

## GOING UNDERGROUND AT CAL: 2003 ON-CAMPUS EXCAVATIONS AT THE UNIVERSITY OF CALIFORNIA, BERKELEY

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*In June, 2003 thirty-five field-school students excavated the underground remains of the late 19th-century Students' Observatory and Botanical Conservatory on the University of California, Berkeley campus. Our ongoing investigations into the archaeological and archival materials pose questions about social and academic communities of past scholars, and the University's changing educational and architectural priorities.*

Looking out from the Berkeley Hills over the University of California campus gives only a hint of the historical depth of the grounds. Much has changed in the central campus since the institution was founded in the 1860s, and as the oldest of the University of California campuses, many potential sites of national significance are preserved here. In June, 2003, Dr. Laurie Wilkie led a crew of University of California, Berkeley archaeology students in excavations at two such sites: the Astronomy Department Students' Observatory (ca. 1886-1973) and the College of Agriculture's Conservatory (ca. 1894-1924) (Figure 1).

### PROJECT BACKGROUND

In 2002, University of California Capital Projects approached Dr. Wilkie to archaeologically test the locations of these two historically documented facilities, both in the construction area of the East Asian Studies Department's proposed Tien Center (Wilkie and Kozakavich 2004). According to current architectural plans, a library and departmental building will be erected east of Haviland Hall, in an area that has been open space since the 1924 demolition of the conservatory and the 1970s abandonment and partial destruction of the Students' Observatory.

At the site of the former Zeta Psi Fraternity House, today the Archaeological Research Facility building at 2251 College Avenue, University of California students demonstrated that archaeological investigations of campus sites can be successfully combined with field school programs. Also supervised by Dr. Wilkie, the 1995 and 2001 excavations at the Zeta Psi house were popular with students due to the ease of access to the site, their own connection with the campus community,

and their ability to maintain other local obligations during a field class. We chose to operate a similar field school at the Observatory and Conservatory, with 35 students, three Graduate Student Instructors, and four weeks of excavation. University of California Capital Projects also funded the labor of one graduate student researcher and undergraduate work study students to conduct archival and materials research, and to aid in report preparation following the excavation.

### THE STUDENTS' OBSERVATORY

The Students' Observatory was founded with an appropriation of \$10,000 in 1885, and instruction in astronomy began two years later. Professor Armin O. Leuschner took over the nascent program in 1892, and in 1896, the Astronomy Department was officially founded (Crawford 1939:2). Construction began on a few small buildings at the Students' Observatory in 1886 (Figure 2). During the earliest years, visitors were welcomed to the facility several times a month, as evidenced by a number of *Daily Californian* advertisements. This extract from September 2, 1897 is typical:

The Students' Observatory will be open to visitors, as usual, the first and third Monday of every month from 7 to 10 o'clock pm. Admission will be by ticket, good only for night issued, which may be procured in advance at the Recorder's office. The number of visitors on any one evening is limited to twelve.

The Department of Civil Engineering and Astronomy also published the *Monthly Meteorological Synopsis of Berkeley*, a newsletter that was sent to interested members of the campus community. Berkeley newspapers, such as the *Berkeley Daily Gazette* (Schwartz 2000), regularly featured articles on

