

The Sierran

— A Publication of the Sierra County Historical Society —

The Impact of Lester Pelton's Water Wheel On the Development of California Rivals the 49ers!

While hordes of gold-seeking 49ers swarmed into the Sierras in search of their fortunes, Lester Pelton, a farmer's son living in Ohio, came to California in 1850 with ambitions that didn't include gold mining. He tried making money as a fisherman in Sacramento before coming to Camptonville after hearing of the gold strike on the north fork of the Yuba River. Still not interested in being a miner, Pelton instead spent his time observing the mining operations in the Camptonville area and noted that both kinds of mining, placer and hard rock, required large amounts of power. He realized that hard rock mining was more difficult to provide because power was needed to operate the hoists to lower men into the mine shafts, bring up loaded ore cars, and return the men to the surface at the end of the shift. Power was also needed to operate the rock crushers and the stamp mills, and to pump water out of the mines.



Lester Pelton, whose invention paved the way for low-cost hydro-electric power

At the time, steam engines were being used to provide power to operate the mines but they were expensive to purchase, not easily transported, and consumed enormous amounts of wood resulting in forested hillsides becoming barren in a very short time. Water wheels were being tried by some mine owners making use of the enormous power available from water in the mountain regions but they were patterned after water wheels used to power grain mills in the East and Midwest and were not capable of producing the amount of power needed to operate hoisting equipment or stamp mills.

Having never developed an interest in mining, Pelton spent many years doing carpentry and millwrighting, building many homes, a schoolhouse, and stamp mills driven by water wheels. These water wheels were crudely built and not very efficient. Pelton turned his inventive mind to improve the water wheels

Water Wheel (Continued on Page 3) —

— THE SIERRA COUNTY HISTORICAL SOCIETY —



The Sierra County Historical Society is an organization of people interested in preserving and promoting an appreciation of Sierra County's rich history. The Society operates a museum at the Kentucky Mine in Sierra City, holds an annual meeting, publishes a newsletter and conducts historical research. Members are sent notices of Society activities, receive THE SIERRAN, and are admitted free of charge to the museum and stamp mill tour. If you would like to become involved in these activities or would just like to give your support, please join us!

Officers and Executive Board of The Sierra County Historical Society

President: Bud Buczkowske, Alleghany

Vice President: Joleen Torri, Sattley

Secretary: Vacant

Treasurer: Bill Copren, Sattley

Board members in addition to those previously mentioned are Maren Scholberg, Sierraville; Elda Faye Ball, Loyalton; Suzi Schoensee, Sattley; James Connolly, Sierra City; Mary Nourse, Sierra City; Eli Scholberg, Loyalton.

Museum Curator - Virginia Lutes

Assistant - Judy Lawrence

If you have any suggestions or comments, feel free to contact any board member.

Become a Member!

Membership in the Sierra County Historical Society is open to any interested person, business or organization. Members need not be residents of Sierra County. Dues are due and payable each January for the calendar year.

Membership categories are as follows:

INDIVIDUAL	\$20.00
FAMILY & INSTITUTION	\$25.00
BUSINESS & SUPPORTING	\$35.00
SUSTAINING	\$50.00
LIFE (per individual)	\$300.00

(The board increased membership fees commencing in June of 2008)

Please send dues to: S.C.H.S. Membership Chairperson, PO Box 54, Sattley, CA 96124

Music at the Mine Completes 2010 Season

Music at the Mine at the Kentucky Amphitheater has already completed the season. This year, Bob Morrales lined up 5 entertaining evenings of music. It takes a lot of energy to put together these events. We would like to thank Bob, Judy, Bill, Virginia, Toni, Cora & Fritz and others who helped. Also those that supported the events by selling tickets: Old Sierra Hotel, Graeagle Mill Works, La Sierra Beauty Boutique, Indian Valley Outpost, Sierra Valley Feed & Ranch and The Mountain Messenger and Sierra Booster for all the publicity.

HAVE YOU CHECKED OUT OUR WEBSITE?

www.kentuckymine.org

Thank you Cindy for doing such a great job!

Mark Your Calendar Now

IT'S ALREADY TIME FOR SCHS ANNUAL MEETING

When: Sunday, September 19th at noon

Where: the Historic Romano Ranch
(Peterman Family Ranch)

Follow Highway 49 until you see the sign for the turnoff to the ranch.

This year lunch will be provided, so **bring a lawn chair** and come for an afternoon of sharing history. We will have a guest speaker.

Water Wheel (Continued from Page 1) —

that he observed were wasting water through excessive splashing. He believed he could devise a better way to use water to generate power.

