

**SEEDS, PITS AND PRIVIES OH MY:
BOTANICAL ANALYSIS AND INTERPRETATION OF DIETARY HABITS FROM A
19TH CENTURY SAN FRANCISCO HOUSEHOLD PRIVIES COLLECTION**

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This article presents a quantitative analysis of macrobotanical remains from two mid to late 19th-century household privies from San Francisco, California. The macrobotanical remains are from the privies contexts uncovered during the 41 Tehama Street Project. These materials were part of the archaeological collection from the project and were housed at Sonoma State University's Anthropological Studies Center. This study included historical research, and study of the macrobotanical remains. The goal of this research project is to reconstruct urban household usage of fruits to better understand domestic beverage making. It illustrates the contribution and importance of macro-remains, such as seeds, pits, and nut shells, to interpreting 19th-century urban household dietary habits.

This article presents a quantitative analysis of botanical remains from two adjacent household privies dating to the mid to late 19th-century from the archaeological collection of the 41 Tehama Street Project. The collection is housed at Sonoma State University's Anthropological Studies Center (ASC). Paleoethnobotany is the study of plants remains, pollen and phytoliths recovered from an archaeological site (Pearsall 2000:2). Once identified, macrobotanical remains help in interpreting the relationship between humans and plants in any given context. The methods employed in this project include historical research and recovery of the macrobotanical remains through fine sieving and use of low magnification microscopes to identify these plant remains. The goal of this research project was to identify all of the macrobotanical remains within the collection using a comparative collection. Then I reconstructed urban household usage of the fruits to better understand household beverage making processes. This research illustrates how botanical remains such as seeds, fruit pits or nut shells provide archaeologists with unique insights into past dietary habits.

HISTORICAL CONTEXT

San Francisco changed drastically during the Gold Rush. The little town of Yerba Buena grew from 459 people in 1847 to the city of San Francisco with 25-30 thousand by the end of 1849. Life in the rural frontier settlement changed to an urban American city by the late 19th century (Praetzellis 2007:35). Based on the city directory, what is now known as 41 Tehama Street was referred to as 37 Tehama Street in the 19th century. Many families moved in and out of this residence starting in 1859 until 1904, and it was destroyed during the 1906 earthquake. These families occupied the residence for short periods of time, usually staying for two to three years (Praetzellis 2015:23). A small family would have a few boarders living with them to fill up extra rooms. For example, Otto and Amanda von Lindeman were one of 37 Tehama's more permanent families, living there from 1874 to 1878. Otto was a salesman while Amanda taught music and language (Praetzellis 2015:23). They had boarders living with them during their residency, although none of them for more than a year. The only family that did not have any boarders during their residency was the Marion family with five children; they lived there from 1879 to 1883 (Praetzellis 2015:23). Although we do know the families who lived at 37 Tehama Street, it is unclear on which particular family is responsible for the deposit this research is focused on. To figure out the family responsible for this deposit within this collection would require further research.

METHODS

Recovery

Archaeologists from the ASC excavated six privies while monitoring at the 41 Tehama Street Project site in San Francisco in 2014- 2015. This site is also known as Block 3736 which a portion of the block bounded by Tehama, First, Clementina and Second Street. The block described is a part of the Transit Center District Plan area, and 41 Tehama Street Project is within the boundaries of a previously recorded site (CA-SFR-151/H) (Praetzellis 2015:1). Artifacts were collected during excavation and sent back to the ASC for laboratory studies. After wet screening, artifacts were separated by context number and type (i.e., glass, ceramics, botanical remains and other). Lab technicians found some seed samples in situ within various household items including a wide mouth aqua blue bottle, a Rebekah at the well teapot and a brown ale bottle (Figure 1). In these cases, the botanical remains were set aside with their corresponding soil sample. I conducted a dry screening analysis of the soil sample from within the brown ale bottle through a two-screen (1/32" and 1/16") process.