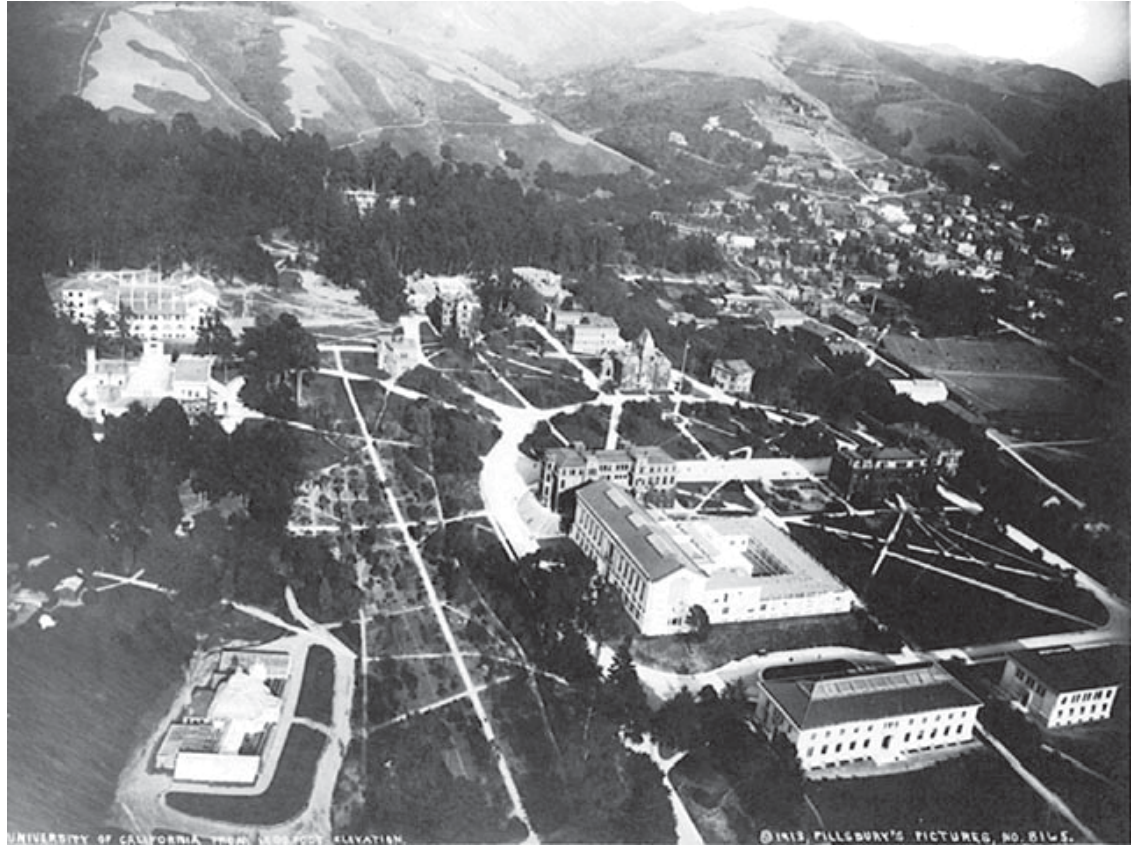


Figure 1: "University of California From 1500 Foot Elevation," Observatory and Conservatory structures in bottom left corner (Pillsbury Pictures 1913).

Figure 2: Photograph of Students' Observatory ca. 1890 (courtesy of Harold Weaver).



seismological and astronomical research being conducted on campus. Aptly named, the Students' Observatory was the place where undergraduates took classes and conducted research, while graduate students worked at the Lick Observatory on Mount Hamilton.

By 1903, the astronomy program added additional telescopes and other equipment, like the first seismograph in the western hemisphere, to their modest group of structures on Observatory Hill. Some time before 1908, the classroom building was constructed and the Observatory structure expanded to the east with an addition that tripled the size of the original complex. A 1911 Sanborn Map Company insurance map also shows the location of a platform that later became known as the "Golden Bear" to the south of the original building (Sanborn Map Company 1911). This platform, designed to look like the deck of ship, was used to teach students the science of nautical survey. As of 1933, the Observatory complex included multiple classrooms, domes, and other facilities and remained densely covered with structures until just before its demolition (Figure 3). In the early 1970s, after much protest from concerned members of the campus community, the University demolished this building complex, leaving only wall fragments from two of the structures.

#### Archaeology at the Students' Observatory

Before the start of the field program, structural remains were visible above the surface of the site, and historical photographs suggested that the modern ground level was similar to what it had been through the

past century. Therefore, we expected to find ample sub-surface remains from the Observatory from which to learn about social activity during the buildings' use. However, we quickly discovered that University landscaping crews had mechanically leveled much of the historical matrix and added different layers of sandy fill over the buildings' sparse demolished remains. On a positive note, field school students had an opportunity to learn stratigraphic excavation in units where it didn't matter much if they made mistakes. Unfortunately, we recovered very little archaeological evidence from the Astronomy Department's occupation.

