

# LIME KILN CHRONICLES

Newsletter of the Friends of the Cowell Lime Works Historic District  
University of California, Santa Cruz

## *Tales From the Cowell Cooperage*

By Frank Perry

The Cooperage stands empty now. The cracks and furrows in its redwood siding deepen with each passing year. Its stone pillars continue to crumble, and one section of the floor has taken an alarming dip. Were it not for emergency cribbing and extra braces, the building would have long ago surrendered to gravity.

Most people think it is an old barn. In fact, this iconic building near the campus entrance was where lime barrels were assembled for packaging lime made in the nearby kilns. The last lime was made here nearly a century ago, and the building is an important reminder of the campus's roots. As discussed in previous issues of the *Lime Kiln Chronicles*, UCSC would not exist were it not for the Cowell family and their lime business. The Cooperage is a vital element in the story of one of the region's most important industries during the latter 19th and early 20th centuries.

### **Making Barrels**

Long before the advent of plastic sacks, pallets, and forklifts, heavy products such as lime were shipped in wooden barrels. Barrels were sturdy enough to support the weight of the contents, and—when tipped on their side—could be rolled. Barrels were essential for shipping the lime to market. Each of the lime making operations around California had a cooperage, but the one at UCSC is the only one still standing.

The word “cooperage” originated from the Latin word *cupa*, which means to contain. Think of the

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Photo by Mark Holsapple

The terraced seating in the restored amphitheater is redwood with concrete supports.

## *Quarry Amphitheater Open Again*

The Friends are pleased to report that the Quarry Amphitheater has been restored and is now open. We quote from a UCSC Newscenter article by Scott Hernandez-Jason:

*The campus broke ground on the restoration in November 2016 and crews have been hard at work bringing the Quarry back to its former glory and up to modern standards.*

*Carved from a former working quarry amidst redwoods and rocky outcroppings, the amphitheater dramatically showcases the deep connection between the campus, its history, and the natural landscape. Designed in the early '60s by modernist landscape architect Robert Royston, its asymmetrical terraces and sunny park-like character highlight the surroundings.*

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## 100 years ago . . .

The following tidbits were extracted from the *Santa Cruz Evening News* for the second half of 1917.

### July 23, 1917

"The crowds at the Salinas Rodeo were tremendous, and the enthusiasm of the visitors was marked. One of the special features of the parade each day was the ox team from the **Cowell** ranch, Santa Cruz."

### July 24, 1917

"Miss Ava Batchelder of Bay Street and Miss Ida Hamilton of San Jose made a record swim yesterday. From the old **Cowell** wharf around the municipal pier to the [Pleasure] pier the girls took only forty minutes."

### December 13, 1917

"Employees of the **Cowell** Company burning brush on the hills northwest of the city last night led many to believe that an incipient blaze had broken out. The fire was handled and watched with care."

### December 14, 1917

"President B. K. Knight of the Santa Cruz Golf and Country Club and President S. A. Palmer of the chamber of commerce will wrestle with the problem of raising publicly the sum of \$3,800 between now and January 6 with which to pay **Harry Cowell** his back lease money and interest for the rental of the golf links property. . . .

It was announced by Chairman Samuel Leask that beginning with 1918, the monthly rental of \$100 paid by the club would be cut in half by a generous citizen who did not care to have his name mentioned." [The golf links under discussion were at Pogonip.]

### December 31, 1917

"The Santa Cruz golf links will be a thing of the past after January 6, unless some immediate action is taken," said a well-known member of the golf club today. . . . The present up-keep of the links from now on will be less by 50 percent than formerly, since the rent has been cut in half through the generosity of **Mr. Cowell**, from whom the land is leased."



Cracks in the wood were just one of the problems that made the old amphitheater unsafe.

*While some features are upgraded, one has returned to its original state—"the rock," an outcropping that dramatically pierces the stage.*

*The project focused on restoration and new enhancements. It provided improvements to accessibility, building code, life safety, and basic operational upgrades to support performances, events, and casual daily use of the venue.*

*Additionally, seating has been expanded from 1,636 to 2,000; stairs, ramps, handrails, lighting, and overall access is improved and provisions made for portable infrastructure to support events.*

The Friends have designed an interpretive sign for the amphitheater that will tell about its historic use as a limerock quarry. It uses photographs taken in the 1920s by quarry worker George Silva. The sign will go up later this year.

**"The limerock is quarried by hand drilling and shooting down with giant powder"**  
—*Mineral Survey of Santa Cruz County* by C. Latzke, 1926

To learn more, enjoy the self-guided walking tour near the campus main entrance.

