Houses and Households

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Houses and Households

Kenneth M. Ames and Elizabeth A. Sobel

The household was the fundamental social, economic and cultural unit in western North America, including along the Lower Columbia River. On the Northwest Coast, houses were the physical manifestation of the household and its social rank; they were theater and stage for social and spiritual rituals...they were also shelter in dank climate; they were food processing factories in which animal resources were butchered, roasted, smoked, rendered, dried, boiled, stored, and consumed: and they were the objects of tremendous effort and skill. Their interior arrangements were often a map of the relative status of the household’s members...[and thought by some to be] maps of the...cosmos. (Ames and Maschner 1999:147-48)

Ancient and not so ancient houses, their contents, and associated dumps and activity areas open windows into the lives of people in ways written records or oral traditions cannot. Consequently, archaeologists have expended much effort on excavating houses.

Households are central to understanding what anthropologists and others term complex societies—that is, societies that feature social stratification, high population densities, monumental architecture, and an emphasis on wealth. Most premodern complex societies practiced agriculture, which enabled the high levels of food production that most researchers thought were needed to support complexity. Northwest Coast peoples, however, including those along the Lower Columbia and a few other known human populations, had complex societies based on hunting-gathering economies (Price and Brown 1985). For several decades, anthropologists have been trying to figure out how this happened. How did communities with only a hunter-gatherer economy produce not only enough resources to meet basic...
needs but also the surplus to support hereditary elites, high population densities, and the other resource-intensive aspects of complexity?

On the Northwest Coast, the answer lies at least in part with the household. The household was the fundamental unit of production, so household production must have been organized strategically, enabling the high output that fueled complexity. How were household members and property, including the house itself, mobilized to achieve such high production levels? We can find some answers to this question by examining the Chinookan household as an economic and social unit. Ethnohistoric and archaeological evidence can help us develop a picture of how houses sustained Chinookan culture and society immediately before the arrival of Europeans and to document some of the changes that occurred between the Vancouver expedition and the devastation of the epidemics (1792–1830).

CHINOOKAN HOUSEHOLDS

Chinookan households were part of larger communities of villages, towns, and regions, but the winter settlement or town was the primary community. Winter communities generally ranged in size from 40 to 500 individuals, although some in the Wapato Valley were larger. The mean number of individuals per community was highest in the Wapato Valley, intermediate at The Cascades, and lowest near the mouth of the Columbia River (Table 6.1).

The number of households per winter community in the Lower Columbia ranged from as few as one to at least 20, with each household having from about 10 to at least 100 individuals. Like community size, household size was largest in the Wapato Valley, intermediate at The Cascades, and lowest near the mouth of the Columbia. The core of each household was a kin-group of two or more nuclear and small extended families (Drucker 1934:32; Hajda 1984:169; Lewis and Clark 1990:221–22; Ray 1938:127); high status families and households were larger. A household also included any slaves owned by the resident families, and some households probably had skilled craftsmen temporarily living there (Drucker 1934:9–11, 32), as well as fictive kin, in-laws, orphans, and assorted hangers-on.

Chinookans had what anthropologists call corporate households. Each had an internal hierarchy with a leader, and many contained members of two or all three rank groups in Lower Columbia society—elites, commoners, and slaves. Members had certain obligations and privileges. They had to contribute to household production, for example, and could access the common household...
**TABLE 6.1. Estimated people per household in the Greater Lower Columbia River Region (from Hajda 1984)**

<table>
<thead>
<tr>
<th>REGION</th>
<th><strong>LEWIS AND CLARK’S HIGH ESTIMATE</strong>*</th>
<th><strong>LEWIS AND CLARK’S LOW ESTIMATE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HOUSES</td>
<td>PEOPLE/HOUSE</td>
</tr>
<tr>
<td>Coast/River Mouth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>286</td>
<td>5,160</td>
</tr>
<tr>
<td>Mean/Group</td>
<td>20</td>
<td>369</td>
</tr>
<tr>
<td>Median</td>
<td>16</td>
<td>225</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>16</td>
<td>304</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>7,820</td>
</tr>
<tr>
<td>Mean/group</td>
<td>12</td>
<td>602</td>
</tr>
<tr>
<td>Median</td>
<td>6</td>
<td>400</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>13</td>
<td>661</td>
</tr>
<tr>
<td>Columbia River Gorge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>2,800</td>
</tr>
</tbody>
</table>

* Lewis and Clark produced two population estimates for the people they encountered: one developed in the fall of 1805, the second in the spring of 1806. The latter has been available in print as "Estimate of the Western Indians," while the former remained in manuscript until the 1980s (Boyd and Hajda 1987). Most GLCR population estimates (e.g., Mooney 1928, Kroeber 1939) are based on the "Estimate," which has higher population figures than the manuscript. Boyd and Hajda (1987) postulate that the differences between the two sets of figures reflect seasonal fluctuations in population along the river, with the lower figures representing a “core” GLCR population.

Food supply (Lewis and Clark 1990:221–22; Swan 1972:161, 166). Finally, Lower Columbia households had multigenerational life spans, with houses inherited by children and household leadership passing from parent to child (Lewis and Clark 1990:221–22; Ray 1938:128; Spier and Sapir 1930:221; Townsend 1999:337).

