity and operated the mine strictly as a family venture. All proceeds of bullion sales not required for the actual running expenses of the mine were promptly diverted to the personal use of the family.

The Gwins built a very comfortable house at the mine. "The ample and luxurious mansion has upper and lower verandas, all hanging as it were on the steep hillside, which by terraces, walls, and steps is made very elegant, and highly adorned with the choicest trees and flowers. One cannot blame the venerable senator for choosing this as his summer retreat from city life . . . we must admire the courage and ability of Wm. M. Gwin, Jr., planner and director of the entire business from the beginning. The outlook . . . is very favorable."[4]

It is said that the Plattner chlorination process was first used successfully in California at the Gwin mine. Although this process later was fairly widely employed as a method of recovering precious metals from sulphide concentrates, it was not too satisfactory, nor as efficient as the cyanide process that replaced it. Its use was discontinued at the Gwin and other Mother Lode mines when it was found to be more practical to ship that type of sulphide concentrate directly to the new smelter at Selby.

The Gwin mansion was sold and moved to Campo Seco, the usable equipment was auctioned off, and some time later the remaining mine buildings were devastated by a forest fire. And by 1893, "a deserted log cabin here and there, or a coil of rusty rope, with bundles of old iron and steel, scattered down the gulch, were the only traces of former activity."[5]

At this juncture, the mine was to be "rediscovered" and brought back into the limelight when Frederick F. Thomas incorporated the Gwin Mine Development Company with several of his friends and associates.*

"F. F.," as he was generally known, was an outstanding mining engineer with an enviable record in mine promotion and management. He was a graduate of Yale (1863) and its Sheffield Scientific School (1865). As a young man, he worked at Cerro Gordo, in Inyo County, California, at Silver Peak, in the Ward district, and at Hamilton, all in Nevada. He was prominent in the early development of copper smelting at Ely, Nevada; it is said that he suggested the city's name in honor of his alma mater. He is credited with developing the very successful United Verde mine in Arizona. Unfortunately, the approaching exhaustion of the rich, oxidized, near-surface ore, the high operating and smelting costs in that region, and sinking copper prices caused Thomas to sell out his interest prematurely. Purchased by Senator Clark, the

*These included M. W. Belshaw, E. C. Voorheis (state senator), E. L. Parker, Charles P. Eells, and David McClure. Among the stockholders were also C. M. Belshaw, J. J. Crawford, C. S. Benedict, C. D. Hyland and Wm. J. McGee.

DOUBLE-JACKING IN THE GWIN STOPES

This photograph was taken before air-powered drills were introduced at the Gwin. One miner holds and turns the steel while the other miner hits it with his double-jack. — California Division of Mines.

Verde later achieved the distinction of being one of the richest mines ever to be owned by one family.

Thomas' next venture was to take over the abandoned Kennedy mine at Jackson, California, in 1885, and to form the Kennedy Mining and Milling Company. The Kennedy ultimately became one of the deepest and most successful of the Mother Lode mines. As soon as this operation was on its feet, the able engineer was called to the Central mine in the Broken Hills district of Australia, to assist in solving their metallurgical difficulties and to supervise deep, large-scale development.

But Thomas saw the Mother Lode of California as his chosen area, and returned to Jackson in 1893 to try to make a mine out of the old Gwin property. He enlisted a younger mine operator, David McClure, who was a close friend and associate of Herbert Hoover, to be his second in command. Thomas and McClure then proceeded to lay out one of the most up-to-date operations to be seen on the Lode. A vertical shaft, the second of its kind in any major Mother Lode mine, was sunk 1400 feet to the former Gwin workings. This shaft, collared right in the draw near the old Alexander incline, was started on May 1st, 1894. The Mining & Scientific Press reported as follows:

