

ZOOARCHAEOLOGICAL ANALYSIS OF MID-LATE NINETEENTH-CENTURY FOOD-WAYS IN SACRAMENTO, CALIFORNIA

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Analysis was undertaken of faunal remains (n=2,483) recovered from a mid to late nineteenth-century site (ca. 1848–1885) under the former Enterprise Hotel in Sacramento. Five areas were represented: (1) the “Back,” a backyard; (2) a “Privy”; (3) “Building 14,” a doctor’s office and pharmacy; (4) “Building 16,” a tin shop, later repurposed as a brothel; and (5) “Building 18,” a brothel. Results demonstrate that the inhabitants had access to a variety of both domestic (n taxa=7; 68% of NISP) and wild (N taxa=25; 32% of NISP) animals. The Privy contained the highest proportions of wild taxa, as well as higher species richness and greater diversity, suggesting that it represents an aggregation from multiple contexts. Historically expensive domesticates (chicken and pork) were well represented, either because of decreased cost related to the influx of industrial-level farming or indicating a socioeconomic/cultural preference. The prevalence of Pacific and Atlantic marine fish indicated the availability of imported foods. Moderate- to low-quality cuts of meat dominated the relative frequency of cow, sheep, and pig butchering units. The consumption pattern reflects a socioeconomic income level that is clearly middle-class and highlights both the diversity and quality of food items available in nineteenth-century Sacramento.

Zooarchaeological studies from nineteenth-century Sacramento have demonstrated the ability of faunal remains to elucidate variation in consumption among different ethnic and socioeconomic groups, as well as to define large-scale economic trends. Here we present an analysis of faunal remains recovered during the excavation of five areas under the Enterprise Hotel (Figure 1) dating to this period: (1) the “Back” area was likely the backyard area of a house owned by Syrian immigrant Peter Zacharias; (2) the “Privy” represents the remains of an outhouse, and is a palimpsest of depositional waste events; (3) Building 14 was a doctor’s office and pharmacy operated by Silas Crane; (4) Building 16 was initially a tin shop until the mid-1850s, then a brothel owned by African American Francis Bass; and (5) Building 18 was a brothel owned by German immigrant Johanna Heigel.

Previous studies of faunal remains in Old Sacramento by Schulz and Gust (1983) used animal taxa skeletal part frequency to reveal how class disparity maps onto food distribution and availability. A comparison of the frequency of butchery units from multiple establishments from Old Sacramento showed that buildings associated with the upper class (e.g., hotel) had access to higher-quality meat cuts, in contrast to more middle class (e.g., saloon) or lower class (e.g., prison) contexts. Additionally, comparisons between European and Chinese immigrant assemblages established that consumption varied along ethnic lines (Gust 1982, 1984, 1997; Schulz 1982, 1997; Simons 1982). Schulz (1997) identified Asian fish taxa from Chinese contexts, likely traded in due to cultural preference. Faunal analyses have also traced wider economic trends in consumption, such as changes in the reliance on wild versus domestic taxa (Simons 1980a, 1980b, 1982), as well as the prevalence of trade goods (Schulz 1997). The current analysis of builds on and integrates previous insights on the economic and socioeconomic consumptive patterns of nineteenth-century historic Sacramento.

ARCHAEOLOGICAL SITE CONTEXT

The Enterprise Hotel site is located under what is now the “Hall, Luhrs & Company” building on 2nd Street in Old Sacramento. Before the current building was constructed and the streets were raised in