**CHINOOKAN HOUSES**

There were three basic house types. The post-and-beam plankhouse, also called the winter or permanent house, was often maintained and reoccupied...
each year for decades and even centuries. The summer or temporary house, which could either be a mat lodge or a plank structure, was smaller and of lighter construction. The mat lodge had a pole frame covered by bark or mats. Some summer or temporary houses had light post frames covered with planks temporarily borrowed from a permanent house (Hajda 1984, 1994:180; Kane 1971b:34, 35; Ray 1938; Spier and Sapir 1930). The pit house or earth lodge was a common winter house on the Plateau east of the Cascade Mountains but historically existed in a minority of settlements in the eastern part of the Lower Columbia. Importantly, historical sources imply that all Lower Columbia settlements containing pit houses also contained plankhouses and that residents of these communities wintered in the pit houses and summered in the plankhouses (Lewis and Clark 1990:119; Wilkes 1845:382). This mix of surface plankhouses and semisubterranean pit houses in the same settlement also occurred along the Lower Fraser River in southwestern British Columbia during the last 2,200 years or so (e.g., Schaepe 2009). We know more about plankhouses than other Lower Columbia house types, and the plankhouse is much more closely linked, mechanically and symbolically, to the suite of indigenous household dynamics of interest here.

**Plankhouse Construction**

Throughout the Lower Columbia region, plankhouses shared some basic architectural features. The rectangular, gable-roofed houses, constructed primarily of western red cedar (*Thuja plicata*), ranged in size from 6 by 8 meters (about 20 by 25 feet) to 12 by 110 meters (about 40 by 360 feet), and even longer. The post-and-beam frame had upright posts or squared timbers set along the house’s center axis, supporting the central ridge beam that formed the gable. Shorter posts or planks along the sides of the frame supported the eaves poles. Rafter poles linked these with the ridge beam. Ridge-beam supports were 4–5.5 meters (13–18 feet) or more high, while the eave posts were 1.5–2.2 meters (5–7 feet) high. Walls were split cedar planks set vertically into a trench beneath the eaves pole, with their tops lashed to it. Roofs were thin planks laid horizontally, vertically, or both and sometimes covered with cedar bark. Floors were earthen or planked; earthen floors were usually covered with mats.

People along the Lower Columbia, as elsewhere along the Northwest Coast, sometimes owned more than one house frame and shifted from frame...
to frame during an annual cycle, but they did not necessarily own more than one set of wall and roof planks. Consequently, they often took the wall and roof planks with them when leaving one house site and reattached the planking to the frame at the destination site (Hajda 1994:180; Ray 1938:126).

Small dwellings had a hearth set in the house’s center, while larger structures had a hearth row down their long axis. As many as 10 hearths have been recorded for one house. Hearths were sometimes placed on the floor, sometimes in pits about 30 centimeters below the floor level, and inside framed boxes. These could be as large as 2.5–3 square meters (8–11 feet). Each served one or more family groups, which occupied the closest bench areas on both sides of the hearth (Hajda 1994). The presence of two or more hearths indicated that two or more families occupied a house.

Platforms for sleeping, storage, and other activities ran along at least the two sides of the house and perhaps at one or both ends. Material was stored on and under them, and sometimes the platforms were doubled, one above the other. The upper platform was reached by a ladder. Doorways—oval openings, roughly two by three feet, cut into a wide wall plank (Hajda 1994; Ray 1938:125)—were in one or both end walls and sometimes on sidewalls. Doors were usually pieces of plank, hide, or woven matting that could be pushed aside by those passing through (Hajda 1994:179; Ray 1938:125).

Many Lower Columbia plankhouses were semisubterranean, with floors and walls 0.3–2 meters (1–6 feet) below ground surface. In some instances, houses were erected over the excavation rather than in it, and the excavated areas were often floored over and used for storage. Archaeological investigations (Ames et al. 1992; Ames et al. 1999; Ames et al. 2008; Foreman and Foreman 1977; Smith 2006) show that extensive subfloor storage-pit complexes were common if not ubiquitous in Wapato Valley plankhouses. Pit complexes were located in two places: (1) below the sleeping benches and/or (2) below the floor planks that extended between the benches and the central hearth. In at least one instance, the excavation created a cellar (Ames et al. 1992; Ames et al. 2008). These pits were used for storage and for collecting refuse before throwing it out. The lack of documentary references to subfloor pits implies that they were not readily apparent to European and Euro-American visitors and that house occupants did not show them to these visitors.

Many documentary accounts describe painted and carved images on the interior surfaces of Lower Columbia plankhouses. Center posts, partitions, rear walls, the inner sides of the plank with the doorway, and the sides and...
ends of benches frequently bore carved and painted images, including geometric, anthropomorphic, and zoomorphic designs (Hajda 1994). The interior surface of the plank containing the doorway was often decorated so that the doorway composed the mouth or space between the legs of an anthropomorphic figure (Parker 1967:245; Vancouver 1984:77). Some observers noted freestanding painted wooden sculptures inside plankhouses (Hajda 1994), but historical accounts do not mention carvings or paintings on the exterior surfaces.

House construction differed among four areas within the Lower Columbia (Hajda 1994): the river mouth and outer coast, the middle Lower Columbia (Oak Point to Wapato Valley), The Cascades, and the upper Lower Columbia (Columbia Gorge Cascades to The Dalles area). Houses at the river mouth and outer coast were generally the smallest, with maximum lengths of roughly 30 meters (100 feet).

The largest houses were between Oak Point and the mouth of the Sandy River in the Wapato Valley. This region also had the only houses with internal partitions and the only large modular houses (those comprised of attached compartments). Meriwether Lewis and William Clark described a structure that was 69 meters (226 feet) long and divided into seven apartments, each roughly 10 square meters (30 square feet) in size. They and other sources apparently described large nonsegmented structures as well, ranging from 12 to 91 meters (40 to 300 feet) in length in this portion of the Lower Columbia (Hajda 1994). Archaeological excavations of Wapato Valley sites revealed both the segmented and large nonsegmented houses reported by Lewis and Clark. Of the six houses at the Cathlapotle site, at least four were subdivided into compartments (Ames et al. 2011). The Meier site, also located in the Wapato Valley, had a single large house featuring an open interior without compartments (Ames et al. 1992).

