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Archaeological Investigations at 45CL1 Cathlapotle (1991-1996) , Ridgefield National Wildlife Refuge Clark County, Washington: a Preliminary Report

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**Archaeological Investigations
at 45CL1 Cathlapotle (1991-1996) ,
Ridgefield National Wildlife Refuge
Clark County, Washington
A Preliminary Report**

by

Kenneth M. Ames, Cameron M. Smith,
William L. Cornett, Elizabeth A. Sobel,
Stephen C. Hamilton, John Wolf
and Doria Raetz

Prepared for

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Wapato Valley Archaeology Project Report #7

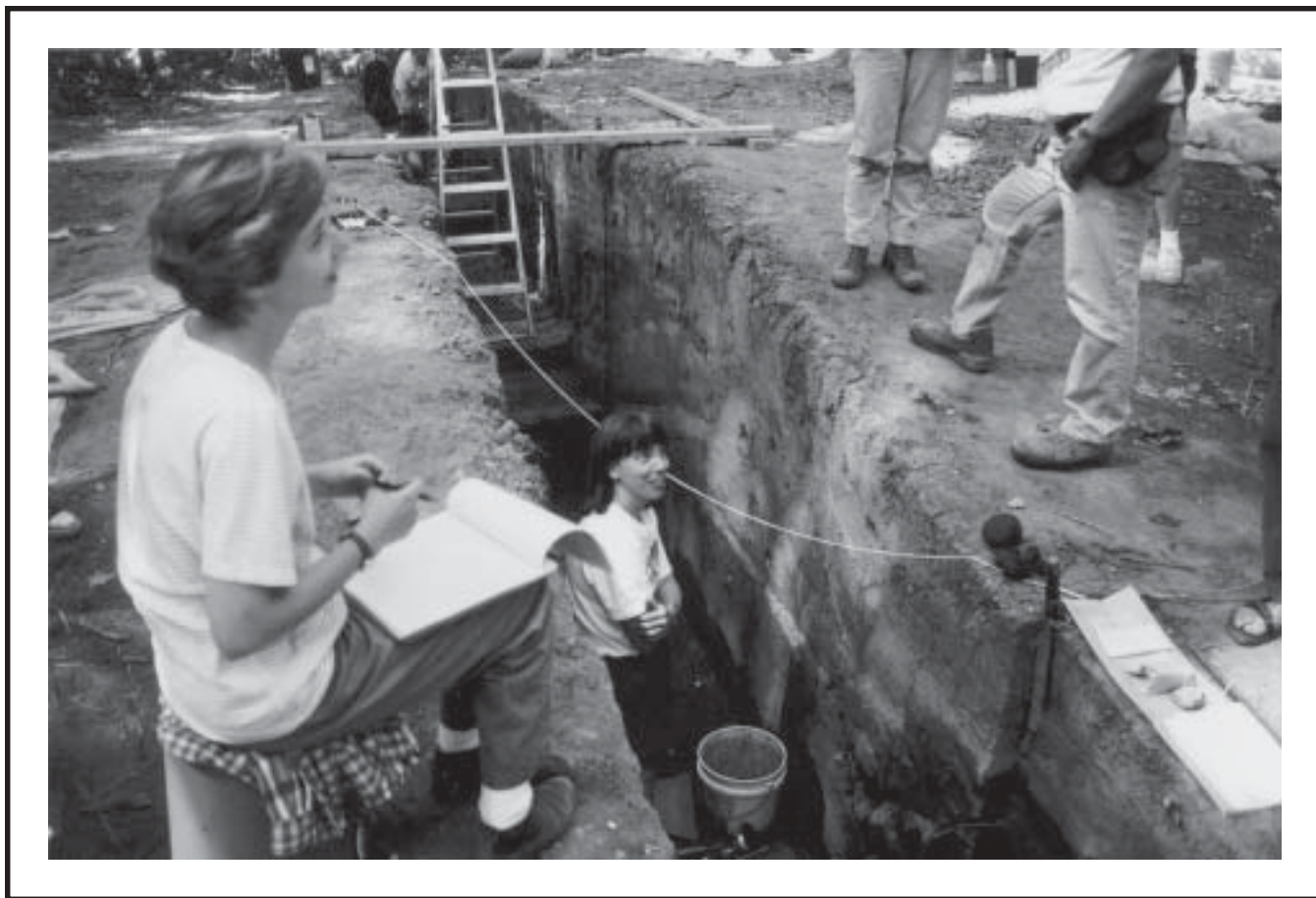
May 1999



U.S. Fish and Wildlife Service
Region 1

Archaeological Investigations at 45CL1 Cathlapotle (1991-1996)

Ridgefield National Wildlife Refuge Clark County, Washington A Preliminary Report



by Kenneth M. Ames, Cameron M. Smith, William L. Cornett,
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1999

Cultural Resource Series
Number 13

U.S. Department of the Interior
Fish and Wildlife Service
Region 1



ABSTRACT

Archaeological investigations at site 45CL1, Clark County, Washington, demonstrate that the locality is a very large (c 1.5ha), deeply stratified (2-4m) town site with an occupation spanning at least 1000 years (c. AD 1000 to 1840). Six large, complex depressions have been mapped. Test excavations show that these depressions represent the semi-subterranean portions of residential structures, probably large plankhouses of the type common on the Lower Columbia River and the Northwest Coast in aboriginal times. The depressions may represent as many as 11 such dwellings. A seventh depression is deeply buried beneath midden deposits. The cultural deposits contain very high densities of artifacts, ecofacts (including both faunal and floral remains), debris and features.

The site is near the Columbia River on a very active flood plain, resulting in site stratigraphy produced by a combination of active cultural and alluvial depositional processes. Site 45CL1, given its location and size, is the best candidate to be the site of Cathlapotle, a Middle Chinookan town visited by Lewis and Clark in 1806, as well as by other early Europeans in the area. The site is extraordinarily well preserved, having undergone only minor alterations since its abandonment, probably in the third or fourth decade of the 19th century AD.

ACKNOWLEDGMENTS

Successful archaeological projects are invariably the result of the cooperation of a wide variety of people. We wish to express our gratitude to the following:

Jim Carty, who grew up on the land that holds Cathlapotle, told us where it was, and provided us with considerable information and assistance.

Anan Raymond, US Fish and Wildlife Service (USFWS) Regional Archaeologist instigated the project, actively encourages it and finds financial support. The project very much is a reflection of his vision and his hard work. He also edited previous reports with a sharp pencil. We look forward to the time he needs a good editor. **Virginia Parks** (USFWS) initiated the public education program in 1994, and has coordinated it, often on her own time, ever since. She has spread knowledge of the Chinookan heritage and Cathlapotle's archaeology far in this region. She also did the final editing and production of this report.

We have been unfailingly helped by the staff of the US Fish and Wildlife Refuge at Ridgefield, WA. **Bruce Wiseman**, former Refuge Manager, provided advice and assistance with working on the refuge and with logistics. The staff was continually helpful, interested and sometimes amused by us.

Members of the **Chinook Tribal Council**, including **Tim Tarabocchia**, **Don Mechals**, **Clifford Snyder**, **Gary Johnson**, **Tony Johnson**, and **Jeanne Shaffer**, visited the site and PSU's archaeology labs several times and provided advice and enthusiasm. In August, 1995, over 80 tribal members visited the site and brought their excitement with them. One, Ed Nielsen, even wrote a wonderful poem about us and the Cathlapotle town.

The people of **Ridgefield, Washington** have displayed keen and excited interest in the project, and never failed to be friendly, even when we filled the market with sweaty, grimy people in search of ice cream and pop on hot afternoons. They have packed our Washington Archaeology Week sessions on the project.

Judith Ramaley, then President of Portland State University, exhibited a strong and consistent interest in our work, visiting the site in July of 1994 and 1995. **Marvin**

Kaiser, Dean of the College of Liberal Arts and Sciences at PSU, has provided essential financial support to keep the project going and invested his thought and energy into fund raising. **Richard Dewey**, of PSU's Summer School and Extended Studies acted as liaison between the field school and summer session. **Miles Turner**, then of Extended Studies, also materially assisted us by his ability to manage our patchwork of funding and support during the summers. No one knows exactly how he does it. **Marc Feldsmen**, Anthropology Department Chair, has unfailingly supported the project through thick and thin.

Connie Cash, Anthropology Department Office Manager, has handled the logistical and administrative complexities that arise from keeping many people in the field for two months. She also has sometimes served as counselor to the distressed and is one of our most indispensable personnel.

The many members of the **Friends of the Wapato Valley** have assisted the project with their donations, their interest and excitement.

Ultimately, however, we are in the deepest debt to the many people who have worked at the site itself.

The 1991 student volunteers who first attempted to locate the site are **Mary Parchman**, **Tana Hickey**, **Darin Molnar**, **Cameron M. Smith** and **Debbie Davis**.

The 1992 field crew were **Steve Hamilton**, **William Cornett**, **Mary Parchman**, **Tana Hickey** and **Anne Morris**. **Alliah Kahn** served as Lab Director.

The 1993 field crew were **William Cornet**, **John Wolf**, **Mary Parchman**, **Anan Raymond** and **Cameron M. Smith**. **Debbie Davis**, **Leanne Penniger** and **Maia Kabat**, veterans of the Wapato Valley Archaeological Project, participated as volunteers, as did **Darrel McCorkle**. **Nicholas Valentine**, USFWS, also volunteered and provided candy at crucial moments. **Carol Wolf** served as Lab Director.

In 1994, the field staff for the summer school included **Stephen Hamilton**, **William Cornett**, **Doria Raetz**, **Cameron M. Smith** and **John Wolf**. **Carol Wolf** was

Field Lab Director, and **Debbie Davis** served as Lab Director. **Bob Church**, University of Missouri, was our peripatetic zooarchaeologist, teaching the students the delights of faunal remains. **Virginia Butler** visited the site on several occasions, offering assistance and advice. **James O’Conner**, USGS, and **Scott Burns** of PSU’s Geology Department, visited the site and helped clarify the stratigraphy. **Andrew Fountain**, also of the USGS, visited the site, and offered suggestions on a wide array of topics.

In 1995, the field staff included **Doria Raetz**, **William Cornett**, **John Wolf**, **Melissa Darby**, **Ann Trieu** and **David Delyria**. **Teri Jackson** was Field Lab director, while **Carolyn Jolly** was Lab Director. **Scott Burns** again visited, providing insights into the site’s complex alluvial history. **Liz Sobel**, University of Michigan, spent the summer learning the complexities of excavating Northwest Coast towns, even when they aren’t in shell middens.

In 1996, the field staff included **William Cornett**, **Cameron M. Smith** and **Liz Sobel**. **Teri Jackson** served as Field Lab director, and **Carolyn Jolly** worked as Lab Director.

Of course, without the field school students, we would be, in Ken Ames’ words “a couple of guys with computers.” And we would not be very accomplished with these machines without the unflagging guidance of resident computer wizard, **Darin Molnar**, who, among other things, has developed our AIMS database software.

1994 Field School

Catherine Barter, **Jessie Berdine**, **Rowan Bibb**, **Briana Bird**, **Greta Camenzind**, **Bill Clontz**, **Renee Clugston**, **Mike Crofton**, **Melissa Darby**, **Laura Engstrom**, **Neal Heupel**, **Ed Howlett**, **Teri Jackson**, **Carolyn Jolly**, **Lane Justen**, **Gretchen Kaehler**, **Dan Kvamme**, **Darrel McCorkle**, **Darin McCoy**, **Kathleen Martin**, **Jennifer Muller**, **Darci Nash**, **Kate Needham**, **Cherilyn Ronningen**, **Amy Seaberg**, **Ann Trieu**, **Mimi Utsumi**, **Matt Van Winkle**, **Tim Vincent**, and **Michelle Williamson**.

1995 Field School:

Chelan Bliss, **Don Aho**, **Rhonda Cannon**, **Alicia Cech**, **Renee Clugston**, **Martha Corcoran**, **Peter Lovell**, **Amber Dalling**, **Tim Delaney**, **Tony Donoghue**, **Dealt Espinosa**, **Andria Fultz**, **Jamie Gaylord**, **Lisa Gugino**, **Damon Grady**, **Wilda Gretzinger**, **Neal Heupel**, **Susan Kelly**, **Andrew Manspeaker**, **Bill Michton**, **Omi McCarthy**, **Darin McCoy**, **Linda McCoy**, **Myron Medlin**, **Darin Molnar**, **Jennifer Muller**, **Jennifer Nelson**, **Hamid Peigahi**, **Rachel Royston**, **David Schmitz**, **John Seidel**, **Merle Speer**, **Sarah Paulson**, **Gully Walker**, **Wallace White**, **Joyce Widdows** and **Jan Wolf**.

1996 Field School:

Tracy Akers, **Linda Anderson**, **Jim Auld**, **Sara Behr**, **Steve Delaney**, **Michele Fahley**, **Heather Fener**, **Tyson Frone**, **Emily Greer**, **Russ Hatz**, **Darci Kaehler-Bean**, **Holly Krass**, **Erin Lewis**, **Nila Markheim**, **Shigeru Mihara**, **Kurt Modahl**, **Melissa Morgan**, **Adrienne Oltjenbruns**, **Aimee Scheckla**, **Erin Stevens**, **Andrew Vile** and **Raven Whitney**.

These crews devoted themselves to their work with a diligence and enjoyment that exceeded that of many professional crews.

The maps in this report were digitized by **Darin Molnar**. The 1994 profiles were digitized by **Cameron M. Smith**, and the 1995 profiles by **Jennifer Muller**.

A large number of spouses, parents, siblings, friends, significant others, and associated hominids visited the site, and many volunteered a bit of labor or provided the crew with refreshments. There are too many of you to thank individually, but we want to acknowledge yours contributions.

We would like to thank **Collins Ax**, of Lewiston, Pennsylvania, whose Pulaskis saved us from a long, wet walk the day a cottonwood tree fell across the road out of the refuge. Finally, of course, we thank our friends at **Marshalltown** for their excellent trowels.

None of these many people are responsible for any errors in this document. Such errors are ours alone.

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INTRODUCTION and BACKGROUND

The Cathlapotle Project is designed to address a range of substantive, historical, methodological, theoretical and cultural resources management issues. The project is part of Portland State University's (PSU) Wapato Valley Archaeological project (WVAP) which was initiated in 1987. The Wapato Valley (also known in the archaeological literature as the Portland Basin) extends from the downstream end of the Columbia River Gorge to the confluence of the Columbia River with the Cowlitz River at Longview-Kelso, Washington. The Wapato Valley includes the greater metropolitan areas of Portland, Oregon and Vancouver, Washington, an area with a population of some 1.3 million people, and is expected to grow by some 500,000 people over the next 20 years. Clark County, Washington, which contains both Vancouver and Cathlapotle, is one of the most rapidly growing counties in the United States. Ames (1994) has recently reviewed the archaeology of the region in detail.

The purpose of this report is to summarize the cumulative findings of the Cathlapotle Project from the 1991 summer field season through the 1996 field season, including the lab work performed thus far. By so doing, we will demonstrate the significance of the site and provide the basis for a site management plan. This plan, including our long-term research design, is discussed in the final chapter of the report.

The Cathlapotle Site (45CL1) is located on the Carty Unit of the Ridgefield National Wildlife Refuge, adjacent to the small community of Ridgefield, Washington. It is located in a riparian forest habitat paralleling Lake River just upstream from the confluence of the Lake, Lewis, and Columbia Rivers. This forested area is called Brush Ridge, although it is a series of three low levees separated by two swales. Inland of this wooded area is a natural meadow, known locally as "Long Meadow." The ridge farthest from the current Lake River channel, and closest to the meadow, is the one upon which the site is located, and it has been dubbed Site Ridge.

The exact location of Cathlapotle has been the subject of several decades of speculation, investigation and dispute. The scope of our project surpasses prior ar-

chaeological work done on the refuge, and has settled the question beyond any reasonable doubt. Another site on the Ridgefield Wildlife Refuge, 45CL4, was for a time identified as the site of the village (Starkey, Ross, and Hibbs, 1974). The history of site designations is lengthy and informative, and we will briefly summarize it here.

Robert Hudziak and Clarence Smith first identified 45CL1 as Cathlapotle in 1948 (Hudziak and Smith, 1948) on behalf of the Washington State Historic Preservation Office. At that time, the land was still owned by the Carty family, specifically William Carty, who acted as an informant for Hudziak and Smith. They place the site "...in a natural meadow between Gee Creek and Lake River..." (Hudziak and Smith, 1948). They locate the village itself in Long Meadow, and speculate that the "present condition" of the site "should be better than any other site on the river" (Hudziak and Smith, 1948). There is no evidence on their site survey form, however, to indicate that they conducted more than a cursory surface investigation, and they list "none" under material observed (Hudziak and Smith, 1948).

Judy Starkey, Lester Ross, and Charles Hibbs, of the Oregon Archaeological Society, resurveyed the area in 1974. The documentation of their survey contradicts Hudziak and Smith's claim that 45CL1 was the Cathlapotle site: "This is a natural river deposit containing no cultural remains" (Starkey, Ross and Hibbs, 1974). They add that, "Hudziak and Smith missed the Quathlapotle site by a mile" (Starkey, Ross and Hibbs, 1974). No notation is made of their means of discerning the nature of the deposit, nor is there any evidence proffered to support their conjecture as to the real location of the site. The site they identify, 45CL4, was subsequently proposed for listing on the National Registry of Historic Places (NRHP).

James Carty, the son of Hudziak and Smith's source, waged a spirited and ultimately successful campaign to prevent the NRHP listing proposed by Starkey, Ross and Hibbs. It bears noting that until that time, the primary "excavations" performed in the quest for Cathlapotle were Mr. Carty's attempts to recover arti-

facts. Mr. Carty took pains to repeatedly and explicitly stress that the subsurface portions of the site were not in Long Meadow, as Hudziak and Smith speculated, but on Brush Ridge, overgrown by dense riparian forest (Carty, unpublished correspondence). 45CL4, located along the landform known as “Big Meadow” at the south end of the Carty Unit, was a more forgiving locale, and was excavated by a Lewis and Clark College archaeological field school in 1984 and 1985. Under the direction of Rick Minor and Kathryn Anne Toepel, these excavations showed that the designation of 45CL4 as Cathlapotle proposed a decade earlier was poorly supported by archaeological evidence. Minor and Toepel suggested that the site “appears to be approximately located to represent the site where Lewis and Clark camped...” (Minor and Toepel, 1985:79). The radiocarbon dates from 45CL4 range from 1920± 100 BP to 320 ±80 BP.

These preliminary investigations were all considered in the Wapato Valley Archaeological Project’s 1990-1991 effort to locate the true location of Cathlapotle village. With the site identified, a comprehensive research program was designed to incorporate a wide variety of techniques in the investigation of social and technological organization at Cathlapotle.

Geography and Geology

The Wapato Valley (WV) includes the region along the Columbia River from the Sandy River downstream to the Cowlitz River. It thus includes the greater Metropolitan areas of Portland, Oregon and Vancouver, Washington. The major physiographic features of the basin are the Columbia and Willamette Rivers. The study area encompasses the Willamette River north (downstream) from its falls at Oregon City to its confluence with the Columbia River. The main branch of the Willamette enters the Columbia at Portland. Dixie Mountain is the highest elevation in the area at 484 meters above sea level (ASL).

The area can otherwise be divided into two topographic sub-areas: (a) the alluvial bottom lands along the shores of the Columbia River; and (b) the higher plateau or table lands of East Portland, which rise to elevations between 75 and 90 meters ASL, and Clark County. Most archaeology has focused on these bottom lands — since they are where the late prehistoric population

of the area was concentrated. There has been ongoing, but poorly reported, work in the Clark County uplands over the past 30 years.

The valley is part of the Puget-Willamette Lowland, which is the southerly end of the Coastal Trough that runs from southeast Alaska through to the south end of the Willamette Valley. The Puget-Willamette Lowland is the only portion of the trough that is not currently drowned by sea water. The outer mountains separate the trough from the Pacific Ocean. In western Oregon, the outer mountains are the Coast Range, while in Washington the outer mountains include the low Willapa Hills. The trough is flanked on the east by the Cascade Range.

The Willamette Valley and the Wapato Valley have a humid climate with low summer precipitation (Hansen 1941, Sprague and Hansen 1946). The majority of precipitation falls between November and March. There is minimal diurnal temperature variation and the variation between minimum and maximum seasonal temperatures ranges from 0° C (32° F) in January and 29° C (81° F) in July (Toepel 1985). The area has a long growing season.

The Portland area has an annual frost-free period of over 200 days. Annual precipitation in the Portland area varies between 33 and 45 inches (838 to 1143 mm.). Some stations have much higher rainfall, ranging from 55 inches (1400 mm) to over 90 inches (2300 mm) of rain near the Columbia Gorge. The mean summer or July temperature is around 14° C on the coast and 15° C inland (Heusser, Heusser, and Streeter 1980).

Flora and Fauna

The vegetation of the Wapato Valley falls into Franklin and Dryness’ “*Pinus-Quercus-Pseudotsuga*” Zone. Along the rivers are riparian forests of Black cottonwood (*Populus trichocarpa*), Oregon ash (*Fraxinus latifolia*), Bigleaf maple (*Acer macrophyllum*), Oregon white oak (*Quercus garryana*), Red alder (*Alnus rubra*), and Ponderosa pine (*Pinus ponderosa*). Oak woodlands dominate the zone’s forests and savannas. Riparian communities and poorly drained areas generally host a variety of minor hardwood species (Franklin and Dryness 1973:124-126). Conifer forests

become predominant in the foothills of the interior valleys. The most abundant species found are Douglas fir (*Pseudotsuga menziesii*), Grand fir (*Abies grandis*), and Ponderosa pine. Western hemlock (*Tsuga heterophylla*) is almost absent from the Willamette Valley and can only be found along its periphery. Western red cedar (*Thuja plicata*), which can sustain itself in dry climates, is concentrated in the area near Portland (Franklin and Dryness 1973:118).