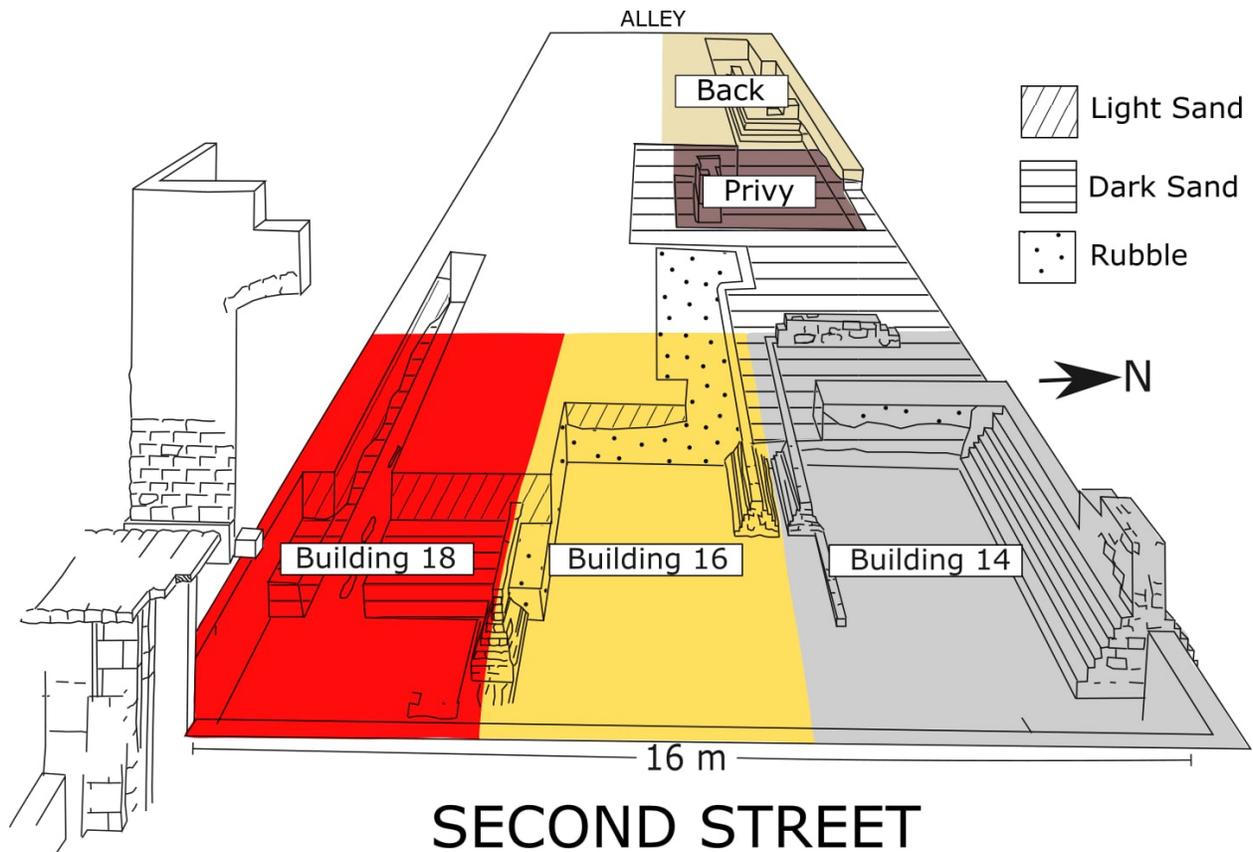


Figure 1. Excavation Area under the Enterprise Hotel in Old Sacramento Delineating the Main Excavation Areas and their Associated Deposits.

1884, the site was a mixed-use area for residential and commercial purposes. The earliest known buildings date to the 1850s, with records indicating that at one time or another a tin shop, doctor's office/pharmacy, and two brothels were located on the site (Abrams 1980). Several of the business owners lived where they worked, including brothel owners Johanna Heigel and Francis Bass, along with doctor Silas Crane and Peter Zacharias, the latter having had numerous occupations including bootblack and sexton (Abrams 1980).

Unpublished field notes reveal that a notable feature within the study area was a nine-foot-deep, brick-lined privy located in an alley between the buildings. It is not known whether the privy was used communally or if it was associated with an individual business or residence. By 1884, the original buildings had been removed and replaced with one single building owned by the Hall, Luhrs & Company grocery (Abrams 1981). What would become the historical (and archaeological) field site, located in the basement, was cemented over and "capable of bearing heavy hand trucks loaded with the most weighty goods" (SDU 1884:2). In 1910, Hall, Luhrs & Company moved their operations to 9th and K streets and the building later housed the Enterprise Hotel (Shawn Turner, pers. comm.). Over time the Old Sacramento waterfront became derelict and the building was occupied sporadically. By the late 1970s, when the excavation took place, Old Sacramento was commonly referred to as "skid row." Today the basement historical field site features prominently on the Sacramento History Museum's Underground Tour, and the building itself was sold to investors in 2018.

Excavations were conducted by Cosumnes River College (CRC) professor David Abrams and his field school from 1979 to 1983. Units were strategically placed where there were known features, such as the privy, building foundations, and brick walls; however, many areas of the site remain unexcavated. The

collection, numbering some 50 boxes of artifacts, was originally housed at CRC until it was permanently moved to California State Parks' Archaeological Collections and Research Facility. In addition to a substantial number of glass, ceramic, metal, miscellaneous household and personal items and faunal remains, the collection also includes soil samples, seeds, sewer pipe, and even liquids.