Houses along The Cascades portion of the river included structures longer than those near the coast but not as long as some of those in the Wapato Valley. Reported house sizes range from 11 by 10 to 49 by 14 meters (35 by 30 to 160 by 45 feet). Sources also describe a partition just inside the doorway of houses along The Cascades (Hajda 1994). Houses in the Columbia Gorge were distinct in at least two respects. First, they were relatively small compared to plankhouses in the Wapato Valley and at The Cascades, averaging perhaps 20 by 30 feet. Second, some settlements contained pit houses as well as plankhouses (Hajda 1994; Lewis and Clark 1990:119; Wilkes 1845:382).
LOWER COLUMBIA RIVER HOUSEHOLD ARCHAEOLOGY

Plankhouses have been used in the Lower Columbia for at least 2,800 years (Connolly 1992; Jermann et al. 1975), and archaeologists have investigated a large number of them (Table 6.2). Rectangular surface structures may have been built on the northern British Columbia coast as early as 6,000–7,000 years ago, with plankhouses constructed as early as 4,000–5,000 years ago. Rectangular surface houses were also present in southern British Columbia on the Lower Fraser River between 5,000 and 6,000 years ago (ca. 3000–4000 BC), much earlier than the Palmrose house (800 BC–AD 300) on the Oregon Coast. Plankhouse use seems to have been continuous on the northern coast after those dates, but there appears to be a gap of perhaps 1,000 or more years in their use (or in the archaeological record) on the Lower Fraser. The temporal pattern on the Lower Columbia before 2,800 years ago is unknown. After that, plankhouses were the dominant form of house in the region, although semisubterranean pit houses were also used in some locales (Bourdeau 2001; Minor et al. 1989:255; Pettigrew 1990:525; Warren 1958, 1960).

Archaeologists have identified over 20 sites with evidence of houses on the Lower Columbia. Only five of these sites have had excavations of sufficient scope to provide the information needed to reconstruct details of household organization and dynamics: Meier (35C05), Cathlapotle (45CL1), Broken Tops (35CO57), Clahclelah (45SA11), and McGowan/Station Camp (45PC106).

The Meier site, in the Wapato Valley near Scappoose, Oregon, contains the remains of one large plankhouse, about 14 by 30 meters (46 by 98 feet) in size, where an estimated 200 people lived (Ames et al. 2008). The site was occupied from ca. AD 1300 to 1800, into the fur-trade era. The house was used continuously between about AD 1400 to 1450 and site abandonment (Ames et al. 1992).

Cathlapotle, in the Wapato Valley near Ridgefield, Washington, is the site of a large town visited by Lewis and Clark on March 29, 1806. They estimated that it had a population of between 900 and 1,400 people. There is evidence for six very large plankhouses (ranging in size from 20 by 10 to 70 by 15 meters) in two rows paralleling the adjacent river. Four were modular houses. The town was established in its current location in around AD 1450 and abandoned by the mid-1830s. It is likely that the town was moved to its known location from another nearby place (Ames et al. 2011).

Broken Tops, in the Wapato Valley east of the Portland International Airport, contains remains of one or two rectangular plankhouse features

