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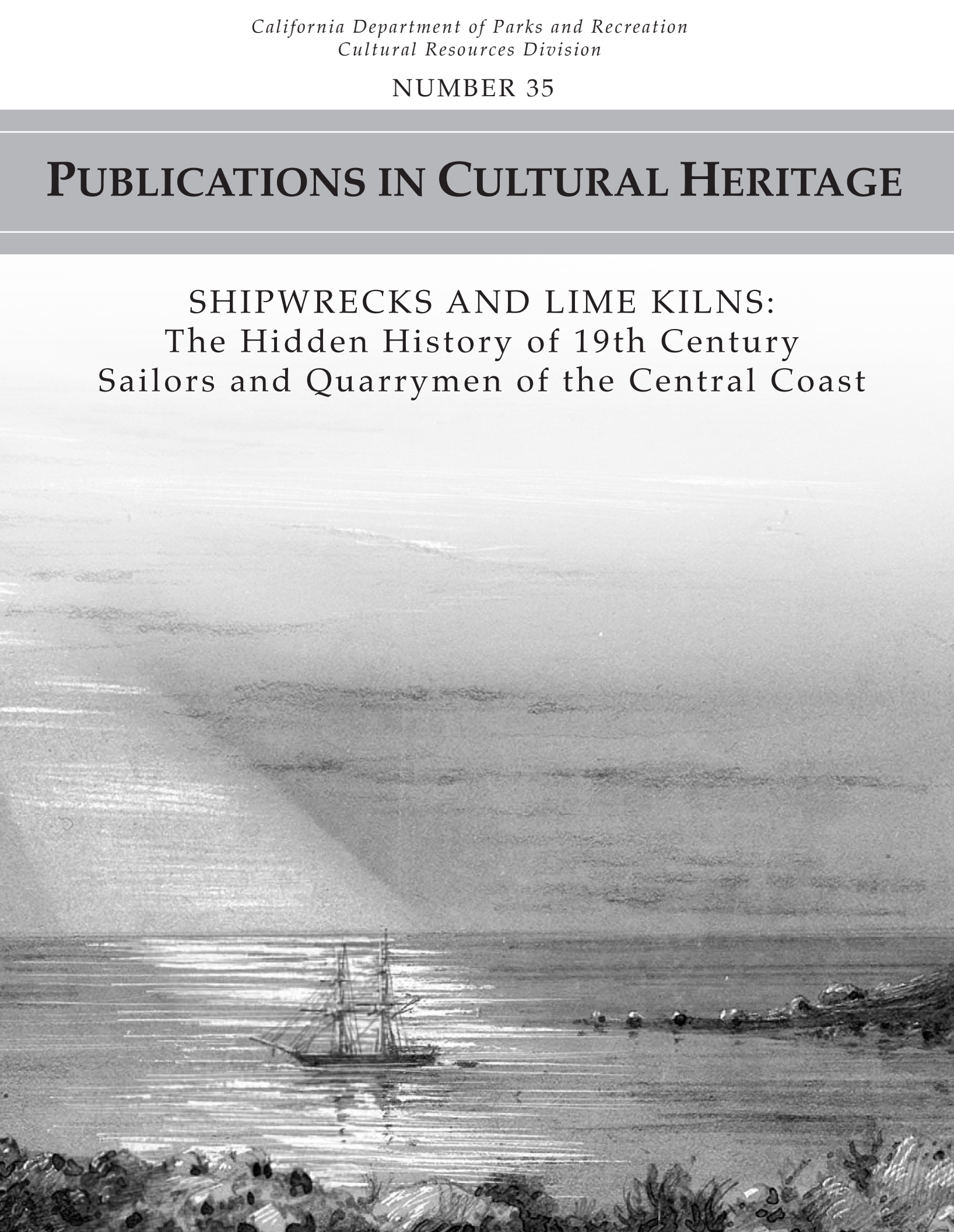
SHIPWRECKS AND LIME KILNS:
The Hidden History of 19th Century Sailors and Quarrymen of the Central Coast



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THE HIDDEN HISTORY OF 19TH CENTURY SAILORS AND QUARRYMEN OF THE CENTRAL COAST

Part I: Archaeology, History, and Stabilization of the Franklin Point Historic Shipwreck Cemetery (CA-SMA-207/H)

Mark Hylkema
Santa Cruz District Archaeologist,
California State Parks

Part II: Archaeological Investigations at the Adams Creek Lime Kilns Site (CA-SCR-339H)

Andrew W. Kindon
Department of Anthropology,
West Valley College

PUBLICATIONS IN CULTURAL HERITAGE
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Series Editor
Christopher Corey
Editorial Advisor
Richard T. Fitzgerald
Department of Parks and Recreation
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By Mark Hylkema and Andrew W. Kindon
Editorial Advisor, Richard Fitzgerald; Series Editor, Christopher Corey

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"Ocean Scene" by Edward Vischer, drawn circa 1862-1873, courtesy of the Honnold Mudd Library, Claremont Colleges Library.

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PREFACE

Shipwrecks and Lime Kilns: The Hidden History of 19th Century Sailors and Quarrymen of the Central Coast (Number 35) marks our tenth publication since the series was revived in 2009. As with that 2009 publication (Number 26), this one features two separate reports on unique cultural resources from the central California coast.

The first report, authored by Santa Cruz District Archaeologist Mark Hylkema, is the tragic story of shipwrecks, loss of life, and the efforts to protect the graves at the ad hoc cemetery at Franklin Point, a particularly perilous area of the San Mateo coast for nineteenth-century mariners.

The second report, written for State Parks by West Valley Junior College professor Andrew Kindon, details the archaeological investigation of the Adams Creek Lime Kilns site located at Wilder Ranch State Park. The use of lime in the production of mortars and plaster has a long and worldwide history and, in California, it dates to the mid-eighteenth century with the arrival of the Spanish missionaries, who used lime for processing and construction purposes. Beginning with the Gold Rush, Santa Cruz County became an important center for lime production, chiefly due to the presence of easily accessible deposits of limestone, an abundance of readily available fuel necessary to fire the kilns, and a safe harbor in proximity to the deposits that was suitable for exporting the finished product to various markets.

Unifying these seemingly divergent archaeological sites and the histories they convey are the storylines of the "invisible" and unsung laborers of the nineteenth century who, as Dr. Kindon writes, are "relegated to the shadowy borders of the historic record." The sailors (seamen, carpenters, mates, ship's boy, and common passengers) who perished in the three shipwrecks at Franklin Point, and the limekiln work force (the quarrymen, archers, blacksmiths, coopers, teamsters, woodcutters, and brick masons) share a common anonymity in the history of nineteenth-century California. Their stories unfold however, through very different lenses.

The victims of the *Franklin*, *Coya*, and *Hellespont* wrecks are viewed through a battery of forensic analyses (anthropometrics, histomorphic, and stable isotope) of their physical remains. Through these analyses, the reader learns about the nature of those nineteenth-century people who perished, as well as their stature, physical activity, health, and diet. The limekiln workers' community is examined conversely through the analysis and interpretation of the constellation of material culture they left behind and the spatial patterning of the existing architectural features that demarcate the domestic and workspaces of this nineteenth-century industrial community village.

Taken together, these two reports—that of the three shipwrecks and their displaced and ultimately reinterred victims, and the investigation of the Adams Creek Lime Kiln site—offer tantalizing insights into the typically invisible lives and culture of mid- to late-nineteenth-century common Californians. Parenthetically, they also reveal the multi-ethnic nature of the workforce, foreshadowing the multicultural State that we have become.

Richard Fitzgerald
Editorial Advisor

ACKNOWLEDGEMENTS

PART I

Although this report is brief, there was a great deal of research and collegiality involved. Special recognition must be given to the archaeological team from San Jose State University that conducted the first episode of burial recovery at Franklin Point. Physical Anthropologist and professor, Dr. Robert Jurmain, along with Field Director Alan Leventhal and other students from the Department of Anthropology recovered the first four individuals in the early 1980s. The research and data recovery report produced for State Parks was extremely useful for the document presented here, and having been participant in that excavation myself, I can assert that their field and laboratory methods were respectfully conducted.

Of particular note and cause for a hearty "thank you," are the contributions made by John Foster and Jack Hunter; maritime archaeologists who not only supported this study but contributed a great deal towards uncovering the contemporary written accounts of the wrecks described here. State Parks Interpreter Mike Merritt at Año Nuevo provided information about the historic recollections summarized in the epilogue.

The delineation of the cemetery boundaries was accomplished with the assistance of the Canine Forensic Institute. Special thanks are given to Adela Morris and her team for their enthusiasm for the task, and for providing the wonderful body-sniffing dogs who did the work of demarcation. Once the boundaries were defined, archaeologist Roman Beck volunteered his time to map the site using his total station survey equipment.

I want to especially thank Dr. JoAnne Semones, local maritime historian and author of several books on central California coast maritime history, for her support and editorial reviews. JoAnne was available to make substantial edits to the draft and provided additional historic information. I am deeply indebted to her for her patience and enthusiasm.

Several technical specialists were contracted to provide detailed forensic studies of the human bones. Robert J. Speakman, Hector Neff and Michael D. Glassock of the University of Missouri Research Reactor Center conducted the laser ablation analysis of the shipwreck victim's teeth. Heather Ramsey of the Department of Anthropology, University of Missouri-Columbia, did the histomorphic and cross-sectional geometry analysis of selected bones. Michael A. Kennedy, who was at that time associated with the University of California at Davis, and Seth Newsome, formerly with the University of California, Santa Cruz, conducted a study of the stable isotopic signatures of the bones to determine diet and origins of the remains sampled.

Christyann M. Darwent of the University of California, Davis, along with Teresa S. Cabrera of the Solano County Coroner's office and Kristi Assad Hunter, formerly with State Parks, conducted the osteometric analysis and bone inventory.

Finally, I want to thank my colleagues at State Parks for their interest in the findings, and for getting this document included in our archaeological publications series. My friends Richard Fitzgerald and Christopher Corey deserve special recognition for their desire to see this information become part of our State Parks legacy.

Today, fifteen years after I worked to stabilize the cemetery, the boardwalk and observation decks out at Franklin Point remain firmly in place, and this facility continues to serve the public by providing a great place to interact with our maritime environment.

Mark Hylkema
Santa Cruz District Archaeologist,
California State Parks

PART II

As with any archaeological project, the research presented in this report is the result of the collaborative efforts of a huge number of people. Their contributions have been invaluable, and their collective expertise, comradery and support made the experience of undertaking this project far more enjoyable. In particular, the Adams Creek Lime Kilns project would have been impossible without the efforts and support of Mark Hylkema. Not only did Mark bring the site to the attention of the Foothill-West Valley Archaeological Survey (FWVAS), but he also acted as liaison between the project and the California Department of Parks and Recreation. Beyond this, I owe a great debt of gratitude to Mark for his friendship and mentorship over the last ten years. His technical and historical insights proved to be crucial to the success of the project, and his good humor and endless wealth of anecdotes made long days in the field seem like minutes. In addition, many thanks to the California Department of Parks and Recreation for both allowing the work to be carried out and also generously supporting the research with a grant to purchase necessary equipment and supplies. Christopher Corey and Richard Fitzgerald are owed thanks for their support in bringing this report to publication, and for providing editorial guidance and suggestions. The gracious support and patience of the Wilder Ranch State Park rangers, docents and other employees is also much appreciated, especially that of Bobbie Haver, whose smiling face greeted us virtually every morning as we arrived to work at the site.

Thanks also to my FWVAS co-director and friend Sam Connell. Sam was a critical part of this project from its inception and contributed a tremendous amount of time and effort to its fruition. Parts of this report have appeared in various forms in unpublished proposals and summaries co-authored with Sam, and as such, his direct contributions to the current report must be acknowledged. In particular, Sam helped to formulate the central research questions upon which the project was built and also provided important logistical support via his position at Foothill College. John Mummert at Foothill College also provided generous support, especially in helping to get the 2009 summer field school off the ground. The field school itself would have been impossible without the contributions and support of Roger Kelly, who co-taught the program with me and directed all of the artifact

processing and analysis at the Foothill College Archaeology Laboratory. Daniel Cearley and Jorge Aguilar also made important contributions to the project, volunteering time in the field and at Foothill. Additional thanks must go to Frank Perry for generously sharing his knowledge of the early Santa Cruz County lime industry, and for providing high resolution scans of the historic photos included in this report. Special thanks also to Frank for taking the time to offer a guided tour of the Cowell Lime Works Historic District to the students in the field school program. The insights and information offered during this tour proved invaluable to both our excavation program in the field and the subsequent interpretation of the materials recovered from the site. Marla Novo at the Santa Cruz Museum of Art and History (MAH) kindly extended permission for the use of archival materials from the MAH collection.

Over 150 students and volunteers from West Valley College, Foothill College, San Jose State University and the University of California, Santa Cruz were involved with this project. Many spent only a day or two at the site or in the lab, while others were there for the duration of the project, taking off work and giving up time on weekends in order to be there for every field day. The contributions of every one of these students were important, and while it is impossible to list all the students' names here, there are several who deserve to be singled out for special thanks. First and foremost, thanks to Rebecca Spitzer and Mike Popham. Rebecca and Mike were among the first students to participate in the project in the spring of 2007 and continued to be involved through the 2009 field school, where they served as field directors helping other students. I could not have succeeded in running the field school without them, and for that I owe them a great debt of gratitude. Their boundless enthusiasm for the project was remarkable and sustaining. Alfonso Tinoco also made significant contributions, both in the field and in the laboratory, where he undertook a detailed analysis of material from the site. Eric Fries not only offered invaluable support and expertise in the field during the first several field sessions, but also created the preliminary GIS for the project with Jorge Aguilar. Anthony Bragg and Peter O'Day helped move a significant amount of dirt, but more importantly brought an exuberance and playfulness to the field that made every day at the site an enjoyable adventure.

Finally, I must acknowledge the students enrolled in the summer 2009 Foothill College archaeological field school. Over the space of only ten days in the field, they managed to conduct the majority of the excavations discussed in this report. Thanks to all of them!

Andrew W. Kindon
Department of Anthropology,
West Valley College

PART I:
ARCHAEOLOGY, HISTORY, AND STABILIZATION OF THE FRANKLIN POINT HISTORIC SHIPWRECK CEMETERY (CA-SMA-207/H)

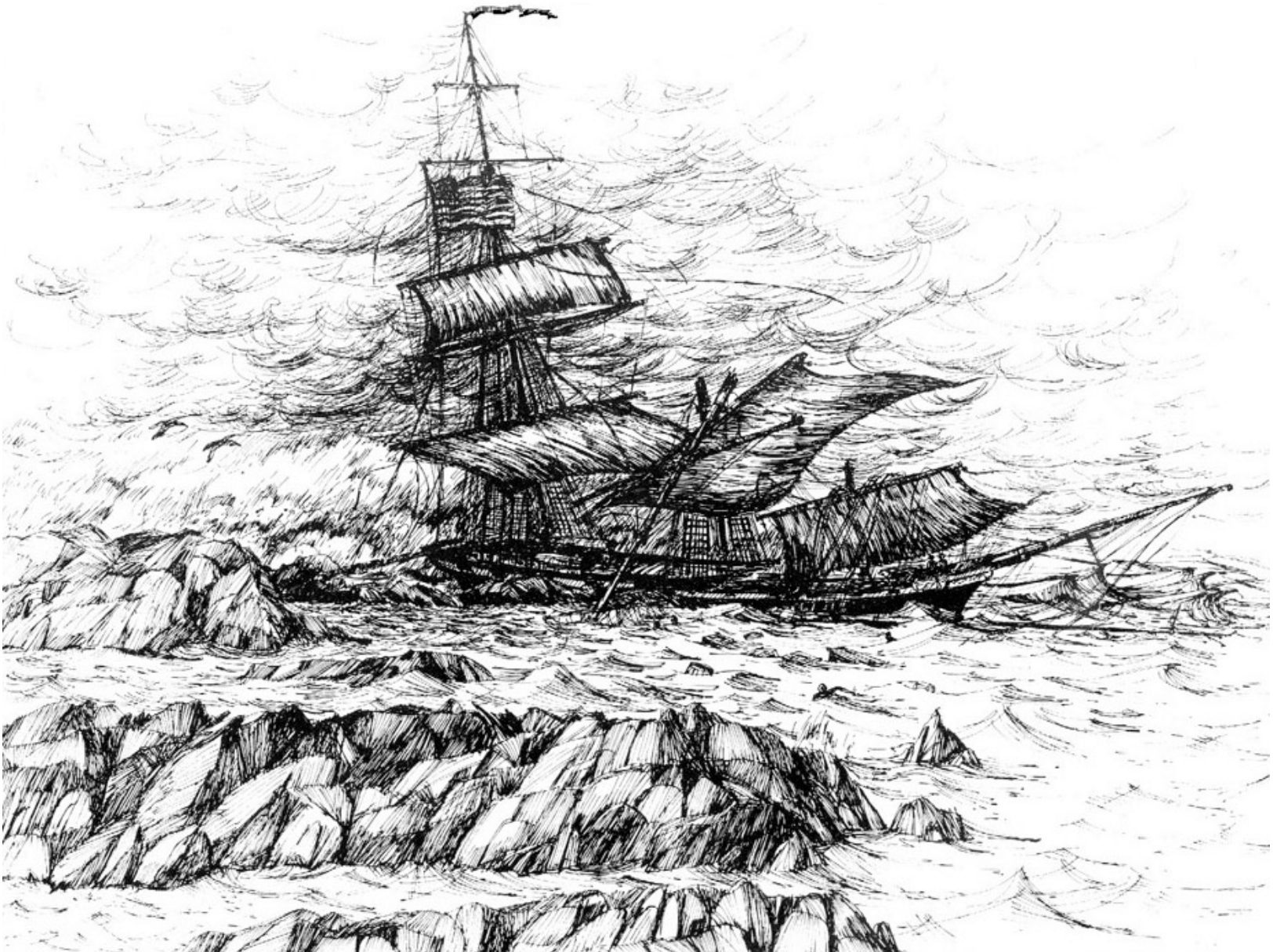


Photo on previous page:
The wreck of the Sir John Franklin by Dorothy Regnery and Gail Smallwood. Pen and ink sketch of the wreck of the Sir John Franklin. Courtesy of Dorothy Regnery and Gail Smallwood (in Jurmain and Leventhal 1987.)

Prologue

"If you would keep alive afloat, you must know what you're about. Unless a man is worthy, the sea will surely find him out" (Gibbs 1969:5).

On the evening of January 17, 1865, while the American Civil War was still reaching towards a conclusion, the crew of the clipper ship *Sir John Franklin* found themselves enveloped in a thick fog as they approached the Port of San Francisco. However, tragedy would intervene, just as it had for the ships namesake a reference to the ill-fated arctic explorers of the Franklin Expedition, for the ship and crew were destined to wreck just as they had. The drama of the calamity, preserved in the accounts of survivors, and manifest in the archaeological findings, served to inspire the following story, which I offer as a prelude to this report…

Sixteen-year-old Edward Church of Baltimore, Maryland, was on his first trans-oceanic passage, having gained employment aboard the *Sir John Franklin*. He had become an experienced seaman during their long voyage and was just ending his watch way up high in the towering reaches of the foretop mast where he and several other mates had been engaged in reefing the fore upper topsail. The ship was drawing close to the Port of San Francisco and it was time to shorten sail to reduce speed and lessen the effects of the ship's lateral drift. There was some concern about their actual position since thick layers of fog had prevented the First Mate from getting a navigational fix; and for the past several days, the sun and horizon had been an opaque blur.

The unwieldy sheet of canvas that Edward and his mates furled was awkwardly stiff with crusted salt after their very long haul from their last port of call in Rio de Janeiro. Now, after several hours of exposure above the open sea, Edward longed to go below and change into dry clothes before catching up on some much-needed sleep. Sometimes when he was in the crosstrees of the fore mast, he would stare up and watch the spiral arc that the tip of the mast made as it etched dizzying circles into the night sky. Although he still enjoyed the exhilarating sensation of the ship accelerating forward on the downward slopes of the waves, the thick night fog had succeeded in dampening his spirit, as well as his clothes, so when he was finally relieved by a shipmate he wasted no time in making his descent.

With the dexterity of a spider, he nimbly threaded his way to the tarred rope backstays, slid down the nearest one to the deck below and headed straight to his designated hammock space beneath the forepeak. The ship easily shouldered the rolling waves as she sailed along with the great Pacific Ocean swells that traveled relentlessly towards the California coastline. As Edward ducked his head below the hatch combing he distractedly reflected on the warm tropical climate of Rio de Janeiro, their last contact with solid land before taking the perilous voyage around the tip of the continent and on into the vastness of the South Pacific, the thought contrasting sharply with the cold, dripping fog that had streamed thickly through the foretopmast on which he had been stationed a few minutes before. Despite the chill of the damp night air, he was warmed by thoughts of Rio, although it was becoming an increasingly distant memory for him as it had been left very far behind. Still, Edward recalled how amazing it was to anchor at the port and roam the waterfront; a teenager from Boston surrounded by all the wonderfully exotic sights; newly exposed to the pleasures of port with its mix of exotic people and dense tropical vegetation. But for now, all Edward wanted to do was to get out of his wet clothes, climb into his swaying hammock (which was still warm from the previous occupant who was now doing his turn on deck), and let the creaking hull and the sound of rushing seawater lull him into dreams of what their destination might be like. Giving in to his growling stomach, he cinched open a small tin and quickly ate some of its rather metallic tasting salted fish while reflecting on the stories his shipmates had told him about the infamous Port of San Francisco, which was now less than 70 miles away… or so he thought since he had overheard Captain John Despeau state as much to the officer on deck before he turned in.

A little after two bells (or was it four?), Edward was awakened by a loud cry from someone repeatedly yelling “Breakers ahead, breakers ahead...!” As the ebb of sleep evaporated and consciousness crept back into his mind, he began to respond, but slow awakening immediately transformed into instant awareness as he heard the Captains frenetic order “All hands, take in sail, crew to the windward braces, everyone on deck!” With this imperative, his training kicked in and he scrambled out of his canvas hammock and groped for his wool jacket, still heavy and sodden from his time up on the foremast.

Edward heard the pounding of feet on the deck just above his head as some of the crew rushed towards the shrouds to climb aloft and organize the network of ropes needed to turn the yards and their massive sheets of sails into better position to catch the wind (hopefully in time) on the opposite tack. Several men were already waiting at their stations in anticipation of when the Captain would give the order for the helmsman to spin the wheel and try to turn the ship. Nevertheless, even as Edward struggled to get an arm through a clinging soggy coat sleeve, he heard the Captain frenetically yell “Wear Ship!”

This command was immediately followed by the loud squealing of blocks and tackle, which produced an audible dirge as the well-used ropes were hauled in, transferring new tension to the masts. The increasingly taught rigging sent thrumming signals throughout the fabric of the ship. This, along with the increased cant of the deck was all apparent to Edward Church; but the great forward lurch as the ship ran into something solid and abruptly checked its momentum threw the entire universe of the lightless forepeak into total confusion. Edward was dashed into the ladder leading up to the fore hatch, as an array of invisible objects hammered into him before gravity reasserted itself.

Someone shouted, "cut away the stays" in a last-minute attempt to let the tall masts break free and release the increasing pressure on the ship's hull, which was now grinding with a terrible noise on submerged rocks. With the pressure of the billowing sails on the masts, the trapped ship risked being wrenched into splinters. Edward grabbed a short-handled axe as he stumbled on deck. He picked himself up and briefly oriented himself before running towards the foremast where the diffuse light of the night fog silhouetted other sailors who could be seen furiously hacking away at the thick ropes that held the mast in place. Another group of men was attempting to do the same to the mizzenmast.

Tripping on the upward heave of the ship, he caught his balance only to make a brief pirouette before being slammed once again onto the deck as the *Sir John Franklin* broached and instantly broke in half with an explosion of splintering timber; spilling cargo, canvas, rope and men into the cold sea.

As the after part of the ship splintered into pieces and ceased to be a coherent structure, the forepart with Edward and several men clinging to its hulk was freed from its grounded status. The fog cleared briefly, and for a moment, he could see some semblance of shoreline nearby as foamy waves broiled onto a brilliantly white moonlit sandy beach. For a couple of seconds, a rocky headland was also visible as a jet of water shot high into the night air after a wave broke upon the partially submerged rocky formation of the continental edge. Nevertheless, the fog quickly closed in once again, and in the ensuing darkness, the free-floating hulk struck more rocks and rolled over before breaking into pieces.

The icy cold sea filling Edwards's heavy clothes was the last thing he experienced before drowning just a short distance from the sandy shore, along with twelve other men, including his Captain…

Although the story presented above is an imagined scenario, the event, the details and the people involved were real. When Edward Church's mother learned of her son's death several months after the *Sir John Franklin* wrecked, she became deeply affected by her loss and was motivated to commission the placement of a marble tombstone (a "cenotaph" when dedicated to sailors) in memory of her dear son who had been laid to rest in the sandy dunes of an ad-hoc cemetery. The cenotaph stood prominently out on the point for many years, marking where he and three other drowning victims from the *Sir John Franklin* had been interred, and the rocky headland that contains them has ever since been referred to as the Franklin Point cemetery.

But Edward and his shipmates would not be the only ones laid to rest at the Franklin Point Cemetery. Within the span of just two more years, many other unfortunate drowning victims would join them when two more ships, the *Coya* and Hellespont met the same fate. The loss of life (and material from the points of view of ship owners and insurance agents involved) resulted in a public effort to leverage the Federal Government into building a lighthouse nearby the wreck sites at Pigeon Point. Ironically, the location of the lighthouse was itself the scene of several wrecks and narrow escapes (including the *Carrier Pigeon* in 1854). The exact number of individuals interred at the Franklin Point Historic Shipwreck Cemetery is not known, but historical records suggest that several dozen may still be present.

Ultimately by 1872 the construction of the Pigeon Point Lighthouse was completed, and its new glass prism bedecked "Fresnel Lens" became operable (Semones 2007). In

addition, in 1872, a foghorn and light station were built out on Año Nuevo Island, just south of Franklin Point (Bischoff 2009). Today, all three maritime features are within Año Nuevo State Park and serve as monuments to the potential perils of maritime traffic along the Central California Coast. In contrast, the cenotaph dedicated to young Edward Church that stood out on the dune for nearly 100 years was stolen sometime in the late 1960s, and the shipwreck cemetery at Franklin Point was largely forgotten—until increasing erosion of the cemetery began to expose several coffins with human remains inside them.

Between 1983 and 2001, the skeletal remains of eight individuals had been recovered and ultimately archived at different archaeological collections facilities. By 2002, it was realized that more burial exposures were about to occur as erosion continued to deflate the cemetery area, and it became necessary that something be done to stabilize the site and prevent further degradation of the resting places of the shipwreck victims.

Continued respect for the individuals buried out on Franklin Point should be an attribute of our social mores, and, therefore, became a position of consideration for the management of this place. With this in mind, the ultimate goals of this project were to:

1. Study the remains that had already been exhumed and attempt to learn something about their mid-nineteenth-century maritime lives;
2. Return the remains, after the analysis, to the place where they had originally been found; and
3. Stabilize the site and minimize pedestrian erosion by constructing a wooden boardwalk to guide the public over the site and provide larger viewing deck platforms to protect the cemetery.

To this end, the forensic studies have been done and eight sets of shipwreck victims have been returned to where they were originally buried; and the boardwalk and observation decks have been installed. However, even though the stabilization effort has been successful, the sea will eventually reclaim both the point of land and the cemetery. Regardless, in respect for the ill-fated foremast hands and passengers of the *Sir John Franklin*, *Coya*, and *Hellespont*, we can appreciate that at least eight individuals rest in the same place from where they had been exhumed and are once again under a wooden deck.

Introduction

With the rapid urban expansion that has transpired throughout California, particularly since the 1970s, many parks and open space preserves have been established to protect natural and cultural resources for the greater benefit of the public. Contained within these public lands are a vast array of historic and prehistoric archaeological sites, monuments and structures. Sometimes these cultural resources include historic cemeteries and these places can become designated as archaeological sites, like the one at Franklin Point, which has been registered as site CA-SMA-207/H.

The Franklin Point site projects out into the Pacific Ocean along the San Mateo County coast of central California (Figure 1) and contains multiple graves from the victims of three shipwrecks. These remains include people who represented a range of cultural and social backgrounds. Unfortunately, many years of erosion has resulted in the exposure of their coffins along with the bodies inside them, and past archaeological salvage efforts have cumulatively exhumed eight sets of human skeletal remains. These recurrent exposures and salvage efforts lead to the need to stabilize the exposed portion of the cemetery to prevent further disturbance of the graves, and it was decided that the human remains already archived should be evaluated and returned to their resting places. These individuals and their lifeways, and the stabilization of the cemetery are the subject of this report.

Agency archaeologists responsible for stewarding cultural resources on public lands are often tasked with the duty of stabilizing and protecting culturally sensitive and significant places that contain human burials, even though we frequently do not know the identities of the individuals at rest. Human skeletal remains recovered from excavations conducted by archaeologists can provide important insights about the past lifeways of individual people. Information ranging from the age, gender, diet, health, place of origin and much more can be gained. Nonetheless, moral responsibilities regarding stewardship and treatment of these remains should encompass values that supersede scientific applications alone. The patterned interment of human remains represents one of the oldest manifestations of human cognitive behavior (Tainter 1978). The designation of specific locations as burial grounds, the orientation, preparation and presentation of the body, and the nature of associated belongings all manifest the overall station in life that the deceased once achieved. Cultural traditions and societal values are downloaded into burial practices and serve as a reflection of our philosophical and religious convictions regarding human life.

American social traditions of the early twentieth century was largely founded on biblical principles. Therefore, we see the establishment of ritual space bounded and designated as a cemetery, with bodies placed ventrally extended in a wooden casket, with an official or priest to dispense a requiem

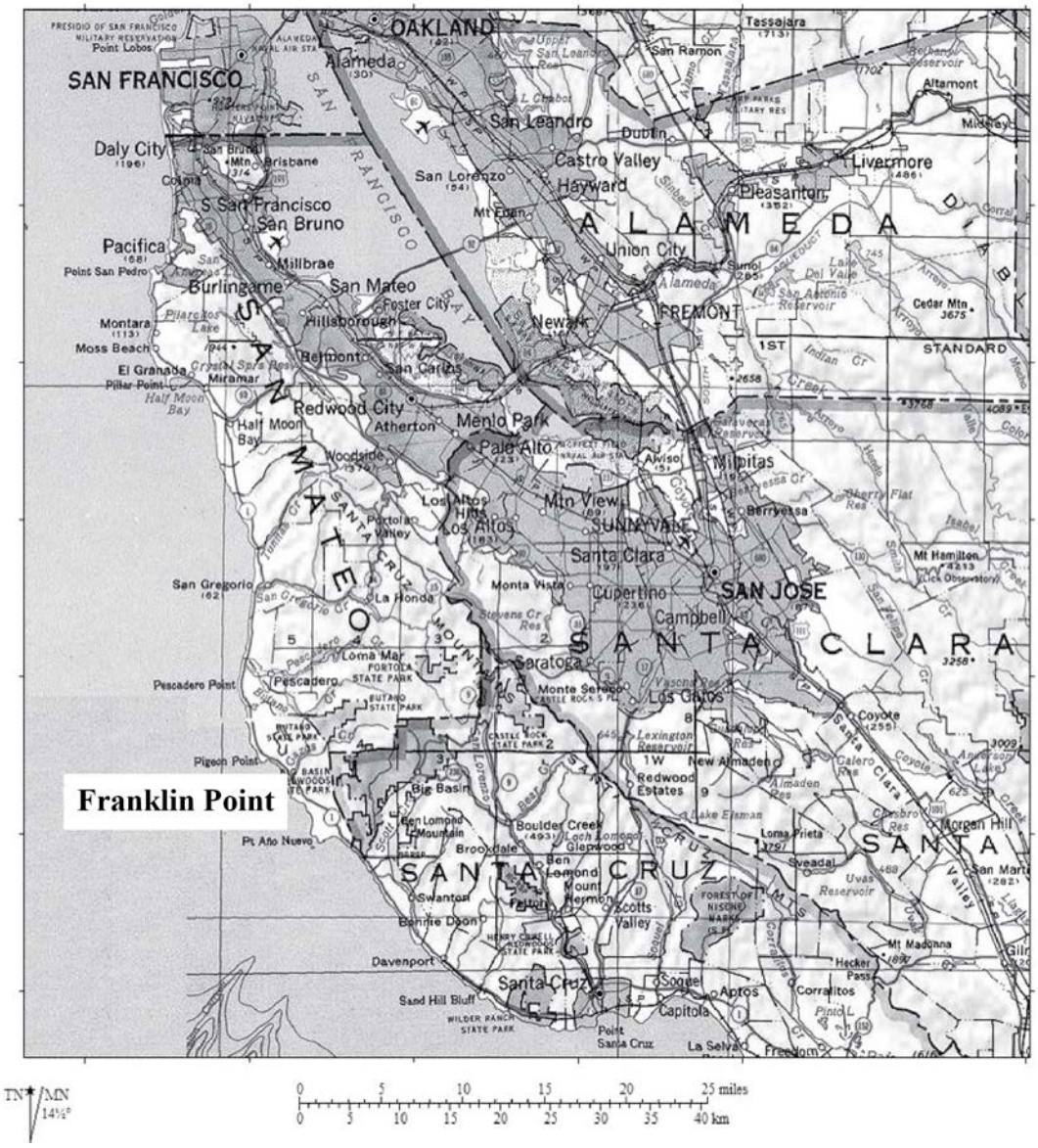


Figure 1. Project Location.

and the placement of a monument in the form of a headstone bearing the identification of the deceased. In keeping with traditional values, the headstone can be assumed to be situated at the head of the casket, which was typically placed six feet deep in a grave excavated to the dimensions of 3 x 6 feet with the individual buried with their head oriented westward.

In the case of the Franklin Point Historic Shipwreck Cemetery we see an expression of how mid-nineteenth-century society coped with handling clusters of drowning victims who included persons of higher social standing (officers and upper deck passengers) and those of lower means (foremast sailors and steerage passengers). The latter folks were often thought of as indigent, nameless, and forgotten people who could be expeditiously disposed of in "potters" cemeteries near hospitals and churches, or, as in this case, right on the edge of the ocean on a windy point.

Predictably, we find that the bodies of the officers and most of the passengers of the wrecks were transported and interred in the "sanctified" cemeteries in San Francisco, while others were immediately buried near the site of their wrecks. At Franklin Point, local ranchers, loggers and fishermen rallied to rescue survivors and tend to the wounded; but the dead sailors were placed in thin redwood boxes and hastily buried out on the point. So too, evidently, were some of the passengers.

FRANKLIN POINT

The cemetery site is located on a narrow finger of scrub-covered sand dune and rocks that extend several hundred yards into the Pacific Ocean along the southern San Francisco Peninsula coast of San Mateo County, California (see Figure 1). The surrounding lands, including the cemetery were annexed to Año Nuevo State Park around 1978. With its inclusion into the State Park system and greater public access, Franklin Point has become an increasingly popular visitor destination. Over the years, beachcombers, along with relic hunters, have found many remnants of the wrecks; but of greater concern have been the episodic exposures of human skeletal remains caused by increased visitation and erosion of the protective vegetation and sand cover.

Franklin Point is one of four landforms that project outwards into the Pacific Ocean within Año Nuevo State Park that are individually designated as geographic "points." Early Spanish mariners referred to these points singularly under the name "Punta Del Año Nuevo," but today they are known as Año Nuevo Point, Franklin Point, Pigeon Point and Bolsa Point (Figure 2). In any case, these points have been the scenes of past maritime tragedies (Morall 1979; Reinstedt 1975; Semones 2007) but only Franklin Point retains a cemetery and has been identified and designated as such on USGS topographic maps ever since the establishment of that agency's cartographic archive. Many of these wrecks, including the three described here, were heading into San Francisco Bay after long trans-oceanic voyages.

The skeletal remains buried at Franklin Point include both sailors and passengers who drowned during the wrecks of three "square-rigged" sailing ships that took place within just a few years of each other. Unfortunately, the officers on board had miscalculated their relative positions and found themselves among the rocks. These ships included the American Clipper *Sir John Franklin*, which wrecked in 1865, succeeded by the British built bark, *Coya* in 1866, and another American ship, the *Hellespont* in 1868. Historic accounts describe how local residents rallied to recover the dead that had washed up on the beach and worked to bury them in redwood caskets in the dune fields out on the narrow point that has ever since been named after the wreck of the first ship.

Between 1980 and 2002, several incidents of burial exposure occurred, mostly because of unbounded pedestrian traffic over the fragile sand dune vegetation habitat. Once the vegetation was trampled and denuded, the surface of the cemetery was subject to aeolian deflation, and as the gusty ocean winds blew away the covering sand, several formerly buried coffins became exposed. This dynamic was an on-going problem at Franklin Point, and the continuing exposure of these shipwreck victims led to several episodes of archaeological recovery and the analysis of eight sets of skeletal remains. Others have been exposed in the past by antiquarians, vandals and the forces of nature. Historic records and the frequency of exposures indicate that numerous people were once interred within the site;

however, an exact number of those remaining is not known. Nevertheless, the relatively undeveloped nature of the area affords the likelihood that many burials are still there.

Over a period of several decades, the skeletal remains that had been archaeologically exhumed from the cemetery had been archived at several different repositories. Fortunately, the opportunity to address these remains collectively transpired in 2002 when the continuing exposure of additional burials (still *in situ*) prompted the need to stabilize the cemetery. A grant from the California State Parks Cultural Stewardship Program allowed for the forensic analysis of the skeletal remains and, ultimately, their reinterment back on site. The funding also supported the construction of a *pedestrian* boardwalk trail and scenic viewing decks over the site, which has served as a means of reducing random pedestrian travel that constitutes the primary cause of site degradation.

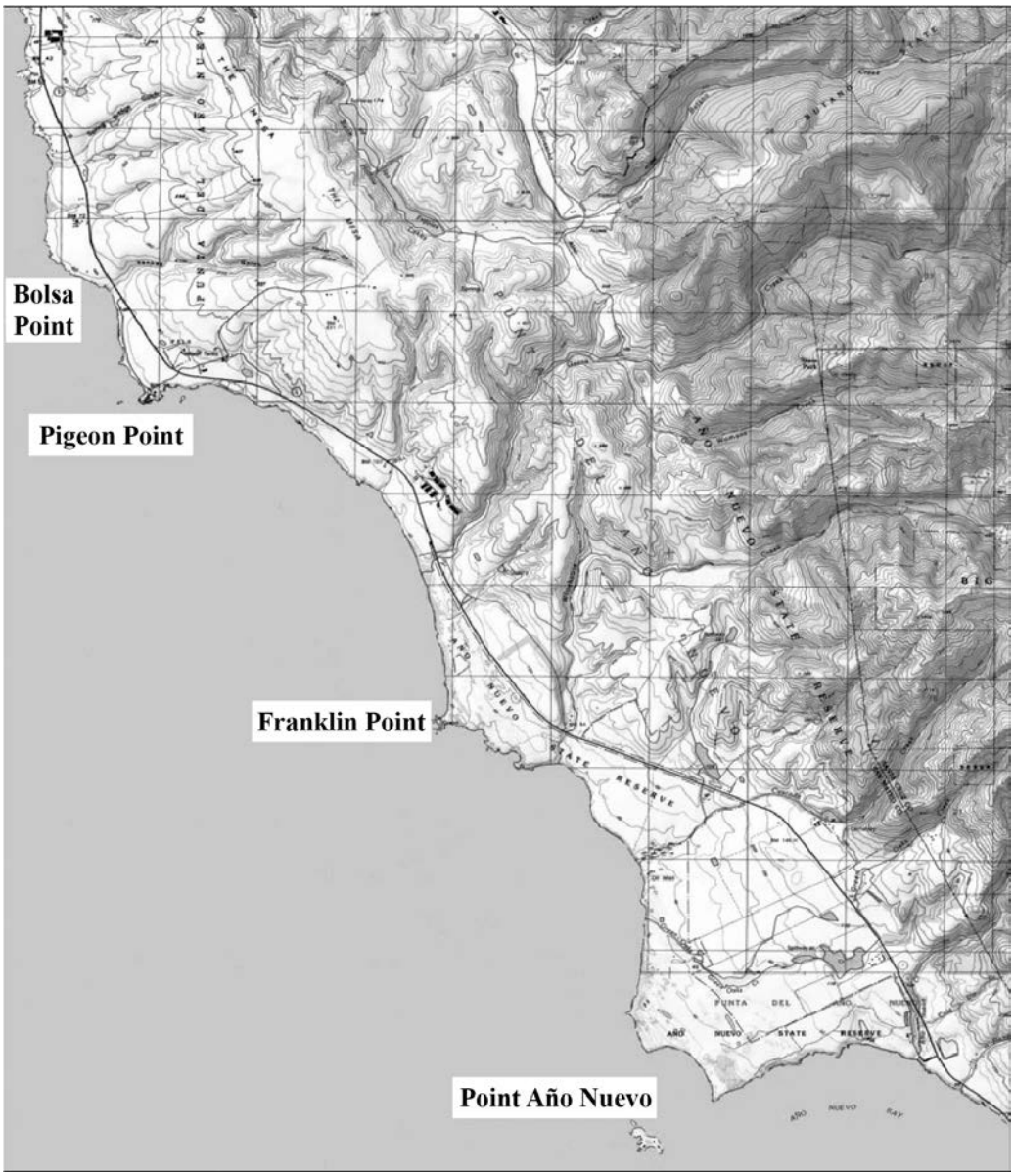


Figure 2. The Four Geographic Points of Año Nuevo State Park.

Historic Context

The halfway point between Pigeon Point and Point Año Nuevo is now named Franklin Point after the *Sir John Franklin* ("Struck rocks at Pigeon Pt.," Marshall 1978:26; Gibbs 1957:277). Before this event, the cape was called Middle Point on early charts of the Coast Survey (CINMS Shipwreck Database).

In historic times, maritime travelers began reaching California as early as 1542 with the voyage of Spanish explorer Juan Rodriguez Cabrillo. Early Spanish mariners viewed the westward extension of the Año Nuevo marine terrace as the northern most point of Monterey Bay, while the inward curve of the San Mateo coast above Año Nuevo and further northward to Point Reyes, with the Farallon Islands to the west, was generally ascribed the name "Bay of San Francisco" (Treutlein 1968) and later, "Gulf of the Farallons." Only after the discovery of today's bay of that name in the year 1769 (Stanger and Brown 1978) did the world learn of the great harbor and interior landscape of California. Since that time, several episodes of historic transformations have shaped the environment, people and economies of the San Francisco Bay area. Throughout the Spanish, Mexican and early American historic periods, most of the settlement and expansion of Upper California was facilitated by the maritime transportation of materials and people.

The discovery of gold in California in 1848 spurred an epic migration of people (Hornbeck 1983). By 1849 tens of thousands were struggling to get to the Sierra Mountain goldfields (Rawls and Orsi 1999), and a mass exodus transpired from eastern US farms and cities, as well as across the globe from the Pacific coast of South America to China as new opportunities and fortune lured in a variety of cultures, customs and traditions. With wild dreams of instant riches, the first major obstacle to be faced was the journey itself because the only way to get to the gold fields was either by traveling overland across the North American continent, through barren, un-mapped territories actively defended by Native American tribes, or by booking passage on a ship and enduring long voyages by sea.

The effect on shipping was huge as demand for transportation of men and material expanded exponentially; the world was in a hurry to reach the formerly dormant Port of San Francisco. In response, shipyards of the Northeast coast of the United States acted on the need for more rapid transportation by experimenting with new technological innovations in ship hull design and production. In so doing, they effectively competed with the old-world shipyards of England, France, Denmark and the Netherlands.

One major innovation in American shipbuilding was the development of the clipper ship (Figure 3). With a more efficient design, these sleek, flush-decked ships, many of which were constructed in New

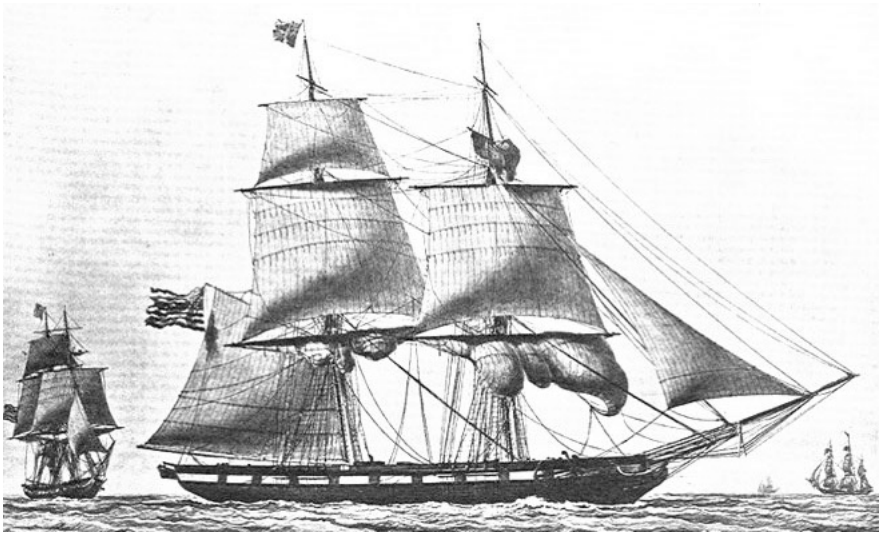


Figure 3. Example of a Medium American Clipper Ship circa 1860s.
Note: "Medium" refers to hull form, not size.

England between the years 1850 and 1870, allowed for greater speed and sailing ability. One of the first of these new classes of ships was the Stag Hound, built in 1850 in East Boston. Soon, many other shipyards began constructing clippers and entered into the competition. These new vessels soon began to break transoceanic crossing records.

Although the *Sir John Franklin*, was a clipper, the *Coya* and *Hellespont* were barks that had been modified as colliers to transport coal. Barks, like clippers were vessels that had three towering masts (sometimes four) but the last one (mizzenmast) of a bark was "fore and aft rigged" rather than square-rigged with yardarms.

Historic accounts frequently note the fate of sailing ships whose useful terms often ended in wreckage at sea or upon rocky shores due to storms, construction failures or navigational errors. In the days of sailing ships, captains and crew were reliant on solar and celestial navigation techniques, coupled with measurements of approximate speed and lateral drift from ocean currents. Variable winds and differing ocean current speeds, the volume of sails at a given time, the placement of cargo in the ships hold and the way a ship handled with the wind at certain points—all combined to create a complex algebraic challenge to navigational skills. Captains and navigators charted their course according to the peculiarities of the individual ship and its contents. In some instances, such as a "leeward shore," the necessary amount of sea room required to maneuver a vessel, coupled with a wind direction angling to a fixed shoreline often proved fatal to those sailing ships that failed to foresee the destructive combination in time to correct for the problem. In such cases, the time involved for the scenario to play out could take a while, but nevertheless lead to an inevitable end. In other words, people aboard a ship locked into a leeward shore could know that their end was forthcoming in whatever time it took for the fatal combination of effects to transpire. Sailing ships needed a lot of sea room to execute maneuvers that involved the readjustment of the yards and sails; as well as the ropes that controlled and supported the whole complex array. To help illustrate the point, Figure 4 through Figure 9 present aspects of sailing ship mechanics.

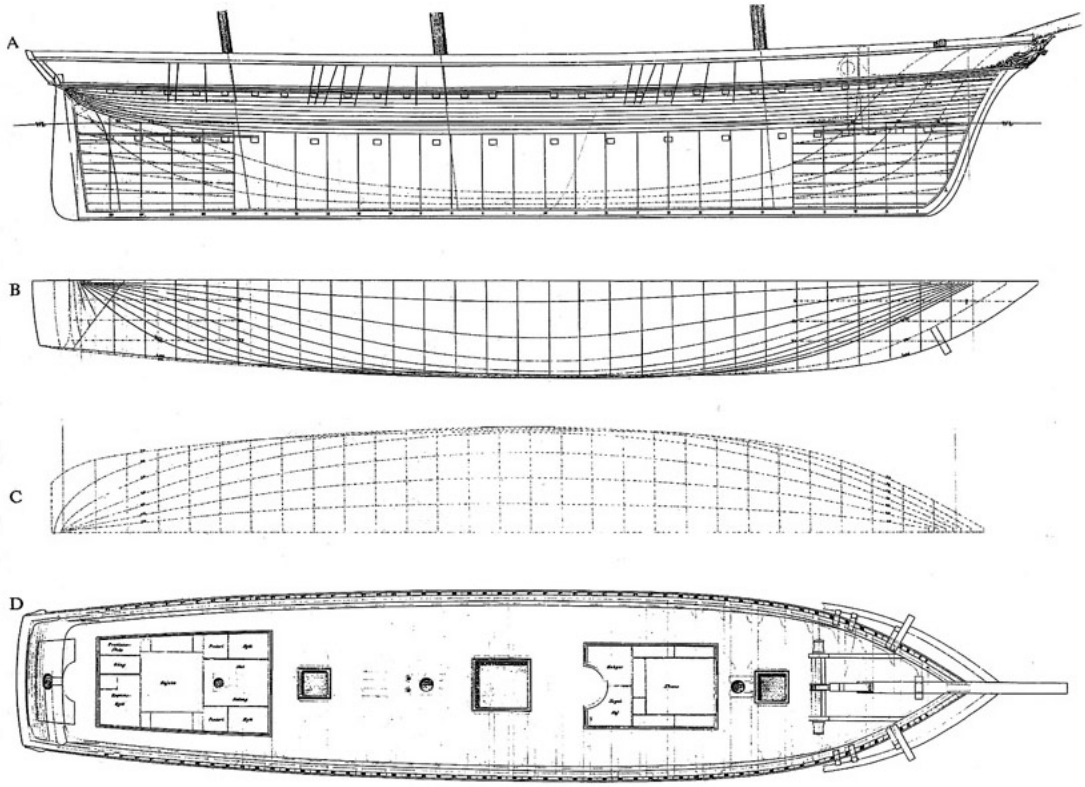


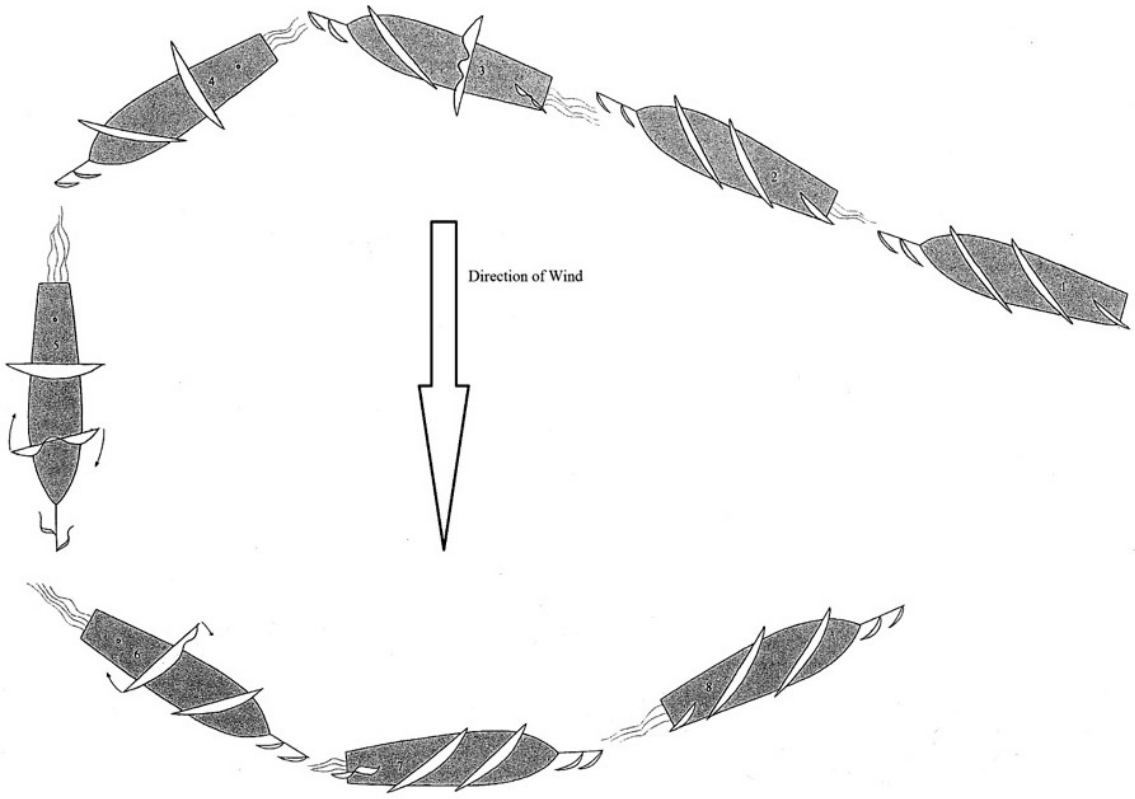
Figure 4. Schematic of a Three Masted Ship's Hull, circa 1860.
From Tryckare 1972:23.

