
PHILBROOK DAM

Where Giants Made History

Robert Colby

In 1968 the mighty Oroville Dam on the Feather River in Butte County made the list of the World's Greatest Dams when it was completed at a height of 770 feet. This giant structure, a multipurpose dam envisioned in the 1920s as part of the Central Valley Project, provides flood control, water storage, hydroelectric power generation and recreation. Oroville Dam is the highest in the United States, some 35 feet higher than Hoover Dam on the Colorado River and 170 feet higher than Shasta Dam on the Sacramento River. The volume of earth fill in the dam is 80,000,000 cubic yards, making this the third largest earthfill dam in the United States. The reservoir has a capacity of 3,537,577 acre-feet and its hydroelectric power plant is capable of generating 819,000 kilowatts of electricity. In design and construction, the Oroville Dam was a world-class engineering project.¹

Forty two years earlier another earthfill dam was built on a small tributary of the West Branch of the North Fork of the Feather River about 33 miles North of Oroville Dam. This was the Philbrook Dam located in the High Lakes country of Butte County. It also made construction history because of the speed with which it was built and because it was the first earthfill dam built entirely by mechanized equipment and without the use of horses and mules. Of equal significance is that it was a major stepping stone for two men, Henry J. Kaiser and Robert G. LeTourneau, both on their way to becoming icons of American Industry. Their lives are American Horatio Alger stories. Contemporaries often thought them crazy, and both did what others considered impossible. They thought big and did things on a grand scale.

Henry J. Kaiser left school in 1895 at age 13 to help support his family by working in a dry goods store. Interested in photography, he sold photographic products and soon owned his own photo shop. Kaiser came west in 1906. He be-



Henry J. Kaiser, weary and unshaven at Hoover Dam, about 1932. The Bancroft Library, University of California, Berkeley.

came a hardware salesman in Spokane Washington. By 1911 he was a salesman and manager of paving contracts for a construction company. He started his own construction company in 1914. During the next 12 years his company did millions of dollars of highway construction in British Columbia, Washington, Idaho and California. Kaiser built a reputation for completing jobs with remarkable speed and at a lower cost than his competition.²

Robert G. LeTourneau always considered himself a mechanic first. After leaving public school in 1902, his technical education was re-



Robert G. LeTourneau at the Santiago Creek Dam, Orange County, California in 1931. He was general contractor on this job and his telescopic scrapers meant the difference between finishing the job on time or not at all. Western Construction News.

ceived on-the-job and from correspondence schools. At age 14, his first job was an iron molder. He later became an automobile mechanic, electrical machinist and a welder eventually owning his own garage in Stockton, California. He got into the earth moving business rather by accident when he repaired an early scraper. It was obvious to LeTourneau that this device left a lot of room for improvement. These early scrapers, were of heavy, riveted construction, operated by belts, gears and levers and required two men to run them. LeTourneau then designed, built and operated scrapers with "light," welded construction. They were powered by electric motors run by a generator on the towing tractor. Only one man was required, the tractor driver who operated the scraper from electrical controls next to his seat. LeTourneau's scrapers were more reliable and efficient; they could move dirt faster than the machines that preceded them. They were the forerunners of the giant earth movers that we see today.³

When Kaiser first saw LeTourneau's scraper in action, he knew that here was a machine to "make big jobs small." Kaiser was 44 years old and LeTourneau was 38.

Cattlemen and Miners

Years before anyone thought of the Philbrook Valley as a reservoir site, it was a summer pasture for cattlemen from the Sacramento Valley. We do not know who first ran cattle in the valley,

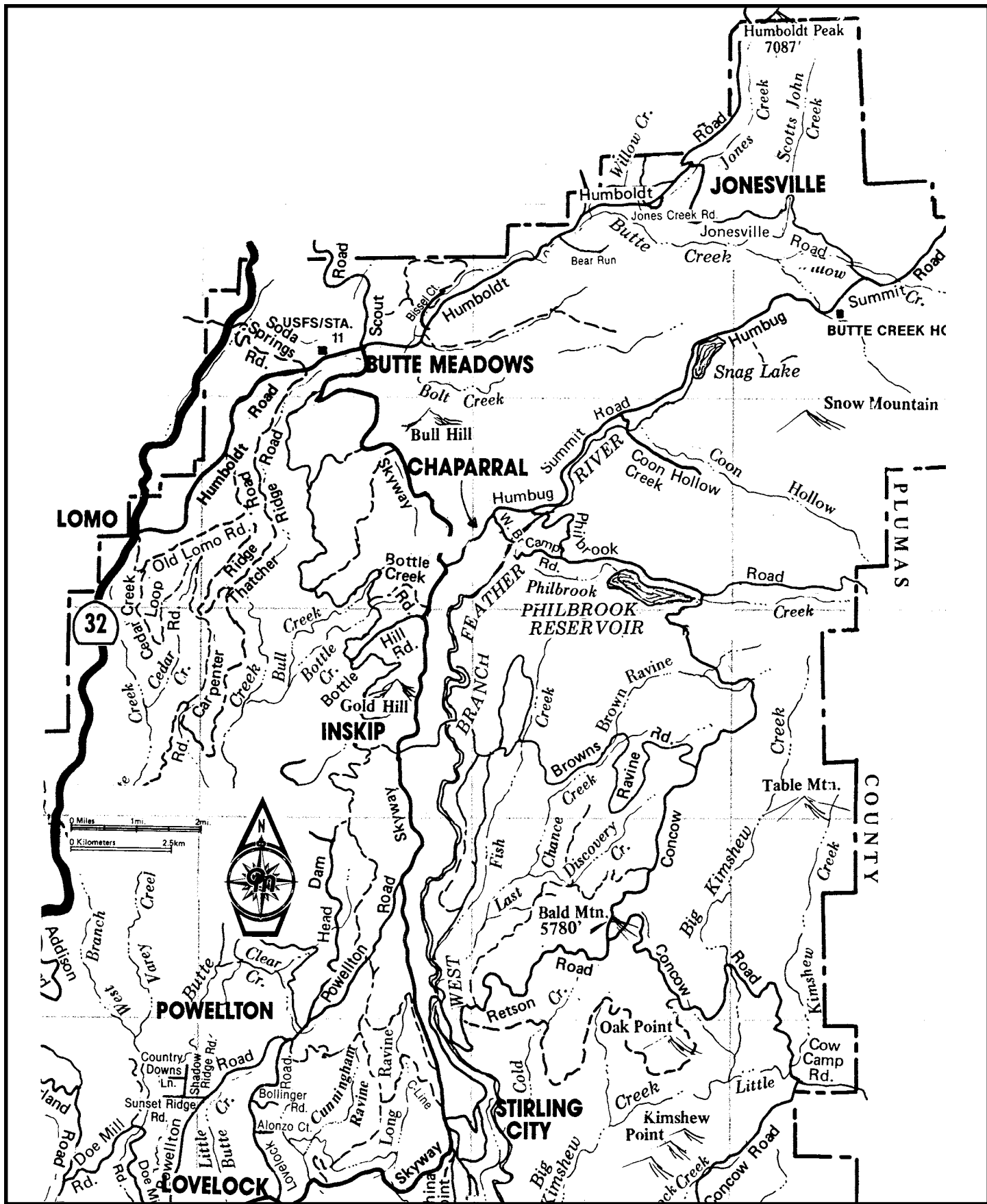
but Alonzo K. Philbrook and his wife Eliza were certainly among the first to do so, probably as early as 1857. They had a small ranch along Mud Creek, north of John Bidwell's Rancho Chico. By 1860 they were driving eighty head of cattle up Neal Road, that had been opened in 1852, through Dogtown and then up the Humbug Road to Powell's Ranch and the mining camp of Inskip. They followed the Humbug Summit Road for about a mile past Chaparral House. Then they turned to the east, crossed the West Branch of the Feather River and climbed the ridge into the valley that would be named after them.