Saleeby (1983) and Hamilton (1989; Figure 1) reconstruct the bottom land environment as it would have been in the middle third of the 19th century. Similar, though less detailed, reconstructions have also been done of the vegetation of the south shore of the Columbia River east of the airport (e.g. Ellis and Fagan 1993). The Saleeby-Hamilton reconstruction of the flood plain indicates it was a remarkably patchy environment with seven habitat types (Fig. 1; Table 1), six of which were on the floodplain proper. It is clear that this was an extremely productive environment. It would be useful to have a better grasp of the vegetation of the uplands and the East Portland plateau areas.

The Wapato Valley was home to a rich array of terrestrial and aquatic mammals, as well as fish and birds. Those that were described as important resources for the valley's residents are listed in Table 2. Table 3 includes fauna that are significant members of zooarchaeological assemblages in the region.

Geological and Environmental History

There are no reconstructions of ancient landforms or vegetation based on data from the Wapato Valley. Beyond catastrophic flood events (see below), there is no detailed geological history available for the basin beyond Trimble's pioneering work (Trimble 1963), at least for the late Pleistocene and Holocene periods. Work has focused on two massive flood events: the Missoula (or Bretz) floods, and the Bridge of the Gods flood. The first event or series of events (Waitt 1980) occurred during the late Pleistocene, and may date as late as ca. 13,000 years ago. The Bridge of the Gods flood has recently been dated to ca. 830 BP. The Bridge of the Gods flood was the result of the damming of the Columbia River by a landslide at Bonneville in



FIGURE 1.
SALEEBY-HAMILTON ENVIRONMENTAL
RECONSTRUCTION
FOR THE WAPATO VALLEY ca. 1850 AD.

the Columbia Gorge. Neither the spatial extent nor the temporal duration of the subsequent natural reservoir is known, nor are the downstream effects of the flood

TABLE 1.
SALEEBY-HAMILTON HABITAT TYPES.
(See Figure 1)

HABITAT	DESCRIPTION	FLORAL / FAUNAL RESOURCES
RIVERINE	Cold, clear waters of rivers and streams.	Cattails, freshwater mussels, freshwater turtles, salmon, steelhead, sturgeon, eucalon, cyprinids (chub, squawfish, chiselmouth), kingfisher, hawk, crow, mink, river otter, harbor seal, raccoon.
LACUSTRINE	Lakes and ponds, emergent vegetation and thick shoreline vegetation (includes some bayous and sloughs).	Cattails, wapato, sturgeon, suckers, cyprinids, waterfowl, kingfisher, freshwater turtle, mink, river otter, muskrat, beaver, raccoon.
PALUSTRINE	Freshwater marsh typified by standing water and herbaceous plants (includes some bayous and sloughs).	Wild celery, cattails, skunk cabbage, horsetail, wapato, waterfowl, sandhill crane, muskrat, beaver, raccoon.
RIPARIAN	Water edge habitat comprised of cottonwood, willow, ash, tamarac and dense undergrowth.	Wild sora, wild celery, salmonberry, dewberry, thimbleberry, blackcap, osoberry, elderberry, cow parsnip, kingfisher, various non-migratory birds, mink, river otter, raccoon, deer, wapiti (elk), brush rabbit.
OAK WOODLAND	Woodlands dominated by oak, sometimes with co-occurrence of Douglas fir, and understory species such as hazelnut / swordfern, serviceberry / snowberry.	Serviceberry, osoberry, acorn, hazelnut, non-migratory birds, deer, puma.
GRASSLAND (prairie)	Grasses and forbes are dominant vegetation.	Crabapple, brackenfern, camas, wild strawberry, sandhill crane, hawk, red fox, ground squirrel, deer.
BRUSH	Brushy deciduous species such as ash, balmgilead rose and vines on ridges and banks of the floodplain.	Crabapple, gooseberry, blackberry, nettles, non-migratory birds, deer.
CONIFER FOREST	Douglas fir is the dominant species, with Grand fir, Western red cedar, bigleaf maple, and sometimes oak.	Lupine, wood sora, kinnik-kinnik, dewberry, thimbleberry, blackcap, huckleberry, serviceberry, osoberry, elderberry, salal, hazelnut, wild strawberry, Oregon grape, non-migratory birds, mountain beaver, marten, porcupine, bear, bobcat, wapiti (elk), blacktailed deer, puma.

caused when the earth dam gave way, though the potential impact of this flood on the basin's floodplain is a topic of some controversy (Pettigrew 1990). Ellis and Fagan (1993) see no evidence for it in the eastern

portions of the basin. Aside from these events, we have *no* Late Pleistocene or Holocene alluvial chronology for the basin.

TABLE 2.
ETHNOGRAPHICALLY REPORTED RESOURCES OF THE WAPATO VALLEY.
(From Boyd and Hajda 1987)

TAXONOMIC NAME	COMMON NAME	HABITAT	HARVEST MONTHS
Aquatic Class I: Staples			
<i>Onchorynchus tshawytscha</i>	chinook salmon	Main trunk of Columbia R. and lower middle tributaries.	March - April and June - July
<i>Onchorynchus kisutch</i>	coho salmon	Lower tributaries of Columbia R.	August - October
<i>Acipenser transmontanus</i>	white sturgeon	Main trunk of Columbia R., deep water,	January - March and August - September
<i>Thaleichthys pacificus</i>	eulachon	Spawns in lower Cowlitz, Lewis, Sandy, Grays and Kalama rivers.	February - March
Aquatic Class II: Secondary Resources			
<i>Salmo gairdneri</i>	trout	Streams.	-
<i>Onchorynchus mykiss</i>	steelhead	Major waterways.	July - September
<i>Lamprreta tridentata</i>	lamprey eel	Taken at falls.	Summer
	clam	Seashores, bays.	-
<i>Onchorynchus nerka</i>	sockeye salmon	Main trunk of Columbia R.	June - July
<i>Onchorynchus keta</i>	chum (dog) salmon	Main trunk of Columbia R., a few tributaries.	
Animal Class I: Staples			
<i>Cervus canadensis</i>	wapiti (elk)	Cosmopolitan, open forests.	Winter
<i>Odocoileus hemionus</i>	blacktailed deer	Cosmopolitan, forests.	-
<i>Odocoileus virginianus</i>	whitetailed deer	River bottoms, praries.	-
Animal Class II: Secondary Resources			
<i>Phoca vitulina</i>	harbor seal	Columbia and Willamette below falls.	Spring - Summer
<i>Eschrichtus glaucus</i>	grey whale	Coast.	April
Vegetal Class I: Bulbs, Roots & Greens: Staples			
<i>Sagittaria latifolia</i>	wapato	Middle river swamps.	Year-round, best in fall
<i>Camassia quamash</i>	camas	Middle river damp praries.	May - July
Vegetal Class II: Bulbs, Roots & Greens: Secondary Resources			
<i>Cirisum edule</i>	thistle	Coast, moist ground.	-
<i>Lupinus littoralis</i>	lupine	Coast, especially beaches.	-
<i>Pteridium aquilinum</i>	bracken	Coast, especially burns.	-
<i>Equisetum telmateia</i>	horsetail	Coast, especially damp ground.	-
<i>Lomatium spp.</i>	shapeiel	Dry rocky ground above cascades.	April - September
Vegetal Class III: Berries			
<i>Vaccinium ovatum</i>	evergreen huckleberry	Coast clearings.	August - October
<i>Vaccinium macrophyllum</i>	mountain huckleberry	Mountain clearings.	August - October
<i>Vaccinium ovalifolium</i>	oval leaf huckleberry	Mid-latitude woods.	August - October
<i>Rubus macropetrolus</i>	blackberry	Middle-river clearings.	August.
<i>Arctostaphylos uva-ursi</i>	bearberry	Dry banks.	Fall
<i>Gaultheria shallon</i>	salal	Woods.	August

Sea level curves give a baseline for a chronology of the evolution of the alluvial floor of the basin. The Pacific Ocean was still some 60 meters below its modern level 10,000 years ago (Hutchinson 1992) (Figure

2). The sea rose swiftly between 10,000 and 7,000 years ago, to a level of -10 meters. Sea rise in the past 7,000 years has been relatively gradual. This gradual rise has significant implications both for the evolu-

TABLE 3.
ARCHAEOLOGICALLY COMMON FAUNA IN THE WAPATO VALLEY.
(Saleeby 1982)

Taxonomic Name	Common Name	35C05	35MU1	35C07	35C03	35MU6	35MU9	TOTAL	
		Meier	Cholick	Pumphouse		Lyons	Merrybell		
MAMMALS									
<i>Odocoileus</i> spp.	deer	276	160	74		35	22	2	569
<i>Cervus canadensis</i>	wapiti (elk)	103	40	7		10	17	0	177
<i>Odocoileus / Cervus</i>	deer / elk	24	37	7		6	2	0	76
<i>Canis</i> spp.	dog / coyote / wolf	21	36	3		6	0	1	67
<i>Procyon lotor</i>	raccoon	15	32	6		4	1	0	58
<i>Ondatra zibethica</i>	muskrat	37	5	1		0	0	1	44
<i>Castor canadensis</i>	beaver	13	10	8		4	0	0	35
<i>Ursus americanus</i>	black bear	20	3	3		1	0	0	27
<i>Lynx rufus</i>	bobcat	9	2	1		0	0	0	12
<i>Mustela vison</i>	mink	4	3	0		0	0	0	7
<i>Lutra canadensis</i>	river otter	6	0	0		0	0	0	6
<i>Bos tarus</i>	cow	0	0	0		4	0	1	5
<i>Sylvilagus bachmani</i>	cottontail rabbit	2	0	0		0	0	1	3
<i>Vulpes fulva</i>	fox	3	0	0		0	0	0	3
<i>Phoca vitulina</i>	harbor seal	3	0	0		0	0	0	3
<i>Aplodontia rufa</i>	mountain beaver	2	0	0		0	0	0	2
<i>Enhydra lutris</i>	sea otter	0	0	0		1	0	0	1
<i>Erethizon dorsatum</i>	porcupine	0	0	1		0	0	0	1
<i>Martes americana</i>	marten	1	0	0		0	0	0	1
	Indet. Large Mammal	446	212	68		66	23	20	853
	Indet. Medium Mammal	39	12	3		7	0	1	62
	Indet. Small Mammal	7	7	2		0	0	0	16
REPTILES									
<i>Boidae / Colubridae</i>	toads / frogs	0	3	0		0	0	0	3
<i>Testudinidae</i>	turtles	55	0	0		0	0	0	55
BIRDS									
<i>Anas</i> spp.	duck	46	28	12		1	1	0	88
<i>Branta / Anser / Chen</i> spp.	goose	12	13	5		0	3	0	33
<i>Aix sponsa</i>	wood duck	9	4	1		0	0	0	14
<i>Cygnus</i>	swan	5	7	0		0	0	0	12
<i>Crus canadensis</i>	sandhill crane	7	3	0		0	0	0	10
<i>Anas crecca</i>	teal	8	0	0		1	0	0	9
<i>Branta canadensis</i>	Canada goose	6	1	0		0	0	0	7
<i>Fulica americana</i>	American coot	0	2	0		0	0	0	2
<i>Accipitridae</i> spp.	hawk	0	2	0		0	0	0	2
<i>Corvus brachyrhynchos</i>	common crow	2	0	0		0	0	0	
<i>Calaptes auratus</i>	flicker	1	1	0		0	0	0	2
<i>Buteo</i> spp.	hawk	0	0	2		0	0	0	2
<i>Buteo jamaicensis</i>	red-tailed hawk	1	1	0		0	0	0	2
<i>Anas / Aix</i>	duck	0	0	2		0	0	0	2
<i>Accipiter cooperii</i>	Cooper's hawk	0	1	0		0	0	0	1
<i>Haliaeetus leucacephalus</i>	bald eagle	0	0	1		0	0	0	1
<i>Megaceryle alcyon</i>	belted kingfisher	1	0	0		0	0	0	1
Indet. <i>Passerine</i>	-	2	2	1		0	0	0	5
Indet. species	-	13	21	5		0	0	0	39
Unidentified	-	390	141	134		9	4	73	751
FISH									
<i>Oncorhynchus</i> spp.	salmon / steelhead	503	150	188		7	3	11	862
<i>Acipenser transmontanus</i>	white sturgeon	195	59	151		12	37	9	463
<i>Catostomus macrocheilus</i>	largescale sucker	82	72	103		0	2	0	259
<i>Cyprinid / Catostomid</i>	minnows / suckers	101	54	53		0	3	5	216
<i>Thaleichthys pacificus</i>	eulachon	137	1	0		0	0	0	138
<i>Ptychocheilus oregonensis</i>	northern squafish	30	36	46		0	0	0	112
<i>Cyprinidae</i>	small minnows	2	59	33		0	0	0	94
<i>Mylocheilus caurinus</i>	peamouth chub	27	12	4		0	1	0	44
Indet. <i>Cyprinid</i> spp.	-	8	0	10		0	0	0	10
<i>Acrocheilus alutaceus</i>	chiselmouth	3	0	0		0	0	0	3
<i>Gila bicolor</i>	tui chub	2	0	0		0	0	0	2
Unidentified	-	267	659	439		0	3	10	1378

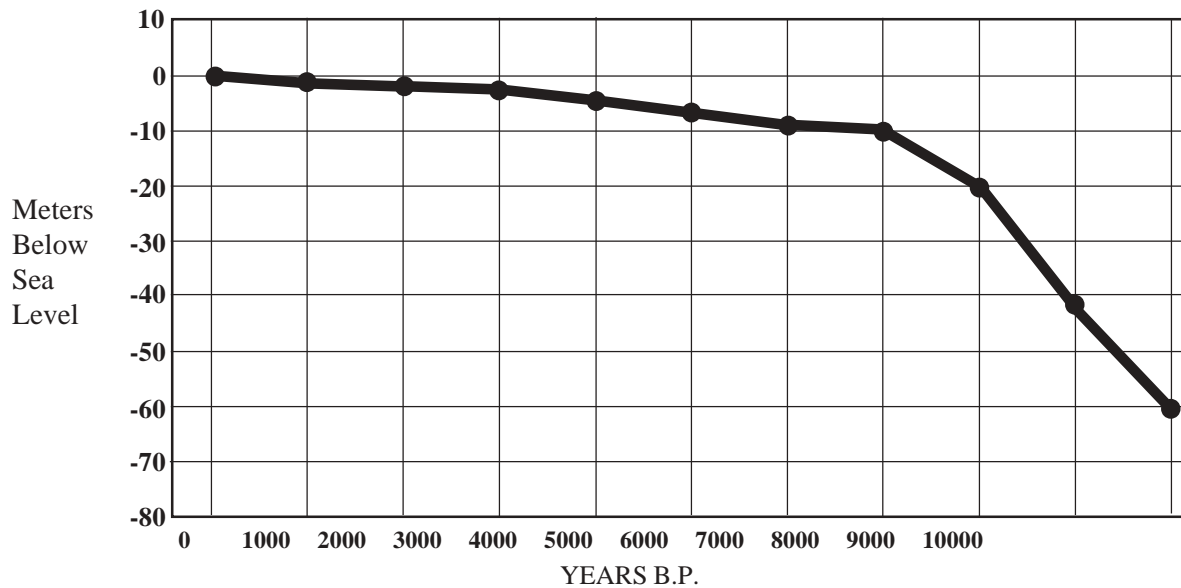


FIGURE 2. PACIFIC OCEAN SEA LEVELS TO 10,000BP.
Adapted from Hutchinson, 1992.

tion of the basin’s critical wetlands, and for our understanding of settlement patterns before 1,000 years ago. The explosion in the number of sites post-dating 2000 years ago on the basin’s floor (see Figure 4) may be a result of : 1) changing sea levels altering the landscape and the “livability” of the basin; 2) maturation of the region’s wetlands and/or; 3) earlier occupations (even slightly earlier) on surfaces which are now submerged. Ellis and Fagan, citing evidence presented in Musil (1992), suggest that the basic topographic drainage features of the eastern floodplain — small channels — may have been stable for the last 2,400 years, Connolly and Bland suggest that levee build-up began in the same area by 2,000 years ago (Connolly and Bland 1989).

Barnowsky conducted pollen studies at three locations north of Vancouver, Washington, in the early 1980s (Barnowsky 1983, 1985), including the Orchards Peatland and Battle Ground Lake (she also cored Davis Lake north of Centralia). In the late 1970s, Heusser et al. (1980) cored Fargher Lake, located 10 km from Battle Ground Lake. Neither Fargher nor Battle Ground Lake are near the Columbia River; Battle Ground Lake has an elevation of 155 m ASL and Fargher Lake is higher at 200 m ASL. Taken together, the two pollen sequences extend back almost 35,000 years (Heusser 1985). We are concerned here with the terminal Pleistocene - Holocene portions of the record (Figure 3).

Heusser (1985) develops a general reconstruction of climatic trends in western Washington, and by extension, Northwestern Oregon, for the past 47,000 years. He suggests that the coldest, driest conditions of the period existed between 28,000 and 13,000 years ago, with mean annual temperatures of 10°C and precipitation averaging 1300 mm (51 inches) — similar to current conditions in the coastal forests of Alaska. The period after 13,000 BP is marked by several climatic shifts.

Temperature increased to 13°C by 8,000 BP, its post-glacial maximum. Rainfall at first increased to a maximum of 2400 mm (94 inches) by 10,000 BP, then declined to 1500 mm (59 inches) by the thermal maximum at 8,000 BP. In Heusser’s reconstruction, the climate in western Washington has been colder and wetter than previously since 8,000 BP, with the period between 5,000 and 2,000 BP the coldest and wettest. Barnowsky ends the postglacial climatic maximum later than does Heusser, by 6,000 BP. These trends are broadly reflected in the pollen cores from Battle Ground and Fargher Lakes.

Reconstructing subsequent vegetation changes requires combining a pollen record with data on the formation of the basin’s alluvial bottom lands. There are some data which may eventually allow construction of rela-

Years B.P.	Juneau	Ketchikan	Graham Island	North Vancouver Island	South Vancouver Island	Puget Lowland	Hoh- Kalaloch	Hump- tulips	Lake Washington	Battle Ground, Fargher Lakes
0					Alder, Herb					
500	Spruce	W. Hemlock	W. Hemlock	W. Hemlock			W. Hemlock	W. Hemlock		Cedar
1000	W. Hemlock	Spruce	Spruce	Cedar	Cedar		Cedar	Alder		Douglas Fir
1500	M. Hemlock	Cedar	Cedar	Pine	W. Hemlock	Cedar	Heath	Heath		W. Hemlock
2000	Spruce	Pine	Pine	Heath	Douglas Fir	Douglas Fir			Cedar	Alder
2500	Pine	Heath	Heath		Alder	W. Hemlock			Alder	Fern
3000	Heath	Sphagnum	Sphagnum		Pine	Alder				
3500	Sphagnum					Fern				
4000				W. Hemlock			W. Hemlock	W. Hemlock		
4500			Pine	Spruce			Spruce	Alder		
5000			W. Hemlock							
5500	Spruce	W. Hemlock	Spruce		W. Hemlock					
6000	Alder	Spruce	Lysichiton		Douglas Fir	Douglas Fir				
6500	Sedge	Lysichiton			Oak / Alder	Oak				Douglas Fir
7000					Pine	Herb				Oak
7500										Fir
8000				Spruce			Alder		Alder	
8500	Alder	Alder	Alder	Alder			Douglas Fir,	Alder	D. Fir	
9000	Spruce	Spruce	Spruce	Fern			Fern	D. Fir,	Fern	
9500	Fern	W. Hemlock	W. Hemlock	Spruce	Alder		Pine	Fern		Alder, Fir
10000	Pine, Alder, Fir	Pine, Alder	Pine	M. Hemlock	Douglas Fir		Spruce		D. Fir, Fir	Douglas Fir
10500			M. Hemlock	W. Hemlock		Alder, Fir,	Hemlock	Pine	Pine	Pine, Spruce, Alder
11000			Sedge	Alder		Douglas Fir			Spruce	Grass, composite
11500										

FIGURE 3.
TERMINAL PLEISTOCENE-HOLOCENE POLLEN SEQUENCE.
After Heusser 1985.

tively fine-grained models of the basin's environmental contexts over the last 1,000 years or so. Generally speaking, for the last 1000 years, the flora of the Willamette Valley floor was dominated by Douglas fir and oak. The Oregon Cascades to the east supported Douglas Fir and hemlock forests.

Wapato Valley Archaeology

The Lower Columbia River Valley has probably received the least archaeological attention of any major river valley of comparable size in the United States (Ames 1994). Pettigrew (1977) recognizes four periods in the history of archaeology for the Lower Columbia River Valley. These are the Early Amateur Period (EAP) (contact-1923), the Early Professional Period (EPP) (1924-1950), the Reservoir Survey Period (RSP) (1951-1965), and the Recent Period (1966-

present). Ames (1994) renamed the latter period the "Developed Professional Period (DPP)." Archaeological work conducted in the Wapato Valley and the vicinity of Cathlapotle is discussed within this chronological framework.