The coastal edge of Año Nuevo State Park has been the scene of many shipwrecks, several of which are shown on Figure 10. However, only the unfortunate victims of the *Franklin*, *Coya,* and *Hellespont* are thought to be present in the CA-SMA-207/H cemetery.

WRECK OF THE *SIR JOHN FRANKLIN*

The *Sir John Franklin* was an American medium class clipper ship built in Baltimore, Maryland by John J. Abraham in 1855 (Marshall 2001; CINMS Shipwreck Database; *Daily Alta California*, January 20, 1865). The ship was made of oak and "lignum vitae," measured 170 feet and eight inches in length, with a depth of 17 feet and ten inches. The beam measured 35 feet and eight inches. The boat's intended purpose was commercial use and she had a great ship rating as an A1/2 vessel on the Lloyd's register. The owner of the ship at the time of the wreck was Lambert Gidden of Baltimore (*Daily Alta California,* January 19, 1865).

Before reaching the California coast, the *Sir John Franklin* stopped off at the Brazilian port of Rio de Janeiro. While anchored there the crew unloaded a portion of her cargo and took on added freight from the *Charles L. Pennel*, which had also been bound for San Francisco. The ship, *Pennel* had been reported as un-seaworthy by port authorities, so an agreement between Captain John J. Despeau and a business representative of the *Pennel* was made to take some of their cargo to San Francisco. The cargo consisted of dry goods, lumber, pianos, coal, oil, candles and "spirits" (Reinstedt 1975:21; *Daily Alta California,* January 20, 1865).



A SQUARE-RIGGED VESSEL, A THREE-MASTED BARK, WEARING

1 The bark is sailing on the wind on the starboard tack.

2 "Ready to wear ship!" The mainsail is clewed up and the braces are coiled down for running.

3 The spanker is furled. "Up helm!" "Square in the mainyard!" The wheel is put to port and the mainyard is squared.

4 Without sail aft the vessel is paying off.

5 The bark is before the wind. "Round forward!" The headsails are braced around and the jibs sheeted over to starboard.

6 When she is coming up on the new tack the headsails will meet her. The after yards are braced up.

7 The spanker is set and all sails are trimmed by the wind.

8 The bark is kept on the wind on the port tack. The main sail is set and the deck cleared up.

Figure 5. Steps Involved in "Wearing Ship."
From Tryckare 1972:248.

The 999-ton *Sir John Franklin* was heading toward San Francisco on January 17, 1865 when she wrecked (CINMS Shipwreck Database). Visibility had been poor due to 24 hours of dense fog and it was thought that the ship was about 70 miles off land, but at 9 p.m., the crew realized that they were close to land. The ship struck rocks, causing the masts to go overboard (*Daily Alta California*, January 19, 1865). Immediately the crew tried to divert the ship into open waters, but the waves continued to pound the ship against the rocks. Captain Despeau and most of the crew of 20 were standing together towards the middle of

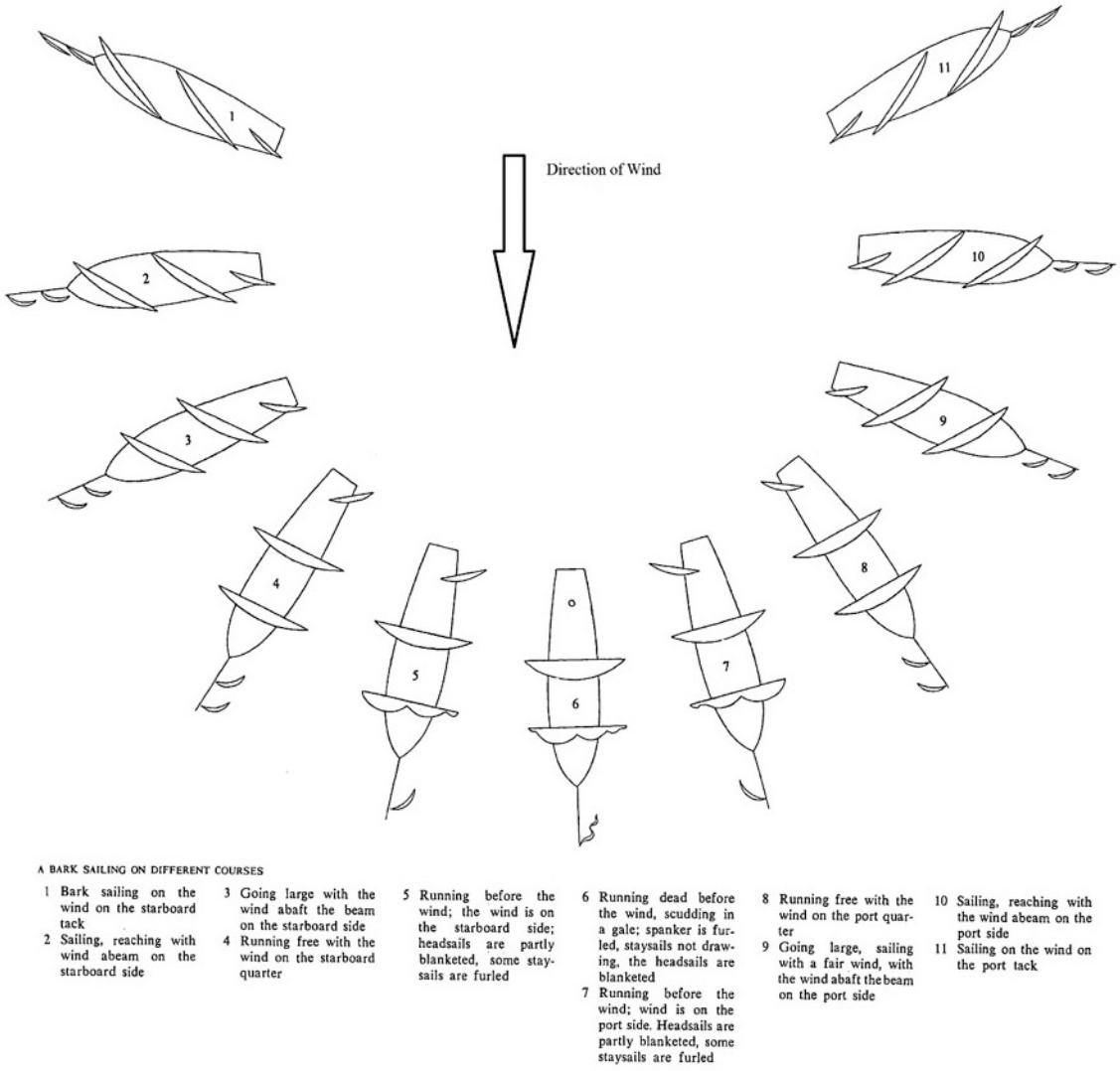
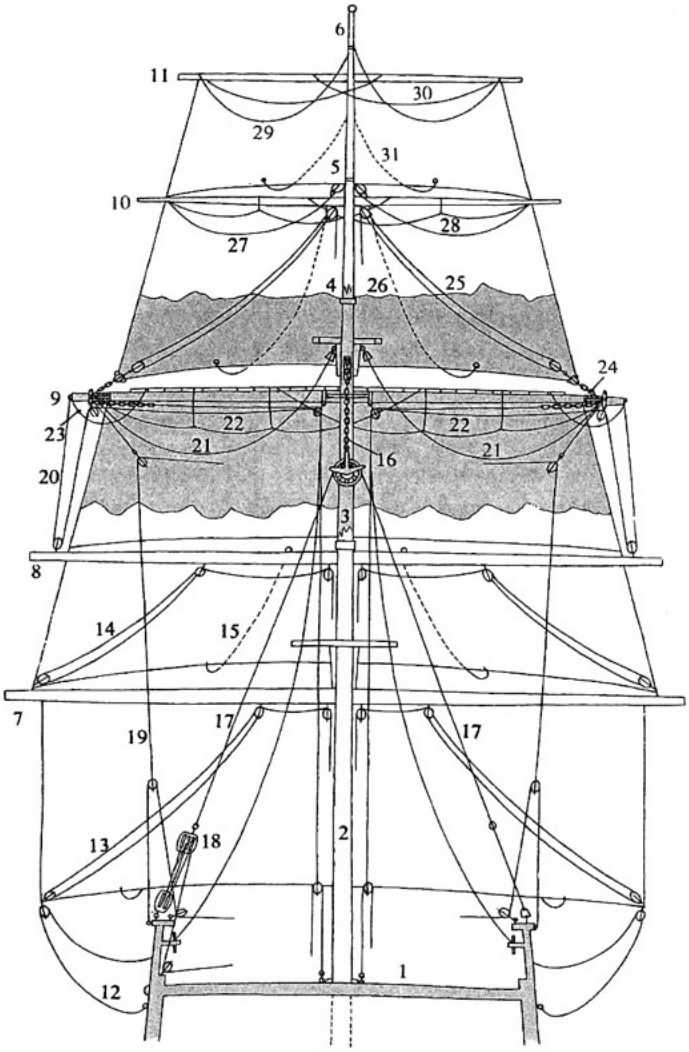


Figure 6. Positions of Yards and Sails Relative to Wind Direction and Courses.
From Tryckare 1972:246.

the ship, except for two men when the ship then split in half, throwing the cargo and crew into the water (Reinstedt 1975:22; *Daily Alta California*, January 19, 1865). The wreck then floated over the rocks, broke up and piled onto the beach (*Daily Alta California*, January 19, 1865).

The sea current and undertow caused surviving Officers Boyd, Ball, and Welch along with five of the crew to struggle with the tide for almost two hours before reaching the beach.

On the brink of hypothermia, they wandered through the coastal scrub and grassland until they found a farmhouse where they were taken care of for several days. While the others recovered, Mr. Boyd left the farmhouse to go to San Francisco to testify about the events leading to the wreck because he was the only one that could afford the trip (*Daily Alta California*, January 19, 1865).

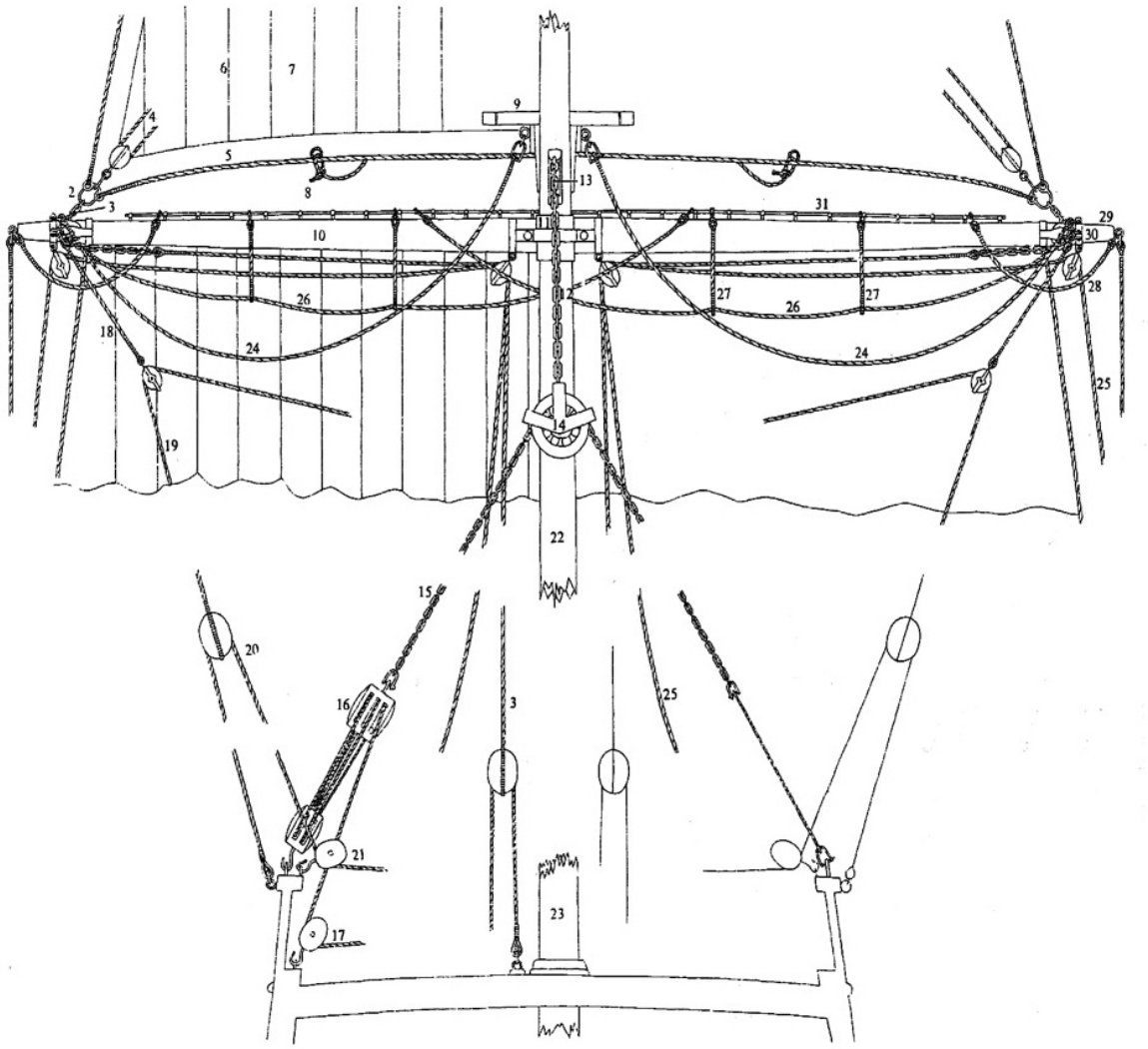


THE SQUARE SAIL

A *Square-rigged mast, seen from aft*
1 Deck
2 Lower mast with top
3 Topmast with cross-trees
4 Topgallant mast
5 Royal mast
6 Pole
7 Lower yard
8 Lower topsail yard
9 Upper topsail yard
10 Topgallant yard
11 Royal yard
12 Lower sheet
13 Clewgarnet
14 Topsail clewline
15 Lower topsail buntline, shown in broken lines forward of sail
16 Topsail halliard, tie
17 Topsail halliard, spanner
18 Topsail halliard, tackle or falls
19 Upper topsail brace
22 Upper topsail yard footrope
23 Upper topsail yardarm horse
24 Topgallant sheet
25 Topgallant clewline
26 Topgallant buntline
27 Topgallant lift
28 Topgallant yard footrope
29 Royal lift
30 Royal yard footrope
31 Royal buntline

Figure 7. Schematic of a Mast, Yardarms, and Sails of a Square-Rigged Ship, circa 1860s.

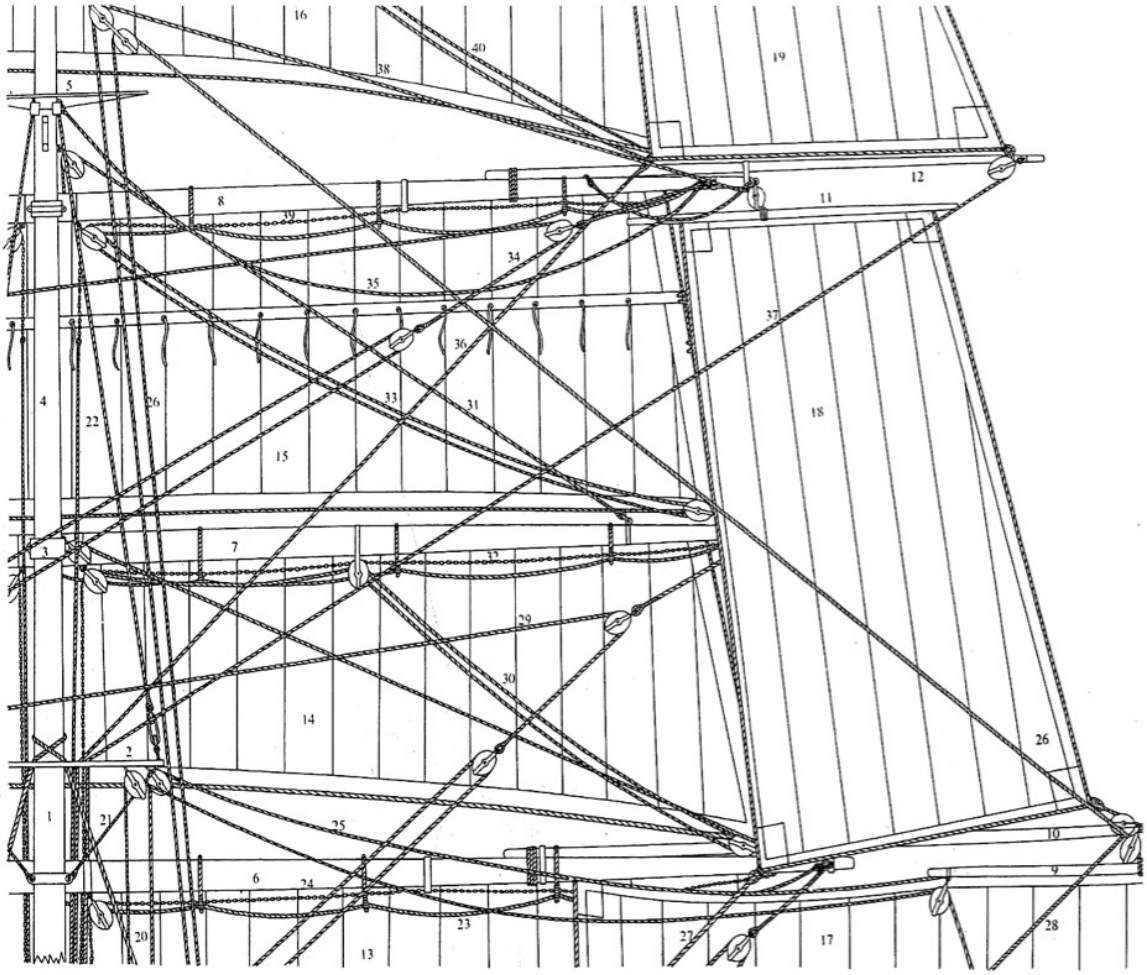
From Tryckare 1972:107. A Close-up diagram of the areas highlighted in gray follows in Figure 8.



TOPMAST, TOPSAIL, AND TOPGALLANT SAIL WITH RUNNING GEAR

1 Topgallant leech, port side
2 Topgallant clew
3 Topgallant sheet
4 Topgallant clewline
5 Tabling on foot of topgallant sail
6 Flat seam between the cloths of the sail
7 Cloth of canvas, generally 2 feet wide
8 Topgallant buntline
9 Topmast crosstree
10 Upper topsail yard
11 Upper topsail yard parrel
12 Upper topsail yard tie
13 Sheave hole in topmast for the tie
14 Topsail tie gin block
15 Topsail halliard chain span
16 Topsail halliard tackle
17 Topsail halliard lead block
18 Upper topsail brace pendant
19 Upper topsail brace runner
20 Upper topsail brace falls
21 Leading block of upper topsail brace
22 Topmast
23 Lower mast
24 Topsail yard lift
25 Topsail yard downhaul
26 Foot rope of upper topsail yard
27 Stirrups to support foot rope
28 Yardarm horse
29 Yardarm
30 Yardarm band
31 Jack stay to which sail is bent

Figure 8. Schematic Diagram of Foretopmast, Sails and Running Gear.
From Tryckare 1972:106.



EARLY METHOD OF RIGGING DOUBLE TOPSAILS, 1860

1 Lower mast, foremast
2 Top
3 Cap
4 Topmast
5 Topmast crosstree
6 Lower foreyard
7 Lower topsail yard
8 Upper topsail yard
9 Lower studding sail yard
10 Topmast studding sail boom
11 Topmast studding sail yard
12 Topgallant studding sail boom
13 Fore course, foresail
14 Lower topsail
15 Upper topsail
16 Topgallant sail
17 Lower studding sail
18 Topmast studding sail
19 Topgallant studding sail
20 Lower rigging or shrouds
21 Futtock shrouds
22 Topmast rigging or shrouds
23 Lower yard footrope
24 Lower topsail sheet of chain
25 Inner lower studding sail halliard
26 Outer lower studding sail halliard
27 Topmast studding sail sheet
28 Topmast studding sail tack
29 Lower topsail brace
30 Lower topsail clewline
31 Lower topsail lift
32 Upper topsail sheet
33 Upper topsail clewline
34 Upper topsail brace
35 Upper topsail lift
36 Topgallant studding sail sheet
37 Topgallant studding sail tack
38 Topmast studding sail halliard
39 Topgallant sheet
40 Topgallant clewline

Figure 9. Schematic Diagram of Method for Rigging Double Topsails, circa 1860s.
From Tryckare 1972:110.

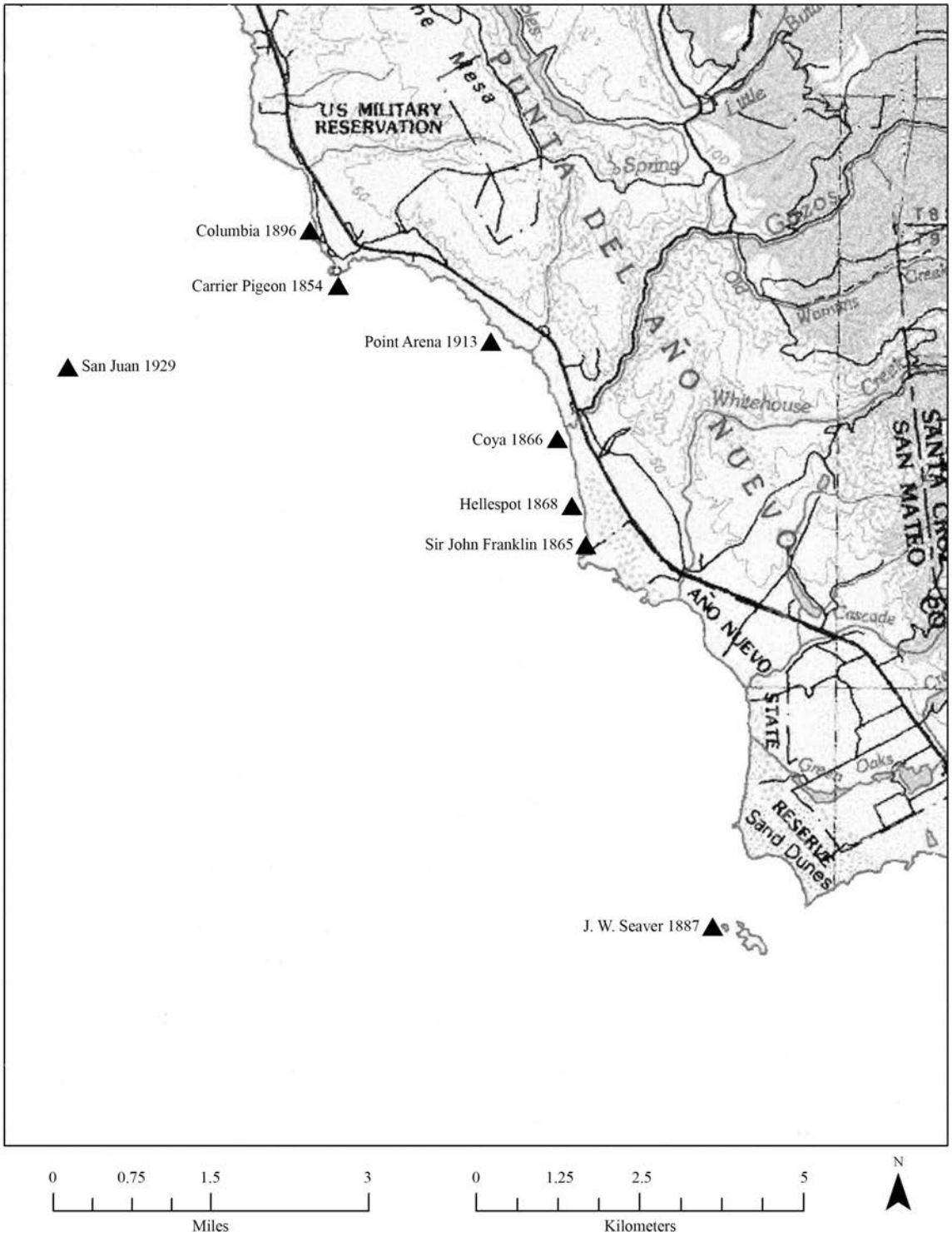


Figure 10. Historic Shipwrecks of Año Nuevo State Park.

The details provided above were cited from the *Daily Alta California*, a well-read local newspaper; however, a letter to the editor appearing on January 24, 1865 from an "A.B." gave a slightly different account of what happened to the *Sir John Franklin* than what the Alta had reported in the previous days:

> I noticed in your issues of the account of the wreck of the *Sir John Franklin* materially differs from that given by the men and some of the under officers. It is stated that she struck at 9 o'clock, but the survivors say she struck at ten o'clock, and that she was running full on, and the fog being very dense, it was impossible to see anything. The first alarm was given by the lookout, "breakers ahead," immediately followed to "wear ship," but before the order could be executed, she struck. The order was then given to cut away the masts, and while cutting the head-stays, she broke in two forward of the poop and then abaft the forecastle. The officers and men using the fore-channels, excepting one who was in the forecastle, were left on one half of the deck. At this time, the fog cleared so that they could see the shore, but very soon thickened so that all was darkness again. In this condition, they drifted close in when this part of the ship capsized and all was terror and confusion. In the darkness, and midst the wreck and cargo that had drifted ashore, only 8 of the 20 reached the shore. This was about the 1 ½ o'clock and at 2 o'clock they reached the house of Mr. Gushee, where they were hospitably cared for, every attention being paid to them. In the morning, the neighbors came to their relief with clothing, and kindly furnished Mr. Boyd with means and conveyance to your city, and would have sent the rest of the survivors had they desired it.

The cargo from the wreck was strewn along the beach for miles (Marshall 2001). Evidently, the cargo of the *Charles L. Pennel*, which made up the bulk of the cargo of the *Sir John Franklin*, was fully insured. The total insurance on the vessel and cargo was around $300,000 (*Daily Alta California*, January 20, 1865). About one-quarter to one-half of the damaged cargo was saved by locals who hauled it away from the surf zone.

The ships insurers, New York Board of Underwriters, dispatched their agent Mr. Artemis Fletcher and six police officers to oversee the salvage and clean-up effort on January 19, 1865. Evidently, a lot of the cargo was still salvageable, although 100 of 300 barrels of whiskey were somehow unaccounted for. The *Daily Alta California* on January 23, 1865 reported this account: "Although great quantities of liquor were in reach, everybody was sober, save one or two men sent down from San Francisco… and everybody acted honorably." Interestingly, the *Santa Cruz Sentinel* reported that the Sherriff of Santa Cruz had unexplainably managed to get a barrel of "the original stuff" for himself (*Santa Cruz Sentinel*, January 22, 1865).

First Officer Boyd, Second Officer Ball, Third Officer Welch and five unidentified sailors survived. Captain Despeau and twelve men died in the wreck; six bodies were recovered, and of these, four were buried at Franklin Point (*Daily Alta California*, January 20, 1865). The Captain was a native of Baltimore and left no family behind (*Daily Alta California*, January 19, 1865), but he and the Supercargo Robert Dawson were buried in San Francisco. Some of the names of the bodies that were recorded by the Coroner of Santa Cruz County were: Seaman Owen, John Devine of Liverpool, Charles Martin of Norway,

John Scoltine and Jacob Staten of Finland, and 16-year-old Edward Church from Baltimore (*Daily Alta California*, January 23, 1865). Nothing of value was found on the bodies, except that of the Supercargo who had a purse in his pocket that contained 20-dollar pieces, which was placed in the hands of the Deputy Marshall. A monument to the memory of Edward J. Church and the other seamen lost on the Franklin was commissioned by his bereaved mother and placed on the point (Table 1 and Figure 11). This monument was ultimately stolen sometime in the late 1960s.

Table 1. The Lost and Saved from the Wreck of the *Sir John Franklin*.

LIST OF PASSENGERS	LIST OF CREW AND THEIR STATION
None Listed	Lost John Despeau - Captain Edward Church - Seaman John Devine - Seaman Charles Martin - Seaman Robert Dawson Owens - Supercargo John Sooltine - Seaman Jacob Staten - Seaman 5 Unidentified Crew Survived Ball - Second Mate Boyd - First Mate Jefferson Welch - Third Mate 5 Unidentified Seamen

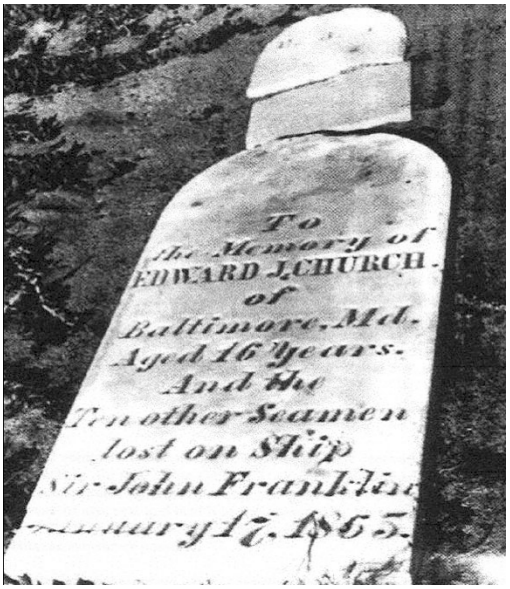


Figure 11. Edward Church Memorial.
Courtesy San Mateo County Historical Museum.

WRECK OF THE *COYA*

On November 24, 1866, just 22 months after the wreck of the *Sir John Franklin*, the British built iron-hulled bark *Coya* wrecked below Pigeon Point (Franklin Pt.; Gibbs [1957:277] "hit the rocks 1 mile off shore at Pigeon Pt. about ½ mile from where the *Sir John Franklin* wrecked;" Marshall 2001). The master of the boat was identified as Mr. Richard Paige, and his ship had been built along the Thames River in Britain in 1863, weighing 513 tons. The owner of the *Coya* was Willis and Company of Liverpool (*Daily Alta California*, November 27, 1866; *Sacramento Union*, December 6, 1866).

Outfitted as a collier to transport coal, the *Coya* left Sydney Australia for San Francisco on September 22, 1866 with 30 people on board—one of whom, Mr. James Martin—was a stowaway who was discovered after the ship had left port. Twelve days into the trip, their misfortune began when Seaman Peter Johnson fell from the jib boom into the sea while furling the sail. Evidently, he had been standing between two others when this happened. The Master and crew tried to circle the ship around and pick him up, but it took too long, and he drowned before the ship could return for him. On October 13, the *Coya* stopped at Pitcairn Island, of *Mutiny on the Bounty* fame, but left the same day (*Daily Alta California*, November 27, 1866; *Daily Alta California* November 29, 1866; *Sacramento Union*, December 6, 1866). After continuing their voyage to San Francisco, they lost sight of their position, having been unable to plot their location for two days because of dense fog. At that point, they believed that they were somewhere around the Farallon Islands well outside of the entry to the bay (Reinstedt 1975:13; *Sacramento Union,* December 19, 1866). The last observation possible was on the Thursday before the wreck, which gave the course as North 5 degrees East, with a distance of 280 miles from the Islands. In order to reduce speed, on Saturday, at 5pm, the crew took in all of the sails with the exception of the close-reefed fore, the main topsails, and the foretopmast-staysail (*Sacramento Union*, December 6, 1866). The *Sacramento Union* reported that their course was "northeast half east, direct for the north head light" (*Sacramento Union*, December 19, 1866). The light was in reference to the solitary lighthouse on the Farallon Islands, just outside of the mouth of San Francisco Bay.

At around 7:30 p.m. most of the crew and passengers were inside having tea, when the second mate reported, "land on the lee bow." Captain Paige went on deck and ordered that the ship be turned around (to wear ship). However, a conflicting account stated that the Captain had not been told of being so close to shore and had been eating dinner at the time the *Coya* wrecked (*Sacramento Union*, November 28, 1866; *Daily Alta California*, November 27, 1866). In either case, breakers were observed directly in the path of the ships traveling direction, and after the order to wear ship the vessel responded too slowly to rotate towards the opposite tack, ran out of sea room, and hit against several submerged rocks (Reinstedt 1975:13). Figure 5, presented earlier, provides a schematic of the procedures involved in turning, or "wearing ship."

Reporters interviewing one of the three survivors, Mr. George Byrnes who was a passenger, produced a written narration of the event. His account, which appeared in the *Daily Alta California* on November 27, 1866, and the *San Mateo County Gazette* on November 28, 1868, provides a very graphic depiction of the tragedy:

> All went well until November 24th all of which day, and day previous, we had very thick and squally weather, and no signals. On this evening, according to dead reckoning we supposed we were near the Farollone light

> and standing in under easy sail, close reefed fore and main topsail and fore top-stay sail; about 71/2 o'clock p.m., we were all down at tea, when the second mate reported land on the lee bow. Captain Paige came on deck and immediately ordered the ship to be wore round. Shortly afterwards breakers were reported right ahead and the ship coming around very slowly, when all of a sudden, she struck very heavily on the rocks and swung broadside on. The sea kept lifting her from rock to rock, crushing her bottom in. She had at this time made considerably closer to land, and we all gave ourselves up for lost. The sea commenced breaking over the bows, carrying everything before it. The boats were swept away by this time. The (other) passengers were all on deck now except Mrs. Jeffreys, who had been confined two days previous. The scene now was something fearful; the main deck, being torn up by the pressure from the water underneath, made one of the most frightful noises ever heard, the ladies screaming and being washed away one by one, and drowning under the lee rigging. One of the ladies, Mrs. Rowden, had a life-buoy on, which Dr. Rowden generously took off himself and gave to his wife, thereby throwing nearly all chance of his own life away to try and save his wife, but it was of no avail. A tremendous sea now swept aft and carried some more poor fellows to a watery grave, and cleaning everything off the poop. There was a move upon the skylight, which was washed off level with the deck, and Mr. Byrnes smashed down head first into the cabin. The ship at this time gave a very heavy lurch and settled over to the windward, with the mast on a level with the water. Those that remained were about ten in number, all sitting upon the side of the taffrail, the sea now breaking over us very often, until we began to be numbed in the limbs with the cold, as at this time no one had on more than a shirt and trousers, ready to do their best for shore. It was enough to pall the energies of any man when he looked to the leeward and saw what a frail man had to contend with; nothing to be seen to leeward but a mass of hissing foam dashing with fearful violence over the rocks. The end of the last few that were left on the doomed ship was fast approaching. There we sat, looking death in the face. Some were making prayers to the Almighty to assist them, while others sat in mute despair, but not a cry of anguish or a word was to be heard, even when the ship commenced crashing up from forward and coming aft to set us all adrift on the waves. We did not think that one would be left to tell the sorrowful tale. All of us are now tossing about on the wild billows. I could count five struggling in an eddy that was whirling us round and round, grasping at anything that comes in their way, one man catching hold of another to save himself, and both going down; it was all for self now. But out of the whole company, only three were to be saved.

Thomas Barstow, first officer of the *Coya*, was another of the three to survive. Here is his account that appeared in the *San Francisco Times* and then was reprinted in the *Sacramento Union* on December 2, 1866:

> About 20 minutes past 7 the man on the look out, where there had been one since noon, reported land on the lee bow. The Captain had just gone below to

tea, but immediately came on the deck, and asked where, saying it could not be land. I said it was certainly land, and although he, having just come from the light, could not see very well, the order was given to put the helm hard up and shiver the after yards to wear her round. The second mate reported breakers right ahead, when the Captain asked him if she paid off. He answered 'Yes, but not very fast,' upon which the Captain ordered the jib to be loosed and the foresail to be hauled down. I ran forward to get it down, when I saw she would not wear round to clear. I cried out to that effect, when the Captain ordered the yards to be backed. I let go and freed the fore braces, and ran aft to let go the lee main ones. Before I could do so, she struck very easy, but immediately swung broadside on, and drove right into the breakers, which commenced to sweep clear over us. The second mate asked me if I thought it was any use to try to get the boats out. I said I did not think it was, but we could try; upon which he and I jumped on deck out of the rigging, but none of the men moved, on which he said, 'Come men, never say die while there is life,' whereupon four or five jumped down and commenced cutting the lashings of the long boat. Just then a tremendous breaker swept over us, smashed the long-boat, also the life boat and gig, besides injuring some of the men, and sweeping others to a watery grave. The second mate and I went upon the poop and held on to the mizzen rigging, the crew taking to the rigging and I believe lashing themselves to it, since as up to the 30th none of the bodies had [yet] come ashore. When I got on the poop all the ladies were grouped about the mizzen-mast, clinging to a pin rail round the mast, when, shortly after, another heavy breaker came hissing and roaring along, carrying all before it. The ladies being in the middle of the deck, got its whole force, and after it had passed, the only lady left was Mrs. Paige, the Captain's wife. She immediately missed her little girl, and cried out, 'Oh, my child! My child!' As the vessel began to keel over, she began to slide down the deck to the ship's side, and the Captain hove her rope to pull her up to where he was standing; but she did not get hold of it, and another sea, which caused the ship to careen, made her fall in the water. We could see her drown, but were unable to render any assistance. The deck by this time was nearly perpendicular, and the same breaker washed Byrnes, a passenger who was saved, down through the opening that had been left by the skylight.

Of the three survivors of the wreck, their recollections noted that Seaman Walter Cooper clung to a piece of timber and rode a wave to shore. Mr. George Byrnes, a passenger, was buried under waves for several seconds at a time but had a life vest on and made it to shore. Mr. Barstow, First Mate, had a cork life belt on and with the aid of a floating board let a wave send him to shore. Barstow had been sitting with the Captain and Second Mate who had earlier told him to lash himself onto the taffrail as they had done, hoping that the ship would break up and wash them to shore, which it evidently did. However, both Barstow and Byrnes were badly injured from hitting the rocks out on the point: Barstow was cut and bruised all over the soles of his feet and legs, and his right side had a succession of wounds, while Byrnes had already suffered from his headlong spill

down the ships open skylight hatchway (*Daily Alta California*, November 27, 1866; *Daily Alta California*, November 29, 1866; *Sacramento Union*, December 6, 1866).

Cooper, Byrnes, and Barstow collected themselves on the beach, dug a hole in the sand and huddled together under a sparse covering of bushes in an effort to try to stay warm. All Cooper was wearing was his underwear, an undershirt, and a scarf. The others were similarly dressed. In the morning, they saw fences and cattle about a mile distant, which turned out to be the "Messrs Fish and Camp's White House Rancho." But before proceeding to the ranch, they went down to the beach to look for any bodies that might have washed up; however, only passenger Mrs. Jeffrey's body was found, and they buried her in the sand. Afterwards the three men were put up at the Rancho for several days to recover. Walter Cooper was the first to leave for San Francisco and report the tragedy since he had not been as badly injured as Byrnes and Barstow (*Daily Alta California*, November 27, 1866; *Daily Alta California*, November 29, 1866). Soon thereafter, Macondray and Company, the ships consignees, sent salvagers to the wreck to recover bodies and cargo, which consisted mainly of coal (*Sacramento Union*, November 28, 1866; *Sacramento Union*, November 27, 1866). The *Daily Alta California* reported on December 1, 1866, that:

> The party sent out to Pigeon Point by Macondray and Co., to look after the wreck of the *Coya* and recover the bodies of the victims of the disaster, have met with considerable success. [However] Every article of value, which came ashore from the wreck, has been carried off by the land pirates who swarm down to shore every time a wreck occurs and appropriate everything they can lay their hands on. The bodies of Capt. Paige, Dr. Rowden and wife, Mrs. Lassiter [Lassetta], Mrs. Pearson, Mr. and Mrs. Jeffries and babe, Frank Bushby [Bashby], James (Cook), Philip Shimmins (Boy), James Martin (Stowaway), and Thomas Smith (Seaman) have been recovered, and buried near the remains of those who perished by the wreck of the *Sir John Franklin*. Mr. Brown [Byrnes], the sole survivor of the passengers of the *Coya*, has remained near the wreck, and superintended the mournful work of recovering and burying the remains of his late companions. It is probable the bodies of the other victims will ultimately be recovered.

What remained of the *Coya* had almost entirely broken up, with only a few pieces of wood and rope scattered along the beach. Mr. Jeffreys's chest of tools, Doctor Rowden's broken chest, and Bashby's tool chest were later found. Mrs. Jeffreys's light woolen shawl was found and taken by Walter Cooper to San Francisco. Jeffreys had wrapped her two-month old baby boy in it before he was torn from her grasp by the waves (*Daily Alta California*, November 27, 1866; *Daily Alta California*, November 29, 1866).

Almost all the passengers and crew were drowned, killing 27 (26 people: Marshall 2001) of the 30 people on board (Reinstedt 1975:13). Table 2 lists the passenger and crew names. Among those who died were the Captain, his wife, and their young daughter; they left behind another daughter in England (*Daily Alta California,* November 27, 1866). Mrs. H. Pearson of San Francisco also died in the wreck. She was a widow and former teacher in the Denman School in Sacramento. She had taken a one-year leave of absence from the school to travel abroad (*Sacramento Union,* November 28, 1866). One passenger was reputedly burdened by his attempt to save his gold coins in a money belt, but he was picked up by a huge wave and thrown head first down an open hatch, and neither he nor the belt

was ever found (Marshall 2001). This contrasts with the *Daily Alta California*'s report of a passenger having $5,000 stowed away in their cabin and not in a money belt (*Daily Alta California,* December 5, 1866).

Aldrich, Merrill and Company sold the wreck of the *Coya* at an auction for $250 on December 4, 1866 to T. J. L. Smiley. The next day, he and several experienced divers went to the location of the wreck, which was still wedged on a rock bottom. The anchors and chains of the ship alone were worth $3,000. Of the more coherent portions of the wreck, the masts were still standing, and the cabin remained intact; however, the cargo of coal was not salvageable (*Daily Alta California*, December 5, 1866). In the coroner's report it was suggested that, "a light be put on Point New Year's due to the number of fatalities of those who had been on the *Coya*, *Sir John Franklin*, and *Carrier Pigeon* ships" (*Sacramento Union*, December 19, 1866), although the latter vessel had wrecked earlier in 1853 with no loss of life. Nevertheless, it would take another shipwreck to fully motivate the eventual construction of a lighthouse on Pigeon Point, and this occurred when the *Hellespont* hit the rocks almost exactly two years after the *Coya*.

Table 2. The Lost and Saved from the Wreck of the *Coya*.

LIST OF PASSENGERS	LIST OF CREW AND THEIR STATION
Lost	Lost
Dr. Rowden and wife, London	Richard Paige - Captain
Mr. and Mrs. Jeffreys, and their infant baby, Portsmouth	William Carr - Second Mate
Mrs. Laisetta, Napa Valley, California	James Skelton - Sailmaker
Mrs. Pearson, San Francisco	Frank Bashby - Carpenter
Mrs. Richard Paige and daughter (Captain's wife & Child)	John Smith - Steward
	James (Last name unknown) - Cook
Survived	John Smith - Seaman
Mr. George Byrnes, Sydney	Tom Smith - Seaman
	P. McNamara - Seaman
	Buquemy English - Seaman
	James Martin - Stowaway
	Frederick Myers - Seaman
	John Jones - Seaman
	George Owen - Seaman
	John Cooper - Seaman
	Oliver Tom - Seaman
	Peter Johnson - Seaman (lost at sea prior to wreck)
	Philip Shimmins - Ship's Boy
	Survived
	Thomas Barstow - First Mate
	Walter Cooper - Seaman

WRECK OF THE *HELLESPONT*

The *Hellespont* was 77 days into her trip from Newcastle, Australia to San Francisco; but unfortunately, the ship had drifted farther southward than had been reckoned, and on November 19, 1868, hit the rocks half a mile south of Pigeon Point (or November 21, 1868 at Franklin Pt. [Gibbs 1969:278]). The ship weighed 868 tons and was rated an "A ¼" type ship. The *Hellespont* was built in Bath, Maine in 1856 and was owned by N. L. and G. Griswold of New York (*Sacramento Union*, November 21, 1868; *Daily Alta California*, November 23, 1868).

The *Hellespont* crew had been unable to establish their position for three days prior to the wreck because dense fog had obscured the sun and its angle. Evidently, the Captain calculated that he was still 20 miles away from the shore; nevertheless, as a precaution the sails had been reduced to only topsails the day before the wreck.

At about 4 a.m. Seaman Fredrick Wilson was at the helm, with Captain Cornelius Soule and the first mate Mr. Charles Alexander Wilson, a Swede by birth, standing close by the wheel. The Captain thought he saw waves breaking ahead in the distance and asked the first mate if he saw them too. The first mate replied that he thought he did, so the Captain ordered Wilson "to put the helm down hard," which in theory should have sent the ship westward away from the imminent shore. However, the ship was not responsive in time and struck the rocky sea bottom broadside at about a half of a mile from the shore. The *Hellespont* then split in two parts: there had been no time to lower the lifeboats, and the falling masts soon smashed them as they spilled into the sea (*Daily Alta California*, November 21, 1868; *Sacramento Union*, November 23, 1868).

The following statement from surviving helmsman Fredrick Wilson was given to the Board of Inquiry at San Francisco in 1868:

> It was the Chief mate's watch on deck. The captain came aft and asked the mate if that was not the loom of land, which they saw. The mate said, "Yes, I believe it is Sir." I then spoke to the captain and told him that I was sure I could see breakers ahead. The captain looked and said to me quickly, "Put your helm down hard." She had her starboard tacks about and the ship came 'round northeast to southeast by east. But as she would not come around, and missed stays, the yards were squared to wear ship and the helm was put hard a starboard. The ship would not pay off however and we ran directly in among the breakers. She struck once, heavily, bows on, and then swung broadsides on. Then I left the wheel and ran forward to the corner of the house, and the captain sung out for the carpenter to cut away the masts. This was done and we ran into the cabin to stand clear of the falling masts. When the masts were gone, a heavy sea was rolling into the ship and all hands got into the house. The ship then split in two. Just as the heaviest sea struck her, I crawled down to the mizzen rigging to leeward and saw the mate trying to turn the boat up that was capsized to leeward. The lifebuoy was lying there and I told him to save himself. As he attempted to take hold of the buoy, the wreck turned over on him, and I did not see him again. I then crawled back upon the wreck and a sea washed the house overboard to leeward. We all got on the house and the wreck partly kept the sea from breaking over us. But a heavy sea struck the ship and capsized the house, knocking us all off. And

> then we're all swimming under water. Then the captain came up alongside of me. He had stripped off all his clothes. He caught hold of the [deck] house, but soon after, let go, and I did not see him again.

After making it to shore, one member of the crew found a trail leading to a nearby Portuguese whaling village out on Pigeon Point. Although he was bruised and bleeding, and had lost his clothes, the sailor managed to reach the village as dawn broke over the eastern hills. As he approached the entryway of the nearest cottage, a waking whaler was startled to see the traumatized sailor at the door. The terrified whaler thought that he was seeing a ghost, turned and ran into the cottage screaming, and then fell onto the floor. The sailor, now inarticulate, tried to follow him but tripped over the whaler and fell on top of him prompting more frightened cries (Evans 1873:49-51; Reinstedt 1975:13).

Hearing the screaming, other villagers ran to the aid of their friend. Finally, the sailor told them what had happened and they all headed for the beach. Bodies of the crew, some dead and some wounded, were found scattered over the beach. With the aid of a telegraph station on the point (primarily used for communication with the Merchant's Exchange in San Francisco), they spread word of the shipwreck up and down the coast (Reinstedt 1975:13-14).