The Philbrooks left no direct evidence that they pastured their cattle in the valley, but it is the best pasture for miles around. They apparently built no cabin in the valley, but operated out of their camp wagon. The fact that the valley and the creek that runs through it into the West Branch are named Philbrook is reasonable evidence that they did.

Smith and Ball built Chaparral House, a large, two-story hotel, in 1857. In the summer of 1860 John H. Smith asked the Philbrooks to manage the inn.⁴ They accepted and this gave them a headquarters convenient to their summer range. In 1866, the *Butte County Great Register* lists Alonzo K. Philbrook, age 36 from Louisiana as a hotelkeeper at Chaparral House. They managed Chaparral House and summered their cattle in the area through 1867. Sometime before the summer of 1868 they sold their ranch on Mud Creek and moved to Santa Clara County.⁵

Undoubtedly there were other cattlemen who used the Philbrook Valley as their summer range, but until 1877 no records have been found. In that year Christopher Lynch, a rancher from Cherokee, drove his cattle up the Oroville-Susanville Road (now Pentz Road) to Neal Road and Magalia (formerly Dogtown). From here he followed the same route that the Philbrooks had taken to the valley. Lynch ran cattle in the valley until the first dam was built in 1909. George Peterson, Christopher Lynch's grandson was first taken there in 1906 when he was three years old and eventually spent no less than 70 summers at Philbrook. He remembers the valley as a beautiful place with the stream from which he caught many trout.⁶

The Terrill, Crowell, Jones and Frank fami-



Philbrook reservoir and vicinity. Note that Skyway was Neal Road below the intersection with Powellton Road. Modified from Compass Maps Butte County Street and Road Atlas, 2000 edition.



Christopher Lynch built this cabin in the Philbrook Valley about 1877. It was along the creek about a quarter mile above the site of the current dam. This photo was taken about 1906. Alan Knotts.

lies also ran cattle in the valley. The Terrills also had a store with a hotel on the second floor. It was an unofficial post office for the ranchers and miners in the area. The building was on the site of the present dam.

Undoubtedly miners had been prospecting on the ridges and mountains surrounding the valley since the Gold Rush, but probably did not make any finds worth the difficulties in mining in the High Lakes country. However, by the late 1800s and early 1900s perhaps 80 to 100 miners were working at in such mines as the Lott, Carr, Westcott, Sky High, Butte King and Butte Queen as well as numerous one-man operations.⁷ The Carr Mine was the last major operation and it shutdown in the 1990s because of environmental concerns.

Before the Dams

The 1926 dam that Kaiser and LeTourneau constructed was not the first dam in the Philbrook Valley. In 1908, Oro Water, Light and Power Company constructed an earthfill dam across the West end of the valley. The idea for a dam in the Philbrook Valley had its genesis back in 1890. But, to really understand how it all

started, we have to go back to 1875 and the era of hydraulic mining.

In February 1875 two partnerships, Davis and Wells and France and Glass, claimed 3,000 miners inches of water from the West Branch of the Feather River. They built the Davis and Company Ditch with a diversion dam on the West Branch just below Magalia. The ditch carried water down the west wall of the canyon and out to mines at Dry Creek in the area southwest of the community of Pentz.

By 1880 the Miocene Mining Company owned the ditch and water rights. The ditch was extended around Table Mountain to the Miocene Mine at Thompson Flat on the southeast side of the mountain. Renamed the Miocene Ditch, both it and the water rights were deeded to the Table Mountain Water and Irrigating Company, a subsidiary of the mining company. The Miocene Mine was quite lucrative, but in 1887 the State of California obtained an injunction against the company stopping discharging or dumping the tailings from the mine into the Feather River. This virtually ended hydraulic mining in Butte County except for the Spring Valley Mining Company at Cherokee, which purchased the land on which the tailings were dumped.

However, in the late 1880s horticulture boomed in the county and the miner's ditches provided water for agriculture as well as to developing municipalities. In 1886, the Oroville Citrus Association was formed and commercial agriculture began in earnest. The Southern Pacific Railroad owned land north of the Feather River near Oroville and proposed the Thermalito Citrus Colony, the first irrigation colony in Northern California. With the Miocene Mine closed, the market for the 3,000 miners inches of water from the Miocene Ditch dried up. The Thermalito project provided a timely and convenient solution to the problem and so water was supplied from the Miocene Ditch.

Frank McLaughlin (famous for his mining enterprises including diversion of the North Fork of the Feather River to mine its bed), Oroville banker E.W. Fogg and State Senator A.F. Jones actually founded the Thermalito Colony in 1887. By 1890 they controlled nearly all of the West Branch ditch systems. They hired a respected California engineer, William Hammond Hall, to

prepare a report on the potential of their irrigation enterprise. One of his recommendations was to construct a large reservoir in the Philbrook Valley. Nothing came of his recommendations as the Thermalito Company was by then in financial and legal difficulties.⁸

“Havoc on the West Branch”

Hall’s recommendation lay dormant for 19 years until 1908 when the Oro Water, Light and Power Company constructed an earthfill dam at the West end of the Philbrook Valley. It is not known if this was a result of Hall’s recommendation, but by then a major purpose of the dam was to supply water for hydroelectric power generation along with the water for agricultural and domestic use. As was the custom of the times, the dam was constructed by men with hand tools and horse and/or mule drawn Fresno Scrapers.

At the West End of the Philbrook Valley is a knoll. According to George Peterson, this first dam closed the valley to the south of this knoll. The saddle north of the knoll was not closed. Thus the 1908 dam was lower than the 1926 dam. The earth abutments were visible for years and were about 50-feet high. He also says that the base of the dam was maybe three city blocks in area.⁹

In January 1909, the *Oroville Mercury* and

Oroville Daily Register ran stories of the exceptionally heavy rains and snow. “The Feather River reached a twenty-four feet and six inches, which was four feet below the high-water mark of 1907.”¹⁰ The flood of 1907 washed out major bridges on the Feather River and inundated Oroville.