By the 1990s, the Enterprise Hotel collection had been left mostly unanalyzed and orphaned, although Eloise Barter, Associate State Archaeologist with California State Parks, continued to work and organize the collection's resource materials, including site records, unpublished reports, and photographs. In 2012, CRC professors Anastasia Panagakos and Amanda Paskey entered into contract with California State Parks to continue analysis of the collection at the newly formed Cosumnes River Archaeological Working Lab (CRAWL). For the last six years, they, along with their students, have worked to digitize the catalog and excavation photographs; verify, re-catalog, and analyze artifacts; provide students with opportunities to present at professional conferences; and bring the collection back to public attention through outreach, including a partnership with the Sacramento History Museum, which prominently features the field site as part of their Underground Tour. As of 2018, approximately 25% of the original collection has been processed, including all the contents of the privy. Previous studies of this collection have investigated the biographical profiles and gender dynamics of site residents (Rocucci 2014, 2015) spatial modeling and mapping (Celayeta and Rocucci 2016), and analysis of artifact types and unique finds (Deutsch and Butler 2013; McNeill 2014; Miller 2017). The focus here, however, is on an analysis of the animal-bone remains recovered from this site.

ENVIRONMENTAL SETTING

The Sacramento River valley lies north of the Sacramento-San Joaquin Delta and is cradled between the Sierra Nevada and the Coast Range mountains (McGowen 1961). The northern portion of the valley is drained by the Sacramento River, whose tributaries delineate much of the shape and geography of the valley. The vegetation is characterized as grassland and wetland. Riverside trees include willows, western sycamore, box elder, Fremont cottonwood, and the endemic valley oak. The pre-twentieth-century native fauna of the Sacramento Valley was rich and diverse (McGowen 1961; Storer 1965). Tule elk, California grizzly, mule deer, pronghorn, rabbit, and hare were abundant. A huge assortment of winter water birds and migratory birds visited the valley's wetlands between spring and fall (McGowen 1961). The waterways supported a variety of freshwater fish, including several endemic species (Moyle 1972) as well as seasonally available anadromous taxa, notably Chinook salmon, who spawned in massive numbers (Yoshiyama 1999). The surrounding faunal distribution and biodiversity have changed drastically since the city's initial establishment. Within 20 years after the Gold Rush (1848–1855), settlement and unregulated exploitation negatively impacted the surrounding wildlife, reducing local biodiversity (McGowen 1961). Deer, elk, and antelope were driven into the foothills or overhunted. The last tule elk was shot in 1968, while the last grizzly bears had already disappeared by 1865. Habitat destruction caused by agricultural expansion as well as organized slaughter in 1877 decimated waterfowl populations. Hydraulic mining debris destroyed salmon spawning habitats, leading to salmon conservation efforts as early as 1870 (Yoshiyama 1999). In response to declining salmon stock, several non-local fish species such as shad, carp, and striped bass were introduced to increase freshwater productivity; however, these actions had devastating effects on local and endemic fish that were outcompeted by the newcomers (Brown and Moyle 2005).

METHODS

From early-mid 2017, identification of the faunal remains was undertaken using the comparative skeletal collection at the UC Davis Zooarchaeology Lab, which includes the Peter D. Schultz Osteoichthyology (fish) collection. Terms and quantification methods follow Lyman (2008), with basic counts presented using Number of Identified Specimens (NISP). Faunal composition of each assemblage was assessed using taxonomic richness, the Shannon-Wiener Heterogeneity (H), and the Shannon Evenness (e) indices. Taxonomic "richness" is a measure of the number of non-overlapping taxa. The Shannon-

Wiener Heterogeneity index factors in the number of taxa, the relative contribution of each taxon to the total assemblage, and how balanced the represented taxa are across a given assemblage. The index is on a scale from 0 (not very diverse) to 3.5 (highly diverse). Evenness is a measure of the relative abundance of taxa and is constrained to fall between 0 and 1 (1 indicates that the assemblage is equally distributed).

We conducted a meat-cut analysis following Schulz and Gust's (1983) methods to measure the retail quality of the meat cuts present. Such analysis assumes that socioeconomic status dictates access to food—in this case, the particular parts of a domestic ungulate carcass. Since retail meat cuts from different sections of the animal are ranked differently economically, the frequency of consumption of differently priced cuts will vary with the socioeconomic status of the consumer (Lyman 1987; Schulz and Gust 1983). We must distinguish between social and economic class, since class is often attached to prestige and does not always reflect purchasing power. As Lyman (1987) notes, a “madam” may have low prestige but high income. Prestige is difficult to trace using faunal evidence, as one's access to food may vary throughout one's lifetime, regardless of social class. Therefore, our use of the term “class” in this case refers to income level.