Very little professional archaeology was conducted in the Wapato Valley prior to the DPP. Most preceding work was focused in the Columbia Gorge and up river at The Dalles. The only professional work in the Wapato Valley during the EAP was Harlen I. Smith's description of artifacts that had been collected by amateurs (Smith 1906).

The first professional field work conducted in the Wapato Valley was in 1924 at the onset of the EPP when University of California at Berkeley conducted limited test excavations on Sauvie Island as part of a

larger, more extensive project in the Dalles region (Strong, Schenck, and Steward 1930). No other work was done until the close of the EPP, when Hudziak and Smith (1948) surveyed along Lake River, identifying four sites on the Ridgefield Wildlife Refuge (45CL1, CL2, CL3, CL4) including the general location of Cathlapotle.

The RSP marks the first major projects in response to industrialization of the area. Once again, most work was conducted up the Columbia River in the Dalles area, including Wakemap Mound (University of Washington) and the Road Cut site (University of Oregon) (Cressman et al. 1961). Fieldwork in the Wapato Valley was limited to two surveys (Touhy and Bryan 1959; Warren 1959). These projects resulted in a number of publications with discussions about cultural historical relations of the Wapato Valley inhabitants. Generally, it was argued that early inhabitants of the valley were related to Columbia Plateau groups (Butler's Old Cordilleran) and later populations with the maritime people of the coast (e.g., Bryan 1957, Touhy and Bryan 1959). The end of the RSP is marked by the first academic thesis on Wapato Valley archaeology, a University of Oregon MA thesis about projectile points from the Sauvie Island area written by Lionel Brown (1960).

Amateur archaeology flourished in the 1960s and 1970s, following the publication of the first synthesis of Lower Columbia prehistory written by a well-known amateur archaeologist, Emory Strong (1959). The Oregon Archaeological Society (OAS), comprised primarily of amateur archaeologists, excavated a number of larger sites in the western Wapato Valley, resulting in small publications for each. The OAS also began the publication of the newsletter "Screenings," which today provides important information about artifacts recovered in the valley.

The DPP for the Wapato Valley is characterized by a marked increase in professional work. The earliest projects were initiated in response to dredging and highway construction in Clark County, Washington. Among these were a series of surveys, testing programs and salvage excavations employed by the University of Washington on the Columbia River floodplain in the Lake River area. This work is discussed in more detail below.

Although located in the Columbia Gorge, the salvage excavations at 45SA11, near Bonneville Dam, from 1976-1979 are worthy of mention (Dragoo and Keeler 1978; Minor, Teopel and Beckham 1989). Among its unique qualities, the excellent preservation of architectural features for seven rectangular, semi-subterranean plank houses provides regional archaeologists with unprecedented comparative data for plank house excavations elsewhere, including at Cathlapotle.

During the early part of the DPP, a number of projects made significant contributions to the development of the region's archaeology. In the early 1970s, the University of Washington conducted the first professional excavation of a Wapato Valley site containing evidence of a Native American living structure, 45CL21 (Kirsting Site) (Jermann et al. 1975). Additionally, Dunnell et al. (1973) developed a site typology and proposed a settlement pattern model for the Wapato Valley based on survey in the Vancouver Lake-Lake River area. Concurrently, Richard Pettigrew tested seven sites in the Sauvie Island area in order to develop the framework for a cultural-historical chronology for the Wapato Valley (Pettigrew 1977). Pettigrew's cultural chronology and Dunnell's settlement pattern model were the first systematically-derived theoretical contributions to Wapato Valley archaeology.

Using the faunal material collected during Pettigrew's excavations in the Sauvie Island area, Becky Saleeby developed an ecology-based settlement pattern model for the valley (Saleeby 1983). Both Saleeby's model and Dunnell's model have undergone continual assessment by regional archaeologists and ethnohistorians (eg. Skolnik et al. 1979, Wessen 1983, Hajda 1985, Hamilton 1992, Ellis 1992), but no significant alternatives have been proposed (Ames 1994).

Complementing the University of Washington's work in Clark County, Washington, Thomas Newman of PSU oversaw a number of projects on the Oregon side of the valley in the late 1970s and early 1980s. This work included the documentation of the "Sunken Village" wet site (35MU1) on Sauvie Island (Newman 1991) and the first surveys along the southern shore of the Columbia River (Kongas 1979). To date, the most extensive excavations in the Wapato Valley were completed at the Meier site under the direction of Ken-

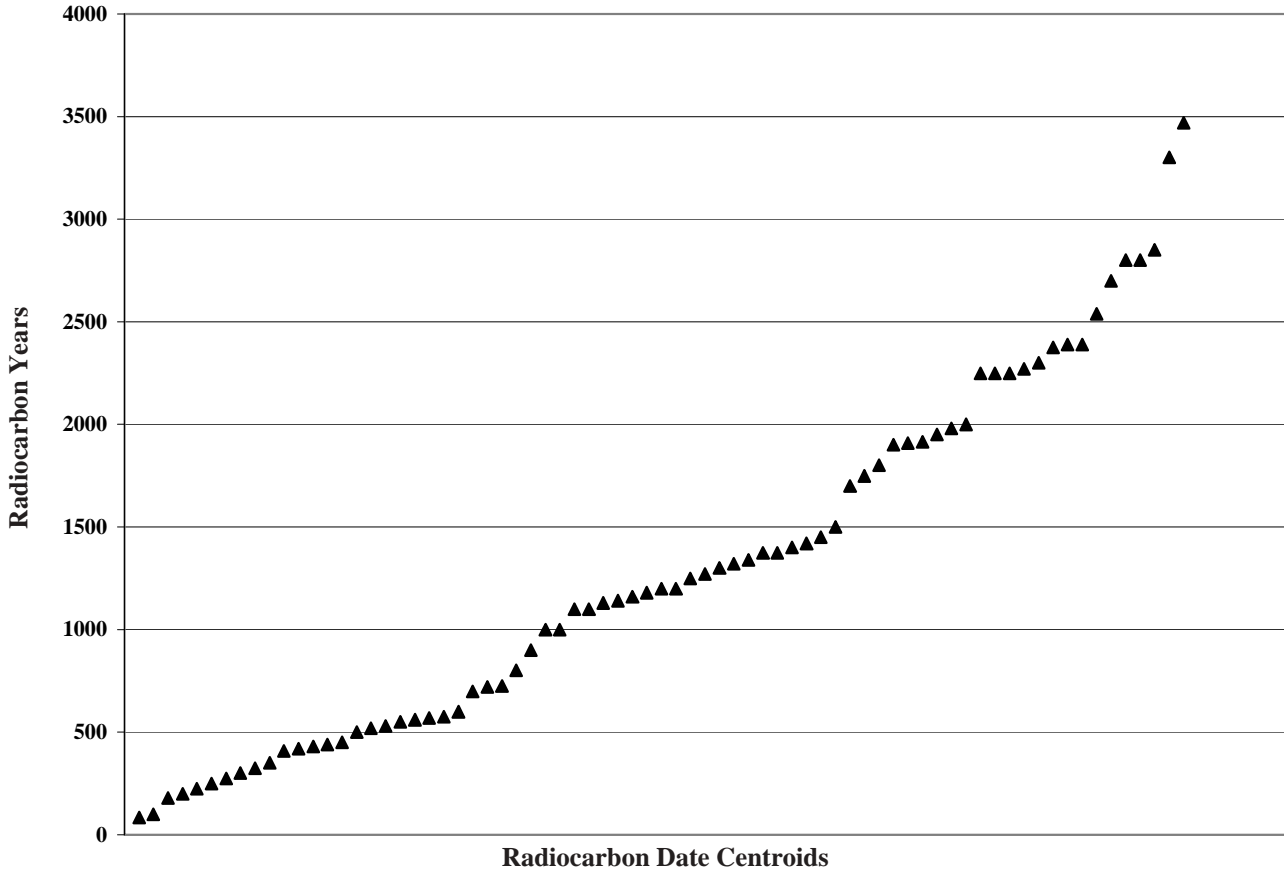


FIGURE 4.
SITE CHRONOLOGY ON THE WAPATO VALLEY FLOOR.

neth Ames, also of PSU (Ames et al. 1992). This five-season excavation (1987-1991), with ongoing analysis, initiated the “Wapato Valley Archaeological Project” of which Cathlapotle is a part.

Most professional archaeological projects in the Wapato Valley have been oriented toward cultural resource management. This work has increased dramatically in the last two decades making it difficult to review (Ames 1994). The projects include survey, testing and data recovery in many areas throughout the Wapato Valley. During the past decade, most CRM work in the Wapato Valley has focused on what is called “The Columbia South Shore.”

This term encompasses the Portland Metro area along the south shore of the Columbia River east of Portland International Airport to roughly the Sandy River. This area is undergoing rapid, planned development,

including construction of major highway connectors (Airport Way) and industrial campuses. This work has led to several surveys and augering projects (see Minor, Musil, and Toepel 1994 for a summary of this work) and one major data recovery excavation project at 35MU57 (Ellis and Fagan 1993) as well as numerous smaller projects.

Figure 4 plots 73 archaeological radiocarbon dates from the Wapato Valley, indicating the rapid increase in sites with time, particularly after 1500 radiocarbon years.

Refuge and Vicinity Archaeology

The Ridgefield Wildlife Refuge and vicinity, as defined here, is comprised of the narrow floodplain from Vancouver Lake to the Lewis River, including the full length of Lake River and Bachelor Island (Figure 5).

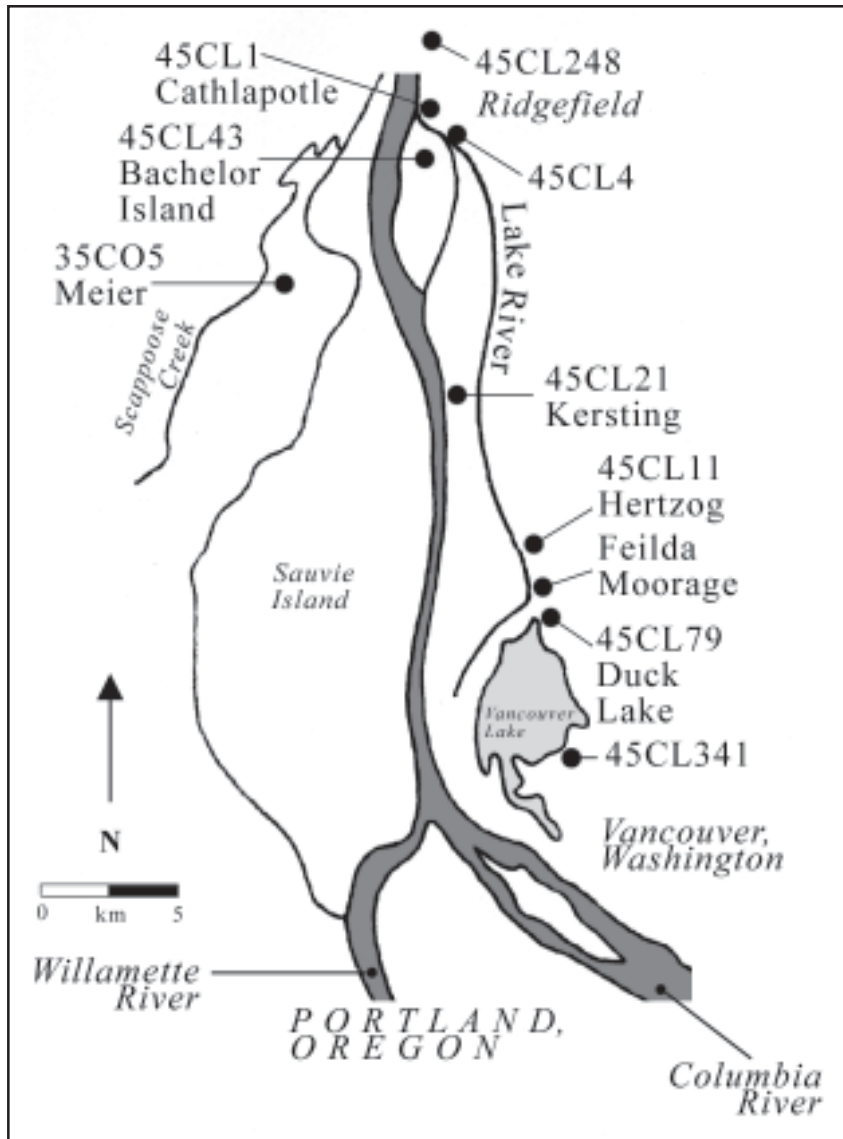


FIGURE 5.
SITE DISTRIBUTION IN THE VICINITY OF 45CL1, CATHLAPOTLE.

The natural catchment area of Cathlapotle also includes the Lewis River drainage, though our studies have yet to take us there. The work in this area has contributed significantly to the development of archaeology in the Wapato Valley, particularly in the 1970s during the early DPP. However, most of the professional work in the area has been survey.

The earliest archaeological project in the area was Hudziak and Smith's (1948) recording of Lake River sites. Most significantly, the records included 45CL4 and the approximate location of Cathlapotle. In 1954,

Donald Touhy and Alan Bryan conducted a pipeline survey in Clark County, including an area along Lake River (Touhy and Bryan 1959).

To date, the most extensive excavations in the vicinity have been conducted by the Oregon Archaeological Society in the 1960s and 1970s. The relevant sites are 45CL79 (Duck Lake) (Slocum and Matsen 1972), Falida Moorage (cited in Ames 1994), 45CL11 (Hertzog Site) (Foreman and Foreman 1977), and 45CL43 (Bachelor Island) (Steele 1980). These excavations, while sometimes of enormous scale, are not

well reported. The OAS is an amateur society, and during that period, their excavations were not to professional standards.

Consistent professional work in the immediate Lake River area began in the late 1960s and extended into the 1980s. These were primarily surveys, but testing and salvage also occurred in response to highway construction and dredging. This work included salvage excavations at the Kirsting Site (Jermann et al. 1975); limited surveys around Vancouver Lake by Hibbs and Ross (1972); Munsell (1973), Dunnell, Chatters and Salo (1973); and a survey along lower Lake River and Bachelor Island Slough (Starkey and Ross 1975). Following these surveys in 1978, the University of Washington conducted limited testing at 45CL117, a site with a moderate lithic assemblage located on the south bank of the Lewis River (Kennedy and Jermann 1978).

The work by Dunnell et al. (1973) in the Vancouver Lake-Lake River area was followed by two survey projects with limited excavations (Skolnik et al. 1979; Wessen 1983). These works culminated in the creation of the Vancouver Lake Archaeological District, comprising a total of 91 documented archaeological sites. The district includes a wide array of Native American sites ranging from small, special-purpose sites to large residential sites with house depressions. Some of these are multicomponent sites and one (45CL31) includes a fish weir (Wessen 1983).

Subsurface testing on the Carty Unit of the Ridgefield Wildlife Refuge began in 1979. Abramowitz (1980) conducted surface reconnaissance, subsurface coring of known sites and high potential landforms, and subsurface testing of 45CL4 (see Figure 5). The project confirmed five previously recorded sites and recorded one additional Native American site (45CL284), located just northeast of Cathlapotle on the southern bank of Gee Creek and comprised of a single ash and charcoal lens with bird bone flecks.

Based on auger probes and limited testing, Abramowitz concluded that 45CL4 was the best candidate for Cathlapotle. This led to excavations by the Lewis and Clark College Archaeological Field School in 1984 and 1985, directed by Rick Minor and Kathryn Anne Toepel. They concluded that 45CL4 was probably not Cathlapotle, but rather represented a series of small

encampments created by the repeated use of the landform for a long period of time (Minor and Toepel 1985). They also suggested that this was likely the location where Lewis and Clark camped on March 29, 1806, and described Chinookan women procuring Wapato from the adjacent lake. The search for Cathlapotle resumed in 1991 and is described in more detail elsewhere in this report.

The archaeology in the vicinity of Cathlapotle reveals a wide range of Native American site types on the surrounding alluvial valley floor. The most frequent sites are fire-cracked rock concentrations and some lithic scatters. These sites are probably low impact, special-purpose sites. They reveal the archaeological integrity of the area and its potential for providing information about subsistence-settlement patterns related to Cathlapotle. Most of these sites have not had much professional attention. Limited excavations have been conducted only at some of the larger sites (eg. 45CL4, 45CL117, 45CL21 and 45CL31). For the most part, this work has either been limited testing or salvage archaeology rather than goal-oriented, systematic research. We plan to fill this void in Wapato Valley archaeology, in part through research geared toward understanding the settlement and landuse patterns surrounding Cathlapotle.

Ethnographic Background

The Cathlapotle town (also spelled Quathlapotle, Cathlapoodle, etc.) was one of nineteen Chinookan towns recorded by Lewis and Clark (Thwaites 1908) in the Wapato Valley. The term Chinookan refers to the speakers of several closely related languages who occupied the Columbia River from the upstream end of the river's gorge (near the present town of The Dalles, Oregon), and the river's mouth, and along adjacent portions of the present coasts of Washington and Oregon, from Tillamook Bay in the south, north to Willapa Bay in southwest Washington. This region has been called the "Greater Lower Columbia River" by Hajda in her synthesis of Chinookan ethnohistory and ethnography (Hajda 1984). Hajda's work is presently the definitive study of the Chinookan peoples at contact with Europeans, while Boyd's work is the basic study for Chinookan demography through the first century of the Modern period. Silverstein (1991) provides a useful summary of what is known of Chinookan

TABLE 4.
WAPATO VALLEY VILLAGES AT THE TIME
OF THE LEWIS AND CLARK EXPEDITION.
(from Hajda 1984)

POPULATION ESTIMATE:		
VILLAGE	MINIMUM	MAXIMUM
Quathlapotle	300	900
Clackstar	350	1200
Cathlacumup	150	450
Clannarminnamon	280	280
Shoto	180	460
Clannaqueh	130	130
Multnomah	200	800
Clanninata	100	200
Cathlanahquiah	150	400
Cathlacommahtup	70	170
Nemalquinner	100	200
Clackamas	800	1800
Carcowah	200	200
Cushhook	250	650
Neerchokio	40	100
Nechacolee	100	100
SUM	3400	8040
MEAN	212.50	502.50
STANDARD DEV.	173.50	457.60

life before contact and their contact history.

The Chinookan language family can be divided into two branches: Lower Chinook spoken by peoples living on both sides of the river's mouth, and Upper Chinook spoken along both sides of the Columbia from its estuary upriver through the Gorge. Upper Chinook is divisible into three languages: Cathlamet, Multnomah and Kiksht. Multnomah was spoken in the Wapato Valley, where the region's densest human populations occurred.

Boyd and Hajda (1987) suggest that the Valley's permanent winter population more than doubled every spring by people moving into the area to exploit its abundant seasonal food resources. Boyd (1985) estimated that the resident population of the basin two centuries ago was 4,000 people, with the numbers rising to perhaps 10,000 during spring and summer. His

estimates are probably lower than precontact levels because the people of the region were afflicted by smallpox in the early 1770s and again in 1801. His figures translate to a winter population of approximately 16 people/100 sq km in winter and 40 people/100 sq km during the summer (Alfred Kroeber estimated 28 people/100 sq km for the Northwest Coast as a whole [Ramenofsky 1987]).

Dobyns' (1983) estimates for the pre-epidemic population of the Northwest Coast are between 116 and 120 people/100 sq km; his figures are controversial but may provide an upper limit on the winter population of the basin, which would have been between 29,000 and 30,000 people or three times the contact-period numbers. Whatever set of figures one chooses, these are high densities for hunter-gatherers (Wobst 1974, 1976).

Boyd and Hajda report 16 named Multnomah and Clackamas villages in the Wapato Valley study area (Table 4), based on Lewis and Clark's Journals (Thwaites 1904-1905). These 16 villages had a minimum population of 3,400 people, perhaps representing the permanent population of the basin, and a maximum estimated population of 8,040, representing, they argue, the effects of the annual influx. Boyd and Hajda's figure of 8,040 probably represents a minimal figure for the pre-epidemic permanent population of the Wapato Valley, with the actual figure being closer to 12,000 to 14,000 (Ames 1994).

Chinookan peoples were hunter-gatherers exploiting a wide range of terrestrial and riverine resources. The Wapato valley is an ecologically complex and productive environment (Saleeby 1983, Hamilton 1989). Its productivity is the result of its being quite fine grained in habitat structure, thus providing a wide variety of microenvironments and ecotones. As has been indicated, the area supported a diversity of plant and animal life. In addition, the Columbia River was the most productive salmon stream in the world. Among the staples in the Chinookan subsistence system in the valley were wapiti (elk, *Cervus elephas*), deer (*Odoceolious sp.*), bear (*Ursus*), wapato corns (*Sagittaria latifolia*), camas roots (*Camassia quamash*), salmon (*Oncyrhinchus*), sturgeon (*Acipenser*), and smelt (*Spirinchus thalerchthys*), among others.

Like most peoples of the Northwest Coast and Columbia Plateau, the household and village or town were the primary economic, social and politic units. The household was the most important. Households ranged in size from a score of people to well over a hundred. Households occupied large, cedar plank houses that ranged in size from as little as 90 m² to well over 1000 m². Chinookan societies were stratified, divided into classes of free individuals and slaves. Mitchell (1985) estimates that perhaps 25% of the area's population were slaves. Free people were divided into a relatively powerful elite and "commoners" who were household members but who exercised little or no power.