Eleven people died, but seven men managed to survive after having made it to shore by holding onto pieces of the wreck. Most of them were severely bruised and cut by the spars, which had been cut away, and by other portions of the wreck that floated dangerously amongst them. They stayed at the Swanton Ranch House for three nights and then left for San Francisco on November 22 where they ultimately found shelter at the Sailor's Home, which was once at the corner of Vallejo and Battery streets. Only J. Fleming, the second mate, who was severally injured in the back, stayed behind to receive medical treatment (*Daily Alta California*, November 21, 1868; *Sacramento Union*, November 23, 1868).

George Thomas, also one of the survivors of the crew of the *Hellespont* and a native of England, gave his story to the *Daily Alta California*, printed on November 22, 1868:

> I was below when the watch was called. I was awake; the first mate came forward and cried out to the men, 'For God's sake come out or we shall be ashore.' We all hurried on deck. I saw land on the port beam and breakers ahead, probably half a mile. The Captain gave orders to stay the ship, but she would not stay. He then gave the order to square away the foreyard, but before she was around the ship struck forward. I ran aft and she struck a rock just as I reached the cabin door the Captain up with an axe in his hands and ordered us to cut away the masts. He and the first mate assisted, and the masts were cut off, and as they went over the ship swung broadside [broached] on the rocks. There was a tremendous sea running. A heavy roller struck the ship and parted her, fore and aft, like a reed. The main deck was torn completely up and carried away by the sea. I was at the mizzen channels and crawled up to the cabin, and all hands were gathered there by that time, standing on the weather side. Another roller struck the wreck, parted the cabin from the ship and drove it, with us on top, 50 or 60 yards in towards shore. Captain Soule stood alongside of me and was stripping off his clothes. John Smith, one of my mates, stood next to me. I said to the Captain, "We are rather nearer land than we thought." He replied, "Yes, but it is not my

> fault- I did the best I could." He had all his clothes off now, and said he was chilled. John Smith took off his flannel jumper and wrapped it around Captain Soule's shoulders. The Captain called out to the first mate, but he could not have heard him. I looked around and saw the mate trying to put on a life buoy. A sea struck the house and I saw him knocked down and rolled over on the top of the house. Captain Soule said to me, "I am bleeding to death." I asked, "What is the matter, Captain?" He said, "Here," and showed me a wound on his neck, which was bleeding profusely, covering his body with blood. Another sea swept aboard the house and threw a portion of the wreck on it. When it cleared away, I saw John Smith lying at my feet, but at first did not recognize him for he was terribly cut about the head and face. I asked, "Who is this?" He replied, "I am John Smith." Just then, an immense roller struck house and turned it completely over, burying us all beneath the water. I swam with all my might five or six yards under water, and then came up clear of the house, but among the floating drift of the wreck…

The body of the first mate, Charles Wilson of the *Hellespont*, was recovered and was buried next to the cabins of the Portuguese whalers living on Pigeon Point (Evans 1973:50-51), but he left a wife and three children behind in New York. Charles Wilson was well known in San Francisco, as he had made several trips to the port in the Panama as first officer under Captain Soule. Soule, who also died in the wreck, left a wife and family in Brooklyn, New York. An inquest was made over Captain Soule's body on November 22 at Pescadero. The body of seaman Frederick Williams came on shore November 23. The second officer, H. J. Fleming, was left in charge to bury the bodies. Besides Fleming, the following seaman survived the wreck: Michael Johnston, Frederick Wilson, William Green, Charles Brown, George Thomas, and another seaman with the same name as the first mate, Charles Wilson (*Sacramento Union*, November 23, 1868; *Daily Alta California*, November 21, 1868).

Most of the wreck was spread along shore for a mile in length and included 500 tons of coal. The anchors and chains were buoyed to the foremast in 18 feet of water (*Daily Alta California*, November 21, 1868). The *Hellespont* was insured in New York, but the exact amount was not learned. The survivors lost their wages for the entire voyage, although the wreck of the *Hellespont* was sold on November 24 at the new Merchant's Exchange for $200.00 to Charles Harley. The coal was disposed of to Peter Duncan for $140.00 (*Daily Alta California*, November 25, 1868). Table 3 lists the victims and the survivors.

SUMMARY

Although some of the bodies that had been hastily buried near the wreck sites were later relocated to cemeteries in San Francisco, others were left behind. It is not known how many people were buried at the Franklin Point Historic Shipwreck Cemetery—or how many still remain—but in 1871 Colonel Albert S. Evans wrote in his book titled *A La California, Sketch of Life in the Golden State* (1973) that:

> On the sandy bluff at Point Año Nuevo is an enclosure within which lie buried, side by side, forty of the victims of these terrible disasters. Others were removed by their friends, and one, the mate of the *Hellespont*, sleeps

Table 3. The Lost and Saved from the Wreck of the *Hellespont*.

LIST OF PASSENGERS	LIST OF CREW AND THEIR STATION
None listed	Lost John Baptiste - Seaman William Brimer - Seaman James King - Seaman Olof Peterson - Seaman John Smith - Seaman Cornelius Soule - Ship's captain Frederick Williams - Seaman Charles Alexander Wilson - First mate Unidentified - Three crew Survived Charles Brown - Seaman Henry Fleming - Second mate William Green - Seaman Michael Johnston - Seaman George Thomas - Seaman Charles Wilson - Seaman Frederick Wilson - Seaman

> undisturbed by the merry prattle of the children or the wild screams of the seagulls, beside one of the whaler's houses at Pigeon Point (Evans 1973:49; Morall 1979:59).

Regardless of how many people may still be buried within the cemetery and its surroundings, the wrecks of the *Sir John Franklin*, *Hellespont* and *Coya* became the catalyst to improve maritime safety along the San Francisco Peninsula Coast and Northern Monterey Bay. An article from the San Mateo County Gazette (November 29, 1868) presented a detailed description of the situation:

> The recent terrible wreck of the ship *Hellespont* at Pigeon Point in this county which resulted in the loss of eleven of her crew, including Captain Soule, constitutes another appeal to the government at Washington for the establishment of a lighthouse at Pigeon Point. Several vessels have been wrecked in that vicinity within the past few years, in every instance of which, many lives have been lost, and the vessels invariably a total loss. Pigeon Point is the most extensive promontory on the coast south of the golden gate, and which point seems especially adapted for a lighthouse. No other one place on the Pacific Coast has proved so fatal to navigators as this locality and it behooves those most interested in maritime affairs on this coast as well as in the east to bring their influence to bear immediately upon the government officials, and never relax their efforts until a lighthouse is erected at Pigeon Point. We believe that all the vessels that have been wrecked at Pigeon Point and Point New Years, but a few miles below, have

> been lost solely on account of the want of a lighthouse. The Chambers of Commerce in San Francisco, New York and Boston, together with the Boards of Underwriters in the cities named, should unite in urging the importance of this measure. Thousands upon thousands of dollars are monthly expended from the National Treasury for matters of much less benefit to the country than would be the construction of a lighthouse at this point. While there are none too many lighthouses on this coast, there is no doubt but what some are located in places of much less importance to navigators, and to commerce in generally than one would be at Pigeon Point. A lighthouse is not the only thing required as a means of warning mariners against the dangers of the coast in this latitude, for it is well known that dense fogs prevail at most seasons of the year along this coast. In case of fog of course a light would afford little protection to mariners. If we are not mistaken, it is a matter of fact that all the vessels that have been lost in the vicinity of Pigeon Point have been wrecked in consequence of dense fogs which prevented the land being sighted until the vessels were among the breakers. A fog bell or whistle would unquestionably in most instances be found more useful than a light. Either a bell or whistle of sufficient volume at Pigeon Point would have saved the *Hellespont*, the Franklin and other vessels which have been lost in that vicinity. Our delegates in Congress are expected to make it their business to look after this matter and they should not be permitted to forget the interests of their constituents.

Evidently the expressed concerns were successful and resulted in the construction of the Pigeon Point fog signal in 1871 and completion of the lighthouse in 1872, along with the installation of a fog horn, lighthouse and Coast Guard base on Año Nuevo Island in 1872 (Bischoff 2009). Even so, other ships continued to wreck over the years to come (Semones 2007), but we can assume that many more maritime disasters were successfully averted by the lighthouse and foghorn facilities. Today the Pigeon Point Lighthouse is a State Park and serves to remind us of the potential dangers mariners face, and the perils of a leeward shore (Figure 12).

Figure 12. Pigeon Point Lighthouse.

The Archaeology of Franklin Point, CA-SMA-207/H

Starting in the late 1970s, increased erosion of the vegetation and rolling sand dunes of the Franklin Point Historic Shipwreck Cemetery (CA-SMA-207H) has caused episodic exposures of multiple human burials. This situation prompted three archaeological salvage events, with the first conducted by San Jose State University in 1983, and the second in 1999 by State Parks archaeologists. A third event occurred in 2001, when the State Parks District Archaeologist recovered additional remains. Collectively, these excavations recovered the articulated remains of eight individual burials, as well as the disarticulated remains of uncertain associations found scattered throughout the eroded burial area.

These eight sets of human skeletal remains were archived at different places but were re-united for detailed forensic evaluations. On October 20, 2002, the remains were returned to their original place of origin (Figure 13). Immediately following reburial, a wooden boardwalk and two decks were constructed over the cemetery location to prevent further exposure or looting; and two benches facing the sea were installed for the benefit of Parks visitors. The findings of the archaeological and physical anthropological research are presented below, and a description of the site stabilization effort follows in a subsequent section.

INITIAL FINDS

In 1980, two park visitors found a human skull and two cervical vertebrae exposed in the eroded dunes of Franklin Point. Somehow, a local newspaper reporter from the San Francisco Chronicle learned of it and published a picture of the discoverers with the skull in their hands. Of course, human remains are protected under both State and Federal Law and disturbing the scene of a possible homicide is a federal offense, so once the collectors were made aware of the serious implications of their actions they brought the remains to the San Mateo County Sherriff's Office. The bones were in turn placed in the care of the San Mateo County Coroner's Office. Initially, the coroner assumed that the remains were those of a Native American; however, after a visit to the site by the County Sherriff, County Coroner and State Parks Ranger Walter Ward, it was proposed that the remains might instead have derived from the historic shipwrecks that were known to have occurred there (Jurmain and Leventhal 1987).

Forensic Anthropologist Dr. Rodger Heglar of San Francisco State University positively identified the cranium as belonging to a person of Caucasian descent (Jurmain and Leventhal 1987:6). This spurred an initial survey of the site by Mathew Clark, an archaeologist affiliated with the

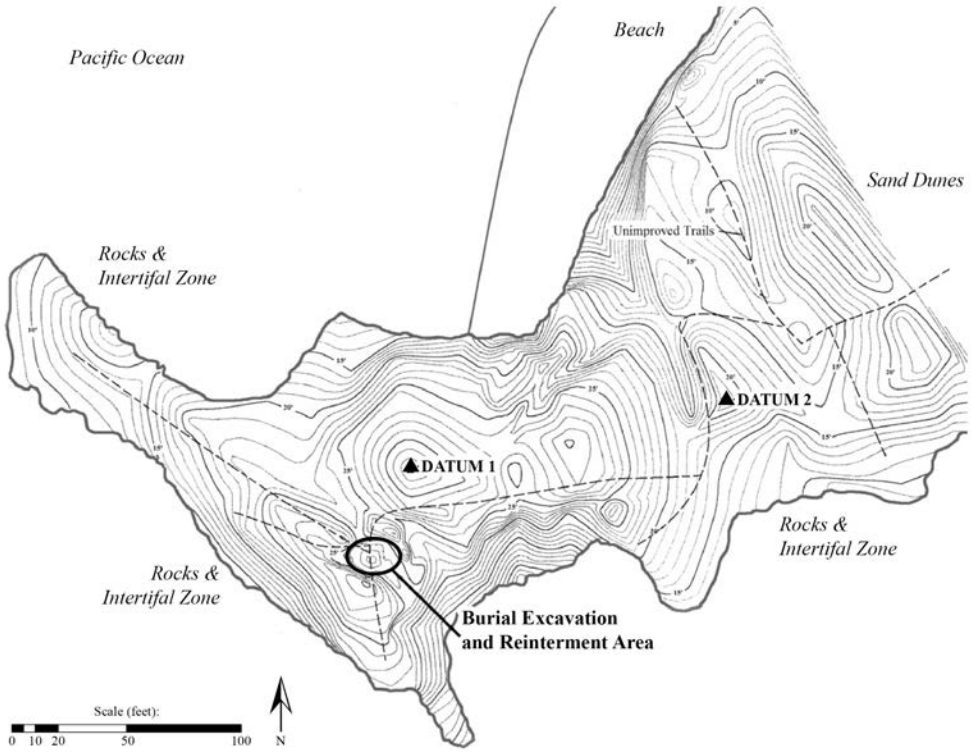


Figure 13. Franklin Point Burial Excavation and Reinterment Location.

Datum 1 GPS N 4111691, E 556807 meters.

university, who observed that the historic remains were mixed within a prehistoric Native American deposit, one of many in the region (Clark 1980). In discussion with Ranger Ward and given the evidence at hand, Clark concluded that additional shipwreck victim's remains were likely to still be present. Clark (1980) was able to acquire a site trinomial, CA-SMA-207/H, from the California Historic Resource Information System, Northwest Information Center at Sonoma State University.

Senior State Parks Archaeologist John Foster did a subsequent evaluation of the site's condition in April 1982. Foster observed that additional exposure of bones and casket fragments had occurred and decided that it would be prudent to contract archaeological specialists to recover the partial remains that were then visible. It was assumed that only four individuals might be found, based on the historic record of the *Sir John Franklin* disaster; research had not yet shown that victims from two more wrecks were also present.

In 1983, California State Parks requested the services of the Department of Anthropology at San Jose State University to assist with the recovery of the exposed skeletal remains. San Jose State University succeeded in recovering the remains of four articulated skeletons, as well as evidence of a fifth, Burial 1A (Jurmain and Leventhal 1987). Continued exposures over the years made it apparent that additional burials from other incidents were present at Franklin Point. In 1999 State Parks archaeologists (Motz et al. 1999) excavated two more individuals.

1983 SAN JOSE STATE UNIVERSITY EXCAVATION

By May 1983, with the discovery of newly exposed human remains at CA-SMA-207/H, the California Department of Parks and Recreation contacted the San Jose State University Department of Anthropology to inquire if students and faculty might implement a salvage archaeological project at the Franklin Point Historic Shipwreck Cemetery. A crew of eight student volunteers was organized under the direction of Physical Anthropologist, Dr. Robert Jurmain, and archaeologist Alan Leventhal. The summary presented below has been parsed from their report of findings (Jurmain and Leventhal 1987).

During the fieldwork of June 2 and 3, the team successfully recovered the semi-articulated skeletal remains of four individuals, as well as numerous dislocated elements from others (Figure 14). At the time of the excavation, numerous isolated human bones and coffin fragments were found scattered throughout a location described as a wind-swept depression, or swale that cut downward into the burials. Forty-seven bone elements were plotted and recovered, mostly originating from an area described as the "main burial locus" (Jurmain and Leventhal 1987:8). Later, another 47 isolated bone elements were collected, for a total of 94.

Excavation of the burial area involved establishing a site datum and grid transect system over the primary locus, and then carefully screening sand through 1/8-inch mesh sifting screens and retaining all cultural artifacts, ecofacts and human bones until a burial feature was encountered.

The remains recovered in 1983 reflect a very young population with a range of health issues that were primarily of a dental nature. Evidently, the physical exertions accompanying life at sea was not as visibly detrimental as the effects of poor oral hygiene. As far as artifacts go, very few material things accompanied the victims to their graves, other than some portions of fabric from burial shrouds, shawls or clothing, a few buttons, and, in one instance, a folding pocketknife. This suggests that these people were probably not of high social standing and were likely the foremast sailors; however, as was learned several years later to our surprise, Burial 3 turned out to be a woman of African descent. Whether she was passenger or crew is not presently known.

Burial 1 had been partially exposed by erosion and the remains of the lid of a redwood coffin were clearly visible. After removing the disintegrating coffin lid, which had long since collapsed onto the skeletal remains, individual bones were pedestalled *in situ*, recorded and photographed (Figure 15). The cranium was missing, and other bone elements that had been in contact with the acidic wood of the coffins were in various stages of disintegration (the cervical and lumbar vertebrae were dissolving, and the left femur was already absent); however, most of the remaining bone elements were in good condition. Burial 1 (like the others that were soon to be found), was oriented in an east-west direction, with the head to the west.

The excavation of Burial 1 recovered 86 individual human bone elements including both right and left innominates, although the pubic symphysis on both sides had deteriorated due to contact with the redwood coffin, which precluded aging and sexing through traditional forensic measures. It was found that a left rib showed a healed fracture and an unusual pathology of the right tibia was also noted. An unusually high density of bone growth on the right tibia suggested healing from repeated shin damage, or perhaps less likely, manifestations of a past incidence of scurvy (Jurmain and Leventhal 1987:19-20).

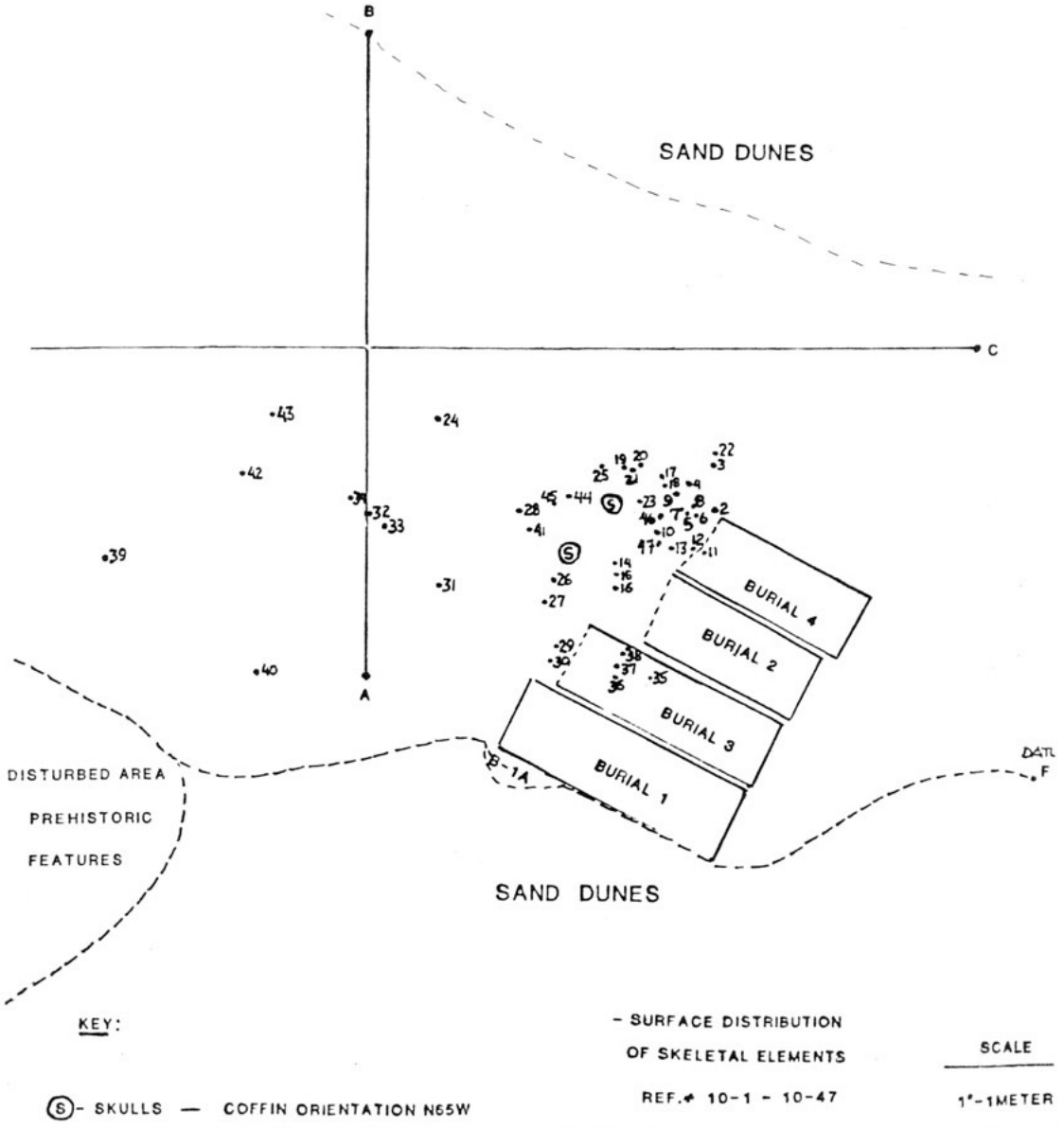


Figure 14. San Jose State University Excavation Plan.
Top of page is oriented magnetic north (Jurmain and Leventhal 1987).

Burial 1A consisted of many dislocated bones that were found directly adjacent to Burial 1, including a mandible, two partial vertebrae, two rib fragments, a partial left scapula and hand phalanx. It was concluded that these were not from Burial 1, and so they were designated Burial 1A. The mandible showed evidence of severe dental caries, including the complete erosion of the enamel crown on left lower molar. It was estimated that the remains were from someone aged 18-21 years.

Figure 15. Excavation of Burial 1, 1983.
Jurmain and Leventhal 1987.

Burial 2 was uncovered one meter north of Burial 1 and was reported to have been in a similar condition; however, remnants of fabric were found to be in association with the legs. A total of 75 bone elements was recovered "in good condition," but the foot phalanges and upper arms were missing, presumably from contact with the acidic wood of the coffin. Similarly, the innominates were in a poor state of preservation and other elements were dispersed outside of the deteriorated coffin.

The left humerus exhibited a post-mortem fracture, probably incurred during the shipwreck. Interestingly, this individual's teeth did not reveal any dental caries, but the first pre-molars showed polish and wear "looking very much as though something was consistently pulled through this specific area" (Jurmain and Leventhal 1987:19). This individual was estimated to have died at 21 years of age.

Burial 3 was situated immediately between Burials 1 and 2, having been encountered after the removal of Burial 2. A total of 39 bone elements was reported, with the vertebrae mostly dissolved, and the remaining bones very fragmented. The pelvic bones were those of a female, with an estimated age at death of 21 years old; but of interest was the fact that she had been buried face down (see the lower limbs and pelvis in Figure 16).

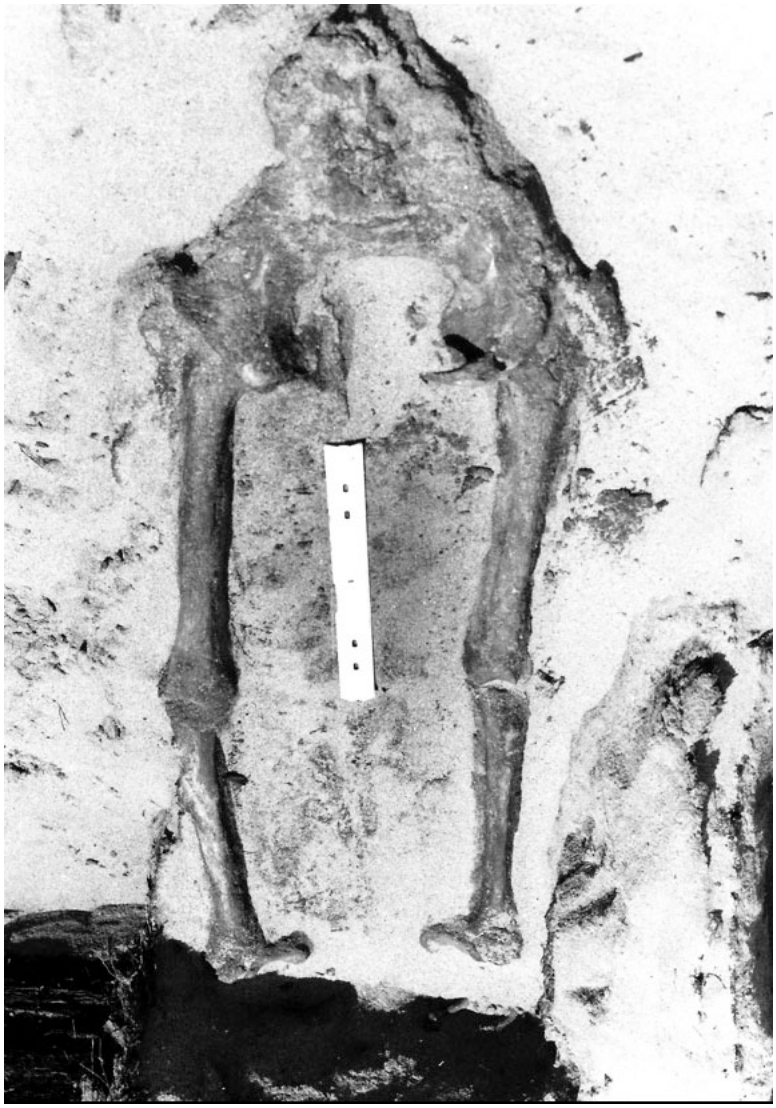


Figure 16. Burial 3 Buried "Face Down." (Jurmain and Leventhal 1987)

Jurmain and Leventhal 1987.

Although Burial 3 was originally found without a cranium, it was thought that the skull that the hikers had found prior to the archaeological excavation was associated with Burial 1A; however, after further study it was found that it had a greater affinity to Burial 3. The cranium, associated with Burial 3 showed evidence of *cribra orbitalia* in the left eye orbit, which is symptomatic of metabolic or dietary stress, most probably iron deficiency, which was a not infrequent event in a sailor's life where food stored on long voyages can get

limited, scarce or potentially lethal. But of interest, as discussed below, a more detailed analysis done in 2002 discovered that Burial 3 was in fact a woman of African origin.

Burial 4 was reported as the least complete assemblage, with only 35 bones still in reasonable shape, although an intact cranium was found to be in good shape just outside of the deteriorated coffin remnants. This unfortunate person suffered from severe dental problems including periodontal disease and partial socket resorption of the upper lateral incisors. The locations of the upper back teeth revealed exposed roots. The approximate age of death for this individual was estimated at 25 to 35 years.

1999 State Parks Excavation

In 1998, continued erosion at Franklin Point uncovered two more coffins. In April 1999, California State Parks archaeologists Lee Motz, Richard Hastings, Cristi Assad Hunter and Peter Schulz, working through a 1998/1999 Statewide Resource Management Program grant went to the site and recovered the skeletal remains from the two coffins. It was found that they were laid directly in contact with each other, side-by-side, suggesting that they were contemporaneous (Figure 17).

Figure 17. Exposure of Burials 199 (Burial 5) and 299 (Burial 6) in 1999.

The two individuals were referenced as Burial 199 and Burial 299 to inventory the remains as separate from the earlier 1983 San Jose State University excavation (later these were changed to Burials 5 and 6). Recovered artifacts included a folding pocketknife, and an iron ring. Both Burial 199 and 299 represent adult males. The following description of these burials is derived from the field report (Motz et al. 1999).

Burial 199 (Burial 5) was nearly complete, with only some smaller hand bone elements, portions of vertebrae and areas of ribs missing. In addition, portions of both scapulae and the right distal ulna were missing. In these instances, it was thought that acidity from the redwood coffins and extensive vegetation roots were the principal cause for the deterioration of these bones. This individual was presumed to represent a male, aged 45 to 55 years old, based upon the advanced closure of the cranial sutures. Several teeth in the maxilla exhibited dental carries, and it was missing one tooth, probably lost before death.

The caries were located on the right M1, M3, and left M2. The left M3 was lost before death and its alveolus was completely resorbed. The right and left central incisors (I1) had been broken off close to the root with little enamel remaining. These appeared as sharp breaks and did not exhibit wear, so it was possible that this tooth might have been broken during the shipwreck. No other caries were noted on the mandibular teeth, except for a moderate amount of dental calculus formation on the lingual face of the incisors. The report goes on to note that:

> There is some thinning of enamel due to wear on some of the maxillary and mandibular teeth, including the upper and lower incisors, canines, and first molars. None of this wear has completely broken through the enamel layer, however. Evidence of dental hypoplasia is present on the incisors, premolars and canines indicating that the individual suffered poor nutrition or some type of sickness during childhood which affected the development of the permanent teeth. [Motz et al. 1999:8]

Burial 299 (Burial 6) was noted as being in similar condition as Burial 199, but the left patella and the distal portion of the left ulna are absent. Preliminary observations identified the individual as male, aged somewhere between 35 to 50 years old (based on the condition of the cranial sutures). Also, similar to Burial 199, the teeth showed evidence of dental hypoplasia suggesting poor nutritional health or sickness during childhood.

The report states that the teeth were found to be in very good condition, despite a moderate wear of enamel, but otherwise with little dentin exposed. No caries, abscesses, or other dental pathologies or calculus deposit were observed, except for the dental hypoplasia visible on the incisors, canines and premolars.

2001 State Parks Recovery of Burials 7 and 8

In December 2001, the San Mateo County Sherriff's Department and San Mateo County Coroner were notified of a possible homicide at Franklin Point after a hiker had once again found human remains—along with a 22-cal bullet casing—which they mistakenly assumed to be related. Neither the sheriff nor coroner were aware of the historic significance of the place and proceeded to recover many bone elements before State Parks Rangers, who had contacted the District Archaeologist, Mark Hylkema, stopped them. The next day, December 28, a field reconnaissance took place and the remaining bones from the

remnants of two more coffins were retrieved. These fragments of coffins and scattered bones were directly within the route of pedestrian traffic at the rapidly deflating site and were designated as Burials 7 and 8.

Because Franklin Point is subject to strong Pacific winds, deflation of the sand dune matrix surrounding the buried coffins caused their episodic exposure. Moreover, after the 1983 and 1999 burial removals, the area where they had been uncovered had not been stabilized so aeolian action continued to "bowl" the depression until it had become a large ten-foot-deep swale in the middle of the dune. The swale became a crater, and the public began using the pit to get protection from the wind, which further contributed to the deflation problem. As visitors wandered throughout the dune field and trampled the vegetation, the high winds down cut the exposed trails downward until they reached the coffins below (Figure 18).

Figure 18. Deflated Swale where Multiple Burials had been Recovered.

The higher dune portion was the original grade. Person is standing at former locations of Burials 5 and 6. (Photo by Mark Hylkema, 2001).

Several routes traversed directly through exposed portions of coffins, which most people probably did not notice since the dried and decayed redwood boards resembled the vegetation root clusters that formed around the wood. In fact, scattered throughout the exposed area were isolated human bones, rusted metal coffin strap fragments, rusted fragments of small square nails, natural beach cobbles, sparse shell and chipped stone debitage. These latter three materials were related to a prehistoric Native American archaeological component dispersed throughout the cemetery area. This mix of prehistoric

and historic archaeological artifacts was also noted by Jurmain and Leventhal (1987) and Meyers and Praetzellis (1999). This material is not further discussed here; however, this author has frequently observed this dispersed and isolated scatter of prehistoric cultural materials and in comparison, to other regional sites, it can be said to be very sparse, and not an intensively used location, unlike the many prehistoric sites in the vicinity (Hylkema 1991, 2002; Hildebrandt et al. 2006; Hylkema and Cuthrell 2013).

The remains recovered from the two partially preserved coffins included lower limb bones and other portions, but most of the bones had already either dissolved or were removed by the San Mateo County Coroner, who returned them to State Parks for inclusion in this analysis, and reinterment. The condition of these bones was poor, and further discussion of these elements follows below in the section describing the skeletal analysis of the human burials.

Summary of the Physical Anthropology of the Skeletal Remains

The State Parks 2001/2002 CRMP grant provided the necessary funding to implement the next two phases of the project, which included the forensic review of the skeletal remains prior to their reinterment, and construction of a pedestrian boardwalk along with two observation decks to protect and cover the reburial site and reduce further deflation of the cemetery surface.

In 2002, the skeletal remains recovered from the 1983 excavation, and those recovered by State Parks in 1999 and 2001, were retrieved from both San Jose State University and the deep storage shelves at the State Archaeological Collections Research Facility (SACRF) in West Sacramento. For the first time, the eight sets of skeletal remains and additional surface isolate bones were brought together. Once at the SACRF, archaeologists Cristi Assad Hunter and Teresa Cabrera began the task of organizing the remains and preparing an inventory of identified bone elements (Appendix A) as well as photographing individual bone elements.

Our interests extended into attempting to learn more about the lives of these nineteenth-century people who had met their untimely deaths at Franklin Point through a series of maritime tragedies. Subsequently, State Parks funded several specialized studies to examine the health and diet of the eight individuals before reburying them back at the site.

A grant from the State Parks CRMP fund was used to contract services for specialized forensic studies that would augment the standard anthropometric measurements, etc., that had already been done for Burials 1 to 4 (Jurmain and Leventhal 1987) and reconsider these remains along with the remaining four individuals that had been recovered later. Specialists from several universities and institutions who examined a variety of bone samples conducted research between 2002 and 2004. Their specialized studies have been included as appendices to this report and include:

- Appendix A: Anthropometrics (Darwent et al. 2014).
- Appendix B: Histomorphic and Cross-sectional Geometry Analysis (Ramsey 2002).
- Appendix C: Stable Isotope Analysis of Human Bone Collagen and Tooth Enamel Appetite (Kennedy and Newsome 2002).
- Appendix D: Laser Ablation-ICP-MS Analysis of Teeth (Speakman et al. 2002).
- Appendix E: Miscellaneous Photographs and Documents.

Interestingly, several problems developed from having the analysis of the skeletal remains done by multiple researchers. It turned out that not all of them agreed about the gender and age of the individuals. Rather than attempt to sort out these discrepancies, all their opinions are captured in Table 4.

Table 4. Summary of Burial Traits and Analytical Sources.

BURIAL	GENDER	ESTIMATED AGE	STATURE (INCHES)	ESTIMATED LATITUDE OF ORIGIN
1	M [1, 3, 4]	18–21 [1] 30–34 [3] 28 [4]	67.4”	Tropics[5]
2	M [1, 3, 4]	21 [1] 31–43 [3, 4]	67.5”	Tropics[5]
3	F [3, 4]	19–21 [1, 4] 35–45 [3]	60.0”	Africa[5]
4	F (? [4]) M [1, 3]	25–35 [1] 35 [3, 4]	65.5”	Tropics[5]
5	M [3, 4]	45–55 [2] 22 [3, 4]	66.0”	Tropics[5]
6	M [3, 4]	35–50 [2] 35 [3, 4]	67.4”	High Lat. [5]
7	M [3] M/F (?) [4]	26 [3, 4]	67.5”	Tropics[5]
8	M [3]	28 [3, 4]	65.5”	Tropics[5]

Notes: [1] Jurmain and Leventhal 1987. [2] Motz et al. 1999. [3] Kristi Assad-Hunter, Teresa Cabrera and Chrystianne Darwent (n.d.). [4] Ramsey 2002. [5] Michael Kennedy and Seth Newsome 2002. [6] Robert J. Speakman, Hector Neff, and Michael D. Glascock 2002.

According to Ramsey (in Appendix B) the age discrepancies may be attributable to the nature of the lifestyles reflected by the individuals analyzed. For example, Burial 4 has a 15-year difference between its rib histological age estimate and the clavicle histological age estimate. This discrepancy was proposed to have reflected higher levels of biomechanical stress in the upper limbs; relative to the other six burials (Burial 3, missing the upper portion of the body, cannot be included). Except for Burial 4, the Franklin Point Cemetery sample showed that these people were subjected to a variety of biomechanical stresses; perhaps from heavy lifting, pulling things and carrying heavy loads. With little evidence of nutritional stress (see the Bone Density section in Appendix B), mechanical loading was assumed to be the most likely cause for the delayed skeletal maturity and reduced bone remodeling, at least relative to comparative modern samples.

Based on gross anatomical measurements, Burials 1, 2, 5, and 6 were determined to be male, and Burial 3 is a female. As Ramsey noted, the questionable sex determinations made for Burials 4 and 7 should be viewed with caution “since digenesis of the bone tissue may have distorted some of the anatomical markers on the femurs.” Youth and race may also be factors in conflicting sex estimation.

The right femur of Burial 6 exhibited pathological conditions including the distortion of the femoral head (see Picture B1). The condition probably manifested itself by a shift in the individual's gait, which would have altered the structure of the femur. "The individual probably used his left femur as a pivot, shifting his weight to his left side and twisting his entire body for placement of the right leg. His gait would have been significantly altered by this pathology" (Ramsey 2002). In other words, he limped.

Overall, the Franklin Point Cemetery individuals did not exhibit evidence of pathologies indicative of anterior-posterior bending stresses, except for Burial 4. Dr. Ramsey suggested that Burial 4 exhibited a much higher index of bending rigidity, indicating, perhaps, that this individual was subjected to different biomechanical requirements than the other individuals. Burial 4's Imax/Imin ratio values exceeded those of the other burials "and may be indicative of performing specialized tasks that involved running or rough terrain negotiation" (Ramsey 2002).

The lower levels of bending and torsional stress, coupled with the higher level of compressive stress, suggest that the individuals in this assemblage were performing tasks that involved weight bearing activity, such as pushing or transporting heavy objects. One individual, Burial 7, exhibited "marked robustness in the femoral diaphysis (%CA = 84.6%), indicating, perhaps, a higher level of weight bearing activity than the other Franklin Point Cemetery individuals" (Ramsey 2002).

The Franklin Point Cemetery sample bone volumes (BV/TV) indicate that the burial skeletons were not adversely affected by either disease or significant nutritional deficiencies; however, LA-ICP-MS analysis of tooth dentine and enamel from six individuals demonstrates that they had been exposed to significant levels of lead during their lifetimes (Speakman et al. 2002:Appendix D). Enamel on adult teeth, formed in the human body during childhood, remodel only slightly during an individual's lifetime and can retain evidence of childhood exposure to lead. As it turned out, the lead levels in the tooth enamel of the Franklin Point burials fell into two groups: a higher (>10 ppm) and lower (<10 ppm) lead group. In all cases, lead exposure significantly exceeded what we consider today to be safe levels of lead (<10 µg/dl or .1 ppm). Most of these individuals had undergone significant lead exposure, which would likely have affected their demeanor and comportment.

Stable isotopic analyses of human bone collagen and tooth enamel apatite conducted by Kennedy and Newsome (2002:Appendix C) found that the overall diet of the people in the burial assemblage appeared to have been balanced between terrestrial and marine foods, without a significant predilection one way or another. However, of interest were the results of the mean δ18O molar enamel apatite values. These values suggest that six of the eight Franklin Point individuals ingested drinking water "from low-latitude tropical regions during infancy and childhood" (Kennedy and Newsome 2002).

Evidently, most of the eight burials had seen their infancy and childhood years in the low-latitude tropics and may indicate that at least some of these individuals were brought on board the *Sir John Franklin*, *Coya* or *Hellespont* from Australia or other Pacific ports. Only Burial 6 reflected a higher latitude signature (which is assumed to reflect European ancestry), and Burial 3 was located as African in origin. Although we cannot be certain, this information makes it unlikely that any of the eight burials from this study included the remains of Edward Church from the wreck of the *Sir John Franklin* since Burial 6 was aged

at between 35 and 50 years of age at death, and Edward was a 16-year-old from Baltimore, Maryland. The cenotaph dedicated to him, formerly visible on the site of the cemetery, and the lack of forensic association means that he may still be at rest in his coffin out on the point.

As previously noted, Burial 3 was a woman who showed an affinity with Africa, and she proved to be of particular interest. Her cranium showed evidence of having sustained severe fractures, possibly a result of striking the rocks in the high surf or by being struck by floating timber in the sea. Ironically, as Ojo (1976:99-100) noted, several central African cultures believed that drowning victims were considered to have died "unnaturally," and were interred alongside the riverbanks where they had died rather than in a communal cemetery. In her way, Burial 3 was interred in this fashion; however, it would appear that different cultural values were imposed. Specifically, although her coffin was placed directly adjacent to other drowning victims, her burial position face down (dorsally extended) was different from the others who had been interred face up and requires further interpretation. A brief literature search regarding historic New World African American cemeteries excavated archaeologically found only one example of an individual buried face down. This occurred at the Newton Plantation in Barbados (Handler and Lange 1978) where 58 human burials were exposed, one of which was a woman-interred face down in a separate mound by herself. Here, it was proposed that her burial posture might have reflected a practice of the "*Nyongo*" witchcraft practitioners in coastal Cameroon "in an effort to confuse the spirit so that if it attempted to leave the grave it would go the wrong way" (Handler and Lange 1978:198-199). Along these lines, ethnographic information about African American life in Georgia during the 1940s recorded that; "if repeated deaths of children in a family occurred, burial face down of the last child to die would ensure that the next child would live to adulthood" (Combes 1972:58). The examples mentioned describe aspects of ancestral African customs; however, it is likely that local citizens who were not of African descent interred Burial 3. Nevertheless, Euro-American society of earlier times also made exception for standard ventrally extended burials, relegating those deemed to be of an undesirable nature to a dorsally extended orientation—particularly those accused of being witches.

Artifacts from the Excavations at CA-SMA-207/H

Very few artifacts were recovered during the excavations of the eight individual burials. This is not surprising when considering the accounts of the survivors, as presented earlier in this report. Many of the victims had lost their clothing during the wrecks, and in several cases, people removed their clothes prior to drowning, probably to make it easier to float. It is also likely that the so-called "land pirates" that began looting the wrecks rifled the belongings of the deceased as well.

San Jose State University maintained an inventory of surface collected and burial associated artifacts (Table 5), which include fragments of coffins, portions of several different fabrics (shawl, shroud and clothing), several buttons, etc. In addition, artifacts collected by the San Mateo County Coroner were also returned to San Jose State University and inventoried.

Although this report will not go into detail about these artifacts, it should be noted that they were not reinterred with the burials and they are still available for study at the California State Parks Archaeological Curation Facility in Sacramento (accession number P-1315). A brief review of some of the Franklin Point artifacts and some observations about them follows below.

FABRICS

Several of the burials were found with varying amounts of fabric that remained from clothing and burial shrouds. Unfortunately, neither the field notes from the 1983 nor 1999 excavations provide any description of the orientations of fabrics, other than to mention that the bones were still adhered to some fabric portions, which needed to be separated from the remains. Fortunately, the project files contain a short manuscript by Cindy Walker of the Textiles Department at the University of California, Davis, in which she describes the fabrics recovered during the 1983 San Jose State University excavation. Her review is reprinted here:

> The shrouds in all bags appear to be 1 x 1 plain weave wool flannel fabrics. Most contain clean-cut holes which are characteristic of moth attack on the fabric. Fiber identification was made difficult by the extent of exposure to moisture, insects, and particulate debris that they had endured. The fabrics, which are probably off-white originally, have become dark and fragile.
>
> Microscopic examination of the wool-like fabrics revealed dark, round fibers, which varied in diameter between the contiguous fibers and occasionally along the length of individual fibers. Both the warp and nap fibers looked the

Table 5. Historic Artifacts Recovered from the San Jose State University 1983 Excavation.

PROVENANCE	CAT. #	ITEMS
Burial 1	1-100	Coffin fragments
	1-101	Shroud
	1-102	Metal coffin nails, misc. metal pieces
	1-103	Wooden pegs with metal nails.
	1-104	Buttons (4)
Burial 2	2-100	Coffin fragments
	2-101	Shroud
	2-102	Nails and misc. metal pieces from coffin
	2-103	Leather belt
	2-104	Wooden pegs with nails
Burial 4	4-100	Coffin fragments
	4-101	Shroud (with button)
	4-102	Nails and misc. metal pieces from coffin
	4-103	Wooden pegs with nails
Burial 5	P-1315-	Iron Ring
Burial 6	P-1315-48	Folding pocket knife
Screened Material	11-100	Square nails, 22 cal. cartridge, misc. metal frags.
	12-100	Common tack nail, square nails, misc. metal frags.
	12-101	Glass (clear, one piece)*
	14-100	Coffin nails, 22 caliber cartridges*, misc. metal pieces
	14-102	Shroud fragment (found in screen)
Coroner's Office (1979)	15-1	Metal strips from coffins (4)
	15-2	Square nails (4)
	15-3	Leather fragments (2) - shoe?)
	15-4	Metal belt clasp with wool fabric
	15-5	Wool fragments (10) - shrouds or pants?
	15-6	Unidentified non-human bone (4)
	15-7	Plastic lid fragment (modern)*
	15-8	White glass button
	15-9	Rubber coat buttons (2)

Notes: * Deposited sometime after the wrecks: not associated with the burials.

same. No scales were detected. The surfaces of all fibers, whether they were thought to be wool or not exhibited small, curved markings along the entire length of the fibers. Cross-sectional examination of selected wool fibers revealed that they were not perfectly round as wool, or most animal fibers are and this is thought to be the result of the severe conditions that the fabrics were exposed to. In cross-sectional as well as longitudinal view, fibers were uniformly dark brown in color.

Some wool pieces were edged with a non-wool binding. Microscopic examination of these fibers showed that while most were swollen, some had

twists and depressed center region characteristics of cotton fibers. The binding fabrics are thought to be of 1 x 1 twill weave cotton. Where cotton fabric was found either loose or attached to the shroud at some location other than at the edge (for example, on the back of a button) it was found to be a looser weave of 1 x 2 twill cotton.

Each of the wool fabric pieces was examined for the presence of weft yarns, yet surprisingly, none were observed. Even when the nap of the fabric was relatively intact, no weft yarns were apparent. The judgment that they are 1 x 1 plain weave fabrics is based on the impressions the weft yarns had left on some of the warp yarns.

No chemical tests were performed on the fabrics, but a visual and microscopic examination of fabric samples allowed for the following sample specific observations:

- Burial 1-101: Contains plain weave wool fabrics, but also a much larger amount of cotton twill than the other bags. The use of cotton fabric here is not confined to wool fabric edges.
- Burial 2-101 (bag 1 of 5): Fabrics are all wool. One piece has wood still attached to it.
- 2-101 (bag 2 of 5): Fabrics are darker than those in the other sample bags. Some wool pieces contain cotton-binding fabric. Two fabric pieces have cloth-covered buttons. Another has the remnants of a button. The buttons appear to have had metal cores. Some fabric pieces were a much lighter colored wool than any other was of the shrouds; this fabric is thought to be entirely wool.
- 2-101 (bag 3 of 5): Contains all wool fabrics.
- 2-101 (bag 4 of 5): Contains all wool fabrics some of which are edged with cotton fabric, and also a piece of 1 x 2 twill weave cotton fabric not connected to another fabric.
- 2-101 (bag 5 of 5): Contains primarily wool flannel fabrics, as with the other bags. One wool piece has a button sewed on it.
- Burial 4 4-101: One button was found in this sample. Fabrics were woolen and of a similar construction as the rest of the wool samples; however, when the nap fabrics were observed microscopically, it appeared as though it were composed of both cotton and wool fibers. This was the only case where the nap fiber content differed from that of the warp yarns.

RUBBER BUTTONS

Two vulcanized rubber coat buttons were recovered by the San Mateo County Coroner's Office in 1979 and later returned to San Jose State University during their investigations at CA-SMA-207/H. It is likely that these buttons were associated with Burials 1-4 since that was also the area where the human bones were first reported. Figure 19 presents an illustration of one of the buttons, which reads: "Novelty Rubber. New York. Goodyear's Patent 1894 951."

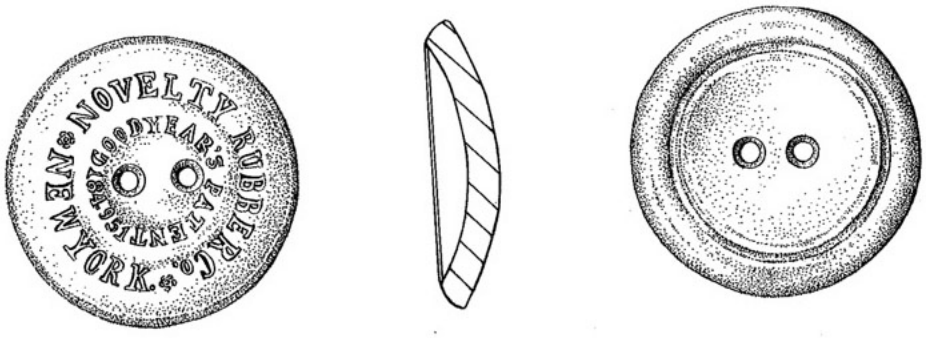


Figure 19. Illustration of a Rubber Coat Button from CA-SMA-207/H.
Illustration on file, State Parks Archaeological Curation Facility.

IRON RING AND POCKET KNIFE FROM BURIALS 5 AND 6

The latter two artifacts were recovered from Burials 5 and 6 during the 1999 excavation and their positions relative to the bodies are depicted in a field sketch (Figure 20) below. The rusted iron ring was probably a metal grommet attached to a portion of sail fabric that might have been used as a burial shroud. The 3 ½-inch folding pocketknife was found near to the distal end of the left femur of Burial 5. Not much more can be written about it since it is severely damaged (Figure 21); however, an interesting observation can be made. The blade was snapped off close to the handle and had been unfolded and extended outward at the time when it was broken, possibly because of use during the wreck. The one remaining scale on the handle is made of bone.

COFFINS

The eight individuals recovered had all been buried in hastily constructed redwood boxes. The dimensions of these boxes averaged 70 inches in length, by 33 inches width. Field notes commented that some of the coffins still had portions of their lids on top, although caved in from pressure, so it could be seen that the average depth of these boxes was about ten to eleven inches. Figure 22 shows the lid on Burial 1 exposed in 1983.

The boards composing the coffins are particularly interesting as they are only ¾ inch thick, which is a thin cut for mills in the vicinity that were at that time engaged in harvesting enormous old-growth trees. When the *Sir John Franklin* wrecked in 1865, wood to make the box coffins was probably not very common on the coast, and the only mills nearby the wreck site were in the upper drainages of Pescadero Creek (Stanger 1967:91). These first mills were mostly producing larger boards; but as can be seen from the burial coffins, they were certainly capable of milling very thin boards. However, after 1867, multiple sawmills were established along both Gazos Creek and Pescadero Creek drainages within closer proximity of the wrecks.

Each of the coffins had been pieced together with tiny square sided nails and metal straps. The metal straps were about an inch and a half wide and although none was found intact, many fragments were noted and recovered. It is likely that these were used to reinforce the corners of the boxes. Figure 23 shows a surface scatter of nails, metal strap fragments, and Figure 24 shows the surface exposure of the coffin from Burial 5, which was right in the middle of an informal trail used by hikers.

