

LIME KILN CHRONICLES

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

Exhibit and Tour

On April 17-18 UCSC hosts its annual alumni weekend, this year titled “Day by the Bay.” Alumni, families, friends, and community members are invited. The Friends will have a table and displays at the outdoor fair on Saturday afternoon in the East Field. On Sunday morning from 10 to noon there will be a guided tour of the Historic District. Members who have not yet enjoyed a tour of the district (or would like to see it again) are welcome to come. We will meet at the Barn Theater parking lot, at 10 a.m. To sign up, please visit the event website: <http://www.ucsc.edu/daybythebay/>

Lime’s Sweet History

By Frank Perry

One of the more interesting uses of lime, yet one that few people know about, involves the manufacturing of sugar. While sugar does not contain lime, the refining process—extracting pure sugar from beet or cane juice—uses lime to remove impurities. Unwanted minerals and organic chemicals bond with the lime, forming a precipitate that is then removed from the sugary syrup before it is crystallized. Lime has been used in the refining process since at least the seventeenth century and probably earlier.

Sugar was manufactured in the Monterey Bay area for over a hundred years. In the late 1800s, three successive sugar refineries were built, one in Soquel, one in Watsonville, and one south of Salinas in the town of Spreckels. The latter operated until 1982. All extracted sugar from sugar beets, and all used lime in the process.

My curiosity about the role of lime in local sugar manufacturing began a couple of years ago with the discovery by historian Allan Molho of a short news item in the Watsonville *Pajaronian*. It was dated April 24, 1890, and said, “Another lime kiln is being put in at the beet factory.” I wondered if limestone from Santa Cruz was ever used to make sugar.

Sugar was first extracted from what became known as the “sugar beet” by a German chemist, Andreas Marggraf, in 1747. Beet sugar remained a laboratory curiosity for over sixty years until the Napoleonic Wars. The English blockade cut off France from West Indian cane sugar, prompting the French to produce beet sugar as a substitute. In fact, it can be argued that Napoleon was the father of the modern beet sugar industry. In the United States, it was not until the late 1800s that beet sugar was manufactured profitably on a large scale. A century later, in the 1990s, beet sugar production in this country finally surpassed that of cane sugar.



Photo: Jim MacKenzie

Visitors touring the historic lime kilns.

Now on Facebook

Thanks to board member Tremain Jones, the Friends now have a Facebook page. If you are a member of Facebook, please come see our page and become a fan. Tell your friends!

(continued on page 3)

Student Interns Experience Hands-on History

(see story on page 5)



Photo: Sally Morgan

Archaeological excavation at the site of the Cardiff Shed.



Photo: Frank Perry

Salvaging parts of Cabin C.



Photo: Frank Perry

Students work on the west side of Cabin B.

“Through this internship I have learned a great deal about the community and history of Santa Cruz. . . . I have also been able to help on stewardship at the kilns, which proved to be hard but rewarding work on the landscape.”

—Pippa, senior



Photo: Frank Perry

Repairs being made with wood epoxy.



Photo: Jim Mackenzie

Students clear brush from near the kilns.

(Lime's Sweet History cont'd from page 1)

The first beet sugar refinery constructed in California was in San Francisco in 1856, but it was not commercially successful. The second was constructed in Alvarado (now part of Union City), Alameda County, and operated from 1870 to 1873. Although this plant turned a profit its first year, growing beets in marshy soil proved difficult, and the high cost of coal for fuel cut into profits. In 1874 the operation moved to Soquel, near Santa Cruz. Here, the beets grew well in the rich soil, and the nearby redwood forests could be cut to supply fuel at a third the cost of coal. Local farmers provided the farmland, and Chinese laborers planted, tended, and harvested the beets.



Photo: Frank Perry

It is the root of the sugar beet that is processed to make sugar.

factory folded in 1880, however, unable to compete with less expensive Hawaiian sugar imported by Claus Spreckels.

In 1888 a new and much larger plant was built in Watsonville by the Western Sugar Beet Company. Claus Spreckels, widely known as the "Sugar King," was the principal stockholder. Because Spreckels had purchased a large ranch in Aptos in 1872, he was familiar with the earlier operation and the quality of sugar beets that could be grown in the region. When his business dealings in Hawaii ran afoul of the Hawaiian King, Spreckels turned to making sugar in California.

The Watsonville plant was much larger than the one in Soquel, handling hundreds of tons of beets per day during peak production. Its average output of sugar was 50 tons per day.