## Table 6.2. Lower Columbia archaeological sites with house features

<table>
<thead>
<tr>
<th>REGION</th>
<th>SITE</th>
<th>AGE APPROXIMATION</th>
<th>HOUSE SHAPE</th>
<th>ESTIMATED MIN. HOUSE SIZE (M)</th>
<th>MIN. NO. OF HOUSES</th>
<th>SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalles</td>
<td>Wakemap Mound</td>
<td>AD 900–1400</td>
<td>Circular</td>
<td>?</td>
<td>multiple</td>
<td>Butler 1960</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AD 1400–1800s</td>
<td>Rectangular</td>
<td>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gorge</td>
<td>Caples (45SA5)</td>
<td>AD 1500–1700</td>
<td>Oval</td>
<td>6 x 4</td>
<td>41</td>
<td>Dunnell and Beck 1979</td>
</tr>
<tr>
<td></td>
<td>Clahclelah (45SA11)</td>
<td>AD 1700–1840</td>
<td>Rectangular</td>
<td>9 x 7 to 11 x 10;</td>
<td>7</td>
<td>Minor et al. 1989</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AD 1500–1700</td>
<td>Oval</td>
<td>4 x 3</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Gorge</td>
<td>SK1*</td>
<td>Precontact (and postcontact?)</td>
<td>Circular and oval</td>
<td>6 x ? to 20 x ?</td>
<td>17</td>
<td>Warren 1959</td>
</tr>
<tr>
<td>Gorge</td>
<td>SK2*</td>
<td>Unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>3</td>
<td>Strong 1959</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Wagon Wheel Park (CL8*)</td>
<td>Precontact</td>
<td>Circular</td>
<td>10 x 10</td>
<td>11</td>
<td>Warren 1959</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>CL14* CL3*</td>
<td>Precontact</td>
<td>Rectangular</td>
<td>12 x 7 to 36 x 7</td>
<td>4</td>
<td>Warren 1959; Strong 1959</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Cathlapotle (45CL1)</td>
<td>AD 1400–1830</td>
<td>Rectangular</td>
<td>60 x 10 to 16 x 10</td>
<td>6</td>
<td>Ames et al. 1999</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Meier (35CO5)</td>
<td>AD 1400–postcontact</td>
<td>Rectangular</td>
<td>30 x 12</td>
<td>1</td>
<td>Ames et al. 1992</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>45CL2*</td>
<td>Unknown</td>
<td>Rectangular</td>
<td>90 x 7.5</td>
<td>1</td>
<td>Strong 1959; Warren 1959</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Broken Tops (35MU57)</td>
<td>AD 1375–AD 1500</td>
<td>Rectangular</td>
<td>unknown (9 x 8; 9.5 x 8.5)</td>
<td>2</td>
<td>Ellis and Fagan 1993; Ellis 2006</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Herzog (45CL11)</td>
<td>Pre- and postcontact</td>
<td>Rectangular</td>
<td>21 x 10&lt;</td>
<td>1</td>
<td>Foreman and Foreman 1977</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Kersting (45CL21)</td>
<td>0 AD</td>
<td>Rectangular</td>
<td>8 x 5; 5 x 5&gt;</td>
<td>3</td>
<td>Jermann et al. 1975</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Lady Island (45CL48)</td>
<td>500 BC</td>
<td>Rectangular</td>
<td>unknown</td>
<td>1</td>
<td>Pettigrew 1981</td>
</tr>
<tr>
<td>Wapato Valley</td>
<td>Merrybell (35MU9)</td>
<td>900 BC</td>
<td>unknown</td>
<td>unknown</td>
<td>1. possible</td>
<td>Pettigrew 1981</td>
</tr>
<tr>
<td>Site Name</td>
<td>Date</td>
<td>Shape</td>
<td>Dimensions</td>
<td>Site Type</td>
<td>Notes</td>
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</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>--------------</td>
<td>-----------</td>
<td>--------------------------------------------</td>
<td></td>
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<tr>
<td>Wapato Valley Pumphouse (35C07)</td>
<td>AD 260 +/- 80</td>
<td>Rectangular</td>
<td>30 x 10; 17 x 7</td>
<td>2</td>
<td>Pettigrew 1981; Strong 1959; Warren 1959</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Lyons (35MU6)</td>
<td>530 +/- 80 BP</td>
<td>Rectangular</td>
<td>unknown</td>
<td>1</td>
<td>Pettigrew 1981</td>
<td></td>
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<tr>
<td>Wapato Valley CL11* (Warren)</td>
<td>Pre- and postcontact</td>
<td>Rectangular</td>
<td>37 x 7 to 12 x 7</td>
<td>2-3</td>
<td>Warren 1959; Strong 1959</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley CL4* (Strong)</td>
<td></td>
<td>Rectangular</td>
<td>3.5 x 3.5 to 2.5 x 2.5</td>
<td>2</td>
<td>Strong 1959</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Felida Moorage CL6*</td>
<td>Unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>Strong 1959</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Bachelor Is. (45CL43)</td>
<td>300 BC-AD 50</td>
<td>Rectangular</td>
<td>8 wide, 6 wide</td>
<td>2</td>
<td>Steele 1980; Ame et al. 2008</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Ede (35CO34)</td>
<td>120 BC-AD 1000</td>
<td>Circular or oval</td>
<td>&gt;7.5 x ?</td>
<td>1</td>
<td>Minor et al. 1985</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Yale Reservoir (45CL20)</td>
<td>?</td>
<td>Circular or oval</td>
<td>unknown</td>
<td>1</td>
<td>Bryan 1992; cited in Wilson 1999</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley Long Jump (45CL460)</td>
<td>340 +/- 50 BP</td>
<td>Circular or oval</td>
<td>7 x 7</td>
<td>1</td>
<td>Wilson 1999</td>
<td></td>
</tr>
<tr>
<td>Wapato Valley La Camas (45CL406)</td>
<td>AD 1670-AD 1810</td>
<td>Rectangular</td>
<td>20 x 7s</td>
<td>1</td>
<td>Chatters and Reid 1997</td>
<td></td>
</tr>
<tr>
<td>Estuary McGowan/Station Camp (45PC106)</td>
<td>AD 1792-1829</td>
<td>Rectangular</td>
<td>8 x 10</td>
<td>1</td>
<td>Wilson et al. [year?]</td>
<td></td>
</tr>
<tr>
<td>Outer Coast Palmrose (35CLT47)</td>
<td>300 BC-400 AD</td>
<td>Rectangular</td>
<td>&gt;16 x 6</td>
<td>1</td>
<td>Connolly 1992; Phebus and Drucker 1979</td>
<td></td>
</tr>
<tr>
<td>Outer Coast Par-Tee (35CLT20)</td>
<td>250 AD-900 AD</td>
<td>Circular</td>
<td>?</td>
<td>?</td>
<td>Connolly 1992</td>
<td></td>
</tr>
<tr>
<td>Outer Coast Martin</td>
<td>- 600 AD-?</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>Shaw 1977</td>
<td></td>
</tr>
<tr>
<td>Outer Coast 45(C101)</td>
<td>1 AD-Contact?</td>
<td>Rectangular</td>
<td>?</td>
<td>2</td>
<td>DePuydt 1994</td>
<td></td>
</tr>
</tbody>
</table>

* Site number given by Strong and/or Warren; may not be current site number.
dating from ca. AD 1375 to 1500 (Ellis and Fagan 1993). The structures were smaller (8 by 9 meters) and less permanent than those at Meier or Cathlapotle, and they lacked the interior fittings described earlier. The site was probably inhabited seasonally, in spring and summer or both, by one or two small households engaged in subsistence tasks for immediate consumption and perhaps also to store resources for later consumption. It produced relatively few artifacts (Ellis 2006).