"The Gwin Co. erected a complete water power hoisting plant and the shops in the summer of 1894. Sinking was steadily prosecuted for two years, until the 1000-foot level was reached. Drifts were run at the 700 and 1000-foot levels . . . a well-boring machine was used to sink a prospect hole in advance of the shaft work and down past the old drifts. It encountered the north prolongation of the orebody vein at 1195 feet. This bore was sunk to the 1300-foot (vertical) level and happily just escaped the old drifts enough to ensure safety in sinking the shaft down near them. The shaft was then continued to the 1400-foot level and the work of opening up the orebody began on the 1200, 1300, and 1400-foot levels, where the vein in a great many places was over 20 feet in width of milling rock."[6]

So certain was Thomas of the reliability of his information of the ore on the old Gwin 1500 level, and of the probable vertical continuity of this "ore chimney," that he contracted for the erection of a 40-stamp mill in August of 1896, while just cutting the 1300 station and yet to open up the vein in the new workings. Right on schedule, the mill was started up in January, 1897, with most pleasant results. By April, 1900, some 171,748 tons of quartz had been milled, to produce a total of $702,000 in gold bullion, and substantial monthly dividends were already being paid to the fortunate owners of Gwin Company stock.

The initial headframe used for sinking the shaft and for the first few years of the mine's operation was constructed of wood timbers, with the water-powered hoist on the east side of the draw. Early in the new century a large, well-engineered steel headframe replaced the older one, and a faster hoist, also water-powered, with steam standby facilities, was installed in a new building across the ravine to the west. The 40-stamp mill was enlarged in 1899 to accommodate a total of 100 stamps, with improved Frue vanners for concentrating the sulphides. Early in the Thomas-McClure period of operation a compressor was placed down on the Mokelumne River, powered by a 19-foot Pelton wheel run by the discharge water from the hoist and mill wheels, under a head of 380 feet. The compressed air was piped back up to the mine. This permitted the introduction of the latest air-operated underground equipment, some of which was designed and built by the Demarest iron works at Altaville. A second compressor was added later.

F. F. THOMAS

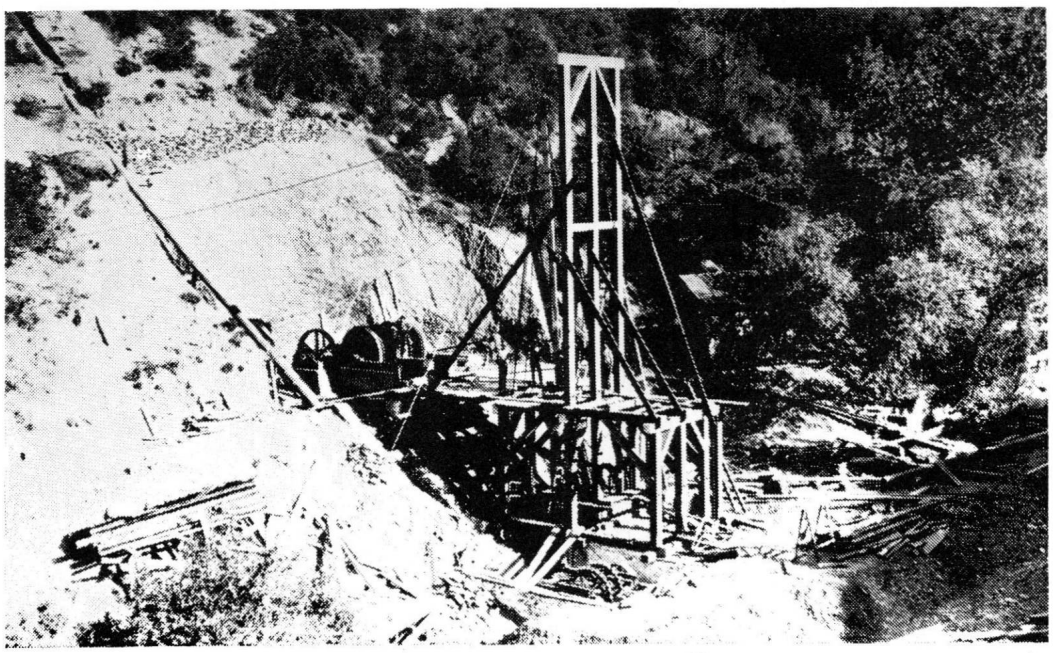
Enterprising engineer who made over the abandoned Gwin mine into one of the leading gold operations on the Lode. — Photograph loaned by F. F. Thomas, Jr.