Several contemporary accounts noted the use of lime by the Watsonville factory. On September 13, 1889, the *Santa Cruz Surf* reported: "After several experiments with

lime from different parts of the State, the beet factory people think that they have at last discovered the article for which they have been searching. It is from the lime quarry owned by Jasper Twitchell and situated in the San Juan Canyon, near San Juan [Bautista]. A contract for lime has been made with Mr. Twitchell, and he has put on teams to haul the same to the factory."

According to contemporary accounts of the factory, the sugar was extracted from the beets in a series of steps not unlike those followed by modern-day sugar refineries. At one point in the process, the syrup was placed in "large cisterns with lime in them" (*Santa Cruz Sentinel*, Nov. 28, 1874). The factory employed two hundred men during the fall processing season and had a capacity of 60 tons of beets per day. The factory

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It is not clear from the article whether Twitchell was providing lime or limestone. The term "lime" is sometimes used loosely (and incorrectly) for limestone, as in the case above, where it refers to "lime quarry." But, since we know the factory was installing "another lime kiln" the following spring, Twitchell was most likely providing stone. Sugar refineries often make their own lime to ensure that it meets their exacting specifications. In some operations, carbon dioxide gas is also used in the refining process. By manufacturing their own lime, the factories can capture the carbon dioxide released in the lime-making process and use it in the refining process.



From *The Bay of San Francisco*, 1892

Claus Spreckels

Twitchell's involvement may have been short lived. A promotional booklet published for the Santa Cruz County Board of Supervisors in 1890 reported that the Watsonville plant consumed some "1,300 tons of lime-rock imported annually from Santa Cruz."

Further evidence that Santa Cruz provided limestone to the Watsonville refinery comes from a short item in the *Santa Cruz Surf*, Nov. 4, 1897: "Three and four car loads of lime rock per day are being shipped to the sugar factory at Watsonville."

Phil Francis, in an 1896 book touting the county's resources, included several pages on the Watsonville factory. "The lime rock used in the beet sugar process is brought from the inexhaustible quarries near Santa Cruz, and enormous quantities are taken at the factory. Thus an incidental industry is fostered, and a distant part of the county receives some share of the benefits of sugar making in the Pajaro Valley."

(continued on page 4)

Correction

In the hard copy of last fall's *Chronicles*, page 5, column 2, paragraph 2, the name should be Marion Kathleen (Jordan) Asche. We thank Peter Jordan for correcting our error.

(*Lime's Sweet History cont'd from page 3*)

From these accounts, it is clear that Santa Cruz was providing plenty of limestone for sugar production, but they do not state the exact source of the rock.

The Watsonville refinery shut down after the 1898 season, replaced by an even larger plant built by Spreckels, which opened in 1899 along with the company-named town, Spreckels. Headlines in the *Santa Cruz Surf* summed up the new factory: "One of the Modern Wonders of the World—Dimensions and Details that Stagger the Mind." The massive complex covered 22 acres, the main building being a brick behemoth 5 stories high, 102 feet wide, and 582 feet long. The plant could turn 3,000 tons of beets into 450 tons of sugar daily. It was quite simply the largest beet sugar factory in the world. It remained so for over eighty years.



From Beautiful Santa Cruz County, 1896

Western Sugar Beet Company plant in Watsonville, 1890s.

A description of the new factory noted, "two enormous steel limekilns, which stand upon an open iron frame work base, some 4 feet high, and then tower up through a circular opening in the roof to a height of 52 feet," (*Santa Cruz Surf*, August 9, 1899). The limestone was delivered and dumped on a flat near the bank of the Salinas River and hauled about 640 feet to the kilns by means of an aerial tramway. Each bucket on the tramway held 5 tons of rock.

In the early years, some of the limestone for this plant came from company quarries along Alisal Creek in the hills east of Salinas, but some apparently also came from Santa Cruz. It is known that Santa Cruz area lime companies often sold limestone in addition to lime. Other Santa Cruz businesses quarried limestone exclusively for purposes other than lime (stone walls, foundations, paving, and poultry grit). Several of these businesses quarried stone west of Spring Street, just a few blocks east from the present Cowell Lime Works Historic District. Individuals who had quarrying operations there in the late 1800s and/or early 1900s included Isaac Thurber, Louis Doderer, William and Leo Caplatzi, W. E. Miller, and Fred W. Johnson.

So far, the only source this writer has discovered that

links specific Santa Cruz quarries to sugar refining is a piece in the weekly Santa Cruz newspaper called *Riptide* (Oct. 6, 1949). It says the old Thurber (later Miller) quarry near the present intersection of High Street and Kalkar Drive, provided limestone "used at Soquel by the California beet sugar company and later at Watsonville by the Western sugar company." The quarry owned for a time by the Caplatzi brothers (near the end of Spring Street) also sold to sugar companies. "That which did not go to the Western sugar company at Watsonville and later the Spreckles [sic] plant near Salinas was sold as chicken grit." Alas, the article is but a secondary source and its author uncredited. Although the account is probably accurate, it would be important to find further documentation.