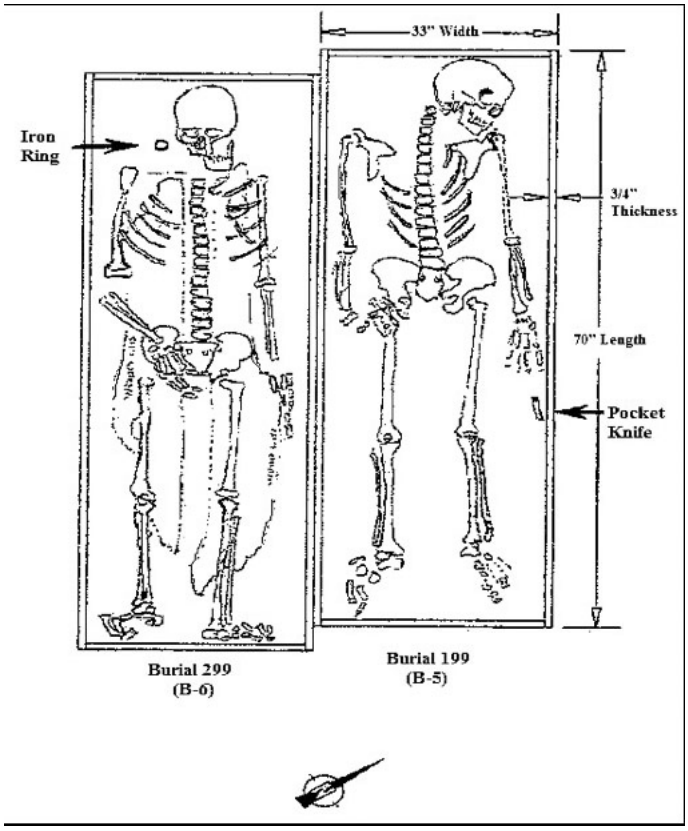


Figure 20. Sketch of Burials 5 and 6 showing Artifact Locations and Coffin Dimensions.
Motz et al. 1999.

Figure 21. Folding 3 ½" Pocket Knife Associated with Burial 6 (P-1315-48).

Figure 22. View of Burial 1 Redwood Coffin Lid.
Jurmain and Leventhal 1987.

Figure 23. Surface Scatter of Coffin Nails and Metal Strap Fragments.

Figure 24. Deflated Dune with Coffin from Burial 5.
Motz et al. 1999.

SIR JOHN FRANKLIN SHIP'S NAME BOARD

Among the artifacts that have been recovered from the shipwrecks, one in particular needs to be mentioned—although it was not recovered from the excavations. The actual nameplate from the *Sir John Franklin* was salvaged and evidently, the Steele Family residents of nearby Cascade Ranch picked up the wooden, engraved name board that would have once graced the stern transom of the *Sir John Franklin*. It was known to have been hung suspended by two hooks in the Cascade Ranch barn for many years but was later donated to the National Park Service National Maritime Museum where it has been stored at their Fort Mason Facility in San Francisco (catalogue number 9821). The board is about seven feet long and is broken on the left end such that the name "Sir" is absent. The Cascade Ranch Barn still stands at the former Steele family ranch and is now within Año Nuevo State Park.

Stabilizing the Cemetery

The repeated exposure of human skeletal remains from the Franklin Point Historic Shipwreck Cemetery occurring between 1981 and 2001 was largely attributable to episodes of severe deflation of the overlying sand dune. Much of this erosion was caused by the many informal trails that carved through the protective dune vegetation, which allowed the strong sea winds to deflate the sand matrix and cut downward to the depths of the coffins. It was concluded that by building a pedestrian boardwalk over the burial site State Parks would be able to protect the surrounding vegetation while still allowing the public a route to access the point, without further affecting the cemetery. However, before designing the boardwalk and establishing an effective area of coverage, the extent of the cemetery needed to be determined. This was done by mapping the distribution of exposed coffins and human bones, and by plotting the aerial extent of scattered bone elements and various fragments of coffin hardware (rusted metal strap and small square-sided iron nails) scattered within a defined area. However, an even more effective means of delineating a site boundary for CA-SMA-207/H was achieved with search and rescue dogs trained by the Canine Forensics Institute of Woodside, California.

DELINEATION OF CEMETERY BOUNDARY BY FORENSIC CANIDS

In 2002, several search and rescue dogs and their handlers from the Canine Forensics Institute (CFI) in the City of Woodside were deployed at Franklin Point site CA-SMA-207/H in an experiment to see if the highly specialized dogs would react and identify human remains from archaeological contexts. These dogs had learned to distinguish the difference between decomposing animal remains and humans, and each was trained to react differently to confirm a potential find. Their method prescribes that multiple confirmations by different dogs at a given location signal a high likelihood that human remains are present. Given this ability, the CFI has developed a long history of working successfully with search and rescue teams, and other law enforcement agencies that regularly require the assistance of the canids to recover people. However, at the time, it was not known if they could detect the scent of human skeletal remains from much older events.

Four border collies trained by CFI were individually allowed to walk over the area, and each immediately signaled their discovery of the exposed human remains and coffin fragments that were still visible in the impacted and eroded sand dune matrix. This first part of the test confirmed that the historic remains still retained sufficient decomposition scent to trigger the alerts of the individual dogs. In a short time, they began to signal at several other loci throughout the area of the point, but lost scent a little further inland

from the known cemetery area. Ultimately, the test confirmed that they could in fact identify human remains from the past, and that the area still contains more burials that have not yet been exposed.

In March 2017, the CFI was invited back to CA-SMA-207/H to test another generation of dogs, and to re-confirm the site boundaries in preparation for this report. With permission from the Park Superintendent and our District Ecologists, and under the supervision of the District Archaeologist, five dogs were allowed to work within an otherwise dog prohibited environmentally sensitive habitat. Each was leashed and wore a vest that identified them as Search and Rescue Canids, and they also contained GPS tracking devices to record their areas of coverage. The handlers in the field also recorded GPS points, and alert positions plotted with hand-held devices. The result was that each of five dogs rapidly alerted to both the re-burial locus that was six feet under a memorial deck (see description below), and at the places from where these remains had been excavated, including Burials 1-4; these had been removed in 1983 (Figure 25).

The 2017 canid survey also resulted in the positive identification of two more areas of interest towards where the pedestrian boardwalk begins. In the end, as re-confirmed by the recent survey, it would appear that the installation of the boardwalk and two observation decks adequately covers and protects the cemetery, from its start to ending extent. Figure 25 through Figure 27 show the CFI team at work at CA-SMA-207/H in 2017.

Figure 25. Alerting at the Location Where Burials 1-4 were Recovered in 1983.

Figure 26. Canid Signaling a Burial Find.

Figure 27. Molly, Star of the Survey.

REBURIAL OF THE SKELETAL REMAINS AND CONSTRUCTION OF THE PEDESTRIAN BOARDWALK

As the design of the trail was being drafted, it was realized that there was an opportunity to securely return the eight sets of human skeletal remains to their original resting places. Ultimately, the reinterment took place on November 20, 2002 and the boardwalk trail was completed on January 22, 2003. Figure 28 illustrates the alignment of the pedestrian boardwalk, as well as the burial excavation and reinterment area.

With the assistance of the trail contractor and his crew, along with a couple of local farm field workers, cardboard archive boxes containing the individual remains of Burials 1-8 were placed in the pit depression from which they had been excavated (in some cases 20 years earlier). The bone elements in the boxes remained in their paper bags in order to contain them during the process. It is anticipated that the paper products will progressively dissolve and leave the bones in place.

The boxes rested on a layer of plastic screen mesh that was also folded over them and pinned down with metal T-posts. The screen was used to discourage rodents from burrowing in to the progressively decaying boxes and perhaps unearthing the contents after the boxes flatten out. Once arranged in the pit and enveloped in the screen, the boxes containing the bones were covered with about six feet of sand, and a wooden memorial deck was built over them. Figure 29 through Figure 31 show details of the reinterment process.

To build the trail, the contractor was challenged with finding a suitable access route to the site from Highway 1, which is about ½ mile inland from the point. There are no direct routes through the thickly vegetated dune landscape, and substantial amounts of timber, hardware, tools and a large generator were necessary for the job. It was decided that the best route would be along the beach at low tide from an access point near the mouth of Gazos Creek, about one mile further up the coast. The contractor was forewarned that he needed to be expedient and not prolong the work since winter storms were looming. Each year the beach approach to Franklin Point loses its sand as tidal actions draw it out to sea, and the beach exposes numerous impassable jagged rocks and gravel surfaces. Unfortunately, the contractor delayed work after depositing many of the necessary materials, and winter storms removed the beach. Consequently, the half-completed trail was cut off from direct access.

In order for the contractor to fulfill his obligation to State Parks, he contracted the services of a helicopter and crew to ferry materials back and forth to the job site for a day. The helicopter arrived from Reid-Hillview Airport in San Jose and became a very valuable asset towards the completion of the project.

Before grading the boardwalk trail alignment, State Parks Resource Ecologists surveyed the project site to ensure that no endangered species would be impacted. As it turned out, a lot of the vegetation included invasive ice plant, and this was removed whenever it was encountered. However, all of the native plants that were disturbed by the grading were gathered and re-planted throughout the disturbed and exposed dune areas after the trail was completed.

Permission to build the trail included receiving an exemption from the Americans with Disabilities Act, since the boardwalk could not be linked to another ADA accessible route, and the primary purpose was to stabilize the archaeological site. Similarly, the

Figure 28. Layout of the Pedestrian Boardwalk and Reinterment Location.
Datum 1 GPS N 4111691, E 556807 meters.

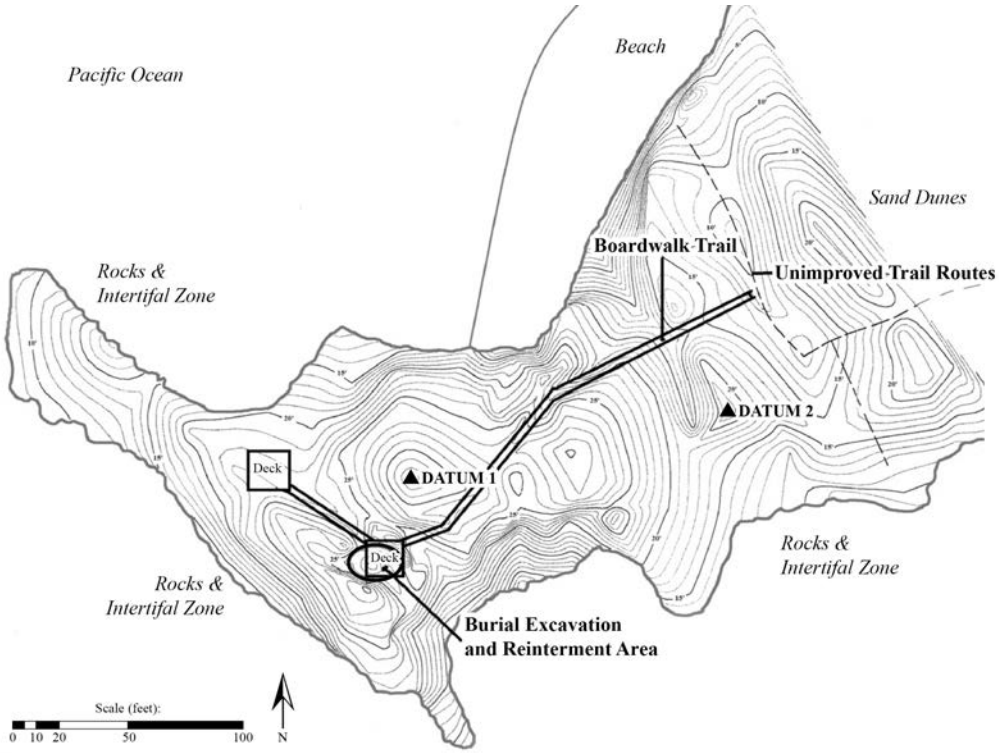


Figure 29. Reburial of the Skeletal Remains.

Figure 30. Covering the Burial Boxes with Screen.

Figure 31. Backfilling the Burials.

California Coastal Commission agreed to support the project and exempted the work from permit application.

The trail was made of pressure treated Douglas fir and old railroad ties, and measures nearly 250 feet in length with a tread width of four feet. The tread boards were cut perpendicular to the axial length of the travel route and span two parallel eight-foot long stringer beams to create trail segments. These segments were linked together in flexible sections that can accommodate the changing topography of the surrounding terrain. The stringers rest in turn upon railroad ties set perpendicular to the travel direction and extending outward from the tread way by about a foot on each side. These extensions were drilled and pinned into the sand with long rebar rods.

Two larger deck areas, measuring 10 x 10 feet each were installed to create places for people to congregate and enjoy the magnificent maritime views. At the second deck, located at the end of the trail, two heavy wooden benches with back rests were angled together and anchored down, facing outward towards the sea. This platform is referred to as the "observation deck," while the first deck where the eight sets of skeletal remains were reinterred is referred to as the "memorial deck." The memorial deck serves as a protective barrier over the reburial location.

A series of galvanized metal stanchions with eye rings on the ends were fastened along the entire length of the boardwalk and around the two decks; enclosing them with ¼-inch-thick plastic-coated metal cable that was threaded through the stanchion ends to create a "railing" and define areas of prohibited public access. Ultimately, after the vegetation had stabilized, these stanchions were removed in about the year 2010.

Figure 32 through Figure 40 illustrate the construction of the boardwalk, observation decks and bench.

Figure 32. Establishing a Trail Route.

Figure 33. Drilling Stringers for Metal Rebar Anchor Pins.

Figure 34. Start of Trail.

Figure 35. Reinterment Site with Memorial Deck.

Figure 36. View Towards Northwest.

Figure 37. Helicopter Support Landing on the Observation Deck.

Figure 38. Airlifting Supplies.

Figure 39. Observation Deck and Benches.

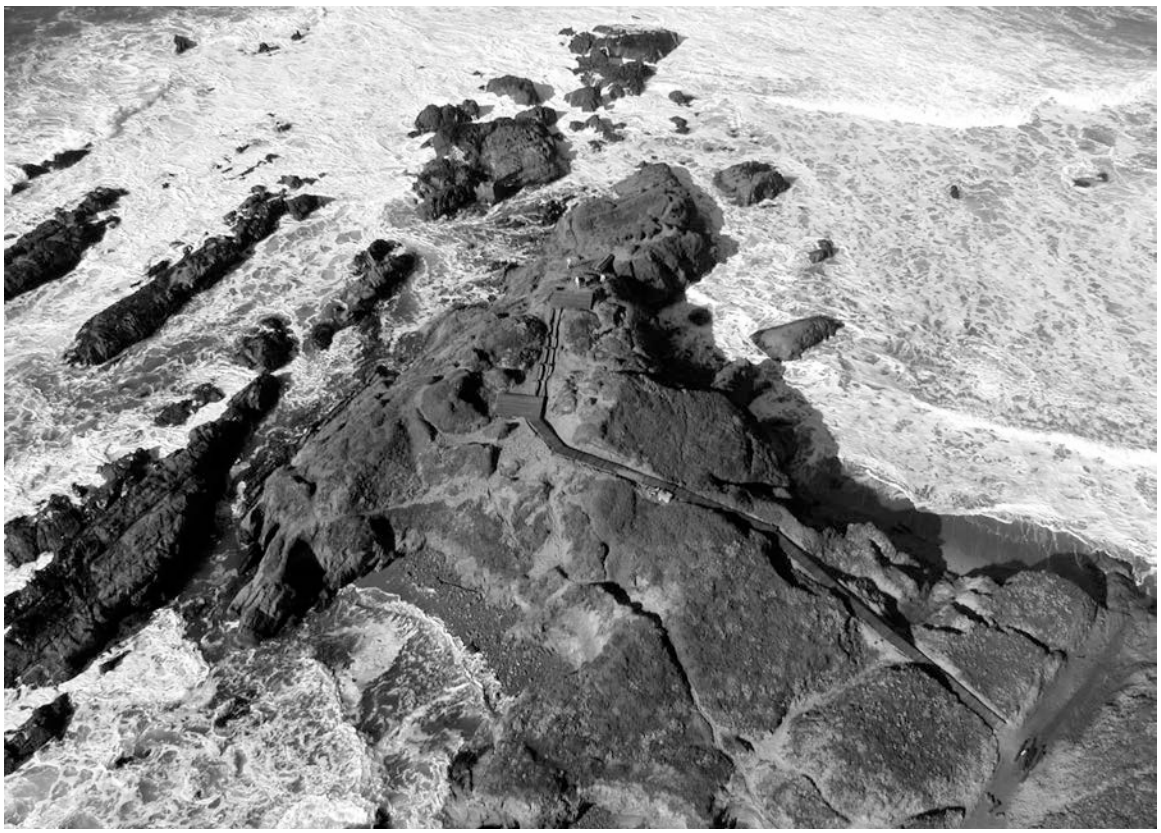


Figure 40. Aerial View of the Project.

Epilogue

At the beginning of this report, I wrote that the disposition of human remains after death and how they are treated afterwards serves as a measure of our social mores and values. Unfortunately, humans are composed of many conflicting ideologies, and opportunities for personal gain frequently supersede decency or virtuous behaviors. Historic records inform us that the Franklin Point shipwreck victims were being robbed even as they washed ashore, prompting some survivors to stay on site and preside over their disposition. Even though Franklin Point became a designated cemetery, people with no respect for the tragedy that occurred there continued to loot the buried remains.

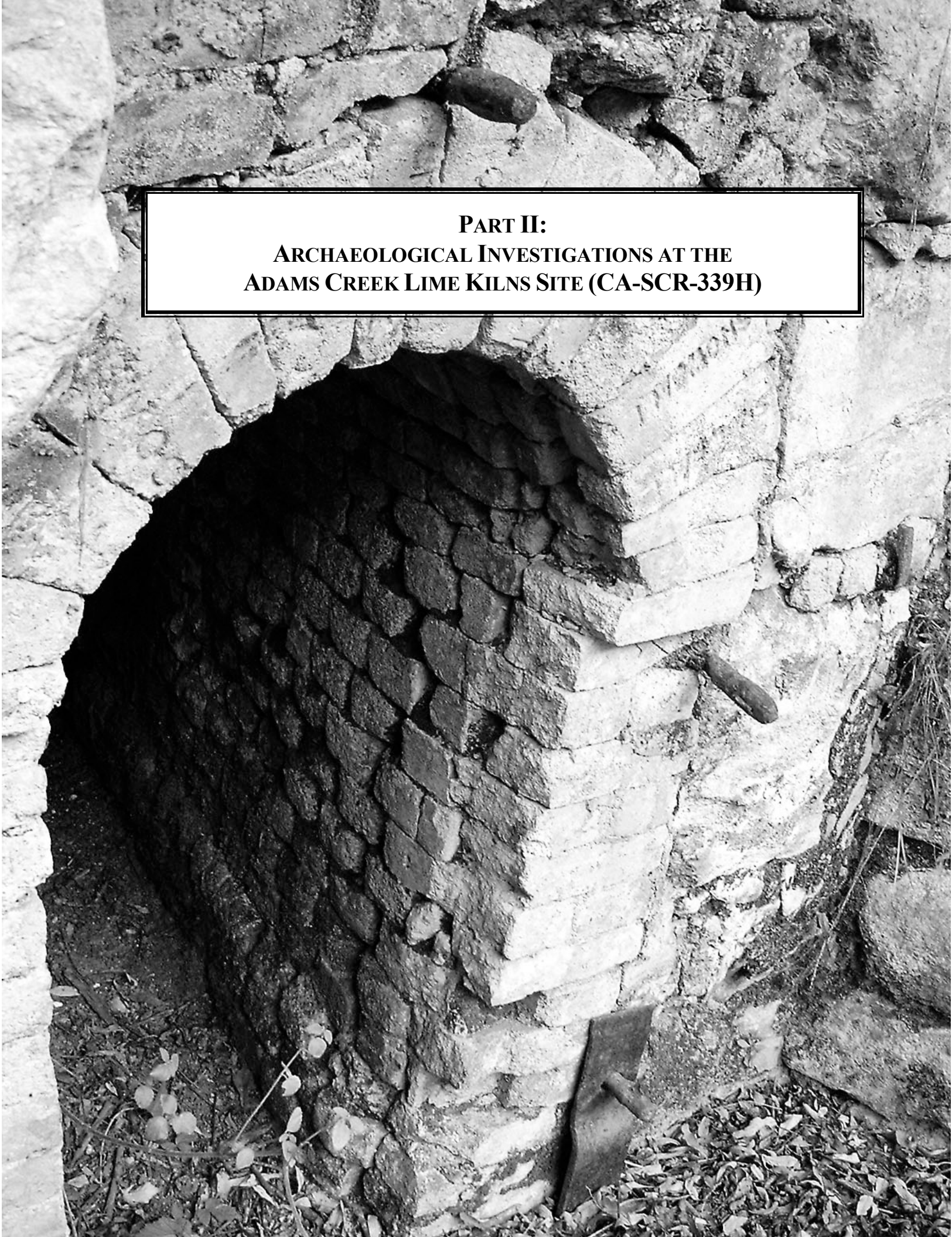
In the 1970s, Harvey Mowry—a local historian writing about the history of the Gazos Creek and Pigeon Point area—interviewed a former coastal resident named Carol Littlefield and asked her about what it was like growing up there between 1902 to the 1920s. Carol responded and wrote several letters back; but of particular interest were her observations about the shipwreck cemetery:

> At the mouth of the Gazos Creek where we lived, the Ocean Shore Railroad put a cut and fill at the end of our place. Going through the first hill south of our pasture, they dug up bones of many bodies that were buried in the sand hill from the wreck of the *Sir John Franklin* that had washed ashore there. The men took jewelry and what they found and then dug a big hole to one side and scraped all debris into it and covered it. We kids used to watch them. My mother called constable Good from Pescadero and he came down but was nothing anyone could do about it. (The burials) had been there too many years and no one (knew who) to contact… An old safe was wedged between rocks near wreck and divers, different ones, tried to get into it. (I) have seen it at minus tide when we used go down there on Saturday's. [Mowry, February 2, 1970]

Of special note is her recollection that human burials had been exposed by excavation for the proposed Ocean Shore Railroad; which never materialized because the 1906 San Francisco earthquake had destroyed several proposed crossings. Nevertheless, many portions of the railway alignment can still be discerned on the landscape today. In fact, the area Carol Littlefield discussed can still be seen as an excavated lineal alignment, but it is much farther away from the location of where the burials from CA-SMA-207/H where recovered; the two loci are about one mile apart. Evidently, more people were interred over a larger area than has been supposed.

It is possible that people-other than shipwreck victims, were similarly buried in the vicinity. Once again, Carol Littlefield's recollections provide some support for this. While listing a variety of names of people who were both neighbors and workers in the area, she added that: "A Ben Young from Younstville, California hauled ties and dead men to Pigeon Point" (Mowry 1970). What dead men might these have been? Moreover, where exactly were they disposed of? Perhaps Carol Littlefield transposed her memories of the burial looting, which occurred near to the Franklin Point graves, and assumed the skeletal remains were those of the shipwreck victims.

Today, no trace of the wreckage from the three ships is visible, and the fate of the safe described by Carol Littlefield remains a mystery. The marble cenotaph dedicated to Seaman Edward Church that was once prominent on the point until the 1970s, has vanished. Nonetheless, both the disturbed and undisturbed skeletal remains of who knows whom, or how many people, may rest in peace within the jurisdiction of Año Nuevo State Park. At least we know that some of them are below the wooden deck that was built to protect them.



PART II:
ARCHAEOLOGICAL INVESTIGATIONS AT THE ADAMS CREEK LIME KILNS SITE (CA-SCR-339H)

Photo on previous page:
Close-up of Kiln at CA-SCR-339H, courtesy of Andrew W. Kindon, Department of Anthropology, West Valley College.

Introduction

From the fall of 2006 to the summer of 2009, the Foothill-West Valley Archaeological Survey, in partnership with the California Department of Parks and Recreation, conducted a public historical archaeology project at the Adams Creek Lime Kilns site in Wilder Ranch State Park (Figure 41). The project focused on the domestic contexts of the nineteenth- and early twentieth-century Santa Cruz County lime industry, particularly the daily lives of the workers who lived and worked at the limekiln facility. More than 150 students and volunteers from the local community participated in the project. The excavations provide a fascinating window into the hidden history of the oft-overlooked community that formed around and supported the early California lime industry. As such, this work makes an important contribution to our understanding of a critical part of Santa Cruz County's industrial and social history.

PROJECT LOCATION

The Adams Creek Lime Kilns site (CA-SCR-339H) is located in Wilder Ranch State Park in Santa Cruz County, California (Figure 42). The site has been known variously as the Samuel Adams Limekilns, Davis & Cowell's Kilns, Cowell's Upper Kilns, and the Gray Whale Ranch Limekilns. In an effort to avoid confusion, the site will be referred to as the Adams Creek Lime Kilns throughout this report, following Perry et al. (2007b). The kilns, limestone quarries and associated architectural features became part of state park lands in 1997 when the California Department of Parks and Recreation acquired the 2,300-acre Gray Whale Ranch property. Located approximately 1.8 miles (2.9 kilometer) north of the Wilder Ranch State Park visitor center, the site is currently only accessible via fire roads or hiking/equestrian trails (Figure 43). The limekiln facility covers roughly 28 acres and consists of a large number of extant architectural features including three large limestone pot kilns, the foundations of a cooperage and two large barns, and the remnants of several smaller structures which likely included worker cabins, industrial facilities and food preparation areas (Figure 44). These features were surveyed and mapped in 1998 by Thomas Wheeler (see below).

The landscape and physical environment of the site consists of a patchwork of open meadowland interspersed with dense stands of poison oak and live oak. A large, sloping meadow lies to the north and west of the site, while the areas to the east and south are covered in a mixture of

redwood, fir and oak forest. Most of the site lies nestled along the sides and bottom of a shallow, bowl-shaped valley (Figure 45). The quarries lie on the northeast edge of the site at the transition from meadowland to forest. Beyond this the topography becomes increasingly steep, covered in dense forest, and descends quickly to Wilder Creek and Cave Gulch to the east.

Present use of the site consists primarily of recreational activities, including equestrianism, hiking and mountain biking. The limekiln complex sits at the intersection of two popular trails in the park (Engelsmanns Loop and Long Meadow Trail) and as such sees a relatively high volume of traffic. An unofficial trail runs directly in front of the pot kilns and links into a series of trails outside of the park that are popular with mountain bikers. This trail also provides access to the UCSC campus. There is currently no interpretive signage at the site and the architectural features appear to be in a state of benign neglect, little changed from when the park system first acquired the property.

Figure 41. The Westernmost Pot Kiln at the Adams Creek Site as it Appeared in Fall 2007.
Photograph by Michael Popham.

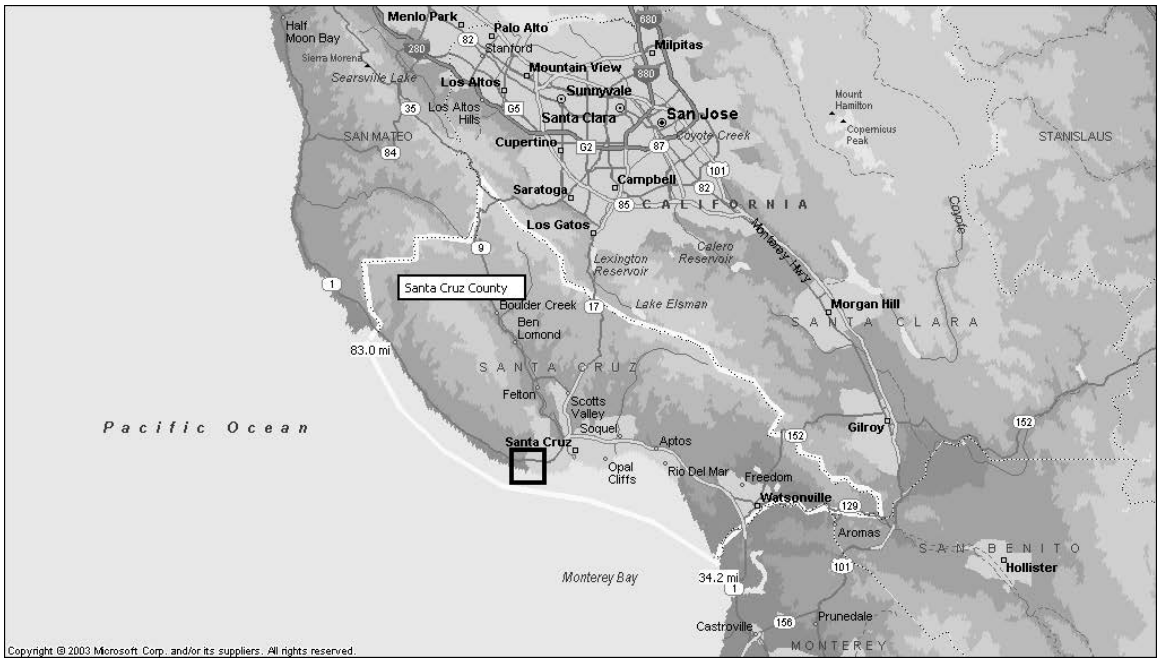


Figure 42. Map Showing Location of Wilder Ranch State Park within Santa Cruz County.
Map prepared by Samuel Connell.

PROJECT BACKGROUND

The Foothill-West Valley Archaeological Survey (FWVAS)

The Foothill-West Valley Archaeological Survey (FWVAS) was a collaborative partnership between Foothill College and West Valley College, two neighboring California Community Colleges located in the Santa Clara Valley. The partnership was established in the fall of 2006 by Andrew Kindon (chair of the Anthropology and Geography Department at West Valley) and Samuel V. Connell (instructor in Anthropology at Foothill College). Having both recently been hired as community college instructors in the Bay Area and realizing that many of their students were unable to afford the time and expense of travelling out of the country, they wanted to establish an opportunity for local students to participate in local archaeological excavations. The work at the Adams Creek site was the first project undertaken by the FWVAS. Subsequently, this collaboration has been subsumed by the Bay Area Cultural Landscapes Research Group (BACLRG), a collaborative working group focused on investigating historic and prehistoric landscapes in the Bay Area. BACLRG includes members from local community colleges, San Jose State University, Santa Clara University, The University of California, Santa Cruz, the University of California, Berkeley, Stanford University, the State of California Department of Parks and Recreation and several other organizations.

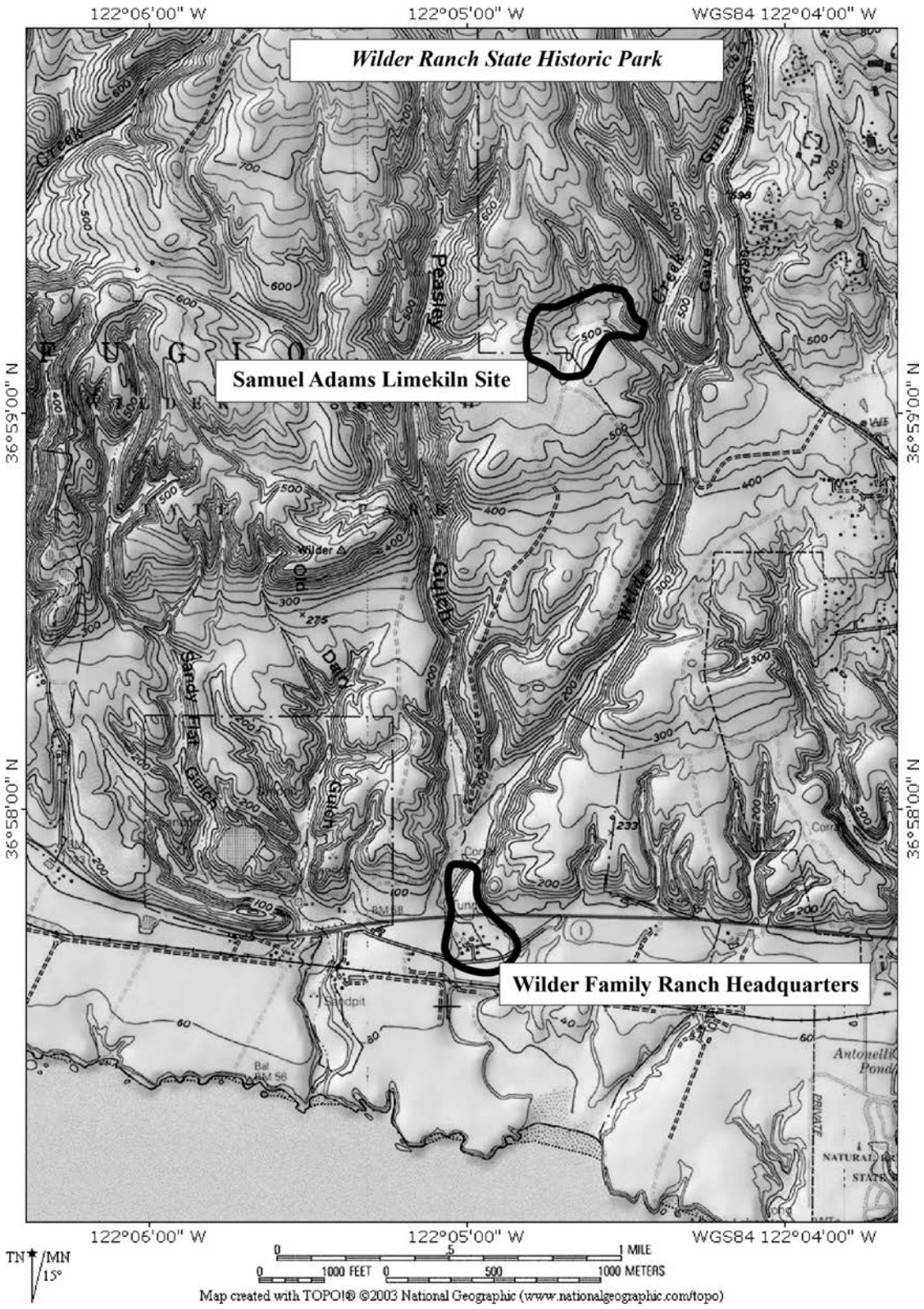


Figure 43. Map Showing Location of the Adams Creek Lime Kilns (aka Samuel Adams Limekilns).
Map prepared by Samuel Connell.

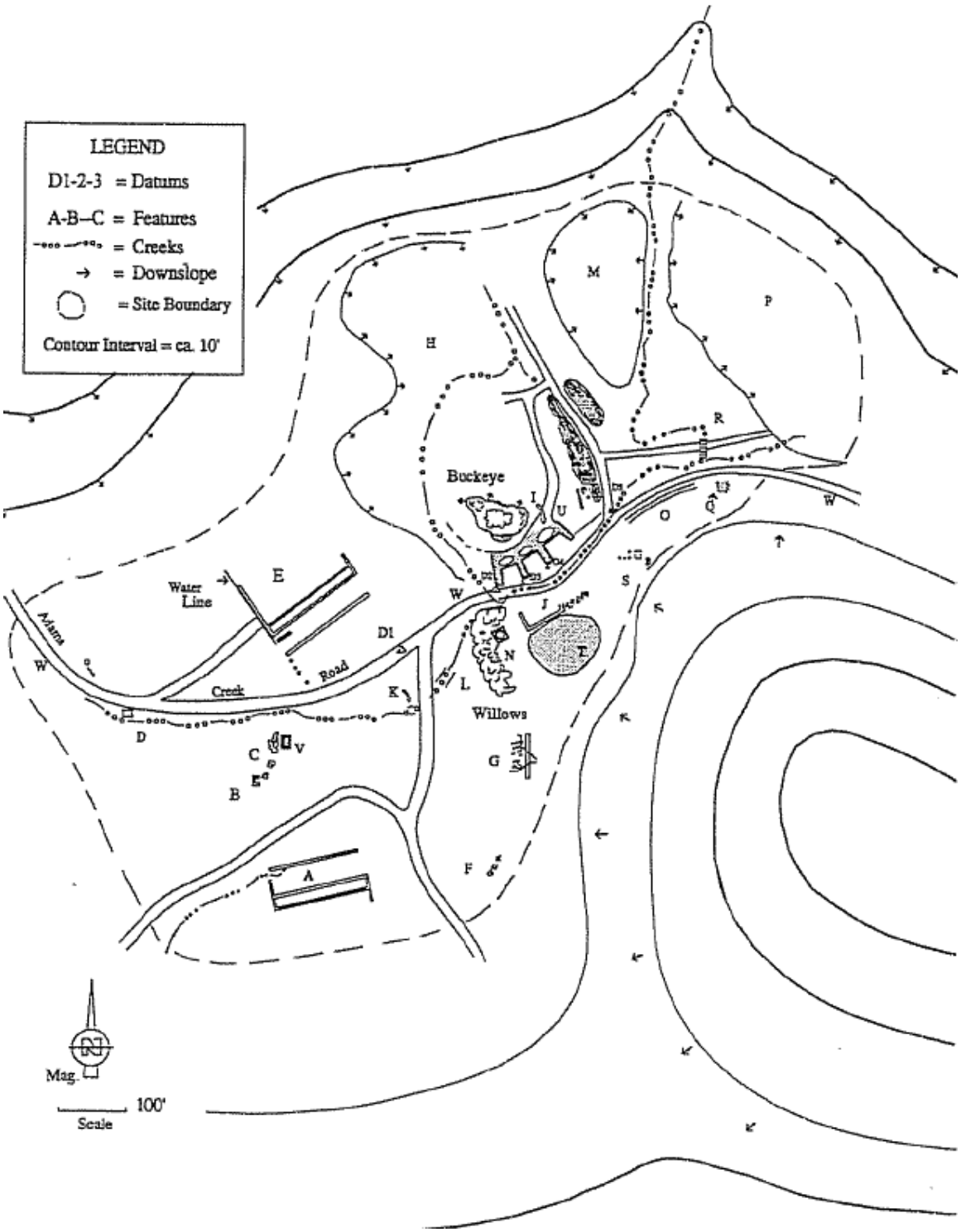


Figure 44. Wheeler's Map of the Adams Creek Lime Kilns Site.
Wheeler 1998.

Figure 45. The Adams Creek Lime Kilns Complex as it Appeared in 2007.
View looking south from the edge of the westernmost quarry. The foundation of the "North Barn" (Wheeler's Feature E) is in the foreground and the foundation of the "South Barn" (Wheeler's Feature A) can be seen in the background to the right of the trail. The worker cabins (Wheeler's Features F and G) were located on the sloping hillside to the left of the trail, at the lower edge of the wooded area (photograph by Sam Connell).

The Adams Creek Lime Kilns Project

The FWVAS involvement with the Adams Creek Lime Kilns site was initiated in the fall of 2006 after a meeting of the Bay Area Anthropology Consortium at West Valley College. The purpose of this meeting was to encourage greater collaboration and interaction across the anthropological community in the Bay Area, and to create connections between experienced members of the community and relative newcomers like Kindon and Connell. During this meeting, Kindon and Connell expressed an interest in finding a local archaeological project that they could undertake as an educational opportunity for their students. Mark Hylkema, Associate State Archaeologist for the California Department of Parks and Recreation, was in attendance and suggested that the limekiln site located in Wilder Ranch State Park might be an ideal place to undertake such a project. Hylkema had been the first person to document the location of the Adams Creek Lime Kilns facility during a pedestrian survey for Sequoia Forest Industries in 1988. A subsequent survey by Thomas Wheeler (1998) carried out after the acquisition of the site and the surrounding area by the California Department of Parks and Recreation in 1997 described the extant site features in more detail (see *Previous Research* section below). Hylkema indicated that he was interested in seeing more intensive work carried out at the site, both to provide interpretive materials to the Department of Parks and Recreation and also to help in identifying conservation needs.

After an initial visit to the site with Hylkema in fall 2006, the FWVAS was established to start work at the Adams Creek Lime Kilns. From the outset the project had dual purposes: first, to investigate the limekiln facility and provide important historic information to the Department of Parks and Recreation for use in developing interpretive materials for the site. The second objective was to act as a teaching laboratory for undergraduate students and public volunteers interested in learning more about both local history and the archaeological process in general. In this respect the FWVAS was a "public archaeology" project. The work carried out was intended to benefit the local community and to involve that same community in a collaborative and constructive way.

During a total of six field sessions (from spring 2007 to summer 2009), more than 150 students and volunteers participated in fieldwork at the Adams Creek site. In the fall and spring 2007-2009 sessions, excavations were typically carried out at the site on Fridays and/or Saturdays when weather permitted. Connell required students enrolled in his Introduction to Archaeology class to participate in the project, both in the field and in the laboratory at Foothill College. Kindon offered the project as a volunteer opportunity to any student enrolled in Anthropology courses at West Valley College. In many cases students participated for only one or two field days. However, several students from both Foothill and West Valley became very involved in the project and participated in nearly every field session over the duration of the entire project. The majority of the work described in this report was carried out during the summer of 2009, when Foothill College offered an intensive field school in archaeology focused on the Adams Creek site. This field school was run jointly by Kindon, who oversaw the excavations, Roger Kelly, who oversaw the cataloguing and analysis of artifacts in the Foothill College laboratory, and Mark Hylkema, who acted as liaison with the Department of Parks and Recreation. Of the students who participated in the FWVAS project from 2007 to 2009, several went on to receive bachelor's degrees in Anthropology, two have gone on to receive master's degrees in Archaeology, one is currently working on a Ph.D. in Archaeology, and another has become a Cultural Resource Management professional. In this regard, the FWVAS project at the Adams Creek site was a great success in inspiring local students to pursue careers in the archaeological field.

Treating the site as a teaching laboratory came with many challenges. First and foremost was the simple fact that the majority of the students who participated had no previous archaeological experience. In addition, because of the constant rotation of students, continuity in record keeping and documentation was a concern. There was also significant inconsistency from week to week in the number of participants, with as many as 25 students and volunteers showing up on some days and as few as three or four on others. Due to these circumstances, work at the site was intentionally undertaken at a relatively slow pace. Students and volunteers were constantly supervised by the project co-directors, and inexperienced participants were paired with more experienced "veterans." During the 2009 summer field school, this process was formalized with the designation of two field crew chiefs (Rebecca Spitzer and Michael Popham) who were responsible for insuring accurate and consistent completion of field forms, notes and other documentation. A "pop-up" field laboratory was also established during the field school where artifacts could be cleaned, counted, weighed and catalogued on-site. Despite these efforts, documentation of the work carried out by the FWVAS at the site is admittedly inconsistent in quality and detail and in some cases, important documentation is either currently missing or misplaced (see *Special Note* below).

Another facet of the work carried out by the FWVAS that was shaped by these challenges was the basic research design and execution. Because of the relative inexperience of the excavators and the wide range of research questions the project directors hoped to address, the decision was made to rely primarily on limited test excavations rather than large areal clearing excavations (see *Methods* section below). While this choice limits the depth of detail derived from any specific context at the site, it did allow a relatively large and varied sample of different contexts across the site. As such, the conclusions drawn from the excavations carried out by the FWVAS at the Adams Creek site remain preliminary.

However, it is hoped that the results described below will serve as a useful basis for more intensive work at the site in the future.

The FWVAS also took seriously its goal to be a public archaeology project. The Adams Creek site is within Wilder Ranch State Park and is located at the intersection of several trails that are very popular with equestrians, mountain bikers and hikers. These public visitors to the site have likely contributed to the ongoing decay of many of the architectural features and have possibly contributed to the occasional loss of data from the site. Early on during the FWVAS project, it became clear that many casual passersby were very curious about the excavation activities, and many stopped to ask questions and offer their own insights and ideas. Looking at this as an opportunity to bolster public interest in the project, help disseminate basic facts about the site, and gain local knowledge about land use around the site, the FWVAS encouraged these interactions. During the summer 2009 field school the "pop-up" lab doubled as an information center for the public, where they could view some of the artifacts found at the site, read informational signs about the history of the site as well as the project, and ask questions and offer information. All the students enrolled in the field school were required to spend part of their time at the site interfacing with these visitors, which gave them excellent experience in explaining the archaeological process and sharing insights gained from their own work at the site. All passersby were invited to share their contact information with the project co-director and were offered the opportunity to volunteer for future work at the site.

In addition to these informal interactions with the public, the FWVAS also strove to disseminate information about the project via more formal avenues. In 2008 the FWVAS submitted updates to the State of California Department of Parks and Recreation Primary Record for the site to reflect additional findings and documentation beyond Wheeler's original recording of the site. In April 2008, Eric Fries from Foothill College presented a paper titled "Hidden Histories: Preliminary Results of the Foothill-West Valley Archaeological Survey at the Gray Whale Ranch Site, Santa Cruz County" at the Society for California Archaeology meetings in Burbank, California. This paper was co-authored by Kindon, Connell and Fries (Kindon et al. 2008). In October 2009, Kindon presented a talk titled "Recent Excavations at the Samuel Adams Limekilns Site (CA-SCR-339H)" to the Wilder Ranch State Park docents, outlining preliminary results from the summer field school and previous work at the site (Kindon 2009). From 2010 to 2011 Kindon served as the faculty mentor for Alfonso Tinoco, a student enrolled in the McNair Scholars Program at San Jose State University. Tinoco's research on material from the Adams Creek site resulted in an article titled "Quarrying an Empire: An Archaeological Investigation of the Adams Limekiln Site, Santa Cruz, California" (Tinoco 2011). Despite these previous efforts, the current report represents the first cohesive and complete summary of all the work carried out by the FWVAS at the Adams Creek site to date.

RESEARCH GOALS AND QUESTIONS

The initial and primary goal of the FWVAS excavations at the Adams Creek Lime Kilns site was to investigate the entire complex and to obtain a better understanding of the people who worked at the kilns and the nature of their daily lives. Of particular interest was the nature and structure of the community, which existed around the lime works. Historical accounts of the Santa Cruz County lime industry already provide detailed biographical

information about the colorful figures behind the industry, especially such luminaries as Henry Cowell. Other than incomplete census records and occasional passing references in local news stories, the workers who provided the labor upon which the industry was built have remained virtually ignored (but see Paramoure 2012 for an important exception to this).

The realities of historic industries such as those carried out at the Adams Creek site are quite different from those of modern industrial settings in North America. From the vantage-point of the late twentieth and early twenty-first centuries, with our increasingly efficient means of transportation and the growing literal and figurative distance between "work" and "home," it is almost impossible to understand the daily life of a typical nineteenth-century industrial worker. The Adams Creek Lime Kilns were not simply an industrial complex to which individuals commuted on a daily basis to work. Instead, they were the nexus around which a tiny but vibrant industrial village emerged. In this respect, the Adams Creek site must be understood within the framework of a typical nineteenth-century "company town"—a community linked together perhaps solely via the common thread of working for or being associated with the lime industry, but a community all the same. Ironically, this community in some ways may not be all that far removed from some of the communities currently emerging within the high-tech industry in Santa Clara Valley. Similarly, this community would have been comprised of a wide variety of people, diverse in age, ethnicity, status, and gender.

This latter point is a critical one within the research carried out by the FWVAS at the Adams Creek site. The stereotypical assumption regarding late nineteenth century industries like the Santa Cruz County lime industry is that they were driven primarily by European and/or European-American adult males. Historic documents seem to support this. Census records seem to support this. Even historic photographs seem to support this (e.g., Figure 46). But it must be remembered that all of these sources of data could be (and likely *were*) biased in their reporting. It is possible that they ignored the presence in these industrial villages of

Figure 46. Lime Workers at the Adams Creek Lime Kilns, circa 1890.
Note the structure in the background to the far right of the image, likely Feature F or Feature G in Wheeler's survey report (courtesy of the Santa Cruz Museum of Art and History).

non-male, non-European, none-adult members of the community. In this regard, as much as the largely European immigrant labor force associated with the lime industry has been relegated to the shadowy borders of the historic record; we suggest that other members of the community (women, children, non-European males) have become all but invisible. Archaeology has the ability to place these individuals back into the historical imagination.

Through the FWVAS investigations at the Adams Creek site, our goal was to arrive at a more representative, multidimensional picture of the community that surrounded the lime industry in early Santa Cruz County. Based on this central research interest, archaeological explorations at the site focused primarily on the domestic structures associated with the industrial facility at Adams Creek. However, the FWVAS investigated a wide range of different contexts at the site in an effort to better understand the relationship between public and private use of space and thereby further develop a dynamic portrait of daily life in one of California's most important early industries.

Another area of interest for the FWVAS was the evolution of the Adams Creek site itself, especially temporal and functional shifts in land use at the site. A classic challenge in archaeological investigations is the issue of contemporaneity: while a site may have been occupied for decades, generations, or even millennia, the archaeologist arrives to a landscape whose extant state is a palimpsest of multiple historic and prehistoric eras. Records (see *Site Background* section below) indicate that the Adams Creek site experienced at least three distinct historic phases of development and use. The first of these; the "Adams Phase," corresponds to the initial kiln construction and the beginning of quarrying at the site while under the ownership of an individual named Samuel Adams (not to be confused with the Samuel Adams of beer and revolutionary fame) from 1858 to 1869. The second of these, "Cowell Phase I," corresponds to the period from 1869 to 1909 when the Adams Creek facility was referred to as Cowell's Upper Kilns and was integrated into first Davis and Cowell's and then solely Cowell's ever-expanding lime empire. The third phase of activity at the site could be referred to as "Cowell Phase II," associated with the period after 1909 when the Adams Creek kilns fell into disuse and the surrounding land was used for dairy and beef cattle ranching. These three temporal phases reflect only part of the overall history of the site—there were certainly prehistoric impacts on the landscape prior to Adams' arrival and there have been significant subsequent impacts on the site, including its acquisition by California State Parks for recreational purposes.

Focusing solely on the three historic periods of use defined above, the FWVAS wanted to investigate whether it was possible to discern differences or changes at the site associated with these temporal and functional transitions. It was deemed of particular interest to determine whether all of the extant architectural features that are found around the kilns today were built during the "Adams Phase" or whether the site grew and expanded over several decades. Historic photos of the facility circa 1900 (Figure 47) appear to show the majority of the current architecture, as do photos from the 1920s (Figure 48 and Figure 49). However, it is possible that many of the structures were added to the facility after the purchase of the kilns by Davis and Cowell in 1869. In addition, it is assumed that many of the buildings at the site were abandoned at the same time as the kilns and that the Adams Creek "industrial village" was deserted, with the exception of the barns. However, archaeological investigations offer the ability to test this assumption and search for evidence of continued use, repurposing or renovation during the later ranching period.