On Saturday, January 16, 1909 the *Oroville Daily Register* ran the headline, “Philbrook Dam Out – Havoc on the West Branch.” The story that followed states that at 1 A.M. that morning, the dam failed releasing 90,000,000 cubic feet (2,066 acre-feet) of water into the West Branch. “The water came down in a solid mass, reaching ten feet above the highest level and carrying everything in the way with it.” The Diamond Match Company and Valley Counties Power Company dams above Stirling City, along with the Oro Water, Light and Power Company Miocene Canal Diversion Dam below Magalia were washed out. Loss of the Miocene Canal dam was especially serious for Oroville as the canal brought water to the city and to the hydroelectric power plants that supplied electricity to the city. Every bridge on the West Branch was swept away including the one at Whiskey Flat below Magalia, the covered bridge at Nelson Bar and the one near Vinton Gulch. Apparently one of the wooden bridges floated past Oroville. However, the dike built to protect Oroville after the 1907 flood did its job.



These photos taken on July 15, 1909 show the effects of the January failure along Philbrook Creek below where the dam stood. The man in the right photo may be Ed Ward. Paradise Historical Society (Gladys Semrau).



The wooden, covered bridge across the West Branch of the Feather River at Nelson Bar. It was washed away when the first Philbrook Dam failed in January 1909. Paradise Historical Society (William C. Lesson).

Archie Nesbit was quoted in the article. “He states that he was informed by those in charge of the dam that the basin was filled to its fullest capacity at 4 o’clock on Thursday afternoon and that the dam was swept away between 12 and 1 o’clock.” The article goes on to say that Oro Water Light and Power Company officials “... were at a loss for an explanation for the catastrophe. The dam lay close to the summit of the Sierras and the site was considered an admirable one. The structure was completed during the latter part of the summer and engineers considered it amply strong enough to withstand the pressure of the water that it impounded.”

As far as the author knows, the cause for the dam failure was never really determined. In those days, there was no California Division of the Safety of Dams to investigate. Speculation as to the cause of the failure started within days. Without giving the source, the *Oroville Daily Register* on January 19 reported. “Although the details of the Philbrook Valley accident are still meager, it was stated yesterday that the spillway was the weak point in that dam. The carrying capacity of the spillway was found to be too small and the water slopping over weakened the dam and finally caused its destruction.”¹¹

In the 92 years since the failure, various other reasons have been put forth. They include: the dam was completed very late in the year thus

some of the fill was partially frozen. There was no concrete spillway so when the water reached the top it simply washed the dirt away. There was no drainage pipe in the bottom of the dam to help control outflow of the water. There was no compacting of the dirt nor did the dam have time to settle before it was filled to the brim.

After the Failure

Between the failure of the first Philbrook Dam in 1909 and the construction of the Pacific Gas & Electric Company (PG&E) dam in the latter half of 1926, the Philbrook Valley returned to its idyllic state. Again cattle were pastured there during the summer, this time by the Van Gooden family.¹²

By 1917 PG&E had acquired all the rights to the ditches, water and land owned by the various companies that had developed the West Branch for mining and then generation of hydroelectric power. The company was certainly aware of Hall’s recommendations and the 1909 dam failure and sent their own engineers to investigate the site. PG&E eventually purchased property in the valley and in 1925 filed an application with the State of California to build a dam on Philbrook Creek to supply water for their hydroelectric powerhouses in the DeSabra-Centerville Project.¹³

During this same time period, the Kaiser Paving Company was paving highways in California.¹⁴ On September 6, 1924 Kaiser was awarded the contract to build the Gordon Valley Dam. This, his first dam, was in the Vaca Mountains of Napa County. It created Lake Curry Reservoir to supply water to Vallejo, California. The earthfill dam contained approximately 300,000 cubic yards of material and cost \$310,000. It took 17 months to build, from September 1924 to January 1926. Kaiser built it right because in 1927 a “thirty year flood” did little damage to the dam.¹⁵

In building the Gordon Valley Dam Kaiser used some animal-powered equipment. The state-of-the-art in construction equipment was such that horses and mules still pulled bottom-dump wagons and scrapers. When he started the Gordon Valley job, Kaiser apparently had heard little or nothing about LeTourneau’s tractor-drawn, electrically-powered scraper. At the

time, LeTourneau was a locally known mechanic and small earth moving contractor operating out of Stockton, California.

Fresnos and Scrapers

Generally speaking, these devices, sometimes called earthmovers, are not designed to dig up hard ground, but to move dirt that already has been turned or ripped up. To really understand the significance of LeTourneau's new electric-powered, telescopic scraper and why it was so important in building the Philbrook Dam, we must look at what preceded it.

The simple dirt moving device known as the Fresno Scraper was invented about 1880. It is said that the Fresno has moved more dirt than gossip ever did and it is considered to be second only to the wheelbarrow in earth moving history. Dragged by one to four horses or mules, the Fresno is a flat bucket, three to five feet wide, with a cutting blade on its forward edge. It is dragged on its bottom and manually operated by a lever. The operator tilted the blade down into the earth to fill the bucket. When full, he tilted it upward to a horizontal position and the bucket was dragged with its load of dirt to the dumpsite. Then men with shovels had to smooth out the dirt.



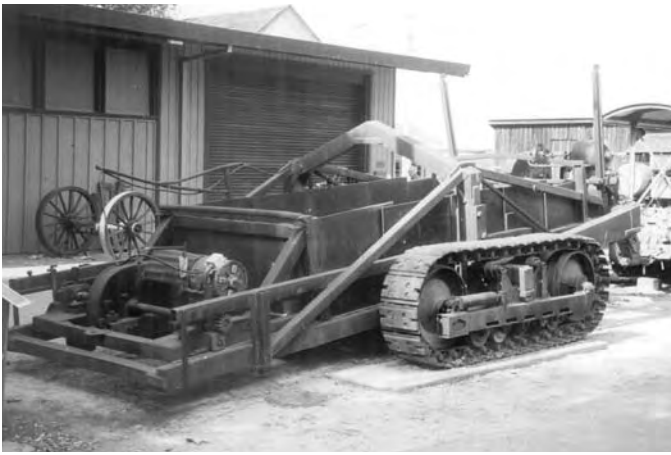
A two-horse drawn Fresno Scraper at work building the Magalia Dam sometime after 1916. The man in the foreground is driving the team while the man next to him uses a loop-shaped lever to tilt the scraper blade into the ground. This was state-of-the-art in those days. Paradise Irrigation District.

Scrapers that followed the Fresno were mechanically operated and partially supported by wheels. They were patented about 1910. Very heavy machines of riveted and bolted construction, they were manually operated by cables, clutches, gears and levers. One man operated the scraper and another handled the teams of horses or mules or later, around 1911, drove a tractor. The load of dirt still was dragged on the ground and handwork was required to smooth the surface after it was dumped.