Meat cuts were determined using methods established by Peter Schulz and Sherri Gust for their Old Town Sacramento research. Location of cuts was designated using historic butchery diagrams of beef (Schulz and Gust 1983:48), mutton (Gust 1997:225), and pork (Gust 1997:224). Cuts follow an ordinal rank (Gust 1997) and are designated as low, medium, or high in quality. The frequency of cuts was quantified using NISP. Although we recognize that Minimum Number of Butchery Cuts (MNBC; Lyman 1987) would be more appropriate due to aggregation problems inherent with NISP, we chose to use NISP because MNBC masked the variation in this assemblage because of small sample size, and NISP allowed our results to be comparable with Schulz and Gust's (1983; Gust 1997) data.

RESULTS

We examined nearly 2,500 bone fragments recovered during excavations of nineteenth-century deposits under the Enterprise Hotel: Privy=60%, Back area=23%, Building 16=11%; Building 14=7%; Building 18 = <1%. Of the 2,500 specimens, 1,516 (61%) could be identified to family level or lower (Table 1). At least 31 different taxa contributed to these four assemblages. The Privy had the highest species richness, with 27 different taxa, and of those taxa, seven were unique to this context. Comparison between the two largest assemblages (Privy and Back; Figure 2) indicates differences within faunal proportions. Overall remains from the Privy ($H=1.01$) are considerably higher in terms of taxonomic diversity than the Back ($H=0.75$). However, evenness was similar between the two assemblages (Back: $e=0.68$; Privy: $e=0.71$), suggesting that faunal remains were not skewed toward any one taxon in particular, but rather were distributed among a few. Domestic ungulates comprised 75% of the Back assemblage, in contrast to 46% from the Privy. Wild fauna made up 31% of the total across the site but represented 42% of the Privy assemblage and only 13% of the Back area (Figure 3). Wild animals were regionally hunted and offered for sale in the markets of Sacramento (McGowen 1961; Storer 1965); however, they may also represent hunting by household members. Higher frequencies of fish (17%) from the Privy may be accounted for by the relatively small size of fish bones, which could have been consumed, digested, and excreted. Fox ($n=105$; 17%) was also found in relatively high frequency from the Privy. Fox remains appear to be from a single subadult that may have been killed and tossed in the privy or was the victim of its own curiosity. Due to the high taxonomic richness and diversity, our analysis suggests that the faunal assemblage from the Privy represents an aggregation from multiple contexts. Unfortunately, we are unable to discern which contexts contributed to the Privy assemblage and in what relative frequencies.

Table 1. Number of Identified Specimens from Deposits under the Enterprise Hotel, Old Sacramento.

TAXA	BACK	PRIVY	B-14	B-16	B-18	TOTAL
Oyster (<i>Ostreoida</i>)	3	–	1	–	–	4
Bivalve (indet.)	–	–	2	–	–	2
Total SHELLFISH (n=1)	3	0	3	0	0	6
Salmon (<i>Salmonidae</i>)	–	4	–	–	–	4
Sacramento pikeminnow (<i>Ptychocheilus grandis</i>)	1	3	–	–	–	4
Minnow (<i>Cyprinidae</i>)	2	5	2	6	–	15
Cod (<i>Gadidae</i>)	–	13	1	–	–	14
Surfperch (<i>Embiotocidae</i>)	–	2	2	–	–	4
Sacramento perch (<i>Archoplites interruptus</i>)	–	132	6	8	–	146
Rockfish (<i>Sebastes</i> sp.)	–	9	–	–	–	9
Pufferfish (<i>Tetraodontidae</i>)	–	1	–	–	–	1
Fish (indet.)	1	74	28	5	–	108
Total FISH (n=7)	4	243	39	19	0	305
Turkey (<i>Meleagris gallopavo</i>)	1	4	–	–	–	5
Chicken (<i>Gallus gallus</i>)	18	75	2	15	1	111
Quail (<i>Callipepla californica</i>)	–	9	–	–	–	9
Dabbling duck (<i>Anas</i> sp.)	7	39	1	11		58
Goose (<i>Anserinae</i>)	1	5	–	10	–	16
Duck/goose (<i>Anatidae</i>)	2	16	1	5	1	25
Gull (<i>Larus</i> sp.)	–	–	–	1	–	1
Crane (<i>Grus</i> sp.)	19	–	–	–	–	19
Pigeon (<i>Columba livia</i>)	–	4	–	–	–	4
Wilson's snipe (<i>Gallinago delicata</i>)	–	8	–	–	–	8
Bird (indet.)	86	295	25	38	–	444
Total BIRD (n=9)	134	455	12	42	2	698
Norway rat (<i>Ratus norvegicus</i>)	–	1	2	–	–	3
House mouse (<i>Mus musculus</i>)	–	–	1	–	–	1
Squirrel (<i>Sciuridae</i>)	–	11	–	2	–	13
Cottontail (<i>Sylvilagus</i> sp.)	–	3	–	–	–	3
Jackrabbit (<i>Lepus</i> sp.)	–	1	–	–	–	1
Rabbit/hare (<i>Leporidae</i>)	–	2	–	–	–	2
Cat (<i>Felis catus</i>)	1	–	–	–	–	1
Dog (<i>Canis lupus familiaris</i>)	9	2	1	1	–	13