Figure 47. The Adams Creek Lime Kilns Facility, circa 1900.
Whowing (from left to right) Feature S (partially obscured by trees), Feature J (the cooperage), Feature A (the "South Barn"), Feature I (the pot kilns, center foreground), Feature C (the cookhouse?), and Feature E (the "North Barn") (courtesy of the Santa Cruz Museum of Art and History).

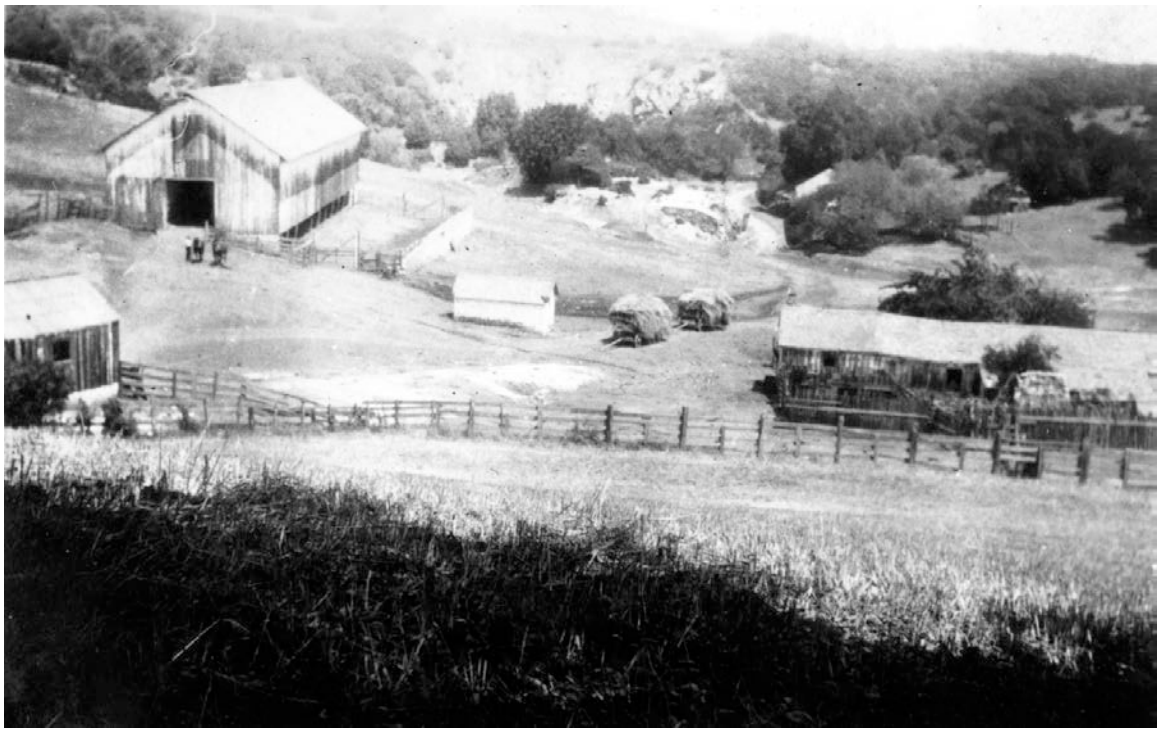


Figure 48. The Adams Creek Facility, circa 1925 during the Cowell Ranching Phase.
From left to right: Feature D (Wheeler's "cistern"), Feature E (the "North Barn"), unknown structure (possibly Feature V, the "cold room"), Feature I (the pot kilns, center background), Feature J (the cooperage, mostly obscured by trees), and the back of Feature C (the cookhouse). Photo taken by George Silva, a Cowell employee. (courtesy of the Wagner collection, Friends of the Cowell Lime Works Historic District, UCSC).

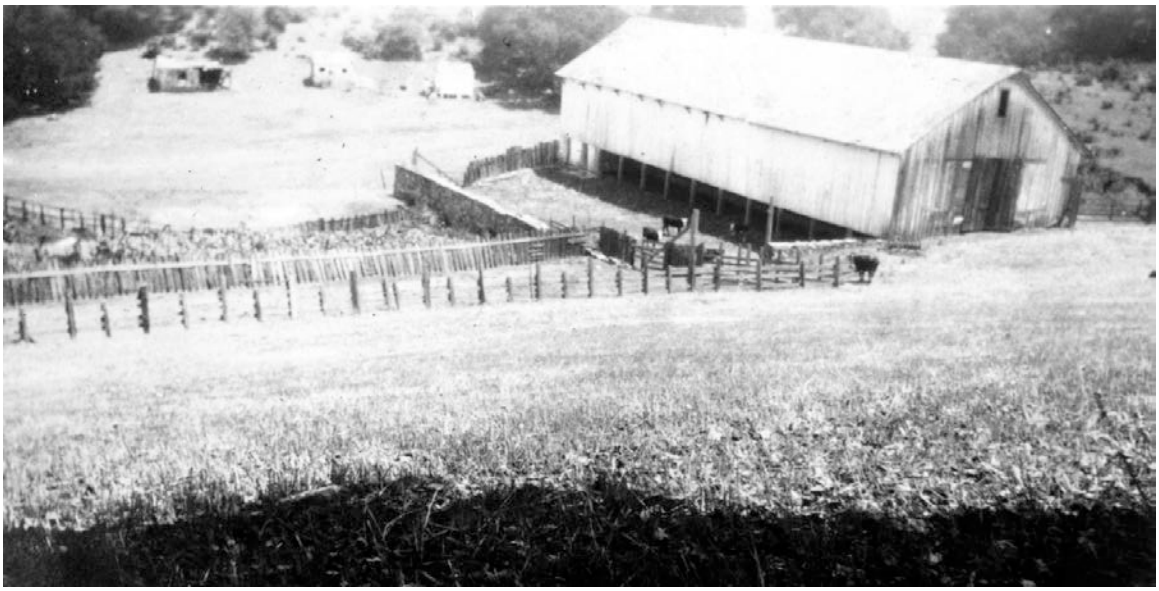


Figure 49. The Adams Creek Facility, circa 1925 during the Cowell ranching Phase.
From left to right: Feature G (including both the cabin on the left and cabin in the center), Feature F (the small cabin on the right), and Feature A (the "South Barn"). Photo taken by George Silva, a Cowell employee. (courtesy of the Wagner collection, Friends of the Cowell Lime Works Historic District, UCSC).

Beyond temporal changes at the site, the FWVAS also was interested in better understanding the function of the various architectural elements at the site. During the initial survey and description of the site (Wheeler 1998), several architectural features were noted whose function was not immediately apparent. To better understand land use patterns at the site, as well as the overall organization of the community and the daily routines of the workers, it was deemed necessary to attempt to determine the functions of different areas and structures across the site. Of particular interest given the primary research question raised above were any features that might be associated with the daily domestic routines of the lime workers.

Finally, an ancillary topic of interest to the FWVAS at the outset of the project was the impact that the lime industry had on the surrounding environment. For more than 50 years during the late nineteenth and early twentieth centuries, the lime manufacturing industry in Santa Cruz County was increasingly productive and profitable, forming the foundation upon which the fortunes of some of the most prominent businesspeople of the period were built. This industry grew and grew, until a lack of locally available fuel and the advent of new technologies effectively reduced the competitiveness of the region (Wheeler 1998). As such, the lime industry appears to have fallen victim at least partially to shortsighted management practices that placed profits ahead of sustainability and environmental stewardship. This industry did not just leave a legacy of prominent names and romantic limestone ruins strewn amidst the redwoods; it clearly also left physical scars on the landscape of Santa Cruz County, from open limestone quarries to radically altered woodlands. In our current state of rapidly decreasing natural resources this aspect of the mining history in Santa Cruz County provides a compelling narrative that helps not only to understand the historical rise and fall of the lime industry, but in fact the rising and falling fortunes of California itself.

Based on the interests and concepts outlined above, the FWVAS established three specific research goals that served as the basis for all work carried out at the Adams Creek Lime Kilns site from 2006 to 2009:

Research Goal 1: To understand the personal and daily lives of members of the Adams Creek industrial village community.

Under this goal were several specific research questions: What was the nature of their clothing, tools, recreation and food, including hunting? Were workers living on site or commuting in from surrounding communities? Is it possible to address the demographics of the community via archaeological materials recovered from the site? Are there continuities in worker demographics and material culture throughout the different phases at the site? Is there evidence of ethnic, racial, class, age or gender diversity within the community?

Research Goal 2: To identify and define domestic and work spaces during each period of use at the site: the nineteenth-century Samuel Adams limekilns operation; the late nineteenth- and early twentieth-century Cowell limekilns operation; and the subsequent twentieth-century Cowell ranching activities.

Under this goal were several specific research questions: Were there overlaps of work and domestic spaces? Are the architectural features found at the site in 2007 contemporaneous? Did re-use and/or renovation of spaces, technology, or natural resources occur across the three use periods? Can analysis of the recovered artifacts and/or analysis of the extant architectural features actually identify the differences between "domestic" and "work" contexts?

Research Goal 3: To identify changes in land use patterns and understand the environmental impacts of the lime industry.

Under this goal were two specific questions: Is there evidence of any significant changes in land use at the site associated with the shift away from lime burning to cattle ranching (such as new construction sequences, modification of the landscape, or use of different areas of the site)? What extant evidence remains of the lime industry across the landscape in and around the Adams Creek site?

PREVIOUS RESEARCH

Very little systematic archaeological research has been done at the Adams Creek Lime Kilns site prior to the work carried out by the FWVAS. The limekilns were first documented by Mark Hylkema in 1988 during a survey conducted for Sequoia Forest Industries as part of a proposed timber harvest. Hylkema noted four archaeological sites during his survey. Two of these were prehistoric sites (recorded as CA-SCR-142 and CA-SCR-143) and two were historic sites. One of the historic sites (CA-SCR-262H) was a cabin site and the other was the Samuel Adams Lime Kilns. While Hylkema described the limekilns site in his survey report, he did not submit a primary record form for the site.

The only other archaeological work to focus directly on the Adams Creek site was Thomas Wheeler's 1998 Cultural Resource Management survey conducted for the California Department of Parks and Recreation. This survey was commissioned by the state after its 1997 acquisition of the historic 2,300-acre Gray Whale Ranch property which includes the limekilns. Wheeler's survey focused specifically on the limekilns and the associated cultural features and was aimed at documenting all extant features and making

recommendations for further research and conservation measures. The survey covered an area of approximately 28 acres and identified 23 cultural features. Wheeler prepared a scaled map of the site and assigned each feature an alphabetical letter (see Figure 44). In addition, he drew and photographed all features that were easily visible and accessible. He did not conduct any excavations at the site. Wheeler's survey report served as the basis for the FWVAS investigations at the Adams Creek site, and as such the work reported here can be seen as an extension of this initial survey of the site. The FWVAS retained Wheeler's original designations for features at the site and attempted to follow many of his suggestions regarding areas of the site that were most important for additional exploration (see *Methods and Results* sections below).

While few previous projects focused on the Adams Creek site specifically, several other archaeological surveys and projects have been carried out in the larger region surrounding the site. Like Hylkema's survey, many of these were Cultural Resource Management projects prompted by proposed timber harvests. Joseph Morris (1976) carried out a survey approximately 1.2 miles to the north of the kilns as part of a proposed timber harvest on the S. H. Cowell Foundation lands. This survey did not find evidence of cultural resources within its focus area. Similarly, a survey carried out in 1991 by LSA Associates on a 100-acre area of the Gray Whale Ranch also recorded no cultural resources (LSA Associates 1991). Steven Staub surveyed seventeen small areas in 1992 as part of a proposed timber harvest and recorded an historic barn, but no other cultural resources (Staub 1992). Steven Ziegler (1993) surveyed an area west of Smith Grade and noted segments of an old roadbed and one prehistoric site (CA-SCR-180).

Rob Edwards, a professor from Cabrillo College in Aptos, California, conducted several archaeological surveys in the area around the Adams Creek site during the 1970s and 1990s (Edwards et al. 1976, 1977; Edwards and Simpson-Smith 1990). These included surveys of the cultural resources of Wilder Ranch, surveys of historic properties associated with the Cowell ranch on the University of California, Santa Cruz campus, and a reconnaissance survey associated with the proposed widening of Empire Grade road. Beyond the previously documented historic cultural resources at Wilder Ranch and UCSC, these surveys identified four prehistoric sites in the area (CA-SCR-42a, CA-SCR-42b, CA-SCR-26, and CA-SCR-160). While none of these projects directly focused on the limekilns site at Adams Creek, they do indicate that the region was occupied for significant periods of time prior to the establishment of the kilns. The majority of this prehistoric activity appears to have been seasonal campsites used by local Native American groups. While this phase of land use in the region is of great interest, it falls outside the scope of the FWVAS project.

Of most interest concerning the FWVAS project at the Adams Creek kilns are several projects carried out at the Cowell Lime Works Historic District on the University of California, Santa Cruz campus over the past ten years. The majority of this work occurred simultaneous to the excavations at the Adams Creek site and as such did not directly inform the work of the FWVAS as it was being conducted. However, the work undertaken at the Cowell Lime Works provides important comparative data to the work at Adams Creek and is therefore extremely important to the interpretations of the FWVAS project. This is especially true given the fact that the Adams Creek Lime Kilns eventually were incorporated into the Henry Cowell lime empire and not only were in operation at the same time as the Cowell Lime Works facility but were managed by the same company. In this respect, the work done at the Cowell Lime Works could be considered to be focused on a different part

of the same cultural "site" as the Adams Creek kilns, at least during the second and third phases of the Adams Creek facility. This makes comparison between the two kiln facilities critically important.

Four different archaeological excavations have been conducted at the Cowell Lime Works. The first was carried out at the location of Cabin J, one of the lime worker cabins that was demolished by UCSC in the early 1980s (Reese 2007). In 2006, the university began construction on a new housing complex and this project threatened the Cabin J site. Despite the cabin having been demolished, the decision was made to undertake a Cultural Resource Management mitigation to obtain whatever remaining cultural materials were still present. The university hired Pacific Legacy, Inc. to conduct the mitigation, and approximately one-third of the cabin footprint was sampled. These excavations recovered a large amount of architectural debris along with a significant volume of domestic refuse from the cabin. Much of this material was extremely similar to that obtained by the FWVAS excavations of cabin sites at the Adams Creek Lime Kilns complex, including clothing remains, tools, dishware, bottle glass fragments and faunal remains. Reese estimates an occupation range for the Cabin J site of 1870-1920 based on the materials recovered, which is roughly similar to the date ranges found at the Adams Creek site.

Pacific Legacy also undertook a data recovery project in 2007 associated with the blacksmith shop. This project was prompted by the same construction as the mitigation of the nearby Cabin J site. The artifact assemblage here was distinctly different from that at the cabin site, with far fewer domestic artifacts and a higher volume of tools and refuse debris from the smithy. Reese (2009) suggests that the blacksmith may have lived in Cabin J, and that the blacksmith shop itself was solely an industrial facility. While the lack of domestic materials associated with the blacksmith shop is not surprising, it is important to note that functional differences between domestic and industrial buildings appear to be identifiable via the associated artifact assemblages. This raises interesting questions about some of the architectural features excavated by the FWVAS at the Adams Creek site, especially Feature S, where the architectural remnants do not suggest a domestic context, but the associated artifact assemblages contain a relatively high volume of domestic refuse.

The third project carried out at the Cowell Lime Works was also prompted by construction activities on the campus. In 2006 and 2007 construction work exposed cultural materials likely associated with the Cowell Ranch cookhouse. In this case, the university hired Archaeological/Historical Consultants from Oakland, California to undertake a Cultural Resource Management mitigation of the deposit (Baker 2009). The ensuing project uncovered a large amount of material, including several *in situ* features. The most significant of these was a pig feeder, which is still in place at the site. As with the materials recovered from the blacksmith shop, the artifact assemblage from the cookhouse excavations is noticeably different from the assemblages associated with the worker cabins. In particular, the cookhouse excavations yielded a much higher number of food-related items like cookware, utensils and faunal remains. It is also interesting that some of the materials recovered from the cookhouse seem to reflect the ethnicity of the cook, who was Chinese. These findings suggest that even across a relatively small area at the limekiln facilities there are likely to be identifiable functional and demographic differences in the material record associated with different features. As with the cabin excavations, there are important parallels between the Cowell Lime Works cookhouse and the artifact assemblages from Features B and C at the Adams Creek site.

The fourth archaeological project undertaken at the Cowell Lime Works was the excavation of the soils surrounding and under the foundation of Cabin B, one of only two worker cabins still standing at the site. This project was carried out by Sally Morgan from UCSC with the aid of graduate student Patricia Paramoure and volunteers from the Santa Cruz Archaeological Society, Cabrillo College and UCSC. The results of this work are reported in Paramoure's 2012 master's thesis for Sonoma State University. The excavations at Cabin B were prompted by plans to restore the cabin by the Friends of the Cowell Lime Works and were carried out in conjunction with the restoration project. The results of this work are remarkably similar to those from both the Cabin J excavations described above and from the cabin features at the Adams Creek site, albeit much more extensive. Paramoure's research questions were also similar to those of the FWVAS and therefore the results of both studies are complementary. In her analysis of the materials from the Cabin B excavations Paramoure finds evidence of dietary patterns, social behavior, ethnicity and gender. Where relevant, the results from the projects at the Cowell Lime Works will be referred to in more detail throughout this report.

Historic Context

The following is a very brief overview of the lime production process and the history of lime production in Santa Cruz County. For a much more extensive and detailed history of this industry, see *Lime Kiln Legacies: The History of the Lime Industry in Santa Cruz County* by Perry et al. (2007a) and *The Lime Industry in Santa Cruz County* by Jensen (1976).

LIME PRODUCTION

The earliest known historical reference to lime as a building material comes from Vitruvius, a Roman architect who provided guidelines for the production of lime mortar mixes in the second book of his, *De architectura*, written sometime between 30 and 15 B.C. (Vitruvius 1931). However, archaeological evidence has shown that lime mortar and plaster was being produced and used for construction purposes perhaps as early as 12,000 B.C. during the Natufian Period in the Near East and had become quite common by 1400 B.C. when it was used extensively by the ancient Egyptians and Etruscans (Boynton 1980; Dancaster 1915; Kingery et al. 1988). In the intervening millennia, lime mortar and plaster grew to become one of the most ubiquitous building materials in the world, and the technology for producing it was discovered and employed independently by cultures ranging as far afield as the ancient Maya in Mesoamerica (Villaseñor Alonso 2009).

The production of lime starts with the conversion of calcium carbonate into calcium oxide. This process requires heating limestone or lime rock (or any material containing sufficient amounts of calcium carbonate) to a temperature high enough to drive off all the CO_2 and water in the material. Temperatures above 900° C are required to achieve this process (Boynton 1980; Eckel 1905). Once accomplished, the remaining material has now been converted to calcium oxide, or "quicklime." This material is highly caustic and reactive and must be kept as dry as possible. When quicklime is mixed with water, it causes a chemical reaction, producing calcium hydroxide. The resulting material is referred to as "lime putty" and remains in a semi-fluid or paste-like state as long as it is kept under water. Lime putty can be used for a wide range of construction applications, including as a thin wash ("whitewash"), plaster, mortar, concrete or stucco. In order to produce a durable construction material, the lime putty is typically mixed with an aggregate such as sand, hair, or plant fiber to enhance its strength and binding properties. Once the lime putty is exposed to air, it reabsorbs the CO_2 that was driven off in the kilning process and reconstitutes as calcium carbonate (Figure 50). Lime products produced in this manner were in common use until the early twentieth century when they began to be replaced by more sophisticated dolomitic lime products (Davey 1971).

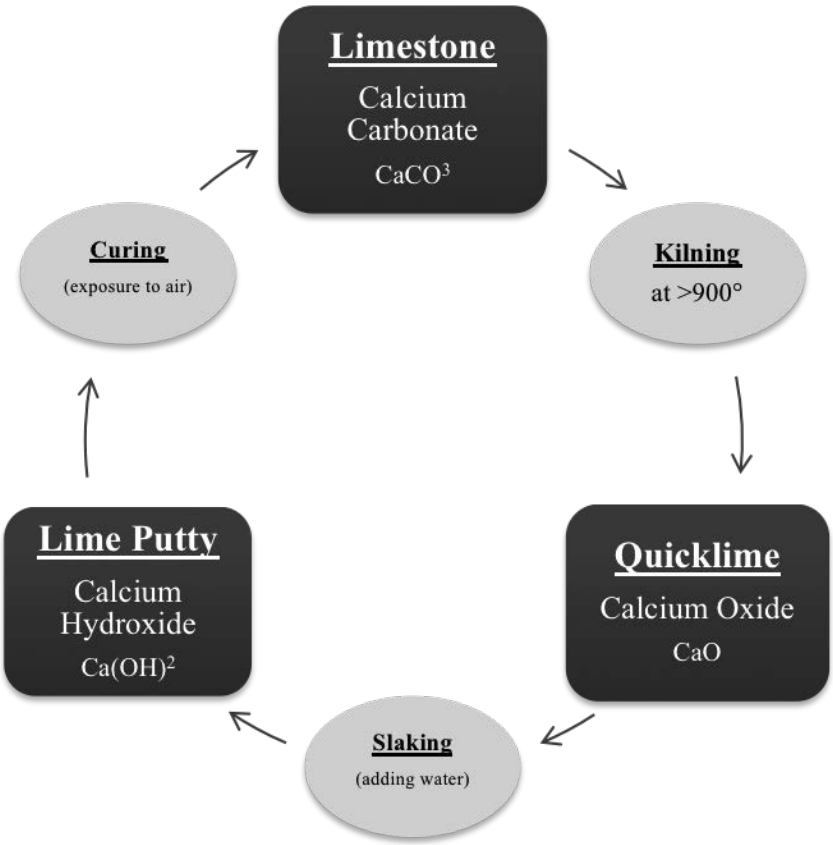


Figure 50. The Steps in the Lime Cycle.

In order to produce lime products in the manner outlined above, at least three specific things are required. First, the process requires access to a suitable source of limestone, lime rock or other source of calcium carbonate. Typically, this means quarrying the material from naturally occurring geological deposits, although there have also been instances of lime production using oyster and other types of marine shell (e.g., "Tabby concrete" in the southeastern United States, Manucy 1952). Second, in order to achieve the temperatures required to transform calcium carbonate into calcium oxide (900°-1,100° C) the material must be burnt in either kilns or pits. Piling the material and surrounding it with fuel has also been reported, although with significantly decreased efficiency (Morris et al. 1931). Third, this process requires a source of fuel sufficient to produce the necessary temperatures for extended amounts of time (sometimes as much as three or four days). As will be discussed below, Santa Cruz County offered the ideal locale for access to the first and third of these requirements, leading to its emergence in the mid nineteenth century as one of the most important lime-producing areas on the west coast (Perry et al. 2007b).

THE HISTORIC LIME INDUSTRY IN SANTA CRUZ COUNTY

The earliest documented use of lime in California dates to the mid eighteenth century with the arrival of Franciscan missionaries, who used lime as both a construction material and in the processing of cowhides and maize. However, there is little evidence that the early Spanish population was quarrying limestone for these purposes. Instead, it is likely that they were producing lime by burning seashell, perhaps obtained from the numerous

Native American shell mounds found along the coast (Costello 1977). It is also likely that the majority of lime production during this period was aimed at fulfilling only the immediate needs of local communities and did not necessitate the construction of large kilns. Jensen (1976) has argued that the earliest limekiln in Santa Cruz County was probably built in the last decade of the eighteenth century.

The need for locally produced construction materials in northern California increased dramatically in the mid nineteenth century with the influx of people and the subsequent building boom associated with the Gold Rush (Perry et al. 2007). While the primary mining activities of the Gold Rush focused in the Sierra foothills to the east, the Bay Area was heavily impacted by the economic, social and cultural transformations it brought about. Beyond the sudden spike in population, the Gold Rush also spawned a wide range of ancillary industries that were outgrowths of gold mining itself. Chief among these was the need for mercury, or quicksilver, for use in extracting gold from its matrix, and high-quality lime for building construction. While the New Almaden mine in Santa Clara County satisfied the former, the limekilns of Santa Cruz met the latter.

Santa Cruz County was a prime location for the production of lime, as it lies on a geological formation called the Salinian Block, which is primarily granitic and includes deposits of high grade limestone (Davis 1966; Hart 1978; Logan 1947; Stanley 1982; Wheeler 1998). One of these limestone deposits occurs as a number of easily accessible outcrops in a roughly 1.25 square mile area of the county that became the focus of the lime industry during the second half of the nineteenth century. Several different companies established kilns in this area in the mid-1800s and competed fiercely for dominance of the market throughout the duration of that century (Perry 2007). The first of these was founded by Isaac Davis and Albion Jordan, who built three kilns sometime between 1851 and 1853, at what is now the Bay Street entrance to the University of California, Santa Cruz campus. At the time, this was the largest lime operation in the entire state (Perry and Piwarzyk 2007a; Wheeler 1998). These kilns still stand and are today part of the Cowell Lime Works Historic District. Over the next several decades, at least thirteen additional limekiln operations were built in the county by various entrepreneurs. By 1884, Santa Cruz County lime operations were producing fully a third of the lime in the state of California and fulfilling three-quarters of the demand for San Francisco (Perry et al. 2007b). Production increased until it peaked in 1904, after which a combination of technological changes and decreasing access to fuel led to an eventual decline in the industry (Perry et al. 2007b; Wheeler 1998).

The majority of the nineteenth-century lime operations in Santa Cruz County utilized pot kilns for burning the limestone. These kilns were massive constructions of limestone that were usually built into a hillside somewhere in close proximity to the quarry. Building the kilns into a hillside helped to stabilize the structures, insulate the interiors, and ease the loading of the kilns from above (Wheeler 1998). The interiors of the kilns were lined with firebrick to protect the limestone construction from the intense heat of the firing and to insulate the kiln. In order to fill a kiln, limestone would be blasted out of a quarry using dynamite or hand tools and then broken into smaller chunks by hand (Perry and Piwarzyk 2007b). These chunks would then be loaded into carts or wagons and transported (either by workers or mules) to the top of the kiln. Before loading the rock into the kiln, “archers” would build stone archways extending from small doorways located along the front of the kiln to within roughly two feet of the back wall of the kiln (Perry and Piwarzyk 2007b). These archways allowed the continual replenishing of fuel during the actual kilning

of the lime. Once the archways were complete, the kiln would be filled to the top with limestone chunks from the quarry.

Once the kiln was full, fires would be started in each of the archways and constantly monitored. Metal fire doors were mounted on the arched doorways of the kilns and could be opened and closed to both monitor the fire and regulate the flow of air into the kiln. Typically, the fires would be kept burning round the clock for three to four days until all the limestone had been "calcined" (Perry and Piwarzyk 2007b; Wheeler 1998). Once the firing was complete the lime was allowed to cool, then would be unloaded from the kiln through the front doors, and immediately packed into wooden barrels to protect it from exposure to moisture and air. Due to the time required to fill, fire, cool and unload a kiln, most lime operations built at least three kilns. This way one kiln could be loaded while a second was being fired and a third was being allowed to cool and then unloaded (Wheeler 1998).

The nature of this production process meant that nineteenth-century lime operations had to be strategically located. Due to the significant mass of uncalcined lime rock, it was ideal to build the kilns as close as possible to the quarries. Once the lime rock was burned and reduced to quicklime the product was much lighter and easier to pack into barrels for transport (Perry 2007). The burning process also necessitated huge quantities of fuel, and therefore the majority of Santa Cruz County kilns were located in or on the edges of heavily forested areas that could be exploited for fuel. In fact, most kiln owners purchased large tracts of forested land from which to extract firewood (Perry and Piwarzyk 2007b). Based on the need to be close to natural outcrops of limestone and sources of readily available fuel, most of the kilns were located in relatively remote areas far removed from the town of Santa Cruz. These remote locations coupled with the round-the-clock process of lime production meant that many of the lime workers lived at or nearby the lime production complexes.

These complexes also consisted of far more than just quarries and kilns. An entire range of ancillary activities was required to successfully produce and package quicklime for transportation to the market. First, in addition to the human labor force the lime production process also required some degree of animal labor. Mules were often employed in helping to transport the raw lime rock from the quarry to the kiln. Mules and oxen were also essential for the transportation of redwood timber to the kilns for fuel, and subsequently for the transportation of packaged quicklime away from the kilns to warehouses located in Santa Cruz or at ports along the coast (Wheeler 1998). These animals needed to be fed and sheltered, necessitating the construction of large hay barns at many of the kiln complexes. The production of wooden barrels for packing the quicklime also occurred on-site, especially due to the highly fragile state of the product. Because quicklime reacts when exposed to moisture and air, it had to be packed into airtight containers as quickly after cooling as possible. Hence, the kiln facilities typically had a cooperage located in close proximity to the kilns where barrels were produced, filled and sealed (Wheeler 1998). Many lime companies also employed blacksmiths to help produce and repair tools and equipment (Perry and Piwarzyk 2007b). Finally, since many of the workers lived at the kiln complexes, bunkhouses or dormitories were common parts of the architectural assemblage, as were cookhouses, cold houses, cisterns and various other domestic features. The net result of this complex industry was that the limekiln facilities in Santa Cruz County were not simply industrial landscapes like modern factories or production facilities. They were small villages. The nature of the community that emerged within these nineteenth-century industrial villages is the focus of the work described in this report.

THE ADAMS CREEK LIME KILNS

The first of the Adams Creek Lime Kilns were built in 1858 by Samuel Adams, who arrived in Santa Cruz from Vermont at the age of 27 (Wheeler 1998). Adams had moved to California in 1849 as part of the massive migration of people seeking wealth during the Gold Rush. After trying his luck in the gold fields, he moved to San Francisco and worked for a company selling lime, cement and other building materials. He eventually decided to go into business for himself and sought a suitable property in Santa Cruz County (Perry and Piwarzyk 2007a). He initially purchased 200 acres of land only a mile or so away from the Davis and Jordan kilns upon which to quarry for lime rock, build the kilns, and cut timber as fuel. Perry and Piwarzyk (2007c) argue that the three kilns still extant at the site were likely not all built at the same time and were remodeled over the life of the site, although all three kilns appear to have been completed by 1866.

According to an article in a local Santa Cruz newspaper, by the mid-1860s Adams employed 30 men at the kilns and had installed a stave machine to help improve the speed of barrel production at the site. The same article says that rock from the quarry was transported to the kilns on a tramway and that the loaded carts were moved by means of gravity and human power. According to the article's author, "Quite a village has sprung up at the works…" ("Natural Resources" 1865:2, cited in Perry and Piwarzyk 2007a). By this time, Adams had also purchased an additional 70 acres of land adjacent to the kiln facility, along with land for the construction of a warehouse and wharf rights in downtown Santa Cruz (Jensen 1976). It appears that Adams reached his peak production in the late 1860s, when he was reported to be producing 30,000 barrels of lime per year ("Manufactures" 1869, cited in Perry and Piwarzyk 2007a). However, a major earthquake in 1868 apparently caused Adams to decide to divest himself of the limekilns and move back to the east coast.

In 1869 Adams sold the Adams Creek Lime Kilns and associated property to his primary competitors, Isaac Davis and Henry Cowell (the latter of whom had entered into business with Davis in 1865 after the departure of Jordan (Jensen 1976; Wheeler 1998; Perry and Piwarzyk 2007a). Jensen states that the Adams Creek facility was abandoned for the next ten years until Davis and Cowell constructed a road between the kiln facility located at Bay Street (the "Lower Kilns") and the Adams Creek kilns in 1879. With the construction of this road, the Adams Creek kilns were put back into use as part of the larger Davis and Cowell operation and were henceforth referred to as the "Upper Kilns." After Davis died in 1888, full ownership of the company (including the Adams Creek property) transferred to Henry Cowell (Perry and Piwarzyk 2007a). At that point, an inventory of the property owned by Davis and Cowell included kilns, quarries, tramways, warehouses, cooperages, barns, wagons, ox teams, worker housing, a wharf, and two or three ships. By the last decade of the nineteenth century, Cowell had managed to build a veritable lime empire, with over 12,000 acres of property and 175 employees (Francis 1896, as cited in Perry and Piwarzyk 2007a).

In 1906, Henry Cowell's son Ernest began construction of oil burning kilns at Rincon and had the hardware stripped from the Adams Creek kilns and Cowell's "Lower Kilns," effectively ending the lime production phase at Adams Creek (Jensen 1976). After the kilns fell into disuse, it appears that the Adams Creek property continued to be used by the Cowell Company as ranch land (Perry and Piwarzyk 2007a). An interview with George Cardiff (Cardiff 1965), who served as supervisor of the Cowell Ranch from 1925 to 1965,

suggests that the land was used first for pasturing dairy cattle and then later for beef cattle. In addition, Cardiff said that hay was grown throughout the ranch and stored unbaled in large barns in multiple locations on the Cowell property. It is likely that during this period of use many of the buildings at the Adams Creek site were abandoned and fell into disrepair. However, the large barns almost certainly continued to be used and may have been modified or renovated (Wheeler 1998). Very little is known about the site from this point until its acquisition by the California Department of Parks and Recreation in 1997.

LIMEKILN WORKERS

Relatively little is known about the people upon whose labor the Santa Cruz lime industry was built. Historical records tell us quite a bit about the company owners, particularly the Cowell family, but other than old photographs and census records, the personal biographies of the workers are virtually nonexistent. Even these census records are likely at best only partially accurate, as they typically include the identities of only adult males. Recent research attempting to delve into the identities and daily lives of the lime workers (e.g., Paramoure 2012; Perry and Perry 2007) parallels similar developments in both historical and archaeological research. Paramoure (2012) gives an excellent overview of this trend within the field of historical archaeology and presents a fascinating comparison of nineteenth-century "industrial villages" in California, including the village associated with the Cowell Lime Kilns and the community that emerged around the construction of the Los Angeles Aqueduct.

One of the most important facets of the labor associated with the limekilns is the range of activities and skills it demanded. As outlined above, the lime industry did not simply consist of quarrying and burning the lime. A wide diversity of other activities was also required to successfully produce high quality lime for the market (Perry and Piwarzyk 2007b). Miners/quarry workers skilled in the use of explosives and drilling tools were essential. Brick masons were needed to continuously replace or repair the fire brick linings of the kilns. Teamsters were required to manage ox and mule teams. Kiln loaders or "archers" specialized in building the temporary arches inside the kilns. Lumberjacks/wood choppers cut timber for fuel. "Firemen" lit and maintained the kiln fires. Coopers made the barrels needed for packing the quicklime. Blacksmiths were required for making and fixing tools. Cooks prepared food for the workers. Lastly, foremen were necessary to supervise the labor (Perry and Perry 2007; Perry and Piwarzyk 2007b; Wheeler 1998).

While it is possible that some of the lime workers were engaged in multiple tasks, it is clear that some of these skills were specialties that were fulfilled by different labor forces. As an example, historical records indicate that in 1895 Cowell employed a total of 20 men at his lime quarries, 25 men at the kilns, 12 coopers, 30 wood choppers, and 50 teamsters (California State Mining Bureau 1896, cited in Perry and Perry 2007). Records also suggest that the coopers employed by both Adams and Cowell were "contract" workers who were paid based on the number of barrels produced (Perry and Piwarzyk 2007b). It is unclear whether these workers lived at the limekiln sites or not. Wood choppers apparently had separate camps where they lived and worked (Perry and Piwarzyk 2007b). The net result of this complex constellation of skills is that the limekiln companies employed relatively large work forces. Adams had at least 30 men in his employ in the mid-1860s and Cowell had as

many as 175 workers on his payroll by the late 1890s (Francis 1896; "Natural Resources" 1865; both cited in Perry and Piwarzyk 2007a).

It is impossible to tell exactly how many of the lime workers actually lived at the kiln complexes themselves. Given the numbers cited above, one would assume that the kiln facilities would have had to include a large amount of worker housing. However, records indicate that some of the workers commuted to the work site, especially in the early years of the industry (Perry and Perry 2007). Despite this, based on the fact that the men engaged in burning the lime worked round-the-clock in 11- to 12-hour shifts, it is likely that many of them lived at or near the kiln facilities (Perry and Perry 2007; Wheeler 1998). Davis and Cowell housed most of their workers in small, one-room cabins. In addition, each limekiln facility typically had its own cookhouse where the workers ate their meals each day (Perry and Perry 2007).

The communities that evolved around the limekilns must have been diverse and dynamic ones. These communities also very likely did not consist of only adult men. Records indicate that Cowell maintained housing for both single and married workers, with the married housing spatially segregated from the bunkhouses of the single men (Perry, personal communication, 2009; Perry et al. 2007a). Based on the archaeological work conducted at the Adams Creek kilns, it appears that this may have also been the case there. The presence of women and perhaps also children at the limekilns facilities is something that is not reflected in any of the historic photographs (see Figure 46) or census records (other than the wives and children of the managers and owners). These members of the limekiln community have essentially become invisible.

We also know that there was some degree of ethnic diversity at the limekiln sites. Census records indicate that the majority of the lime workers were Irish, Swiss, Portuguese and Italian (Paramoure 2012; Perry et al. 2007a). Perry and Perry (2007) have shown that the demographics of the lime worker community shifted significantly over the last several decades of the nineteenth century, with an increasing portion of the workers being Swiss and Portuguese and a dramatic drop in the number of Irish workers. Despite this, some degree of ethnic diversity persisted throughout the entire life of the lime industry in Santa Cruz County. In addition, census records and oral histories show that Cowell tended to employ Chinese cooks to prepare meals for the workers (Perry and Perry 2007). While these individuals would have made up a very small percentage of the overall population of workers, they would have made an important contribution to the community.

In addition to the range of ethnic identities and marital statuses of the lime worker community, it must also be pointed out that there was at least some degree of social stratification. The supervisors and managers at these sites would have had greater financial and social status within the community and hence may be identifiable in the material record, assuming they maintained some kind of durable presence within the community. The resulting population would have been a microcosm of the larger nineteenth-century society in California in many ways. As such, any accurate portrait of a late nineteenth-century "industrial village" in Santa Cruz County must include a consideration of all these different groups. A large part of the impetus behind the work reported here is the attempt to test whether it is possible to discern the nuanced differences that must have existed within the small village that grew up around the Adams Creek Lime Kilns. As will be seen below, while the work carried out thus far at the Adams Creek site is only preliminary, it has

opened an enticing window into the vibrant life of the limekiln community. It is hoped that this work will serve to place some of the "invisible" members of this community back into their rightful place as important parts of the story of Santa Cruz County's industrial past.

Methods

INITIAL STAGES AND MAPPING (FALL 2006-SPRING 2007)

The FWVAS began initial investigations at the Adams Creek Lime Kilns site in the fall of 2006. On the first visit to the site it became evident that some of the features Wheeler (1998) had recorded were overgrown or no longer readily visible, whereas some features which had received only minimal attention in his survey were now cleared and easy to investigate. Because of this, the FWVAS undertook an intensive pedestrian survey of the site in order to relocate all of the features noted by Wheeler and to begin designating areas of the site for future excavation. In order to insure accurate recording of spatial data at the site, a geographic information system (GIS) map of the site and surrounding area was created in the spring of 2007 which would provide a more accurate and detailed map than Wheeler's. Ward's Surveying from Santa Cruz provided a CAD-based topographic map of the site, which was converted to ArcGIS format by Eric Fries and Jorge Aguilar. This limited map was used as a baseline for the GIS (Figure 51).

SHOVEL TEST PITS AND REMOTE SENSING SURVEYS (SPRING 2007)

The first active FWVAS field season at the Adams Creek site took place in the spring of 2007. The area of the site chosen for preliminary investigation was the space between the two barns at the north and south ends of the small valley and extending east and west upslope into the forested area surrounding the site. Based on the FWVAS research questions focusing on the domestic contexts of the lime workers, the decision was made to ignore the industrial areas of the site in this initial stage of exploration, including the cooperage, the quarries and the kilns themselves. In addition, the FWVAS wanted to probe areas of the site where there were no extant remains of architecture in order to test for the presence of cultural contexts that were inaccessible to Wheeler during his survey. It was hoped that this strategy would help to clarify land use patterns across the site and aid in the subsequent selection of areas for more intensive clearing excavations

In order to achieve these goals, three transects of shovel test pits (STPs) were placed across the identified area of the site (Figure 52). This STP program was initiated using the northeast corner of Feature A (the "South Barn") as the site datum. STP Transect A was designed to run southeast from the South Barn across the Engelsmans Loop fire road to intersect Feature F ("structure remains" assumed to be the remnants of a collapsed cabin) and continue upslope through the wooded area above Feature F to the crest of the hill forming the eastern boundary of the site. STP Transect B was placed perpendicular to Transect A, running from the

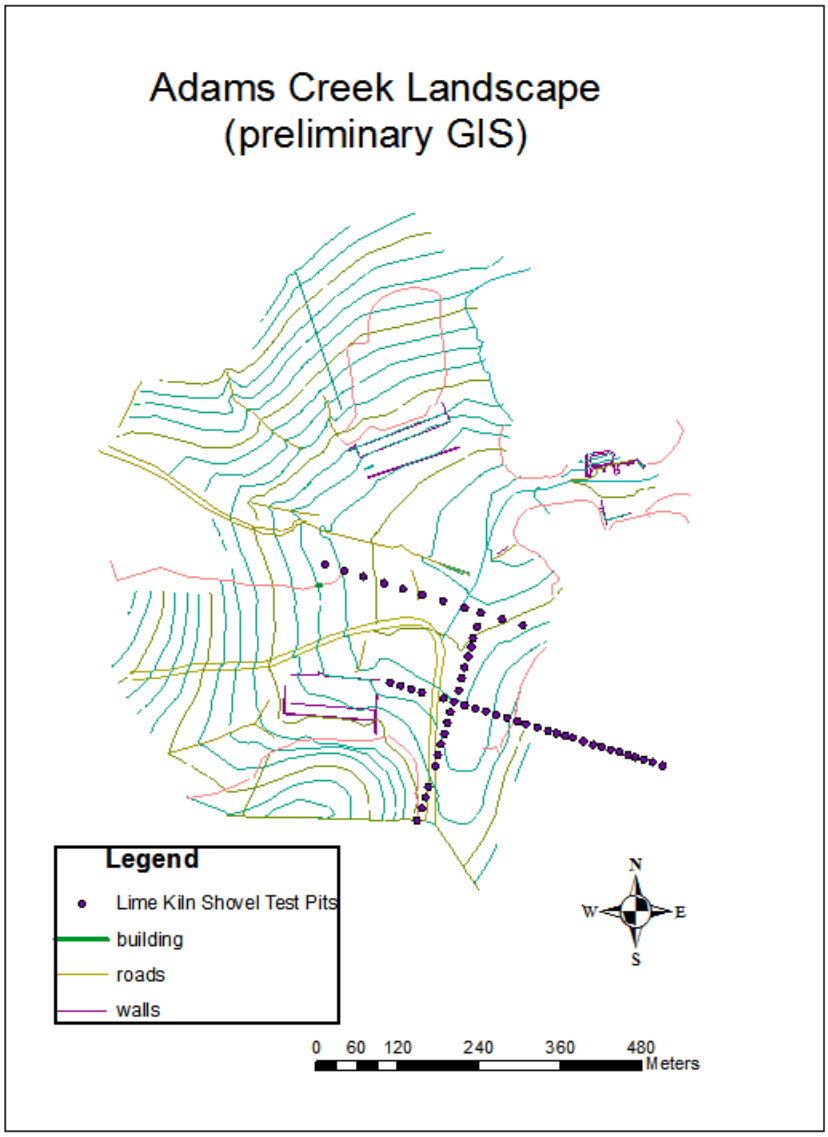


Figure 51. GIS Map of Adams Creek Lime Kilns.
Map by Eric Fries and Jorge Aguilar.

intersection of Engelsmans Loop and the connector trail to the Old Cabin Trail (the southern boundary of the site) northeast to terminate on the east side of the trail immediately downslope from Feature G ("structure remains" assumed to be the remnants of one or two collapsed cabins). STP Transect C was placed parallel to Transect A and 50 meters north, intersecting with the northern end of STP Transect B and running from Feature C ("unidentified remains" thought to be the remnants of a cookhouse) on the west to Feature G on the east.

STP Transects A and B had 50-x-50-centimeter shovel test pits dug at intervals of five meters, while Transect C had 50-x-50-centimeter shovel test pits dug every ten meters. STPs were dug to the depth of sterile soil, which at the Adams Creek site typically consists

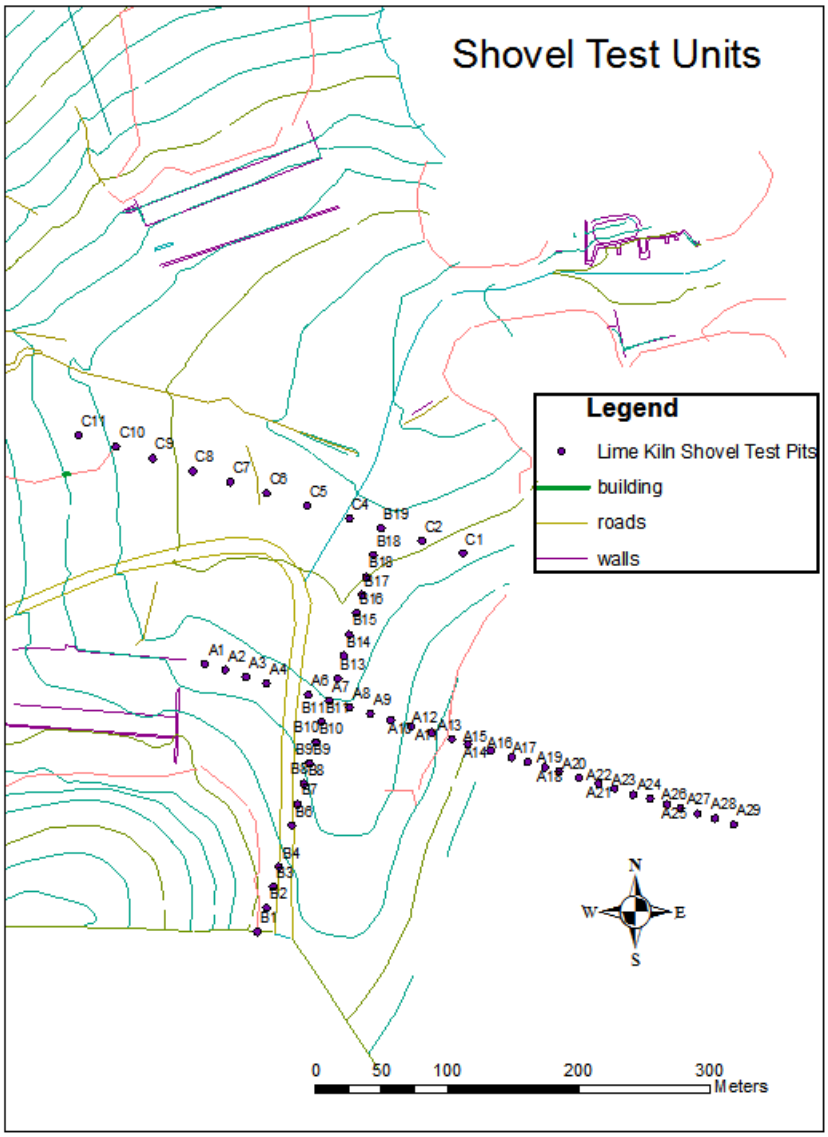


Figure 52. Shovel Test Pit (STP) Excavations Carried out by FWVAS in Spring 2007.
Map by Eric Fries and Jorge Aguilar.

of a reddish-yellow (Munsell 7.5YR 6/6) sandy loam with rocky inclusions. This sterile soil is found approximately 30 centimeters deep across the majority of the site, as demonstrated by the STP program and subsequent excavations elsewhere at the site. Each STP was designated a letter (according to the respective transect) and number, running sequentially from west to east (Transect A), south to north (Transect B) and east to west (Transect C). In all three transects pits were not dug where doing so would have meant excavating into existing roads or trails; however, the points where these pits would have been placed were included in the numbering of units in each transect. Artifacts from each STP were collected *en masse* and the backdirt was not screened. Each STP was backfilled immediately upon completion.

This STP program yielded more than 1,000 artifacts, consisting mostly of glass and ceramic sherds, faunal remains, and metal items (especially a large quantity of iron nails and nail fragments). Overall, the results served to show that the highest densities of artifacts across the site were associated with the surface-visible architectural features documented by Wheeler. In turn the lowest densities of artifacts were found in areas of the site where no surface-visible architecture is found. This finding suggests that most cultural activities at the site were localized in and around the still-extant architectural features and that little evidence is likely to be recovered from excavations in "empty" areas of the site. In addition, the shovel test program successfully identified two distinct concentrations of domestic refuse and other artifacts, one associated with Feature F (STPs A-10, A-11, A-12, A-13 and A-15, see Appendix G for details) and another associated with Feature C (STPs C-8, C-9 and C-10). Two artifacts of special interest were recovered from test pits associated with Feature F: a smashed but mostly intact coffee pot or similar metal vessel with attached handle and spout, and a pipe bowl with a broken stem (see ahead to Figure 87).

During the spring of 2007, the FWVAS also used remote sensing equipment at the Adams Creek site to augment the STP program. A test survey using metal detectors was conducted in a ten meter-wide transect parallel to STP Transect A. This survey recorded the location of numerous metal objects, with a clear clustering of positive signals in the same area of the survey transect as the STP program recorded the highest density of artifacts (the sloping hillside area associated with Feature F). This indicated that metal detection could serve as an effective nonintrusive method for determining target areas for future excavation, particularly in the absence of visible surface-level features. The FWVAS continued to utilize metal detectors at the Adams Creek site over the subsequent field sessions as an aid in selecting the placement of excavation units (see the discussion of Features D and E below). In the spring of 2007 Sam Connell of the FWVAS also surveyed part of the site area with ground penetrating radar, the results of which have yet to be fully disseminated.