Towns were linguistically polyglot, given the area's marriage practices, so while a town such as Cathlapotle was within Chinookan territory, its occupants would very likely include Cowlitz and people of other regional language families.

Chinookan people generally shifted their residence twice a year from a winter village or town to various summer locations. In the Wapato Valley, it appears that the occupants were fully sedentary, with people remaining in the same settlement year-round. Excavations of a plank house at 35CO5 (the Meier Site), on the Oregon side of the Columbia River, indicate that the structure stood for 400 years and was continuously occupied.

The Chinookan peoples were deeply involved in trade. An annual trade fair at The Dalles was the largest such fair in Western North America, and any movement of materials between the coast and the fair passed through Chinookan territory. The Dalles trade fair itself was within the territories of Kitsht speakers. The Chinook were also engaged in trade up and down the coast itself.

The town of Cathlapotle appears to have been among the largest towns along the river. It also was strategically located vis-a-vis any movement up or down the river. It is perhaps suggestive that both Broughton and Lewis and Clark were met by peoples from Cathlapotle as they traveled the river.

Historic Accounts of Cathlapotle

Several Euro-American explorers and settlers in the late 18th and early 19th century described Cathlapotle and its Chinook Indian inhabitants. Many archaeologists have scrutinized these accounts in an effort to pinpoint the location of the town site. Minor and Toepel (1985) and Parchman and Hickey (1993) offer the best assessment of the site's location based on these early records. We reiterate much of their work below.

Lt. William R. Broughton

In 1792, Lt. William R. Broughton sailed up the lower Columbia River from its mouth to Pt. Vancouver, which he named for his Captain, and back. On October 28th, Broughton and his crew met a group of Chinook Indians at the lower end of Sauvie Island. He called it:

"...Point Warrior, in consequence of being there surrounded by twenty three canoes carrying from three to twelve persons each, all attired in their war garments and in every other respect prepared for combat. On these strangers discoursing with the friendly Indians that attended our party, they soon took off their war dress, and with great civility disposed of their arms and other articles for such valuables as we presented to them, but would other niether part wirth their copper swords nor a kind of battle axe made of iron."

"At Point Warrior the river is divided into three branches; the middle one was the largest, about a quarter of a mile wide, and was considered as the main branch; the next most capacious took an easterly direction and seemed extensive; to this the name of Rushleigh's River was given; and the other that stretched to the S.S.W. was distinguished by the name of Call's River."

"On the banks of Rushleigh's River was seen a very large Indian village and such of the strangers as seemed to belong to it strongly solicited the party to proceed thither; and to enforce their request, very unequivocally represented that if the party persisted in going to the southward they would have their heads cut off. The same entreaties, urged by similar warnings had been before experienced by Mr. Broughton during his excursion, but having found them to be un-

necessary cautions he proceeded up that which he considered to be the main branch of the river..."

(Vancouver 1926:21-22)

Most readers agree that Broughton's "Call's River" is Multnomah Channel (Kennedy and Jermann 1978, Neilson 1926). "Rushleigh's River" is probably the Lewis River, or perhaps Lake River (Minor and Toepel 1985). Kennedy and Jermann (1978) name Austin Point as the location of Broughton's village on the bank of Rushleigh's River. However, later explorers never place an Indian settlement there.

We think that Broughton's village was Cathlapotle, which is at the mouth of the Lake River but so close to the mouth of the Lewis River that Broughton might have generalized his description.

Lewis and Clark

Captain Merriwether Lewis and Lt. William Clark give the best description of Cathlapotle and its location. They observed the settlement on their expedition down the Columbia River in 1805, and again on their return in 1806 (Figure 6). On November 5, 1805, Clark wrote:

"...passed an Isld. Covered with tall trees & green briers Separated from the Stard. Shore by a narrow Chanel at 9 [8?] miles I observed on the Chanel which passes on the Stard Side of this Island a Short distance above its lower point is Situated a large village, the front of which occupies nearly 1/4 of a mile fronting the Chanel, and closely Connected, I counted 14 houses [NB: Quathlapotle nation] in front here the river widens to about 1/2 miles. Seven canoes of Indians came out from this large village to view and trade with us, they appeared orderly and well disposed, they accompanied us a few miles and returned back..."

(Moulton 1990[6]:23)

After wintering on the at the mouth of the Columbia River, Lewis and Clark turned back for the East. On March 28, 1806, Clark wrote:

"...we were visited by a large canoe with ten natives of the Quathlahpohtle nation who are numerous and reside about fourteen miles above us on the N.E. side of

the Columbia above the Enterance of a small river which the Indians call Chah wah-na-hi-ooks."

(Thwaites 1969: 212)

The following day, Lewis and Clark visited Cathlapotle for several hours. Lewis described the town and the people:

"...on the North side of the columbia a little above the entrance of this inlet a considerable river discharges itself. this stream the natives call Cah-wah-na-hi-ooks. it is 150 yards wide and at present discharges a large body of water, tho' from the information of the same people it is not navigable but a short distance in consequence of falls and rappid a tribe called the Hul-lu-et-tell reside on this river above it's entr.- at the distance of three miles above the entrance of the inlet on the N. side behind the lower point of an island we arrived at the village of the Cath [X: Quath]-la-poh-tle wich consists of 14 large wooden houses. here we arrived at 3 P.M. the language of these people as well as those on the inlet and wappetoe Island differs in some measure from the nations on the lower part of the river. tho' many of the words are the same, and a great many others with the difference only of accent. the form of their houses and dress of the men, manner of living habits custom &c as far as we could discover are the same. their women wear their ornaments robes and hair as those do below tho' [NB: Indian women on Wappato Island & in that Valey] here their hair is more frequently braded in two tresses and hang over each ear in front of the body. in stead of the tissue of bark woarn by the women below, they wear a kind of leather breech clout about the width of a common pocket handkerchief and reather long. the two corners of this at one of the narrow ends are confined in front just above the hips; the other end is then brought between the legs, compressed into a narrow foalding bundel is drawn tight and the corners a little spread in front and tucked at the groin over and arround the part first confind about the waist. the small robe which dose not reach the waist is their usual and only garment commonly woarn be side that just mentioned. when the weather is a little warm this robe is thrown aside and the leather truss or breech-clout constitutes the whole of their apparel. this is a much more indecent article than the tissue of bark, and bearily covers the mons venes, to which it is drawn so close that the

whole shape is plainly perceived. the floors of most of their houses are on level with the surface of the earth tho' some of them are sunk two or 3 feet beneath. the internal arrangement of their houses is the same with those of the nations below. they are also fond of sculpture. various figures are carved and painted on the peices which support the center of the roof, about their doors and beads. they had large quantities of dried Anchovies strung on small sticks by the gills and others which had been first dried in this manner, were now arranged in large sheets with strings of bark and hung suspended by poles in the roofs of their houses; they had also an abundance of sturgeon and wappatoe; the latter they take in great quantities from the neighbouring bonds, which are numerous and extensive in the river bottoms and islands. the wappetoe furnishes the principal article of traffic with these people which they dispose of to the nations below in exchange for beads cloth and various articles. the natives of the Sea coast and lower part of the river will dispose of their most valuable articles to obtain this root. they have a number of large symeters of Iron from 3 to 4 feet long which hang by the heads of their beads; the blade of this weapon is thickest in the center tho' thin even there. all it's edges are sharp and it's greatest width which is about 9 inches from the point is about 4 inches. the form is thus. this is a formidable weapon. they have heavy bludgeons of wood made in the same form nearly which I presume they used for the same purpose before they obtained metal. we purchased a considerable quantity of wappetoe, 12 dogs, and 2 Sea otter skins of these people. they were very hospitable and gave us anchovies and wappetoe to eat. notwithstanding their hospitality if it deserves that appellation, they are great begers, for we had scarcely finished our repast on the wappetoe and Anchovies which they voluntarily sat before us before they began to beg. we gave them some small articles as is our custom on those occasions with which they seemed perfectly satisfied. we gave the 1st Cheif a small medal, which he soon transfered to his wife. after remaining at this place 2 hours we set out & continued our rout between this island, which we now call Cath-lah-poh-tle after the nation, and the Lard shore. at the distance of 2 miles we encamped in a small prairie on the main shore, having traveled 19 miles by estimate..."

(Moulton 1990[7]:26-29)

Clark also wrote a description of the March 29, 1806, visit to Cathlapotle:

"...we proceeded on to the lower point of the Said island accompanied by the 3 Indians, & were met by 2 canoes of natives of the quath-lah-pah-tal who informed us that the chanel to the N E of the Island was the proper one. we prosued their advice and Crossed into the mouth of the Chah-wah-na-hi-ooks River which is about 200 yards wide and a great portion of water into the columbia at this time it being high. The indians inform us that this river is crouded with rapids after Some distance up it. Several tribes of the Hul-lu-et-tell Nation reside on this river. at 3 oClock P. M. we arrived at the Quath lah pah tle Village of 14 Houses on main Shore to the N E. Side of a large island. those people in their habits manners Customs and language differ but little from those of the Clatsops and others below. here we exchanged our deer Skins killed yesterday for dogs, and purchased others to the Number of 12 for provisions for the party, as the deer flesh is too poore for the Men to Subsist on and work as hard as necessary. I also purchased a Sea Otter robe. we purchased wappatoe and Some pashaquar roots. gave a Medal of the Small Size to the principal Chief, and at 5 oClock reembarked and proceeded up on the N E. of an Island to an inlet about 1 mile above the vil-lage and encamped on a butifull grassy plac, where the natives make a portage of their Canoes and Wappato roots to and from a large pond at a short distance. in this pond the natives inform us they Collect great quantities of wappato, which the womin collect by getting into the water, Sometimes to their necks holding by a Small canoe and with their feet loosen the wappato or bulb of the root from the bottom from the Fibers, and it imedeately rises to the top of the water. they collect & throw them into the Canoe, those deep roots are the largest and best roots. Great numbers of the whistling swan, Gees and Ducks in the Ponds. Soon after we landed 3 of the natives came up with wappato to sell a part of which we purchased..."

(Moulton 1990[7]:30)

Another interesting note comes from Sergeant John Ordway of the Lewis and Clark expedition. He states that most of the "huts" at Cathlapotle joined together (Ordway 1916).

Other Accounts of Cathlapotle

Fur trappers and traders surged into the lower Columbia River after Lewis and Clark returned to Washington. The Chinook Indians at Cathlapotle and along the entire lower Columbia River were active participants in the fur trade (Ruby and Brown 1976). Documents left by traders, settlers, and residents from Astoria and Fort Vancouver (19 river miles from Cathlapotle) occasionally mention Cathlapotle and its Chinook inhabitants (Wuerch 1979). For example, a typical entry from an Astorian fur trapper in May 1811:

"...proceeded to another large village that our guide told us was called Katlapoutle. It was situated at the mouth of a small river..."

(Franchere 1967:50)

Beginning in 1830, the Wapato Valley was struck by annual epidemics of "fever and ague." These epidemics were of increasing ferocity until 1835, when they waned. Boyd, who has conducted the most recent research on Northwest epidemics (Boyd 1985) has demonstrated that the disease was malaria. Middle Chinookan populations were devastated, and Cathlapotle, along with much of the valley, was abandoned. The actual timing of this event is difficult to pinpoint. In 1833, William Tolmie, a Hudson's Bay Company doctor observed of Cathlapotle that "only its superior verdure distinguished the spot from the surrounding country." Presumably by verdure he is referring to the vegetation that rapidly colonizes abandoned ground in this wet area. There is no mention of structures in this all too brief remark. However, according to Meredith Gairdner, another HBC doctor, Cathlapotle was still occupied in 1835 (as cited in Wuerch 1979). It is possible that in 1835, the people at or near Cathlapotle were no longer Chinookans.

FIGURE 6.
CONFLUENCE OF WILLAMETTE AND
COLUMBIA RIVERS AND ENVIRONS,
3 APRIL 1806

Missouri Historical Society Archives,
Voorhis #2, William Clark Papers, Ink on paper
by Clark, William, 1806



In 1836, another Hudson's Bay doctor treated a sick girl in the vicinity of Cathlapotle, "on a plain below Warrior's point...several large lodges of Kowalitsk Indians, in all probably one hundred persons." The area had clearly been reoccupied, but by Cowlitz people.

The Cathlapotle area may have been occupied by Indians as late as 1853 and after. The survey notes of the General Land Office (GLO) (USGS, 1853), refer to an "Indian lodge" on the southeastern bank of Gee Creek, where it enters the Lewis River, approximately 800 meters north of Cathlapotle. This 1853 GLO map shows a trail, perhaps blazed during the fur trade, from Vancouver which passes directly alongside Cathlapotle. However, the site is not marked on the map

In 1854, Tappan (1854) states that 140 to 200 Taitnapams were living in the valley of the Lewis River. While Taitnapams were Sahaptin speakers, the Cowlitz were speakers of a Salish language. Except for Tillamook, Cowlitz is one of the most southerly Salish languages. Sahaptin languages were spoken to the east, in the mountainous areas north of the Columbia Gorge and out onto the Columbia Plateau. The presence of Sahaptin speakers in the area of Cathlapotle suggests a downstream expansion.

The General Land Office Survey of 1854 also described an "Indian Lodge" at or near the mouth of Gee Creek

north of Cathlapotle. The expansion of Salish and Sahaptin speaking groups into the Wapato Valley following the decimation of Chinookan populations is well documented. Paul Kane, an artist who visited the region in 1846 and 1847, noted that Cathlapotle and other Chinook towns were "entirely extinct as villages" (Kane 1971:21). Nevertheless, Kane produced a record of Chinook culture in his paintings and writings (Harper 1971).

The term Cathlapotle was not limited to the Chinookan town. In fact, according to Swanton (1968), the real name of the town was *Nah-poo-itle* with an additional village called *Wakanasisi* also belonging to the band (the location of *Wakanasisi* is not clear to this day). Lewis and Clark applied the name Cathlapotle to what is now called the Lewis River. Kane used this label for the river during his travels and it appears on various old maps of the region as well. In 1925, the *Oregonian* newspaper referred to a remote school district and election precinct called "Cathlapoodle" which was named for a "small tribe" that once dwelled on the banks of the Lewis River. Tyee Umtuch was its the last great chief, killed during the Indian war of 1855-1856. Fred Umtuch, the great grandson of Tyee Umtuch, was reported to have been buried in an old Indian cemetery near "Cathlapoodle" (Oregonian 1925).

RESEARCH AND PROBLEM ORIENTATION

The excavations at 45CL1 have been guided by a series of goals and problems. This section summarizes these as they were understood in the spring of 1994. The project was designed to meet three broad, interrelated sets of goals: 1) management and scientific goals, 2) outreach goals, and 3) public education goals.

Management and Scientific Goals

1. The primary task of the Phase I work at Cathlapotle was to: (a) determine the horizontal and vertical extent of the site, (b) establish the stratigraphic integrity of the deposits, (c) evaluate the condition of the site and its contents, (d) establish the site's age, and (e) map the site in detail.

Related management and scientific goals and tasks included the following:

2. *Locating house walls or corners.* The initial determination that the locality was indeed that of Cathlapotle was based on surface indications, including extensive scatters of fire-cracked rock and the locality's topography, particularly the presence of a series of long, linear depressions that appeared to be house depressions. Chinookan houses were sometimes semi-subterranean, and some at least had cellars (Ames et al. 1992). Abandoned semi-subterranean structures are marked by such surface depressions. However, other processes could also account for these features, and it was necessary to test several of them to confirm that they indeed were the remains of large structures. Particular attention needed to be paid to locating either the house walls or corners.

At least one of these depressions had low, narrow ridges crosscutting the depression's main axis. These ridges subdivided the larger depressions into subdepressions. Further, three of the larger depressions contained one or more subdepressions that were considerably deeper than the rest of the feature. Some large Chinookan houses, including those at Cathlapotle, have been described as having interior walls that sectioned the large dwelling into apartment-like units (e.g., Hajda 1994). The features we observed at 45CL1 were hypothesized to represent these interior walls. The dif-

ferentials in depths within the larger depressions suggested either that: a) some "apartments" had cellars and others did not, or (b) that the larger depressions had been used for smaller houses placed within the larger feature, and the deeper subdepressions represented the cellars only for those smaller dwellings.

3. *Stratified testing.* Like many intact Northwest Coast residential sites, the surface of 45CL1 is topographically complex. The surface complexity was thought to reflect, at least indirectly, functional differences in how different portions of the site were used and in how debris were discarded. Ongoing research on Northwest Coast residential sites indicates that they are very heterogenous in their structure (Ames 1994). By heterogeneous we mean that the contents of these sites are spatially and functionally differentiated. Immediately adjacent deposits may have quite different contents. Therefore it was deemed important to stratify our testing of the site according to rather broad categories of the topography, and according to the spatial relationships of particular classes of surface feature to the presumed house depressions. Work at similar sites shows that the depressions (both as houses and after abandonment) are the primary factors affecting formation of the site (Ames 1991).

4. *Placing structures into their geological context.* Previous research at a large plank house (35CO5) showed us that it was essential to firmly place these structure(s) in their geological context (Ames et al. 1992). This could only be done through extensive trenching. Isolated test pits would be quite difficult to tie together later (Brown 1975, Flannery 1976) in what was potentially a very deep and complex site. The size and depth of the site indicated that except where specific excavation goals required smaller units, or conditions permitted, some form of large block excavations were needed.

Our earlier work also suggested that the ridge complex containing the site fronted either on an abandoned channel of Lake River or on a small, abandoned bay. James Carty has suggested that the eastern bank of Lake River has moved westward some 40 meters or more in the last 70 years (Carty, pers.com.). The 1994

trenching of the site was designed to produce a profile completely through one of the houses, tying deposits at the back (eastern) side of the site through to the swale fronting the site, to test whether that swale had been a bay. The resulting profile could then be used as a model against which the geology of the rest of the site could be matched and interpreted.

5. *Radiocarbon dating of deposits.* The size of the site and its stratigraphic complexity suggested that standard geological techniques of correlating sediments across the site might not work. Given that the site is located on a very dynamic flood plain, it was reasonable to expect that the same depositional regime would be represented by several, perhaps quite distinct depositional facies. Heavy reliance on cultural time stratigraphic markers such as projectile points to correlate and date deposits was questionable since the time of occupation might be shorter than the use-spans of most of the major prehistoric styles. For these reasons, it was decided that an extensive program of radiocarbon dating the deposits was necessary.

6. *Determining potential for archaeological data pertaining to precontact and contact period.* The site was known to have been occupied through the entire fur trade period, and the initial Euro-American settlement of the region. A key question was whether the site contained data relevant to: (a) reconstructing life in the area prior to contact and (b) documenting the potential effects of contact, including epidemics, social and economic disruptions and cultural changes. The effects of contact with the highest archaeological visibility were expected to appear in the residents' material culture, but some researchers have devised methods indicating that other effects, such as population decline, can also be monitored archaeologically (e.g. Campbell 1985).

7. *Determining population sustainability methods for sedentary hunter-gatherers.* The human population densities of the Portland basin prior to prolonged contact were quite high for hunter-gatherers. Therefore, a significant research question is how were those numbers sustained, particularly in light of the evidence that they were also rather sedentary. The long term goals of the project involve research centered on that issue (e.g., Ames 1994).

Outreach Goals

1. *Outreach to Native American Communities.* Ongoing consultation with the appropriate tribal groups is seen as absolutely essential to the project's success and was initiated in 1991. Tribes include the Chinook, whose tribal headquarters are located in Chinook, Washington; the Confederated Tribes of the Grand Ronde, in Grand Ronde, Oregon; and the Cowlitz, in Longview, Washington. Initial consultation involved meetings with all three tribal councils, and site visitations by members of the Chinook tribal council. Our long-term goals are to expand participation in the project by these groups, including the setting of project goals as well as active participation in the field research.

2. *Outreach to the Ridgefield Community.* The project staff has given several public lectures in the Ridgefield Community on the project's goals and progress. We have encouraged visitations to the site by community members when excavations are in progress. We plan to develop programs for volunteer participation in the field research.

3. *Environmental and Archaeological Education.* This goal is inseparable from the previous two. However, it expands the outreach effort to include the joint metropolitan areas of Vancouver, Washington and Portland, Oregon. Since these are major media centers for southwestern Washington and much of western Oregon, in some sense, it expands our outreach to that large area. Presently the focus of effort has been the USFWS development of a teaching kit for elementary school teachers based on the excavations at 45CL1, and of a small, portable display about the site that can be set up in almost any indoor location.

These efforts are ultimately tied to the effort by the USFWS to construct an interpretive center at the Ridgefield National Wildlife Refuge that will use the excavation's results as the basis of their displays and education programs.

Sampling

Given the scientific goals outlined above, the sampling methodology was essentially a judgmental sample, stratified by: (a) landform within the site, and (b) com-

pass position within the site. Experience at other Northwest Coast town sites and in mapping Cathlapotle suggested that we could divide the site into several large zones:

Site rear identifies the area of the site behind the major residential features.

Rear berm describes the low ridge area immediately behind the presumed house depressions, usually created by use of the area as a dump.

House depressions are the topographic dips visible on the surface.

Site front areas at 45CL1 these tend to be quite flat with a gentle slope towards the swale. These were thought to represent activity areas and debris fields.

Dumps or middens are discrete mound-like areas which may be the result of dumping. They are located primarily between depressions.

We also wanted to distribute excavation units across the entire site area. To that end, units were distributed through all four quadrants of the site.