Table 1. Number of Identified Specimens from Deposits under the Enterprise Hotel, Old Sacramento continued.

TAXA	BACK	PRIVY	B-14	B-16	B-18	TOTAL
Fox (<i>Urocyon/Vulpes</i>)	1	102	–	1	–	104
Raccoon (<i>Procyon lotor</i>)	–	1	–	–	–	1
Cattle (<i>Bos taurus</i>)	113	117	29	38	9	306
Sheep/goat (<i>Ovis/Capra</i>)	54	115	9	32	2	212
Pig (<i>Sus scrofa domesticus</i>)	37	178	13	27	2	257
Deer (<i>Odocoileus</i> sp.)	–	6	–	4	–	10
Mammal (indet.)	224	200	47	74	–	545
Total MAMMAL (n=13)	439	741	100	179	13	1472
Grand Total	580	1439	173	276	15	2483
Taxonomic Richness	13	24	14	12	5	31

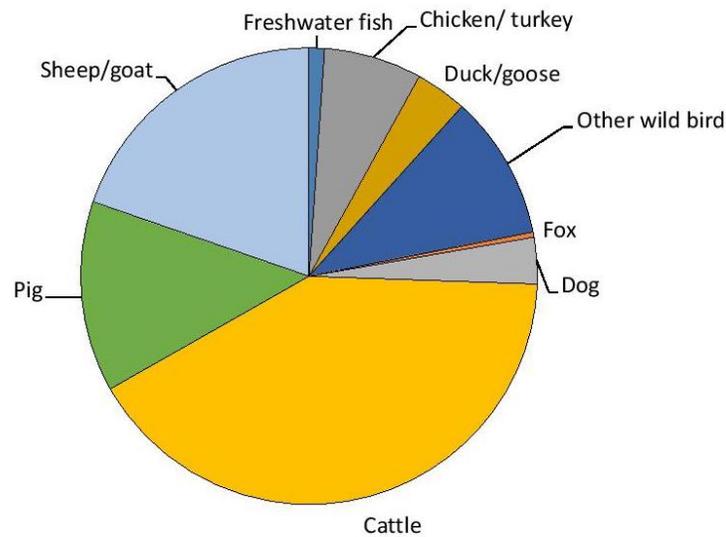


Figure 2a. %NISP from the Back Area of the Site (n=274, Richness=12).

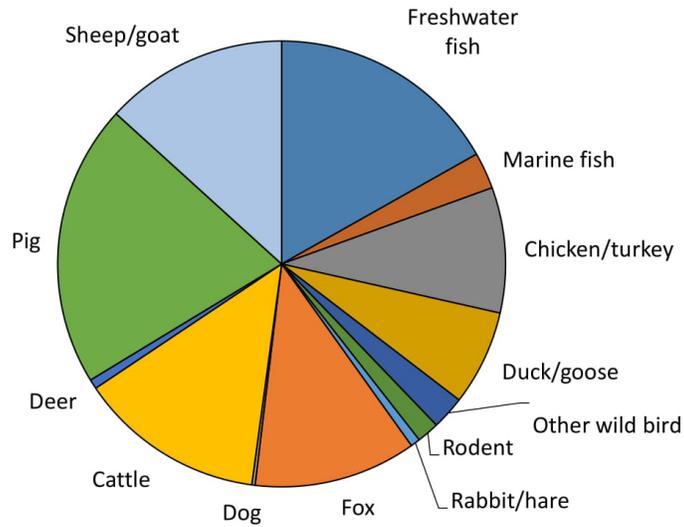


Figure 2b. %NISP from the Privy area of the Site (n=869, Richness=24).