Identification

According to Pearsall (2000:142), using a comparative collection is one of the most accurate identification methods of identifying macro-remains. In the analysis of macrobotanical collections from Privy 1 and Privy 2, I used low magnification microscopes to separate the different types of seeds and compare them to the collection made by Madeleine Hirn (1999). With the aid of the comparative collection and photographs from Martin and Barkley's (1961) Seed Identification Manual, I was able to identify the macro-remains within the two privies. In addition, I also consulted the Ohio State Seed Identification workshop database (2015). After identification, the seeds were quantified and organized by feature and context.

Quantifying

All of the macro remains recovered in this collection was visible to the naked eye. I was able to count the seeds by using tweezers and little paintbrushes to place them in piles of ten. This method decreased the chance of losing count. When counting larger quantities of seed samples, I used a simple seed sample splitter method (Adrian Praetzellis personal communication 2015). This method involves pouring the "seeds sample" into a card stock "boat" that divides the seeds evenly into two halves. I poured the seed sample into the boat and shook evenly until the seeds are equally divided between two half, then took out half of the sample and set side. I repeated this process until I reached a number of seeds that is more manageable to count. Once I reached the arbitrary number of seeds, I counted them and counted the number of times I split the initial seed sample. I used this simple linear equation to find the total number of seeds within the original quantity; $T = n + n(1) + n(2) + n(4) + n(8)$. T equals the total number of the seeds within the original sample and n equals the number of seeds counted after the four times I split the seed sample. For example, in the case of the seed sample from Privy 2 context 129, the number of seeds I counted was 150, so $n = 150$. Therefore, $T = 150 + 150(1) + 150(2) + 150(4) + 150(8)$, resulting in $T = 2,400$ seeds.

RESULTS

Based on McNeill and Barkworth's (1996:25) framework, I begin with each fruit's botanical nomenclature then progress into using their common names. The results are presented in Table 1. I took into account that all these macro remains were found within privies and therefore, could have been deposited in two different ways. First, through human feces, which can give insight into human dietary habits; and second, is that the people living at the associated residence just threw them away in the garbage. This mode of disposal can also tell us about what people during the mid to late 1800s were eating as well as how they prepared and served their food.

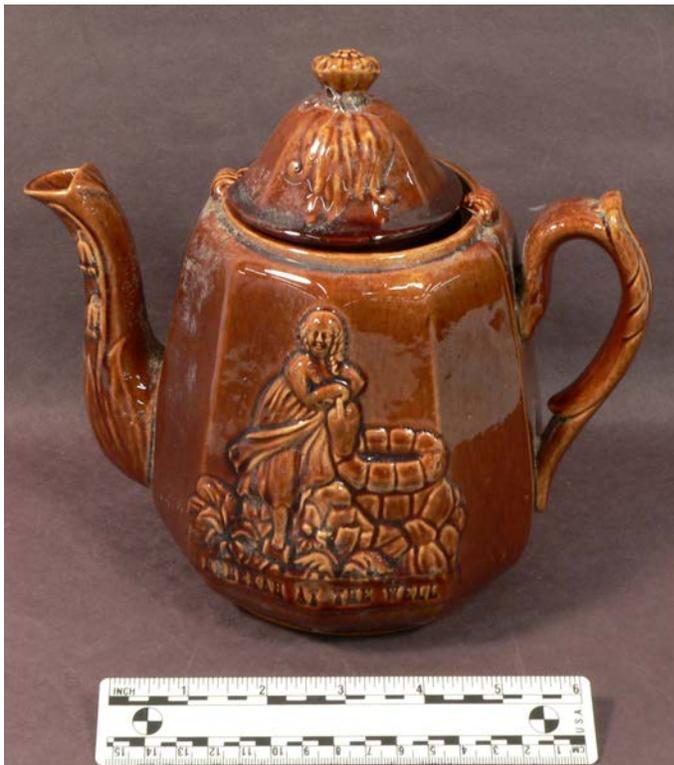


Figure 1. Photos from top to bottom, left to right: 1. Soda water bottles 2. Rebekah at the well teapot 3. Brown ale bottles.

Table 1. Statistical Data of Macro-Remains Identified.