SYSTEMATIC ARCHAEOLOGICAL EXCAVATIONS (FALL 2007-SUMMER 2009)

Starting in September of 2007, the FWVAS began a program of systematic archaeological excavations at the Adams Creek site. The initial excavations focused on the two areas of interest identified in the STP survey described above (Features C and F). Over subsequent field sessions a total of 26 excavation units was opened, associated with a total of 11 different features at the site (nine of these features had been previously identified by Wheeler in his 1998 survey, two were identified by Sam Connell in 2009; Table 6). Excavation units were selected based on a number of criteria. The primary basis upon which units were selected was the set of FWVAS research questions, in particular the desire to explore contexts related to the daily lives of the limekiln workers. Based on this, the majority of excavation units were focused on areas of the site that were most likely to yield data relating to the workers' daily domestic activities (in particular the collapsed cabin features and the cookhouse). Another factor in the selection of excavation units was the issue of contemporaneity at the site, particularly related to the large barn features. A third criterion was the functional role of specific features at the site, particularly those whose use was uncertain, such as Features B, D and S. In addition, an attempt was made to sample a variety of contexts at the site in order to obtain as wide a range of comparative data as possible.

Table 6. All Foothill-West Valley Archaeological Survey (FWVAS) Excavation Units and Associated Cultural Features.

Feature	Unit	Size (m)	Excavation Dates	Description	Function
A	8	1x2			
A	9	1x2	2009	South Barn	Barn
A	11	1x2			
B	5	1x1	2008-2009	Rubble Structure Remains	Associated w/ cookhouse, possibly storage/pantry
C	2	1x2	2007-2009	Unidentified Remains	Cookhouse
D	6	1x2			
D	7	1x2	2009	Cistern	Cistern? Eventual midden?
D	13	2x2			
E	20	1x1	2009	North Barn	Barn
E	26	1x1			
F	1	1x1	2007-2008	Structure Remains	Worker cabin/bunkhouse
F	18	1x1	2009		
G	3	1x2	2008-2009		
G	4	1x2	2008-2009	Structure Remains	Worker cabin/bunkhouse
G	10	1x2	2009		
G	12	1x1	2009		
S	19	1x1			
S	22	1x1	2009	Structure Remains	Unknown, possible barrel mill, also possible cabin
S	23	1x1			
S	25	1x1			
T	16	1x2			
T	17	1x2	2009	Collapsed Wood Structure	Cabin, possible foreman's housing/office
T	21	1x2			
T	24	1x1			
X [a]	15	1x2	2009	n/a	Non-cultural feature
Y [a]	14	1x2			

Notes: Feature designations and descriptions from Wheeler 1998. [a] Identified by Connell in Spring 2009.

Due to the relatively slow rate of excavation and the relative lack of experience on the part of the majority of the student excavators, the FWVAS made an explicit decision from the outset to limit the size and extent of excavation units. In addition, based on the assumption that the work carried out by the FWVAS would be only the first stages of a longer term and more in-depth exploration of the site, excavation units were typically placed along the edges of features rather than directly within or on top of them (one exception

being Unit 6 in Feature D, see below). Not only did this approach allow for the testing of a larger number of contexts across the site, but it minimized disruption of the features and avoided for the most part the necessity to remove or damage extant architecture and architectural collapse. It is hoped that these measures will contribute to the eventual conservation and possible restoration of some of these important historic buildings.

All excavation units were laid out in square meter increments (1 x 1, 1 x 2, or 2 x 2 meters). Rather than placing the units within a predesignated grid, each unit was laid out according to feature boundaries and natural topography. After excavation each unit was mapped from the site datum (the northeast corner of the "South Barn") using a total station and placed on the site GIS. Figure 53 shows the approximate location of each unit relative to the features designated on Wheeler's original 1998 survey map. Units were numbered sequentially in the order in which they were opened. Table 1 lists all excavation units opened by the FWVAS at the Adams Creek site from 2007 to 2009, along with the unit size, the cultural feature with which it was associated (based on Wheeler's designations) and the possible function of the feature based on both Wheeler's description and the FWVAS excavations.

The standard FWVAS excavation procedure was to clear the surface vegetation from all excavation units and collect all surface-visible artifacts prior to excavation. Excavations were conducted by hand using shovels, trowels and dustpans (with the exception of Units 6 and 7 at Feature D) and typically were undertaken in arbitrary ten-centimeter increments. Very few of the excavation units at the Adams Creek site showed any significant natural stratigraphic changes, other than the transition from the cultural soil layer to the underlying sterile soil layer. Most excavations were continued at least five centimeters into the sterile soil layer before being abandoned. All soil removed from excavation units was sifted through 1/4-inch screens. Artifacts were segregated by material in the field and were counted and bagged separately. All artifacts recovered from a single excavation level were then placed together in a larger bag and taken to the Foothill College Archaeological Laboratory. Descriptive data about each excavation was recorded on individual Unit and Level Forms, and all excavators were required to maintain a field journal during their work. Photographs were taken at the termination of each excavation level and detailed plan and profile drawings were made of all units prior to closing. After excavations were completed, all units were backfilled.

During the summer 2009 field school, preliminary processing of artifacts was carried out at the Adams Creek Lime Kilns complex in a "pop-up" field lab through which all students and volunteers revolved during the duration of each field day. This field lab doubled as an informational booth offering basic descriptive and interpretive information to the large volume of curious hikers and mountain bikers who passed through the site on a regular basis. This served both a practical and educational purpose: it helped to decrease the number of disruptions to excavation activity from curious passersby (an occasional issue during previous field sessions) and also offered the public an opportunity to learn about both the Adams Creek site and the general archaeological process. It forced students to learn how to interface with the public and explain the FWVAS's activities, essentially making the students become "teachers." An unforeseen benefit of this interaction with the park visitors was a wealth of local oral history and insights into artifacts that otherwise would have been missed. These interactions demonstrated the value of a truly "public" archaeology project,

where anyone who was interested could take an active role in the archaeological process and provide invaluable information to the "experts" in the field.

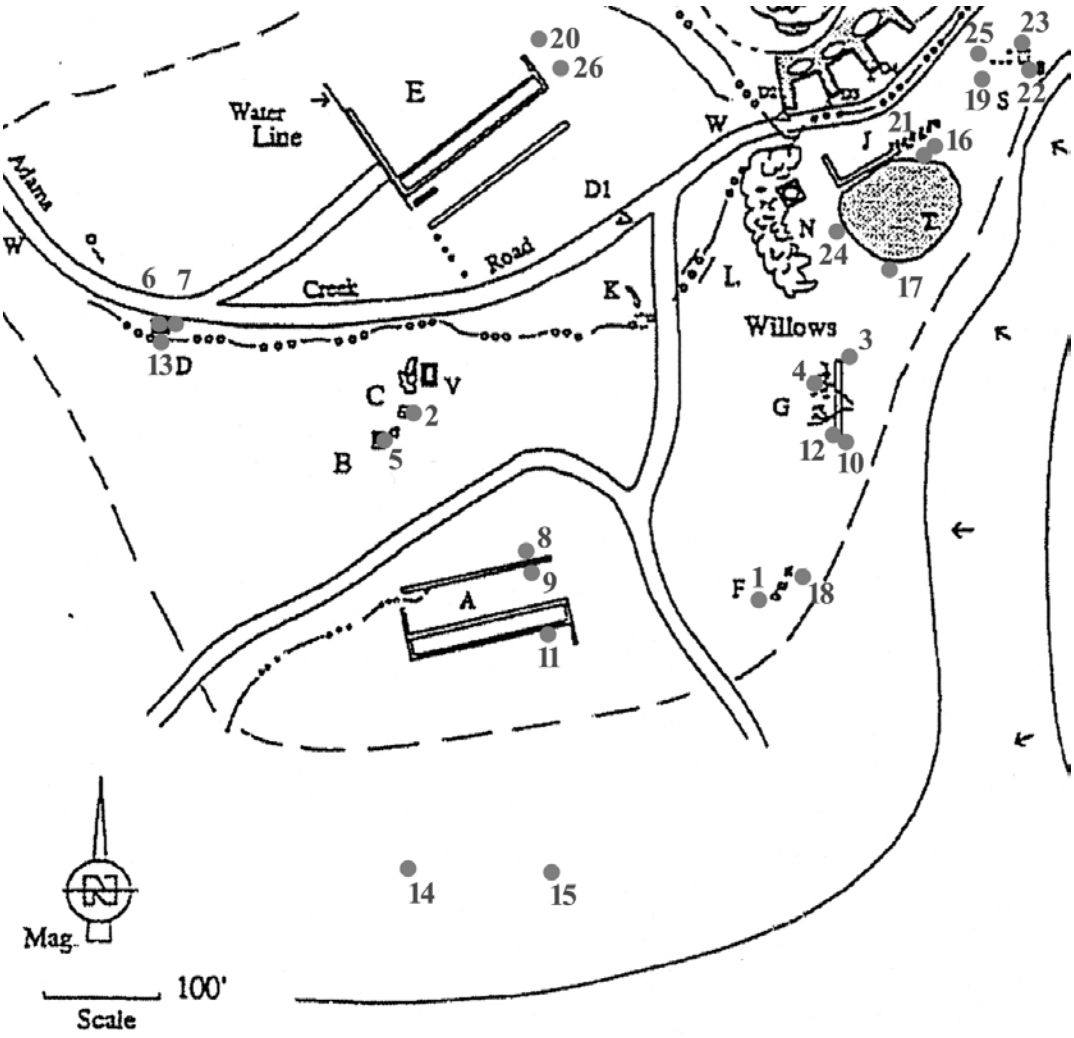


Figure 53. Approximate Locations of All FWVAS Excavation Units at the Adams Creek Lime Kilns Site.
Map adapted from Wheeler 1998.

ARTIFACT PROCESSING AND ANALYSIS

Cataloging and cursory analysis of artifacts from the Adams Creek site were conducted at Foothill College under the auspices of Sam Connell and Roger Kelly. In total, more than 14,000 artifacts were catalogued from the FWVAS excavations at the site (Appendix G). All artifacts were cleaned, counted, weighed and entered into a digital database along with provenience and basic descriptive data. Once catalogued all artifacts were re-bagged and stored in the Foothill College Archaeology Laboratory.

To date the only systematic analysis of artifacts from the Adams Creek site to be disseminated was undertaken by Alfonso Tinoco, a student from West Valley College who participated in the 2009 summer field school. Tinoco analyzed a total of 3,279 machine-cut ("square") nails and 487 wire ("round") nails from the site as part of a McNair Scholars research project at San Jose State University (Tinoco 2011). His analysis applied Adams (Adams 2002) methodology for dating late nineteenth- to early twentieth-century North American historic sites using a probability curve based on the ratio of machine cut versus wire nails. This seriation method is based on the technological transition from machine cut to wire nails in the late 1800s, with machine cut nails being more common prior to 1883 and wire nails being more common after 1897. Tinoco also utilized Nelson's (1968) and Wells' (1998) chronological studies to help in classifying the nail assemblage from the Adams Creek site. This analysis found that 87% of the nails recovered by the FWVAS from the site were machine cut, yielding a construction date range from 1867 to 1887 for the overall assemblage. This would suggest that many, if not most, of the structures at the site were built after Adams sold the kilns to Davis and Cowell. However, analysis of the nail assemblages from individual excavation units and features shows a wider range of results and suggests that there were likely at least two phases of construction at the site, with periods of renovation and remodeling during the early twentieth century (Figure 54). The results of Tinoco's nail analysis are discussed in detail below as part of the summary analysis of individual excavation units and can be viewed in Appendix F.

In addition to his work with the nail assemblage, Tinoco also analyzed 2,911 bottle glass fragments and 1,865 window glass fragments. Utilizing several different resources (Lindsey 2010; Newman 1970; White 1978), he was able to assign specific uses to a total of 41 different bottles or bottle fragments. These ranged from alcohol (Tinoco identified 16 wine or champagne bottles, four spirits or whiskey bottles, three brandy bottles and two bitters bottles) to medication (he was able to identify 12 medicine bottles and one possible opium or single-dose medicine bottle). These results closely reflect similar findings by Patricia Paramoure (2012) during her excavation of Cabin B at the Cowell Lime Works at the nearby UCSC Campus. Using seriation methods outlined in Lindsey (2010) and Newman (1970), Tinoco also suggests an occupation range for the site of 1852-1919 based on his bottle glass analysis. This falls directly within the known historic use of the site. He also suggests date ranges for individual features based on this same method, but with the caveat that due to the low sample sizes, in most cases these dates should be taken with significant caution.

Tinoco's analysis of the windowpane glass yielded very similar results to his study of the nail assemblage. Using Wieland's (2009) method for dating historic structures in North America by measuring the thickness of window glass, he arrives at a mean construction estimate of 1865 for the entire site. Analysis of individual excavation units yielded a wide range of results, from as early as 1839 in Unit 13 (associated with Feature D) to as late as 1894 in Unit 24 (associated with Feature T). This variance reinforces the evidence that the Adams Creek site as seen today was the result of multiple (and likely ongoing) phases of construction and renovation, starting during Adams' ownership of the kilns and continuing through and past the abandonment of the kilns themselves and use of the area for cattle ranching by the Cowell family. However, Tinoco synthesizes all three analyses and concludes that all of the structures at the site were built before 1880 (Tinoco 2011:333). As with the results of his nail analysis, the implications of Tinoco's bottle and

window glass analyses are discussed in detail below as part of the summary analysis of individual features and excavation units.

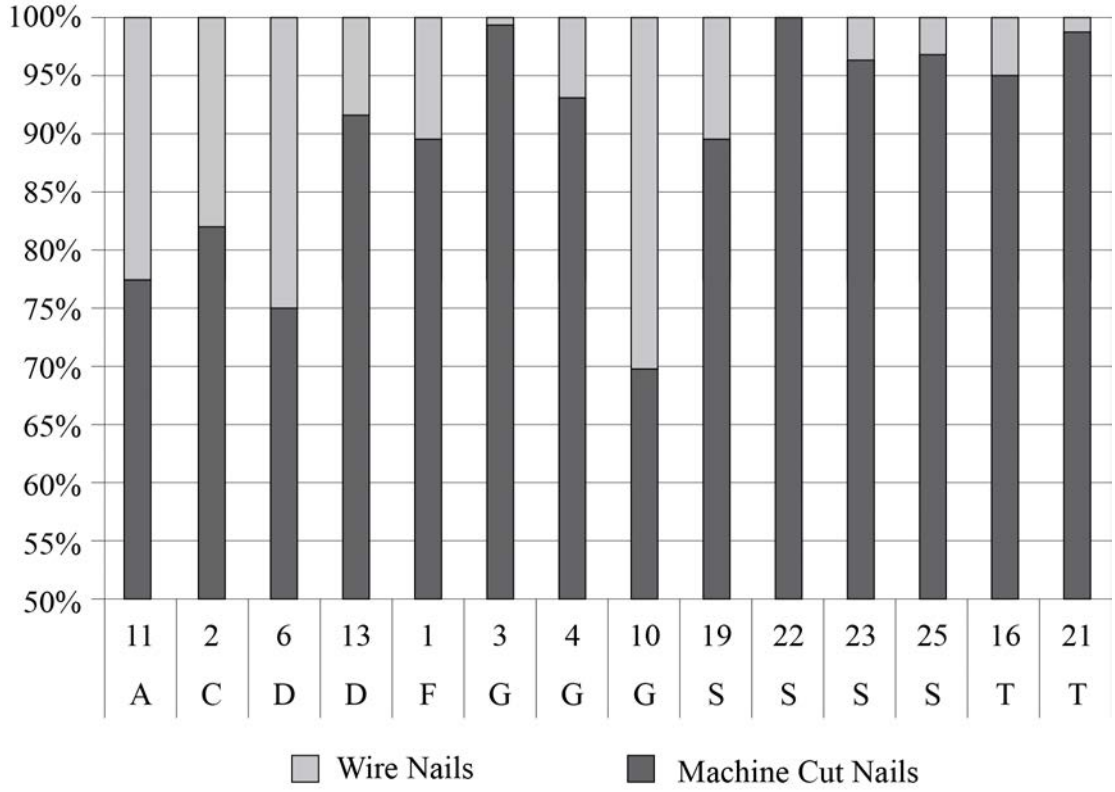


Figure 54. Relative Percentages of Machine Cut Versus Wire Nails Recovered from Individual Excavation Units at the Adams Creek Lime Kilns Site.
Only units with more than 50 nails are shown
(chart by Andrew Kindon, based on statistics from Tinoco 2011).

** SPECIAL NOTE ** As of the writing of this report in March 2017, all material from the Adams Creek site has been removed from Foothill College and is currently housed at the University of California, Berkeley pending analysis by graduate student David G. Hyde as part of his doctoral dissertation research. During the transfer of these materials, it became apparent that all excavation forms, diagrams and drawings from the FWVAS project had been misplaced at some point between summer 2009 and fall 2016. Fortunately, all the excavator field journals and photos, as well as the detailed field journals maintained throughout the project by the project directors, are still available. It is hoped that the missing data will be recovered at some point. However, it must be noted that the following descriptions of the FWVAS excavations carried out at the Adams Creek site are based solely on the remaining field journals and photographs.*

Results

The following are detailed descriptions and discussion of the excavations carried out from 2007 to 2009 by the FWVAS. Rather than listed in numerical order, each excavation unit is grouped and described according to the cultural feature with which it was associated. For the sake of ease and consistency, the cultural features are listed according to Wheeler's alphabetical designations, as described in his 1998 report and listed on the State of California Department of Parks and Recreation Primary Record.

FEATURE A

Feature A, the "South Barn" as described by Wheeler (1998), is a large stone construction measuring approximately 149 feet east/west by 63 feet north/south located along the southern edge of the site (Figure 55). Photos of the Adams Creek lime works circa 1900 and 1925 show a large gable-roofed, whitewashed barn standing at this location, with a stone-walled enclosure in front of the northern side of the structure (see Figure 47 and Figure 49). A photo of the site from the 1950s provided to Wheeler by Gary Meehan appears to show this same structure (Wheeler 1998:19). Another informant, Lauren Lazarotti, suggested to Wheeler that this structure might have been burned in the late 1960s or early 1970s as a precautionary safety measure by the S. H. Cowell Foundation (Wheeler 1998). Wheeler notes in his report that this statement appears to be supported by evidence of charring on gateposts and other elements associated with the structure. Excavations by the FWVAS in the southern portion of the feature found significant amounts of burned wood, supporting a major burning event. Wheeler also suggests in his report that the barn may have been remodeled at some point prior to the late 1950s, as the historic photograph shows a smaller structure than would otherwise be suggested by the extant construction footprint. Based on the earlier photographs (see Figure 47 and Figure 49), it would seem that any such remodeling event must have taken place prior to 1900. Wheeler (1998) further recounts interviews with George Cardiff and Lauren Lazarotti suggesting that the remodeling of the barn might have been related to a shift in land use at the site from dairying to beef ranching.

While the barns at the site were not of central interest to the project's primary research questions it was deemed important to test the contemporaneity of the barns to the rest of the site, especially given Wheeler's suggestion that the barns might have been built and/or remodeled after the initial use of the site for producing lime products. Adams very likely would have constructed barns to shelter mule and oxen used for hauling lime and lumber and/or to store hay to feed these same animals. However, historic

Figure 55. Feature A (the "South Barn") as it Appeared in Spring 2008.
Photograph by Michael Popham.

records also indicate that Cowell ran dairy and beef cattle on the land after the kilns fell into disuse. Based on this, it is important to determine whether the extant barn foundations actually represent activities contemporary with the limekilns, or rather represent later use of the area for non-lime manufacturing activities. The barns were also of interest in terms of investigating the entire range of activities associated with lime production, including ancillary aspects such as transportation and non-human labor. Hence, during the summer 2009 field school, the FWVAS placed three excavation units in or around Feature A (Figure 56).

Unit 8 was a 1-x-2-meter excavation unit placed perpendicular to and abutting the exterior of the northern wall of Feature A. Unit 9 was another 1-x-2-meter excavation unit placed perpendicular to and abutting the interior of the northern wall of Feature A, directly on the opposite side of the wall from Unit 8. These units were placed in their respective locations in hopes of investigating differences between the interior and exterior space of the barn (Figure 57). Based on Wheeler's report and the historic photos of the barn, it appears that Unit 9 would have been located in an enclosed area in front of the barn rather than inside the barn itself, at least during the latter phase of construction. In an attempt to further investigate variance in the use of space within this feature (and to test questions regarding remodeling of the barn), another 1-x-2-meter excavation unit (Unit 11) was placed on the higher area immediately to the south of the barn, perpendicular to and abutting the southernmost extant wall of the feature. Based on photos and descriptions of the barn, the assumption was that this location would have been the interior of the upper, or back, portion of the structure. As attested in Wheeler's report, the barn appears to have been constructed

on a terrace cut into a hillside, with the rear (southern section) of the building resting on this higher ground.

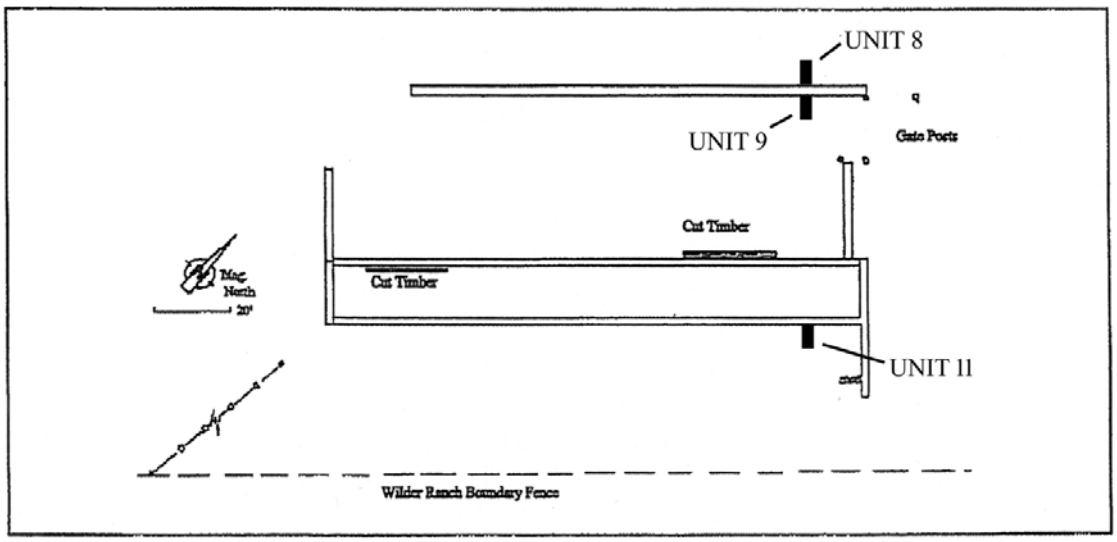


Figure 5. Feature A - South Barn Plan View

Figure 56. Feature A, Locations of FWVAS Associated Excavation Units.
Map adapted from Wheeler 1998.

Figure 57. Feature A, Northern Wall.
Unit 8 was placed to the right of this wall (exterior to the barn), Unit 9 was placed to the left (interior to the barn or barnyard) (photograph by Michael Popham).

Excavations in Units 8 and 9 (Figure 58 through Figure 61) yielded very low quantities of material, as might be expected from the context. In both cases, the units were excavated in only two levels. The first level was an arbitrary ten-centimeter level to remove the uppermost humus soil. In both units the second level was excavated down to the sterile stratigraphic level of reddish-yellow sandy loam that appears to be found broadly across the entire site. This sterile stratigraphic level was relatively shallow in this area, being reached at approximately 20 centimeters below ground surface. Both units also exposed the base of the Feature A wall. Unit 8 was excavated deep enough to expose some rough footer stones that appear to have been used as a base for the construction of the masonry wall. In both units, the total artifact assemblage consisted of a relatively small amount of broken window glass and nails. In the case of Unit 8, 100% of the nails excavated were wire cut, suggesting a construction phase sometime after 1897. This is a marked divergence from the pattern across the site, where the majority of nails found were machine cut. While the sample size from Unit 8 is small (only 30 nails total), this is still a surprising anomaly. It is unclear at this time why this discrepancy exists but, given the location of Unit 8 on the exterior of the barn, it is possible that the artifacts found in this unit represent later use and/or remodeling at the site (construction of a fence abutting the feature, for instance).

Unit 11 was excavated in a total of seven levels down to a depth of approximately 75 centimeters (Figure 62). All levels were excavated in arbitrary increments of ten centimeters. A large amount of burned wood and limestone rubble (most likely wall collapse from the barn foundation) was found throughout all levels of the excavation, with a sharp decline below 50 centimeters. The primary class of artifact recovered from the unit was nails, which comprised over 90% of all material. Of these nails, 77% were machine cut, while 23% were wire cut. Tinoco's (2011) analysis of all the units at the site yielding 50 or more nails showed that Unit 11 had the lowest overall percentage of machine cut nails. While the majority of the nails from the unit were still machine cut, this analysis does suggest that the south barn very likely did undergo significant repair and/or remodeling at some point in the early twentieth century. This conclusion seems to be supported by the wire cut nails from Unit 8.

Another interesting find from Unit 11 was a large (approximately 4-x-4-inch) wooden beam or log running parallel to the barn wall at approximately 70 centimeters below ground surface (Figure 63). The placement of this beam suggests that it was *in situ* and may have been laid on the original ground surface at the time of construction and used to support a raised wooden floor on the interior of the upper section of the barn. A large flat redwood plank was excavated immediately above this beam and may have been part of the original floor of the barn. Both pieces of wood showed evidence of burning, again further supporting the likelihood that the barn was intentionally burned at some point in the twentieth century. Excavations around this beam exposed an abrupt and marked soil change as well. Further, excavations at this level exposed a change in the construction of the masonry wall of the barn, with the relatively small, well-placed cobble construction of the upper section of the wall giving way to what appeared to be large, undressed rubble construction below. It is likely this lower section was part of a rough retaining wall constructed to support the earthen terrace upon which the rear section of the barn rested.

The excavations in and around Feature A yielded very little of diagnostic value that might further clarify the use or function of the building. Beyond the minor construction details and the temporal analysis based on the nails it is impossible to say much more about the structure than that it does not appear to have served a domestic function. Despite this, it

does appear that the barns at the Adams Creek site experienced a longer use life than many of the other structures and were likely remodeled and used well into the twentieth century, until their destruction.

Figure 58. Feature A, West Wall Profile of Unit 8.
Photograph by Rebecca Spitzer showing thin layer of topsoil above reddish-yellow sterile soil.

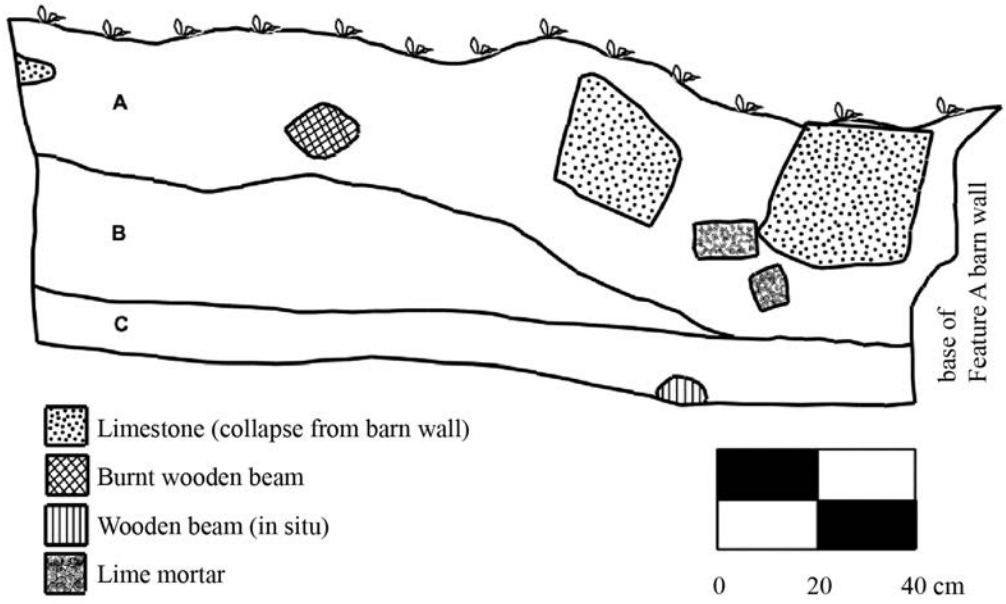
Figure 59. Feature A, South Wall Profile of Unit 8.
Photograph by Rebecca Spitzer showing exposed base of feature a structure wall.

Figure 60. Feature A, West Wall Profile of Unit 9.

Photograph by Rebecca Spitzer showing thin layer of topsoil above reddish-yellow sterile soil.

Figure 61. Feature A, North Wall Profile of Unit 9.

Photograph by Rebecca Spitzer showing exposed base of feature a structure wall.



Stratum A: Hard packed 7.5YR 3/2 dark brown silty loam
Stratum B: Hard packed 10YR 3/3 dark brown sandy loam with rocky inclusions
Stratum C: Hard packed 2.5YR 3/3 dark olive brown sandy loam

Figure 62. Feature A, West Wall Profile of Unit 11.

Drawing by Nora Mercer showing in situ wooden beam and base of south barn wall.

Figure 63. Feature A, Aerial View of Unit 11, Level 7, 60-70 cm.

Photograph by Rebecca Spitzer showing north wall profile, base of Feature A structure wall, and in situ wooden beam running east/west through excavation unit.

FEATURE B

Feature B is one of the more enigmatic structures at the Adams Creek site. Wheeler (1998:19) describes the feature simply as "a collapsing U-shaped mortared limestone rubble structure" and goes on to point out that it has the appearance of a large chimney, but that there is no evidence of carbon staining on the interior. He also noted a large number of artifacts scattered on the ground surface around the feature, consisting primarily of domestic trash. In his report, Wheeler refers to an historic photograph of the structure from 1957, but the figure provided is a plan view from his survey. The aforementioned photograph does not appear to have actually been included in his final survey report. However, Wheeler (1998:20) describes the structure in the photograph as a "gable-roofed, wood-framed, board and batten sided building suggestive of a habitation as opposed to an office, workshop or other utility building."

Feature B drew the attention of the FWVAS early on in the project for a number of reasons. Its proximity to the "cookhouse" (Feature C, see below), along with the large volume of domestic trash and debris on the surface, suggested that it likely played an important role in the domestic lives of the workers at the limekilns. If nothing else, the sheer volume of material visible on the surface suggested that this area of the site was the focus of heavy use. Based on Wheeler's description, an early working hypothesis was that the structure might have been the domicile of either the cook or perhaps the kiln foreman, which would have provided an interesting contextual comparison with the material culture of the workers' cabins. In addition, the extant architecture is unique at the site and offers no immediately obvious functional interpretations. Other than the large rubble remains, no extant evidence of the wooden structure described by Wheeler from the historic photograph is visible (Figure 64). Based on all of this, the FWVAS opened up a 1-x-1-meter test excavation (Unit 5) here in 2008.

Unit 5 was placed in the interior of the U-shaped rubble construction of Feature B, with the unit's western edge centered on and abutting the eastern interior wall of the structure (Figure 65). Excavations were carried out here by the FWVAS in 2008 and 2009. The unit was excavated in four arbitrary ten-centimeter levels down to sterile soil, with the lowest level exposing the basal edge of the structure wall (Figure 66 and Figure 67). Despite the chimney-like appearance of the rubble construction, no evidence of charring, carbon or charcoal was found in the excavations. Instead, this unit yielded a wealth of domestic utilitarian artifacts, strongly suggesting a context associated with food preparation and/or consumption. This unit yielded the largest amount of bottle glass from any excavation at the site (a total of 1,397 bottle fragments!), comprising more than half of the entire bottle assemblage excavated by FWVAS at Adams Creek. Tinoco's (2011) analysis of the bottle glass from Unit 5 indicates a use life of 1873-1918.

Of these bottle fragments, a total of 11 wine or champagne bottles and two medicine bottles were identified.

In addition, Unit 5 contained over 200 pieces of domestic ceramic ware, including plates, cups and bowls, along with some more decorative pieces of porcelain and glass. These artifacts were found relatively uniformly and densely throughout the unit, although a denser concentration of artifacts was noted in the northern half of the unit, particularly in the northeast corner of the unit. Excavations also uncovered what appeared to be an

Figure 64. Feature B as it Appeared in Spring 2009.
Photograph by Michael Popham.

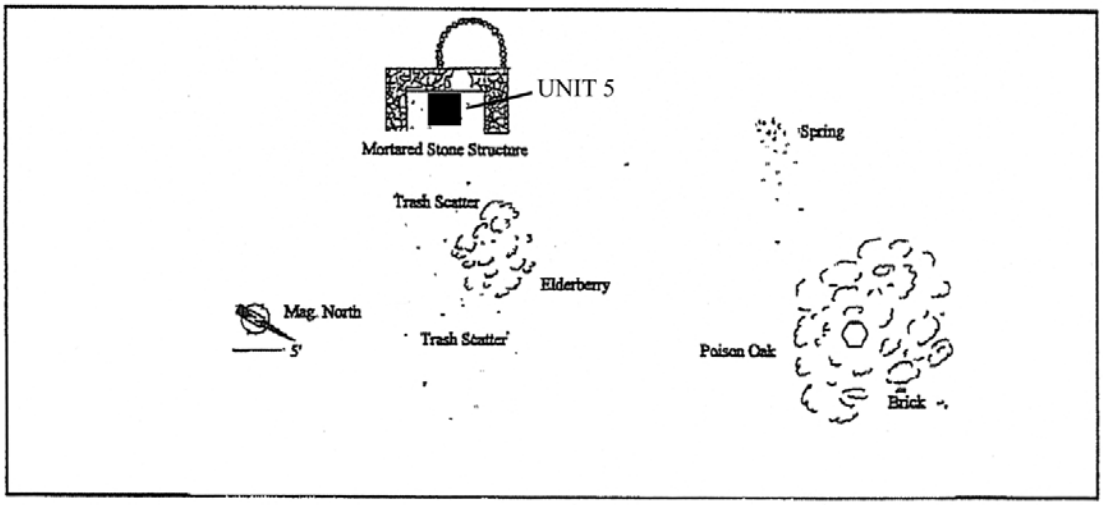


Figure 7. Feature B - Rubble Structure Remains Plan View

Figure 65. Feature B, Location of FWVAS Associated Excavation Unit.
Map adapted from Wheeler 1998.

Figure 66. Feature B, Aerial View of North Wall Profile of Unit 5, Level 4, 30-40 cm.
Photograph by Rebecca Spitzer, July 22, 2009.

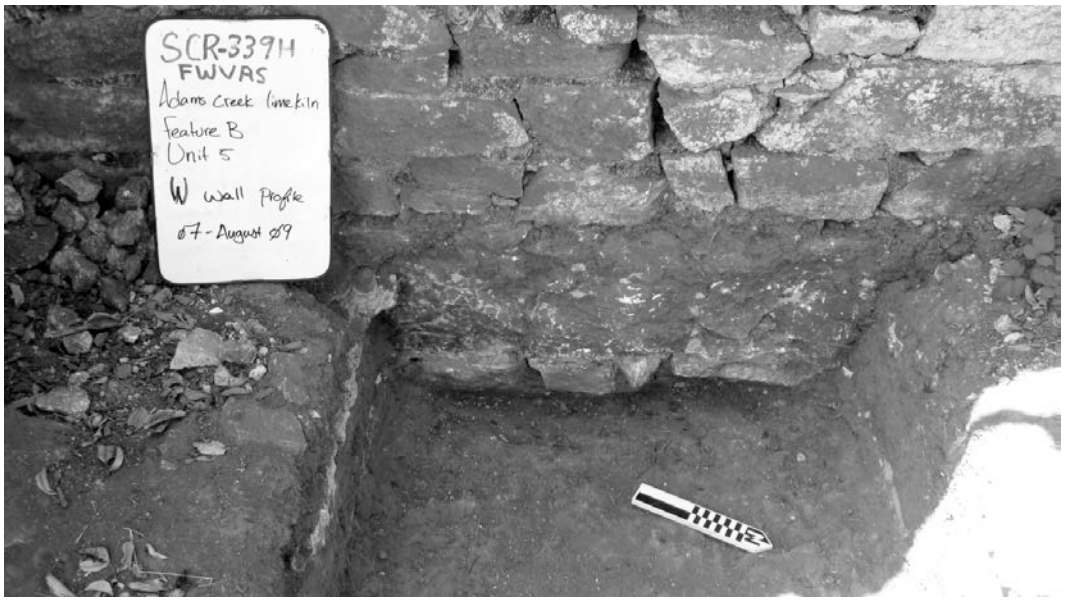


Figure 67. Feature B, West Wall Profile of Unit 5.
Photograph by Rebecca Spitzer showing white plaster "lens" at approximately 20 centimeters deep and base of feature B interior wall.

approximately four-centimeter thick lens of plaster at a depth of 20 centimeters and abutting the structure wall. This lens of plaster did not extend across the entire unit but seems to have extended only 15-20 centimeters out from the wall. Artifacts were found above and below this feature, and as such, it does not appear to have indicated the original living or use surface. Of the nails excavated from this unit (only 23), 87% were machine cut, suggesting that the building was constructed sometime during the initial use of the site.

Based on the excavations in Unit 5, the specific function of Feature B is still unclear. It seems certain that the remnant architectural elements were not in fact part of a chimney. The associated artifact assemblage strongly suggests that the building played some kind of role in food production or consumption at the site. Being that Feature C is suggested to have been the actual cookhouse for the limekiln workers and is located only 60 feet away from Feature B, it is highly likely that these two features were functionally associated with each other. It is possible that Feature B represents the remnants of a storage facility or pantry for the cookhouse or that, unlike at the Cowell Lime Works, the Adams Creek facility had a separate cookhouse and mess hall/dining room. The cookhouse (Feature C) at Adams Creek is certainly much smaller than the one at the Cowell Lime Works, which may support the idea of separate food preparation and consumption areas. It is also possible, as Wheeler hints at in his report, that the volume of artifacts in and around this feature may represent refuse behavior, although how this might relate to the extant architecture is unclear. Further, it should be pointed out that based on the sheer volume of food-related artifacts, there is no indication that Feature B was a habitation structure, either for workers or anyone else. It is also interesting to observe that the remnants of several wine or champagne bottles were found here. This brings up intriguing questions about the domestic lives of the limekiln workers. Were wine and champagne consumed on a regular basis as part of the normal dietary consumption of the workers? Were these instead "prestige" items that were only periodically consumed and/or consumed only by certain members of the community? Or do these items reflect temporal pollution from later use of the site? Feature B warrants further exploration, both as a way of better understanding its role in the overall life of the site, and as a context within which to better explore the daily domestic lives of the people living and working at the limekiln facility.

FEATURE C

In his 1998 survey, Wheeler was unable to describe Feature C due to a dense thicket of poison oak. The only details he was able to note were a pile of limestone and brick and a large iron fragment that may have been part of a stove resting on top of the pile. His report includes an historic photo (assumed to be contemporary to the other photos included in the report) of this feature showing a single-story board and batten structure (1998:21). A photo dating to circa 1900 (see Figure 47) appears to show this same structure slightly to the upper right of center in the image. In both photos, the structure looks similar in construction to the worker cabins shown in other historic photographs and still extant at the Cowell Lime Works Historic District. However, these photographs also show that the structure at the location of Feature C appears to have been longer than most of the worker cabins, suggesting that it might have had a different function. The structure is also segregated from the area known to have been the location of several smaller worker cabins. In addition, shovel test pits placed adjacent to this feature in 2007 by the FWVAS uncovered a relatively large quantity of processed faunal remains, especially cow bones, as well as large quantities

of broken ceramic items and an intact metal fork. These observations, along with the fact that the structure was located roughly in the center of the Adams Creek site, proximal to a structure that Wheeler describes as a "cold room" (Feature V), suggest strongly that Feature C is likely to have been the cookhouse or mess hall for the kiln workers. During a guided tour of the Cowell lime works Perry (2009) pointed out that most of the lime workers lived on-site and were segregated based on marital status. Single men lived together in small cabins in one area of the site (the cabins still standing to the right of the roadway when entering UCSC via the Bay Street entrance) and married men with families lived in another area (most likely on the hillside behind the cookhouse). The single men ate all of their meals at the cookhouse, which was a much larger structure than any of the cabins. Perry and Piwarzyk (2007a:174) also state that the Cowell Ranch maintained several cookhouses, including one at the Adams Creek kilns. Due to this, Feature C was considered to be of great interest to the FWVAS in understanding the overall functioning of the site and the spatial organization of activities in the daily life of the community.

In 2007 when the FWVAS began selecting areas of the site for excavation, Feature C was still mostly obscured by poison oak and other overgrowth. However, due to the feature's importance to the project research interests (and with the blessing of State Park authorities) the decision was made to clear as much of the feature as possible. These efforts succeeded only in exposing the front/eastern edge of the feature, which was deemed adequate for the project's needs. This clearing process exposed a relatively well-built mortared limestone rubble foundation with a well-defined corner on the northeast of the feature (Figure 68). This foundation is partially collapsed on the southern end and was obscured by the poison oak thicket to the west. Because of this, it was impossible for the FWVAS to make accurate measurements of the foundation dimensions, although it is clear that this structure was both larger and more robust than the worker cabins at Adams Creek, none of which were built on stone foundations. The clearing efforts also exposed the large iron fragment observed by Wheeler, which was confirmed to be part of a cast-iron stove. Due to its size, this fragment was left *in situ*.

The FWVAS investigated Feature C from 2007 to 2009 via a single 1-x-2-meter excavation unit (Unit 2, Figure 69). The unit was oriented roughly north/south and was laid out with its long edge placed directly against the easternmost masonry wall of the feature. As with other excavations at the site, Unit 2 was excavated in arbitrary ten-centimeter levels, down to sterile soil. Five levels were excavated to a depth of approximately 50 centimeters, exposing the basal edge of the masonry foundation (Figure 70). During the excavations, it was noted that the artifact density began to diminish at 40 centimeters, only to expose a dense concentration of metal and ceramic material lying on top of a much denser, compacted soil at approximately 45 centimeters. This denser soil may represent the original occupation level of the site, with the concentration of material on top of it being the result of refuse activity associated with the original functioning of the building. The material from upper excavation levels is very likely the product of architectural collapse after abandonment. One of the artifacts found as part of the former assemblage was a plate fragment bearing the maker's mark "John Maddock & Sons Royal Vitreous, England." Cursory research indicates that this maker's mark dates to between 1880 and 1896 (Birks 2005), placing the use of this structure during the Davis and Cowell period or later. However, Tinoco's (2011) analysis of nails, window glass and bottle glass recovered from

Figure 68. Feature C, East Wall.
Photograph by Michael Popham after clearing by the FWVAS in 2008.

Figure 69. Feature C, Aerial View of North Wall Profile of Unit 2, Level 4, 30-40 cm.
Photograph by Rebecca Spitzer, May 17, 2008.

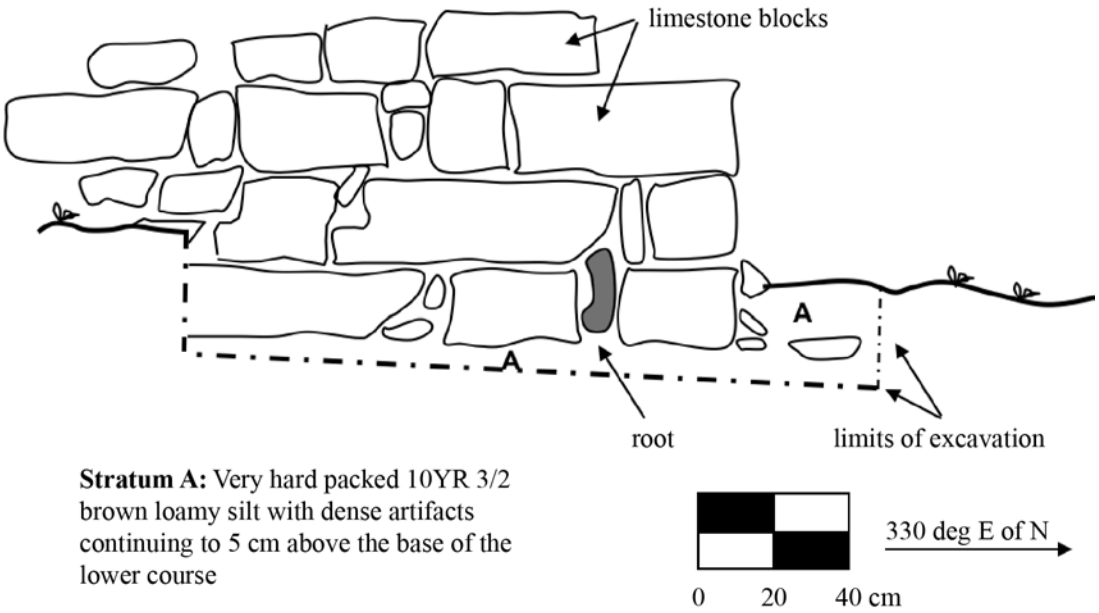


Figure 70. Feature C, East Wall Profile of Unit 2.
Drawing by Samuel Connell.

Feature C suggests a construction range from 1852 to 1918, making it likely that this structure was built by Adams and was continually used after the kiln facility was bought by Davis and Cowell. In total, excavations in Unit 2 recovered 111 bottle glass fragments, including a spirit bottle and a mineral bottle and a large quantity of domestic ceramic ware (mostly fragments of stoneware plates and cups). The excavation crew also recovered several domesticated animal bones with evidence of cut marks and butchering.

Taken altogether, this evidence suggests strongly that Feature C was the location where food for the lime workers was prepared. It is possible that the food was also consumed in or at this structure, although the plethora of food-related artifacts associated with Feature B may indicate that consumption activities actually took place there instead. In addition, Features B and C are located only a short distance away from Feature V, which Wheeler (1998:40) describes as a "cold room" based on its similarities to the Moyle House at Bodie, known to have been used for the storage of beer and soda. Wheeler suggests that the structure at the Adams Creek site might also have been used for the storage of milk. The FWVAS did not place any excavation units in or around Feature V due to its inaccessible location within a dense thicket of poison oak. However, there seems to be no reason to reject Wheeler's interpretation of the function of this structure. Hence, based on excavated materials, architectural remnants and their location within the overall site, it seems clear that Features B, C and V (Wheeler's "cold room") formed a single cohesive function at the site associated with the storage, preparation and consumption of food. The excavated materials suggest that the workers enjoyed a relatively wide range of food and drink, including alcohol of various types, as well as an assortment of both mundane domestic and more elaborately decorated ceramic and glasswares. This general area of the site deserves greater attention, especially regarding questions relating to diet and the daily life of the working community at Adams Creek. In particular Features B and C both need to be further explored

in an effort to clarify the exact functional nature of each structure. In addition, further investigation into exactly how all three of these features complemented each other in fulfilling the dietary and social needs of the community is necessary. These structures likely formed both the literal and figurative "heart" of the community at the Adams Creek Lime Kilns and thus warrant further exploration. They also present a wonderful potential opportunity for State Parks to provide informational and interpretive signage focusing on the human element of the lime industry in a relatively accessible area of the site close to the major trails running through the facility.

FEATURE D

Wheeler (1998:21) describes Feature D as a cistern, although other than its proximity to an "ephemeral stream" and a spring (which is over 200 feet to the NW of the feature) he provides no specific reason for this functional attribution. The feature consists of a low, thick, mortared limestone wall enclosing a rectangular space of approximately 120 square feet (9'3" x 12'11"). Wheeler noted that the interior was filled with soil to the level of the surrounding grade (Figure 71). Visual inspection of the feature in 2007 did not find any evidence of pipes that might have either fed into or drained out of the cistern. It appears that the feature was constructed on top of a roughly paved roadway (labelled "Adams Creek Road" on Wheeler's (1998:16) survey map) that continues to both the east and west of the feature. This road appears to have been paved using lime cement and unburned limestone waste from the kilns, and according State Park Archaeologist Mark Hylkema (personal communication, 2007) may be the oldest paved road in Santa Cruz County. The placement of Feature D squarely in the middle of and on top of this road feature seems a rather curious location and suggests that the structure may be a later addition to the overall site complex. Due to this, along with questions regarding the function of the structure, the FWVAS spent a significant amount of time and effort investigating both in and around this feature, excavating three units here during the spring and summer of 2009.

Unit 6 (Figure 72) was a 1-x-2-meter excavation unit centered in the interior space delimited by the masonry walls of Feature D. As Wheeler notes in his report, this interior space was filled with soil to the same level as the slope on the exterior of the feature. Given the functional assessment of the feature as a cistern, the FWVAS assumed that this soil represented an intentional episode of infilling, perhaps as an attempt to avoid the risk of humans or animals falling into the cistern and injuring themselves. It was further assumed that the interior of the cistern would be deeper than the surrounding ground surface and that this interior fill might present an excellent chance of finding relatively intact and well-preserved midden material.

The initial intent was to excavate this unit in arbitrary ten-centimeter levels, as was done at the majority of the other excavations carried out by the FWVAS at the site. As was hoped, excavations in this unit quickly exposed a wealth of material, including a dense concentration of burnt wooden boards and flat window glass in the eastern half of the unit. The presence of what appeared to be structure collapse was surprising given that the assumption had been that the cistern would have been uncovered or at best covered with a simple wooden lid or roof. This led the excavation crew to speculate that perhaps the structure had actually functioned as a spring house or cold house where water was collected and where food and drink items could be kept cold as well.

Figure 71. Feature D as it Appeared in Spring 2009.
Photo view looking east down the historic road feature. Photograph by Mark Hylkema.