Field school students excavated a total of 40.75 square meters at the Students' Observatory site during the 2003 season, in areas both inside and outside of known building locations. A portion of the original structure's front (southern) wall had been spared demolition, and a section of the brick foundation was left, so using the building dimensions recorded on the 1911 Sanborn map, we placed units to find the northwestern corner of the structure and locate evidence of room partitions inside. We identified surviving brick foundations in seven of these excavation units (Figure 4). Scant artifactual evidence of the historic occupation was found only in the units adjacent to standing foundation remnants.

Artifacts recovered from these excavations included ceramic, glass, and metal objects. The vast majority of ceramics from the original Observatory building and yard were structurally related, including utility porcelains representing parts of a toilet, sink, and light fixtures. A minimum of five porcelain electrical insulators was recovered, and terra-cotta and coarse earthenware drain pipes, suggesting both sewage and run-off water removal, were also found. We recovered a minimum of five ceramic tableware vessels from the area: a plain porcelain plate, an undecorated whiteware teacup, an undecorated whiteware plate, a brown transfer-printed ironstone bowl, and a turquoise-glazed whiteware art-pottery plate. While the undecorated whitewares and porcelains could have been manufactured anytime during the Observatory's occupation, the brown transfer-printed wares were particularly popular from the 1880s to the early 1900s. Art pottery was popular through the 1930s and 1940s (Cunningham 1992). These

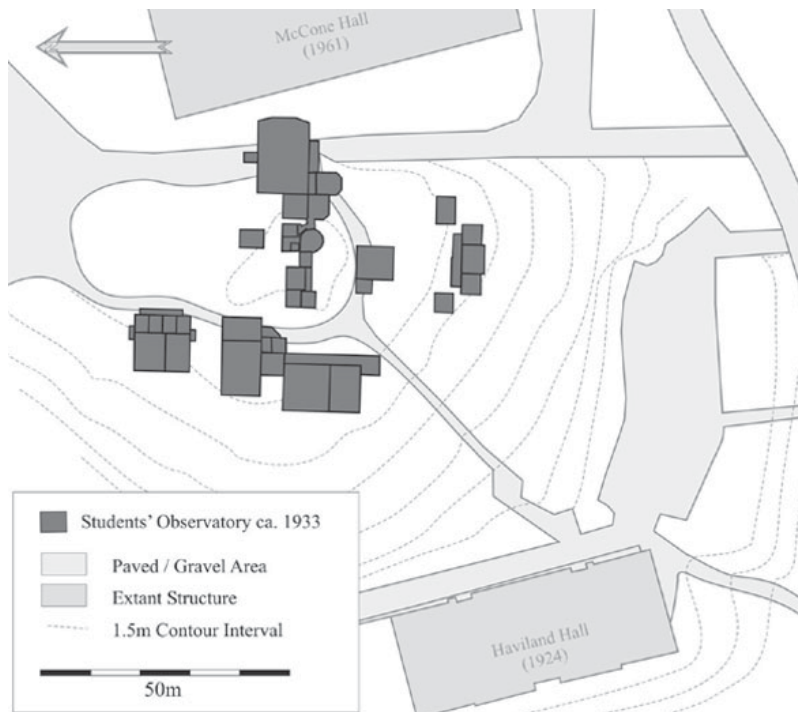


Figure 3: 1933 extent of Students' Observatory relative to modern landscape.



