



SAN JOAQUIN HISTORIAN

PUBLISHED QUARTERLY BY THE SAN JOAQUIN COUNTY HISTORICAL SOCIETY

Volume V, New Series

Spring 1991

Number 1

Water in San Joaquin County

Part II

A Contemporary Perspective

by Warren D. Noteware

An old English proverb states: "You never know the worth of water till the well runs dry." Over the years this maxim has been applied to many situations where we don't appreciate things that we take for granted. Now we can take it literally, because our "well" is virtually dry. Our region's reservoirs are nearly empty; Lodi Lake is barely a mud puddle; no one alive today can remember seeing Lake Tahoe's surface level any lower; and nearly every day throughout this past winter local newspapers carried articles about communities in California proposing drastic rationing and other conservation strategies.

The last article in the San Joaquin Historian was a historical perspective that dealt with the background of our county's relationship with water from prehistoric times until the present. Now that we've looked at what has happened in the past, it's time to look at what our current problems are, what is being done, and what must be done if we in San Joaquin County and throughout California are to have abundant clean

water, not just to survive the current drought, but for the future we all want for our children and our grandchildren.

The San Joaquin Historian, as its name suggests, focuses on history, and it consistently does this very well. But it's important to look up occasionally and make sure that our knowledge of history can be the basis for intelligent contemporary decisions. The decisions we make today are the foundation for tomorrow's history.

It is not the purpose of this article to suggest how we can conserve water. By now we all know what we should and should not do.

The Global Picture:

Although 1991 is a crisis year for California, our current water problem could be considered a reflection of what has been happening throughout the world. Seven years ago Sandra Postel of the Worldwatch Society wrote, "Mounting pressures are currently manifest in pervasive pollution, depletion of groundwater supplies, falling

water tables, and damage to ecological systems. Failure to heed these signs of stress, and to place water use on a sustainable footing, threatens the viability of both the resource base itself and the economic systems that depend on it. The struggle for a secure water future will not end until societies recognize water's natural limits and begin to bring human numbers and demands into line with them." Her point is that the availability of water could be the controlling factor of the world's population.

As world population grew from 1.6 billion to more than 5 billion over the last 90 years, irrigation became a cornerstone of global food security, and we now know that much of the world's current irrigation is not sustainable at present levels. This is because in many areas groundwater is becoming exhausted or too polluted to use, and many sources of surface water are now almost totally depleted.

The California Picture:

The scarcity of anything as fundamental as water is bound to cause serious hardships for many Californians. For some it will mean loss of their jobs; for many farmers it portends loss of a year's income; for some businesses it will mean greatly reduced profits. For all of us it will mean higher food prices.

With our snowpack so far below normal and our reservoirs so nearly empty, where will we get enough water to meet our needs until next winter?

Fortunately, under much of California there is still a supply of groundwater which can be pumped out through wells. This groundwater provides a dependable supplemental source, but its quantity is limited. We have depended upon this groundwater to augment our surface supplies even in normal years. In fact, Californians pump out an average of 16 million acre-feet every year, and yet only 14 million acre-feet are returned to our underground basins. (An acre-foot is the amount of water that will cover an acre one foot deep — about 326,000 gallons — what a typical family of five uses in a year.) Obviously, even with rationing and other severe

conservation strategies, our deficit will be larger this year than the average two million acre-feet.

Groundwater exists in underground formations called aquifers. Some aquifers, like the ones underneath San Joaquin County, are recharged from subsurface springs which bring in water from the snowpack in adjacent mountains, and if we can reduce our pumping from wells the ground water table will rise. It is possible to establish an equilibrium, so if we don't pump out too much, Nature will replenish what we use, and the underground water level will remain constant. The structure of some other California aquifers is different, and in these, as water is pumped out the voids in which the water was stored collapse, the ground above settles, and there is no way to reintroduce water into them. Other aquifers can be recharged only by forcing water down into them through wells. Even though our area's aquifers can be replenished with no effort on our part if we stop drawing water from them, the groundwater level continues to drop because we have not developed adequate surface water supplies to meet our needs.