CONTEXT NUMBER	TAXON	COMMON NAME	COUNT	CONDITION	PERCENT ¹	ASSOCIATION WITH ARTIFACTS
PRIVY 1						
113	<i>Rubus occidentalis</i>	raspberry	1	whole	0.1%	
113	<i>Rubus occidentalis</i>	raspberry	975	whole	81.8%	Brown ale bottle
113	<i>Vitis vinifera</i>	grape	6	whole	0.5%	
113	<i>Vitis vinifera</i>	grape	45	whole	3.8%	Brown ale bottle
Total from Context 113			1,027		86.2%	
115	<i>Rubus occidentalis</i>	raspberry	83	whole	7.0%	Glass tumbler
115	<i>Vitis vinifera</i>	grape	23	whole	1.9%	Glass tumbler
Total from Context 115			106		8.9%	
116	<i>Coffea arabica</i>	coffee bean	3	whole	0.3%	
116	<i>Coffea arabica</i>	coffee bean	7	fragment	0.6%	
116	<i>Vitis vinifera</i>	grape	4	whole	0.3%	
116	<i>Vitis vinifera</i>	grape	3	fragment	0.3%	
116	<i>Rubus occidentalis</i>	raspberry	26	whole	2.2%	
Total from Context 116			43		3.6%	
117	<i>Rubus occidentalis</i>	raspberry	4	whole	0.3%	
117	<i>Vitis vinifera</i>	grape	9	whole	0.8%	
117	<i>Malus pumila</i>	apple	1	whole	0.1%	
117	<i>Curcubita moschata</i>	pumpkin	2	fragment	0.2%	
Total from Context 117			16		1.3%	
TOTAL FOR PRIVY 1			1,192		100.0%	
PRIVY 2						
102	<i>Prunus persica</i>	peach	4	whole	0.1%	
123	<i>Prunus persica</i>	peach	2	whole	0.1%	
128	<i>Arachis hypogaea</i>	peanut	1	fragment	0.0%	
128	<i>Vitis vinifera</i>	grape	1	whole	0.0%	
128	<i>Prunus persica</i>	peach	2	fragment	0.1%	
128	<i>Prunus virginiana</i>	cherry	1	whole	0.0%	
128	<i>Prunus virginiana</i>	cherry	2	fragment	0.1%	
128	<i>Prunus americana</i>	plum	1	whole	0.0%	
128	<i>Vitis vinifera</i>	grape	18	whole	0.6%	Rebekah at the Well Teapot
128	<i>Rubus occidentalis</i>	raspberry	226	whole	8.1%	Rebekah at the Well Teapot
Total from Context 128			252		9.1%	
129	<i>Prunus persica</i>	peach	5	whole	0.2%	
129	<i>Prunus persica</i>	peach	1	fragment	0.0%	
129	<i>Vitis vinifera</i>	grape	7	whole	0.3%	
129	<i>Rubus occidentalis</i>	raspberry	2,400	whole	86.5%	
129	<i>Rubus occidentalis</i>	raspberry	71	whole	2.6%	aqua glass soda water bottle

Table 1. Statistical Data of Macro-Remains Identified continued

CONTEXT NUMBER	TAXON	COMMON NAME	COUNT	CONDITION	PERCENT ¹	ASSOCIATION WITH ARTIFACTS
PRIVY 2						
Total from Context 129			2,484		89.5%	
130	<i>Vitis vinifera</i>	grape	7	whole	0.3%	
130	<i>Rubus occidentalis</i>	raspberry	9	whole	0.3%	
Total from Context 130			16		0.6%	
132	<i>Vitis vinifera</i>	grape	9	whole	0.3%	
132	<i>Rubus occidentalis</i>	raspberry	8	whole	0.3%	
Total from Context 132			17		0.6%	
TOTAL FOR PRIVY 2			2,523		90.9%	

Note: ¹ Percent of collection within each privy.

This analysis focuses on the botanical remains found within the household items (i.e., bottles, tumbler, teapot) recovered from the privies. I believe these macro-remains can tell us more about what the individuals were using the fruit for, compared to the “loose” seeds which are more indicative of what they were eating.