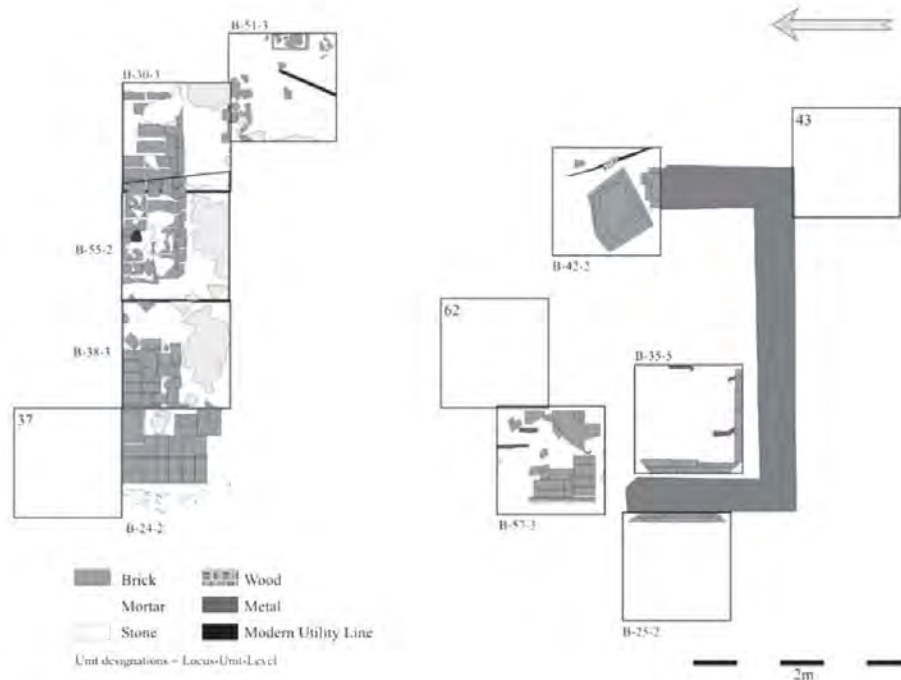


Figure 4: Architectural remains in excavation units at Students' Observatory.

ceramics may be a small glimpse into the lives of the students and others who resided in the Observatory.

The glass remains from the Students' Observatory suggest the deposition of a small number of electrical parts (fluorescent light bulbs and circuits), one medicine bottle, and a modest number of beverage bottles.

A hand-painted China clay marble recovered from Unit 56 is white with remnants of red and green paint still intact. The design is badly worn, but a bulls-eye pattern can be seen on one side of the marble, and bits of green paint still cling around the center. China clay marbles like this were popular from 1884 through the 1920s (Grist 2000: 4). This manufacture date suggests that the marble's deposition occurred early in the occupation of the Observatory. Was this a toy played with by a child of one of the astronomers? Or perhaps, the astronomy students themselves, bored with long nights of record keeping, amused themselves with marble games. Two notable coins also found at the site, a 1954 Japanese 100-yen piece and an 1887 American "seated liberty" dime, were manufactured at times when the Observatory was still in use.

Archaeology students working at the Observatory site excavated one unit adjacent to a granite pillar located north of the building remains. This feature is visible in early photographs and could have provided a useful anchoring point for mapping the other structures, if it had not been moved since its installation. The results of our excavation showed this to be the case. Discarded redwood lumber scraps surrounded the

pillar's base, at 80 cm below surface. It is our belief that the lumber was from a pallet or similar platform that was used to lower the pillar into its construction trench and then discarded as backfill. The remainder of the backfill was coarse gravel which, presumably, would have allowed for the pillar's position to be adjusted and properly leveled once in the ground. To our surprise, excavators found pinhead-sized balls of mercury resting on the wood scraps at the base of the pillar. We stopped excavation temporarily in order to alert the campus' hazardous waste unit and, although the amount of mercury recovered was found to be of little threat to our workers, the illustration of the unit's stratigraphy was completed under the guidance of the hazardous waste unit, and we abandoned further excavations around the pillar. The mercury ended up being the most significant find from the Observatory. Pools of mercury were used in making solar observations in the yard, as can be seen in a ca. 1890 photograph of an astronomy class at work (Professor Harold Weaver, personal communication 2003). One spilled dish of mercury could account for all of the droplets we found at the base of the siting pillar.

While the artifactual material from the Observatory archaeological site was sparse, we fortunately have access to other resources which help us understand daily practice in the campus astronomy community. One of the treasures of our campus is Emeritus Professor Harold Weaver, who first came to Berkeley as an undergraduate in astronomy in 1934 and returned as faculty in 1951. In addition to his remarkable memories of inhabiting this complex, he also managed to salvage two scrapbooks from the old building before its demolition. He has kindly shared these with us. The scrapbooks provided by Professor Weaver include cartoons drawn by students that record their relationship to the social space of the complex, as well as musings, departmental announcements, and other whimsy that provide us a rare view into this community (Figure 5). Further, in addition to the architecture still on site, the astronomy department saved one piece of an old door frame from the Observatory. Written on this board are

the initials and heights of students in the astronomy program who worked at the Observatory. With these tools, we can begin to construct a materially-based social history of this internationally significant academic community.