Clahclehlah, at the Middle Cascades on the northern or Washington shore, is probably the site of a town visited by Lewis and Clark in April 1806. The site was completely excavated in the late 1970s when a second powerhouse was constructed at Bonneville Dam. Seven plankhouses were aligned in two rows facing the Columbia River. While generally similar to the Meier and Cathlapotle houses, the Clahclehlah houses were much smaller, although they did have the standard interior fittings of Chinookan houses. The site appears to date from AD 1700 to perhaps as late as AD 1855 (Minor et al. 1985; Sobel 2004).

McGowan/Station Camp is located on Baker Bay on the Washington shore of the Columbia River estuary (Wilson et al. 2009). The bay was a major ship anchorage during the maritime fur trade, and the site was across the river from the fur-trading post of Fort Astoria/Fort George (1811–25). The McGowan/Station Camp site, which appears to have been occupied between about 1792 and 1820 (Wilson et al. 2009), contains evidence for one or more small (8 by 10 meters) plankhouses, although the remains may represent a single modular house. The structure was probably temporary and burned at least once, as archaeologists found burned planks that may be the remains of a wall or a shed-style roof. While the structure may have had sleeping platforms and interior pits, it did not have the large pit complexes found at upstream sites. The site also lacked domestic artifacts while having a rich assemblage of trade goods. It was probably a Chinookan trading depot (Wilson et al. 2009).

HOUSEHOLD PRODUCTION
Food Getting, Processing, Cooking, and Eating

Chinookan houses were the physical and organizational centers of an intensive food-getting economy. Lower Columbia peoples harvested a wide array of food resources, including mammals, fish, and plants; and large amounts of resources were transported to the house for processing. Many hunter-gatherers processed
harvested resources in the field, but Chinookan people also used a great diversity and number of canoes, some capable of hauling several tons, so they hauled home everything from the largest elk to plant roots and berries. While some field processing did occur, most production activities took place in and around the house. Recent research in the vicinity of Cathlapotle, for example, suggests that food-processing activities were concentrated in and around winter residential sites (Daehnke and Funk 2005).

Initial food processing, including animal and fish butchering, occurred both inside and outside the houses. Salmon and sturgeon, for example, were processed inside the house (Sobel 2004). The archaeological recovery of articulated animal skeletal sections from subfloor storage pits also points to indoor food processing (Ames et al. 2011).

Cooking, including boiling and roasting, took place both inside and outside the house. Indoors, people cooked in and around the central hearth or hearths (Curtis 1970:92; Lockley 1928:59; Ray 1938:128–29; Swan 1972:111); outdoors, they used earth ovens and small hearths. Archaeological evidence for the large size and scale of indoor hearths and the high frequency of outdoor hearths and ovens shows the intense effort that people invested in food processing. Food was stone boiled by heating rocks in a fire and then dropping them into a container of water and food (Drucker 1934; Kane 1971b; Lewis and Clark 1990:215–17; Lockley 1928:59; Simpson 1968:103; Ray 1938:129; Spier and Sapir 1930:185); fish and meat were rendered into oil in this way (Lewis and Clark 1990:215–17). Meat and fish were roasted near or above the hearth fire (Lee and Frost 1968:300; Lewis and Clark 1990:215, 219; Ray 1938:130; Swan 1972:109), while roots, nuts, berries, moss, and meat were steamed and baked in outdoor earth ovens (Drucker 1934; Ray 1938:118–21; Lee and Frost 1968:181; Ray 1938:129; Spier and Sapir 1930:182–84).

Like indoor cooking, indoor eating generally occurred around hearths. In everyday situations and during feasts, individuals ate while seated on mats around hearths, with their food placed in containers or on mats. An entire family might eat food from a single container or mat (Boyd 1996:99–100; Curtis 1970:92; Drucker 1934:6; Lee and Frost 1968:299; Lewis and Clark 1990:118–20; Lockley 1928:59; Ray 1938:128).

Storage

Plankhouses were the major storage facilities along the Lower Columbia, as elsewhere along the Northwest Coast (Ames 1996). Great quantities of dried
and smoked foods were stored, especially in late fall, when most winter provi­
sions had been gathered. Euro-Americans described houses that were seem­
ingly stuffed with provisions. In 1814, Alexander Henry (1992) observed that “the insides of these Indians Houses are crowded with smelt [eulachon] dry­
ing, suspended by the heads to poles, the roofs are lined every where except­
ing the fire place is full, all hanging tail downwards” (665). Nathaniel Wyeth (1973), in 1835, estimated that the house of one Lower Columbia “chief” con­
tained four tons of dried fish, roots, and other food (175).

Many items were stored on or beneath benches, on the floor in other parts
of the house, and in subfloor storage pits. Storage was not limited to foods, as
an array of materials was kept in the subfloor pits, including raw materials,
wealth goods, and trash. Butchered animal parts may have been stored for
use as raw material (e.g., bone and tendons for making tools) as much as for
food. The pits were probably lined with mats or baskets (Ames et al. 1992:283;

Objects were hung from rafters, ridgepoies, eaves posts, wall planks, and
other structural members. A variety of foods, particularly those with high fat
content and oil, were stored this way. Lamprey, salmon, eulachon, and some­
times berries and roots were suspended from the plankhouse ceiling (Swan 1972:111; Strong 1906:10). Perishable resources hung from the roof were dried
and, to varying degrees, smoked by the hearth fires below (Henry 1992:665;
Swan 1972:111). Items stored on benches and floors were in boxes, baskets,
and bags (Henry 1992:637; Lockley 1928:39), and those hung from ceilings and
walls were probably in baskets and bags. A few sources indicate that stored
items were sometimes concentrated in the rear parts of plankhouses (Curtis

Plankhouses could readily accommodate large volumes of stored goods.
The Meier house had an estimated 1,000 meters or more of storage space
under its eaves and in its cellar. Ames et al. (2008) estimate that the Meier
cellar could have held over 20 tons of stores. While this probably was not
typical, smaller houses still had substantial volumes of storage space.