The main focus of the 1994 work was to develop a detailed understanding of the site's geology and a history of the site formation processes at work at 45CL1. It was felt that this was essential for evaluating results of further testing. As noted above, a series of scattered test units would be afflicted with the problems of inter-unit correlation discussed by Brown (1975) and ridiculed by Flannery (1976).

In 1993 and 1994, isolated units were therefore placed to meet very specific goals: 1) test the rear berm of the site; 2) test the interior slopes of depressions to establish that they represent structures by locating either (a) the interior wall of the excavated depression or cellar, or (b) locate the actual exterior wall of the house; and 3) test particular topographic features to determine what they are (a) a raised area which auger testing suggested was a midden deposit, and (b) house front areas thought to represent activity zones and resultant debris fields.

The rest of the testing effort was to trench one depression (that the 1993 test had shown to be a house) from the rear berm to the front swale to provide the profile

needed. A second trench was placed at right angles to tie that deep subdepression to its larger depression.

In 1995, isolated units were again used to sample particular topographic features or zones of the site. These units were placed in the "midden" zones between Depressions 1 and 2, and 5 and 6. Otherwise, units were placed as parts of larger blocks, or as parts of a "checker-board" arrangement of units. A large block was excavated within the main subdepression of Depression 1 and four units were excavated across the center of Depression 4.

The 1996 excavations were intended to increase the sample of the interior of established Houses 1 and 4, provide additional stratigraphic information (in particular for tying strata in the 1994 trench to adjacent strata), and to attempt to identify a building sequence for House 4 (which is partly buried by adjacent cultural deposits: see below).

The sampling process has also been designed to acquire a sample of artifacts, ecofacts and features from the site. Recent work on sampling methodology suggests that rather large volumetric samples may be required to assure an adequate sample. Lyman (1991) indicates that at least 100 cubic meters is necessary. Ames (1994) supports that conclusion for sites on the northern British Columbia coast. However, Lyman also discusses the problem of how one actually knows one has achieved an adequate sample. He recommends sampling to redundancy, that is, sampling a site until one essentially ceases to recover new categories of artifact, ecofact, or feature. In his analysis of the fauna recovered from 35CO5 he determined that while it only took one or two seasons to recover an adequate sample indicating the number of faunal taxa present at that site, it took five seasons to recover a sufficient sample to show their relative proportions in the assemblage (Lyman 1994). The only way he knew that the 35CO5 fauna had been sampled to redundancy is because six excavations seasons (including Pettigrew's excavations) had been spent there.

The implication is that at a site of the apparent size of Cathlapotle, acquiring a statistically adequate sample will require several seasons of excavation, regardless of other project goals. One can only know that one has sampled to redundancy after one has passed redundancy.

From this perspective, four years of testing at 45CL1 may or may not be statistically adequate for some purposes; the issue is being studied. However, the four years of excavations will certainly provide adequate data to achieve the basic goals of the test and a basis

for designing further testing of the site. Our present view is that it would take two to four years of excavation beyond the four years of Phase I (completed in 1996) to test 45CL1 to have adequately sampled the entire site and its constituent features.

CATHLAPOTLE PROJECT HISTORY

Initial Site Search: 1991

The initial survey of Brush Ridge was conducted by a group of Portland State University volunteer students on December 16, 1991. Augers were placed into the dry channel closest to Lake River, in Long Meadow, and atop Site Ridge. A total of seven augers were completed, and in only one case was cultural material located. The location of the successful attempt was atop Site Ridge, at what would turn out to be the northern extent of the site. No surface cultural material was observed in the area, undoubtedly a result of heavy leaf cover. Due to the unsatisfactory outcome of this attempt to locate the site, it was determined that a period of ethnographic research would be beneficial prior to the resumption of testing at the site. This material was summarized in Parchman and Hickey (1991). This study included conversations with James Carty, whose family had sold the land to the Fish and Wildlife Service and who had intimate knowledge of the landscape from growing up there. It was Mr. Carty's information that led us to the Cathlapotle site during subsequent work.

Augering: 1992

In February, 1992, a small crew of student volunteers returned to the area. Based on Carty's information, the area of 45CL1 was closely examined. Since much of the annual understory vegetation had died off, and the surface topography was much more visible than in December, 1991, it quickly became apparent that there was a major residential site on what we came to call Site Ridge.

Field investigation of the site resumed in June of 1992. This stage of the project lasted ten days. With the exception of the first day, which was showery, the weather was excellent. A crew of four established a 400 meter baseline running roughly parallel to the direction of the Brush Ridge landform, (325 degrees true north). This baseline was placed atop Site Ridge, and was cut through understory so that the transit would have an unimpeded line of sight. Next, five parallel lines were placed, at twenty meter intervals, along the Brush Ridge landform. This provided the crew with a

grid on which to place and record auger units. The location of the augers was recorded in crew notebooks, and by the placement of metal tags upon nearby trees. In addition, a vial containing the address of the auger was placed within the auger shaft prior to backfilling. The augers were identified according to their placement on the grid. For instance, the north-south (site orientation) baseline was Line 1 (L1). The east-west baseline was North 0 (N0). The auger twenty meters north of this point was, therefore, "L1 N2." Although the grid was plotted in twenty meter increments across the Brush Ridge landform, after it became apparent that the site was limited to Site Ridge, not all of the auger points were excavated. This method of recording augers was abandoned and replaced following the 1993 field season, and all augers from 1992 were given new designations (92-26, for example).

Several augers were placed to examine topographic features deemed of interest. These included the suspected house depressions and the adjacent ridge or berm areas. These were recorded according to their placement on the "working map" of the site, and referenced to nearby grid points or auger tags.

Each auger 'bite' constituted a level, and materials were recorded and bagged by level. The levels averaged 11 cm. in depth, with a 20 cm. diameter, which produced auger levels of 3457 cubic centimeters. Depth from surface measurements were taken after each auger bite. When possible, general stratigraphy was noted on a field form. Sediment descriptions were also noted on field forms. All sediment was screened through 1/8" mesh. Lithic debitage, lithic artifacts, floral specimens, faunal material and artifacts, hardened clay, cobble material, and trade items were collected. Charcoal samples were taken for possible testing. Soil samples were taken under circumstances when they were considered to be of particular interest. Augers were taken down until the sediments seemed culturally sterile, or, in some instances, until roots prevented farther extension.

In the course of laying the augering grid, it became apparent that there was a surface component to the site which had been concealed by leaf litter the previ-

ous winter. Several large cobble items and one scoria figurine preform were recorded and collected. Fire-cracked rock and faunal material was also observed on the surface of Site Ridge but not collected.

Upon completion of the augering in 1992, we had established that the surface and subsurface cultural components of the site were limited to Site Ridge. Based upon the augering results, it appeared that the site extended for approximately two hundred meters along Site Ridge, and was as much as fifty meters wide. The depth and density of the cultural deposits varied considerably, but several of the augers were still producing cultural material when they were fully extended (approximately 2.5 meters), and could not be continued. The deepest areas of the site appeared to be the ridges or berms associated with the depressions. This was interpreted as being due to periodic house construction and cleaning.

Artifacts recovered included two cryptocrystalline (CCS) projectile points, one barbed metal projectile point, cobble tools, abraders, glass trade beads and a rolled copper bead, as well as worked bone.

Features were detected in several augers. A shell midden deposit was located in 92-13. The augers placed into Depression 1 detected probable hearth related deposits, a cobble cache, and a small peg mold comprised of charred wood.

Topographic Mapping: 1992

In late winter, when the visibility of the landform is best, personnel from USFWS completed a topographic map of the site area using a laser transit (Figure 7). A PSU project staff member familiar with the site assisted. A 40-meter interval horizontal grid system was set up. Steel rebar was driven into the ground to mark the mapping points. Each rebar has a 1 1/4" aluminum cap with the grid point designation. The grid-system baseline runs north-south in the open meadow (Long Meadow). Where trees interfered, the mapping points on the grid were displaced. The datum was placed at the southern end of the baseline and keyed into the USGS system. The landform topography was mapped by recording elevations at approximately 20 meter intervals, focusing on places where landform variations are most pronounced. Where the landform is complex,

such as in the vicinity of oval depressions, the number of recorded reference points was increased in order to pick up the details. The resulting contour interval is 0.20 meters.

The surface area mapped is limited to the immediate area of the site as defined by the distribution of cultural materials and features identified during auger testing. This area includes the entire width of Brush Ridge from the present Lake River shoreline into the western portion of Long Meadow. It extends just beyond the presently defined north and south boundaries of the site. As the project proceeds, pertinent information will be placed on the topographic map. For example, in addition to general topographic features, we have thus far recorded the location of mapping grid points, excavation units, auger probes, house pits, cultural features (e.g., ovens, wall trenches, hearths) and the Quarry Haul Road.

The topographic integrity of the site is excellent. To take full advantage of this potential information, it would be worthwhile to increase the accuracy of the map in order to more clearly delineate midden berms and topographic variation between sections of the larger house depressions.

Augering: 1993

Testing of the site resumed in July of 1993. This phase of the project lasted twenty days. A five person crew, occasionally augmented by student volunteers, participated in additional augering and the excavation of two test units. In contrast to the 1992 field season, which had been dry and temperate, the 1993 work was conducted during the one of the wettest Julys on record.

In 1994, the augers were placed to firmly establish horizontal site boundaries, and to examine the topographic features of Site Ridge in order to see how they related to the vertical dimensions of the site. Auger location was recorded by transit using the recently placed mapping points, and augers were numbered sequentially as they were performed (Auger 93-15). As the crews often worked some distance apart, one crew was designated "odd" and one "even." By the end of the augering portion of the project, more "even" than "odd" augers had been completed, hence the omitted numbers in our records. Vials with the auger iden-



FIGURE 7.
TOPOGRAPHIC MAP OF BRUSH RIDGE SHOWING LOCATION OF 1992 AND 1993 AUGERS.

tification number were again placed within the shaft prior to backfilling. All sediment was screened through 1/8" mesh, and materials were recorded and collected consistent with the fashion of the previous auger testing. The inclement weather made differentiating the composition and appearance of the sediment more difficult than it had been the previous summer, and the cultural material was also more difficult to retrieve from the screens. Despite these disparate circumstances, the material assemblages and descriptions of stratigraphy produced in 1992 and 1993 are essentially the same.

Artifacts recovered during auger tests included projectile points, chipped and ground stone tools, trade beads, shoto clay, and worked bone tools.

The results of the auger testing clearly show that Site Ridge was the locus of cultural activity at 45CL1. The

west slope of Site Ridge, in particular, appeared to have the greatest density (defined as number of examples) per cubic meter of cultural material. Auger 92-13 produced the highest density of FCR; Auger 93-01, the highest density of macrobotanical material; and Auger 92-12 the highest density of faunal material. The greatest artifact density indicated by an auger test was from Auger 92-28. It should be noted that this was one of the augers that revealed a feature, and that a number of these artifacts were unmodified pieces of raw material that were assumed to have been cached. High density of cultural material of one type can be seen to indicate that there is a likelihood of high densities of other cultural materials in the auger as well.

The auger tests also clearly demonstrate that the areas of cultural activity are bordered by areas of little or no activity on the east slope of Site Ridge, and of no activity beyond approximately the 5.4 meter contour line

on the west slope of Site Ridge. This was probably due to the riverine orientation of the town, and the location of the river channel.

Six large, rectangular depressions were noted atop Site Ridge. They vary somewhat in length and consistency of shape, with those from the middle of the site to the north appearing generally more distinct than those to the south. The vegetation on Site Ridge is more dense to the south, and this probably has played a role in obscuring the depressions in that area. The depressions vary between 20 and 70 meters in length, and between eight and twelve meters in width, with their long axis orientated parallel to the direction of Site Ridge. Their depths vary, but average between 1-2 meters. Often the "rims" of the depressions appear as berms around them.

Fifteen of the 53 augers were placed in order to investigate deposits within the depressions or beneath the associated berms.

Augers placed in the depressions in 1992 were 92-27, 92-28, 92-30, and 92-31 in Depression 1, and 92-32 in Depression 3. These augers exposed a layer of duff and relatively sterile recent sediments to approximately 25-30 cm below surface. Beneath that, all contained significant cultural deposits, with some of the in-house variation suggested by extensive excavations at other plankhouses (Ames, et al., 1992). Augers 92-27 and 92-30 were quite close to each other and both encountered deposits of burned earth, ash, charcoal, calcined bone, and fire-cracked rock which appeared to be hearth-related.

Auger 92-27 contained a small charcoal deposit, approximately 4 cm across and surrounded by notably compact sand, which extended downward from 28 cm past 45 cm. This was interpreted as being a small postmold, perhaps related to the construction of a hearth box. Auger 92-31 was placed near the center of the depression in an area which may have been an area of storage pits, as it contained the deepest cultural content of the augers placed in the depression. Auger 92-28 produced dark, organic soil similar in appearance to that called "reworked pit fill" at the Meier house (Ames, et al., 1992). It also struck a cache of cobbles between 75 and 100 cm below surface, which would be appropriate for an interior pit deposit. Some of the

cobbles showed slight cultural alteration (battering, hammerstone use), but most appeared unused.

Auger 92-32 was placed in Depression 3 at the south end of the site. It was placed in the center of the depression, and may have also been related to storage features, as no hearths were struck. Cultural materials continued down to 1.15 meters below surface. A rolled copper bead was found between 36 and 45 cm below surface.

In 1993, Auger 93-18 was placed within Depression 2, from which several artifacts had been surface collected in 1992. The results of this auger were similar to those of 1992 in which cultural material was intermingled with recent duff in its upper levels and increased noticeably around 25-30 cm below surface. It contained sediments interpreted as reworked pit fill, and was probably in an area of the house comparable to Auger 92-28, which appeared to be an interior storage pit.

Auger 93-14 was placed with the intention of investigating the northern extent of Depression 1 toward the north end of the site. The stratigraphy is unlike that of the other house depression augers in that it is relatively uniform, and shows little evidence of cultural features. The auger contains less cultural material than other Depression probes, and is sterile below 75 cm.

Two interpretations of these results have been hypothesized. The auger may have been placed in an area outside a house due to difficulty in reading the landform through the foliage. The other possibility is that the depression is noncultural in origin. Excavation of a 1x4 meter trench which took place subsequent to this auger, placed so as to investigate the subterranean evidence of a house wall, indicates that an auger placed in a "wall" area might appear relatively sterile.

Other augers placed in the border or "berm" areas of the depressions uncovered deep and extensive deposits. Auger 92-09, placed on the ridge surrounding the Depression 3, produced cultural deposits which extended below two meters from surface. Such variation in the nature of house-associated deposits would be natural at a town site that was occupied for a long time, as houses were built, maintained, rebuilt, and built anew.

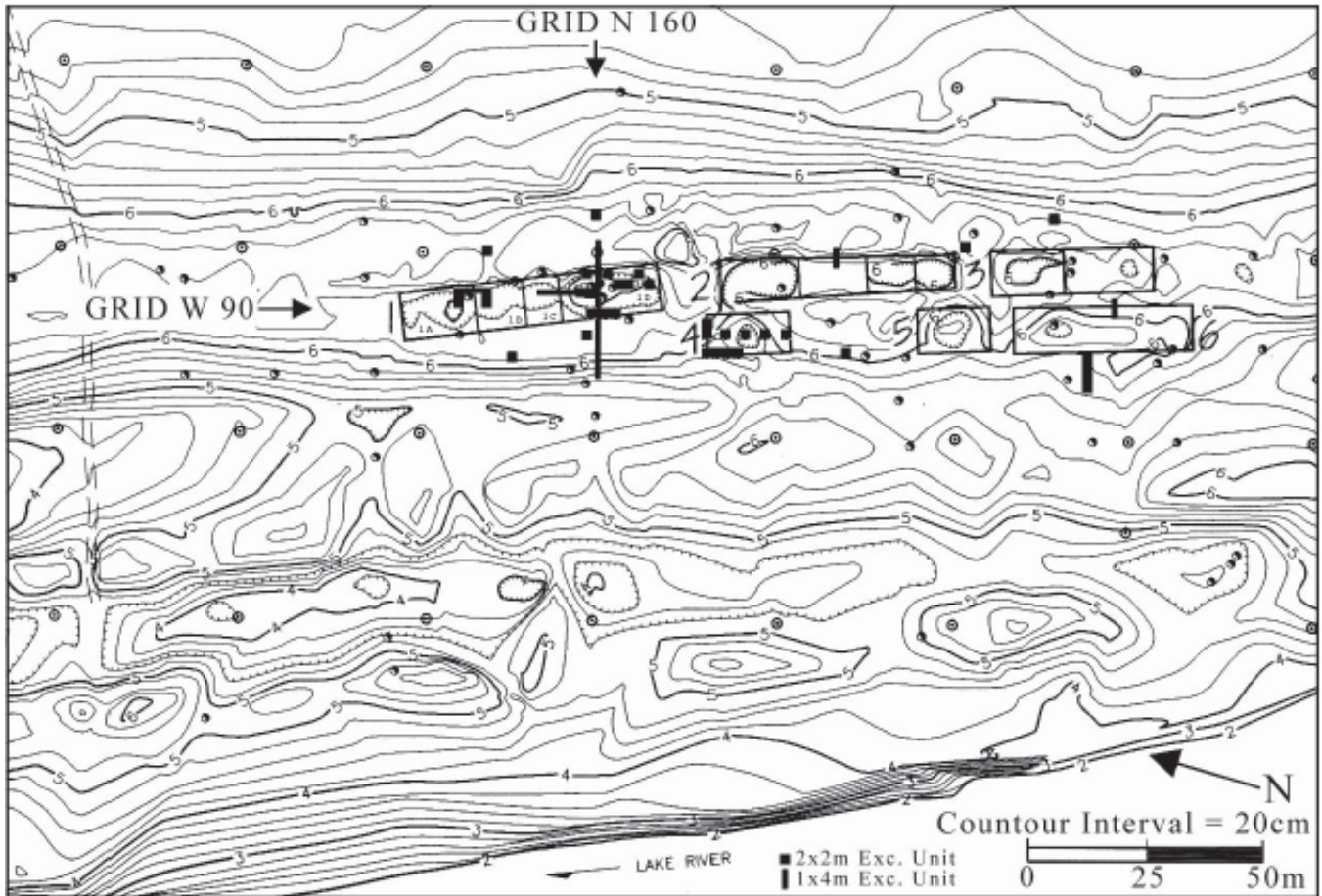


FIGURE 8.
TOPOGRAPHIC MAP SHOWING LOCATION OF 1993, 1994, 1995 AND 1996 EXCAVATION UNITS.

Excavations: 1993

1993 Goals and Methods

Following the completion of augering in 1993, two test units were excavated in areas deemed promising from our assessment of the auger data. One was a 1x4 meter unit placed to investigate the interior slope of a suspected house depression. This was an area of Depression 1, into which Augers 92-27, 92-28, 92-30, and 92-31 had been placed. It was designated “House” in the field, but was later identified as N159-160/W91-95. A 2x2 meter unit was placed in an area where cultural material appeared to extend beyond the reach of Auger 93-20. It was referred to as “midden” in the field paperwork, but was later designated as N107-109/W98-100.

Excavation was conducted using shovel, trowel, and brush in both test units. Sediment was screened through 1/4" mesh. The only exception to this was during the course of work in N107-109/W98-100, when three buckets of sediment were screened through 1/8" mesh to test whether trade beads were being missed. Five were found. Cultural material was sorted into obvious “types” (e.g., bone, chipped lithic tools, debitage) in the field and bagged for examination in the lab. All faunal material, botanical material unrelated to current site habitat, unworked stone that appeared to be raw material, debitage, and any unique or curious items were collected. Charcoal was collected for possible use in radiocarbon dating when deemed appropriate. Cultural features were noted, drawn, mapped, and in some instances, photographed prior to removal. Since this was a test, however, they were not assigned a separate feature number.

Artifacts recovered included projectile points, ground stone tools, chipped lithic tools, scrapers, bone tools (including a bone tool handle and several bone awls), trade beads, a Phoenix button, a Chinese coin, a bone digging stick handle, net weights, scrapers, a geometrically-incised pumice fragment and a bone pendant that appears to have a somewhat zoomorphic shape.

Excavations: 1994

The auger probes and two units excavated in 1993 provided a good basis for initiating the Phase I testing program in 1994. The 1992-1993 limited subsurface testing provided basic information on the distribution of cultural deposits (vertical and horizontal) and revealed the richness of these deposits. The testing had also shown the complexity of the site. The purpose of the 1994 testing project was to more adequately understand the site's contents by exposing stratigraphic profiles and cultural features in a wide variety of site deposits. The excavations were conducted over a seven week period during the summer. The weather was remarkable, and excavation conditions were optimal.

1994 Goals

The 1994 excavation project had three distinct goals. Goal 1 was to complete the unfinished 1993 test unit N107-109/W98-100. Goal 2 was to begin testing three major on-site topographic features— rear berm, oval depressions, and front debris fields. Goal 3 was to clarify general site stratigraphy by determining: (a) the depth of cultural deposit, (b) the stratigraphic record in relation to depth, and (c) the nature of the stratigraphic profile across the site's major topographic features.

Carrying out Goal 1 was straightforward. The 1993 excavation of unit N107-109/W98-100 revealed a deep sequence of discrete depositional events that were deemed invaluable for providing information on site chronology and formation processes. At the end of the 1993 field season, this unit contained substantial cultural deposits below the final excavated level. Excavation through the remaining cultural deposits was completed to get the full stratigraphic record for this portion of the site (front debris field).