In 1920 Robert LeTourneau was using one of these early tractor-drawn scrapers on earth moving jobs. He saw how it could be improved by using an electric motor as the power source. A generator powered by the tractor engine supplied electricity to the motor and the tractor driver operated the scraper through electrical switches next to his seat. In 1922, he designed and hand-built his own scraper that was pulled by a tractor and powered by motors from electric automobiles. Not only could it be operated from the driver's seat of the tractor, it partially lifted the bucket off of the ground. Thus tractor and scraper could move somewhat faster.

A major problem of all scrapers of the time was that of forcing several cubic yards of dirt into the bucket. The friction caused by the dirt already loaded into the bucket increased dramatically as more dirt was pushed into it. This greatly reduced the speed of the scraper and its carrying capacity. LeTourneau saw the answer to this problem in a collapsible aluminum cup. In 1923 he designed and built a scraper with two telescoping buckets that fit inside each other. He called this machine the "Mountain Mover." In 1923 he also built the first self-propelled, telescopic scraper in which each wheel was powered by an electric motor within the wheel. Thirty-five years later, the electrically powered wheel would become standard on all LeTourneau scrapers.

By 1925 he had designed the first all-welded, tracked, telescopic scraper. Empty, there are five buckets stacked together that appear to be one laminated bucket approximately 7-feet wide, 3-feet high and 3-feet long. Using reversing switches next to the tractor seat, the driver lowers the buckets into the ground. As the scraper moves forward, the fifth bucket is loaded is moved to the rear on gears. As it moves rear-



Another view of LeTourneau's telescopic scraper behind a Caterpillar™ Sixty tractor at Micki Grove Park. The five buckets are in the fully loaded position. The electric motor and gear mechanism that moves the buckets is visible behind the fifth bucket. Author.

ward, the front of the fifth bucket engages the rear of the fourth as it is filled and moves to the rear with the fifth. In sequence the other three buckets filled in like manner until all are loaded. When fully loaded, the scraper appears to have one bucket that is 15-feet long. To unload, the buckets work in reverse with the fifth bucket moving forward to push the dirt in the fourth bucket that pushes the dirt in the third and so on until the load is dumped. The raising and lowering of the scraper blade and the telescoping of the buckets were powered by electric motors run off of a generator on the towing tractor. The unit was mounted on tracks making it possible to traverse almost any kind of ground surface. It was pulled by a 60-horsepower, Caterpillar™ tractor and 10-yards of dirt could be loaded in less than a minute. With the loaded bucket(s) lifted off the ground, the tractor could travel at its highest speed. The result was revolutionary, a high-capacity, relatively fast moving scraper, operated by one man, that left a smooth surface behind it. It was the first modern earth-mover.¹⁶ Four of these “telescopic scrapers” made it possible to move some 169,000 cubic feet of material and complete the Philbrook Dam in less than five months.

“A Big Dam Job”

In 1925 while Kaiser was still building the Gordon Valley Dam, Robert LeTourneau won a contract to construct the Crow Canyon highway between Castro Valley and San Ramon, California. One reason he bid contracting jobs was to test and demonstrate his newest design. He may have won this bid because nobody else wanted it, due to the difficult terrain and exceptionally hard ground. Experts figured that it would take three years to complete the job. With his telescopic scraper and other equipment of his design, LeTourneau completed it in a little over six months.

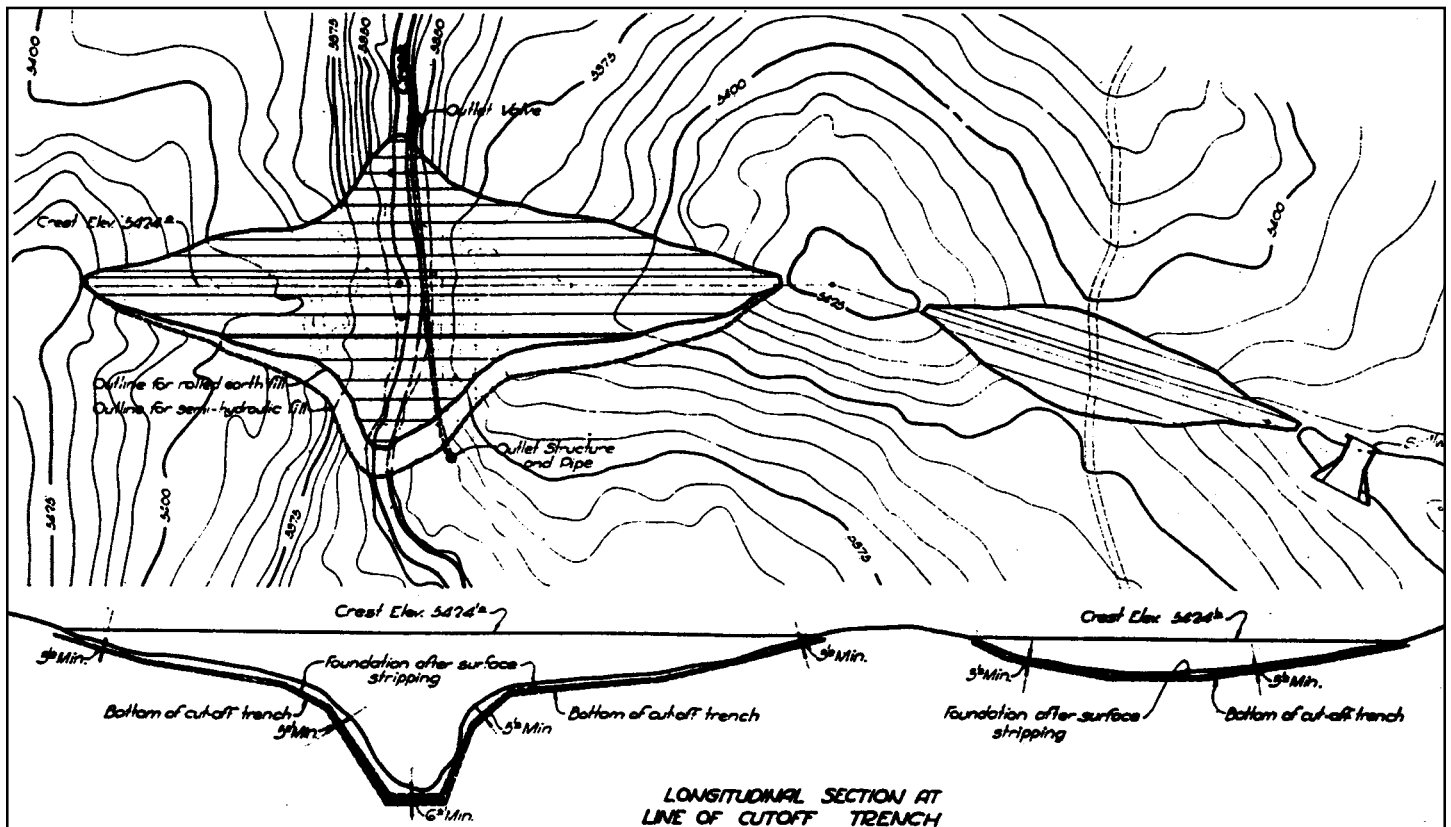
He was on site one day when one of his foremen came up and said: “Henry Kaiser is down there watching your big scraper work.” LeTourneau went down to talk to Kaiser who wasted no time in saying: “That’s quite a machine you’ve got there.” The next thing LeTourneau knew, Kaiser offered to buy three of the telescopic scrapers for cash. Kaiser was the first man to see his machines not just as gimmicks, but as tools to make big jobs small.