A total of 1,192 macrobotanical remains were recovered from Privy 1 (Figure 2). Majority of the seeds were recovered from Context 113 (Table 1). Overall, *Rubus occidentalis* (raspberry) dominates the collection accounting for 81.8 percent of the seeds. Furthermore, all, except one, *Rubus occidentalis* (raspberry) seeds (n=975) were associated with the brown ale bottle. The brown ale bottle also yielded 45 *Vitis vinifera* (grape) seeds. Also from Privy 1, 83 *Rubus occidentalis* and 23 *Vitis vinifera* recovered from a glass tumbler (Context 115). The remaining two contexts (116 and 117) yielded the lowest frequencies. The four contexts in Privy 1 yielded different plant taxa, with Context 117 having the highest diversity (four taxa) although it has the fewest seeds in the collection.

The macrobotanical collection from Privy 2 (Figure 3) includes 2523 seeds from 6 contexts (see Table 1). Similar to Privy 1, *Rubus occidentalis* (raspberry) dominates the collection accounting for 86.5 percent of the seeds. In addition, 18 *Vitis vinifera* and 226 *Rubus occidentalis* were recovered from a Rebekah at the Well Teapot from Context 128; 71 *Rubus occidentalis* recovered from an aqua blue glass soda water bottle from Context 129. Context 129 yielded the highest frequency of the seeds in this privy. *Rubus occidentalis* are found in higher quantities compared to *Vitis vinifera* within both Privy 1 and Privy 2.

Dating Techniques

In determining depositional dates for the two privies, archaeologists from the ASC used relative dating techniques like terminus post quem (TPQ) (Praetzelis 2015:45). Terminus post quem dating is based on the artifacts that were recovered from the oldest context (i.e., lower undisturbed layers) within the privies. Manufacturing date of all the artifacts was examined to determine date based on their maker’s marks (Praetzelis 2007:25), which gave a 3-year time frame. Privy 1 context 116 dates to 1875 AD based on TPQ from a CA Reiner Co. soda water bottle (Praetzelis 2015:45). Thus, the deposition of Privy 1 context 116 dates to the mid-1870s. Privy 2 TPQ dates to 1859 based on an A.W. Cudworth soda water bottle recovered in context 129 (Praetzelis 2015:45). These TPQs indicate that context 129 dates from the mid-1860s to 1870s. Thus, these privies correspond to the post Gold Rush era in San Francisco.