While I have yet to find direct evidence that Cowell sold limestone to the sugar refineries in the Monterey Bay area, it certainly remains a possibility. Other Santa Cruz companies were clearly major suppliers. The refineries seem to have had an insatiable appetite for limestone, and Cowell had large quarries with direct railroad access (at Rincon) and equipment for loading rock (as well as lime) into railroad cars. If any readers know of evidence that Cowell sold limestone for making sugar, I would love to hear about it. Historical investigations

California sugar refineries mostly used lime that they manufactured on site by burning limestone in company kilns. However, sometimes they purchased lime that was made elsewhere. An old Cowell company ledger preserved at Special Collections, McHenry Library, UCSC, shows that in the fall of 1912 Cowell paid rebates each month for the return of empty lime barrels by the California and Hawaiian Sugar Refining Company. Clearly, the implication is that the company was buying lime from Cowell. If true, the lime may very well have come from Santa Cruz County. Cowell had three manufacturing plants in operation here at that time (at Felton, Rincon, and Santa Cruz). However, Cowell was also producing lime in El Dorado County.

The sugar factory, better known as C & H Sugar, established its refinery in Crockett (Contra Costa County) in 1906 to process raw cane sugar imported from Hawaii. The number of barrels listed in the ledger, roughly 150 barrels per month, was miniscule compared to the amount of lime used to refine beet sugar. However, the cane sugar was partly refined before shipment to California.

such as this are never really “finished.” There is always more to learn.

(The author wishes to thank Bob Piwarzyk, Allan Molho, Judy Steen, Meg Clovis, David Dawson, and Joe Michalak for their help.)

Further Reading

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Fabing, Horace W., and Rick Hamman. *Steinbeck Country Narrow Gauge*. Boulder, Colorado: Pruett Publishing, 1985.

Kirk, Anthony. *A Flier in Oil: Adolph B. Spreckels and the Rise of the California Petroleum Industry*. San Francisco: California Historical Society, 2000. (Biographical sketch of Claus Spreckels, pp. 15-16.)

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Student Interns Experience Hands-on History

by Sally Morgan

The Historic District provides UCSC students with valuable hands-on experience doing archaeology, recording information on historic structures, and assisting with actual restoration work on some of the buildings. Since 2006, student interns from the anthropology and history departments have dedicated hundreds of hours to District projects. Departmental advisors provide academic independent study credit for the work, and the students gain experience under the supervision of professionals in the fields of archaeology and historic preservation. “This project was my first experience with concrete archaeological work of any kind,” says Justin, a junior.

During the 2009-10 academic year students have participated in archaeological excavations at the workers’ cabins and spent many hours washing and cataloguing artifacts. They also have documented hundreds of farm artifacts from inside the Cooperage, assisted with wood restoration and documentation at historic Cabin B, participated in brush clearing and storm water protection work around the lime kilns and Cooperage, and conducted archival research to bolster understanding of the people who lived and worked here long ago. “I am very grateful to have been offered this wonderful opportunity,” says Christina P, a junior. “I am now certain that archaeology is the field I would like to pursue, and am anxious to get on board with new projects. I look forward to continuing with the Lime Works excavation for as long as I am at UCSC.”

Artifact Mystery Solved?



One of the more intriguing items on display at the Lime Conference last August was the artifact shown here. It belongs to the UCSC collection and dates back to the site’s lime-making past.

We think it was used as a lever to tip loaded barrels from the horizontal to the upright position. The tool seems to be just the right shape for this, and the long handle would provide the necessary leverage to lift a barrel loaded with lime.

Loaded barrels were moved by tipping them onto their side and rolling them. Tipping them back to upright was not so easy,

with barrels weighing from 150 to 250 pounds. With hundreds of barrels being loaded and moved each day, such a device would be a real back-saver.

Alas, we have found no historical descriptions of this device. If any readers have more information, or have seen such a device in use elsewhere, we would appreciate knowing about it. Send us an email at limeworks@ucsc.edu.





COWELL LIME WORKS HISTORIC DISTRICT
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

The Bay Street Lime Kiln, part of the the Cowell Lime Works Historic District, located on the campus of the University of California, Santa Cruz. The kiln were used to manufacture lime, a building material essential to California development in 18th and early 20th centuries. In 2008, the District was added to the National Register of Historic Places. To learn more, and to support efforts to preserve and restore these and other District structures, please visit limekiln.ucsc.edu. Photo and design by Jim MacKenzie.