Sometime later Kaiser told him: “There’s a big dam job up in the High Sierras near Philbrook. I’ve been figuring on it, but I don’t see how I could tackle it without tying myself up for a couple of years. With those scrapers of yours, we can put that thing in like a boy damming a gutter. How about you coming along to see that they work.”¹⁷

Under Contracts Awarded, the July 10, 1926 edition of *Western Construction News* carried the following announcement: “Dam in Plumas County, Calif., for Pacific Gas & Electric Co., to Kaiser Paving Co., Oakland, Calif., \$250,000.” Based on the use of LeTourneau’s scrapers, Kaiser bid the job at a cost significantly less than if he had needed two years to construct the dam without them. The dam is actually in Butte County at an elevation of approximately 5400 feet. It is in the Northeast quarter of Section 13, Township 25 North, Range 4 East.¹⁸

The Dam(s)

The Philbrook Dam is not one, but two adjacent dams. The main dam is about 87 feet high and 850 feet long. It lies across Philbrook Creek and is on the site of the failed 1909 dam. About



Engineering drawing of the Philbrook Dam(s) showing both plan and longitudinal views. Western Construction News.

170 feet to the north, across a small knoll and in a topographic saddle, is the smaller dam. This auxiliary dam is about 24 feet high and 470 feet long. Both are rolled or compacted earthfill dams. The capacity of the reservoir is 5000 acre feet and has a surface area of 173 acres.

At the base of the main dam is a 33-inch out flow pipe that empties into Philbrook Creek, as does the concrete spillway at the north end of the auxiliary dam. In 1940 a gated spillway was added to the auxiliary dam to increase capacity during times of high water. The dam has a core of red clay overlaid by alternating layers of dirt and glacial conglomerate most of which came from the meadow above the dam. The upper part of the reservoir-side of the dam is covered with rip-rap to lessen the effect of wave action. The ground surface upon which the dam is constructed is a glacial moraine deposit that is a heterogeneous mixture of volcanic boulders, cobbles and gravel set in a dense matrix of clay and silt. Under this and in the dam abutments is volcanic rock.

Among geologists there is an old and somewhat facetious saying. "If you want to find an earthquake fault, look for a dam." This is all too true in much of California and even Butte County. Witness the Paradise fault under Paradise Lake and the Magalia fault under that reservoir. But, this old saw is not true for the Philbrook Dam. The nearest known fault is the Paradise fault about 13-miles to the southwest.

Philbrook reservoir is a part-time storage reservoir. About April 1 of each year, the spillway gate is closed and flashboards are installed. The reservoir fills in the late spring from snowmelt runoff. During the summer the water is held at a consistent level and the lake is used for fishing and water sports. Around Labor Day the spillway is opened and water flows down Philbrook Creek into the West Branch of the Feather River where it is used for hydroelectric power generation and to maintain a water level consistent with environmental concerns. During the winter the reservoir usually is nearly empty.¹⁹

There is no powerhouse at the dam. About



A photo of the construction site showing some of the many pieces of equipment on the job. Western Construction News.

8-miles down stream the Hendricks Diversion Dam diverts water into the Hendricks Ditch (canal). This miner's ditch, dating back to 1868 and upgraded by PG&E, directs water down the ridge to the Toadtown Ditch, through the Toadtown Powerhouse to join with the Butte Creek Ditch just above DeSabra Reservoir. The reservoir is the forebay for the DeSabra and Centerville Powerhouses in Butte Canyon.

Still further down the West Branch below Magalia, water again is diverted, this time by the Miocene Canal Diversion Dam. Water from this canal operates the Lime Saddle Powerhouse lower in the canyon and the Coal Canyon Powerhouse on the western slopes of Table Mountain. The water then flows around the mountain for use by the city of Oroville.

On the Job

Kaiser was awarded the contract in June 1926 and his men started work on June 23 and completed it before November 1 of that year. This was just over four months! Such speed was unheard of and in large part it was due to LeTourneau's "Earth Movers." One hundred and fifty men and over \$150,000 worth of mechanized equipment were used. The men worked two 10-hours shifts, at night under lights powered by a portable lighting plant. J. J. Little was Kaiser's resident superintendent.

Kaiser started with three, 10.5-yard telescopic scrapers and later added a fourth. Other

equipment included: ten 60-horsepower and one 30-horsepower Caterpillar tractors, six Mack 5.5-yard dump trucks, ten Fordson tractors with sheepsfoot steel wheels (for compacting the fill), six 7-yard dump wagons, two Northwest gasoline-powered shovels, one large and one small roadgrader and a deep subsoiler (to rip up the hard ground for the Letourneau's scrapers to move). There also were service and freight trucks, welders, pumps and a complete shop with all the tools and equipment necessary to maintain all of this machinery.

And then there were all the tents, stoves, bedrolls and myriad pieces of equipment, supplies and food to maintain 150 men in the field. However, there were no horses nor mules nor the feed to maintain them nor the wranglers to handle them; this was a first in dam construction!²⁰

Besides the scrapers, the deep subsoiler and the heavy grader were LeTourneau's. Of course, both units were powered by electric motors controlled by the tractor operator. He went along with his machines, taking with him his key men who had been added to Kaiser's payroll.²¹

This was a lot of equipment to be used for a fixed-fee contract of just \$250,000. But, Kaiser wanted to set a record and also knew that if the dam was not completed before winter the cost of maintaining the partial fill through the winter and resuming the work in the spring would be excessive. He also knew of the 1909 disaster.

All this equipment moved over the Southern Pacific's Butte County Railroad from Chico to Stirling City. It then was hauled and driven the remaining 15 miles up to the Philbrook Valley. The *Oroville Daily Record* states: "A road is now being constructed by the Pacific Gas and Electric Company to the scene of the dam site."²² Apparently PG&E actually was improving the old cattle and later wagon trail used by the cattlemen and miners. A wood bridge crossed the

West Branch near where the Forest Service West Branch campground is today and zigzagged up to hill on a section known as "the ladder." The road and concrete bridge used today to reach the Philbrook area was constructed by Diamond Match Company in the 1970s.²³

Robert LeTourneau in his autobiography, *Mover of Men and Mountains*, gives a vivid description of the work on the dam. "The Philbrook Dam was a milestone in the engineering business and in my life. It was

the first major project in which the new broke entirely away from the old. There was not a mule on the site. We were still using men with shovels and pick axes for clean-up work, but the heavy labor was done with power shovels, mechanized dump trucks and, in the starring role, my scrapers. From the start it was clear that nothing short of an earthquake would stop us from setting an all-time record in dam building.

