THE SAGA OF P. G. & E.

Donna Howell

Donna Howell, a native of Auburn and Placer County Historian, has contributed her research for this publication about the PG&E in its early days. Donna has published many articles, taught classes on Placer County History at Sierra College and has presented her program on the History of Placer County to many Civic groups. She gives a short, concise history of the Company as it relates to Placer County and Drum Division.

Note: While working on the Historic Resources Inventory in 1989-90, I was privileged to be given access to PG&E files in order to document their holdings in Placer County. I found it a fascinating story and one worth passing on to the public. D. Howell.

The idea of harnessing the water of Bear River dates from the 1870's. But it took the right people and the right times to put it together.

First was the demand for water for washing gold. Fordyce Dam was begun in 1873 as the main storage reservoir for the South Yuba Canal Company. The site was chosen because of the narrow gorge and broad meadow up stream to store the water. In this meadow were three ranches. One was owned by Justus Fordyce who had already built a ditch and had begun to control water on a small scale.

Upon trying to complete the dam in 1874, several problems arose. The dam, built of rock with an outlet pipe and sliding gate, reached a height of 20 feet and leaked badly. Local dirt did not have enough clay to seal the rock face of the dam. Resources were limited.

Enter John Spaulding. Spaulding came by steamer from Canton, N. Y. in 1853. He did some gold mining near Oroville and was aware of the water storage in relation to gold panning and started building ditches in that area. He went on to drive stage for the California Stage Co. from Nevada City to Sacramento and from Folsom to Dutch Flat from 1856 to 1862. Then he drove for Wells Fargo from Placerville to Virginia City and three years later was in charge of Wells Fargo operations between Sacramento and the Comstock in Nevada. The completion of the Central Pacific railroad ended his position in 1868.

Spaulding's friend, Alvinza Hayward, employed him at his Polar Star and Southern Cross mines. Hearing of the problems at Fordyce, Hayward loaned Spaulding to the project so he could use his knowledge of water control. Spaulding took charge of the dam construction and re-organized and enlarged the whole operation. Rock from nearby quarries was brought to the dam by train and the rails left in the dam at different levels for reinforcement.

By 1875, there were 145 men working on the dam and by seasons end there was 65 feet of water behind the dam. The next few years, Hayward ran into financial problems and dry years. In the summer of 1877, Warner Van Norden of New York, (later to become President of the National Bank of North America), a friend of Hayward's, came to look over his property and help with financing. As a result, in 1880, the South Yuba Water and Mining Company bought the South Yuba Canal Company and the Nevada Hydraulic Mining Company and Spaulding headed the

new organizations. By 1882, the dam reached 96 feet, the largest dam in California at that time.

Meadow Lake, (due north of Fordyce Lake) the former site of Summit City, drains into Fordyce. This town had a population of 4,000 during the gold rush. In the fall of 1866, a heavy snowstorm panicked the residents (the memory of the Donner Party was fresh on their minds) and they left without their possessions, even leaving bread baking in the oven. Most never returned.

Lake Fordyce was also the site of the first long distance telephone. In 1878, two years after Bell got his patent, the South Yuba Canal Company strung wires along 184 miles of its waterways to their headquarters.

Spaulding Dam

Spaulding Dam, when finally complete, was 275 feet high. It took 12 years from conception to approval of financing in New York. W. A. Englebright was superintendent of construction and later became Congressman from the First District.

Warner Van Norden's son, Charles, a clergyman, was the person who first suggested using the water system for irrigation. Charles' son, Rudolph, joined the South Yuba Canal Company and helped design the power houses to be supplied from the ditches. The Van Nordens formed a hydroelectric subsidiary, the Central California Electric Company in 1895 and built three powerhouses--Newcastle in 1896, Auburn in 1898 and Alta in 1902. Newcastle closed in 1914 and Auburn closed in 1912. Alta, is the only powerhouse still in operation and utilizes much of the original equipment. This electric company and about 17 others were absorbed by PG&E by the 1920's.

The intricate canal system was a vital part of the gold rush and is now our chief water supply. PG&E operated and maintained the canals until they were sold to the Placer County Water Agency in 1968.