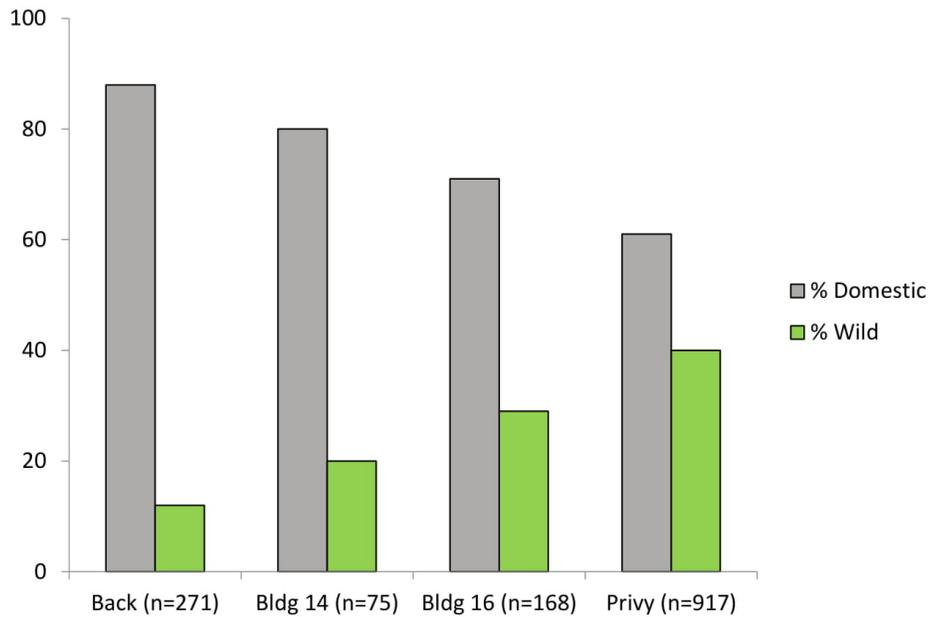


Figure 3. Relative Frequency of Domestic versus Wild Species across Four of the Areas under the Enterprise Hotel, Old Sacramento.

Mammals

Thirteen different mammal taxa were identified. Of those, cattle, sheep/goat, and pig made up 84% of the mammal assemblage. Other mammals appear to have been of minor consumptive importance or were intrusive. Generally, late-nineteenth-century Euro-American sites in the West are dominated by beef, which is reflected in other nineteenth-century assemblages in Sacramento (e.g., Schulz and Gust 1983). The environment of California was better suited for range animals like cattle and sheep, as opposed to pigs

(Burchman 1957). Pigs are usually underrepresented in Euro-American assemblages but common from Chinese occupations (Gust 1982, 1984, 1997). Livestock statistics for the city and county of Sacramento for 1861–1862 show that there were three times as many cows ($n=38,832$) and sheep ($n=37,155$) in the area than pigs ($n=12,821$; Burchman 1957). Because of limited availability, pork was usually more expensive (Hittell 1882). Despite this fact, pig comprised a surprisingly large proportion of the faunal assemblage. Pig accounted for 19% of the identified specimens, making them the second most common taxa, surpassed only by cow (22%), and followed by sheep (15%). The bulk of the pig remains came from the Privy assemblage ($n=178$; 69% of all pig remains). Given our limited information regarding the past contributors to the Privy assemblage—in other words, who used it—we cannot make further comments on what might have been driving this relatively high pork consumption.

Fish

In 1850, full-time professional fisherman began operating in Sacramento to harvest freshwater and anadromous species. Historically salmon were the most important fish commercially in terms of volume caught and men employed (Kirkpatrick 1860; Skinner 1962). During the off-season fishermen on the lower Sacramento River caught local species. Seven fish taxa were identified at the site: four taxa were likely caught locally, two were from the Pacific coast, and one was likely traded from the Atlantic coast. The fish assemblage was dominated by local Sacramento perch—74% of the identified specimens. Sacramento perch are the only native sunfish in California and were once abundant in local lentic (i.e., still, freshwater) environments; they are now locally extinct in the Sacramento River (Crain and Moyle 2011). Sacramento perch dominate all other investigated historical sites in the Sacramento River system (Schulz 1980, 1982, 1984, 1997) as well as the prehistoric fisheries of the region (Gobalet et al. 2004). Despite its historical commercial importance, salmon made up only a small portion of our assemblage, a trend which is mirrored at other sites of the same period.