The Gwin mine became known as one of the best-managed on the Mother Lode. It was not, as it had been in the Gwin period, a high-grade mine. On the contrary, the 984,442 tons of quartz run through the mill during the years 1897-1908 averaged only about $3.55 in gold per ton. But Thomas and McClure held the total mining and milling expenses down to about $2.40 a ton, thus making a substantial operating profit, most of which was promptly paid out to the stockholders. The mining fraternity was sufficiently impressed with this operation that the American Institute of Mining and Metallurgical Engineers routed their historic western field trip in 1899 by way of Gwinmine. A well-attended banquet was held in the brand new mill extension, following a trip through the mine and mill, and the after-dinner talks, by F. J. Solinsky, F. F. Thomas and David McClure were well received by the visiting AIME'ers.

D. C. Demarest, proprietor and manager of the foundry at Altaville, often went over to Paloma. "I always

GWINMINE — 1900

This view shows the congestion of buildings and activities in the ravine at Gwinmine. It was necessary to flume the winter run-off of Lower Rich Gulch under the mine yard. A freight team, empty, is starting up the grade to Paloma and then Valley Springs, for more mine timbers. — California Division of Mines.



THE NORTH SHAFT — SPRING, 1894

The new shaft has just been "collared" and the wooden headframe is being erected. The double-drum hoist has been installed and the Pelton weels mounted in the wheel pit (center foreground). The pressure line from the Mokelumne ditch can be seen to the left. — California Division of Mines.

considered that my frequent visits to the Gwin mine returned me good profits besides the commercial ones that came from the machinery orders I secured. Mr. Thomas had a brilliant mind stored with wide knowledge of subjects other than those of his profession. Mr. McClure was very interesting with his accounts of far-flung travels. The many hours that I spent with these two men at the Gwin gave me a lot of real pleasure at the time, and left lasting memories of some of the most satisfying experiences of my lifetime."

"Through the Thomas-McClure period, the Gwin mine was 'home' to these two mining men, although the family of Mr. Thomas resided in Berkeley. Their living quarters were in the so-called cottage, a two-story structure, within a stone's throw of the North shaft. Their office facilities were on the ground floor of the cottage, which was occupied mainly with a large office room containing the bookkeeper's desk,* the timekeeping cards and tags, the draftsman's table and the private desks of Mr. Thomas and Mr. McClure. The room was served with electric fans in summer and with a huge fireplace in winter. There were no walls to give the "bosses" privacy—they were in sight of and accessible to every employee, as he came to the office to get his tag and to record his time, at the beginning and the end of each shift. Even in the boarding house where Thomas and McClure took their meals regularly, their table was in the same big dining room with the men. However, on occasions when guests were there, they were served after the men had finished their meal.

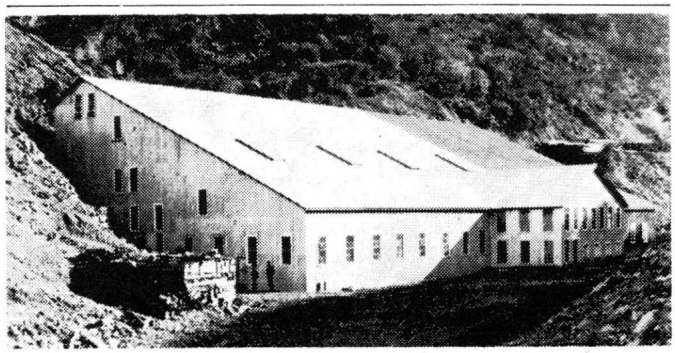
"On the upper floor of the cottage, there were comfortable room accommodations with baths that served Thomas and McClure and their frequent visitors. During the hot season, when the ditch water supply was ample, liberal use was made of sprinklers to keep the cottage surroundings green and shady and cool. Regularly timed pilgrimages were made to this inviting 'home' by a legion of friends, among whom were wealthy and distinguished men."[7]