## THE CONSERVATORY

In an 1890 or 1891 memorandum, Eugene Hilgard, of the College of Agriculture, articulated the need for a new facility to replace the dilapidated structures used to house botanical and agricultural research collections. The building requested by Hilgard would not be the first, nor the only, glass house on campus, rather it was a replacement for aging College of Agriculture structures which housed sensitive exotic and economic plant collections. In response to Hilgard's requests, a Regents' Special Committee on the Plant House formed to solicit and receive proposals for the desired structure.

On March 23, 1892, after reviewing proposals from three other applicants, the committee received an answer to their need in the form of a letter from W.A. Burnham, President of Lord and Burnham, Co. of Irvington, New York. The Lord & Burnham Corporation began in 1856 as Lord's Horticultural Manufacturing Company, which settled in 1870 at Irvington, New York, near the estates of wealthy private clients (Burnham Corporation 1956). Lord & Burnham's 1892 catalogue, which would have been available for perusal by the University of California committee planning for their own conservatory, boasts among their clients Jay Gould, T.C. Eastman, and William Rockefeller of Tarrytown, New York. In similar pattern to that displayed by Lord & Burnham's client lists, most other northern California conservatories of the late nineteenth and early twentieth centuries were part of private estates, rather than the property of public institutions. An 1879 article by Charles H. Shinn in the *California Horticulturist* describes a few of these structures. The Stanford and Hopkins conservatories of San Francisco apparently represent "what the wealthy citizens of California are really doing in the growth and delight of flowers" (Shinn 1879:337).

W.A. Burnham saw the opportunity to expand his company's clientele to the West Coast. While negotiating the contract, Burnham wrote to his Berkeley contractor, George Pape, that "We are anxious to put up one of our Iron Houses on the Pacific Coast, and we know of no better place to put it than at the University of California. It certainly will be of great advantage to us" (Burnham 1892). Construction of the

Conservatory began in 1894 and continued through 1895. Local excavating, masonry, and glass contractors erected the structure from pre-fabricated parts and plans that Lord & Burnham shipped to their client by rail. Photographs in the collection of the Bancroft Library illustrate small changes made to the Conservatory's structure and surroundings in the years following construction. In an 1897 photograph in the collection of the Bancroft Library, the glass surfaces are whitewashed to filter sunlight for the plants within. Out-buildings associated with the Conservatory are also visible in a small number of photographs. In a rare aerial view showing the rear of the building (Figure 1), a small structure is located behind the east wing, a larger one (presumably the potting shed) behind the Palm House, and a lath house behind the west wing. These buildings are also present on the 1911 Sanborn map, but were not part of the plans tendered by Lord & Burnham.

Corresponding information about what was going on inside the Conservatory is comparatively sparse. Only two photographs in the Bancroft Library collection illustrate the interior of the Palm House and the Carnation House in use. Aside from this, our best insights are drawn from a review of the *Daily Californian* student newspaper. An 1896 article heralded the success of one of the "rare plants":

The three carica pepaia, or so called melon trees, in the west wing of the conservatory, are now laden with fruit. There appears to be two varieties, but in reality there is but one. The male and female trees bearing entirely different fruit. (These melons are highly esteemed by natives of the Islands, yet they are not very tempting to the European and American palate, so there is little danger of a moonlight raid) [*Daily Californian*, 10 Sept. 1896]

Later that same year, the same newspaper reported,

Notwithstanding the stringency of funds, work in and about the conservatory has progressed very noticeably. Many new and interesting plants have been received. The cotton plant with its round bulb of cotton, attracts much attention. It was grown from the seed here in Berkeley [*Daily Californian*, 2 Nov. 1896]

The mention of the cotton plant provides evidence that some research was being conducted within the greenhouse. Hilgard was part of a mid-nineteenth-century soils survey in the American South, and a review of his publications indicates an interest in developing cotton agriculture in California—today one of the state's thriving agricultural industries.

By the time the University of California Conservatory was built in 1894, the fashion of elaborate

glasshouses was in decline, and the decorative building could not fulfill the College of Agriculture's research needs. Its short lifespan attests to the fact that it was a temporary solution to an immediate need, and did not figure into the larger plans for Cal's growing landscape. A 1912 report in the *Daily Californian*, on renovations at the Conservatory, reported that

While the Conservatory is being rejuvenated as far as possible it is certain that it will not suffice for the Agricultural Department for any length of time. A committee composed of Professors Wickson and Setchell and Mr. Lipman, was appointed last November to investigate ways and means for new greenhouses and agricultural laboratories. It is expected that an appropriation for this purpose will be made by the Regents.