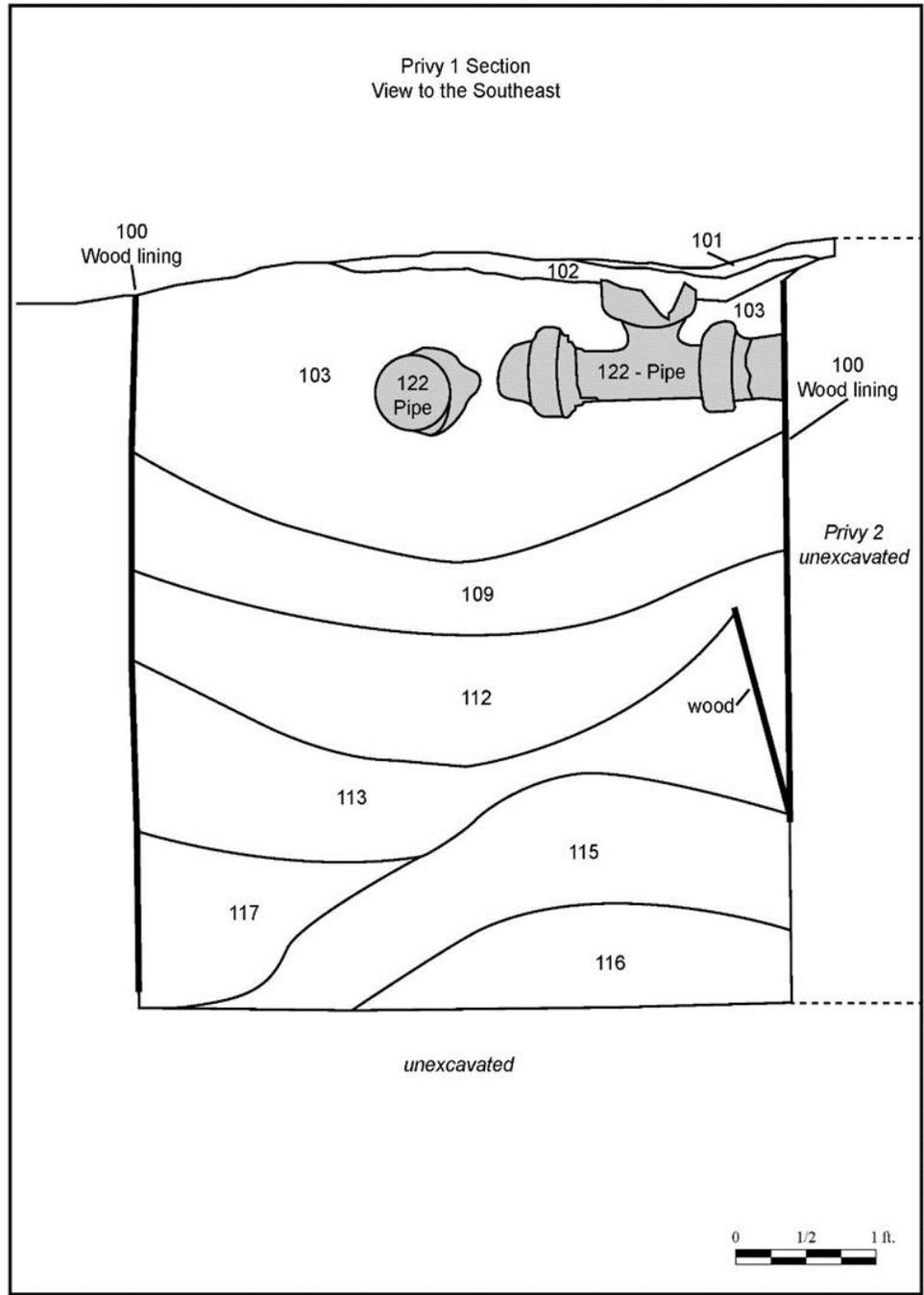


Figure 2. Privy 1 cross section (Praetzelis 2015:38).