Goal 2 was to test the three major topographic features on the site: (a) the rear berm, which is an el-

evated ridge that extends the full length of the site between the eastern most row of depressions and Long Meadow, (b) the rectangular depressions believed to be house pits, and (c) the midden debris fields covering much of the west portion of the site.

Auger probes and 1993 testing led us to hypothesize that these features are the result of three distinct formation processes at the town site. Testing in 1994 was therefore aimed at providing information about the formation of each feature and to determine if there is significant spatial variation in content and temporal chronology within each feature type.

Goal 3 was to enhance our understanding of site stratigraphy. The pertinent aspects of stratigraphy include the depth of cultural deposits, the stratigraphic record in relation to depth, and the nature of the stratigraphic profile through the site's major topographic features. The stratigraphic profile of concern crosses east to west from the rear berm, through a house depression, through the front debris field and into the beach deposits.

From the information gained by testing the topography of Site Ridge through augering and initial phase I excavations, we have the ability to begin inferring site formation processes and determining the history of those processes. This allows us to formulate a basic template by which to assess future exposures.

1994 Methods

Each 2 m² was excavated by a two-person crew of students. Additionally, three field crew members were assigned to assist students in excavation strategies and interpretations of complex deposits. A field lab director was also employed to manage preliminary curation and record keeping. The students and staff were overseen by a field director and assistant field director.

Each 2m² unit was subdivided into four 1x1 meter quadrants for increased spatial control. A combination of skim-shovelling and trowelling was used to excavate each quadrant. Where features and large faunal material were encountered, more careful methods of excavation were usually employed. Material collected from each quadrant was treated as a separate sample, but recorded on a single level form for each

level excavated in a 2m² unit. Arbitrary 10 cm, 15 cm or 20 cm levels were excavated, depending on their location at the site. All elevation measurements were taken using line levels on nylon string attached to the unit datum. Each elevation was transcribed into meters above sea level (ASL) according to the elevations provided by the laser transit record for unit datums.

A variety of sampling strategies were applied to each level excavated. Given the extraordinarily high density of cultural material at the site, the matrix in three of the four quadrants was screened through 1/4" mesh. The remaining quadrant was screened through 1/8" mesh to recover smaller materials such as retouched flakes, fish bone, and trade beads that are often lost through the larger mesh. To supplement these larger samples, a one-quart 1/16" screen sample and a one-quart bulk soil sample were taken from the same quadrant as the 1/8" screen sample. These samples were obtained to collect the small items necessary for microbotanical, microfaunal, and soil analysis. These smaller samples were also taken from some features, such as storage pits. The 1/16" screen samples were water screened adjacent to the site at Gee Creek.

Pertinent information was recorded in a variety of places, including a label on each artifact and specimen container, three field catalogues (artifact, specimen, and feature), level forms, feature forms, and personal notebooks.

Data from each excavated level was recorded on a level form. This data included the number of sample bags and the kinds of material collected (e.g., bulk soil, faunal, botanical, lithic), the count and weight of fire-cracked rock, a soil matrix description (color and character), a list of field catalogued artifacts and specimens, an interpretive summary, and a floor map showing soil boundaries, features and artifacts.

Three catalogs were maintained at the field lab: an artifact catalog, a specimen catalog, and a feature catalog. Formed artifacts (i.e. bone tools and stone tools, preforms, and cores) were recorded in the artifact catalog. Other items of interest that were found *in situ* such as charcoal, wood, shell with hinges, nuts, and bulbs were recorded as specimens. Bulk soil samples and 1/6" screen samples were also recorded as specimens. When possible, the three-point provenience was recorded for each item cataloged. Other information in-

cluded a field name, the date found, unit address, level, elevation, and the recorder's name. This basic information was recorded in their respective catalog, on the artifact or sample container, and on the level form.

Features are obviously treated somewhat differently than collected items. Basic feature data was recorded in the field catalog. More detailed description of the feature was recorded on a feature form. In addition to the basic field information, the form data includes, when pertinent, a feature sketch at various levels of excavation, soil matrix descriptions, shape and orientation, and contents. Samples collected from the feature were also recorded on the feature form, as well as the level form.

Cultural material collected from the screens and found *in situ* were placed in labeled field containers. Formed artifacts and specimens were individually placed in field containers and the three-point provenience recorded when possible. These were sent directly to the field lab for processing. Other materials collected were separated by material type and by quadrant and feature. Basic material categories included lithic, faunal, botanical, and miscellaneous. These materials were placed in a level box and given to the field lab for processing at the termination of each level excavated. Fire-cracked rock was weighed and counted for each quadrant and/or feature, but was not collected.

Personal notebooks were kept by each individual. These contained daily descriptions of anything the students believed to be relevant to the archaeological project. Such diverse information as excavation methodology, their interpretation of the unit, the weather, their mood and how they were getting along with their partner or other crew members were included.

Three cameras were used to keep a photographic record of site excavation. One Minolta 35 mm contained black and white print film, a second Minolta 35 mm contained color slide film, and the third was a Polaroid. The photographic record includes overview pictures of the site and unit blocks, in-progress shots of feature excavation, and formal pictures of features, unit floors and profiles. The Polaroid was primarily used to take snapshots of features, which were attached to the feature form. A photo log was maintained for each roll of black and white and color slide film.

A field lab was established to process collected materials and paper work. Artifacts, specimens, and level boxes were field checked to make certain items were properly labeled and in appropriate containers. Paper work such as field forms and feature forms were also checked to be sure all pertinent data was recorded and consistent with other recorded data. Additionally, the field lab was responsible for processing the 1/16" samples.

A main laboratory was also in operation at PSU during the field work. Catalogued artifacts and specimens were sent to the main lab daily while level boxes were sent in once the level was completed. After preliminary processing in the field, the main lab did final curation. Here perishable material was properly curated and general artifact data was entered into a spreadsheet (EXCEL 5.0). A running database therefore provided basic information on artifact frequency and distribution that could be used for methodological decision making in the field while excavation progressed.

A total of 19 units were opened (including the reopening of the 1993 units) in 1994. Each unit covered a 4 m² area. The three goals discussed above and the kinds of data desired at particular locations influenced the shape, orientation, and spatial placement of units. Where the recognition of features was deemed most important, we used 2x2 meter units to maximize horizontal exposure. When stratigraphic profiles were the primary goal, we used 1x4 meter units. To increase the stratigraphic exposure in one oval depression, we linked a series of 1x4 m units to create two long, perpendicular profiles.

The units were laid out using the same laser transit system employed in making the 1993 topographic site map. One corner of each unit (usually the NW) was placed on the landform and the address related to the grid system of the topographic map. The remaining three corners were triangulated from the unit corner laid out by the transit using tape measures and, when necessary, a plumb bob. Unit datums were also laid out for each unit using the laser transit. A primary datum point for a mechanical field transit was created as a single reference point for easily correlating the elevations of the units comprising the N159-160/W79-107 trench and the N161-172/W88-89 trench.

1994 Excavation Unit Placement

The placement of units was geared toward excavating a broad sampling the site and examining a substantial stratigraphic exposure linking major features together. In addition to reopening the 1993 test units, eight units were widely spaced over the site to collect a spatially-broad sample from the three major topographic features. Previous work on the rear berm was limited to auger probes. The 1994 testing included four 2x2 m excavation units (N183-185/W78-80; N159-161/W70-72; N75-77/W76-78; N56-58/W70-72) intermittently dispersed along the full length of the east berm. The testing strategy was aimed at finding cultural features as well as revealing the stratigraphic record at various locations along the entire extent of the berm. Unit N75-77/W77-81, although on the rear berm, was unique in that it was placed on a mound associated with a berm between two house depressions (Figure 8).

The 1993 testing of the front debris fields was expanded to include two additional units (N136-138/W94-96 and N179-181/W101-103). The units were widely spaced northward from the 1993 test to cover the northern extent of this feature. Two-meter square units were used in hopes of finding yard activity features within these midden fields.

Two strategies were employed to increase our sample of house pit deposits. First, two house pits were tested using the same basic technique as in the 1993 oval depression test. Each depression was tested by placing one 1x4 meter unit, oriented E-W, on the eastern side slope (N106-107/W77-81 and N44-45/W89-93). The tests were successful in locating the house wall trench features and linking these to storage pit corridors. The second strategy was employed in Depression 1. Here, three 1x4 meter units were linked together to create a 1x12 m, N-S oriented trench that bisected the approximate center of the northern side slope of the depression. This was done, in part, to find the northern wall trench and the location of various interior house features.

Finally, to maximize the stratigraphic exposure and study the relationship between the three major types of site deposits, eight 1x4 meter units were linked together with the 1993 test unit, creating a 32 m trench that crosscuts E-W through the three major topographic

features. The trench, N159-160/W79-107, crosses westward from the rear berm, bisects the northern half of Depression 1, and cuts through the frontal debris fields just short of what is believed to be a beach front. The primary goal of this trench was to create a continuous stratigraphic profile linking these major features together. The information gained by such a large exposure may now be used as a basis for interpreting smaller, isolated stratigraphic profiles at the site. Additionally, the trench stratigraphically links features in each depositional context. For example, the continuous exposure should allow the house floor and other household features to be more easily linked to dumping episodes and yard activity features in the debris field and rear berm.

Unfortunately, discontinuities and facies changes may make this more difficult than originally expected. Finally, the combination of the two trenches in the same house pit provides a substantial horizontal exposure for studying the house structure and interior deposits.

Excavations: 1995

1995 Goals

The 1995 excavations focused on three house depressions: 1, 4, and 6 (see Figure 8). The excavations continued to be guided by the goals of the 1994 season, but with refinements based upon what we had learned and on changes in the context of the project. In a Memorandum of Agreement between the USFWS, the Washington State Historic Preservation Office (WA SHPO), and the Advisory Council for Historic Preservation (ACHP), it was agreed that 1997 would be the final season for excavation in Phase 1 work at Cathlapotle. It had also become clear that the site was so rich that excavations would be difficult to continue over a long period of time without significant increases in funding levels from the various sources supporting the project. It was thought that, due to funding problems, 1996 might actually be the last season of work. Therefore, the sampling approach was modified. Twenty units were opened, for an exposure area of 88 m².

1995 Methods

Field and recording methods used in 1994 continued, with one significant change. Bulk samples were collected from the NW quadrant of every unit, as well as from features (on a judgment basis). These 10-liter minimum bulk samples were water screened through four nested screens of 4 mm², 2 mm², 1 mm², and .5 mm². The resulting samples were then dried. These samples replaced the 1/8-inch mesh screen samples of 1994. It was felt that constant volume sampling and sorting in laboratory conditions would provide greater control over microartifacts than would 1/8-inch mesh screening and field sorting. This procedure was very successful.

1995: House Depression 6

Auger tests in the east berm of Depression 6 had recovered charcoal that had produced three of the four oldest dates in our sample (910 ± 210, 740 ± 140, and 720 ± 150 BP) (see *Radiocarbon Dating* in Results, and Table 5). The samples were recovered at depths approaching 2 meters. It was necessary to expose these sediments and to determine the context from which the samples were taken. We also wanted an exposure at the south end of the site comparable to the long trench excavated in 1994 through Depression 1. To these ends a 2x6 meter trench (N52-54/W99-105) was excavated from the western edge of Depression 6 to the west. The placement of the trench was intended to locate the western wall of the structure, and to expose a long profile and the deep sediments as close to where the dates had been recovered as possible.

1995: House Depression 4

The house depressions at Cathlapotle occur in two rows (see *Other Structural Features* in Results). The three depressions in the westernmost row (Depressions 4, 5, and 6) are, as a group, smaller than the three depressions to the east. Our previous work, and that described below, had focused on Depression 1, the largest depression of the six. Since we were sampling the largest structure, it was necessary then to sample at least one small structure. In contrast to Depression 1 which is approximately 73 meters x 10 meters, Depression 4 is only 20 meters x 10 meters. (The Meier structure is 32 meters x 15 meters). We had located

the north wall of the structure in 1994. Five units were laid out across the center of the house depression to sample what we expected to be the area containing the structure's central hearths and roof supports (see Ames et al. 1992). The plan was to complete a checkerboard by excavating a second series of units in 1996 to sample the house's sleeping areas. The units in Depression 4 were aligned along the W96 grid line (W96-98/E132-134, W96-98/E128-130, W96-98/E124-126 and W96-98/E120-122).

1995: House Depression 1

Depression 1, or House 1, is subdivided into several subdepressions based on internal topography (see section *Large House Depressions* in Results). The deepest and largest subdepression (D) is at the southern end of the depression. It has received the most attention of the depressions and the 1995 excavations continued that focus. The house test of 1993 had been located on its western rim, and the long test trenches of 1994 were excavated through it. In 1995, this effort was expanded by placing a checkerboard arrangement of four 2x2 meter units (N147-149/W86-88, N149-151/W84-86, N155-157/W84-86), one 2x4 meter unit (N151-153/W 86-88) to the south of the 1994 trench, one 2x2 meter unit (N160-162/W84-86), and a large 3x4 meter unit (N160-164/W87-90) to the north. The units to the south of the trench exposed a portion of the central area of the house and portions of the area along the structure's east wall, under where the sleeping benches would have been located. The single 2x2 meter unit north of the 1994 trench was also placed to expose sediments in this area. The large block to the north of the trench exposed a large portion of the center of the structure.

Work at the Meier Site (Ames et al. 1992) and our earlier work at Cathlapotle had made it clear that major storage features were located below the floors and sleeping platforms of these structures. The placement of units was arranged in part to sample those features. Additionally, work at Meier had shown that both significant architectural features and hearths were located in the center of these structures. The central hearths at the Meier Site had proven important in developing a construction history of that structure, as well as providing evidence for the intense food processing and other activities. The sampling of such areas was, there-

fore, considered an important part of the overall excavation strategy.

1995: Other Areas

Two excavation units begun in 1994 were completed in 1995. Unit N159-160/W103-107 was excavated down to culturally-sterile deposits. Completion of this unit finished excavation of the N159 trench. Unit N75-W77/W76-78, located on the eastern-most portion of the midden lobe (Lobe B) between Depressions 2 and 3, was also completed by excavating down to sterile. A third 1994 unit (N136-138/W94-96) was extended two meters south to unit N136-138/W 92-94. The 1994 unit had exposed a portion of the north wall of House 4 and we planned to extend that exposure. We also intended to expand our sample of the midden deposits capping the wall.

Excavation units in the two midden lobes were placed to acquire topographically-parallel samples. Unit N70-72/W93-95, located 20 meters west of N75/W76 in midden Lobe B, was opened in 1995. It exposed deposits in the western portion of Lobe B, between Depressions 5 and 6. Unit N136-138/W86-88 was opened at the eastern edge of Lobe A between Depression 1 and 2. Unit N136/W86 in Lobe A approximately parallels the placement of N 75/W76 in Lobe B, and N70/W93, in Lobe B, paralleled the 2x4 m² unit N136-138/W92-96 in Lobe A.

Excavations: 1996

1996 Goals

The objectives of the 1996 excavation were: 1) to increase our samples of a large house (House 1) and a smaller structure (House 4); 2) to expose interior structural features of these houses as well as a corner of House 4, and 3) to sample the debris field west of House 1. These goals were pursued in order to "round out" the Cathlapotle excavation project, considering that excavations in 1997 might not be possible for reasons mentioned above.

1996 Methods

Field methods were generally the same as those used in previous years at Cathlapotle. Units were excavated

primarily by trowel and skim-shoveling technique. Five-liter bulk samples taken from a predetermined 1x1m quad of each excavation unit, and botanical waterscreening continued at Gee Creek. In addition to the bulk samples collected for the botanical analysis, extensive bulk samples were collected opportunistically for forthcoming microdebitage, botanical, mechanical and chemical analyses.

1996: House Depression 1

As previously noted, Depression 1 has been divided into four subdepressions or “compartments:” A, B, C, and D, consecutively from north to south. Two 2x2 meter excavation units were placed in compartment B to identify structural features and hearth and pit deposits (N180-182/W88-90 and N180-182/W90-92). Both units yielded excellent samples of these deposits. One 1x4meter unit crossed from compartment B into compartment C. This unit (N176-180/W88-89), aligned with the roughly north-south axis of the plankhouse, was intended to sample cellar deposits as well as any features relating to the low berm between compartments B and C, possibly an interior wall or partition. Both wall and pit deposits were encountered in this long unit, evidence that pits at Cathlapotle are often found directly adjacent to walls. Compartment C was sampled by two 2x2 meter units (N174-176/W90-92 and N174-176/W88-90) placed to sample hearth and pit deposits. Feature 478, a large, sand-lined hearth in excellent preservation was found and excavated in the easterly of these two units (Figure). This is one of the few Cathlapotle hearths with a hearth box as commonly seen at the Meier site. The western unit produced a rich and diverse assemblage of artifacts, many in strikingly undisturbed sandy deposits.

Three excavation units were placed in depression 1D , bringing the total sample of House 1 excavations to over twenty units. Two 2x2 meter units were placed just South of the 1994 trench to expose the western wall as well as pit deposits (N157-159/W90-92 and N155-157/W90-92). Excavators here encountered typically excellent preservation which yielded a wide variety of artifacts as well as many informative structural features. The western wall was exposed as a 4 meter long wall trench feature traversing both excavation units, roughly aligned NNW. In the southeastern area of unit N155-157/W90-92 a large charcoal

feature was discovered, possibly representing a burn episode of this structure. In 1996, a unit just north of the 1994 trench on the western side of the house (N160-162/W90-92) yielded pit deposits directly adjacent to what must have been the western wall. Among the artifacts recovered from this unit is a wooden stake which was situated vertically in the matrix.

The establishment of stratigraphic relations between strata exposed in the 1994 trench and strata documented in the 1996 excavation units should be very instructive as to site formation and questions of depositional continuity. Analysis of the features recorded should reveal important details of construction history.

1996: House Depression 4

This depression, sampled previously in 1994 and 1995, was sampled by four excavation units aligned north-south as a large, 2x8 meter trench (N128-130/W99-101, N130-132/W99-101, N132-134/W99-101 and N134-136/W99-101). These units were placed to identify both cellar and wall deposits. Extensive wall features were encountered, including a series of intersecting plank- and postmolds in the most northerly unit. This appears to be a structural corner, with the corner turning east as expected and correlating with the wall trench identified in a separate excavation unit in 1994. At one point, a north-south trending wall trench roughly 8 meters in length traversed most of these excavation units simultaneously. The presence of multiple, overlapping structural features in this trench clearly indicated that the wall here had been replaced several times, or that several different walls were placed in the same area over some span of time. In addition to these distinct features, the usual wide variety of artifacts were recovered.

1996: Debris Field West of House 1

One unit was excavated by staff members only. This unit (N161-163/W104-106) was intended to sample the debris field west of Depression 1 and north of the 1994 trench at grid 159 North. This unit exposed a variety of burn features (though notably not hearths), ash, charcoal and generally-turbated deposits rich in artifacts and bones, and rather lacking in structural features aside from some indeterminate postmolds. Thus, it appears that the debris field characteristics identi-

fied in the 1994 trench extend at least to grid 163 North. This, as well as the deposits found in the western 1994 trench units, is suggestive of the great extent of the debris field deposit type between the village proper and Lake River. It will be of great interest to compare the activities suggested by the debris field contents with those suggested by 'within-dwelling' deposits.

1997 Laboratory Exercises

Due to the likelihood of flooding at 45CL1 in the summer of 1997, and due to a lack of funding, a lab school

was conducted in place of a field school. Students were instructed in the generation and handling of archaeological laboratory data, specifically Meier Site and Cathlapotle Site data. Each student then chose an excavation unit from Cathlapotle or Meier (representing either bench, cellar, or hearth/hearth-periphery deposits) and analyzed its contents with a variety of methods, such as mass analysis of lithic debitage, or the examination of artifacts for evidence of recycling. While the results are too limited to mention here, they clearly indicated that such studies are both feasible and worthwhile, if laborious.

RESULTS

Site Description

Cathlapotle is located on the Carty Unit of Ridgefield National Wildlife Refuge, in Clark County, Washington (Section 11, Township 4N, Range 1W). It sits on an abandoned levee on the east side of Lake River approximately 1.3 km upstream from the river's confluence with the Columbia River. This landform, known as Brush Ridge, runs parallel to Lake River on one side and Long Meadow on the other. Brush Ridge is actually comprised of three parallel ridges with swales between. The site is located on the easternmost ridge, adjacent to Long Meadow. We call this Site Ridge. The site covers an area of 17,500 sq. meters (ca. 4 acres, 250 meters long and 70 meters wide).

Situated on the Columbia River floodplain in the Wapato Valley bottomlands, the site surface ranges from as low as 4.4 meters ASL to upwards of 7.4 meters ASL. The U.S. Army Corps of Engineers estimates that prior to modern dam construction, the average annual flood crest would have been 16 feet (4.9 meters) ASL. If this estimate is accurate, then much of the Wapato Valley, but not Cathlapotle, would have been subject to annual flooding (Hamilton 1993). The Wapato Valley floodplain averages 3.3 meters ASL. Consequently, the surrounding area of the site was and is frequently flooded (Abramowitz 1980). The flooding of February 1996 provided us with a "living geology" experiment in flooding at Cathlapotle. This "100-year flood" covered the site with seven to nine feet of water. The surface of the site was little affected beyond the deposition of less than 2-3 centimeters of alluvium, and so minor erosion. The flood caused a large number of trees to fall however. Whether this flood is at all analogous to pre-dam floods is an open question.