### Was Once the Rincon Quarry

Limerock quarrying began here around the time of the Gold Rush. The limerock was heated in kilns fueled by split redwood logs. The heat turned it into lime, which was packed in barrels and shipped to San Francisco and other markets. The lime was used mostly to make mortar and plaster.

At first the lime was made in kilns beside the quarry. By the late 1850s, most of it was hauled to kilns near what is now main entrance to UCSC. In 1907 a new lime-making plant was built beside the railroad tracks at Rincon, now part of Henry Cowell Redwoods State Park beside Highway 9. The rock was hauled to the new kilns by wagon and later by dump truck. The quarry slowly grew until the plant closed in 1946.

By the middle 1920s, dump trucks began to replace wagons. Carts were still used to haul the rock from the quarry face to the truck.

Until the middle 1920s, rock was hauled to the kilns by wagon.

Quarry workers, many of them Italian and Portuguese, pose next to a large boulder.

### COWELL LIME WORKS HISTORIC SITE

This quarry supplied limestone for a major lime manufacturing operation. Mortar and plaster made from Santa Cruz lime played a vital role in the development of the State's cities and towns.

Learn more at <http://limeworks.ucsc.edu>

Interpretive sign presented to UC Santa Cruz by the Friends of Cowell Lime Works Historic District in 2017.

The interpretive sign for the amphitheater will be similar in design to those in the Historic District.

## In Memory of Peter Jordan

We were saddened to learn that Peter Jordan passed away earlier this year. He was 87. Peter was a long time member of the Friends and the great grandson of A. P. Jordan, who made lime here in the 1850s and 1860s. A. P. Jordan sold his half of the business to Henry Cowell in 1865, but the Jordan family house (now known as Cardiff House) remains and is part of the Historic District.

Peter was a professor of wildlife biology at the University of Minnesota, but often visited family in Santa Cruz. A few years ago I had the great honor of interviewing Peter and giving him and his daughter, Marion, a tour of the district and the old Jordan house. He grew up in Alameda, but frequently came to Santa Cruz as a kid—staying in the family mansion on Mission Street, exploring local beaches and tide pools, and hiking through family acreage in the mountains near Laurel. It was those experiences around Santa Cruz, and the influence of his older sister, also named Marion, that fueled his interest in biology.

I asked him if he wished the family still had the 5,000-acre Rincon Rancho once co-owned by A. P. We all laughed. Just imagine what that land would be worth today!

—Frank Perry



Peter Jordan on a recent visit to the Santa Cruz Mountains.

## New and Renewing Members

Our sincere thanks to these new and renewing members. Their donations enable to Friends to continue its mission of education and historic preservation. We have several important projects in the works which we will be sharing in future issues of the *Lime Kiln Chronicles*.

Jim and Jeriann Bosso  
 George Brown and Julie Dryden-Brown  
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The *Lime Kiln Chronicles* is published twice each year (Spring and Fall) by the Friends of the Cowell Lime Works Historic District



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The cooperage was originally much longer than it is today, as revealed by the isolated stone pillar in the distance.

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terms “chicken coop” or to “coop up.” A cooper is a barrel maker, though some also make wooden buckets. There are still people in the trade, but mostly they make barrels for wine.

Barrel making was so common in the late 1800s, that none of the reporters who wrote about the Santa Cruz lime industry bothered to write down how it was done. But by examining how present-day barrels are made and studying some of the surviving lime barrels, one can get a pretty good idea of the process. It took a fair amount of skill, the kind that comes with years of practice, to be an efficient barrel maker. While not air tight, the barrels were fitted together as neatly as possible. Indeed, if you hold one up to the sun, there are few, if any, cracks where light shines through.

Originally, the barrel parts were made entirely by hand. Each stave was cut and shaved until it was just the right shape. The parts for the surviving barrels (made in the early 1900s) were made with the aid of machinery, thus saving time. A stave machine sliced the redwood into 1/2-inch thick strips, 2-6 inches wide and 27 inches long, each with a slight curve conforming to the circumference of the barrel. Each of these was then trimmed to be slightly narrower at the top and bottom. This makes the barrel bulge slightly in the middle, essential so the barrel could pivot when rolled.

The side of each stave was slightly beveled so that the staves would fit tightly together. The end of each stave at the top of the barrel was also beveled, while the bottom end was left flat (see photos below).

The Cooperage was only for the assembly and storage of the barrels. The staves and heads were cut at a barrel mill even closer to what is now the campus entrance, near the Stonehouse. It was powered by a small steam plant. That building caught fire and burned in 1951 when workers were using cutting torches to remove and salvage some of the machinery.