The Conservatory also has no place in the plans for the greater university so new structures must be made in time [*Daily Californian*, 8 Feb. 1912]

In the 1920's, botanical collections were relocated to the current Strawberry Canyon location, and around 1924 the Conservatory was demolished.

#### Archaeology at the Conservatory

Our search for architectural remains of the UC Conservatory began with 50 cm x 50 cm units plotted at five-meter intervals along two east-west lines across the historically documented location of the Conservatory. At 18-20 cm below surface in one test unit, part of an intact brick structure was uncovered in a silty clay layer below the decomposing mulch. This unit was expanded into a two-square-meter unit that would become part of the east wing block excavation. Sixty-two square meters of site area were excavated at the conservatory, with 28 square meters in one block exposing a 3 x 9-m section of the eastern wing (Figure 6). This excavation block was vital to our understanding of the internal layout of the wings and shaped our testing of the west wing.

Figure 5: Hand-drawn cartoon from the Students' Observatory "Blues Chaser" Volume 1, Page 62 (Courtesy of Harold Weaver and the UCB Astronomy Department).

We quickly found that despite electrical, water, and sprinkler-system intrusions, and that while the topmost courses of brick had been removed during demolition, the foundation was consistently and remarkably intact, measuring three courses wide at its uppermost extent. (Figure 7). We also recovered a series of brick and cement piers on the interior of the structure that appear to be associated with the heating system used in the greenhouses. The contract provided by Lord and Burnham in 1893 described their obligation, "to provide 4" cast iron pipes in nine foot lengths weighing about 11 or 12 lbs per lineal foot, to be arranged under the side tables in the various houses, consisting of about 3,000 feet, also fittings, valves, expansion tanks and other necessary appliances to complete the apparatus and control the temperature in each compartment" (Lord & Burnham Co. 1893). Further, two interior photos of the Palm and Carnation houses, in the collection of the Bancroft Library, show heating pipes resting on support surfaces, which resemble these piers, emerging slightly above the buildings' dirt floor.

The Conservatory excavations recovered a relatively small amount of materials, considering the size of the original structure. Window glass, slate tile fragments and red earthenware plant-pot sherds dominated the finds. We expect that most of the glass, iron framing, slate tile, and metal tables were recycled or disposed of off-site. Artifacts that were left behind speak to the workings of the plant houses.

A total of 1,455 small fragments of slate was recovered throughout the excavations at the Conservatory. Slate was used in the construction of plant