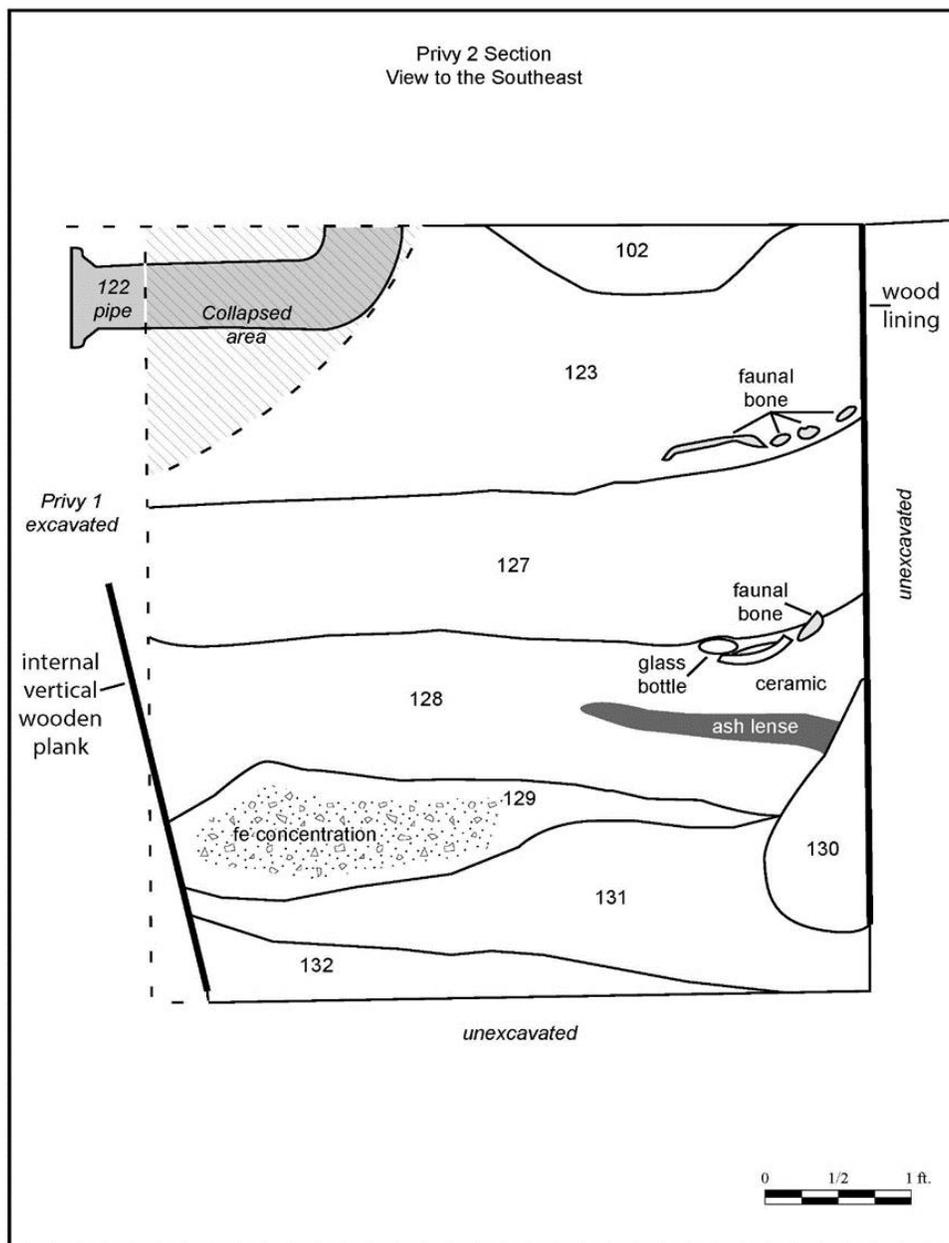


Figure 3. Privy 2 cross section (Praetzellis 2015:40).

INTERPRETATIONS

The original source of the macrobotanical remains could have been either through human feces or as residue and discard in a food or serving vessel. With this in mind, the focus of my analysis was on the macrobotanical remains recovered from within various household items (i.e., aqua glass soda water bottle, brown ale bottle and a Rebekah at the well teapot). I reviewed historical documents such as various local newspapers as well as cookbooks dating to the mid to late 1800s. The most abundant macro-remain recovered from within Privy 1 and Privy 2 were *Rubus occidentalis* (raspberry). Thus, I focused my investigation on the use of raspberries within the 1800s, specifically the 1850s through 1899, corresponding to the dates of the two privies based on relative dating techniques. While looking through this historical data, cookbooks and newspapers, the commonality of raspberry vinegar recipes arose. All

of the cookbooks I found that dated within my focal timeframe, including the Buckeye Cookery Book (Wilcox 1877) and Jennie June's American Cookery Book (Croly 1870), have recipes for raspberry vinegar or other beverages calling for raspberries. Local newspapers from San Francisco to Sacramento also regularly had raspberry vinegar recipes and advertisements. For example, the Pacific Rural Press based in San Francisco (in print from 1871 to 1894) had seasonal articles about raspberry vinegar.

It is important to note that the recipes within the cookbooks are not the same as those found in cookbooks today. The older recipes were written as narratives. For example, in the English Cookery: Invalid Cookery (1858) Walsh writes about beverages that are made with raspberry vinegar such as "A refreshing fever drink". This drink was made by pouring boiling water over black currant jam with sugar and adding a little raspberry vinegar (Walsh 1858:319). The fever drink was recommended to be consumed whenever feeling feverish or on a hot summer day. There was also a recipe called "raspberry vinegar and water". Walsh (1858:321) describes "it as a drought-friendly drink that quenches the thirst of a feverish patient with a dessert spoonful of raspberry vinegar mixed with a glass of cold water". I became curious as to why people of the 1800s were drinking vinegar. So I looked into information about possible health benefits of drinking vinegar. According to Johnston and Gaas (2006), vinegar has anti-infective properties and can be used to sooth sore throats (2006). Dr. J. F. Donnelly gave advice via the Sacramento Daily Union newspaper, urging people suffering from scarlet fever to drink vinegar as a homemade remedy as well as wash your body in vinegar (Logan 1873:3). The use of raspberry vinegar in homemade tonic drinks suggests that illness was rampant in the newly growing city of San Francisco, and that it may have been necessary to make your own remedies at home.