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The San Joaquin County Historical Society, a non-profit corporation, meets the fourth Monday monthly except July, August and December. Membership includes subscriptions to *The San Joaquin Historian* and the newsletter, *News and Notes*. Non-members may purchase individual copies from the Society. The Society directs the operation of the San Joaquin County Historical Museum.

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God's Greatest Gift

by Warren D. Noteware

Give me some land by a lake or a stream
And there let me build my home.
For 'tis there I would work; I would play; I would dream.
I would have no cause to roam.
Or give me some land by the bay or the sea
And there let my days go by.
An invisible force keeps pulling at me
Like a cord I just can't untie.

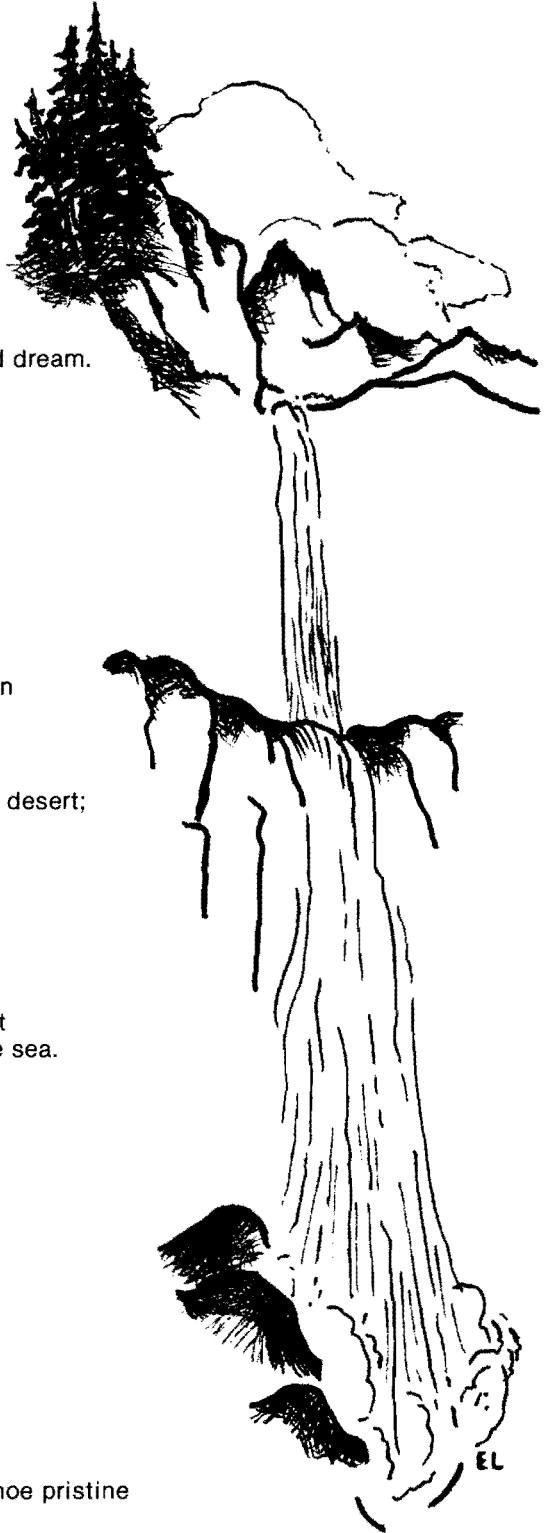
I relate to the beaver, the seal, and the otter,
Whose fur is usually wet.
Like these happy creatures I head for the water
Every chance that I get.
To be near the water when I need inspiration
Eliminates all thoughts of strife.
For 'tis here I can lose every care and frustration
And live a more meaningful life.

I agree with Isaiah's concept of heaven:
"Eternity, lovely and cool;
Where waters shall gush forth in streams in the desert;
Burning sands shall become a pool."
Evolutionists claim that our ancestors came
To the land from a watery start,
And I for one feel just the same
For I know this is true, in my heart.

When a baby is born a cord must be cut
So he can grow up and be free.
He can travel around and get far from home, but
Something keeps pulling him back toward the sea.
Our love of the water is thus explained
(And on this there should be accord)
For as we have evolved there still has remained
An unseen umbilical cord.