Fabrication and Craft Production

Fabrication and craft production were key household functions and were
often carried out indoors (Ray 1938:128). James Swan (1972:161–64) reported
that in winter, when heavy rains limited outdoor activity, men and women

often spent time making and repairing objects. For example, Swan wrote that women wove mats “on the lodge floor” by pounding two pegs into the ground, one at each end of the in-progress mat for the attachment of fibers, while men reportedly made and repaired spears, fishhooks, “daggers,” wooden spoons, bowls, and dishes.

The archaeological visibility of fabrication activities is conditioned by preservation factors. The Lower Columbia archaeological record most directly reflects fabrication activities that involved nonperishable materials such as stone, bone, and metal. In contrast, fabrication activities involving perishables—basket making, for example—are often archaeologically invisible. Furthermore, most of the stone and bone artifacts commonly found by archaeologists were once parts of larger tools with nonperishable components. A stone net weight, for example, was once secured to a net woven of cordage, perhaps of nettle fiber, that did not preserve. Stone and bone artifacts are the visible tips of an invisible iceberg of technology. The iceberg’s size is suggested by the Ozette site on the Washington Coast, which contains remains of several plankhouses dating to the early 1700s. The houses were buried beneath a vast mudslide that preserved the wooden objects in the houses. Archaeologists estimate that less than 5 percent of the tools at Ozette are of bone or stone (Croes 1996). The Sunken Village site, located on Sauvie Island in the Lower Columbia River (Croes et al. 2009), was likewise buried in wet mud. The many perishables recovered from Sunken Village hint at the range and diversity of wooden items that the Lower Columbia River houses probably contained. It is no surprise, then, that stone artifacts from Lower Columbia sites include many woodworking tools, indicating that carpentry was a major, ongoing effort.

Archaeological evidence for carpentry includes stone hammers or mauls, stone adze blades, antler splitting wedges, abraders for smoothing and sanding rough wood, saws, chisels, and wood shavings and chips. Among possible woodworking tools are beaver incisors, which may have been used as adzes for fine work and carving (Lyman and Zehr 2003). The diversity of tools indicates that the full range of woodworking and carpentry occurred at the houses. While it is possible that high status individuals at the Meier house engaged in more fine woodworking (e.g., carving) than other members of the household, they did not do so at Cathlapotle.

Fabrication also includes the acquisition of raw materials for tools and other items. Archaeology indicates that most of the stone for chipped stone tools was collected nearby and stored in the cellars against future need. Bone
and antler were similarly locally available and were collected and stored. Other raw materials were imported through trade and travel. For example, obsidian and some high quality cherts were imported from other areas, and metals were obtained mainly from Europeans and Euro-Americans (Sobel 2012).

Fabricating activities occurred primarily inside, around the hearth, and the storage areas near the hearths are rich in fabrication debris, broken tools, and the like. They also contained evidence of racks and other small structures. The hearths themselves probably produced good light and sometimes quite high heat, required for working copper and treating some kinds of stone used for chipped stone tools. Less often, fabrication took place on the benches or outdoors.

The archaeological recovery of highly crafted items, such as those carrying decoration, is exceedingly rare. It is clear from museum collections, historical accounts, ethnographic data, and the occasional archaeological find, however, that such items were made. Small adzes, beaver teeth, stone gravers, perforators, and saws used for fine woodworking are ubiquitous but not abundant. At Meier, such tools are concentrated in the high status end of the house, suggesting that some high status individuals specialized in skilled woodworking. At both Meier and Cathlapotle, the distributions of faceted hammerstones, used to make groundstone objects, suggest focused work areas, which also implies specialization by groups within households (Ames and Smith 2010).

House Construction, Renovation, and Repair

The construction of a plankhouse was a significant investment in time and energy (Trieu 2006). The Meier house, for example, may have contained some 55,000 board feet of lumber, without a plank floor, to 75,000 board feet, with a plank floor. (Modern, single-family houses use 10,000–12,000 board feet). Building the house may represent the labor of from 1,400 to 2,600 people, if erected in a single day, as was the practice elsewhere on the Northwest Coast. Even the much smaller Clahclelah houses each may have required the labor of as many as 400 people (Trieu 2006). The town of Cathlapotle likely contained over a million board feet of lumber at one time. These estimates do not include fittings—planking for storage boxes, hearth boxes, interior frames—not the acquisition of wood for interior fires or the fabrication of tools.

Plankhouses were regularly repaired and rebuilt (Trieu 2006). Renovation...
included rebuilding houses almost from scratch, replacing and resetting eave support posts and ridge-beam support planks and filling, re-excavating, and refilling subfloor pits and post holes. Houses burned and were damaged by floods, and planks and beams rotted and were eaten by insects. Over its 400-year lifespan, the Meier house was repaired and rebuilt as many as 18 times (Ames et al. 1992); the house likely contained 500,000–1 million board feet over its lifetime (Ames et al. 1992).

**Ceremonial Gatherings**

The plankhouse was the primary setting for ceremonial gatherings in the Lower Columbia (see Sobel 2004). Ceremonial gatherings that took place partially or completely in houses included a series of life-cycle ceremonies, curing ceremonies, and winter spirit dances. The Lower Chinookans also held secular feasts or gifting ceremonies in the summer and fall to mark an individual’s change in status from commoner to elite and ceremonies seeking spiritual aid in periods of food shortage (Ray 1938:48, 115). Ceremonial activity occurred primarily in the space that circumscribed, partially or completely, the hearth or hearths in a house. Feasts were sometimes, if not often, consumed in one house but prepared elsewhere. Wooden planks and posts were planted upright or laid horizontally on the house floor in various ceremonial contexts. The most sacred components of spirit dances took place in the rear of the house, while the front of the house was open to anyone who wished to attend.