The following article appeared in the December 28, 1889 Placer Herald:

'Worthy of mention is the electric light plant, owned and operated by Messrs. Bell and Hill. This enterprise was begun May 15th, and the light was turned on the 28th of October 1889. The dynamo is the Thompson & Houston patent, and is run by water power obtained from the Bear River Ditch. (Ed: this ditch was built in 1852, from a point below the junction of Greenhorn Creek with Bear River to an area just North of Auburn. Greenhorn Creek flows into Rollins Lake.)

The dynamo has a capacity of 1000 lights and is managed by Al Armbruster who talks of amperes and rheostats as glibly as an expert. J. Russell is lineman. There are 18 miles of wire in use now. The proprietors intend to erect arc lights in the spring. The lights are incandescent and give a soft, brilliant light, which does not tire the eyes and can be used to great advantage by the student or artisan. Some 300 lights are in use now and this number will be doubled by spring'

The plant continued as the B. & H. Company for a few years, when Hill sold out and the Company continued to supply Auburn and vicinity under the name of Bell Electric Company until it was purchased by PG&E in 1926. The original power plant was abandoned when the

Central California Power Company completed the Auburn Power House in 1898 and thereafter the power was purchased for resale. The plant was located north of Auburn, (near what is now Ashford Park) in Auburn Ravine, close to the city limits where the old foundations are still visible.

The reason behind the development of hydro-electric resources of Placer County was to get electricity from Bear River to Cordelia and on to the Bay Area. Those located along the way benefitted by receiving the extra power. First known as "Pacific Service", PG&E was incorporated in 1905. The plant took years to get started. First, financing could not be found on the west coast. The N. W. Halsey investment firm was contacted in the east and they took great interest in the project. Mr. Halsey himself came out to see the area and became a member of the Board of Directors of PG&E Second, the re-building after the 1906 earthquake in San Francisco made building material hard to get and very expensive. Third, permission had to be obtained from Southern Pacific to unload supplies and equipment at Cisco. Previously, supplies were brought in from Truckee to Weber Lake then by boat to Lake Fordyce, a two-day haul and was not very convenient.

Drum powerhouse was the most difficult to build because it was in such a remote area. Living quarters were provided for the workers and their families. There was already a two story bunk house at Lake Fordyce occupied by Ed Roening and Gus Anderson, caretakers who lived there a total of 39 years. Crews worked in shifts around the clock all year. During the winter, they dug the tunnels. This was all done by pick, shovel, horse, mule, and wagon. The powerhouse was named for Frank Drum who was President of PG&E from 1907 to 1920. The original powerhouse produced 36,000 HP. In 1923 it was enlarged to 50,250 HP and later a second turbine was added.

The workers had many social events and recreation at their fingertips, but led an isolated life. Holidays were well celebrated with parties and big dinners prepared by the wives. On Christmas Day at Clipper Gap in 1915, the three shifts of tunnel workers in that area, 125 men, were fed a dinner of creamed oyster soup, roast pig, sage dressing, mashed potatoes, creamed carrots, sugar corn, green peas, hot rolls, raisin biscuits, plum pudding with hard sauce and wine sauce, pumpkin, apple and mince pies, sunkist oranges, assorted nuts, cheeses and coffee. The office and dinning hall were decorated with holly and red and green electric lights with green and red bells in the rafters.

There were also mishaps. An accident report at the Lake Spaulding Development in August 1912 states that a pack mule lost its footing on the trail and fell over the bank and was killed. The mule was being rented from Vic Matthews of Towle and was packing in a crate of cabbage from headquarters to Power House Camp which seemed to have been packed wrong. The mules were tied together and when the pack turned under him, he was pulled off the trail. Matthews was paid $75.00 for the mule.