We can control a river as we break a horse
To make it conform to our will.
It will generate power as we alter its course,
'Though it would rather be tumbling downhill.
To harness a river on its way to the sea
By damming it up, this is true:
It's like taking a wild creature born to be free
And confining it in a zoo.

So let those of us here who hold water so dear
Resolve not forget what should be so clear:
Clean water, it's God's greatest gift.
So let's get the San Joaquin clean and keep Tahoe pristine
And protect our grand mountain streams.
For it's up to us when we must intervene
So we can realize our most cherished dreams.



The San Joaquin County Prospects:

With regard to providing adequate clean water, every community has unique problems. And each region is looking for solutions with little concern for the problems of other regions. Our neighboring counties can not meet their needs this year without an impact on us, and vice versa. Even within San Joaquin County we have competing requirements. We have eight separate incorporated cities and towns, 15 irrigation districts, 25 county service areas, and 52 reclamation districts. Each of these agencies has its own governing body, and each has its own special needs and concerns. The cities and towns must provide adequate clean water for their residents and their industries, their parks and golf courses and recreational facilities; the irrigation districts must supply water to our county's many farms and ranches; the county service areas must provide water for neighborhoods outside city limits; and the reclamation districts have serious concerns over water quality and the effect of the rivers and sloughs on their levees.

With the realization that we in San Joaquin County have to protect our own resources, and also that there are many competing interests within the County, in early 1989 the Board of Supervisors established the position of Water Resources Coordinator in the Public Works Department and hired John Pulver to fill the post. He is a Registered Civil Engineer, experienced in water projects, and he has become one of the busiest and most important people in the county as he works to expand our surface water supplies and diminish our dependence on groundwater. Our outlook for an adequate supply of water in the future is much brighter because of his efforts, and those of us who live in San Joaquin County owe a debt of gratitude to George Barber who had the foresight to lead the Board of Supervisors to establish the office of Water Resources Coordinator, which is located in the Public Works Building at 1810 East Hazelton Avenue in Stockton.

The San Joaquin County Water Im-

plementation Plan was adopted in June, 1989, and it provides the framework and the authority for many activities that are being pursued now by Mr. Pulver. In a recent interview he discussed some of the goals of the plan, which are to:

- Pursue the Goodwin Dam Project and support ongoing efforts to import supplemental water from the Stanislaus River, and continue to participate in other South County activities.

- Coordinate county-wide efforts to protect river flows in the Mokelumne River, and investigate options to secure additional supplies of water.

- Evaluate groundwater recharge projects to replenish the water in our area's aquifers.

- Coordinate county-wide efforts to secure 221,000 acre feet of supplemental water from the American River.

- Evaluate participation in the Auburn Dam and other storage facilities, so as new facilities are built we will have a share of their capacity.

- Support efforts of Delta agencies to protect Delta water quality and San Joaquin River flows.

- Evaluate a Delta supply for eastern San Joaquin County.

- Support the restoration of San Joaquin River quality and volume of flow.

- Evaluate other potential sources of water.

- Establish funding for a comprehensive county-wide program.

The Board of Supervisors has also adopted a Water Policy Statement in which it calls upon the State of California to develop a fair Water Plan which will overcome regional polarization and partisan politics and address the problems of conservation, the Delta, water quality, and other vital water issues that should be addressed by the State.

A Record of Accomplishments:

Californians should be proud that in spite of an environment of competing needs and strong parochial interests, many outstanding projects have been completed and many very significant decisions have been reached—decisions that give us confidence that

tough problems can be solved when responsible people work together. One of the greatest challenges facing Governor Wilson's new administration will be developing the compromises necessary to facilitate providing dependable supplies of adequate clean water for over 30 million Californians. This will require a balance between idealism and realism—an ability to mix statesmanship with technical expertise—and the cooperation of us who use the water.

We could be much worse off now if we hadn't learned a few lessons from the prior abuse of our water supplies. Those of us who have lived in this area since the 1930s and '40s can remember when canneries dumped their waste into our rivers and sloughs, so decaying asparagus butts, rotting tomatoes, and other decomposing organic matter took so much oxygen out of the water that dying fish accumulated in places like the dead end of Smith's Canal in Stockton. Many towns along our rivers had as sewer systems only big pipes discharging into the water. I remember in 1950 working in Sacramento County to reroute an open ditch which carried raw sewage through the Isleton Elementary School playground. These are examples of problems that had to be solved as our population grew and we became more aware of health and ecological necessities.