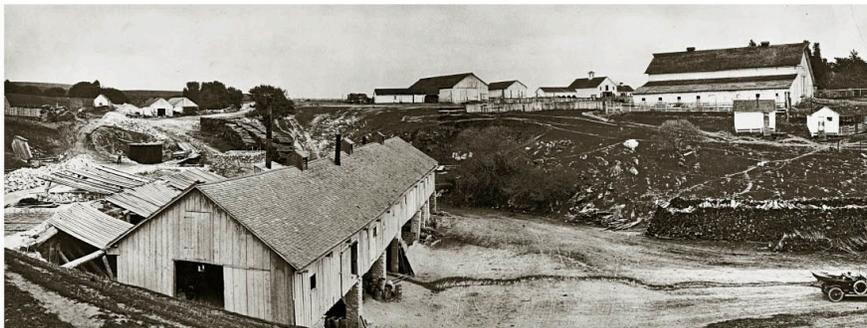
COWELL LIME WORKS HISTORIC DISTRICT
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

Detail, historical contents of the Coopersage, one of 26 structures in the Cowell Lime Works Historic District, which is located on the site of the historic Cowell Ranch, now the University of California, Santa Cruz. In 2008, the District was added to the National Register of Historic Places. To learn more and to support efforts to preserve and restore District structures, please visit limekiln.ucsc.edu. Photo and design by Jim MacKenzie.

Photos: Jim MacKenzie

New Posters Depict Historic District

Color posters of the historic district will be available at our booth at the Day by the Bay celebration on April 17. They will also be available soon at the Bay Tree Bookstore. Profits from poster sales benefit the Friends. The Friends thank board member Jim MacKenzie for designing these beautiful posters and Christine Bunting of Special Collections, McHenry Library, for permission to use the historic photo.



COWELL LIME WORKS HISTORIC DISTRICT
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

Cowell Lime Works, first decades of 20th century, view to the northeast. Coopersage and kilns in foreground at left, workers' cottages and "Bum H" at far right. Note massive pile of cordwood (fuel for the kilns) at right. In 2008, the District was added to the National Register of Historic Places. To learn more, and to support efforts to preserve and restore the District's structures and better illustrate its history, please visit limekiln.ucsc.edu. Produced by Friends of the Cowell Lime Works Historic District. Photo, UCSC McHenry Library Special Collections. Design, Jim MacKenzie.

**Join the Friends of the
Cowell Lime Works Historic District**

Your membership donation will help to restore, preserve, and interpret this historic site.

All of our Friends receive invitations to special tours and events, biannual newsletter, opportunities to volunteer on restoration projects, and opportunities to be a docent for historic district tours.

In addition, memberships at the \$100 category or above receive benefits provided by the UC Santa Cruz Foundation, including their names in the annual Honor Roll of Donors, a subscription to UCSC Review, and invitations to campus and Friends Groups events.

Memberships are tax-deductible as allowed by law. UC Santa Cruz Foundation Federal Tax ID #23-7394590.

Mission Statement

The mission of the Friends of the Cowell Lime Works Historic District is to aid in the documentation, restoration, preservation, and interpretation of the historic lime kilns and related structures and buildings of the Cowell Lime Works Historic District and other historic sites on the campus of the University of California, Santa Cruz.

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Plaque Dedication



Photo: Terry Way

Attendees gather for the plaque unveiling.

Over forty people attended the Fall dedication of the bronze plaque commemorating placement of the district on the National Register of Historic Places. The festivities began with short talks by Santa Cruz Mayor Cynthia Mathews, County Supervisor Neal Coonerty, former Assemblyman and UCSC alumnus John Laird, Rachel Ann Goodman (representing Assemblyman Bill Monning's office), Friends President Frank Perry, and Chancellor George Blumenthal. Allyson Violante, representing Congressman Sam Farr, read a commemorative statement entered into the Congressional Record (available on our website).

After the unveiling, attendees enjoyed refreshments and historical exhibits at the adjacent Cook House. Coverage of the event appeared the following day in the *Santa Cruz Sentinel*.

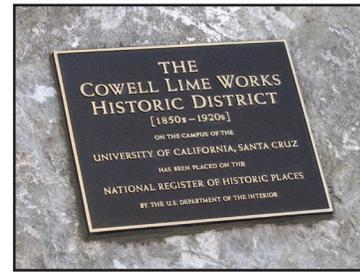


Photo: Jill Perry

The plaque.

The Friends thank Jim MacKenzie for help with design of the plaque, David Subocz for fastening the plaque to the boulder, and the many UCSC staff members who helped make this event a success.



Photo: Jill Perry

Unveiling the plaque.

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