Ditch capacity was expanded by the construction of Lake Arthur and Lake Theodore. The construction of Lake Arthur was supervised by Jim Martin. The work camp was established March 15, 1909 and actual work time was from May 28 to July 23rd. The work camp was abandoned August 10, and the lake filled by September 1st. Dam construction was completed by 119 men, 76 horses, 3 plows, 12 four-horse fresno-scrapers, 6 two-horse fresno- scrapers, 14 wheel scrapers, 10 dump-wagons, 1 roller, 1 road grader, 1 harrow, and 2 road wagons. All surface rocks and brush were removed. Dirt was taken from the nearby hillsides, packed and watered

from a water tank 30 feet above the final crest of the dam. A 2 œ inch pipe was suspended on uprights from bank to bank for sprinkling. The floor was cut into V shapes to hold tamped dirt and was tamped by hand near the outlet and elsewhere by a large horse-drawn revolving cylinder bristling with tampers. Small rocks were rolled upstream for rip-rap. The larger rocks were rolled downstream for the finished wall of the outside of the dam. The rock face was laid by hand. Repeated samples of dirt were taken by hydraulic engineer James Wise to determine if the dirt would tamp well and hold water. The finished dam was 45 feet high 300 feet long and cost $4,000. The lake had a surface of 8 acres to an average depth of 25 feet, capacity of 6 million cubic feet of water. The dam was 8 feet thick at the top and 168 feet thick at the bottom. The pot hole in the center was filled with rock with a drain pipe outlet covered with 12 inches of concrete around the rim. The outlet pipe was 30 inches in diameter, the gate was concrete. On the upstream face a painted gaugeboard sloped to the bottom with marked figures to show the depth of the water. A row of posts were set along the crest of the dam from bank to bank. The tops were cut to the same height so they could see if the dam settled and by how much. Lake Arthur was the beginning of the Fiddler Green Ditch, and was named for W. R. Arthur, who was Assistant Manager of Placer County Water District. Arthur came to Auburn as a boy and knew the George Reamer family. Mrs. Reamer (Reamer St. in Auburn is named for this family) was his Sunday School teacher.

During the construction of the lake, about a half a mile of county road was built around the side of the lake. This later became part of the Lincoln Highway.

Halsey and Wise powerhouses were started together in 1913. At Halsey, one million dollars was spent in four months, with 30% of the work done in April 1913. The powerhouse was of steel frame reinforced concrete. The projects seven tunnels were begun in December 1915 and employed 150 men. Aggregate length of the tunnels was 9,430 feet with steel penstocks 72" in diameter. Power was generated by a Francis type 18,000 HP Allis-Chalmers turbine and 12,500 KVA electric generators with a maximum static head of water of 342 feet. The turbine was a variation on the Pelton wheel for maximum power.

To supply the powerhouse, Halsey Forebay was built to the north (intersection of Christian Valley Road and Bancroft Road). The site was the old Columbia ranch dating from 1858 owned by the Bancroft family. Since the Bancrofts would not sell, the PG&E took the ranch by right of eminent domain, re-locating the family and set up offices in the old home. James Martin, Manager of Drum Division in Colfax, was in charge of construction of the forebay and powerhouse. Two earth dams were built to hold 300 acre feet of water from the Bear River Canal. The water exits over the hill by syphon in the penstock to the powerhouse. In December, 1915, an air compressor plant was installed between tunnels 5 and 6 to furnish air for the drills. This was the only power used in the whole project. At this time, the electric power lines were built to this point from Drum.

Halsey powerhouse had an afterbay (Christian Valley Road and Dry Creek Road) to catch the water and direct it into the Wise Canal to Rock Creek Dam. Excess water flowed down Dry Creek. Rock Creek Dam was built in 1916 for storage. It was concrete, 1015 feet long, 36 feet high, consisting of 35 arches of 30 feet each with a spillway in the center. Net storage was 440 acre feet. The multiple arch construction was the longest of its kind built at that time and was of European design. Several engineers on the project were from Europe.

Wise powerhouse is similar to Halsey. The water came from Rock Creek via the Wise Canal to the forebay located at Merry Knoll (off Mt. Vernon Road west of Nevada Street, Auburn). The

penstock consisted of 1600 feet of 96" diameter wood stave pipe, 500 feet of reinforced concrete lined tunnel 8' in diameter and 6700 feet of steel pipe. The water enters through the penstocks over Duncan Hill (accessed by Stone House road, off of Ophir Road) to the powerhouse at the corner of Wise and Ophir Roads. The horizontal, Francis type turbine had 20,000 HP and single discharge design. It was the largest single wheel built at that time by Pelton Water Wheel Works in San Francisco. The turbine was on display in the Machinery Hall at the Panama-Pacific International Exposition in 1915 prior to installation. The 12,500 KVA electric generator was one of four original units for the Drum Division. Static head of water available was 520 feet. Canals diverted the water at the tailrace to the large agriculture industry in the Loomis Basin. The electricity went to Standard Electra lines at Stockton then to Cordelia.