"For my part, I was getting lessons from a master organizer. At onetime we must have had 1,000 men on the job, with some crews working on digging and others on hauling, and some on concrete mixing, and others on 57 varieties of odd jobs. Kaiser had that big job timed to perfection. More, he knew how to get along with men even when the men didn't know how to get along with each other." (Note that *Western Construction News* states that there were 150 men on the job. Ed.)

LeTourneau goes on to say: "The speed with which



Two views of the telescopic scraper at Philbrook Dam. The one in the top photo appears to be dumping its load of dirt while the one in the bottom photo is scraping up a load as is evident from the smooth trench behind it. The Bancroft Library, University of California, Berkeley.



we completed the Philbrook Dam astonished the construction world. Kaiser was swamped with offers of even bigger jobs. He came to me as we were getting the machines ready to move out. We had that big dam up there and the water was already backing up behind it, and I suppose I was feeling like a graduate student is supposed to feel when he looks back on his college for the last time. 'Your machines did the trick, Bob,' he said. 'I'll be needing a lot more of them. How about selling me the patents?'" LeTourneau sold Kaiser the patents along with the machinery to build scrapers. Kaiser then hired him to setup a factory to build scrapers in Oakland.

As long and hard as the work was, there were some times when things got downright humorous. LeTourneau tells of one such instance. "That was rough country up there. I remember the first night we camped out near the edge of the timber and were invaded by a couple of big bears. We had been assembling some of the machines that had been taken apart for shipment, leaving a lot of small parts and tools around when night caught us. When those bears came, we went right through there, heading for the tall timber and some of those parts we never did find. Bill Wickman, one of my foremen, saved our beds and grub for us with a bit of quick thinking. He jumped into a Ford truck and with lights blinking and horn blowing, went to the rescue. By the time he had chased those bears over the rocks and through the underbrush, I am sure they were never the same again. Neither was the Ford."²⁴

George Peterson recalls that he spent much of the summer of 1926 watching all those men and machines at work on the dam. He desperately wanted to go down to the job site, but 10-year old boys were definitely not welcome. Fishing in the creek above the dam was gone, but in later years it was good below the dam. And while the Philbrook residents had neither choice nor say in the building of the dam, they benefited from the lake that formed behind it. George especially remembers the aquaplanes and later water skis; he was an expert on both.²⁵

A Not So Slight Distraction

On September 23, midway through the construction job, the Coon Hollow Fire started near



It was at Philbrook the boys used to chase wild animals with their car lights. One night they got a bear in their lights, chased him round and round, finally between the legs of the night grade foreman's horse. Grade foreman landed on grade.

A cartoon illustrating the "bear incident" at Philbrook Dam. It appeared in NOW, the LeTourneau Company magazine in 1944. LeTourneau, Inc.

Snag Lake, some five miles to the north. Possibly caused by hunters and driven by a strong east wind it burned southwestward toward Chaparral House. By September 25 it burned over Bull Hill and turned toward Butte Meadows. Two hundred men were on the fire and it was nowhere near under control. Magalia District Ranger Frank B. Delaney was fire boss and desperately needed men on the line as the fire threatened the small community. Butte Creek flows between Butte Meadows and Bull Hill and a backfire was started at the edge of the creek, that burned up the hill, preventing the fire from jumping the creek.

By September 27, the danger to Butte Meadows was past, but the fire turned back to the Northeast and threatened Jonesville. According to the *Oroville Mercury*, the area of resort cabins "... was for two days in danger of being wiped out. "At one time the flames were within ten feet of a cabin owned by Don Bird of Chico,

but a crew of forty men was successful in saving the property.”

On September 29 rain began to fall and the fire was under control. It had burned about 18,000 acres of which 11,800 were National Forest. It was the largest fire in Butte County to that time and cost \$10,000 to suppress.

Four hundred men had been on the fire line including a crew from Plumas County and men from the Diamond Match Company. Typically, there were not enough men for the job at hand. In those days to get enough firefighters, men often were conscripted. The *Oroville Daily Record* said: “To meet the emergency the Chico police are holding all idle men and vagrants. They have to choose between fire fighting and spending the time in jail.” They also noted that “Joe Plmental refused to fight fire yesterday when requested to do so by a police officer and that being the second refusal in two days, he was locked up in a cell at the police station to think it over.”

The shortage of men to fight the Coon Hollow Fire affected dam construction. As the fire burned toward Chaparral and over Bull Hill it was less than three miles to the west of the job site. The nearness must have been of concern to Kaiser and his men. Then rangers asked for men on the job to volunteer. The *Oroville Register* states; “(Ranger) Delaney said that it was necessary to conscript several men employed by the Kaiser Construction Company who are working on the Pacific Gas and Electric Company dam, when they refused to work voluntarily.” Whatever the reason, Kaiser was on a very tight schedule and was probably not pleased to lose men to fight the fire.²⁶

Icons

Philbrook Dam was a major milestone in the careers of Henry J. Kaiser and Richard G. Létourneau. Between 1927 and 1930 Kaiser’s companies constructed \$20,000,000 of highways in Cuba and built miles of levees on the Mississippi River. From 1931 to 1936 Kaiser was Chairman of the Executive Committee for The Six Companies and directed the construction of Hoover (Boulder) Dam on the Colorado River. A job of this magnitude had never been attempted before. Over 4.5 million cubic yards of concrete



Henry J Kaiser in later years. Current Biography Yearbook.

were used, more than the U.S. Bureau of Reclamation had used in all previous federal jobs.

Kaiser set up subsidiary corporations and affiliates as he needed them and by 1960 he had over eighty. In 1934-38 one of these affiliates built Bonneville Dam on the Columbia River and in 1939-42 another built Grand Coulee

Dam 350 miles further up the river. Losing his bid to build Shasta Dam in California, he won his bid to supply concrete. He built a plant to make concrete and supplied 24 million bags to the job while astounding skeptics by building a 10-mile conveyor to carry aggregate to the job site. His concrete plant then supplied most of the concrete used by the military in the Pacific Theater during WW II.

During the war, Kaiser Shipbuilding built fifty small aircraft carriers and 1,490 cargo ships, one third of the entire wartime merchant fleet. An interesting sidelight is the fact that Howard Hughes’ infamous Spruce Goose was the result of Kaiser’s imagination. Axis submarines were sinking merchant ships almost as fast as they could be built and Kaiser suggested that a fleet of 5,000 huge aircraft could carry the cargoes without the risk. He also built steel, aluminum and magnesium plants, becoming the largest steel producer on the West Coast.