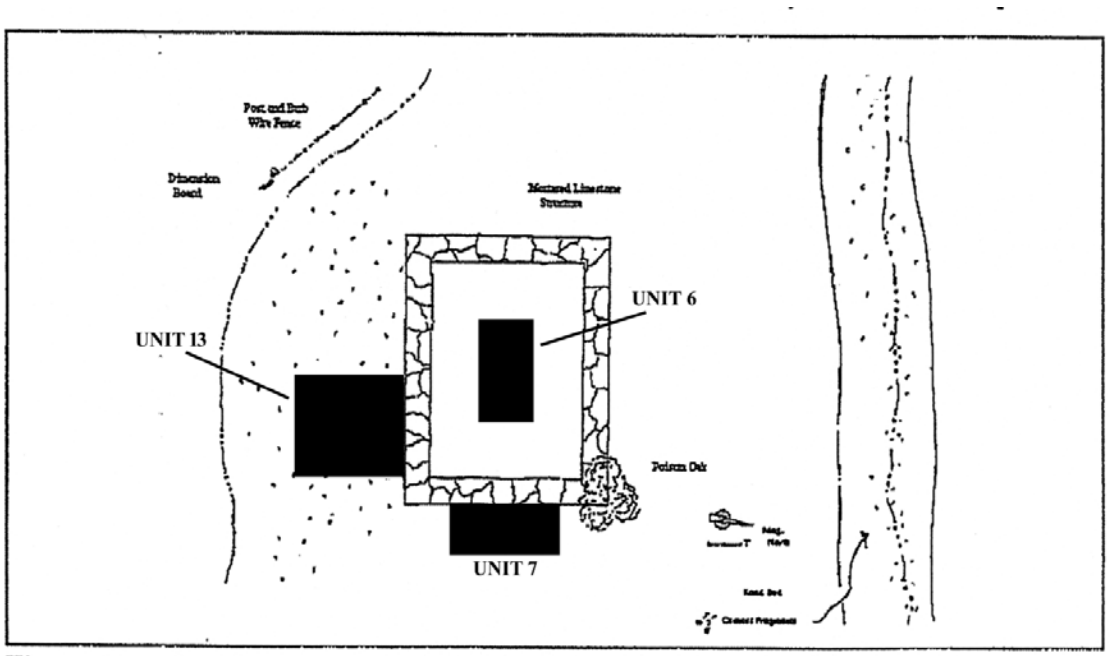


Figure 10. Feature D - Cistern Plan View

Figure 72. Feature D, Locations of FWVAS Associated Excavation Units.
Map adapted from Wheeler 1998.

This area of the unit also yielded some very interesting artifacts, including an intact and sealed medicine bottle with "J. H. Horsnyder, Druggist & Chemist, Santa Cruz, Cal." embossed on its side (Figure 73 and Figure 74). Cursory research found that Horsnyder's Pharmacy was opened in Santa Cruz in 1884 and remains in business today. According to an employee at Horsnyder's, the maker's mark on the bottom of the bottle suggests that the bottle was manufactured sometime after 1900. Another fascinating find was a small, intact bottle of light blue glass that looked very much like historic opium bottles that have been excavated from this period at other sites in the region (Hylkema, personal communication, 2009; Figure 75). While it was impossible to verify the original contents of this bottle, as it might also have been a small single-dose medicine bottle or perfume bottle, it is interesting to note the presence of both these bottles in remarkable states of preservation in this location. If, in fact, the structure was some kind of cistern or cold house, these bottles might have been kept here in order to keep their contents cool. On the other hand, it is possible that these bottles and the other artifacts from this context were placed here as refuse. These finds encouraged the excavators' hopes that the feature would provide a rich context of well-preserved midden material. A detailed plan view of the structure collapse and exposed artifacts was drawn before removing them. Unfortunately, this plan view was attached to the unit and level excavation forms that were stored at Foothill College and is currently unavailable.

Once the internal contents were removed from the unit, further excavation almost immediately began exposing the lime cement surface of the roadway on the interior of the "cistern." At this point, the decision was made to collect all artifacts from the unit above the road surface as part of level 1. In order to test whether the plaster surface exposed on the interior of the structure was in fact the historic road rather than a cemented surface perhaps meant to render the interior capable of holding water, the decision was made to excavate through the lime cement surface to determine its consistency and thickness. This proved to be an extremely arduous task, and impossible to perform with hand trowels. The excavation team instead worked with pickaxes, removing the plaster marl and limestone as one single excavation layer. Very few artifacts were found in this matrix, and it proved consistent with and the same thickness as the road feature on the exterior of the structure. Because of the immense difficulty in removing all of the road fill across the entire unit, the excavators concentrated their efforts primarily in the northwest corner of the unit and halted excavation when they reached a layer of dark brown, sterile soil at approximately 40 centimeters below ground surface (Figure 76).

Tinoco's (2011) analysis of the window glass and nails from these excavations yielded contradictory conclusions. His analysis of the nails from Unit 6 (75% machine cut versus 25% wire cut) suggests continued use and remodeling of the structure into the late nineteenth to early twentieth century. His analysis of the windowpane glass on the other hand suggested a very early date for the structure, perhaps as early as 1858. It is certainly possible that Feature D was constructed early on by Adams and then maintained and repaired well into the Cowell period. However, this would then suggest that the road was paved extremely early during the site's lifespan (perhaps verifying Hylkema's argument that this is one of the oldest paved roads in the area), then almost immediately obstructed by the construction of this building. Another possibility is that the density of artifacts in the interior of Feature D does not represent the collapse of a superstructure that once stood on the foundation, but rather refuse and midden material that was deposited here from elsewhere at the site. It is

Figure 73. Feature D, Unit 6, Detail View of Intact Horsnyder Pharmacy Bottle.
Photograph by Michael Popham.

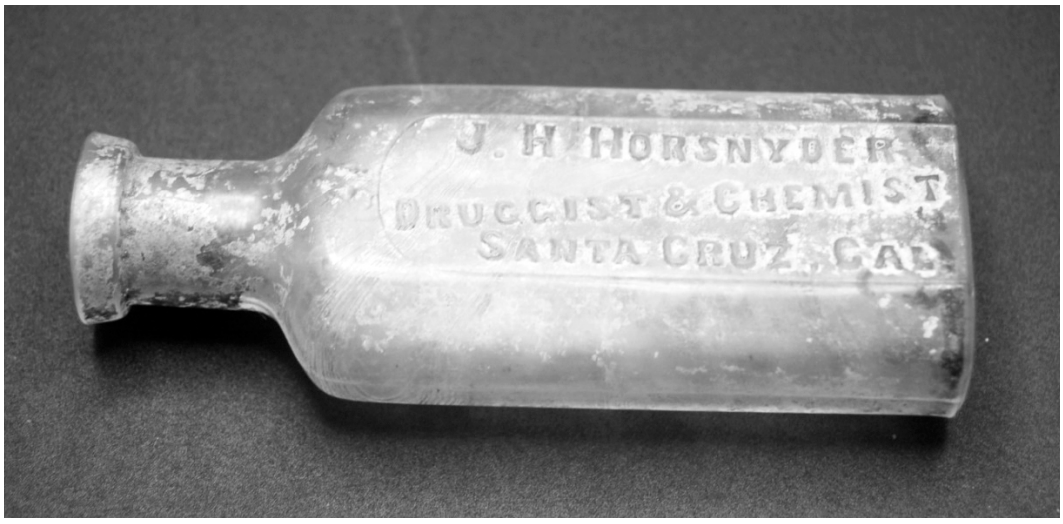


Figure 74. Feature D, Unit 6, J. H. Horsnyder, Druggist & Chemist, Santa Cruz, Cal. Medicine Bottle from ca. 1901.
Photograph by Rebecca Spitzer.

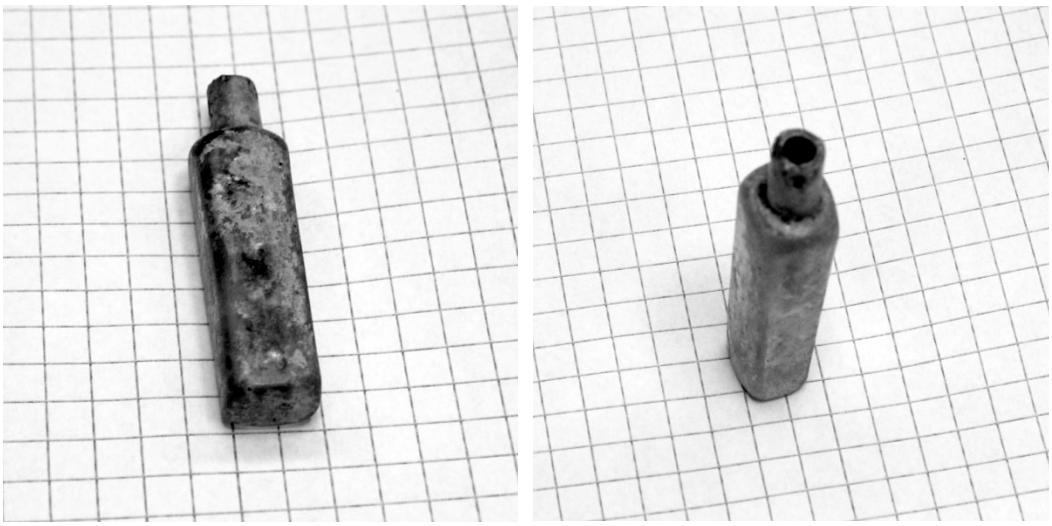


Figure 75. Feature D, Unit 6, Side and Top Views of Small Opium or Medicine Bottle.
Photograph by Rebecca Spitzer.

Figure 76. Feature D, North Wall Profile of Unit 6.
Photograph by Rebecca Spitzer showing thin cultural fill layer over deep lime cement and limestone road fill.

interesting to note that excavations from the interior of this feature (Unit 6) and the exterior of the feature (Unit 13) yielded significantly different results in Tinoco's analysis, with the nail assemblage from Unit 13 containing 92% machine cut nails and suggesting an earlier construction. This variance presents a cautionary note, both in terms of relying too heavily on the analysis of a single class of artifact for dating purposes (particularly when sample sizes are relatively small), as well as on the difficulties of attempting to date architecture that stood for several decades and was very likely constantly being remodeling and renovated.

Based on the excavations in Unit 6, the FWVAS decided to open a unit on the exterior of Feature D to compare the artifact assemblages and the depth and thickness of the road feature between the two contexts. The primary goal was to establish whether the road actually was a consistent feature running beneath the Feature D foundation. Unit 7 was a 1-x-2-meter excavation unit oriented north/south and placed immediately to the east and abutting the eastern wall of the Feature D foundation (Figure 77). Unlike the majority of the excavations carried out by the FWVAS, Unit 7 was excavated in natural and cultural stratigraphic levels rather than arbitrary ten-centimeter increments. The first excavation level (Strata One) consisted of a dark brown humus layer approximately five centimeters deep in which a relatively small number of cultural artifacts were found, including a small amount of window and bottle glass, a shotgun shell and only four nails. The dearth of artifacts here was surprising, particularly in comparison to the amount of material recovered from the upper excavation level in the interior of Feature D (Unit 6). Level 2 in Unit 7 (Strata Two) consisted of the road fill and was comprised of large, friable chunks of limestone and lime cement identical to the material excavated from the interior of the feature. Once again, excavators had to resort to the use of pickaxes to remove this layer, which was approximately 30-40 centimeters thick. The observation was made that the upper surface of the road feature was a densely packed layer of lime and limestone that came out in large chunks. Below this compacted surface was a looser, moist layer of decaying lime that eventually gave way to a soft, reddish-brown subsoil (Strata Three). No cultural material was recovered from this second excavation level. Surprisingly, Strata Three did yield a small amount of cultural material, including two .22 shells, a small metal buckle and over 30 nails (mostly machine cut). This presents an interesting opportunity to compare what appears to be a "sealed" cultural context from under the road feature to the later cultural materials found on top of the road surface and inside Feature D. This analysis has not been carried out but has the potential to offer data regarding the timing of the road construction and the different occupation and use phases at the site. It is important to make note of the fact that the stratigraphic layers discussed above are identical for Units 6 and 7, and clearly indicate that Feature D was built at some point after the road feature was created.

A final exploration of Feature D was carried out during the summer of 2009 via Unit 13, a large 2-x-2-meter excavation unit opened to the south of the feature and abutting the southern foundation wall (Figure 78). The unit was placed 50 centimeters to the west of the southeast corner of the Feature D foundation. This area of the feature was explored during the spring of 2009 with a metal detector and yielded a significant number of positive results. In addition, there were many surface-visible artifacts found in this area including two large metal bolts and a cast-iron grate that likely came from a stove. All surface artifacts were collected and catalogued by the FWVAS. The hope was that this area might help to clarify both the function and the dating of the structure.

Unit 13 was excavated only down to the historic road surface (Figure 79 and Figure 80). Previous experience in Units 6 and 7 suggested that excavating through the lime cement road feature would be both extremely time consuming and laborious, and likely fruitless in recovering cultural material. Despite the excavation only going approximately eight centimeters deep, a large amount of material was recovered from this unit. Much of this

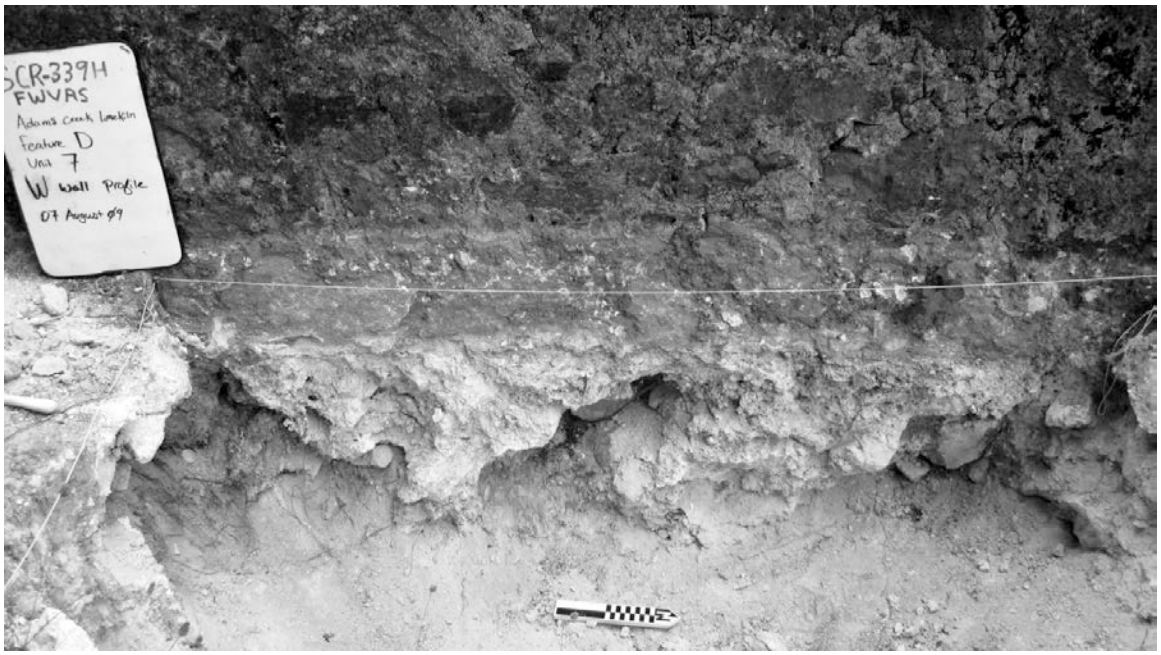


Figure 77. Feature D, West Wall Profile of Unit 7.

Photograph by Rebecca Spitzer showing the base of Feature D wall built directly on top of cement and limestone road feature.

Figure 78. Feature D, Unexcavated Surface View of Unit 13.

Photograph by Rebecca Spitzer showing relationship of unit to south wall of the "cistern."

Figure 79. Feature D, North Wall Profile of Unit 13.

Photograph by Rebecca Spitzer showing the base of Feature D wall built directly on top of cement and limestone road feature.

Figure 80. Feature D, West Wall Profile of Unit 13.

Photograph by Rebecca Spitzer showing thin layer of fill above cement and limestone road feature.

material appears to have been domestic refuse or trash, remnants of clothing (such as metal grommets, metal buckles and a Levi-Strauss rivet), bottle glass and what appears to have been the handle from a fork or spoon. These findings run counter to the idea that the structure was a cistern, although as noted above the size of the Feature D foundation also makes it unlikely to have been a cabin. Tinoco's (2011) analysis of the nails from Unit 13 (of which there were 396) shows that 92% were machine cut, suggesting a relatively early construction date. His analysis of windowpane glass from the excavations also places the construction very early, perhaps as early as 1858. This must be taken with some caution however, especially if the area was the focus of refuse and trash dumping.

Taken altogether, the materials found both inside and outside Feature D strongly suggest that at some point during the site's occupation this feature was used as a refuse area. Unfortunately, they do not help to clarify or indicate the original function of the structure. It is certainly possible that Wheeler's assessment of the structure as a cistern is accurate, although based on the excavations this seems unlikely (the other cistern feature Wheeler identified at the site—Feature N—is much more clearly a water catchment feature and is completely different in size and construction from Feature D). The walls of Feature D stand only approximately 25 centimeters in height on the interior of the structure, and the plaster cement road surface would likely have been porous and unable to hold any appreciable amount of water for any significant amount of time. At the same time, the relatively small size of the structure suggests that it was not a cabin or domicile and likely would not have been used for any kind of interior activity. Given this, it is possible that the structure served as a storage facility perhaps for the later life of the site after the cessation of lime production. Regardless of its original function, it is clear that Feature D was built at some point after the road was paved, directly on top of the pre-existing road surface.

FEATURE E

Feature E is the "North Barn" at the Adam Creek site (Figure 81). Wheeler (1998:22) describes this barn as being similar to Feature A (the "South Barn"), with an almost identical footprint. An historic photo from 1957 included in Wheeler's report (1998:24) shows a large wooden barn standing on a stone foundation with its rear resting on a terraced hillside and a stone walled enclosure in front. It is assumed that these barn features are contemporary with one another and fulfilled identical functions at the site—likely the storage of hay for feeding the mule and oxen teams involved in the lime work initially, followed by subsequent use during the dairy and beef ranching phases of the Cowell operation. Curiously, a photo of the Adams Creek kilns from circa 1900 (see Figure 47) appears to show only the South Barn. A smaller structure appears to rest close to the location of the North Barn, but in the photo, this structure does not appear to rest on a stone foundation and also appears to be located much closer to the edge of the westernmost quarry. A photo of the area from circa 1925 (see Figure 48) clearly shows the North Barn as described by Wheeler and as seen in the 1957 photo. These observations, while keeping in mind the difficulty of interpreting spatial relationships and perspective in historic photographs, suggest that perhaps Feature E was built later than Feature A and that another, earlier structure stood roughly where Feature E currently rests.

Figure 81. Feature E (the "North Barn) as it Appeared in Spring 2008.
Photograph by Michael Popham.

Given that the FWVAS had already undertaken excavations within the South Barn (see *Feature A* above), the project directors decided not to place any additional excavation units within Feature E itself. However, based on the speculation that there might have been an earlier structure located in the vicinity of Feature E, albeit slightly to the northeast of the current foundations (and closer to the quarry), an intensive pedestrian and metal detector survey of the hillside to the north and east of Feature E was undertaken. While no obvious evidence of a structure closer to the quarry was encountered during this survey, it was noted that a small retaining wall abuts the east wall of Feature E. Above this wall there appears to be a mound of limestone rubble fill (this feature was noted by Wheeler in his plan view of Feature E [1998:23]). This area yielded a number of positive results when scanned with a metal detector. Further examination of this area uncovered what appeared to be a faint line of limestone rubble delimiting an area below (southeast of) this retaining wall, suggesting the presence of a structure that would have stood along and abutted the exterior eastern wall of Feature E. In order to investigate this possible structure and to provide comparative material to the Feature A excavations, the decision was made to open two excavation units in the area just northeast of Feature E (Figure 82).

Unit 20 was a 1-x-1-meter excavation unit opened by the FWVAS in the summer of 2009. The unit was placed approximately five meters from the Feature E foundation just uphill from the retaining wall noted in Wheeler's plan view and on top of the mounded gravel fill behind this retaining wall. Excavations in this unit removed a very shallow (~five-centimeter) layer of topsoil containing only some nails and other pieces of non-diagnostic

metal. Below this level was a dense layer (Level 2) of gravel mixed with heavy yellowish-orange clay. The soil in this level was identical to the sterile soil found across the site typically 40-50 centimeters below ground surface. The consistency of this layer suggests that it was a fill layer excavated elsewhere and deposited here, perhaps during the construction of Feature E. Level 2 was almost completely devoid of artifacts. Below the fill layer, excavations exposed a dark organic soil (Level 3) that contained several nails (Figure 83 and Figure 84). The unit was excavated to sterile soil and then closed. Given the dearth of artifacts from this unit very little can be said regarding either the dating of Feature E or the presence of any earlier construction.

Unit 26 was another 1-x-1-meter unit located approximately five meters from the Feature E foundation. This unit was placed downslope from Unit 20 within the small area delimited by the limestone retaining wall noted in Wheeler's plan view of Feature E, the east wall of Feature E itself, and the faint line of limestone noted by FWVAS members during the pedestrian survey of the area northeast of the barn. This unit was opened primarily to test the hypothesis that a smaller, earlier building may have stood here prior to the construction of Feature E. This Unit was opened at the very end of the summer 2009 FWVAS Field School and was only excavated down a single level through approximately ten centimeters of topsoil (Figure 85). This level yielded only a few pieces of glass. Excavations then exposed a densely compacted disturbed soil similar to the fill layer exposed in Level 2 of Unit 20. Based on this, the decision was made not to continue the unit. Neither of the excavations associated with Feature E offered any evidence of the presence of an earlier structure in this area, and the conclusion was that the photograph included in Lime Kiln Legacies likely simply shows a view of Feature E barn from an angle that makes it appear smaller and closer to the quarry. While an ungratifying conclusion, it was a worthwhile experiment to test the validity of assumptions based on historic photographs!

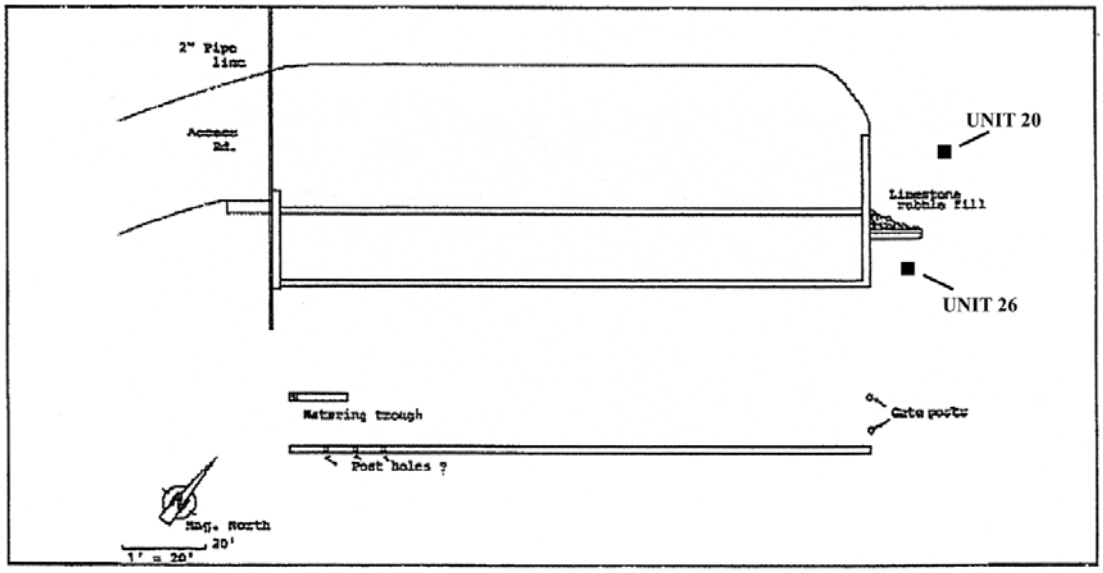


Figure 12. - Feature E North Barn Plan View

Figure 82. Feature E, Locations of FWVAS Associated Excavation Units.

Map adapted from Wheeler 1998.

Figure 83. Feature E, Aerial View of North Wall Profile of Unit 20, Level 3, 20-30 cm.
Photograph by David LeBlanc showing the clear stratigraphic change from the thin topsoil to the rocky reddish-yellow fill layer.

Figure 84. Feature E, Detail View of North Wall Profile of Unit 20.
Photograph by David LeBlanc showing the rocky reddish-yellow fill layer.

Figure 85. Feature E, North Wall Profile of Unit 26.

Photograph by David LeBlanc, August 7, 2009.

FEATURE F

Wheeler (1998:25) describes this feature as "structure remains" consisting of a mortared firebrick corner and the remains of a dry laid rock wall, along with various other structural elements (wood, bricks and firebricks) scattered across a low sloping hillside. His report lists several different firebrick manufacturers identified from the remains, with manufacturing dates ranging from 1823 to 1967. Historic photographs dated to circa 1900 and circa 1925 of the Adams Creek kiln works show a small wooden cabin located at this approximate location (Figure 86; see also Figure 49). Two additional cabins are located

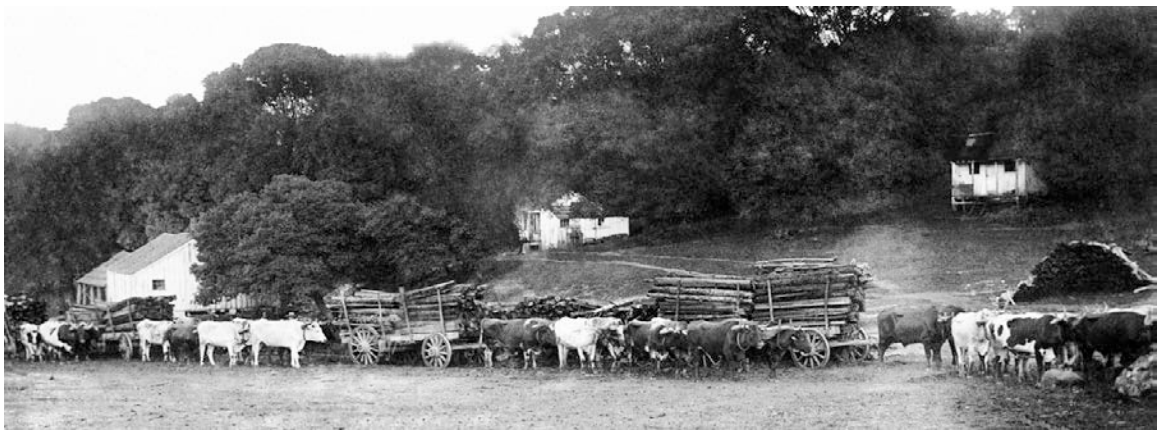


Figure 86. Ox Teams at the Adams Creek Lime Kilns Facility, circa 1900.

The cabin on the right is at the location of Feature F, while the structures in the center correspond to Feature G. Feature J (the cooperage) can be seen on the left. Courtesy of the Santa Cruz Museum of Art and History.

slightly downhill and to the north and appear to be located in the area that Wheeler refers to in his report as Feature G. The cabin shown at the location of Feature F in these historic photographs appears to be supported on the downhill side by wooden piers and has a single door in the front flanked by two small windows. It is impossible to determine if the cabin had a brick foundation on the back, or a brick chimney. Based on these photographs, this cabin is very similar to the extant lime worker cabins at the Cowell Lime Works Historic District which, according to Perry (2009), were also built on a sloping hillside with the rear of the cabins resting on a double line of recycled brick. The front of the cabins was built on short wooden piers which themselves stood on a base of recycled brick and were also sheathed in recycled bricks up to the ground surface, apparently to protect them from rot and the moisture of the surrounding soil. None of the worker cabins at the Cowell facility had fireplaces or chimneys and were instead heated by stoves, which were vented through the roofs with pipes.

In addition to the surface remains described by Wheeler and still visible at the time of the first FWVAS visit to the site in 2007, shovel test pits (STPs) placed near Feature F in the spring of 2007 uncovered a large amount of domestic material. In fact the STPs associated with this feature (A12-A15; see Figure 52) yielded by far the highest density of artifacts, including several ceramic pipe fragments, buttons, and a nearly intact enameled metal kea kettle, along with large numbers of nails, bottle glass and animal bones (Figure 87). Given Wheeler's observations, the historic photograph and the evidence from the test units, it is clear that Feature F represents the remains of at least one of the worker cabins associated with the Adams Creek Lime Kilns. Given the FWVAS's research interests to investigate the daily lives of the lime workers and to better understand the domestic contexts within which they lived, Feature F was an obvious target for exploration and became the location of the very first test excavation undertaken at the site in the spring of 2007.

Unit 1 was a 1-x-1-meter unit located on the low sloping hillside east of the current fire road that enters the limekiln area from the southeast. The unit was placed immediately beside the mortared firebrick corner described by Wheeler, in hopes of probing the structure collapse without necessitating the removal of any major architectural features. The unit was excavated in a series of arbitrary ten-centimeter increments down to a depth of 70 centimeters, making it one of the deepest excavation units at the site (Figure 88). The excavation recovered a tremendous amount of material, including a large amount of shell (catalogued as clam and mussel shell) throughout nearly all levels. This material was unique to this area of the site, and at first was thought to be anomalous. However, excavations around Cabin B at the Cowell Lime Works also encountered a significant amount of shellfish remains. Patricia Paramoure (2012) argues that the shellfish remnants at Cabin B are evidence of the lime workers supplementing the food provided at the cookhouse with locally foraged foods that they obtained on their own and prepared in the cabins. She goes on to speculate that the shellfish might be interpreted as an indication of ethnic identity among the workers, specifically citing census records indicating that many of the workers at the Cowell Lime Works were of Portuguese-Azorean background. While tempting, this conclusion is difficult to justify (at least within the context of the materials excavated by the FWVAS at the Adams Creek site). It is interesting to note, however, the prevalence of this material at Unit 1 compared to the dearth of similar material elsewhere at the site. This may indeed indicate some degree of variance in identity at the different cabin sites at Adams

Creek. Of course, it may also simply indicate variance in food preferences rather than ethnic identity.

Figure 87. Enameled Tea Kettle and Ceramic Pipe Bowl Recovered from Shovel Test Pits (STPs) in Proximity to Feature F.
Photographs by Samuel Connell.

Figure 88. Feature F, Aerial View of East Wall Profile of Unit 1, Level 7, 60-70 cm.
Photograph by Rebecca Spitzer showing east wall profile, April 26, 2008.

In addition to the shell, a large number of nails and various ceramic and glass fragments were also recovered from Unit 1. Interestingly, despite the material recovered from the shovel test units in this area, the excavations in Unit 1 did not yield much in the way of diagnostic domestic materials. Not only this, but the excavation did not uncover any clear evidence of architectural collapse or burning. Based on the lack of architectural elements, the excavation team speculated that the wooden superstructure of the cabin was removed from the site (rather than collapsing and/or being burned by the Cowell Foundation as apparently was done with the large barns). The lack of wooden structure collapse at both Features F and G is in marked contrast to the clear architectural remnants found on the surface at Feature T. A local resident of the area who stopped to chat with the project director in 2007 mentioned that in the 1960s and 1970s it had been popular with local people to come to the site to remove old wood and lumber to use in "rustic" renovations to their homes. It is possible that this looting activity accounts for the lack of wooden collapse associated with the cabin locations at Features F and G. Being that Feature T is located in a densely wooded area overgrown with poison oak, it may have escaped this particular kind of activity.

Another observation made during the excavation of Unit 1 was that the dense accumulation of surface material near Feature F does not seem to show any clear spatial patterning that would suggest that it is the *in situ* remnants of a cabin. Instead, it seems to be a relatively chaotic jumble of debris spread over a large area. The project members began to question whether it was possible that Feature F was the result of one or more worker cabins being intentionally razed and bulldozed, perhaps due to liability concerns, resulting in the highly disrupted patterning apparent on the surface. In particular, the mortared firebrick corner does not appear to correlate to any surrounding architectural material and instead seems to be the focus of an accumulation of fire and regular construction bricks, perhaps the result of pushing scattered architectural collapse into one smaller pile. It is possible that rather than the remnants of a single cabin, Feature F is merely an historic refuse area associated with more recent land use and clearing at the site.

During the summer of 2009, it was decided to return to Feature F and try to clarify some of the remaining questions regarding the nature of the material deposited here. Unit 18 was a 1-x-1-meter excavation unit placed approximately two meters northeast of Unit 1 (Figure 89). The unit was intentionally placed on the opposite side of the rubble pile from Unit 1 in an attempt to understand if the brick and stone elements were actually part of *in situ* structure collapse. The placement of the unit was based on the premise that if Unit 1 had not exposed remnants of cabin collapse, then Unit 18 definitely would (assuming there was any collapse present).

Unit 18 was excavated in a series of five arbitrary ten-centimeter levels and was taken down to sterile soil (Figure 90). Once again, no convincing evidence of architectural collapse was uncovered. The majority of the material recovered from the unit was comprised of nails and glass, with some bottle glass and a single Levi-Strauss rivet. Similar to Unit 1, the relative dearth of material here was surprising, especially when considering the amount of surface material and the findings from the shovel test units. The low amount of material did not allow Tinoco (2011) to engage in any statistically relevant analyses, other than to point out that the nail assemblage from the unit consisted of 90% machine cut nails. Tinoco concludes that this suggests a relatively early construction date for the feature.

Figure 89. Feature F, Aerial View of Unit 18, Level 1, 0-10 cm.
Photograph by Alfonso Tinoco showing firebrick and limestone rubble.

Figure 90. Feature F, Aerial View of East Wall Profile of Unit 18, Level 4, 30-40 cm.
Photograph by David LeBlanc showing east wall profile, July 25, 2009.

Ultimately, the investigation of Feature F remains inconclusive. It is clear that a cabin stood at or near this location at the time the kilns were active, hence the large amount of architectural debris and artifacts on the surface. However, it is also likely that the surface debris is the result of intentional demolition and moving of the cabin remains. It should be pointed out that the excavations at Feature G rendered similar results, although in that case the excavation crew did in fact find convincing *in situ* evidence of one of the cabin piers and a recycled brick foundation from the rear of the cabin. However, this find was largely the result of lucky unit placement. Perhaps the most important conclusion to be drawn is that the worker cabins were quite ephemeral, and assuming the intentional removal of the wooden superstructures, very little intact architectural evidence remains. Despite this, the workers appear to have left a relatively rich archaeological footprint behind, albeit one that necessitates clearing and excavation of a much larger area than was possible within the limits of the FWVAS.

FEATURE G

Wheeler (1998:25-26) describes this feature as "structure remains," similar to Feature F. The feature is located approximately 135 feet north of Feature F on the same low, sloping hillside. Despite the area being partially obscured by a dead oak tree and a thicket of poison oak, Wheeler was able to document what appeared to be a collapsed wooden structure containing machine cut nails associated with a 20-foot-long alignment of brick. He also noted a large number of artifacts scattered across the feature, including bottle fragments, the remains of what might have been a stove, and several fire bricks. His report includes a 1957 photograph showing two small cabins in this same location, as does an historic photograph from circa 1925 (see Figure 49). A photograph dated to circa 1900 of the Adams Creek kiln works (see Figure 86) appears to show these same two cabins (in the center of the photograph) located slightly downhill and to the north of the cabin which stood at the location of Wheeler's Feature F. When the FWVAS began work at the site in 2007, many of the surface visible artifacts and structure collapse were no longer apparent, either due to looting activity or expansion of the poison oak thicket. Based on the project's research interests in the limekiln workers, the decision was made to investigate this area in hopes of finding more evidence than was uncovered at Feature F.

A total of four excavation units was opened in the vicinity of Feature G starting in the spring of 2008 and continuing through the spring and summer of 2009 (see Figure 53). As with prior excavations, these units were placed around the edges of the feature in hopes of avoiding unnecessary removal or disruption of existing architectural elements. In addition, as Wheeler notes in his survey report, a large portion of the feature is obscured by a dead oak tree and dense poison oak thicket. This forced the FWVAS to excavate on the northern and southern extremes of the feature, as the center was inaccessible or would have required significant labor to remove the vegetation. Further, due to ongoing concerns about looting the FWVAS intentionally chose not to engage in any significant brush or vegetation removal that would have made archaeological and historical features more likely to draw public notice.

The first excavation unit opened at Feature G was Unit 3, a 1-x-2-meter unit oriented roughly east/west on the northern edge of the feature. The unit was placed here in hopes of exposing the basal edge of the northernmost of the two cabins shown in the historic

photographs. The unit was excavated in five arbitrary ten-centimeter levels to sterile soil. Unfortunately, very few extant architectural features were uncovered here, suggesting that the unit was placed too far away from the original location of the cabin. Despite the lack of obvious architectural features, 163 nails were recovered from the unit, with 99% being machine cut. This suggests an early construction date for the cabins. In addition, a fair amount of domestic trash was found here, including fragments of two wine or champagne bottles and one medicine bottle. Based on his analysis of the bottle glass recovered from Unit 3, Tinoco (2011) concludes that the majority of the trash dates from 1863 to 1919, supporting the idea of early occupation here but also suggesting prolonged use of the cabins well into the twentieth century and after the abandonment of the limekilns at Adams Creek. This could mean that the cabins were repurposed as housing for workers on the Cowell ranch during the early twentieth century. Other domestic rubbish recovered from this unit included ceramic pipe stem fragments and several buttons. In addition, two pieces of bottle glass were excavated here that initially appeared to show evidence of retouch and reuse as tools (Figure 91). Subsequent reassessment of these artifacts has brought this interpretation into question, although careful analysis of these artifacts by a lithic expert may be warranted.

Unit 4 was another 1-x-2-meter excavation unit oriented roughly east/west on the sloping hillside associated with Feature G. This unit was placed just downslope from the brick alignment noted by Wheeler in 1998, with the eastern edge of the unit abutting the very northwest edge of the alignment. As in Unit 3, the goal here was to expose architectural elements of the cabins pictured in the historic photographs of the Adams Creek site. Since Unit 3 failed to uncover any significant architectural features or collapse, Unit 4 was placed closer to the center of Feature G (although vegetation and large tree roots prohibited placement of the unit directly in the center of the scatter of surface artifacts and architectural remnants noted by Wheeler). The unit was excavated in four arbitrary ten-centimeter levels and was taken down to sterile soil.

The excavations in Unit 4 were much more fruitful than those in Unit 3, as the excavation crew almost immediately upon starting exposed architectural collapse from the cabins, consisting primarily of boards and other pieces of lumber, many with machine cut nails still in them. Stone rubble and fire and regular bricks were also found during the excavations, particularly in the upper excavation levels and concentrated heavily in the eastern half of the unit (Figure 92). The excavation also exposed and more clearly defined the brick alignment noted by Wheeler in his 1998 survey. Excavators at first interpreted this feature as a possible brick pavement or the remnants of a collapsed chimney, but after speaking with Frank Perry in 2009, it is almost certain that this feature was a rudimentary foundation of recycled brick meant to support the rear (uphill side) of one of the cabins. At the time, Perry and a colleague had recently excavated around the base of one of the cabins standing at the Cowell facility on the UCSC campus and found that the rear of the cabins rested on a double line of reused fire and regular brick. This strategy would have been an expedient way of protecting the wooden frame of the cabin from moisture and rot without necessitating significant amounts of labor or material and appears to have been a common building technique at the time.

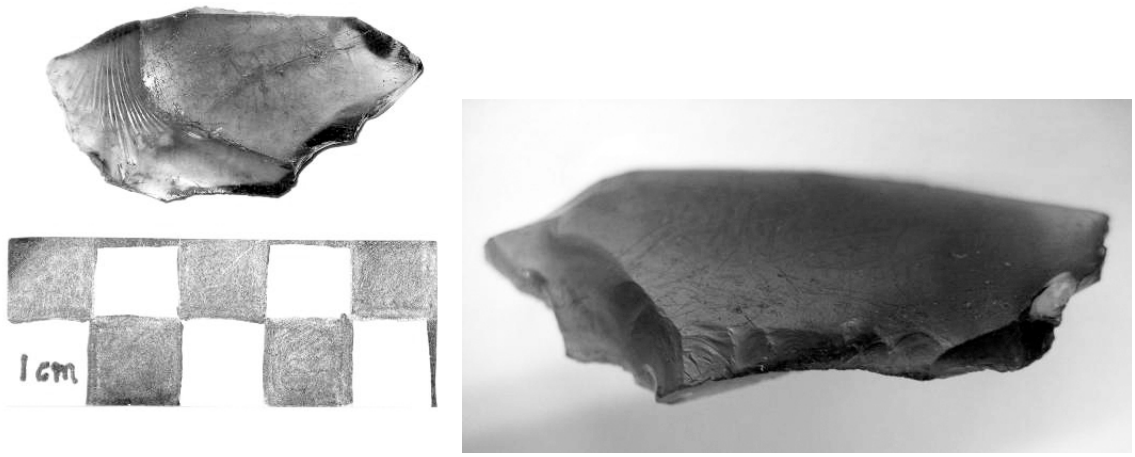


Figure 91. Feature G, Unit 3, Piece of Blue Bottle Glass.
Photographs by Samuel Connell showing possible evidence of retouch.

Figure 92. Feature G, Aerial View of East Wall Profile of Unit 4, Level 5, 40-50 cm.
Photograph by Rebecca Spitzer, July 11, 2009.

In addition to the architectural elements exposed in this excavation, a large amount of domestic refuse was recovered. This material included several buttons and one Levi-Strauss rivet as well as the fragments of several bottles. Unit 4 also yielded fragments of animal bone, which might indicate some level of food consumption here. Similar to Unit 3, a large number of nails (131 total) were collected from this unit, with 93% being machine cut. As above, Tinoco (2011) argues that this indicates a construction date range for the cabin of 1867-1887, suggesting that these cabins might have been built after Adams sold the kilns to Davis and Cowell.

In an attempt to further define the architectural remains at Feature G, the FWVAS opened up a third excavation Unit I the spring of 2009. Unit 10 was a 1-x-2-meter unit oriented roughly east/west and placed approximately five meters south of Unit 4 on the same sloping hillside. The unit was placed on the south side of the dead oak tree and poison oak thicket that covers Feature G, opposite the locations of Units 3 and 4. It was hoped that Unit 10 would expose the continuation of the brick alignment/foundation that was defined in Unit 4 and recover more domestic refuse associated with the worker cabins.

Excavations in Unit 10 almost immediately exposed a dense jumble of firebrick in the southwest corner of the unit. Unlike the brick alignment exposed in Unit 4, the material in Unit 10 appeared to be construction collapse or refuse debris rather than *in situ* architectural elements. The first two levels in this unit yielded a large number of ceramic fragments, nails and other domestic rubbish. As the excavators were clearing the bottom of level two in the unit, they began to expose the remnants of a leather work boot partially extending into the north wall of the unit. The boot, although badly decaying, was still relatively intact (Figure 93). The excavators pedestaled the boot and continued to excavate around it, eventually exposing a redwood board directly underneath the boot, running north/south across the middle of the unit. Due to the extremely fragile state of the boot, and the speculation that the board might be an *in situ* element of one of the cabins, the decision was made to open another unit (Unit 12) immediately to the north of, and abutting, Unit 10. This unit was a 1-x-1-meter excavation specifically opened to completely expose the boot and any other material in the same context.

Unit 12 was excavated in two arbitrary ten-centimeter levels and taken down to the same depth as Unit 10. Once this was accomplished, both units were excavated simultaneously, although material recovered in each unit was bagged and catalogued separately. Once the entire boot was exposed, it was carefully removed in its soil matrix and then cleaned in the Foothill Archaeology laboratory (Figure 94). Upon removing the boot, excavation continued in level 3 of both Units 10 and 12, further exposing the redwood board, which appeared to have been stood on its narrow edge (Figure 95 and Figure 96). It is possible that this was part of the support structure underneath the front of one of the cabins and that the boot had been placed there either for storage or as refuse. Further excavation in level 3 of Unit 10 recovered a large metal chisel which may have been a tool used in quarrying limestone. This suggests that the workers may have stored their tools in or under the cabins, and that each worker may have been responsible for supplying some of their own tools. The excavators continued to find firebrick in this unit at this depth, particularly in the western half of the unit. Unit 12 did not contain the same amount of firebrick or other debris. Both units yielded a significant amount of domestic refuse, including clothing buttons, ceramics and bottle fragments.

Figure 93. Feature G, Aerial View of East Wall Profile of Unit 10, Level 2, 10-20 cm.

Photograph by Rebecca Spitzer showing in situ remnants of leather boot circled in red.

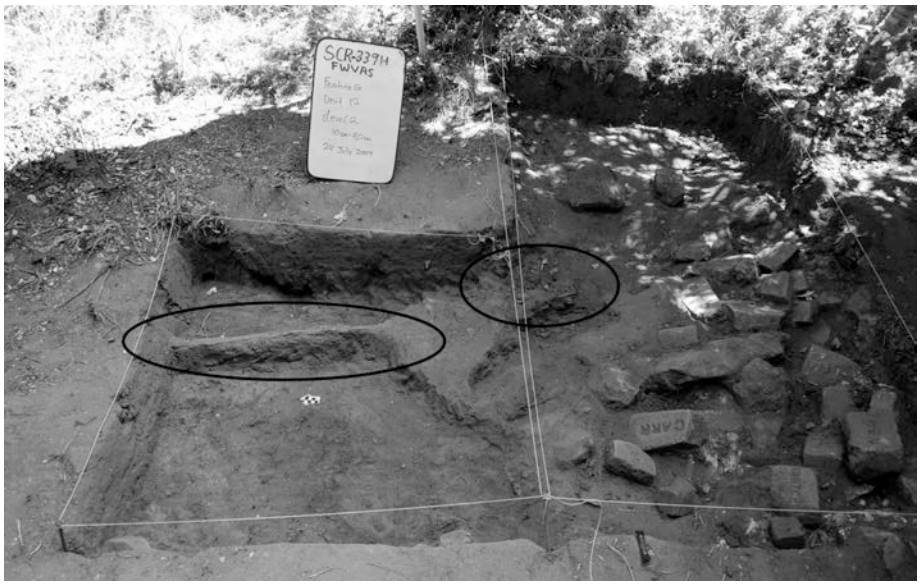


Figure 94. Feature G, Detail Views of Leather Boot.

Photographs by Rebecca Spitzer showing (left) detail of leather boot after being removed from the surrounding matrix and (right) detail of leather boot after being cleaned in laboratory.

Figure 95. Feature G, Aerial View of East Wall Profile of Unit 12, Level 2, 10-20 cm.

Photograph by R. Spitzer showing Unit 10 on the right, in situ remnants of boot circled in red, and redwood board circled in yellow.

Figure 96. Feature G, Aerial View of East Wall Profile of Unit 12, Level 3, 20-30 cm.

Photograph by Rebecca Spitzer showing in situ redwood board.

In level four of Unit 12 excavators exposed the top section of a vertical 4-x-4-inch wooden post that appeared to be *in situ*. The soil immediately around the post was a different texture and consistency than the rest of the soil in the unit and contained a greater number of artifacts. This indicates that the post had been intentionally placed in a hole excavated for the purpose, and then the void around the post was filled back in. This feature is highly reminiscent of the architecture of the Cowell Ranch cabins on the UCSC campus, the fronts of which rested on wooden posts or piers placed vertically into the ground on the downhill side supporting the front edge of the cabins, which stood approximately a foot above the ground surface (Perry, personal communication, 2009). Perry and a colleague excavated around the piers of one cabin in 2009 and found that they stood on small bases of reused brick and were often sheathed in brick up to the ground surface. The wooden post found in Unit 10 at Feature G does not appear to have been sheathed in brick (although some of the firebrick removed from the level 1 and 2 excavations may in fact have been used for this purpose). Its placement relative to the redwood board found in level 2 and the brick alignment exposed in Unit 4 suggests strongly that it was one of the piers used to support the front edge of one of the cabins at the Adams Creek kilns.

Interestingly, there is also evidence that the workers who lived in the cabins often stored belongings under the sheltered front edge of the cabins afforded by this method of construction. While visiting the Cowell Lime Works Historic District in the summer of 2009, the author spoke with some volunteers (including Patricia Paramoure) who were screening through the backdirt from Perry's excavations and conducting additional excavations at the rear of one of the cabins. In the course of this work, they had recovered an abalone hairpin (most likely a women's adornment), several clothing rivets and several tobacco tins, one that contained a ring, from under the front of the cabin. An exhaustive description of these investigations and their findings in included in Paramoure's master's thesis, entitled *Life in an Industrial Village: The Archaeology of Cabin B at the Cowell Lime Works Historic District, Santa Cruz, California*. This lends credence to the argument that the boot, chisel and clothing remnants excavated here were very likely intentionally stored here by the lime workers themselves. Further excavation in Unit 10 also unearthed a large metal spike or drill head that was likely a tool used in the quarries.

Levels 10 and 12 were both taken down to sterile soil (~40 centimeters below ground surface). Tinoco's analysis of the nails recovered from both units found some of the lowest percentages of machine cut nails anywhere at the site (70% and 75%, respectively). While this is still a large proportion of machine cut nails, it does suggest that the cabins located here either were built later than some of the other buildings at the site or (more likely) the cabins were occupied and remodeled for longer than some of the other buildings. Perhaps most interesting is that the nail assemblages from Units 3 and 4 showed a quite different pattern, with both those units showing very low percentages of wire cut nails. It is possible that this discrepancy is simply due to sample size error, but it is also possible that the excavations at Feature G recovered materials from two different cabins that were either built at different times or occupied for different durations. Based on this analysis, it would suggest that the northern of the two cabins is older, or fell into disuse earlier, than the southern cabin. Despite these differences, the material recovered from all four excavations at Feature G was remarkably consistent and bears a strong similarity to the material excavated at the Cowell Lime Works (Paramoure 2012). Much of this material suggests domestic use of the cabins, including a total of six Levi-Strauss rivets, eight buttons of various materials, a

metal clothing buckle, fragments from an ironstone platter from T&R Boote (dated to before 1891), wine and medicine bottle fragments, ceramic pipe fragments, and domesticated animal bone bearing cut and butcher marks. However, as noted above there are also some tantalizing artifacts suggestive of the industrial lives of the denizens of the cabins, including the large metal chisel and the metal spike or drill head. Taken altogether this evidence gives a fascinating window into the delicate balance between work and leisure that the lime workers maintained.

Unfortunately, excavations in Units 10 and 12 were terminated at the end of the 2009 FWVAS field school and were not resumed. It may be of interest in the future to revisit these excavations to further expose the wooden support post and the surrounding matrix. Based on the wealth of artifacts here and the *in situ* architectural elements, this area of Feature G presents an enticing opportunity for extensive clearing excavations. Further excavation here would likely help to clarify the material culture and daily lives of the lime workers and ranch hands who occupied these cabins throughout the second half of the nineteenth century and early twentieth century.