Demarest goes on to say that "All of the mine 'bosses' along the Mother Lode were adept at reducing ore samples to their metallic contents by water concentration, in a gold pan or a horn, which latter was a smooth-surfaced spoon-shaped receptacle made from a cow's horn. And they were experts at estimating—from the showings in the pan or horn—the free-gold value per ton of the ore." Mr. Thomas' son describes his father, "the 'old man' of the camp, moving about everywhere, observing everything. Impatiently waiting for samples from underground when something special was expected from one of the faces. Patiently horning out a portion of the sample, as soon as the assayer had it ground, because he was too impatient to await the assay—his estimate per ton usually confirmed within a matter of cents by the assay completed hours later."[8]

Young Thomas, who would visit the mine on his vacations, later recorded his boyhood impressions. He "especially admired Mr. Genochio, the senior engineer at the North shaft, and his smooth and loving handling of the water-powered hoisting machinery. There was a fascination in hearing the surge of water in the Pelton wheel beneath the floor when the power was applied, and in watching the two great reels, wound in opposite directions revolving as one, the empty skip in its descent helping with the lift. Or at the change of shift, in observing a knot of fresh men in dry yellow slickers stepping onto the double-decker and promptly disappearing, and, after an interval, in seeing a load of tired men from the relieved shift, step off the cage arriving in the other compartment, their oilskins dripping as they hurried to the change house.

"Everywhere it was noise, noise, noise. The intermittent noise of the rock-crusher chewing up each skipload of freshly-hoisted ore. The noise of the crushed ore as it was released through the chute into the one-mule ore car, which trammed it to the mill and dumped it into the bunkers. The thud of the trip-hammer in the blacksmith shop and the clang of the smith's hammer on anvil, beating time for the song of white-hot drills being re-sharpened. The Brunnehilde cry from the sawmill, as the ends of the great timbers were 'framed' for the sets required underground.

"The deafening roar of the mill. Awakened at night by the sudden deafening silence whenever the mill was stopped for any reason. Good-looking Ernest Taylor, presiding genius at the mill. The jiggle and slow revolution of the belts of the concentrators. Sacking the sulphurets for shipment to the smelter at Selby.