At the time, Pelton was boarding at the home of Mrs. Margaret Groves in Camptonville.

When Pelton told her of his plan to invent a better water wheel, She offered to let him build a workshop at the back of her house and asked him to create a better water wheel to operate her sewing machine. Working through the winters of 1877 and 1878,

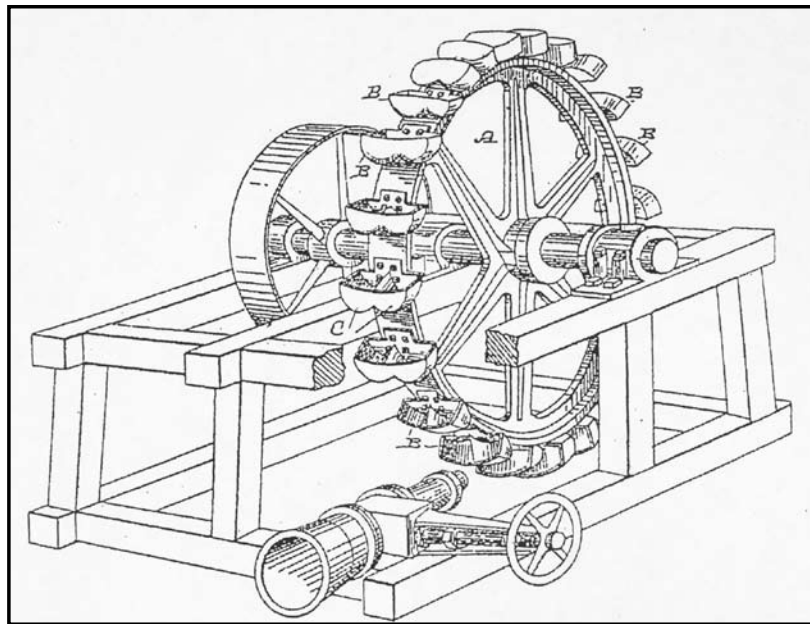
Pelton built a small water wheel for Mrs. Groves but wasn't satisfied with its design feeling that he needed to solve the problem of water splashing back onto the wheel before he could claim success. He immediately set about creating a prototype water wheel that was made of iron that had paired buckets featuring a splitter in each bucket to discharge the water away from the wheel.

There are varying accounts of what circumstances led to Pelton's development of the splitter design for his water wheel but one story has it that one day Pelton's neighbor as trying to drive a cow out of a clover patch with a garden hose and Pelton observed that

when the stream of water hit the cow squarely on the sharp bone of its nose, the water was divided and no water came straight back. Whether this story actually took place or not, Pelton used the concept of splitting water to reduce splashback on the wheel and he invented a water wheel superior to all others.

The first Pelton water wheels were

manufactured at the Nevada Foundry in Nevada City and Lester patented his design in 1880. They were offered for sale but there were no takers because they no one had confidence in the strange looking wheels until the Pelton water wheel was



The Pelton water wheel featured "undershot" design and "splitter" cups.

proclaimed the overwhelming winner in a competition between different water wheels held in 1883 to determine the most efficient water wheel. Pelton's water wheel was over 90% efficient in converting the power of the water to energy beating out its closest competitor by over 25%! Sales of the Pelton wheels soared and the Empire Mine installed Pelton wheels the next year, followed by conversion of the Idaho-Maryland and North Star mines to waterpower. The first two wheels included a six-foot diameter wheel turning 220 rpm, producing 80 horsepower to drive the rock breakers and the stamp mill.

By 1887, 261 Pelton wheels had been

Water Wheel (Continued on Page 1) —

Water Wheel (Continued from Page 3) —

purchased with nearly 80% being used in California. Demand for the wheels outgrew the Nevada Foundry's production capabilities and in 1888 Pelton moved to San Francisco and formed the Pelton Water wheel Company with the machine works of Rankin, Brayton & Co. By 1895, about 850 companies throughout the world were using Pelton water wheels. The wheels ranged in size from the smallest at 4 inches to 30 feet in diameter which is the largest in the world.

Pelton wheels are still being used around the world today to power hydroelectric plants where large quantities of water are available.

They are still driving generators in many PG&E stations. However, their use in California mines became limited because a completely dependable source of water could not always be assured due to droughts and winter ice jams that reduced the flow of water. With the advances in electrical technology, Pelton wheels became obsolete in the mines, and by the 1950s nearly all of the gold mines were closed.