There are many impressive success stories of accomplishments in California. Let's look at some of what has been achieved:

First, we have developed a system of storage and distribution that has made possible the great population centers of Southern California and the Bay Area, as well as providing irrigation water to sustain the superb agricultural production of the San Joaquin Valley, from here all the way to the Tehachipi Mountains.

Second, multi-purpose dams that control floods, store water for use in the summer and fall, and generate electricity, which have been constructed on our major rivers, have greatly reduced the flood danger for those of us who live so near to sea level.

Third, these same dams have made it possible to prolong the irrigation season downstream all the way to the Delta, enabling growers to raise crops that would be impossible otherwise.

Fourth, we have developed hydroelectric facilities which, according to the California Energy Commission, normally generate a fifth of our state's electricity needs.

Fifth, thanks to funding through the federal Clean Water Act and the State Water Resources Control Board, we have reduced the pollution of our surface water by building wastewater treatment facilities and establishing water quality control measures that have resulted in diminishing the pollutants in San Francisco Bay and other waters of the state by as much as 75 percent. This has been accomplished despite an exploding population, many new industrial facilities throughout the state, and the increased use of a variety of toxic chemicals.

Sixth, decisions by the State Water Resources Control Board assure outflows through the Delta sufficient to maintain beneficial urban uses as well as agriculture and a healthy fishery.

Seventh, an environmental ethic has developed which is manifested in the responsible attitude of most of our citizens, making possible continued industrial growth, increased agricultural production, and an improved standard of living, all with a minimum of ecological damage.

Some Problems Left To Confront:

Now let's take a look at some statewide problems: The first problem is that Southern California has three principal sources of water: the Colorado River, the Los Angeles Aqueduct through the Owens Valley, and exports from the Delta. Two of these sources will be diminished in the near future. Arizona is entitled to take a larger share of the Colorado River outflow. The Los Angeles Aqueduct will carry less water into the Southland, because much of the runoff from the eastern Sierras, which for decades has been diverted into the Aqueduct, will have to be returned to Mono Lake to keep the lake from

shrinking any further than it already has. This means—you guessed it—increased pressure for more Northern California water heading south out of Tracy to make up the difference.

We must develop additional storage and supply of surface water, not just for the state's expanding population, but also to maintain our agricultural production. The alternative is continued over draft of our groundwater — and this alternative can not continue indefinitely. We can't pump out 16 million acre-feet per year and replenish only 14 million acre-feet. As pointed out earlier, many aquifers have limited capacity and can not be fully restored. In the central and eastern portions of San Joaquin County the water table has dropped as much as 60 feet. Not only does this greatly increase the cost of pumping, but groundwater elevations falling this much cause intrusion of salt water which can permanently ruin an aquifer.

Permanent damage has occurred in much of the groundwater throughout the state because of saltwater intrusion, contamination by pesticides, careless disposal of industrial chemicals, leaking underground storage tanks, percolation from landfills, and too many septic systems too close together. Remember when we thought that as water passed through the soil it somehow purified itself? We know better now, and we have much stricter legislation, such as laws requiring double walls for storage tanks and impervious lining for landfills. However, so much damage has been done already that much of our precious groundwater has become useless.

What the Future May Bring:

The lessons learned in this period of five consecutive dry years are bound to bring about some significant developments and a number of proposals for changes. It's always risky to try to anticipate what might happen, but some changes are predictable. Bear in mind that this is a list of predictions, not recommendations:

- Stricter legislation regulating water quality, and stricter enforcement of existing legislation. This will be an effort

to protect both groundwater and surface water from further degradation.

- Stricter controls over water usage, even in "normal" years. This could include mandating low-flow showerheads and low-flush toilets in new residential units, and setting limits on the amount of irrigation water in some parts of the state.

- Attempts to adjudicate some groundwater basins in order to allocate water rights for subsurface water.