In addition to local freshwater fish, marine species (e.g., pufferfish, rockfish) were identified and would have been transported from the San Francisco Bay area. Rockfish have been caught in the San Francisco Bay since 1850 (*Alta California* 1855). Pufferfish, represented by a single element, was not historically an important variety of fish; however, it has been identified in faunal remains from the Woodland Opera House excavations (Schulz 1984). Although this fish has a reputation for being potentially poisonous if not prepared properly, it is often prized today as sashimi. A number of cod vertebra were also identified. Although Pacific and Atlantic cod vertebrae are osteologically identical, no Pacific cod fisheries existed at the time (Schulz 1997); thus, the cod elements likely came from the North Atlantic. Sacramento was a major trade hub in the mid-late nineteenth-century. Salted fish were a major trade item and part of local markets by 1830s; they became a staple during the Gold Rush (Spear 1835).

Birds

Nine bird taxa were identified, and of those, two were domestic taxa (chicken and turkey). At least four of the identified wild taxa were waterfowl, including a large crane recovered from the Back area, and the two remaining wild taxa were pigeon and quail. Chickens comprise 43% of the bird remains, followed by ducks and geese at 39% (osteologically most ducks and geese are difficult to separate to genus, let alone species). Wild fowl made up slightly more than half of the total bird assemblage (53%). Wild ducks and geese would have been hunted locally and sold at the market. During the mid-nineteenth-century, chicken and turkey were quite expensive due to limited supply, resulting in a reliance on wild fowl. Between 1850 and 1880, for example, chickens were at least twice as expensive as ducks and geese (Simons 1982). In a study of bird remains from several Sacramento deposits, Simons (1980a, 1982), found that wild waterfowl dominated most assemblages until around 1880, with the exception of the Golden Eagle Hotel (Simons 1980b). After 1880, the advent of modern poultry production reduced the price of domestic fowl, and thus wild and domestic birds were consumed in relatively equivalent numbers. Additionally, wetland reclamation and overhunting led to a steady decrease in local waterfowl, resulting in increased prices (McGowen 1961). Although the site covers a period from 1849 to 1885, the bird consumption pattern seems to align more

closely to what we would expect after 1880, but it is unknown if domestic poultry proportions represent purchasing power or are a reflection of local availability.

Meat Cut Analysis

Given that the building assemblages yielded small samples, we combined all five areas to examine historical meat cuts across these deposits (following Gust 1997; Schulz and Gust 1983). The Enterprise Hotel beef cuts were dominated by mid-ranked short/cross rib cuts (24%). The least abundant cut is the brisket (<1%), followed closely by the high-ranked sirloin cut (2%; Figure 4a). More than 66% of the cattle bones had butchery marks, and of these, nearly 99% of the cuts were made by sawing. This pattern was mirrored for both the sheep and pig remains. Cuts of mutton (lamb) were dominated by the rib/rack (40%), which is a moderately ranked portion of the sheep, followed by the hindshank (17%; Figure 4b). Low-ranked foot elements were the most commonly identified pork part (33%), but second to pigs' feet was the high-ranked loin cut (21%; Figure 4c). Comparing our results to other areas of Old Sacramento (Schulz 1984), the cuts most closely match those recovered from two saloon deposits; they do not match either the low-ranked city jail or the high-ranked hotel assemblages. Therefore, meat cuts across this site seem to reflect middle-class, urban socioeconomics.

CONCLUSION

Although limited contextual information and marked differences in samples size mask consumption patterns through time and among assemblages, the data presented shed light on the diet and food access of the mid-late nineteenth-century occupants of the lots under the former Enterprise Hotel. Even though the majority of faunal counts were made up of domestic taxa, wild taxa still constituted a large portion of the total assemblage, which marks a continued reliance on local fish and game, characteristic of the market era at that time (McGowen 1961; Simons 1982). Although the cattle remains were slightly more abundant than the other domestic species, overall composition was quite varied. Surprisingly, chicken and pork were relatively well represented, despite being historically expensive. Their high proportion can be explained either by temporal factors, such as decreased prices due to industrial farming, or by socioeconomic preference. As the site represents a relatively long period (from 1849 to 1885) and multiple contexts, it is difficult to assign causality to the high proportion of poultry and pork. Despite the high frequency of chicken and pork, meat cuts represented were dominated by middle-ranked portions, which resemble what was documented by Schulz and Gust (1983). The consumption pattern exhibited by these assemblages generally maps onto a middle-class income level. In short, our analysis contributes to our understanding of the historic economy and natural environment of the inhabitants of nineteenth-century Sacramento.