Chinookan individuals with guardian spirits might possess one or more power boards or power sticks that individuals used while participating in spirit dances (Boyd 1996:122–26). At other times, they might display power boards and power sticks in their houses.

**HOUSEHOLD SPATIAL ORGANIZATION AND SOCIAL STATUS**

The interior arrangements of Chinookan houses, like those on the rest of the Northwest Coast, appear to have reflected the status of household members. The rear of the house had the highest status and was the most spiritually charged part of the dwelling (Sobel 2004), while the front carried the lowest status. This pattern applies to large houses with open interiors, such as Meier, but is more difficult to apply to segmented houses.
Archaeological data have been used to establish which compartments of the segmented houses were occupied by high status families. At Cathlapotle, in each of the four segmented structures, one or both of the end compartments were likely high status living areas, as they are much longer than the others and have more extensive subfloor pit complexes along both front and rear walls. In the excavated middle compartments, the subfloor pits are generally smaller and occur only along the back wall. House 1’s largest compartment contains a cache of high status goods, including iron daggers. At Meier, prestige goods, such as copper bracelets, tend to be concentrated in the rear third of the structure, suggesting that the rear part of the house was a high status living area. Additionally, the only two anthropomorphic artifacts recovered at either site were in the high status areas, perhaps pointing to a high spiritual significance.

The documentary record is somewhat mixed about whether or not slaves were residentially separated from their owners. They may have lived and slept with their owners or near the front door. It is extremely difficult, however, to identify slaves in the archaeological record (Ames 2002, 2008).

The documentary record mentions several restrictions on women’s use of space on the Lower Columbia. At various times, a woman was restricted to a partitioned area within the house in which she lived or to a small structure nearby. At the onset of her first menstrual period, a pubescent girl “ate, slept, and worked in a partitioned corner of the house” for a period of time—Ray reported five months (1938:68, 71–72), while Swan said one month (1972:171). Wacheno (Drucker 1934:25–27) noted that a reed hut within the house constituted the seclusion area, but he did not comment on the length of seclusion for Clackamas girls. Cultee (Boas 1894:246) suggested that the seclusion period lasted for about two months and that the girl used a “separate door” from other house residents. While in seclusion, her activities included eating, sleeping, basketry, and applying red pigment to her face, hands, and the part in her hair (Ray 1938:71). During all subsequent menstruations, the girl reportedly re-entered the seclusion area for five days (Ray 1938:71). Emma Luscier said that the seclusion was in a “partitioned corner of the house,” though Cultee (Boas 1894:247) stated that a young woman left the plankhouse after her first two menstruations and resided elsewhere for five days.

Pregnant women were “secluded before delivery in a hut or partitioned corner of the house” (Ray 1938:68). During delivery, “the woman held to two upright posts”; afterward, “heated rocks were placed around her bed and water poured on to produce steam... to make sure that all the after birth...
would pass” (Ray 1938:68). The new mother stayed in the seclusion area for several days (Ray 1938:68). A woman also stayed behind a partition in the house for at least one month following her husband’s death (Curtis 1970:99). The documentary record does not explicitly mention any restrictions on men’s use of space.

HOUSEHOLD PRODUCTION, SOCIAL RANK, AND POSTCONTACT CHANGE

Specialized Production and Social Rank

Chinookan households did not apparently include full-time specialists. Archaeological evidence for all the production activities described earlier is found throughout each house, indicating that everybody, from the highest status families to the lowest, was involved in production necessary to support the family and the larger household. Some families within households, however, seem to have emphasized particular activities. At Meier, for example, although projectile points are found in all portions of the house, whole and broken projectile points are concentrated in the southern third of the house, suggesting an emphasis on terrestrial hunting by lower status members of this household. The high status end of the house contained only complete points, as though they were made there.

At Cathlapotle, projectile points were most common in the high status compartment of House 1, but most were broken. Similarly, worn adze blades at Meier were associated with only one hearth, hinting at the presence of woodworking specialists. Concentrations of stone tool-making equipment and waste also suggest the presence of specialists, although these occurred in most portions of the houses as if each segment or hearth group had stone toolmakers. The organization of labor appears to have been quite fluid.

Historical and archaeological information about hearths and associated thermally altered rock (TAR) also provide some evidence for differentiation of activities within households that may be linked to status or occupational specialization. Archaeologists working on the Northwest Coast generally recognize that hearths may represent social groupings, such as families, within the larger household. That assumption is also warranted for Lower Columbia houses.

Early accounts and historical paintings consistently portray large hearth boxes in the centers of Chinookan houses. Archaeologically uncovered hearths vary tremendously within houses. At Meier, the southernmost hearth
box was at least 3 meters long and contained the remains of over 30 individual hearths. Evidence suggests temperatures sometimes in excess of 900° F, and the hearth contained bone, shell, and ash that were melted and welded together by the high heat. There were also indications of copper fabrication at this hearth. The surrounding storage pits were filled with great quantities of thermally altered stone from fires and boiling, indicating intense processing. By contrast, the northernmost hearth was relatively small, contained mainly wood ash, and lacked evidence of especially high heat. The middle hearth was similar to the northern hearth, and it contained the lowest quantity of TARs, although the number is still enormous. This all suggests that while food processing and fabricating activities requiring intense high heat occurred throughout the house, they were concentrated at the south end of the house, away from the high status area. So large-scale cooking for feasts and other ceremonials was probably concentrated at the south end and carried out by less elite or nonelite individuals within the household.