After the war he built aircraft and missile components, kitchen and bathroom fixtures and C-119 cargo aircraft. In 1946 he entered the auto business making the Kaiser-Frazer car and later Jeeps. From 1950 through 1960 his companies built houses, hotels and office buildings. The Kaiser Permanente Medical Care Program, an idea that started as a way to provide health care to his workers as far back as 1939, came of age to become the first HMO.

Kaiser passed away in 1967. By the year 2001, without his forceful leadership and ex-

traordinary vision, Kaiser's industrial empire has mostly disappeared. Perhaps his most lasting monuments are the dams he built that will provide electricity, irrigation and recreation for centuries.²⁷

Robert G. LeTourneau's genius was in design and manufacturing. Before the Philbrook job he had sold Kaiser his patents on the telescopic scraper. After the job, Kaiser hired him to build a facility in Oakland to manufacture these scrapers. About a year later, he returned to his Stockton facility to design and manufacture even better earth moving equipment. He also returned to the dirt moving business partly to test and demonstrate his machines. In 1931 he won the bid to construct the Hoover Dam Highway. He "lost his shirt" on this job as the rock was so hard that he could not use his rippers and had to be dynamited before it could be moved. Later that year, he built a dam on his own, the Santiago Creek Dam in Orange County, California. In 1932 his scrapers were the first to use rubber tires, an innovation that soon was to become an industry standard.

In 1932 he was the first to use rubber tires on any earth moving equipment, an innovation that soon was to become an industry standard. By 1935 he had outgrown the Stockton facility. He opened a plant in Peoria, Illinois to produce scrapers, heavy grading equipment, tractors and bulldozers. By WW II he was one of the larger manufacturers of such equipment in the country, supplying nearly 75 percent of all earth moving equipment used by US armed forces during the war.

In LeTourneau's obituary the *Longview Daily News*, called him "..... an internationally known inventive genius who built an industrial empire with a slide rule in one hand and the Bible in the other...." Coming from a religious family, from the beginning he ran his business on Christian principles, considering God his partner. While in Peoria, he was asked to speak about his business to the Peoria Chamber of Commerce. Several ministers were in the audience who later asked him to speak to their congregations. Throughout the rest of his life, he traveled hundreds of thousands of miles to speak to people about religion and this while inventing new earth moving equipment and running his com-



Robert G. LeTourneau in later years. LeTourneau University.

panies. He eventually donated 90 percent of his stock and income to the LeTourneau Foundation that he founded to support religious activities around the globe.

He established plants in Georgia, Mississippi, Texas and Australia. Along with his

wife, Evelyn, he also started the LeTourneau Technical Institute that became LeTourneau University. In 1953, he sold his manufacturing business to Westinghouse Air Brake Company with an agreement that he not build earth moving equipment for five years. But, this did not stop LeTourneau from inventing and manufacturing other heavy equipment including offshore drilling platforms, an Arctic snow train, a jungle tree crusher, a landing craft retriever and missile handling equipment. When the agreement expired, he was back designing and building earth moving equipment.

Robert LeTourneau passed away in 1969. Today LeTourneau, Inc. still operates in Vicksburg, Mississippi, where they build the world's largest offshore, jack-up oil drilling platforms. And in Longview, Texas, they build a number of machines including the world's largest loader that is equipped with a bucket that holds 53 cubic yards of rock.²⁸

Thus Philbrook Dam in remote Butte County is not just another earthfill dam. In a major sense, it was the jumping-off place for two self-made, dynamic leaders of American industry. With them passed the age of the individual industrial entrepreneur.

Endnotes

¹ *Oroville-Thermolito Complex*. California Department of Water Resources, Sacramento, CA.

² *Henry J. Kaiser, Builder in the Modern American West* and *Henry J. Kaiser, American Colossus*.

³ *Mover of Men and Mountains*.

⁴ *Maggie Greeno*: pg. 71-79, 167 and 172.

⁵ *Butte County Great Register 1866*.

⁶ Personal communication: George Peterson.

⁷ *Philbrook*: pg. 17-30.

⁸ *History of the Hendricks, Miocene, Dewey and Miners Ditch Systems: Patterns of Water Development in Pacific Gas & Electric Company's De Sabla Division, Butte County, California*: pg. 12-15.

⁹ Personal communication: George Peterson.

¹⁰ *History of Butte County*: Mansfield, pg. 378.

¹¹ *Oroville Daily Register and Oroville Mercury*: issues from January 9 through January 20, 1909.

¹² Personal communication: George Peterson.

¹³ Application for Approval of Plans and Specifications for the Construction or Enlargement of a Dam and Reservoir: This undated copy of the document is part of an incomplete and undated PG&E report on the Philbrook Dam

¹⁴ *Sacramento Bee*: May 7, 1924, *Henry J. Kaiser, Builder in the Modern American West* and *Henry J. Kaiser, Western Colossus*.

¹⁵ *Western Construction News*: "The Gordon Valley Project," January 25, 1926, pg. 15-19 and "The Gordon Valley Dam," May 25, 1927, pg. 49-51.

¹⁶ The preceding paragraphs are based on: *Mover of Men and Mountains, Tools of the Earth Mover, ARBA Pictorial History of Roadbuilding, The LeTourneau Legend, Engineering News Record, Western Construction News (Dec. 10, 1926)* and *Peterson Tractor Company, The First Sixty Years*.

¹⁷ *Mover of Men and Mountains*: quotes used with permission from pg. 141-145.

¹⁸ United States Geological Survey, Jonesville Quadrangle Topographic Map.

¹⁹ Untitled and dated PG&E report on Philbrook Dam.

²⁰ *Western Construction News* issues of Oct. 10, 1926, Dec. 10, 1926 and Jan. 10, 1927 were sources for the forgoing paragraphs.

²¹ *Mover of Men and Mountains*: quote used with permission from pg. 145.

²² *Oroville Daily Record*: "Philbrook Dam Construction started by PG&E Company," June 24, 1926, pg. 1.

²³ Personal communication: Joyce Jones.

²⁴ *Mover of Men and Mountains*: quotes used with permission from pg. 145-147 and *NOW* magazine.

²⁵ Personal communication: George Peterson.

²⁶ The Coon Hollow Fire information is from articles in the *Chico Record*, *Oroville Daily Record* and *Oroville Mercury* from September 25 through October 1, 1926.

²⁷ The information on Kaiser is based on: *Construction Methods (1929-1930)*, *Current Biography Yearbook-1961*, *Henry J. Kaiser - Western Colossus*, *Henry J. Kaiser - Builder in the Modern American West* and *Western Construction News (Nov. 10, 1927)*.

²⁸ The information on LeTourneau is based on: *Current Biography Yearbook-1958*, *Mover of Men and Mountains*, *Western Construction News*, *The Longview Daily News*, *New York Times* and *Vicksburg Evening Post*.

Bibliography

ARBA Pictorial History of Road Building: Charles W. Wixom, American Road Builders Association, Washington, DC 1975.