Lester Pelton eventually sold the manufacturing rights to his wheel and lived

out the rest of his life in Oakland, California, where he died in 1908. He was honored by the American Society of Civil Engineers by the placement of a National Historic Civil Engineering Landmark plaque in Camptonville in 1929, and was inducted into the California Inventors Hall of Fame in 1983.

We are fortunate to have two Pelton wheels at the Kentucky Mine and Museum in

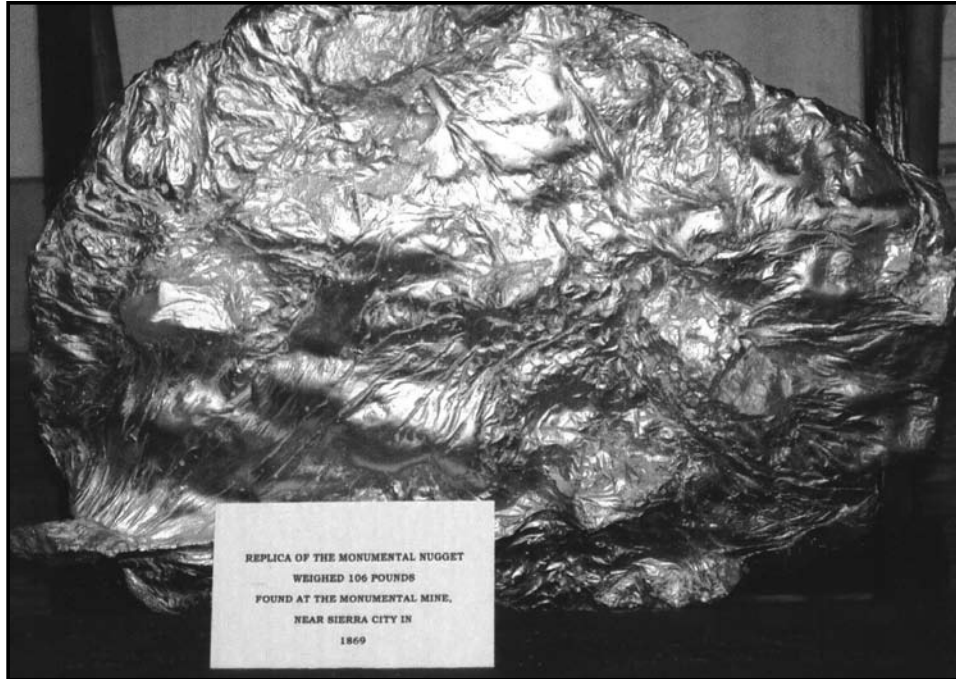
Sierra City. Tours of the county park include the opportunity to observe an operational Pelton wheel as it converts the velocity of water dropping from a spring 1,000 feet above, to energy that once powered an air compressor supplying air-powered drills in the mine.



The Pelton water wheel.

And yes, Lester's splitters send sprays of water in all directions away from the wheel, sometimes dousing unsuspecting onlookers, as it quickly picks up speed. After all, it is the most efficient water wheel in the world!

Source material for this article - "Lester Pelton and the Pelton Water Wheel" by Roger P. Lescohier.



The “Monumental” replica gold nugget on display at the Kentucky Mine Museum.

A Replica of the “Monumental” Gold Nugget is Now On Display at the Kentucky Mine & Museum

A realistic replica of the largest gold nugget ever found in Sierra County, known as the “Monumental,” has been graciously donated to the Kentucky Mine Museum by Carroll Hayes, whose family purchased the Sierra Buttes Mine in 1904. The “Monumental” weighed 106 pounds and was discovered on the Sierra Buttes Mine property at approximately the eighth level in 1869. According to Carroll Hayes, miners on their way to work at the mine saw a portion of the nugget on the trail after rain had washed away the dirt that had been covering it. They quickly began

unearthing the rest of the nugget and couldn’t believe their eyes when they saw the “Monumental” chunk of gold. You can see what this monumental chunk of gold looked like when it was brought from the ground when you visit the Kentucky Mine Museum to view the carefully crafted, life size replica now on display. The museum is open Wednesday through Sunday from 10 am to 4 pm, with guided tours offered at 11 am and 2 pm. And remember, as a member of the Sierra County Historical Society, admission to the museum is free!

Hot Rock Cooking in Sierra Valley

(A continuance of excerpts from a thesis entitled "Prehistoric Use of Hot Rock Cooking Features: Archaeological Investigations at the Webber Gravel Pit Site, Sierra Valley, California, by Judy Lawrence)

Three identified rock cooking features were identified at the Webber Gravel Pit Site. Sites with rockcooking features are often littered with burnt rock middens, Fire Cracked Rock (FCR), and cobbles that have been removed from the pits and basins after use.