To make a barrel, modern coopers start with the hoop for one end, and temporarily hold or clamp the staves in place around the inside hoop until the circle is complete. There are some good videos online that show the process (search for “wooden barrel assembly”). At this point, the staves are still straight



Close-up of the top of a stave, showing curve and beveled end.



Bottom of a lime barrel, showing staves



Wikipedia

A partially assembled wine barrel showing initial arrangement of the staves. The oak staves here are much thicker than those of the lime barrels.

and collectively flair out in a circle at the bottom (see photo above). A second, slightly larger hoop, is pounded down from the top and this starts to draw in the staves. The partly-formed barrel is turned over and a rope or band is used to pull together the staves so that hoops can be added to the other end.

The hoops for the surviving barrels are steel and were made commercially, but originally wooden hoops were used, each made by hand. These hoops were usually made of hazelnut, a native shrub



During tours of the Historic District, the Friends will often “roll out the barrel.”

When lime production was in full swing, the small crew of coopers kept busy. The three kilns next to the Cooperage could each produce 1,000 to 1,200 barrels per load. An account from 1866 mentions 2,500 barrels of lime being produced in one week.

One of the ways Cowell saved money on barrels was by giving a rebate of 20 to 30 cents per barrel to customers who returned their empties. One old photo shows a huge pile of empty barrels beside the railroad tracks at Rincon, and there are accounts of empty barrels also being returned by ship. Of course, these used barrels sometimes needed minor repairs.

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Jim MacKenzie

Lime barrels and staves. The device on the left is for lifting bales of hay.

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**One of the Oldest Structures**

At nearly one and a half centuries, the Cooperage is one of the oldest structures on campus. Only the Cardiff House and the continuous kiln are known with certainty to be older. Photos from 1866 show an earlier Cooperage that was different in shape. A terrible fire in February 1869 destroyed that Cooperage and much equipment at the site. The Cooperage, being so vital to the operations, must have been rebuilt as soon as possible. So, the present building almost certainly was built in 1869. The oldest known photo showing the present Cooperage dates from about 1910.

Close examination of the Cooperage reveals that it was not very well built and needed extra bracing. This suggests that it was built in haste, as might be expected after the 1869 fire. This is unlike some of the barns and other buildings that were carefully designed, in one case with the help of Santa Cruz architect Edward van Cleeck.

The building is constructed much like a covered bridge, with several heavy trusses and large diagonal timbers for bracing. It was originally almost twice as long as it is now. Part of it was removed by the University in the 1960s to make room for Coolidge Drive. But the founding chancellor, Dean McHenry, who was very sensitive to the campus’s natural and historic features, made sure that the rest was saved

even though there were no immediate plans for reuse.

**A Two-story Building**

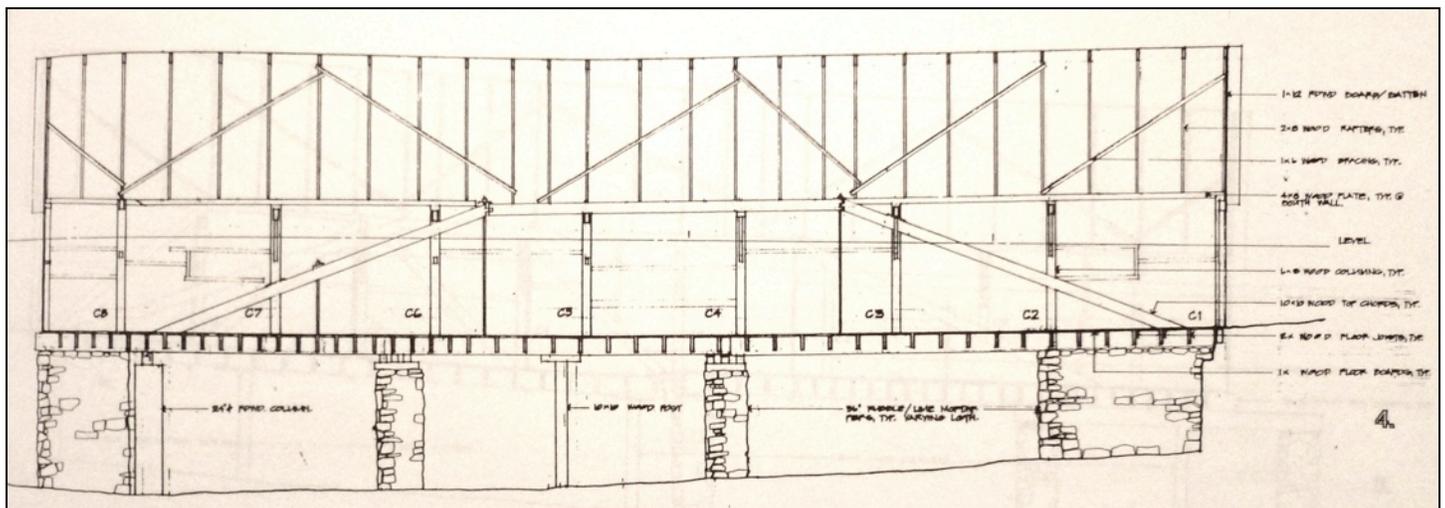
Visitors on tours of the district often ask why the building is up on stone pillars. Basically, it is a two story building, open below and closed above. Other lime cooperages around Santa Cruz County were built the same way. The empty barrels were assembled and stored above. The filled barrels were stored below.