THE GWIN MILL — 1899

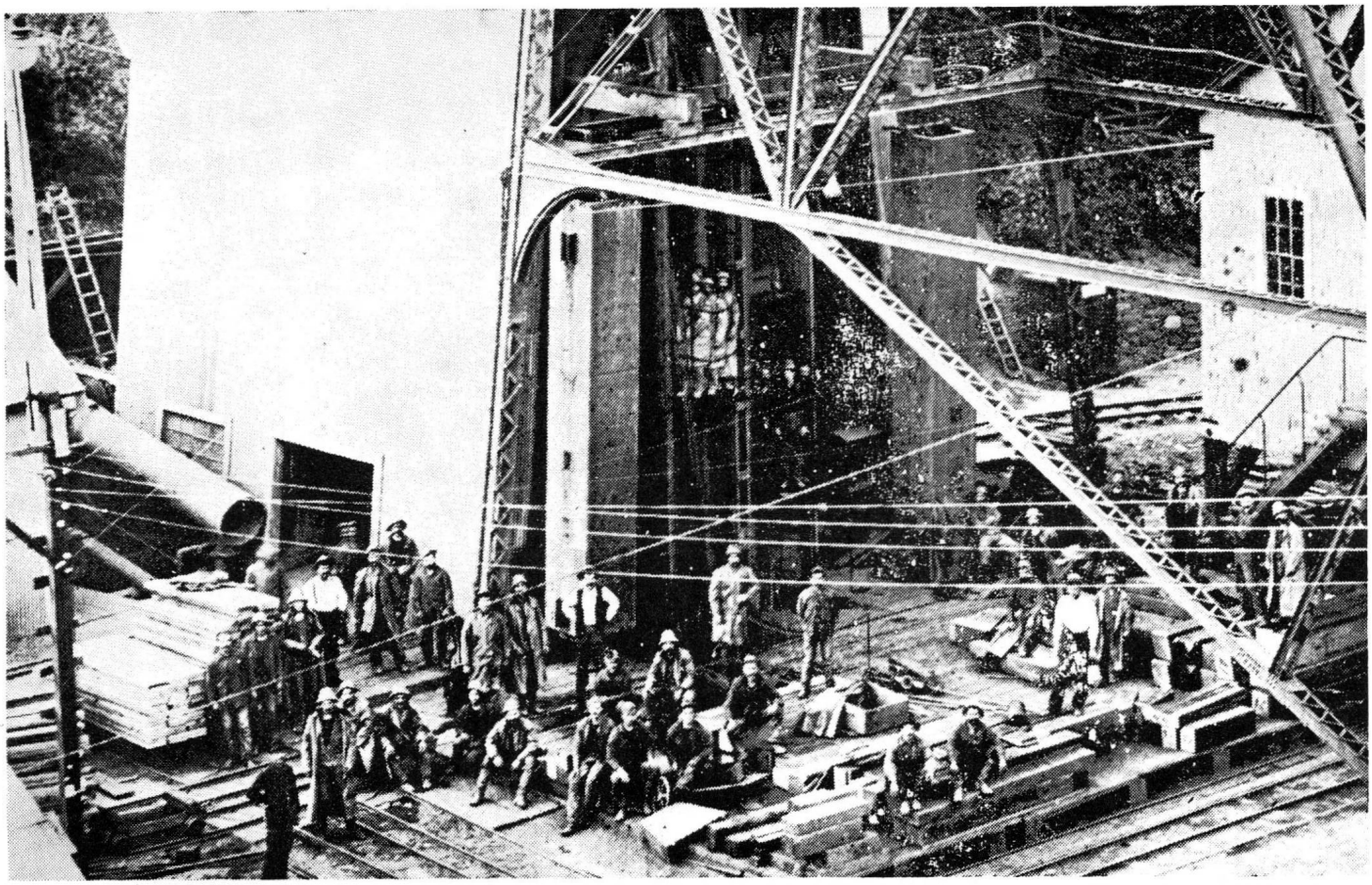
The old 40-stamp section is on the right and the new 60-stamp extension on the left. Power was supplied by Pelton wheels, under approximately 390 feet of head, from the Mokelumne ditch. — Courtesy of the California Division of Mines.

"The milling was a continuous process, but clean-up, across the road in the retort house, was a monthly event, rifles, revolvers and guards on every hand. Amalgam, removed from the plates below the mill batteries, was cooked in a retort, just the right amount to vaporize the quicksilver (most of which was then condensed and recaptured in a trap) and to melt the gold into a brick—in good months there might be two bricks.

"When the brick had cooled it was weighed and marked for source and fineness, ready to go as bullion to Wells, Fargo & Co. at Valley Springs for shipment to the Mint or other outlet. Its transportation to Valley Springs was quite a ceremony. This was one of the jobs of David McClure, Number Two Man in the camp. Armed to the teeth, in a two-horse buggy, he made such speed as the condition of the road permitted. With armed guards on horseback, two outriders some distance ahead, and two a similar distance behind, he would have been no pushover for bandits.