- Increased conservation measures, in agriculture, in domestic use, and in industry. These conservation measures will be designed to minimize evaporation and transportation losses in canals, municipal water pipes, etc.

- Construction of greater storage capacity, particularly south of the Delta (like the San Luis Reservoir) which can be filled during wet years.

- Increased pressure to divert water from agricultural use to municipal use.

- Proposals to limit urban development and population growth where there is an inadequate natural supply of water.

- Increased research into desalinization through distillation, reverse osmosis, and other techniques to utilize sea water.

- Increased use of treated wastewater for irrigation of parks, golf courses, highway landscaping, and farms. Currently only about 10% of treated sewage is reused.

- New proposals to divert water from the North Coast rivers and Oregon, even from Washington and Canada.

- New proposals for some type of peripheral canal, so water can be exported around the Delta instead of through it to minimize reverse flows and other impacts on the fishery.

- Increased marketing of water by those who have water rights to users who are willing to pay for additional supplies.

- Continued self-protection on the part of every community and water user, to make sure "I get my share!"

- And of course, increased cost for water, both domestic and agricultural.

Whatever the future brings, let's hope any changes or new regulations can be developed in a spirit of trust and cooperation so that California's water can continue to be the cornerstone of our enviable lifestyle, our great agricultural production, our vast recreational facilities, our fish and wildlife habitats, and the spiritual uplift so many of us experience along our seashore and at our mountain lakes.

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A Personal Note

These articles on Water in California were written for the San Joaquin Historian by a very fortunate person. I have had a fascinating career — farming, engineering, using water, observing its misuse, and working on projects for drainage, irrigation, sewage treatment, subdivision water supplies, and other water-related activities. In 1982 Governor Jerry Brown appointed me to the State Water Resources Control Board, which is the agency charged with establishing the state's water policies, issuing water rights, and regulating water quality. After my appointment was confirmed by the State Senate, I entered a governmental world I had hardly known existed, because for all of my adult life I had been working in the private sector. Suddenly, I was a policy maker, responsible with four other Board Members for water quality plans, regulations, and policies. The law that established the Water Resources Control Board specifies that one member must be an attorney, one must be a water quality specialist, one must be a professional engineer specializing in sanitary engineering, one (myself) a professional civil engineer, and one member at large. It was our job to issue permits for the use of water (except groundwater), to issue state and federal loans and grants for sewerage construction projects, to hear appeals from the nine Regional Water Quality Control Boards, and to set quality standards for the state's waterways, including the Delta.

Robert Gilmour Letourneau

"Earth Mover"

by James A. Beardsley

November 30, 1990, is the 102nd birthday of this very remarkable individual who once lived in Stockton. A generation has gone by, since his death in 1969, who may not even be aware of his great contributions. Known not only for his earth moving machinery and giant equipment such as cranes, tree crushers and off-shore drilling platforms, his work as a Christian dominated most of his life.

Descending from French Huguenot and Scottish stock, his Christian training stemmed from both parents. This background influenced him throughout his life, especially after age 16. Inheriting his aggressiveness from his father, Caleb, and his mother's optimism and enthusiasm, he grew up in Duluth, Minnesota. The large family - four brothers and three sisters - moved to Portland, Oregon, when Letourneau was 15.

Although he had will power, inquisitiveness and determination, he disliked school, quitting abruptly in 8th grade and again in Portland when he decided to enter apprenticeship as an iron molder at the East Portland Iron Works. At age 16 he experienced salvation and accepted Christ. He was also two years into his apprentice work in the foundry when it burned down. So, at 16 he left home to finish his training in San Francisco at Moore and Scott Iron Works. His unique mechanical ability resulted in design of a steam engine, making the patterns, pouring the castings and performing all the machine shop work to make the engine run.

After the San Francisco earthquake of 1906, his brother hired him to pull stumps on his property near Rex, Oregon. Letourneau went north, bought used cable from a defunct mining operation and an old donkey steam engine and went to work. The experience he gained using cables and

sheaves in many combinations hooked between the stumps and steam engine gave him an excellent background for his cable operated scrapers and bulldozers to be built years later in Stockton.