The Lewis River, Gee Creek, and Lake River enter the Columbia River in approximately the same place. The confluence of the four waterways creates a dynamic fluvial context in the site vicinity. For example, based on their comparison of maps from the 1853 survey to current USGS maps, Parchman and Hickey have determined that Fowler Point, downstream from the site, has been eroding. They also note that the Lewis

River channel appears to be moving north relative to the Cathlapotle Site (Parchman and Hickey 1993). Additionally, Lake River appears to be migrating westward, away from the site.

The Columbia River floodplain is characterized by a mosaic of microenvironments created by a variety of alluvial topographic features. The upland zone, as defined here, is the Wapato Valley slope, which intersects the floodplain 1.8 km to the east. The gentle valley slope has a westward exposure. It is characterized by gently rolling hills and plains that are covered with open farmland and intermixed with stands of conifers and deciduous trees.

On the Columbia River floodplain, between the valley slope and Site Ridge, lies a series of elevated landforms consisting of generally north-south levees, and an area of relatively high basalt outcrops. The elevated landforms are dense with oak and brush and are well drained. The basalt outcrops are concentrated in an area to the east and northeast of the site some as near as 100 meters. These basalt outcrops are the highest landforms in the area. The highest of these is 27 m ASL in what is called the Middle Lands just north of Gee Creek. Most of the outcrops near the site and south of Gee Creek are no higher than 9 m ASL.

Interspersed between the elevated landforms (levees and outcrops) are low lying meadows, wetlands and lakes. One large set of major wetlands are located between the basalt outcrops. Other wetlands are found to the south and southeast in broader, grassy lowlands between floodplain levees. Carty Lake is one of the largest, located 2.3 km south of the site. Farther south are Campbell Lake and Vancouver Lake.

Bachelor Island, just across Lake River, is also comprised of alluvial features but has no basalt outcrops. The island is characterized by a series of levees interspersed with long lakes, wetlands, and low meadows.

The Brush Ridge landform has been disturbed by Euro-American homesteading, logging, and the quarrying of basalt from a nearby deposit (Hamilton 1993). We would not be surprised to find the logging of the Brush

Ridge landform represented in the archaeological record. The site has also been subject to artifact collection by James Carty and possibly others. The 1993 excavation crew found a 1/4" mesh screen near Auger 93-16.

Given the limited nature of development on the Carty unit, it may be that the immediate vicinity of the site has much the same appearance today as it did in 1806. Currently, the Brush Ridge landform is covered by a mature stand of black cottonwood (*Populus trichocarpa*), and a dense understory of willow (*Salix* spp.), bracken fern (*Pteridium aquilinum*), blackberry (*Rubus* spp.), elderberry (*Sambucus* sp.), and stinging nettle (*Urtica dioica*). Rodents are present and disrupt the archaeological context, and mosquitos are regarded as disruptive by field workers. Given that most travelers could see Cathlapotle as they passed by on the Columbia, it is unlikely the site itself was heavily forested at the time of occupation.

The valley and the surrounding foothills possessed high habitat diversity at the time of contact. The riparian forest which was noted in the vicinity of the village by Clark (Moulton, 1990) would probably have consisted of black cottonwood (*Populus trichocarpa*), willow (*Salix* sp.), Oregon ash (*Fraxinus latifolia*), and a tangled understory (Hamilton 1990). In addition, Long Meadow, adjacent to the site, is thought to be a naturally occurring clearing and was probably a low grassland habitat. However, as Hamilton (1990) notes, Euro-American alteration of such areas throughout the Wapato Valley makes their precontact composition conjectural.

The reported campsite of the Lewis and Clark expedition (probably around 45CL4), upstream from the village site in a grassy low-lying area, was located near a pond (probably Carty Lake) from which the natives harvested wapato (Moulton 1990). In addition to these areas, the occupants of the village would have had access to nearby prairies, oak arbors, coniferous forests, and the resources of streams such as Gee Creek, and the Lewis, Lake, and Columbia Rivers (Abramowitz 1980).

Native inhabitants of the village utilized a variety of land, water, and airborne fauna. Abramowitz identified mammals including Rodentia and Lagomorpha,

as well as blacktail deer (*Odocoileus hemionus columbianus*), white tail deer (*Odocoileus virginianus leucurus*), and elk (*Cervus canadensis*). Predators and scavengers included black bear (*Euarctos americanus*), red fox (*Vulpus fulva*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), wolf (*Canis lupus*), and mountain lion (*Felis concolor*). Anadromous fish were plentiful in the region, particularly chinook salmon (*Oncorhynchus tshawytscha*). White sturgeon (*Acipenser transmontanus*), longfin smelt (*Spirinchus thaleichthys*), and eulachon (*Thaleichthys pacificus*) were also locally available (Abramowitz 1980). Both Lewis and Clark mention the presence of sea otter (*Enhydra lutris*) pelts at the village (Moulton, 1990).

Topography and Horizontal Zonation

As described elsewhere, the site has a number of topographic features that provide a basis for defining horizontal zones that can be independently sampled. The horizontal zones we have defined for the site include: 1) the rear berm, 2) house depressions, 3) front debris fields, 4) midden accumulations between house depressions, and 5) beach front. The 1994 testing showed that the surface topography generally reflects subsurface deposits that are the result of particular site formation processes. These zones are discussed in turn.

Rear Berm

The rear berm is a linear feature that extends in a north-south direction between Long Meadow and the eastern most row of house depressions. The berm is probably a natural flood levy accentuated by house depressions excavated on its west side. It is the highest topographic feature on the site at an average height of 6.6 MASL. It extends beyond the northern and southern boundaries of the site, but is most pronounced in the site area. The top is relatively narrow. Most of the berm has a gentle east slope to the meadow. House depressions cut into its western side.

Large House Depressions

The most visible features at 45CL1 are the surface depressions representing the locations of several large houses. The depressions are aligned with their long axis parallel with the present course of Lake River.

They form two rows, each with three major depressions. The relationship between the positions of the house depressions and the layout of the town at any one time remains to be demonstrated. In other words, we do not yet know whether the depressions represent houses occupied contemporaneously.

We do have reason to believe that the three western depressions were abandoned before the eastern row. The depressions are numbered sequentially from north to south, and east to west; thus, Depression 1 is the most northerly and easterly, Depression 6 the more southerly and westerly (Figure 9).

The depressions are the result of the semi-subterranean construction of the original houses, the presence of cellars, and the accumulation of debris and midden around the sides of the standing buildings. The midden accumulations delineate the locations of walls and corners. In some places, the midden actually obscures walls and corners, providing useful information on temporal relationships.

The term “berm” as it is used here refers to the ridges at front and back of the depressions created by the dumping of excavated house fill and garbage, and by the accumulation of flood sediments. These berms are usually most marked on the eastern side of the structures.

Depression 1

Depression 1 is the largest of the six, being approximately 63 meters long and 10 meters wide. In places, it is more than a meter deep to the surface of the present fill. This depression is subdivided into subdepressions by low (ca. 10-20 cm) ridges at right angles to its long axis. These subdepressions are lettered A-D from north to south. There are at least three such ridges. Their positions are clear on the map (Figure 9).

We surmise, based on ethnohistoric evidence, that these ridges represent the position of walls separating compartments within the larger dwelling. Depression 1 also has subdepressions deeper (A and D) than the rest of the feature at both ends. This “barbell” shape is duplicated in Depression 2. The south end of this structure was the focus of the 1994 and 1995 excavations, while in 1996 we explored compartments B and C in

addition to D. Depression 1 has also been extensively augered.

Depression 1 is separated from Depression 2 by a high lateral mound of midden (midden Lobe A) and other debris. To the west of Depression 1 is a broad flat debris field sloping into the swale.

Subdepression D generally conforms to the model of the interior layout of a Chinookan plankhouse developed in the course of excavations at 35CO5 (Ames et al. 1992). At the center of the house was a platform supporting at least three central hearths aligned north-south, flanked by corridor pits; we often refer to these rows of corridor pits as “cellars.” The central platform also carried evidence of the central posts or timbers supporting the house’s ridgepole. The corridor pits appear to have been located entirely beneath the sleeping platforms, in contrast to the Meier structure where they were below the floor in front of these platforms (that is, between the bench and the central platform). It does not appear that this house had storage extending below the floor, which was probably earthen. There is evidence only for one hearth box (associated with hearth Feature 478, excavated in subdepression C in 1996), while at Meier most if not all hearths had containing boxes. (Ames et al. 1992). Nevertheless, the Depression 1 hearths are extensive and well defined. Generally, hearths in Depression 1 appear to have been built on an earthen the floor without containment boxes.

The trenching, augering, and excavations indicate that the fill within the storage pits is between 1 and 2 meters deep. In the center of the house it is perhaps 50 cm. deep.

Since it is clear that we are dealing with a structure in Depression 1, that structure is referred to here as House 1. This house is dated by 12 radiocarbon dates (specimen numbers 12,000 through 19,000; see the discussion *Radiocarbon Dating* in this section and Table 5) collected from the deposits within and adjacent to the depression in 1994. The oldest date associated with the depression is TX 8286, which is calibrated to 427-366 BC. We believe it actually dates formation of the low ridge on which the western wall of the house was built. TX 8296 (AD 1213-1307) dates what appears to be a red cedar post associated with a complex struc-

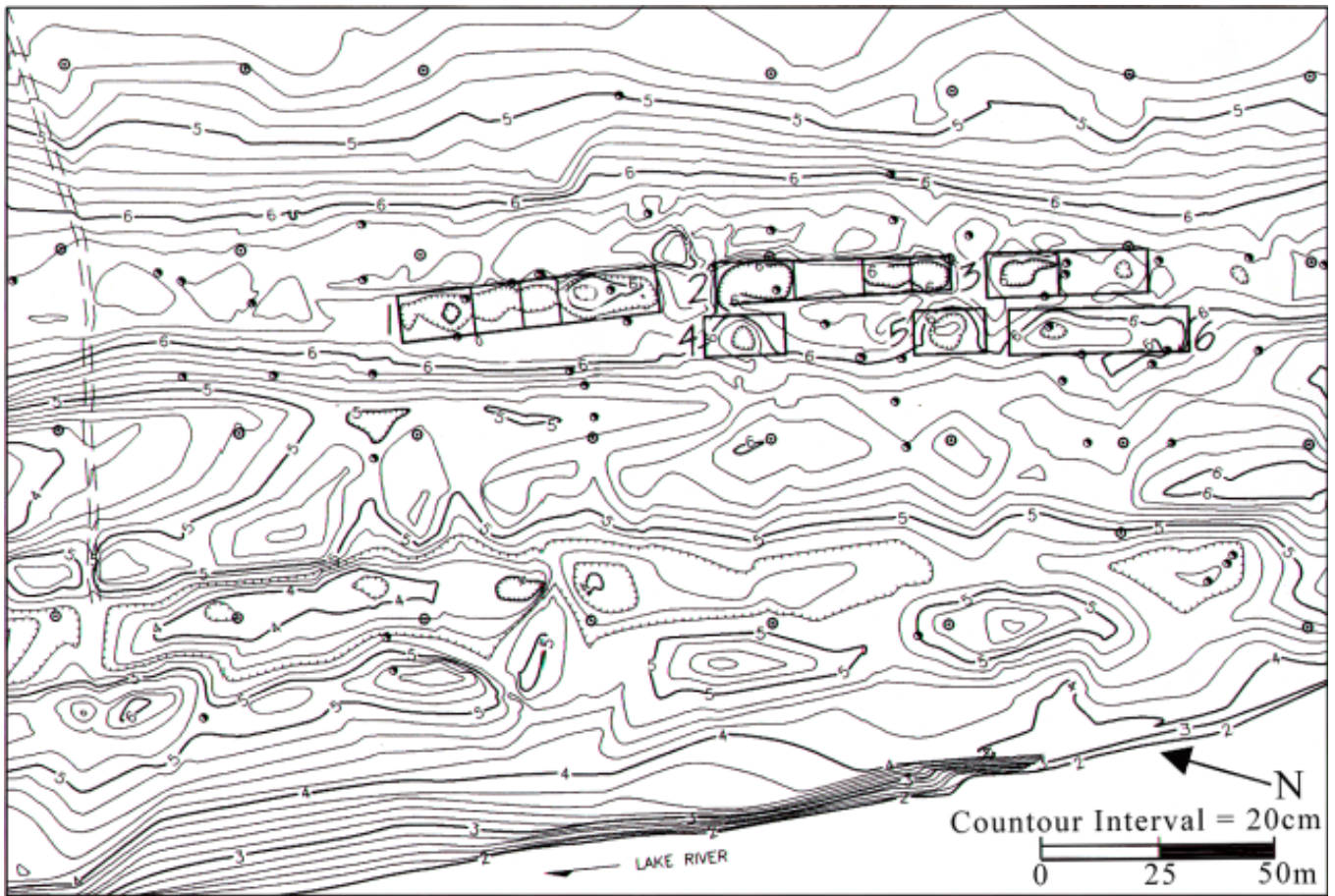


FIGURE 9.
TOPOGRAPHIC MAP FEATURING DEPRESSIONS 1-6

tural feature. It may be old wood, so we regard it with caution. TX 8283 (AD 1433-1489) is perhaps a better lower limiting date on the house in subdepression D. It is based on charcoal from Feature 88, an extensive charcoal stain beneath the major structural features on the central platform.

Feature 88 was separated from the overlying features by a sterile stratum of silty fine sand. However, Feature 88 also has substantial postmolds in this area, suggesting it might represent an earlier house. The rest of the samples were collected primarily from the debris field or yard deposits west of the depression. These span the sixteenth and seventeenth centuries AD. Glass trade beads in the upper deposits firmly indicate that occupation extended well into the contact period.

Depression 2

This structure is some 50 meters long and at least 12 meters wide. It is topographically the most visible of the depressions, characterized by the steepest walls. It too is barbell shaped, with a marked subdepression at either end. The southern subdepression may actually be two features rather than one (Figure 9).

Depression 2 is separated from Depression 4, which is immediately in front of it on its northwest corner, by a low berm. The berm is so low that it was first thought to be an entrance. It is possible that Depression 2 and 4 were in some fashion connected, though there is no evidence for that beyond the topography. Depression 2 is separated from Depression 5, which is immediately in front of its southwest corner, by a steep berm.

Depression 2 and Depression 3, to the south, are separated by a high mound of debris and midden that extends almost to the swale. Depression 2 was tested by a single 1x4 meter unit (N106-107/W77-81) placed to determine the location of its eastern wall.

This depression has seen only limited testing and augering. There are no radiocarbon dates. The deposits from the single test unit, which approached two meters in depth, yielded few trade goods. A wall trench was exposed in this unit as expected.

In 1995, excavation unit N75-77/W76-78 exposed an end wall of a structure two meters below current

ground surface (Figure 10). The position of the unit suggests that this deeply buried structure is below the eastern berm of Depression 2, and is probably ancestral to it. No radiocarbon dates have been run at this writing. The wall is buried beneath the eastern (and highest) portion of midden Lobe B, and thus predates the midden lobe as well as Houses 2 and 3.

Depression 3

Depression 3 is separated from Depression 6, immediately to its west, by a high, narrow berm. Depression 3 has been augered but not otherwise tested. The augers indicate that the depression may be quite deep. We suspect the depression may be one of the earliest at the site, and that it was filled with midden deposits associated with Depression 2. This depression is heavily vegetated.

Depression 4

Depression 4 is a generally circular depression. It appears to have been partially buried by the large debris field in front of Depression 2. Its northern wall was exposed in unit N136-138/W94-96 beneath a meter of cultural deposit. Its southern extent is unknown, and is probably buried beneath a debris field. Its western boundary is a very low berm at the edge of the swale. Depression 4 has been tested through placement of ten units. We did not locate its southern wall in 1995. The 1995 units were placed to test down through the center of the house and to locate central hearths and interior architectural features. The house appears to contain several superimposed earthen floors. Dramatic and numerous structural features were encountered in 1996, indicating multiple occupations or, at least, multiple refurbishment of this structure. East-west trending interior walls were also indicated by post and plank features in 1996. A limited number of storage pits were exposed, but they do not appear to be as extensive as in the House 1 "cellars." Note that the structure at 35MU57 (Ellis and Fagan 1994) has no subfloor storage features.

Three radiocarbon dates (TX 8271, 8272 and 8273) recovered from unit N136-138/W94-96 provide upper limiting dates for this house spanning the period from AD 1458 to 1690 (Table 5). These dates occur in deposits that are either high in the house fill or

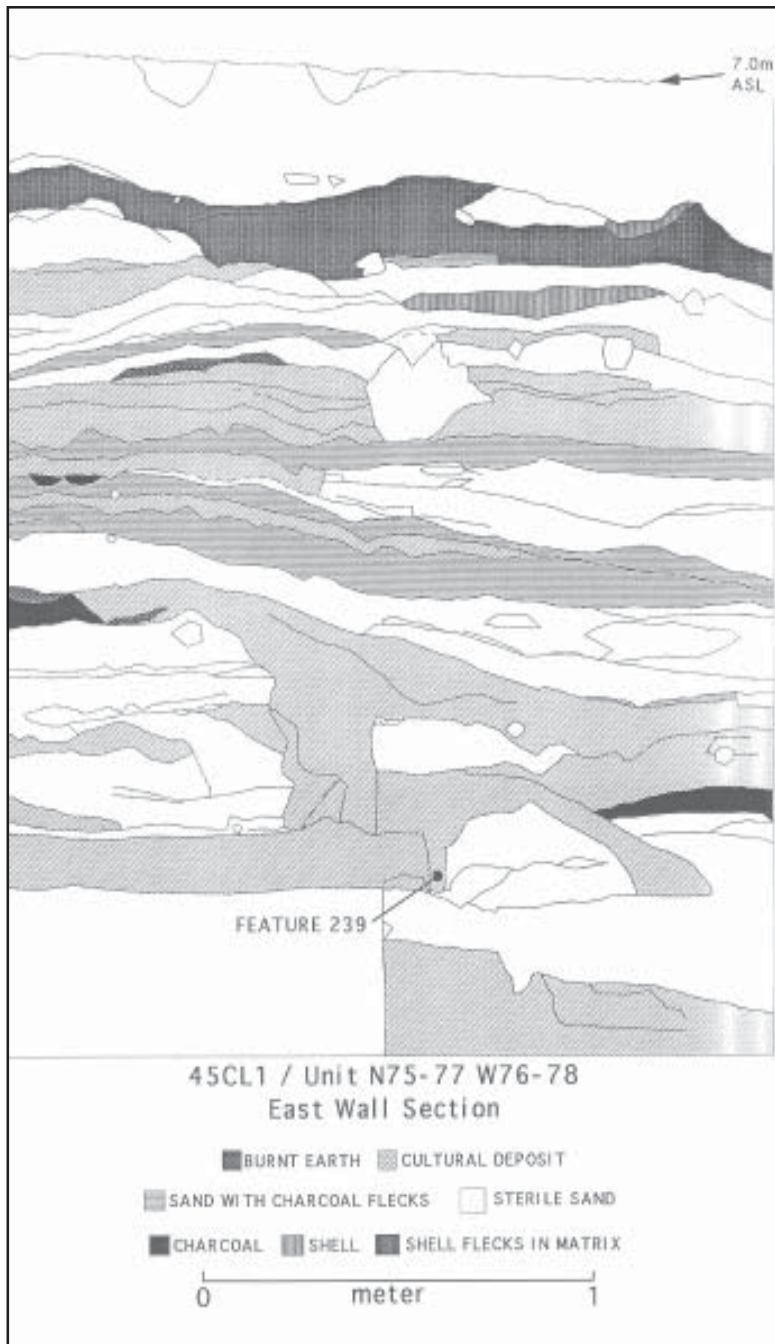


FIGURE 10.
 UNIT N75-77/W76-78 WITH WALL TRENCH BURIED ca.2m BENEATH MODERN SURFACE.
 (MAIN TRENCH IS LEFT OF FEATURE 239 MARKED ON THIS PROFILE.)

stratigraphically superior to the wall itself. They are generally contemporaneous with the Feature 88 date from Depression 1. However, these are upper limiting dates for this structure, probably dating the final episode of infilling and burial of the north end of the depression. The structure, identified as House 4, could have been abandoned some time earlier.

Depression 5

Depression 5 is also generally circular. It is at the southern end of the same debris field associated with Depression 2. It is likely that at least its northern end is buried beneath that debris field. Its southern edge is marked by the terminus of the large debris mound that separates Depressions 3 and 4. This mound also separates Depressions 5 and 6. It is possible that Depressions 5 and 6 represent the same structure that has been partially buried beneath the mound. However, the northern edge of that debris mound does conform to the general configuration of the depression. It is possible that this depression represents a pithouse rather than a plankhouse. Location of a corner will establish the nature of the structure. The depression has not been tested or augered.

Depression 6

Depression 6 is approximately 45 meters long but may originally have been longer. Its northern end has quite likely been buried beneath the debris mound that separates it from Depression 5. A glance at the map will show that the microtopography at the north end of this depression is quite different than that of most of the other structures. Where elsewhere it appears the debris deposits accumulated around standing walls, here the midden slopes gently into the depression, partially filling it. This debris mound is clearly associated with Depression 2, suggesting that its last occupation post-dates the abandonment of Depression 6.

Depression 6 is separated from Depression 3 by a steep berm, and from the swale on the site's western edge by a very low berm, similar to the western berms in Depressions 4 and 5. The profile for the N52 trench suggests that Depression 6 was originally excavated into this berm. The wall trench for the house's west wall is clearly intrusive through the upper deposits whose slope suggests they originated at the top of the

berm on the west side of Depression 3.