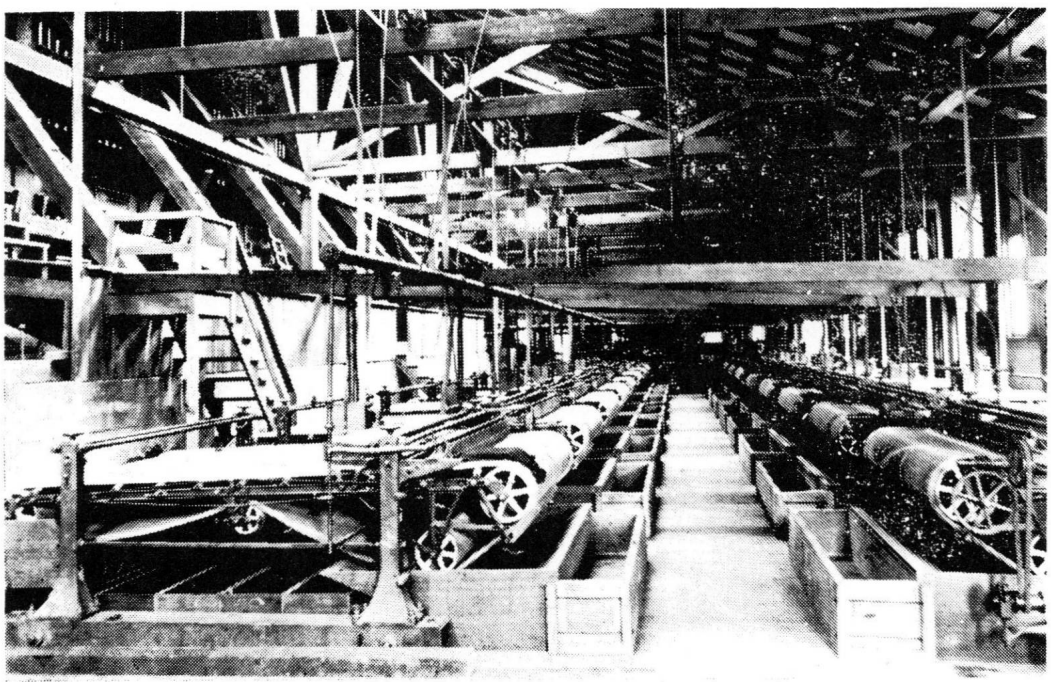
"The horse-drawn stage, making its daily trip, Jack-

*Genial Ben Johnston, bookkeeper and storyteller supreme.



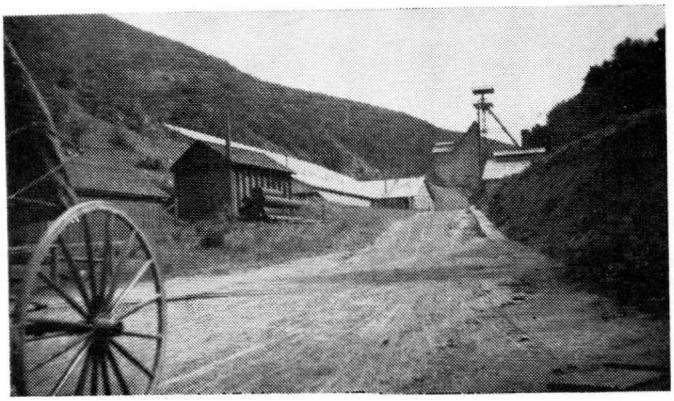
THE AFTERNOON SHIFT CHANGE

Note the men on the double-decked cages. Ore skips are standing on each side of the collar of the shaft. —Photograph loaned by Jack Ludwig.



MILL INTERIOR

In 1899 the mill was expanded to 100 stamps. Some of these can be seen in the upper left. For each five-stamp battery, two Frue vanners (foreground) were used to concentrate the sulphides, after the ore had been ground to pass No. 16 screen and run over the amalgamation plates on the deck to the left. — California Division of Mines.



MIDDLE BAR ROAD BELOW THE GWIN MINE
Photograph taken in May, 1908, by Jeffrey Schweitzer.

son to Valley Springs and return. Toiling up the gulch in the morning. Tooling down the gulch in the late afternoon, pulling up at the post office (Gwinmine) with a flourish and with the spirit notably wanting in the morning's uphill grind. Importantly throwing out the mail sack, and discharging any passengers who might have come up from Lodi on the narrow-gauge. Driver and passengers with their dusters sensibly buttoned up to their chins.

"Hours in the assay office. Watching Will-yum, the assayer, pulverize and quarter the samples. Watching his careful admixture of pulverized ore and litharge for the flux. Observing at intervals the scorification of the several 'runs' in the white-hot coke, each in a separate crucible. Watching the slag being hammered out of the lead buttons. Each button as it was hammered into a neat cube and then placed in its own small cupel. Each cupel as it was put into the muffle furnace by means of tongs, and later removed, nothing now left of the dull, dice-size lead cube but a pinhead of bright yellow gold. The weighing of this residual pinhead. What a tiny object for so large a balance! Encased in glass and kept level by delicate adjustment, the balance was operated by manipulating brass knurls on the outside. How much would the pinhead weigh? What a 'whale of a difference' its weight could make, and to what a host of people!"