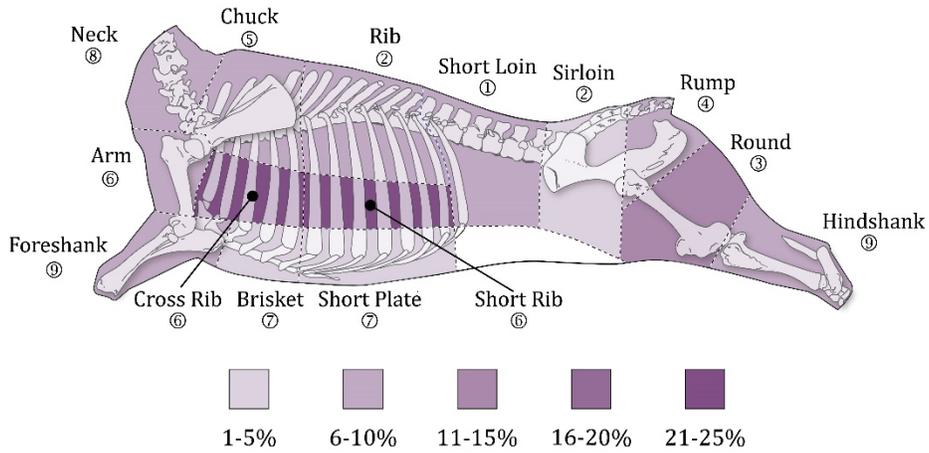


Figure 4a. Relative Frequency of Beef Cuts from the Enterprise Hotel Deposits.

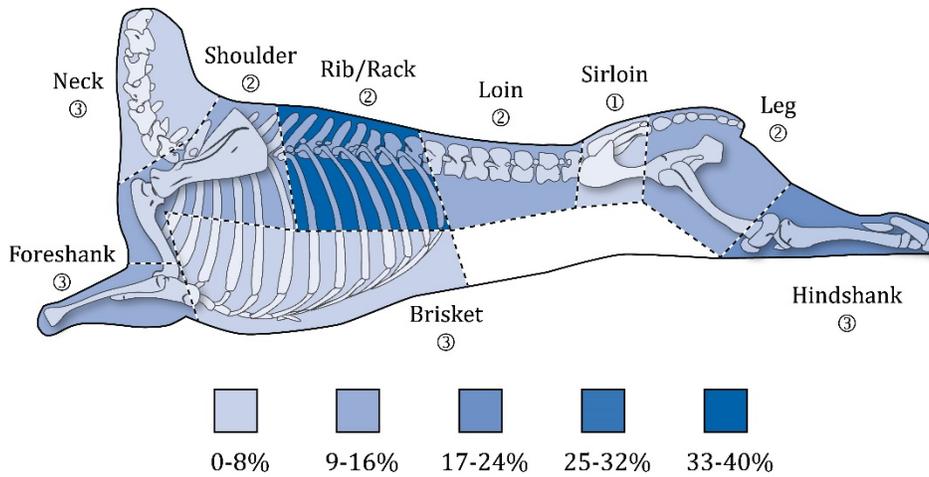


Figure 4b. Relative Frequency of Mutton Cuts from the Enterprise Hotel Deposits.

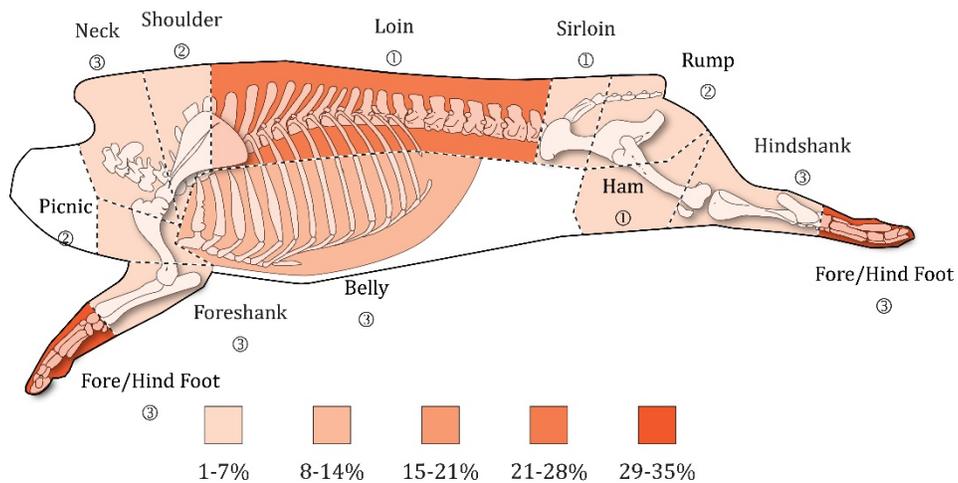


Figure 4c. Relative Frequency of Pork Cuts from the Enterprise Hotel Deposits.

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