This powerhouse was named for James H. Wise, Civil and Hydraulic Engineer. Wise was born February 17, 1880 in Denver, Colorado. He became interested in mining because his father was a miner in Colorado and New Mexico. At 12, Wise came to Alameda to complete grammar school then entered Lick School in San Francisco, graduating at 19. A crackerjack in math, he went to the University of California at Berkeley specializing in mining, graduating in 1903 with a Bachelor of Science degree. He was invited back to Lick to teach for a year. He then joined PG&E as an instrument man, then surveyor, then became assistant to Frank Baun, Consulting Engineer. When Baum resigned, Wise was made hydraulic and civil engineer. After six years, he left PG&E to become partner with Baum in private business. While away, he spent two months in Dawson, Yukon Territory assisting in the construction of a 7,000 kilowatt hydro-electric installation. He also worked on the North Fork of the Klondike for Canadian Klondike Company, Yukon gold company, and Granville Mining Company. Other power projects with Baun included the transmission and street car systems at Monterey. In 1911, Wise rejoined P. G. & E as Assistant General Manager. He was killed in an auto accident in San Francisco while on Company business on September 16, 1912 at the age of 32. He was so well thought of that PG&E started the Wise Library in his memory with his engineering books.

P G. & E. was continuously enlarging the canals to carry more water to the plants to generate more power. In July 1931, enlarging the South Yuba-Bear River Canal System was begun. This comprised 23 miles of canal, three tunnels totaling nearly two miles over 3/4 miles of reinforced concrete, and metal flumes over shifting ground. Capacity increased from 350 to 475 cubic feet per second. The canals were gunited (sealed) with a mixture of sand and Portland cement applied through a nozzle from 1 œ to over 2" where needed.

In remote areas, the berms along the canals were not wide enough for trucks. So the sacks of cement and supplies were loaded into tubs at road crossings, floated down to the work areas and unloaded. Then the empty tubs continued to the next road crossing. sometimes as far as six miles, where they were removed and returned upstream a dozen at a time by truck. Later supplies could be loaded onto caterpillar treaded trailers and drawn along the bottom of the ditch.

On Thanksgiving Day, 1923, Vice President and General Manager, John Britton (formerly of the Oakland Gas and Light Company) closed the switch at Wise powerhouse to send electricity to Cordelia 110 miles away. Even though work on the plants was not complete, everything worked. There was no breakdown, power outage or any failure of equipment. Quite a feat for engineers building a new type system that had never been done before.

Later, when construction was complete, the press was brought from the Bay Area for a tour. The people came by train to Cisco and were driven down into Lake Spaulding where lunch was

served on the top of the dam. A lattice archway had been built the length of the dam with a long banquet table set beneath it. The press was taken on a tour of the powerhouse and stayed the night. The next day, a motorcade came down the highway stopping at each development along the way. By evening, they were returned to their homes.

H. M. Cooper staffed the first business office in 1910, which was upstairs in the Rattlers Firehouse in East Auburn (it has been moved to the corner of LincolnWay & ElDorado St.). By 1911, larger quarters were needed. W. R. Arthur built a building on Lincoln Way for lease to PG&E This is now the location of Nats Men's Store. The business office for the Drum Division of PG&E on High Street in Auburn was completed in December, 1928 at a cost of $50,000 and is still in use as of this date.

The PG&E legal representative in Placer County was John Fulweiler, a well known attorney. Fulweiler Ave. in Auburn is named for him as it is near the location of his home which was on six acres facing the Auburn Ravine.

Over the years PG&E continued to enlarge and advance in technology. In the 1960's, most of the system was converted to remote control and most hands-on operation was no longer needed. This is when the landmark ditch-tenders and powerhouse worker's family homes were removed and workers relocated and consolidated.

The PG&E. facilities are named in honor of the talented pioneers associated with the company. PG&E is also responsible for road improvements, bridges, and parks. They were at one time one of the largest employers in Placer County, and one of the largest land owners. This outline just gives you an idea of how extensive this system is and gives me a whole new appreciation for the light globe.

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