EXPANDED RESEARCH

The question then becomes, were the residents of 37 Tehama Street making this drink for their own use or for profit? Household production of goods for a profit would provide remnants of more raspberry seeds. Based on my investigation of fresh raspberries, I concluded that a raspberry contains 25 seeds per whole fruit. With this new information, I calculated how many raspberries (whole fruit) were in each Privy or artifact. Privy 2 contained 108 whole raspberries, with about nine in context 128 found within the Rebekah at the well teapot and only three in context 129, with the remaining 96 coming from the same context (presumably, from the broken aqua blue soda water bottle). Privy 1 contained a total of 43 whole raspberries, with 39 of them found within the brown ale bottle in context 113. These new insights suggest that the family was not making raspberry vinegar for profit, there is a lack of abundance of raspberry seeds present to support the claim for profit. Instead, the family was most likely making raspberry vinegar in small batches to aid the sickness a family member was experiencing. San Francisco during the mid to late 1800s was a society expanding exponentially. With population growth of this magnitude, infectious diseases would be rampant. A homemade remedy like raspberry vinegar would have eased some of the most acute symptoms. There is also the possibility that the family obtained the drink from someone either through trade or purchase.

Medicines underwent monumental change during the 1800s–1870s, just like the city of San Francisco. The medical philosophy during this time was an emphasis on "therapeutic" medicine; its goal is to cultivate an equilibrium among different systems of the body (Purser 1990:375). During this time, most medicines were produced in small apothecaries. The medicines were often self-administered or purchased on the advice of clerks or even grocers, who sold the chemicals or extracts needed to construct the medicine (Purser 1990:375). Even though therapeutic medicine was the philosophy of the early 1800s, by the latter part of the century it began to shift toward a more professionally educated sphere. In this new paradigm, doctors are beginning to be the only people legally able to prescribe medicine. Yet, the families at 37 Tehama Street were presumably making their own.

DISCUSSION AND CONCLUSION

With the boom of people moving to the little town of Yerba Buena, transforming it into a major city of San Francisco, and with the high amounts of people living in close quarters the rates of illness increased. Due to current medical systems, residents often created home remedies to soothe their sickness. To such a degree I believe the families living at 37 Tehama Street could have been using raspberries to make raspberry vinegar. The use of vinegar for remedies is evident based on the historical data provided in the previous section. Raspberry vinegar was used for fever drinks as well as casual entertaining. The presence of raspberry seeds inside of the soda water bottle correlates to the possible consumption of raspberry vinegar mixed with soda water as described in the cookbooks. The Rebekah at the Well teapot, the most popular piece of American pottery at the time (Stradling 1997:334), may have been used for casual entertaining possibly on a feverish summer day. Further, the presence of raspberry seeds within a brown ale bottle suggests it was being reused as a storage device. This analysis has provided new insights into the lives of the families that lived at 37 Tehama Street in San Francisco during the late 1800s. Going beyond simple identification of botanical remains, I have interpreted these macro-remains to gain a better understanding of the relationship between food, medicine and people living in 19th century San Francisco. I suggest that the residents of 37 Tehama Street were making raspberry vinegar at home, whether for fever drinks or casual entertaining: mixing it with soda or iced water, serving it out of the Rebekah at the well teapot into glass tumblers and possibly storing it in repurposed brown ale bottles. This research project has provided important new insights into how raspberries were used during the mid to late 1800s in urban households in San Francisco, and more broadly illustrates how botanical remains can help archaeologists investigate plants or food usage of the past.

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