However, it has been suggested that these piles of FCR, rather than being simply a by-product of cooking taking place in nearby roasting pits, could actually represent a distinct type of rock cooking feature used to process large quantities of plants on the surface.

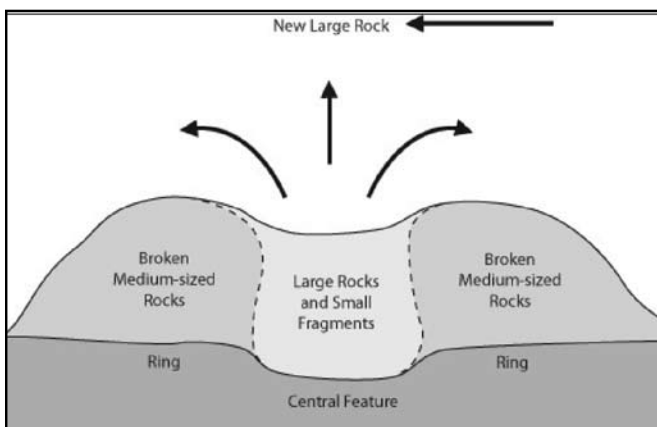
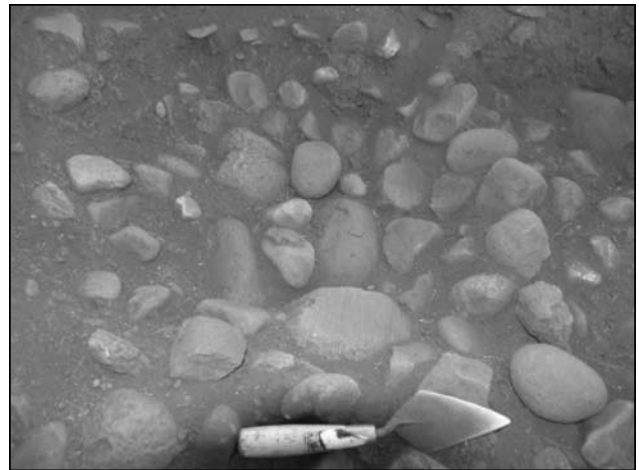
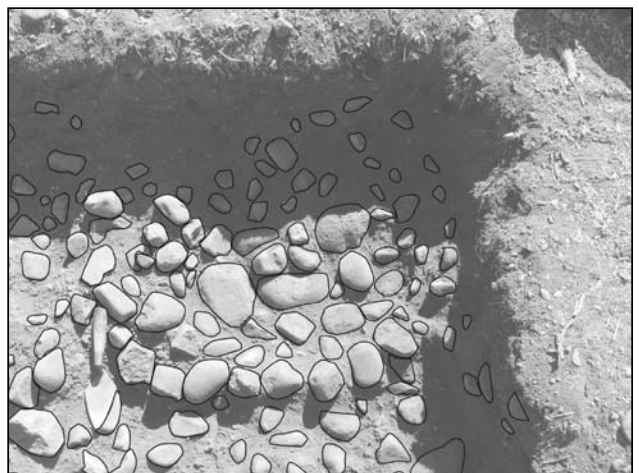


Illustration of Burnt Rock Midden.

Three rock cooking features were identified at the Webber Gravel Pit site. Hand-excavating with trowels enabled us to slowly reveal multi-layered, rock-lined basins that were surrounded by Fire Cracked Rocks and ground stone fragments, often arranged around the feature circumference in concave-layered rings.



Feature 1, Unit 4. (Trowel pt.= N. L=24cm)



Feature 1, Unit 4, with Rock Outlines. (Trowel pt.=N. L=24 cm)