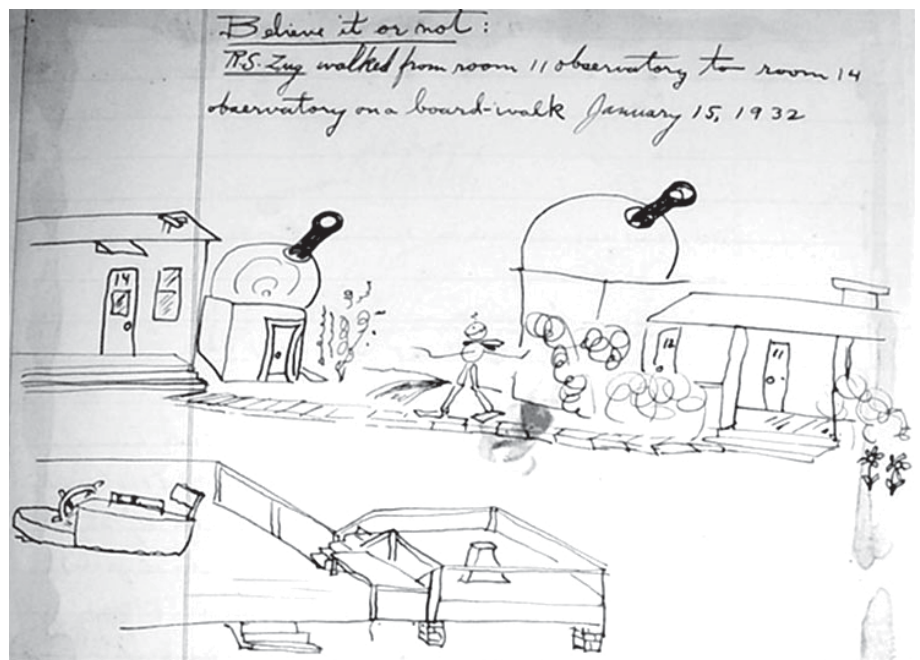
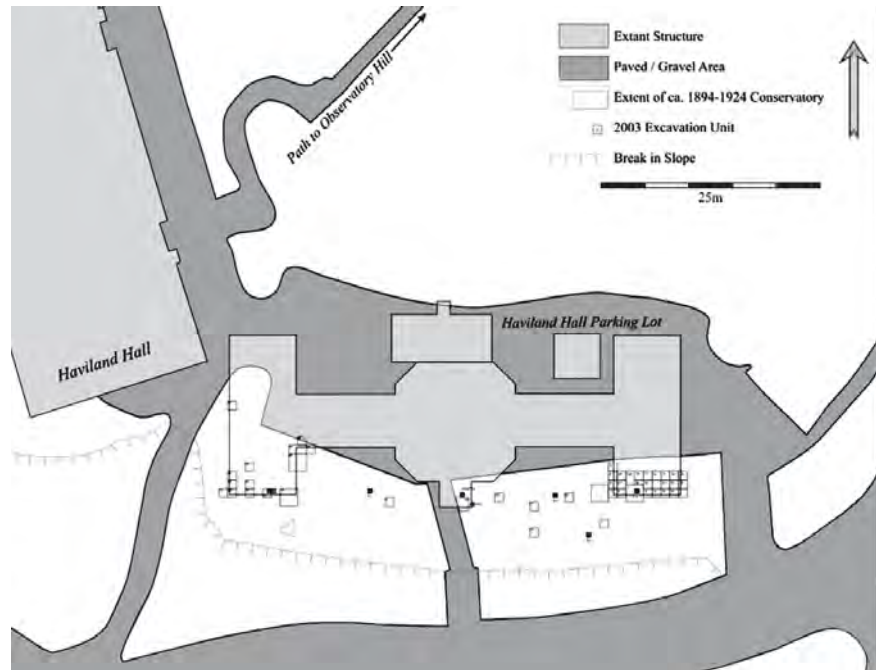




Figure 6: Location of 2003 excavation units relative to Conservatory location and modern landscape.



tables that were meant to hold potted plants, as described in the 1893 contract:

To provide plant tables around the outside of all the compartments about three feet wide, to have wrought iron frames with gas pipe post supports, securely and neatly fastened with brackets and bolts. The bottom of tables to consist of slate about 1/2" thickness with sawed edges, in width not greater than 20" supported by light tee irons. When finished the slate and tee irons will be covered by sand or other material to retain moisture around the base of pots (Lord & Burnham Co. 1893)

The supervising architect's specifications for the Conservatory also describe specifications for glass, as hundreds of 14"-inch-wide panes of varying lengths comprised the walls and roof of the conservatory (Day 1894). Given that the structure was composed mainly of glass, surprisingly little flat glass was found during the excavation. Although a total of 13,439 sherds was found, the glass was highly fragmented and represents only a small portion of the building's glass walls.

Ceramic flower-pot sherds from the University of California, Berkeley Conservatory represent a wide variety of manufacturing and stylistic approaches to these utilitarian vessels. The collection contains examples of both machine-made and hand-finished pots, some displaying decorative slips, while the majority are undecorated. Few examples of ceramics other than flower pots were recovered from Conservatory excavations. Inexpensive vessels representing mismatched sets likely indicate informal food consumption, and possibly application of household ceramics to the different work-tasks of running the Conservatory.

Similarly, container glass fragments from the Conservatory indicate a variety of possible activities, from single meals to occasional bottle re-use, while there is no significant evidence of social drinking or specific commercial product use. The single vessel which conclusively dates to the building's use-life bears the embossed marking "BEN SCHLOSS... MA...T...R... PATENTED FOR.... S.F. CAL..." (Figure 8). This base belonged to a "Golden State" Mason Jar manufactured ca. 1910 by the Illinois Pacific Glass Co., of San Francisco (Toulouse 1969: 135-6). Review of the *Crocker-Langley San Francisco City Directory* issues between 1899 and 1930 indicated that the Schloss Crockery Co., whose president Benjamin



Figure 7: Conservatory foundation remains in East Wing excavation block, view east.