As the mine became deeper—the North shaft had been put down to the 2400-foot level, and an inclined winze to the 2800-foot level, the Gwin thus becoming one of the deepest mines in the west at that time—the ore became more erratic and lower in grade. During the final two years, bullion receipts were insufficient to cover the increased costs. In 1908, an important new orebody, high in grade, was discovered some 1600 feet south of the shaft, on the 2400 level.

One August day that year, as Thomas and McClure were busily engaged at the drafting table in the mine office, enthusiastically planning the proposed deeper operations to develop and mine the new south orebody, the telephone rang. It was the San Francisco office calling with the orders to close the mine down.[9]

Demarest tells his version of the background of this final decision. "I believe I was one of the very few outsiders who knew the circumstances that led to the closing down of the Gwin mine operations in 1908. First, a serious shortage of water supply from the ditch system had curtailed the milling operations and so had impaired the financial position of the company. Then, exploratory work . . . had depleted the treasury of cash and had incurred some indebtedness. However, these explorations had encountered the orebody of the south shoot. The company believed that the newly-found ore would put the mine again on a dividend-paying basis without calling upon the stockholders for financial assistance, provided that the outstanding indebtedness could be allowed to remain until profits were again forthcoming.

"The refusal of the largest creditor (Ike Foorman) to accede to a proposal of such nature—in view of the fact that over a long period of years he had been paid regularly a monthly sum in excess of $2000 for the Gwin water supply, which had provided the bulk of his business revenue—so incensed one of the principal stockholders, director and a wealthy man, that he hurriedly called a meeting of the directors, Thomas and McClure being absent (at the mine), and had a resolution passed that gave the men at the mine orders to 'pull the pumps and let the mine fill with water'."*

More than $3,500,000 in gold was produced by the Gwin Mine Development Company, bringing the total production to about $6,000,000. Over these years, directly and indirectly, the mine supplied a good livlihood for many Calaverans.

The fortunes of Paloma have been the fortunes of the Gwin mine. So, with the final closing of the mine, the town dropped off rapidly and only a few families, those with land to ranch or who could find jobs nearby, stayed on. The endless teams with timbers for the mines, the constant coming and going of the day and night shifts, and the incessant activity of a lively mining town soon

*Mr. F. F. Thomas, Jr., in a personal communication to the editor, points out that the Demarest version is not an entirely accurate one. The company dividend policy was extremely liberal and the mine operators found themselves very short of working capital at the same time that the prolonged water shortage crippled mill capacity. To aggravate the situation still further, waste-dump space had been filled up and low-grade development rock was run through the mill, partly to get rid of it as tailings downstream. This consumed valuable mill time that might have been used on better ore.

"I do not doubt," Mr. Thomas adds, that two of the largest stockholders and directors "may have conferred with Mr. J. J. Crawford, secretary of the company, and communicated to the management at the mine their strong conviction to that effect. But I cannot believe that it was a real 'meeting' of the Board in a legal sense without my father (president of the company) and David McClure, or that it represented a decision of the Board of Directors officially or as such. My information has been so definitely to the effect that it was only a temporary expedient on account of the impossibility of operating the mill and plant, the ditch practically having gone dry. . . . At the critical time surely Thomas and McClure would have attended any regular or special Directors' meeting on so serious a step." Furthermore, mining engineer W. E. Downs had tabulated ore reserves, still remaining, that could have supplied the mill for a year or two more, even without the new south orebody. But, unfortunately, when a deep and wet mine like the Gwin is shut down, a temporary expedient soon becomes a permanent situation.

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The Calaveras County Historical Society, a non-profit corporation, meets on the fourth Thursday of each month at the Grange Hall in San Andreas—except for dinner meetings which are held each quarter at different places in the county.