FEATURE S

Feature S, like Feature B, is one of the more curious features at the Adams Creek site. Wheeler (1998:36-37) describes the feature as a collapsed 7.5-x-7.5-foot wooden structure with partially standing architecture (redwood posts jutting vertically from the forest floor) in close proximity to a poorly constructed "U" shaped limestone and firebrick foundation supporting a heavy iron machine mounting. Wheeler points out that Feature S is similar in shape and construction to Feature U, a feature at the site, which the FWVAS was unable to relocate and did not investigate. At the time of Wheeler's survey, he noted a large amount of surface visible architectural debris and artifacts scattered around the feature, including machine cut nails, windowpane glass, iron pipe fragments, ceramic fragments and firebricks from several different manufacturers.

During the 2009 summer field school, the FWVAS decided to place several excavation units in and around Feature S. There were several different reasons for investigating this feature. First was the hope of clarifying the function of the structure and understanding its role in the activity of the lime works. Second, it is located in relatively close proximity to Feature T, which proved to be by far the most interesting and productive context for FWVAS excavations, especially pertaining to specific research interests in the daily lives of the workers at the site. Third, like Feature T, this feature is located in a relatively inaccessible area of the site. It appears to have escaped some of the destructive effects of looting and other disruptive activities that have led to the loss of significant amounts of material at many of the other features across the site. In particular Features F and G have been especially affected, and it appears that almost all wooden structure collapse has been removed from these features. Further, the speculation was that Feature S would offer an important comparative context to Feature T, as the two features appear to represent different aspects of the lime works community. Feature T, based on Wheeler's descriptions and the surface visible remains, appears to have been either a large cabin or administrative building. Feature S, on the other hand—based both on the diminutive size of the wooden structure remains as well as the evidence of a machine mount—appears to have served a

more industrial function. Due to these apparent functional differences, the FWVAS was interested in excavating both features and comparing the results.

The working hypothesis for the excavations at Feature S was that the feature represented an ancillary industry associated with the limekilns. The initial thought was that the feature might have been a blacksmith shop or forge, similar to the blacksmith shop at the Cowell Lime Works (Perry et al. 2007:177), albeit much smaller. An alternative hypothesis was that the feature was the remains of a barrel mill, as it is located in close proximity to the cooperage (an 1865 article in the Santa Cruz Sentinel mentions a stave machine at the Samuel Adams kilns, although it does not provide a description of the machine or where it was located at the site; "Natural Resources" 1865). In order to test these hypotheses, four 1-x-1-meter excavation units were placed in and around Feature S during the summer of 2009 (Figure 97). As with most other investigations at the site, the decision was made to avoid disrupting or moving extant architectural elements or collapse debris as much as possible. Unit 25 was an exception to this rule, as it was placed in the interior of the square wooden structure described by Wheeler. The other three units were placed at the edges of the feature, as close as possible to surface visible architecture without risking disruption or damage to the feature. This strategy was employed with the hope that at some point in the future an architectural or industrial historian might be able to investigate the extant architecture here and help to interpret and/or reconstruct the architecture. Removing or disrupting the collapse might prohibit this process.

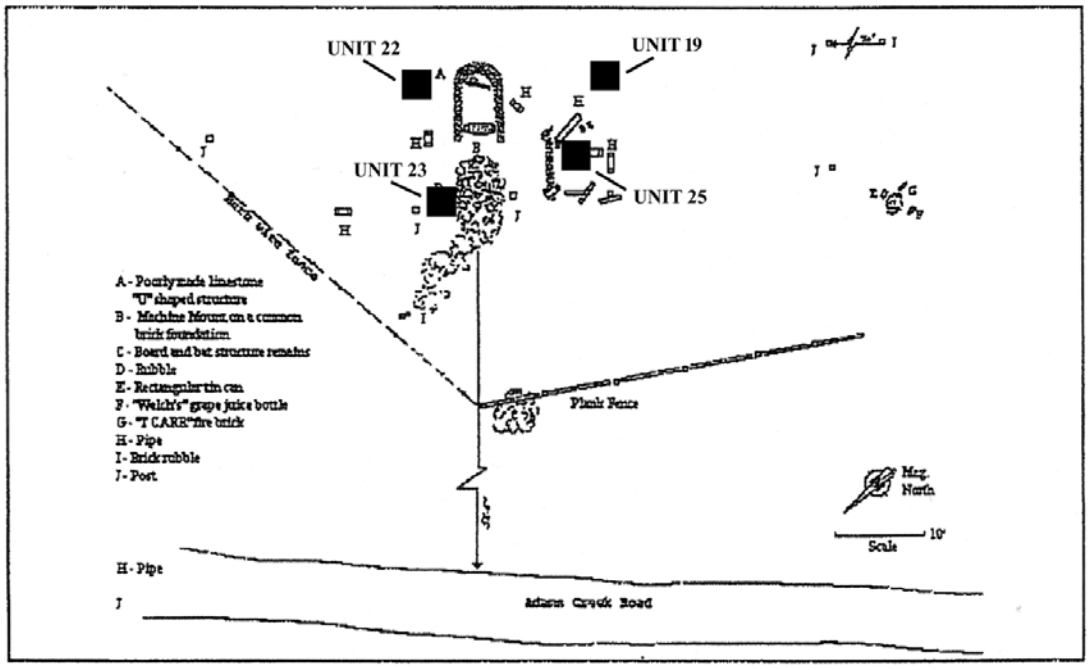


Figure 25. Feature S - Structure Remains Plan View

Figure 97. Feature S, Locations of FWVAS Associated Excavation Units.
Map adapted from Wheeler 1998.

Unit 19 was the first unit opened at Feature S. This 1-x-1-meter excavation was placed on the southern edge of the feature approximately one meter southeast of the wooden structural remains described by Wheeler and approximately three meters away from the "U" shaped foundation structure. This area of the feature contained a large amount of surface-visible artifacts so the decision was made to focus here in order to collect these artifacts from a secure context and preserve them from future looting. These surface finds included a large shovel blade, numerous bottle glass fragments, a large strip of metal, and cut cow bone. The unit was excavated in five arbitrary ten-centimeter levels down to a depth of approximately 50 centimeters below ground surface (Figure 98). These excavations yielded a large amount of what appears to be primarily domestic refuse or trash, including a large number of nails, windowpane glass and bottle glass. The most significant find in this unit was a relatively large amount of animal bone, much of which shows signs of butchering (Figure 99). The latter material is surprising considering the assumption that this was an industrial context rather than a domestic one. Of course, the interpretation of Feature S as being associated with the industrial facet of the lime works may be mistaken. It is also possible that the function of the feature changed with the shifting use patterns at the site, in particular during the latter period of occupation when lime production ceased. Perhaps Feature S dates to the ranching period of the Cowell operation altogether. However, the latter point does not seem to be supported by Tinoco's (2011) analysis of the nail assemblage from Unit 19, which suggests that the structure dates to the late nineteenth century because 90% of the nails collected were machine cut. In fact, Tinoco's analysis showed that the largest percentage of machine cut nails associated with any feature is here at Feature S, which would suggest that it was one of the earliest constructions at the site rather than a later addition.

Unit 22 was another 1-x-1-meter excavation unit opened at Feature S during the summer of 2009. This unit was placed on the eastern edge of the feature, immediately adjacent to the northern basal edge of the "U" shaped limestone and firebrick foundation described by Wheeler.

It was hoped that this excavation would help to clarify the function of this architectural feature, which the FWVAS speculated may have been a base for a furnace or a barrel mill. The unit was excavated in four arbitrary ten-centimeter levels down to sterile soil. Very few artifacts were recovered from the lowest excavation level. It should also be noted that this excavation did not uncover any charcoal, carbon, iron slag or any other evidence that this stone foundation might have been a furnace, or that Feature S represents a blacksmith shop. In fact, the majority of the evidence recovered from this unit appeared to be domestic refuse. Like in Unit 19, there was a large amount of animal bone, including several pieces with evidence of butcher marks. Excavations also recovered several glass bottle fragments (including one spirit/whiskey bottle and one mineral bottle) and clothing buttons. With the exception of the animal bone, the artifact assemblages from both Unit 19 and Unit 22 look very much like the assemblages from Features F and G. This suggests that Feature S might have indeed been the location of a cabin, although the remnant architecture appears to be significantly different.

Excavations in Unit 23 served to underscore the domestic nature of the artifact assemblage associated with Feature S. This was another 1-x-1-meter unit and was placed along the eastern edge of the feature, immediately along the edge of a dense scatter of limestone and brick that Wheeler describes as lying in front of the "U" shaped foundation

Figure 98. Feature S, Aerial View of East Wall Profile of Unit 19, Level 3, 20-30 cm.
Photograph by Rebecca Spitzer, July 31, 2009.

Figure 99. Feature S, Unit 19, Butchered Animal Bones.
Photograph by Rebecca Spitzer.

(Figure 100). This unit was excavated in three arbitrary ten-centimeter levels and was terminated at 30 centimeters due to a significant decrease in the number of artifacts being recovered and a large number of poison oak roots protruding into the unit. As in the other units excavated at Feature S, the majority of the artifacts recovered here appear to be domestic in nature. While there was not as much evidence of animal bone, excavations did find a ceramic pipe fragment, clothing rivets, several different kinds of buttons, two small keys, and fragments of ceramic and glass vessels. Unit 23 also yielded the single largest number of nails from any excavation at the site, with a total of 918. Of these, 96% were machine cut. Again, despite the seemingly industrial nature of the extant architecture here, the material record looks remarkably similar to that associated with the worker cabins.

Figure 100. Feature S, Aerial View of West Wall Profile of Unit 23, Level 1, 0-10 cm.
Photograph by Rebecca Spitzer, August 7, 2009.

The final excavation at Feature S, Unit 25, was a 1-x-1-meter unit placed directly in the center of the 7.5-x-7.5-foot area delimited by the redwood posts and wooden structure collapse described by Wheeler in his report. If in fact these posts show the extent of the original built structure, this was a very small building and would almost certainly not have been a cabin or habitation. The assumption was that the structure was a storage building associated with whatever industrial function the "U" shaped foundation fulfilled. Unit 25 was excavated in three arbitrary ten-centimeter levels and like Unit 23 was terminated at this depth due to a marked decline in the number of artifacts being found (Figure 101). This unit was also the final unit excavated as part of the summer 2009 FWVAS field school and the decision was made at the end of the field school to close up and backfill all open units in order to protect the site from potential looting.

Excavations in Unit 25 recovered much less material than the other excavations at Feature S. In general, the artifact assemblage here consisted of nails, bottle fragments and windowpane glass. It is interesting to note that the wealth of domestic artifacts (clothing remnants, ceramics, animal bone) found elsewhere at the feature are almost entirely missing from this context. This might be due to the placement of the unit within (or under) the structure itself, or it may indicate variance in use patterns within the area labelled as Feature S. A total of 58 window glass fragments was collected from this excavation; based on his analysis of this material, Tinoco (2011) arrives at an estimated construction date for the building of 1890. This places the building relatively late in the life of the limekiln phase, but certainly much earlier than the use of the area for cattle ranching.

Figure 101. Feature S, Aerial View of East Wall Profile of Unit 25, Level 1, 0-10 cm.
Photograph by Rebecca Spitzer showing architectural collapse.

Based on the excavations outlined above, the function of Feature S remains a mystery. Taken altogether, the artifact assemblage from the feature strongly suggests a domestic function for the area. A large amount of clothing remnants (represented by various kinds of buttons, a Levi-Strauss rivet, shoe grommets/eyelets, and metal buckles) were found. In addition, food remnants (a large number of domesticated animal bones showing butcher marks), and indications of social interaction (a ceramic pipe bowl, whiskey bottle fragments) were identified. Despite this evidence, the architectural remnants at Feature S appear to be distinctly different from any of the extant cabin remains elsewhere at the site, and do not appear to have any clear parallels with the domestic architecture at the Cowell Lime Works site. One possibility is that this feature was associated with the butchering and/or processing of animals to provide sustenance for the lime workers. However, it is likely that there would be far more evidence of butchering if this was the case. In addition, it does not seem likely to have a facility associated with butchering or food production located so far from the barns and the other food preparation areas of the site (Features B, C and V). It still remains possible that Feature S did in fact serve an industrial role associated with lime production (perhaps, as mentioned above, as a barrel mill/stave machine associated with the cooperage), but then why the evidence of domestic refuse? Perhaps this structure, located behind the cooperage and somewhat removed from the core of the community, provided a secluded and private area where lime workers could congregate to socialize and interact without the attention of the overseer or other workers (although see the description of Feature T below). Perhaps it is simply the fact that in our modern conception of the separation of domestic space from work space we mistakenly assume that there would have been a similar spatial separation and distinction among industrial workers in the past when in fact there was not. It is important to remember that this was not simply an industrial facility—it was also a vibrant community. Regardless, Feature S warrants further investigation in the future.

FEATURE T

Feature T proved to be the most interesting excavation context at the site, and the most important concerning the FWVAS's primary research questions. Wheeler (1998:37) provides only a brief description of this feature in his report, referring to it as a "collapsed wood structure" and describing it as "consisting of two or more collapsed wood structures, possible privy pits and scattered artifacts in an area densely vegetated with poison oak." He goes on to note that evidence of looting was found immediately behind the back wall of the cooperage (Feature J). Apparently, the feature was discovered at the end of the survey and Wheeler did not have adequate time to fully investigate it. Despite this, he rightly points out that the feature is extremely important due to the wealth of data associated with it. When the FWVAS relocated the feature in 2008, it appeared much the same as it had in 1998 (Figure 102). The area is covered in dense vegetation and difficult to access, which may be why it escaped the attention of passersby and the level of looting and vandalism that has led to the loss of data from areas like Features F and G. In fact, despite the looter's pits associated with the back wall of the cooperage the structural remains that form the core of Feature T appear to have been left undisturbed. Feature T retains the largest amount of extant architectural elements of any of the non-industrial features at the site. A large amount of milled lumber remains on the surface and vertical posts still jut up from the forest floor. Careful removal of the collapse would likely expose relatively intact elements of the floor and/or subfloor

Figure 102. Figure 62: Feature T as it Appeared in Summer 2009.
Photograph by Rebecca Spitzer.

support beams. In addition, the collapsed remains of what appears to be at least one chimney are still evident. The overall size of the architectural collapse suggests that Feature T either was a larger construction than the other cabins at the site or may consist of the remains of more than one cabin. Based on the excavation finds, the FWVAS has surmised that the feature represents the collapse of a single, double-roomed cabin. As discussed below, it appears that this cabin was larger and more elaborate than the cabins located at Features F and G (based both on the archaeological evidence and the historic photos of the worker cabins), and likely was either the domicile and/or office of the limekiln foreman or was housing for married lime workers. Due to the location of the feature directly behind the cooperage, the most likely scenario is argued to be the former.

The FWVAS carried out excavations at Feature T during the summer 2009 field school. The decision was made to focus efforts on the cabin rather than on the looter pits and possible privy features located along the rear wall of the cooperage. The FWVAS had planned to investigate these contexts during future excavations, but to date this work has not occurred. Four units were excavated at Feature T, all placed along with exterior edges of the structure collapse. As with other excavations carried out by the FWVAS, the placement of excavation units was intended to avoid as much as possible the need to remove or disturb *in situ* architectural features. In the case of Feature T, enough of the structure remains are present that an architectural historian could very likely reconstruct the overall size, shape and internal organization of the cabin.

Unit 16 was a 1-x-2-meter excavation unit oriented north/south and placed at the northeast corner of the collapsed cabin within Feature T (Figure 103). As with the majority of the excavations carried out by the FWVAS, this unit was excavated in arbitrary ten-centimeter levels down to sterile soil (30 centimeters). Excavations here almost immediately exposed several large pieces of milled lumber containing machine cut nails and fragments of windowpane glass (Figure 104). These appeared to be boards from the sides or floor of the collapsed cabin. Interestingly, excavations in level 1 of Unit 16 also recovered a piece of leather perforated with several small nails. This might have been used as a door hinge or to patch a hole in the structure roof or wall. The metal top of a kerosene lantern was also recovered from this excavation level. After taking the entire unit down to ten-centimeter, the structural collapse was photographed and then removed. Subsequent excavations in the unit recovered some of the most significant material relating to the daily lives of the lime workers anywhere at the site. As was typical at other cabin features, a large amount of domestic refuse was recovered, including fragments of ceramic ware and glass bottles, clothing elements like buttons and rivets, and a small amount of food refuse (animal bones). However, a number of special finds were made here that were atypical and quite exciting for the researchers. The first of these was a small white cameo pendant or brooch. The image on the cameo was highly deteriorated, and the cameo itself was no longer in its backing or mounting, but the article was unique and exotic when compared to the other material recovered from the site. Its presence was a surprise, as it may suggest a feminine presence at the site. Of course, such conclusions must be accompanied by serious caveats, but it is interesting to point out parallels with excavations at Cabin B at the Cowell Lime Works, where feminine articles like an abalone shell hair stick were found (Paramoure 2012). Paramoure speculates that the presence of feminine articles at an industrial worksite from this period may indicate that the lime workers patronized prostitutes. This is certainly possible at the Adams Creek facility as well, although it may be that such items were simply keepsakes that the workers had from family members or spouses. It is also possible that there were in fact women and families living at the lime facilities themselves. Perry et al. (2007) note that the Cowell Lime Works had a separate area for married workers. Perhaps Feature T served a similar function at the Adams Creek site.

More intriguing than the possible presence of women here at Feature T is the evidence of children. This came in the form of a small porcelain doll excavated in level 3 of Unit 16 (Figure 105 and Figure 106). This doll is nearly complete and is made of glazed white porcelain with painted facial features. Research found that this specific kind of doll was referred to as a "Frozen Charlotte" doll and was quite popular in the United States and Europe during the late nineteenth and early twentieth centuries. The doll is associated with a folk ballad entitled "Fair Charlotte" that was a cautionary tale in which a young woman disregards the advice of her mother and freezes to death while on an outing with her lover (Fraser 1973). The recovery of this doll at Feature T along with the cameo brooch is strong evidence for the presence of women and children here. In addition, a small foil seal was found in Unit 16 embossed with "Purveyors to his majesty… 21 Soho Street London." Research into this address indicates that it was associated with Crosse and Blackwell, a company that produced pickles, sauces and fruits at this address from the 1870s until 1925. The foil was likely used to seal a jar or bottle of pickles or sauce. While it is unknown how "exotic" this particular foodstuff would have been at the time, it is possible that it was a

Figure 103. Feature T, Surface View of Unit 16.

Photograph by Rebecca Spitzer unexcavated surface view showing relationship of unit to collapsed cabin feature in background.

Figure 104. Feature T, Aerial View of South Wall Profile of Unit 16, Level 1, 0-10 cm.

Photograph by Rebecca Spitzer showing milled lumber collapse from cabin.

Figure 105. Feature T, Aerial View of South Wall Profile of Unit 16, Level 3, 20-30 cm.
Photograph by Rebecca Spitzer showing location of "Frozen Charlotte" doll circled in red.

Figure 106. Feature T, Details of "Frozen Charlotte" Doll.
Photograph by Michael Popham, (left) detail view of "Frozen Charlotte" doll in situ.
Photograph by Rebecca Spitzer, (right) "Frozen Charlotte" doll, ca. late 19th- to early 20th century.

relative luxury good for the lime workers and as such may indicate that the inhabitants of the structure at Feature T were of higher economic status than the workers housed elsewhere at the site. All of this evidence taken together makes for a strong argument that Feature T represents a very different kind of domestic context from that found at Features F and G.

Due to the high volume of special finds in Unit 16, the decision was made to open a second 1-x-2-meter unit immediately adjacent to it. Unit 21 was opened on the south side of Unit 16, creating a total exposure of 2 x 2 meters on the northeast corner of the collapsed cabin. Like in Unit 16, excavators here uncovered a large number of milled wooden boards in the first excavation level. The unit was cleared down to this architectural collapse, which was photographed (Figure 107) and then removed. The soil matrix surrounding the collapse was rich with artifacts and once again several of these artifacts are of special note. Perhaps most exciting was the recovery of five glass marbles. Like the Frozen Charlotte doll found in Unit 16, these artifacts suggest the presence of children at the Feature T cabin. Intriguingly, excavations in level 2 uncovered a large number (approximately two dozen) of small round objects that look like they were carved out of red brick. While it is difficult to ascertain the exact function of these objects, it is possible that they were homemade marbles used to augment the collection of glass marbles. Further excavations in Unit 21 also recovered two small rod-shaped artifacts that appear to be some kind of soft mineral (perhaps graphite) carved into a dull point on one end (Figure 108). The function of these artifacts is unclear, but it is possible they were some kind of toy or game piece. It is also possible that they were some kind of writing utensil, although experiments to see if the material would produce any kind of legible marks when applied to paper proved unsuccessful. Once again, it should be noted that the marbles and these latter artifacts are unique to these particular excavations at the site and seem to indicate the presence of a different demographic here when compared to the material recovered from the Feature F and G cabin sites. However, beyond these special finds the majority of the material recovered from Unit 21 is similar to the other domestic contexts across the site: a relatively large amount of bottle glass, Levi-Strauss rivets, ceramic wares, a ceramic pipe fragment, and metal buckles.

In addition to the excavations at the northeast corner of the collapsed cabin, two other units were opened up at Feature T. Unit 17 was a 1-x-2-meter excavation unit placed at the southwest corner of the collapsed structure, immediately south of a large pile of brick and limestone rubble that appears to be the remnants of a chimney and/or fireplace that stood on the western wall of the cabin (Figure 109). The unit was placed slightly upslope from the chimney feature at what was assumed to be the rear corner of the cabin (based on the assumption that the front of the cabin would have faced the rear wall of the cooperage). The placement and orientation of this unit was chosen based on an attempt to avoid the need to move or disrupt too much structural collapse but also to avoid the surrounding vegetation, including the trunk and roots of a large oak tree. Excavations in this unit proved to be very difficult because of the surrounding vegetation as well as a large number of roots from the tree and poison oak running through the unit. In addition, the excavators almost immediately exposed a large amount of firebrick in the unit, with many pieces still mortared together. This appears to have been the remnants of the chimney feature that had collapsed and scattered around the southeast corner of the structure. The fact that the structure appears to have had a fireplace and/or chimney makes it different from the other cabins at the Adams Creek site. The extant worker cabins at the Cowell Lime Works also did not have chimneys

but were instead heated by cast iron wood stoves. This architectural difference may indicate that this cabin had a different function than the smaller cabins located further to the south at the site (Features F and G).

Figure 107. Feature T, Aerial View of South Wall Profile of Unit 21, Level 1, 0-10 cm.
Photograph by Julie Graff showing milled lumber collapse from cabin and Unit 16 on the left.

Figure 108. Feature T, Unit 21, Special Finds
Photographs by Rebecca Spitzer showing fragments of ribbon glass marbles (left) and carved sticks of graphite or another mineral (center and right).

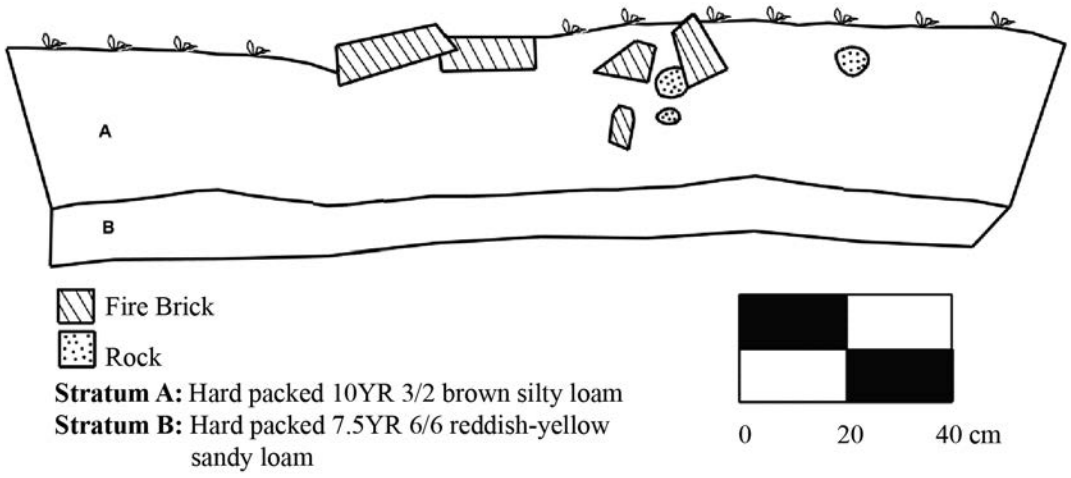


Figure 109. Feature T, East Wall Profile of Unit 17.
Drawing by Christina Balogh.

Unit 17 was cleared down to the level of the brick collapse, which was then photographed and removed. The soil matrix above and around the brick collapse contained a large volume of domestic refuse and debris, including a large amount of bottle glass fragments (Figure 110). Excavations below the brick collapse (level 2) similarly recovered a large amount of bottle glass, with several large diagnostic pieces. Tinoco's (2011) analysis indicates that two of these bottle fragments could be identified as brandy bottles, while two others were bitters bottles, and another was a mineral bottle. Excavations in level 2 also recovered a cut-glass artifact that looks to have been a stopper for a bottle or decanter. The brandy and bitters bottles are unique to Feature T and, like the Crosse and Blackwell foil seal found in Unit 16 may indicate a higher socioeconomic status or preferential access to luxury goods in this location. Tinoco also argues for an occupation range of 1871-1918 based on his analysis of the bottle glass fragments recovered from this unit. This suggests that the structure might have been used predominantly during the Cowell period. The rest of the material recovered from Unit 17 is predictably domestic in nature, consisting of clothing elements like buttons and grommets and fragments of ceramic ware. Level 3 in this unit consisted of relatively few artifacts and the decision was made to close the unit at that point.

The final unit excavated at Feature T in 2009 was Unit 24, which was a 1-x-1-meter unit opened on the northwest corner of the collapsed cabin structure. This unit was only taken down two excavation levels, to a depth of 20 centimeters (Figure 111). The termination of the unit was due to both time pressure as well as a dearth of artifacts relative to other units. Similar to the other units excavated at Feature T, Unit 24 exposed several pieces of milled lumber assumed to be from the collapsed structure. Artifacts recovered from the unit were largely non-diagnostic and consisted primarily of ceramic fragments, bottle glass fragments and nails. Several pieces of window glass were also recovered and were analyzed by Tinoco (2011), yielding a date estimate of 1894. This falls directly in the range derived from his analysis of the bottle glass recovered from Unit 17 and again suggests that the cabin was either built or primarily occupied during the Cowell period of the limekiln operations. One interesting find of note was a butane lighter recovered from

excavation level 1. This artifact bears the logo of Foremost Dairy on the front and has the words "High Quality Lighter, Penguin, NO. 19531 Japan" on the bottom. Cursory research indicates that this lighter dates to Post World War II era. The presence of the lighter here is clearly indicative of ongoing use and disruption of the site well after the limekilns fell into disuse.

Figure 110. Feature T, Aerial View of South Wall Profile of Unit 17, Level 3, 20-30 cm.
Photograph by Rebecca Spitzer, July 31, 2009.

Figure 111. Feature T, North Wall Profile of Unit 24.
Photograph by Rebecca Spitzer.

Taken altogether, the artifact assemblage and structural remnants from Feature T present a fascinating window into the daily life and demographics of the community at the Adams Creek Lime Kilns. Compared to the historic photographs and architectural remnants from Features F and G (the other cabins at the site), it seems clear that the collapsed structure at Feature T was both larger and more complex. From the extant remains visible on the surface, in particular the placement of the *in situ* floor posts, it appears that the cabin at Feature T consisted of at least two rooms. In addition, it appears that the cabin had at least one chimney built on its southern end, although another brick and limestone rubble pile associated with the cabin collapse may indicate a second similar feature. The artifact assemblage indicates two significant differences from the other cabin excavations. First, the presence of women and children is suggested by the cameo brooch, the Frozen Charlotte doll and the marbles. Second, the brandy bottles, bitters bottles and foil seal from Crosse and Blackwell suggest the consumption of higher quality or higher status goods. But what does this actually indicate in terms of the function of this structure?

As stated above, it may indicate that at least some of the men who worked at the Adams Creek kilns were married and living onsite with their families. However, this would not explain the appearance of higher status or more exclusive goods here. Instead, it is possible that the collapsed structure at Feature T was the home and/or office of the kiln foreman. Perry and Perry (2007:126) cite a local newspaper obituary from 1918 for a man named Patrick Dorsey who worked his way up from a lime worker to eventually become the foreman at the Adams Creek kilns in 1867. It is tempting to speculate that perhaps the collapsed structure at Feature T was Dorsey's cabin and office. Regardless, it is clear that Feature T offers an incredibly important opportunity to explore the diversity and complexity of the community that grew up around the limekilns. Of all the contexts explored by the FWVAS at the Adams Creek site, Feature T is the one that most demands further investigation that is much more extensive. As Wheeler himself pointed out in his report (1998:37), "Feature T contains some of the most important information available from this site, concerning the life patterns of the people who resided at this site and/or were employed in the lime and cattle ranching industries…These features embody information unavailable in written histories or local reminiscences." In particular, the evidence for the presence of women and children offers an opportunity to explore a facet of the lime industry that is virtually unknown, and almost completely unacknowledged.

FEATURES X AND Y

Features X and Y were identified by Sam Connell during a pedestrian survey of the area south of Feature A in May 2009 (these features were not noted by Wheeler in his 1998 report). Connell describes these features in his field notes as "stone walls/features" that would have overlooked the Adams Creek site and speculated that they may have been "outliers to the system," inferring that they may not have been contemporaneous with the kiln facility. He goes on to describe both features as "retaining walls" that might have been associated with perishable superstructures. During the summer 2009 FWVAS field school, the decision was made to investigate these features to determine if they were significant to the limekiln research. Efforts to relocate these features indicated that they were quite ephemeral and led the author to speculate that they might not actually represent cultural activity at all. Feature X is comprised of a jumbled pile of what appears to be unmodified limestone and other rock located in the wooded area on the crest of the hill directly south of

Feature A. An historic fence line running east/west across the crest of this hill crosses the very northern edge of Feature X. Feature Y lies further to the west and slightly downslope from Feature X and appears to be a simple line of limestone rock running in a north/south alignment. Like Feature X, Feature Y is crossed by the historic fence line.

In order to investigate these "features," two 1-x-2-meter units were opened in the summer of 2009. Unit 14 was associated with Feature Y and was oriented at a right angle (east/west) to and straddling the line of rock comprising the feature (Figure 112). Unit 14 was excavated in a single level down to ten-centimeter below ground surface and then abandoned. This excavation recovered no artifacts and the determination was made that the rock alignment was not in fact a cultural feature but rather a natural geological/topographic formation. Unit 15 was associated with Feature X and was placed along the western edge of the feature along a north/south alignment. Like Unit 14, this unit was abandoned after a single excavation level of ten-centimeter. The excavation here recovered only two nails and no other cultural material. While the pile of boulders and rock that comprise Connell's "Feature Y" does not appear to be a natural formation, it also does not appear to have been

Figure 112. Feature Y, Aerial View of East Wall Profile of Unit 14, Level 1, 0-10 cm.

Photograph by Rebecca Spitzer showing line of unmodified limestone rock running across unit and historic fence line in background, July 17, 2009.

the focus of any significant cultural activity. Instead, it is likely that the feature is the result of the intentional clearing of rock from the areas around Feature A, either to clear the area for construction or to remove large impediments to the free movement of people and livestock. It is also possible that the feature is the result of removing rock from the route of the nearby access road (currently functioning as a connector trail between Engelsmans Loop and the Old Cabin Trail). While neither of these excavation units yielded any significant cultural artifacts, they were useful exercises for the students enrolled in the FWVAS field school and provided important data regarding the natural topography of the site. As in the Shovel Test Unit program carried out in the initial stages of the FWVAS investigations of the Adams Creek site, these excavations served to underscore the fact that the vast majority of historic land use at the site left behind significant visible traces on the landscape. Further, it indicates that Wheeler's 1998 survey accurately accounted for all significant features at the site.

Discussion

While the work undertaken by the FWVAS at the Adams Creek site consisted primarily of shovel test pits and limited test excavations, the data recovered make it possible to address at least to some degree all three of the research goals originally defined by the project. However, any discussion of the results of the FWVAS must necessarily remain tentative at this point, and further analysis of the materials recovered as well as additional excavation at the site is required to test and clarify any conclusions. The following section is organized according to the three primary research goals identified by the FWVAS at the outset of the Adams Creek project, with brief discussions of the conclusions to be drawn from the data recovered at the site thus far.

RESEARCH GOAL 1

To understand the personal and daily lives of members of the Adams Creek industrial village community.

The excavations carried out by the FWVAS suggest that the daily lives of the workers at the Adams Creek kilns were typical of mid- to late-nineteenth-century industrial communities. The constellation of materials recovered from the worker cabins and the structures associated with food preparation are remarkably similar to those recovered from excavations at the Cowell Lime Works and bear strong resemblance to the material culture associated with workers in other industries in California during the same period (e.g., Paramoure 2012). In general, this evidence indicates that the workers at the Adams Creek facility wore typical work clothes of the time, including Levi-Strauss jeans and sturdy work boots. At least some of the workers likely owned and maintained their own tools and apparently stored some of their tools in their cabins. In addition, evidence suggests that the workers experienced at least some degree of leisure time during their daily routines based on the plethora of alcohol bottles and ceramic pipe remnants recovered from the site. Similarly, while the spatial patterning of data at the site indicates that the majority of food production and consumption took place at a central, communal location (the cookhouse, with food provided by the lime company); at least some food consumption also took place in the cabins themselves. This food consumption appears to have consisted of foodstuffs obtained independently by the workers; including at least some wild hunted and/or scavenged foods (as evidenced by the large amount of clam shell associated with Feature F and the relatively high incidence of rifle and shotgun shells in the artifact assemblage across the entire site).

The evidence clearly indicates that the Adams Creek Lime Kilns site should be understood as a village community. However, the question of how many of the workers actually lived on-site is difficult to answer. Based on both the archaeological excavations and historic photos of the kiln facility, it

appears that at most there were four or five cabins built at the site prior to its abandonment in the early twentieth century. This would seem to be an inadequate amount of housing for the number of workers required by the lime production process. Hence, it is likely that at least some of the workers commuted to the kilns from nearby communities and did not actually live at the site itself. However, these workers would still have consumed at least some of their meals on-site and therefore would have been part of the daily fabric of the community.

Archaeological studies of community demographics are fraught with difficulty. In particular, attempts to identify ethnic, racial or gender identity via material culture are notoriously challenging. Despite this caveat, the material from the Adams Creek site does offer some enticing clues as to the diversity of the village community. As Paramoure (2012) points out in her exploration of the materials recovered from Cabin B at the Cowell Lime Works, certain foods might indicate ethnic identity. Without a detailed faunal analysis of the remains recovered by the FWVAS, it is impossible to delve into this question too deeply. However, the marine shell found almost exclusively associated with Feature F might indicate an ethnic difference between the workers lodging here and workers occupying other cabins at the site. Paramoure suggests that marine shell might be a strong indication of either Portuguese or Italian ethnic identity, but it is important to keep in mind that it may also simply indicate the personal preferences of a single worker or group of workers within the community. It is also important to be cautious when assuming that this material was exclusively associated with Feature F based on such a limited test excavation program. Further excavation in and around the other cabin features may well uncover similar deposits elsewhere.

More interesting is the presence of jewelry and children's toys in the material assemblage associated with Feature T. The jewelry may indicate the presence of a woman or women at the site, although the exact relationship between this feminine presence and the workers is impossible to determine. Excavations at the Cowell Lime Works recovered similar material from Cabin B, which was inhabited by single male workers (Paramoure 2012). Paramoure (2012) argues that this may indicate that the male workers occasionally brought prostitutes to their cabins and states similar evidence from other industrial villages in California. This is certainly possible at the Adams Creek site as well. However, the presence of the porcelain doll, glass marbles and other toy-like objects presents an alternate possibility: that at least some of the workers may have had families living with them at the limekilns. While historic records indicate that Cowell maintained separate living quarters for married workers at the Cowell Lime Works, the image of women and children at the limekilns site is rarely if ever presented in modern or historic discussions of the lime industry. The fact that these individuals were part of the community has been virtually ignored yet including them in the historic imagination underscores the fact that the limekiln facilities truly were villages with a wide range of individuals living and working there. Based on the evidence from the FWVAS excavations, it is possible that Feature T was the location of housing for married workers at the Adams Creek complex.

One other type of diversity identifiable across the Adams Creek site may be that of socioeconomic status. There appears to be a significantly larger amount of higher status or higher quality goods associated with the assemblage recovered from Feature T compared to those from the other cabins at the site (Features F and G). Further analysis of the material is required to clarify this pattern, but in general it suggests that the individuals occupying the

cabin or cabins at Feature T had access to more expensive luxury goods. This, coupled with evidence of the presence of women and children in this same context, leads to some intriguing questions. Was this perhaps the cabin of the limekiln foreman or manager? Alternately, were married workers typically of higher status or in positions garnering higher pay? These questions must remain unanswered at this point, but further investigation of Feature T may provide further information. The location of Feature T directly behind the cooperage and in such close proximity to the kilns and quarries does not seem to recommend it as an ideal location for married workers with children. If, however, it was the cabin or office of the foreman or supervisor the placement makes much more sense.

Overall, while the excavations at Adams Creek indicate that the community was typical of industrial villages at the time, they also offer a fascinating glimpse into the diversity of that very community. Historical records tend to paint the nineteenth-century industrial setting as being very homogenous and almost exclusively male. Archaeological excavation has the ability to present a more nuanced and dynamic picture, one that includes all the members of the community rather than just those deemed to be "important" by historic chronicles and documents.

RESEARCH GOAL 2

To identify and define domestic and work spaces during each period of utilization at the site: the nineteenth-century Samuel Adams limekilns operation; the late nineteenth- and early twentieth-century Cowell limekilns operation; and the subsequent twentieth-century Cowell ranching activities.

The question of contemporaneity at archaeological sites is an important one, but often difficult to resolve. In particular, when investigating a site like the Adams Creek Lime Kilns which was in use for a relatively brief period (from the late 1850s to the early 1900s—a span of approximately 50 years), the effort becomes even more complex. Luckily, the period during which the Adams Creek kilns were in use was also one of rapid technological development, which does yield some useful tools for estimating the approximate construction date for the buildings at the site. Despite this, the results of the nail and window glass analyses conducted by Tinoco are largely inconclusive, other than verifying that all of the architecture at the site was in fact built during the latter half of the nineteenth century.

When referring to Figure 54 showing Tinoco's nail statistics, there appear to be two clear modal distributions at the site: units with more than 90% machine cut nails and units with between 70%-85% machine cut nails. Based on this, one might argue that there were two distinct construction phases at the site. However, upon closer inspection it becomes clear that these two distributions are occasionally found in different units associated with the same feature. For instance, Units 6 and 13 are both associated with Feature D yet each display significantly different nail distributions. The same is true for Feature G, where Units 3 and 4 each contain over 90% machine cut nails yet Unit 10 had just over 30% wire cut nails. In the case of Feature D, it is possible that the variation is due to continued use of the interior of the "cistern" feature as a midden after the site was no longer functioning as a lime burning facility. In the case of Feature G, it is possible that two cabins were constructed in this area of the site and that the first (located on the northern end of the feature) was built earlier than the second (located on the southern end of the feature).

In general, the evidence recovered during the FWVAS excavations suggests that the majority, if not all, of the architecture at the site was built during the Adams lime operation or at the very beginning of the Davis & Cowell lime operation. The buildings do not all appear to have been built at the same time but determining the exact timing and order of construction may be impossible. Despite this, two facts do seem to be unquestionable. First, the lime cement road running between the two barn features was a very early feature of the site and was built prior to the construction of Feature D. Second, the "South Barn" (Feature A) appears to have been renovated and/or remodeled at some point later than most of the other buildings (based on the large percentage of wire cut nails associated with the structure). Further, it does not appear that there were significant shifts in land use or functional contexts at the site across the two different lime operation periods. While Davis & Cowell may have renovated some of the architecture and added a few buildings to the overall complex, there is no major episode of construction or modification evidenced in the material record. Instead, it would seem that Davis & Cowell simply continued the lime operation relatively unchanged from the Adams era. There is also at least some evidence that several of the buildings continued to be used into the twentieth-century Cowell ranching period. The barns certainly appear to have been maintained well into this period and it is possible that some of the cabins (in particular at Feature G) also experienced continued use.

Differentiating functional use of the buildings at the site was relatively straight forward, with a few key exceptions. Overall, Wheeler's original assessments of the architecture during his 1998 survey are supported by the evidence recovered by the FWVAS excavations. There appears to have been very little overlap of work and domestic space at the site, with the worker cabins spatially segregated from the kilns and quarries and physically separated from the latter by both landform and roads. The one exception to this rule is the cabin or structure identified by Wheeler as Feature T. This construction was located directly behind the cooperage and is located much closer to the kilns and quarries than any of the other cabins. Despite this location, the artifact assemblage recovered from Feature T clearly indicates a domestic function. Not only this, but as discussed above the recovered material suggests the presence of women and children. It is possible then that this building represents a mixed work/domestic context—perhaps it functioned as both the domicile and the offices of the plant foreman or supervisor.

Another interesting spatial pattern at the site is the location of the cookhouse and associated food storage and preparation areas (Features B, C and V). These structures are clustered together in an area in the southwest quadrant of the site, equidistant between the two barns. The location of the food preparation areas here may have been to exploit the proximity of the barns for access to fresh meat and also to have access to the small spring and stream that runs downslope past the "cold room" (Feature V). This location is also removed from the kilns, cooperage and quarries, which might have been a way to minimize noise and dust from the lime operation while the workers were eating.

Ignoring the large barn foundations, the net result across the site is of three distinct areas of activity: a food production and consumption area, the domestic area associated with the worker cabins, and the "industrial" area associated with the cooperage, kilns and quarries. Feature T straddles the boundary between the domestic and industrial areas. It should also be pointed out that evidence from the worker cabins suggests that while these three different areas of the site may have been physically separated, the tools and practices associated with each disparate area were not always so clearly segregated. Excavations at

Features F and G recovered clear evidence of typical domestic material, including bits and pieces of clothing, bottle fragments and clay pipe fragments. However, evidence of food production and consumption was also found at the cabins, including faunal material and fragments of utensils and ceramics. Finally, some of the cabin excavations yielded artifacts that were likely tools used in the quarries. This suggests that the men living in the cabins stored and maintained their own tools and engaged to at least some degree in independent acquisition, preparation and consumption of food. Hence, while there were certainly separations between work and domestic space at the site, the workers very likely blurred those boundaries regularly.

The main exceptions to the pattern described above are Features D and S. In both cases, Wheeler's initial assessment and subsequent inspection by the FWVAS at the outset of the project suggested that these structures were nondomestic contexts. Wheeler describes Feature D as a "cistern," and while he does not offer any specific justification for this assessment, the feature does not appear to be similar to any of the worker cabins found elsewhere at the site or at other limekiln facilities in the area. Despite this, excavations at Feature D recovered a large amount of what appears to be domestic refuse, including clothing remnants, bottle glass and ceramic wares. It is possible that this material accumulated here because of disuse of the structure and is therefore midden material, but ultimately it leaves the function of this structure uncertain. The location and style of architecture does not fit with the idea that it served a domestic purpose, yet the material associated with it does not indicate any other specific function. Barring further investigation, it is impossible to ascertain the role of this structure within the larger limekiln complex.

Feature S offers a similar challenge. This area of the site consists of at least one structure, and possibly more than one, comprised of a rough brick and limestone foundation and a collapsed wooden feature. Wheeler noted what he hypothesized was a large metal machine mount associated with the stone foundation. Based on this, and the physical location of the feature in close proximity to the kilns and quarries, the FWVAS assumed that this was an industrial context. However, the majority of the material recovered here consists of typical domestic refuse. There may be a number of reasons for this. First, it is possible that in fact this was the site of a cabin, although structurally it is quite different from the other cabins at the site. Another possibility is that it was an industrial structure that also served as a gathering place for social interactions between the workers, perhaps during breaks from work or while off-shift. One of the hypotheses pondered during the excavations was that this was the location of the barrel mill mentioned in an early description of the Adams Creek facility. The placement of the structure near the eastern end of the cooperage may support this speculation. Further, it is possible that the barrel mill was only used occasionally and hence an area of congregation for the workers. Of course, this is pure speculation and necessitates further investigation of this feature as well as comparison to contemporary examples of barrel mills if there are any extant. A final point regarding Feature S is that while four excavation units were opened here, all were small test excavations (1-x-1-meter) and all were located along the edges of the feature. As such, it is possible that the domestic material recovered in these excavations is the product of taphonomic processes and recent historic disturbance at the site. This area of the site in general does show some evidence of recent looting activity. Before arriving at any conclusions regarding the use and function of this structure, it will be necessary to explore the feature more thoroughly.

RESEARCH GOAL 3

To identify changes in land use patterns and understand the environmental impacts of the lime industry.

The work carried out by the FWVAS at the Adams Creek site at best only tangentially addressed this particular research goal. In particular, limited time and resources did not afford the opportunity to delve into the question of the environmental impact of the lime industry to any significant degree. Despite this, it is clear that the nineteenth-century lime industry had a significant and lasting impact on the environment of Santa Cruz County. Historic documents indicate that the decline of the industry in the early twentieth century occurred at least partially due to decreasing sources of fuel for the kilns. As Wheeler points out, "Logging of the forests for lumber and fuel had denuded most of the timberlands, and alternate fuels were expensive and costly to transport…" (Wheeler 1998:8). Newspaper reports from the time indicate that some residents of Santa Cruz County were very concerned about the deforestation caused by local industries and the ensuing impact on the environment and domestic fuel supply (Perry and Piwarzyk 2007b). The rate of deforestation had accelerated to such a degree by the turn of the century that it spurred the establishment of the Sempervirens Club, which was established in 1900 to preserve old-growth forests and the coast redwood forest specifically (Yaryan 2000). The legacy of this deforestation is still easily seen in the forested areas surrounding the Adams Creek site. Massive redwood stumps carry notches cut into their sides to accommodate the boards on which the lumberjacks stood while operating the huge hand saws used to fell the giant trees. The remnants of what was likely one of many timber camps can be seen nestled along the side of Old Cabin Trail in Peasley Gulch. Many of the trails in the park trace old roads and paths associated with the lime and lumber industries (e.g., "Woodcutter's Trail"), and the remnants of old skid roads can be found throughout the area.

In addition to deforestation and the associated impacts on the environment and wildlife in the area, the lime industry also permanently altered the landscape within which it operated. Extant evidence of the lime industry can be found across the region. At the Adams Creek site, this is most clearly seen via the three large limestone quarries. The blasting of limestone out of these hillsides has left permanent scars on the landscape that, while perhaps only having minor environmental impact, has certainly had an aesthetic impact on the area. The construction of roads like the one running under Feature D at Adams Creek have left a lasting imprint as well, and in the case of this specific road has served as a drainage feature that has contributed to the erosion of hillsides and banks. The limekilns themselves, along with the barn foundations, are massive structures that are constant reminders of the lime industry, but also have become potential hazards to the public as they slowly deteriorate. In particular, the westernmost kiln at the Adams Creek site appears on the verge of collapse (see Figure 41). Despite this, the FWVAS frequently saw evidence of park users interacting with and exploring the inside of the kiln. Overall, although the Santa Cruz lime industry largely ceased operation over a century ago, it is still a very prominent part of the local landscape, albeit one that is rarely understood or acknowledged by the public.

In terms of changes in land use at the Adams Creek Lime Kilns site, we know from historic records that the kilns ceased operation in 1906 (Jensen 1976). After that, it appears that the Cowell family continued to use the area around the kiln facility as ranch land for dairy and then beef cattle. The archaeological excavations carried out by the FWVAS

indicate that all of the extant architecture at the site was built well before this change in land use. While most of the material recovered also supports the idea that the site saw its most active period prior to the cessation of lime operations, there is some evidence that at least some of the buildings were renovated and/or occupied into the early twentieth century. However, there is no indication of any major landscape modification or new construction during the latter phase of the site. This suggests that Cowell simply left the buildings associated with the lime production era to slowly fall into disrepair, with the exception of the barns and perhaps one or two of the cabins. It also clearly indicates that the industrial village that emerged here during the second half of the nineteenth century was abandoned soon after the turn of the century as the quarries and kilns fell silent.

Conclusion

The excavations conducted by the Foothill-West Valley Archaeological Survey at the Adams Creek Lime Kilns site serve to underscore the value of archaeological research focused on the daily lives of "common people." This work offers tantalizing glimpses into the life of an industrial village, portraying the full range of participants in that community. Many of these participants have thus far remained virtually invisible within the modern imagination, rarely reflected in written or pictorial histories of the time and only recently appearing in modern historical accounts. However, the work carried out thus far at the site has been largely exploratory in nature and a tremendous opportunity remains to explore the hidden history of the Santa Cruz lime industry through the lens of the Adams Creek site. Not only were the excavations carried out by the FWVAS primarily comprised of small test units, but also much of the recovered material has only been cursorily analyzed. As such, a wealth of data already exists that may yet yield further insights into the research questions outlined above. It is hoped that the work presented here will serve as the basis for more extensive work at the site, and that subsequent investigations will further our understanding of the dynamic life of this important part of Santa Cruz history. It is gratifying to know that, as of the writing of this report, further work at the site is being conducted by David G. Hyde as part of his doctoral research at the University of California, Berkeley.

It is also hoped that the results presented in this report, however tentative, will be useful to the State Parks in developing interpretive materials for the site itself. Especially as archaeological work continues at the site, engagement with the public will be both necessary and desirable. Public signage and descriptive information may help foster a greater sense of stewardship on the part of park visitors and may help to minimize ongoing damage to the structural remnants of the kilns and barns. The kilns in particular have suffered from years of benign neglect and may soon need to be completely restricted from the public for safety reasons. In this regard, the author would like to echo Thomas Wheeler's recommendations from his 1998 survey of the site. Many of the archaeological features hold invaluable information about the history of the lime industry and the communities associated with it, but several of the most important features are in danger of looting or other damage from park visitors. Other features are endangered by the elements and ongoing structural decay. As the history represented by this site becomes more and more distant, the need to preserve those remaining elements grows ever greater. It was a great privilege to be able to conduct work at the Adams Creek Lime Kilns, and it is the author's greatest hope that the work reported here has made a positive contribution to the preservation and public understanding of this fascinating site.

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