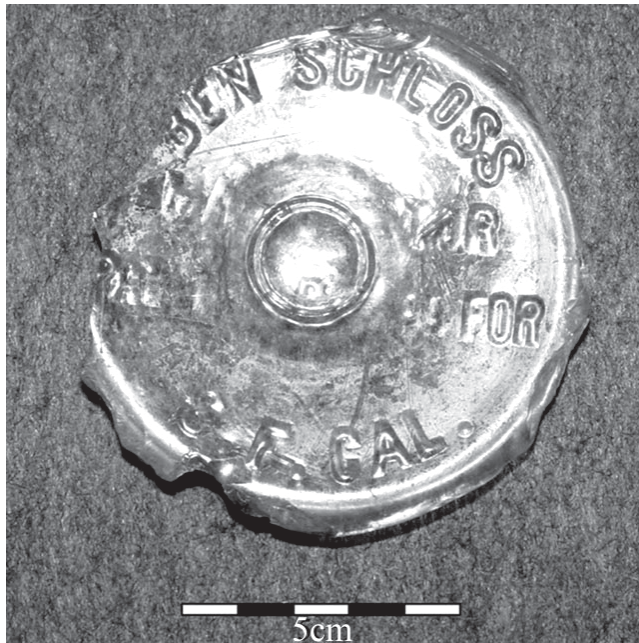


Figure 8: "Ben Schloss" jar base from Conservatory excavation.

Schloss held the patent for this style of jar, operated as container manufacturers between 1899 and 1925. The jar could represent a variety of activities, from food transportation and storage to rooting of plant cuttings.

Three other glass fragments, from two units outside of the building foundation, are parts of a colorless, embossed, 6.5-oz Dr Pepper bottle. Based on the "clock" motif with hands pointing at "10, 2, and 4," we identified the bottle as belonging to promotional campaigns used by Dr Pepper's manufacturer between the late 1920s and the 1950s. Consumers were encouraged to have a Dr Pepper, or "Drink a Bite to Eat," at 10:00 am, 2:00 pm, and 4:00 pm to help revive their lowered blood sugar (Dr Pepper/Seven Up, Inc. 2003). Based on this late date relative to the 1924 demolition of the Conservatory, and the fragments' proximity to copper water pipes which cut through the brick foundation, it is most likely that the bottle was deposited in a pipe installation trench at some point after the Conservatory had been demolished.

Faunal remains from the Conservatory site are too sparse to identify a specific pattern of use. Small numbers of bone fragments from cattle (*Bos taurus*) and sheep (*Ovis aries*) represent commercially available cuts of meat, and were likely the remnants of a few meals left by Conservatory staff or visitors. Pieces of coal and slag indicate the task of maintaining the temperature of the hot houses, as well as possibly the preparation of fertilizers or other soil additives.

After our 2003 field season at the Conservatory, we were not satisfied that we had been able to access the most potentially interesting archaeological deposits there. Our investigations focused on only the portions of building foundation not currently covered by a parking lot—representing the front of the terminal greenhouses and a small section of the concourse between the west wing and the Palm House. As this front area was clearly visible to the entire campus community, it is probably safe to assume that it would have been kept relatively clean and free of debris. The work buildings against the slope behind the greenhouse, including a boiler house, potting shed, and lathe house, were more likely maintained as work areas for Conservatory staff and students. It is with this in mind that we plan to continue our archaeological study in the fall and winter of 2004-2005. After construction crews for the Tien Center remove the parking lot's pavement, we plan to test the area within and behind the glass house that we could not access in the summer of 2003.

## CONCLUSION

The academic community at the University of California, Berkeley, is generally aware of the historical significance and architectural heritage of our campus. More than a century of building and rebuilding, though, has removed many significant structures from the visible landscape. Cultural resource management-based archaeological projects can bring these places back into focus, and synthesize our wealth of archival, material, and human resources. By combining these projects with field-school programs, we can teach Cal's next generation of archaeologists to look for heritage right outside the classroom.

## Acknowledgements

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