Butte County Great Register, 1866: Copy at Paradise Genealogical Society, Paradise, CA.

Chico Weekly Chronicle Record: January 14, 1893, Chico, CA.

Construction Methods: "The Defense Against Old Man River," Robert K. Tomlin, 1929-1930.

Current Biography Yearbook, 1958 and 1961: Charles Moritz (editor), H. W. Wilson Co., New York, NY.

Dams within Jurisdiction of the State of California: Department of Public Works, Division of Water Resources, Sacramento, CA February 1, 1950.

Dams Within Jurisdiction of the State of California: Bulletin No. 17-67, The Resources Agency, Department of Water Resources, Sacramento, CA July 1967.

Engineering News Record: "Electric Operated 'Fresnos' and Graders of New Design," Dec. 2, 1926.

Henry J. Kaiser, Builder in the Modern American West: Mark S. Foster, American Studies Series, University of Texas Press, Austin, TX 1989.

Henry J. Kaiser, Western Colossus: Albert P. Heiner, Halo Books, San Francisco, CA 1991.

History of Butte County, California: George C. Mansfield, Historic Record company, Los Angeles, CA 1918.

History of Butte County - Vol. 1, 1840 - 1919: Joseph F. McGie, Butte County Board of Education, 1956.

History of the Hendricks, Miocene, Dewey and Miners Ditch Systems: Patterns of Water Development in Pacific Gas & Electric Company's De Sabla Division, Butte County, California: Prepared for Pacific Gas & Electric Company by Jackson Research Products, Davis, CA 1985.

Inspection of Dam (Philbrook Dam No. 97-8): Reports for years of 1932, 1933, 1934, 1935, 1937, 1938 and 1939, State of California, Department of Public Works, Division of Water Resources, Sacramento, CA.

Inspection of Dam and Reservoir In Certified Status (Philbrook Dam No. 97-8): State of California, The Resources Agency, Department of Water Resources, Division of Safety of Dams, Sacramento, CA July 26, 2000.

Maggie Greeno: George McDow, Jr., distributed by Lahontan Images, Susanville, CA 1995.

Mover of Men and Mountains: Robert G. LeTourneau, autobiography, Moody Press, Chicago, IL 1972.

New York Times: "R.G. LeTourneau Dead at 80; Made Earth-Moving Equipment," date unknown.

NOW: LeTourneau, Inc., company publication, Vol. VIII, No. 41, February 25, 1944.

Oroville Daily Record: Oroville, CA, June 24, 1926.

Oroville Daily Register: Oroville, CA, January 8, 15, 16, 19, and 20, 1909.

Oroville Mercury: Oroville, CA, January 9, 14, 15, 16, 17, and 18, 1909.

Oroville-Thermolito Complex: (brochure) California Department of Water Resources, Sacramento, CA.

Peterson Tractor Company, The First Sixty Years: Eileen Grafton, Peterson Tractor Co., San Leandro, CA 1998.

PG&E of California: Charles M. Coleman, McGraw – Hill, New York, 1952.

PG&E report on the Philbrook Dam. The actual title and date of this report are unknown as the title page along with pages 1 and 2 are missing.

Philbrook: Joyce Jones, author published, Chico, CA 1984.

Sacramento Bee: “Pouring Concrete Begins on Highway North of Redding” May 7, 1924.

The LeTourneau Legend: Philip G. Gowenlock, Paddington Publications, Brisbane, Australia 1996.

The Longview Daily News: “Industrialist R.G. LeTourneau Dies,” pg. 1, June 2, 1969.

The Sierras, History of California: J.M. Guinn, Chapman Publishing Co., Chicago, IL 1906.

Tools of the Earth Mover, Yesterday and Today: J.L. Allhands, Sam Houston College Press, Huntsville, TX 1951.

United States Department of the Interior Geological Survey, Jonesville, California, 7 1/2-minute Quadrangle Map: USGS, Denver, CO 1991.

Vicksburg Evening Post: “R.G. LeTourneau,” obituary, date unknown.

Western Construction News: San Francisco, CA, Issues of January 25, 1926, July 10, 1926, October 10, 1926, December 10, 1926, January 10, 1927, April 10, 1927, May 25, 1927 and November 10, 1931.

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Others that helped were: Bill Anderson (*Dogtown Territorial Quarterly*), Ray Auerbach (Paradise Irrigation District), The Bancroft Library, Tom Brekeall (Komatsu), Jim Bundy (PG&E), Frank Butler, Eileen Grafton (Peterson Tractor Co.), Paula Greer (LeTourneau University), Ted Gobin, Dale Hardy (LeTourneau Inc.), Joyce Jones, Alan Knotts, Deborah Mastel (San Joaquin County Historical Society), Lois McDonald, George McDow, Jr., Bob Olsen (USFS retired), Bill Pennington (Calif. Div. of Safety of Dams), George Peterson, Dennis Philbrook, Pamela Pugh (Moody Press), Chuck Smay (Butte County Historical Society), and Elizabeth Stewart and her staff (Paradise Branch, Butte County Library).

Back then

Fast driving?

The Chico Record, Dec. 20, 1926. “Oscar Moore, Paradise butcher, narrowly escaped death Friday afternoon coming down from Magalia after having completed his route. One of the wheels to his truck came off and sent the truck sliding down the gutter. The accident occurred near Kegs Sawmill where a long straight stretch of the road encourages fast driving. Moore was going thirty miles an hour when the wheel came off and the axle of the Ford truck made a trench in the road nearly fifty feet long before the car wound up its mad careening in the gutter. Mr. Moore was not injured, though he said that he was badly scared and by fetching a plank from the mill and using it for leverage he was able to jack the car up and get the wheel back on again. The nut and the key were lost, but Moore drove a spike into the keyhole and continued home as if nothing had happened.”

Consider the hassle you would face if a wheel came off your modern Ford truck today. Not too likely that you could fix it on the spot and get on home without an encounter with the law, a tow truck driver and later a repair bill for several hundred dollars. Who says, change is progress?

Oops!

Another E.L. “Red” Sills story. You may remember that Red Sills was a “siderod” for Diamond Match Company. He supervised loading logs onto rail cars for transport to the mill at Stirling City (*Tales Vol. 39, No. 2, Dec. 1988*). This time it seems that Red had given 9-year old Fred Reger a ride on a handcar. They were rolling down the family spur to the Bull Hill Camp mess hall. Red was used to stopping the car by dragging a wood 2x4 over the ties. But, when he reached for it, the board was gone. Fred Reger had accidentally knocked it overboard. In his usual diplomatic fashion, Red shouted: “Dammit, kid; you lost our brake!” Lucky for Fred and Red that the track turned up hill and they rolled to a stop before they ran into anything. (*Harry Reger telling a tale on his brother*)

History

“There is this about history, you never know which particular ember of it is going to glow into life.”

—Ivan Doig in his novel *English Creek*.