In Cathlapotle House 1, the hearths and TAR amounts differ from compartment to compartment. There are at least two very large hearths in the high status compartment (id), and one was clearly in use during the lifespan of the house. Neither appears to have been in hearth boxes, or, if they were, the boxes were quite small. Both hearths lacked evidence for extremely high heat and intensive processing. One compartment (ic) contained a classic hearth box, which was used during the lifespan of the house. Like the southernmost Meier hearth, it was a processing hearth, although temperatures were never as consistently high in it nor the processing as intense. Surprisingly, the TAR data suggest less-intensive heat-related activity in this compartment. The hearth in the compartment was built directly on the earthen floor. While it did not at all resemble the high temperature hearth in the Meier house, the TAR evidence suggests intensive heat-related processing. This compartment also contained a large cache of copper tools, so the high heat may be related to fabrication. All the hearths in House 4 were built directly on the sandy floor and none had hearth boxes, although there appears to have been relatively intensive heat-related processing through this house. The intensity of processing activities varied within houses, from hearth to hearth. Some hearths were associated with very high heats and intensive processing activities, while temperatures elsewhere were kept cooler. It is also perhaps telling that the highest heats were not in the high status areas.

In summary, then, everybody did everything; but within each household, some families, hearth groups, compartment groups, or status groups empha-
sized specific activities such as hunting land mammals or working copper. They do not appear to have done this, however, at the exclusion of other activities. Additionally, different households had different productive emphases. At Meier, there seems to have been a focus on fine woodworking, while at Cathlapotle there was a focus on hide working. What we do not yet know is how these skills were integrated into the larger economy. For example, did the person working the copper exchange his or her products for other goods, perhaps ground stone mauls, or was making such items among their obligations to the house chief or the household (see Ames 1996)?

We also have not yet generated or recognized archaeological evidence for gender roles in household production. On the coast, women’s labor was particularly important in processing resources (e.g., Walter 2006), but it is difficult to tease out gender roles archaeologically.

Beyond individual households, there may have been production differences between communities. Some production differences between Meier and Cathlapotle may be ecological. The sites differ, for example, in the diversity of mammals represented. While this could reflect differences in local habitats, it could also reflect different trade patterns. Archaeological data indicate that Cathlapotle people were much more engaged in hide working. Cleaned and boiled elk hides, known as clamons, were a major export from the Lower Columbia and Willamette Valley during the fur-trade period. European and Euro-American fur traders took bales of clamons, widely used as armor, north along the coast to trade for sea otter pelts. Cathlapotle residents were probably heavily involved in this trade, as the distribution of scrapers indicates a postcontact increase in hide processing at the site. The comparative lack of involvement by Meier residents in hide working may relate to the fact that Cathlapotle was located near the Columbia River and therefore regularly was visited by European and Euro-American traders, while Meier was several miles from the river (e.g., Cromwell 2010). Woodworking increased at Meier after contact (Fuld 2011), which points to some degree of community specialization in production.

Production differences between Meier and Cathlapotle may also relate to different abandonment dates. Meier may have been abandoned 10 to 20 years earlier than Cathlapotle, which was deserted sometime between 1830 and 1836 (Boyd 2011). Therefore, direct involvement in the fur trade lasted perhaps twice as long for Cathlapotle residents as for Meier residents. Cathlapotle households had much more opportunity to alter production in relation to Euro-American contact and colonization.
We do not know whether Chinookan households shifted their production activities as a direct consequence of the fur trade. Did they, for example, increase production of foodstuffs or craft items so they would have materials to trade? The introduction of firearms probably had no impact on production levels, as they were apparently not important trade goods during the pre-reservation era. Archaeologically, gun parts are extremely rare, and while both Cathlapotle and Meier produced hundreds of thousands of pieces of chipped waste, they produced no gunflints (and one percussion cap). The only musket barrel in either site had been cut off the gun and rammed into the ground to support an eave post.

The progressive depopulation of the Lower Columbia during the fur-trade years must have had more impact than the fur trade itself on household production. At some point in the 18th century, Meier residents allowed the cellar to fill with dirt and covered the floor with clay. Perhaps the household population had shrunk to the point that the plank floor (15,000 board feet) became too costly to maintain. Such a decrease in membership would have constrained household production. Changes in the sizes, numbers, and locations of hearths in Chinookan houses also may point to depopulation (Gardner-O’Kearny 2010). Over time at Cathlapotle, hearths increased in number while decreasing in size. The pre-existing interior hearth arrangement broke down as hearths were built directly on the house floors rather than in boxes and were not aligned with the central hearth rows. One possible explanation for this pattern is that as villages like Meier were abandoned, the survivors moved to towns like Cathlapotle, where they were accommodated in the pre-existing houses. This may be why Cathlapotle had a relatively large population and an apparently productive labor force until it was abandoned.

SUMMARY AND CONCLUSIONS

Winter plankhouses were the largest human constructions on the Northwest Coast, including along the Lower Columbia River. Given the resources and labor required for their construction and maintenance, they are certainly examples of monumental architecture (e.g., MacDonald 1983). For more than two millennia, they were the centers of the cultural, social, economic, and political lives of their occupants. Archaeologists and other scholars have learned a great deal about how these institutions operated, but there is much more to learn. It is clear, for example, that prodigious volumes of resources were harvested and processed into stores. What remains less clear is how that...
work was organized and coordinated and what role, if any, specialists played. We do not fully understand the sources of variation in house form along the river. Some of it is seasonal, but other factors must have been at play. Finally, we have barely touched here on the spiritual and cultural roles of these structures. It is not hard, however, to look at the excavated hearth boxes along the central line in the Meier house and visualize elders in the winter firelight, instructing children through songs and stories.