His next job was reconditioning batteries for Yerba Buena Power System which supplied direct current for Oakland trolley lines. This work introduced him to oxyhydrogen gas welding used in re-assembling the plates into the 8 by 4 foot battery cases. About the time he became proficient in welding, his father and uncle began working the No. 5 Exchequer mine in Merced Valley. Here he learned much about geology and the use of dynamite. When his dad earned enough money, he purchased a ranch on the Stanislaus River near Escalon. There were oak trees to be cleared, so Letourneau worked one winter sawing, splitting and chopping wood while he studied four correspondence courses. When he finished, he had 100 cords of wood and he had acquired a motorcycle, the engine of which he could tear down, overhaul and reassemble easily.

Between 1908 and the mid-thirties, Letourneau's life was spent mostly in Stockton. His parents moved there in 1909 from Portland. He met and married Evelyn Peterson, and their six children were born and raised there. In those early days, Letourneau worked as a mechanic, eventually forming a partnership in the Superior Garage on a corner opposite the jail. He could repair broken car parts and design fixtures and special tools needed in the shop. It was here that he learned the value of lightweight welded steel compared to the heavy castings he worked with in his early apprenticeship days.

With the advent of World War I he left the garage business in his partner's hands and went to Mare Island Navy Yard to work as an electrical machinist. He did everything from winding coils to

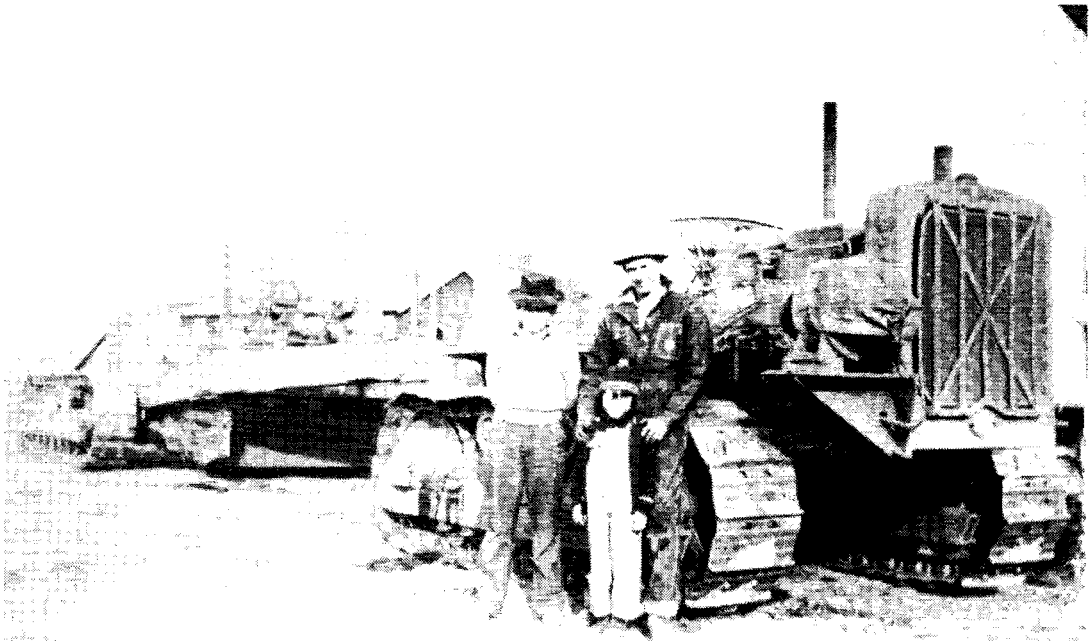
installing generators in warships, a great opportunity to enhance his knowledge of electrically operated equipment. He remained at Mare Island until the Armistice, the year he also turned 30. Upon his return to Stockton he found the garage business in bad shape. In order to satisfy creditors, he made a deal with his partner and the bank to release his half of the business and agreed to pay off \$5,000 within three years. He was now out of work and in debt.

Grunaur and Fabian were Delta area farmers who asked Letourneau to fix a tractor. It took a week to overhaul the Holt 75 and get it running. Grunaur then told Letourneau he would pay him a dollar an hour to level 40 acres with the tractor. Thus Letourneau entered the earth moving field. Believing that leveling might prove profitable, he consulted a local banker and borrowed funds to purchase his own used tractor and scraper. He soon realized the scraper was not built right, so with torch and steel he designed and built his first Letourneau scraper.