The Gwin Mine at Paloma

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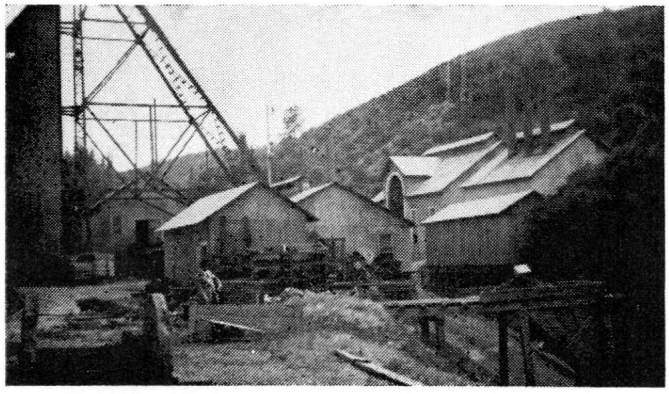
became just memories. In 1917-18, the Gwin company decided to dismantle the surface plant. This was auctioned off to Weisbaum, a San Francisco scrap metal dealer, for $45,000. The headframe was taken down and shipped to Tonopah, Nevada. Wollenberg, an associate of Weisbaum, bought the mill from the latter for $5000, and ground sluiced enough amalgam from around the foundations to give him a profit of $15,000.

F. F. Thomas, Jr., described his last visit to the famous ravine, many years later, in these words: "Nowadays, if you hunt out the site, down in that gulch, it takes a feat of imagination to realize you are there. You ask yourself how it is conceivable that such a defile could ever have accommodated that king-size mill, all those lesser buildings, all those people, all that activity. Where the busy road had sweltered in the sun, its chuckholes hidden by an incredibly thick layer of dust, a narrow ribbon of pavement winds down, and there seems no one left to travel it. Where the very hills had rumbled with unceasing noise, all lies deathly still except perhaps for a couple of saucy bluejays. The ugly dumps at both north and south shafts, what great open sores then! Healed now and scarred over, they are still not hard to find. Scratch around, they remind that far beneath your feet lies a great maze of underground workings on a number of different levels. . . . Filled now with water, they are effectively sealed from any casual exploration.

"If you, too, recall those old days, what will strike you with most poignancy may be two apricot stubs, not quite dead, discouraged survivors of the tidy little orchard that once thrived there on the hillside back of the office



MINE YARD AND HOIST HOUSE
Gwinmine — 1908

building. The massive concrete foundation of the 'new' hoist at the North shaft was not worth wrecking; relic of the latter days, it seems to brood over memories of its own."

* * *

REFERENCES TO THE GWIN MINE:

California Division of Mines reports for technical details.

Mining and Scientific Press for contemporary news and technical stories.

"California Gold," by D. C. Demarest, unpublished. Quotations have been made from this manuscript through the cooperation of Dr. R. C. Wood of the Stuart Western Americana Library at University of the Pacific where this material is located.

"Sons of the Mother Lode," by F. F. Thomas, Jr., privately printed in "Far Afield" by the author.

QUOTATIONS:

1 Mining & Scientific Press, Sept 14, 1895, p. 168.
2 Ibid, May 23, 1874, p. 326.
3 Ibid, June 16, 1877, p. 383.
4 Ibid.
5 Ibid. April 23, 1898, p. 437.
6 Ibid, p. 440.
7 Demarest quotations are from Chapter 18, of the Demarest manuscript.
8 This and the following quotations credited to F. F. Thomas, Jr., are from "Sons of the Mother Lode" in "Far Afield."
9 As recounted to Jeffrey Schweitzer by David McClure.

"Las Calaveras" has published several brief articles on the Gwin mine and Paloma.

Special thanks are due Wm. B. Clark, Emmett Joy, Jeffrey Schweitzer, F. F. Thomas, Jr., and R. Coke Wood. Additional help was furnished by a number of Calaveras County residents who recounted their memories of the Gwin mine.

Forthcoming Meetings

February 22 — Mines of Angels Camp
March 28 — Mines of Angels Camp, con'td.
April 25 — Dinner meeting, place and program to be announced