Filled, each lime barrel weighed 150 pounds. This is based on the size of the surviving barrels, though in the 1800s some were larger. Given the tremendous weight, it would have been foolish to close in the lower story and put in a raised wooden floor. A modern analogy would be an open garage with a concrete floor under an apartment building. In fact, in later years cars and wagons were parked under the Cooperage.

The Cooperage floor is paved with bituminous rock—the historic equivalent of modern day blacktop (see photo on page 8). The loaded barrels could be rolled from the kilns to the area under the Cooperage and set upright until it was time to roll them out the other side and lift them into a wagon.

Up until the very early 1900s, Cowell owned a wharf at the foot of Bay Street where the lime barrels could be loaded onto ships for delivery to towns up

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This scale drawing of the cooperage shows how it was constructed. Several studies have been completed in preparation for restoration.

and down the coast. There was also a warehouse near the wharf. Lime undergoes a chemical reaction with water, so it was important that the lime be kept dry until ready to be mixed with water and sand to make mortar or plaster.



Four hoops held the staves together.

The Cooperage sits on one of the most highly-visible pieces of UCSC real estate. Nearly every person who has ever set foot on campus in the past 52 years has passed by this building and the adjacent lime kilns.

Like the recently restored Hay Barn, the Cooperage offers many intriguing

possibilities for reuse. The Friends look forward to working with campus staff and potential donors to find just the right use that will fit with the University's mission of teaching, research, and public service while preserving an integral part of the pre-campus history of the land.

### *Hay Barn Project Wins Awards*

Not surprisingly, our beautiful restored Hay Barn has already won several awards.

In September of 2016 the project won the prestigious Montana Honor Award from the American Institute of Architects.

In January of 2017, the barn won the WoodWorks Regional Excellence Award. Consequently, it was featured in a video shown around the country and in the book, *Celebrating Excellence in Wood Architecture 2016-2017*. (See [www.woodworks.org/project/cowell-ranch-hay-barn/](http://www.woodworks.org/project/cowell-ranch-hay-barn/))

In July the California Preservation Foundation announced that it would be presenting the Hay Barn project an award in the rehabilitation category. The award was given October 13 at a dinner in the Mark Hopkins Hotel, San Francisco.

All those involved with the project, including the designers, engineers, craftspeople, and fabricators, can be very proud of their achievement.

### *More Opportunities to Help the Friends*

Have you made arrangements to support the Cowell Lime Works Historic District in your estate plan? Or perhaps you'd like to learn how you can use your estate plan to impact the ongoing educational and historic preservation projects within the Cowell Lime Works Historic District. A gift through your will or trust can preserve your income, minimize your taxes, and contribute to the preservation of the Historic District. If you'd like to work with us on ways you can **create a legacy with the Cowell Lime Works Historic District** or if it is already part of your legacy, please contact Tyler Hinz at the phone number or email address below:

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### *Cowell Worker Cabins and Barn*

This beautiful watercolor painting was recently donated to the Friends by Tom Schreiner. It was painted in 1967 by Pat Payne and looks east from the Cook House parking lot near the campus entrance. According to a newspaper clipping from that year, the artist lived in Soquel and was specializing in paintings of historic Santa Cruz buildings. She had come to the area in 1965 and seems to have left in the early 1970s. If you know more about the artist or if she is still living, please let us know.

Thank you, Tom, for this wonderful gift!



**Barrel Imprints.** The ground under the Cooperage is paved with bituminous rock, a natural mixture of tar and sand used to pave roads in the late 1800s (see *Lime Kiln Chronicles*, Spring/Summer, 2013). The heavy barrels of lime were set under the Cooperage until they could be loaded into a wagon for shipment. Apparently on hot days, the pavement softened enough for the barrels to sink in and leave circular impressions. Incredibly, these can still be seen over a century later. (Photo taken in August, 2017)

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