It is believed that the third scraper he built is now on display in the yard at the San Joaquin County Historical Museum, between the Delta and Micke buildings. It was donated by Grace Nelson and was used on her farm on Roberts Island. At the time Medora Johnson and the author went to look at it, about 20 years ago, Miss Nelson told us that Letourneau also taught her how to drive a car. The Regal was the car sold during the Letourneau garage partnership. Perhaps Grace Nelson bought a Regal, but unfortunately she did not say what make it was.

As fast as Letourneau built and improved new scrapers, he sold the old ones to farmers. In 1921 his shop and home were located on Moss Avenue (now 9th Street) west of McKinley, the old Highway 50 south entrance to Stockton.

In Letourneau's biography he "puts his name in with many others" as the inventor of the "bulldozer." His version was developed during construction of Crow Canyon Road in 1926. The job was difficult because so many small washes



LeTourneau Scraper owned by the Nelson Bros. on Roberts Island. The tractor was owned by a land leveler named Ryder. This is the scraper in the museum yard.

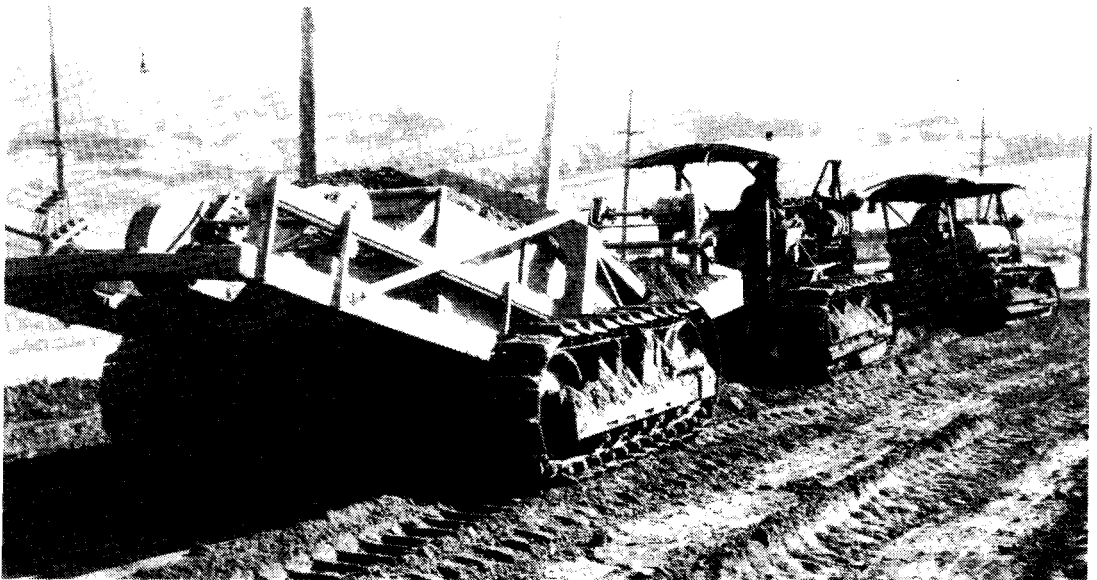
cut through the walls of the canyon. These had to be crossed in order to extend the road each time, with no room to turn tractor and scraper. Mules had been harnessed to boards in front of the animals, but even then it took a very skillful skinner to back the team and turn it around with the boards in place ready for the next load of soil. Inability to lift the "blade" was the problem, so Letourneau rigged a blade in front of his new Best tractor with cable and sheaves to raise the blade, allowing it to lower by gravity. Apparently drawing on his knowledge of stump pulling was where he got his idea. This was probably the first time a dozer was "manufactured" and put into use.