Feature 1

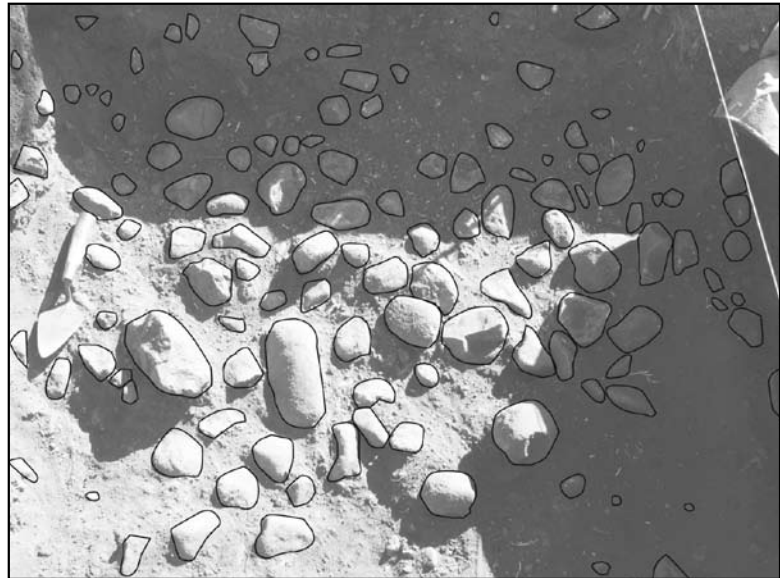
The rocks, ground stone, and FCR fragments used to line the basin are varied in size, with larger, flatter rocks, which heat up more quickly and give off heat more quickly, placed in the center of the bottom. This platform-like bottom structure would suggest that resources were roasted in the basin by placement on the flat surface, either in a basket or tray, or directly on the heated rock

Native Americans (Continued from Page 6) —

platform. Charcoal, was collected at levels 4 through 6 (30-55 centimeters (cm)) in Feature 1, and returned radiocarbon dates of 1050 calibrated Before Present (cal BP) at the 40-55 cm level, and 690 cal BP at 30-40 centimeters below surface (cmbs).

Feature 2

Feature 2 was not a well-defined feature. It had rock scatter filling the unit, and there were indications that the feature extended beyond the unit. This feature was similar to Feature 1 in that it was a shallow rock-lined basin with a diameter exceeding 60 cm and a depth of approximately 50 cm. The rock lining incorporated ground stone fragments, angular Fire Cracked Rock fragments, and various sized rocks, both angular and smooth cobbles, arranged in a circular, multi-layer, concave structure. A large amount of charcoal – 8.24 grams – was collected from the unit. Charcoal from 40-50 cmbs yielded a radiocarbon date of 960 cal BP.



Feature 2, Unit 6. (Trowel pt.=N. L=24 cm)

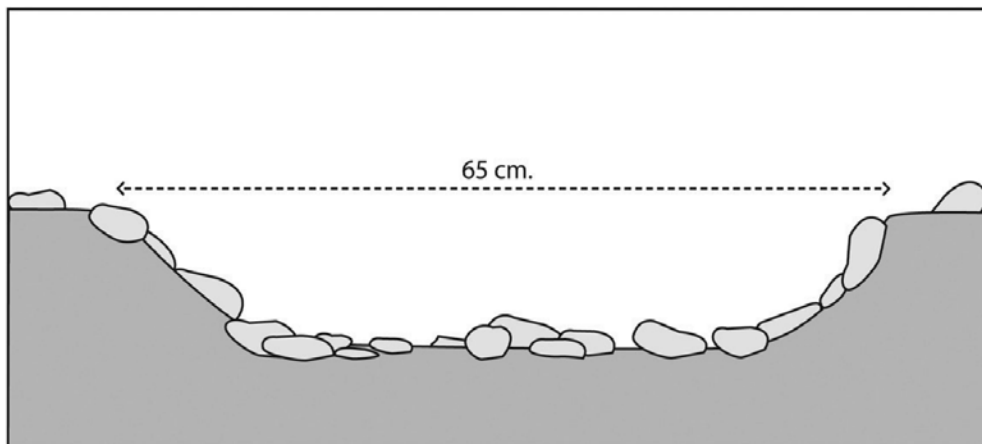
Feature 3

The feature measured approximately 65 cm in diameter and 27 cm in depth, a more shallow basin than the other two excavated features.

Only three rocklined cooking features were excavated due to a limited time frame for our fieldwork and a small, four-person field team augmented by volunteers. It was

our assumption throughout our excavations that more features would have been revealed if we had been able to expand our excavations.

Final research data and thesis conclusions in the next issue of The Sierran.



Feature 3, Unit II

Feature 3, Unit II, Cross Section.

The Sierran

Sierra County Historical Society

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Restoration Work at the Lagomarsino Cabin Continues – You Can Help!

Restoration of the Lagomarsino cabin, located in Sierra City, has been progressing, according to James Connolly, who is heading the project funded through the Sierra County Historical Society. In order to furnish the cabin, Connolly is asking SCHS members to donate any items—a dry sink, cupboards, wood cook stove, or any other furnishings from the 1880 era—that will help to bring the cabin back to life! If you would like to make a donation, email the historical society at www.kentuckymine.org or call James Connolly at 530-862-1770.



Lagomarsino Cabin.