At the time the Crow Canyon project was underway, Henry Kaiser came to see the scrapers on the job. Kaiser had started his business with a contract for a 16-mile concrete highway into Everett, Washington. Losing money on this first job, he worked his way back and was now ready for a large contract to build the Philbrook dam in the Sierras. He needed Letourneau's scrapers and tractors and asked him to boss the job. This job is important in construction history because it was the first time no mules and very few men with shovels and wheelbarrows were employed. With the

changeover to power shovels, tractors, scrapers and dump trucks, the job was completed in record time, thus benefiting both partners financially. Later, Letourneau and Kaiser reached an agreement in which Kaiser bought the Letourneau patents for \$50,000, and then hired him and his crew to build a new factory in Oakland. Upon completion of the factory, Kaiser bid on the two-mile freight yard for Southern Pacific just north of Fresno, and then sub-contracted the job to Letourneau.

Back in his empty shop in Stockton, Letourneau designed and built a big "rooter" machine to break up hard-pan. He also built several all-steel welded self-dumping hopper wagons that could hold 15 tons of soil. Three or four of these could be pulled to move 50 tons each trip instead of 20 as with the telescoping scraper.

In 1928 Letourneau had two large contracts: Patterson Irrigation Canal and a highway at Oroville, plus the manufacture of his equipment. Jobs were now completed much quicker with his development of cable-controlled scrapers. The telescoping scraper, as one can see at the museum, is operated by rack and pinion gears operated by electric motors with direct current furnished by a generator mounted on the Cat 60 tractor.



A 12-yard Earth Mover built by LeTourneau pulled by two Caterpillar sixties. Picture taken in December 1926.

The order that triggered the move from the Moss Avenue shop was an order from Russia for a roter. Prior to this Letourneau had not thought about manufacturing earth moving equipment for direct sale, but the order from Russia caused him to think in terms of machinery sales. In order to have capacity to build large equipment, he had to have more room. The problem was where to locate. He had purchased property in Los Angeles, but the city engineers would not approve his design of an all-steel, welded building. That factory site was sold and vacant lots were purchased in Stockton on Roosevelt Street. The factory building was welded together during the winter of 1930-31. You can still see the structure between Wilson Way and Waterloo Road on the north side of the street with large "H C" letters on the front. Hart-Carter equipment was built there in the fifties. Equipment sales in March of 1930 passed \$110,000 with a net of \$35,000.



R.G. LeTourneau in the 1960s.

In 1931 he got a contract to build a highway from Boulder City to Hoover Dam. Six companies headed by Kaiser and Bechtel had pooled resources to construct one of the world's greatest jobs up to that time. Without the highway, they could not have gotten their equipment to the dam site. Unfortunately, Letourneau ran into some extremely difficult rock to remove. Using his mining experience, his crews blasted through the rock and finished the highway. However, he was now two

months behind on a second contract to build a dam in Orange County. It was to be the largest earthfill dam ever attempted. The State inspector arrived on the job and said Letourneau would have to start next year due to possibility of rain washing out the dam. Letourneau made a deal with him to move 400,000 yards of soil at the base of the dam in 30 days. He had estimated the job on only moving 200,000 yards per month. By working every day, they completed the first part of the dam in 30 days. So, the inspector said, "Go ahead and finish the job!"

But it bothered Letourneau that the men had had to work on Sundays, so he said they would work only six days a week for the rest of the project. When this information got back to the bonding company that was backing him, they balked.

Luckily, after an on-the-job conference between the company president and Letourneau, the matter was settled — a six-day week, and they finished on schedule. He was a very determined individual, certainly where Christianity was concerned.

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GOD RUNS MY BUSINESS

A.W. Lorimer, MCMXLII

Taped Presentation by H.C. Lewis, 1988

(His brother worked for Letourneau)

James A. Beardsley

is Chairman of the Tractor and Equipment Committee and is past President of the San Joaquin County Historical Society. Jim retired in 1984 after a 33-year career as an agriculture teacher at Delta College in Stockton.

Funding for the printing of this quarterly issue was provided by....

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Editorial Comment

Warren D. Noteware is a pragmatic engineer but it is obvious that he is also a very sensitive person as evidenced by his poem entitled "God's Greatest Gift". This poem is "inspired" by the many hours of deep thought and research that Mr. Noteware has spent in his study of water. The HISTORIAN is proud to be the first to be selected to publish Mr. Noteware's new found talent.

We also appreciate the delightful artistic talents provided for this issue by Elsie Leary!

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