The structure may be dated by three radiocarbon dates recovered from 1992 augers in its western berm. These dates are TX 7742, 7744 and 7745. Their calibrated age ranges span a period from AD 910 to 1410. TX 7742 and 7745 were recovered from the same auger in good stratigraphic order at depths between 195 and 212 cm below the present surface.

Other Structural Features

As described in the section on plankmolds, postmolds, and "wall trenches" below (p.46), walls were encountered in N179-181/W101-103, west of and running parallel to Depression 1. There is no evidence of a depression associated with these walls. There was also no stratigraphic evidence of a structure to the east of the wall. It may represent an outbuilding or a structure that has no excavated portion. Heavy postholes and plank molds were also encountered in Unit N107-109/W98-100, between Depressions 4 and 5. Since it is quite likely that the southern end of Depression 4 is buried beneath that debris field, it is possible that other structures are buried within or beneath the debris field. As mentioned above, a 2-meter length of wall trench was exposed 2 meters below the surface in unit N75-77/W76-78. Just north of the wall, pit fill was also exposed. It seems clear that a deeply buried structure lies slightly south and east of Depression 2. This buried structure is identified as House 7. The exposure of this house confirms the fact that visible depressions are not requisite for the presence of additional structures at 45CL1.

Midden Accumulations

Linear berms surround the large depressions and define some of the subdepressions. The prominence of these mounds varies throughout the site and are absent in some places. They range in height from .25 to 1 meter and in width from 3 to upwards of 10 meters. The largest berms define the long house depressions described above. There are two major lobes. Lobe A extends between Depressions 1 and 2 and covers (and partially fills in) the northern portion of Depression 4. This depression is probably excavated into the lobe, but its northern wall is also buried beneath the lobe. Lobe B extends between Depressions 2 and 3 and 5

and 6. Its relationship to the latter two depressions is not known. As mentioned above, a portion of this lobe covers a structure beneath and slightly to the east of Depression 2.

Front Debris Fields

The front debris fields are located to the west of the house depressions. They are the westernmost surface features on the site proper. The zone is defined by a broad, gentle, west facing slope extending approximately 20 meters from the house depressions. There are two broad fields visible on the site surface. These are associated with Depression 1 and Depression 2. A small debris field is also associated with the northern end of Depression 3. No debris fields are visible on the surface south of the N56 line and nor west of the western row of depressions (Depressions 4, 5, 6). However, their presence has not been discounted pending further subsurface testing. Auger tests south of the N56 line show no evidence of debris fields. It is possible that many of these deposits have been eroded away or buried. In support, the southern section of the site is generally lower where the abandoned channel cuts close to the house depressions than the northern portion.

The potential extent of the debris field west of House 1 is hinted at by the typical debris field encountered during 1996 excavation of a unit 1-3 meters north of the 1994 trench. Debris was found in abundance here (see *Excavations 1996* in Cathlapotle Project History for details) in what is probably not a localized occurrence. Rather, this unit appeared to sample a widespread "sheet" of living refuse fanning out westward of House 1 and dipping towards the swale and the ancient beach front.

Beachfront

At present, the Lake River beach is 70-80 meters west of the site. The current hypothesis is that Lake River has migrated away from the site during the last 150-200 years. A long swale extending beyond the full length of the site in both directions may represent the old Lake River channel. Thus, the beach probably extended along the western side of the site. The debris fields extended to and possibly into the water that once flowed through this channel. During the site's occupation, the swale may have acted as a protected inlet

(opening to the north) rather than a flowing water channel. The transformation from a flowing channel to an inlet may have occurred prior to or during occupation. The hypothesized northeastward movement of houses may be related to this process. As alluded to earlier, the alluvial chronology is extremely complex on the valley floor and has not been well defined.

Site Stratigraphy

The testing thus far completed at Cathlapotle is insufficient to conclusively address the stratigraphy at the site. Accurately describing the depositional history of a large, deeply stratified site is a problem which has been examined in detail elsewhere (Flannery, 1976). Given the apparent long-term occupation of Site Ridge, and the probable presence of numerous superimposed floods, house remains, and continual maintenance and reconstruction of the dwellings, several more seasons of excavation at the level of the 1994 testing are imperative to understand the site. It would be presumptuous at this point to attempt to analyze the stratigraphy in detail, as our conclusions would undoubtedly be overambitious, and require potentially confusing amendment at a later time. A graduate student from the Geology Department at Portland State University, under the direction of Dr. Scott Burns, was a part of the 1996 field project; data collected then may be used as the basis of an MA thesis. We are considering the placement of a geological test trench in a noncultural area of the site to establish some baseline data. Such a test would be conducted in consultation with palaeoenvironmental specialists.

What is clear at this point is that there are two major stratigraphic units at the site: the basal alluvial deposits which formed Site Ridge alongside the Lake River channel, and the cultural deposits which overlie them containing numerous crossbedded flood deposits. These deposits are discussed below as they pertain to certain areas of the site.

Beachfront

From Unit N107-109/W98-100, we can clearly see that the beach between the town and the river was a dynamic environment, and there are localized deposits of cultural material within these sediments. At least one large, shallow pit feature in these sediments (dis-

covered at approximately 4 meters below the modern surface) was likely an acorn leaching pit, similar to those observed on the beach front of the Sunken Village Site (35MU1). The depositional history of this particular unit is complex, and given the limited exposure involved, the record in the unit is not sufficient to draw conclusions about other locations at the site.

The continuation of the N159-160/W79-107 trench westward will begin to clarify the relationship of the channel to the partially-examined house and adjacent cultural deposits in that area, but it is likely that more trenching will be required along the river channel to ultimately resolve the relationship between the settlement and Lake River. The problematic nature of making assumptions of relationships between what was observed in N107-109/W98-100, and what was observed in units of the long trench is aptly illustrated by the discovery of an unanticipated house (in unit N136-138/W94-96) between these units.

House Depressions

The stratigraphy of the house visible in N159-160/W79-107 is typical of Wapato Valley plankhouse profiles, and indicates that the final house occupied at that locale is essentially intact beneath the modern A-horizon (Figure 10). The presence of at least one earlier house is indicated by Feature 88, a stratum containing organic material and cultural features, separated from the upper cultural component of the house, and visible from the eastern extent of the trench through the house and down the west slope into unexcavated levels. The hypothesis of multiple house construction at this location is also supported by the relationship of the radiocarbon dates recovered from within the house depression to those in the debris fields to the west of the house, and from the unit in the eastern berm of the house depression (See *Radiocarbon Dating* in this section and Table 5).

Front Debris Fields

The debris fields along the west slope of Site Ridge appear to have been deposited both as a result of cultural activity along the river bank and dumping due to household maintenance. These deposits are often interbedded within each other, as well as within flood sand deposits, and may contain features created by *in*

situ cultural activities such as pits, ovens, and small post and plankmolds. The west end of the N159-160/W79-107 profile shows that the fields accumulated with a westward migration, toward the waterfront. The density of cultural material is comparable to that found within the house units, and the diversity of artifacts, particularly trade goods, has thus far been greater. These deposits contain substantial amounts of charcoal, debitage, faunal material, and fire-cracked rock, in addition to artifacts. There is no indication that these deposits have been disturbed by anything other than subsequent cultural or flood activity, and the radiocarbon dates from this area of the trench, with the exception of TX 8286, do not indicate any appreciable chronological breaks (Table 5).

At this point, differentiating between these debris fields and midden deposits is rendered problematic by inadequate levels of excavation. As can be seen, the initial assumption from 1993 was that the N107-109/W98-100 unit was in a midden area, but there are some indications that what may be considered midden in the upper 70 centimeters could be overlaying the remnants of a buried house. The unit N75-77/W76-78, on the eastern berm of Site Ridge, appears to be a midden area thus far as well, but the locale may not always have been used as a dump. Until more units have been excavated and the stratigraphic sequence of the site has been clarified, the utility of the term midden is somewhat suspect. It is often used to denote the presence of shell deposits in Northwest Coast archaeology, but as can be seen in the two units mentioned above, the shell deposits at 45CL1 are not vertically massive, and are adequately described as debris fields (Figure 12).

The debris fields probably had other structures built on them. Various isolated postmolds have been observed in debris field contexts. These may be associated with houses or smaller “yard” structures such as drying racks or sheds. Additionally, the debris fields evidently cap some older house depressions. This is most obviously illustrated by unit N136-138/W94-96, which contains an east-west trending wall trench that is undoubtedly the north wall of a buried house. To the south of this unit is the exposed house depression that is approximately one half the size of most house depressions at the site. The conclusion is that the northern half of the house has been buried by debris fields.

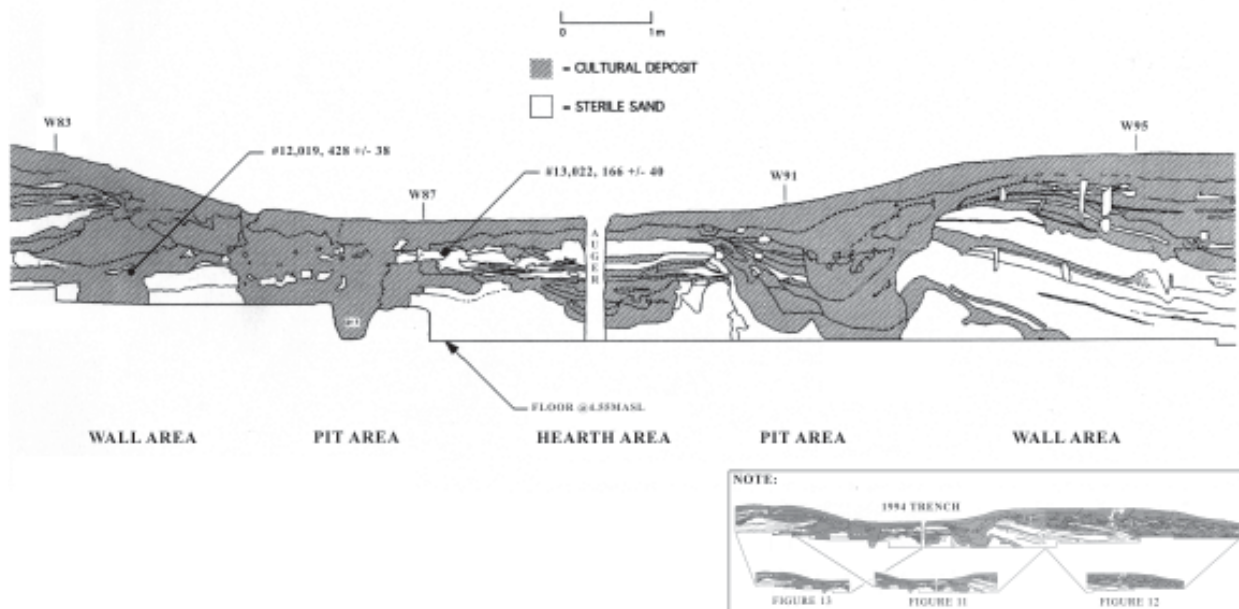


FIGURE 11.
N159-160/W79-107 SOUTH PROFILE MIDSECTION.

Another wall trench in unit N179-181/W101-103 may be associated with a buried house depression or, more likely, the wall of a smaller type of house (or other structure) that did not have a depression.

The south profile of trench N52/W99-105 clearly shows the wall trench representing the west wall of a structure in Depression 6. At the extreme western and bottom corner of the trench, the deposits dip abruptly downward. We hypothesize that these sediments may represent a fossil stream bank. The general dip of these deposits follows a slope from the western berm of Depression 3, leading us to believe Depression 6 was excavated into those sediments.

Midden Accumulations

Very little testing has been done to identify the formation processes of the berms surrounding the large house depressions. Test units N106-107/W77-81 and N159-160/W79-83 cut into the rear berm of the site. At these locations, neither the surface topography nor the subsurface deposits exhibit any indication of midden accumulation. However, the slight mounding of sand strata is suggestive of dumping episodes (from house construction) interbedded with flood deposits.

There exist at least two possible explanations for the formation of the berms. First, when each house was constructed, excavated soil was probably dumped around the circumference of the foundation. Second, waste may have been frequently dumped around the houses. The only significant exposure of these deposits is unit N75-77/W76-78. The unit is located on a surface mound on the east end of a large berm that extends between Depression 2 and Depression 3. This berm is one of the largest at the site. The unit excavated in this berm has dark midden deposits with a high density of cultural material that is reminiscent of fill found in storage pits inside the Meier Site house (Ames et al. 1992). This suggests that the berm was formed by dumping pit fill, possibly associated with repeated episodes of house building and remodeling.

Thus, the surrounding berms between houses may be midden accumulations composed of old interior house deposits excavated from the depressions for new or reconstructed houses. Alternatively, but not necessarily excluding the former hypothesis, these midden deposits may represent periodic garbage dumping around the house not related to house construction. Additional testing is necessary to substantiate these claims. The composition of the berms bounding long houses is ex-

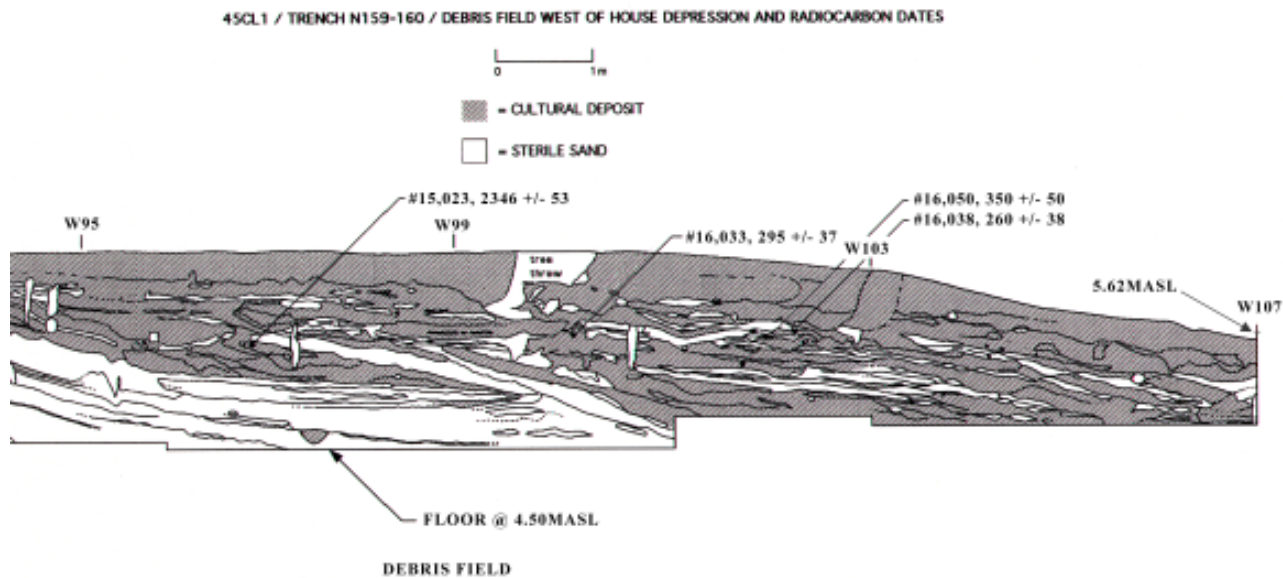


FIGURE 12.
N159-160/W79-107 WEST DEBRIS FIELD.

pected to be different than the smaller berms defining subdivisions. Trenching of one of these berms in 1995 did reveal a wall feature.

Rear Berm

The rear berm of Site Ridge is undoubtedly the most intact remnant of the landform as it existed prior to occupation. This can be seen in the N159-160/W79-107 profile (Figure 11, 12, 13), as well as the auger record from that area of the site. The stratigraphy in this area consists of the modern A-horizon, overlaying massive alluvial deposits, which are disturbed by discrete pockets of cultural material. The three units placed on the eastern portion of Site Ridge (N56-58/W70-72, N159-161/W70-72, and N183-185/W78-80) were relatively unproductive, and excavation of these units was suspended so that the crew could be more usefully employed elsewhere on the site.

The test units on the rear berm yielded a low density of cultural material. The sediments are primarily intact alluvial sands, probably deposited in massive dumping episodes. Two of the units on the berm (N56-58/W70-72, N159-161/W70-72) contained a light density of various cultural items but no features. Unit

N183-185/W78-80 had a relatively high density of large animal bone, but also had no identifiable features. Similarly, the eastern end of trench N159-160/W79-107, which extends a short distance into the berm, revealed a low density of material. However, a number of small oven features were encountered relatively deep within these deposits. The relationship between the various oven features and the adjacent house deposits has yet to be determined.

The excavations thus far conducted on Site Ridge have been concentrated just north of center of the Site, and little is known of the stratigraphy at the northern or southern extents of the site other than what was observed during augering. Augers at the north and south extremes of the site indicate a largely uninterrupted sequence of alluvial deposits, and are probably representative of the original Site Ridge landform.

Features

The features identified at 45CL1 are consistent with those found at other Wapato Valley plankhouses (Figures 14-37). Feature preservation at the site is excellent and allows recording of large architectural features (such as post and plank molds of both the stain

45CL1 / TRENCH N159-160 / BERM EAST OF HOUSE DEPRESSION

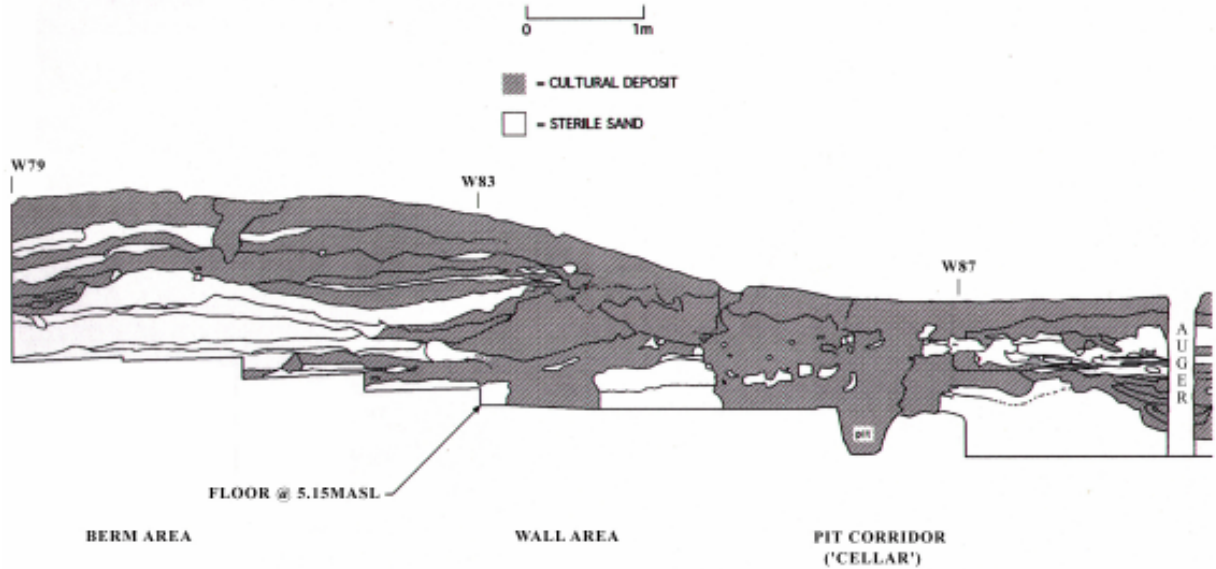


FIGURE 13.
N159-160/W79-107 BERM EAST OF HOUSE DEPRESSION.

and backfilled varieties), hearths and hearth dumps, cobble ovens, storage pits (both within house depressions and outside them), and wall trenches. Cache features have also been identified, including several core or flake caches, a metapodial chisel cache, discreet concentrations of raw cobble and pumice pebble material within larger pits, and lenses of freshwater shell. We describe some of these features in more detail below.

Plankmolds, Postmolds and 'Wall Trenches'

The plank- and postmolds identified at 45CL1 are ubiquitously distributed. They are characterized by organic stains caused by the weather and decaying red cedar posts and planks, and by the backfilling of post and plank holes left during reconstruction episodes. The larger planks and posts located tend to be within the central trench units through the house depression. These were the central load-bearing poles that supported the roof.

The eastern wall of House 1 was exposed in 1994 and its southern wall in 1995. An interior wall was exposed in 1994. This wall was located in the north slope of subdepression 1 and probably represented the di-

vider between compartments C and D. A further (though less well-defined) interior wall was found in 1996, between compartments B and C. Finally, in 1996 a large west wall feature was exposed in House 1. East walls were exposed in Depressions 2 and 6 in 1994. A west wall was exposed in Depression 6 in 1995. As noted above, the north wall of House 4 was exposed in 1994 and its west wall was dramatically exposed in 1996 (see *1996 Excavations* in this section). Perpendicular to this wall trench were exposed other wall features probably indicating interior partitions of this house.

We use the term "wall trench" to conveniently describe complexes of related features which we feel are all indicative of a single wall; each feature, however is assigned a separate feature number. Some wall trenches were constructed as continuous trenches, while others are the result of overlapping, multiple uses of the same area for wall supports.

Large structural features have been encountered outside the depressions. One notable example is Feature 1, located in N107-109/W98-100. This feature is visible in the unit's east profile (Figure 15). It consists of the remains of at least two backfilled post holes, ap-

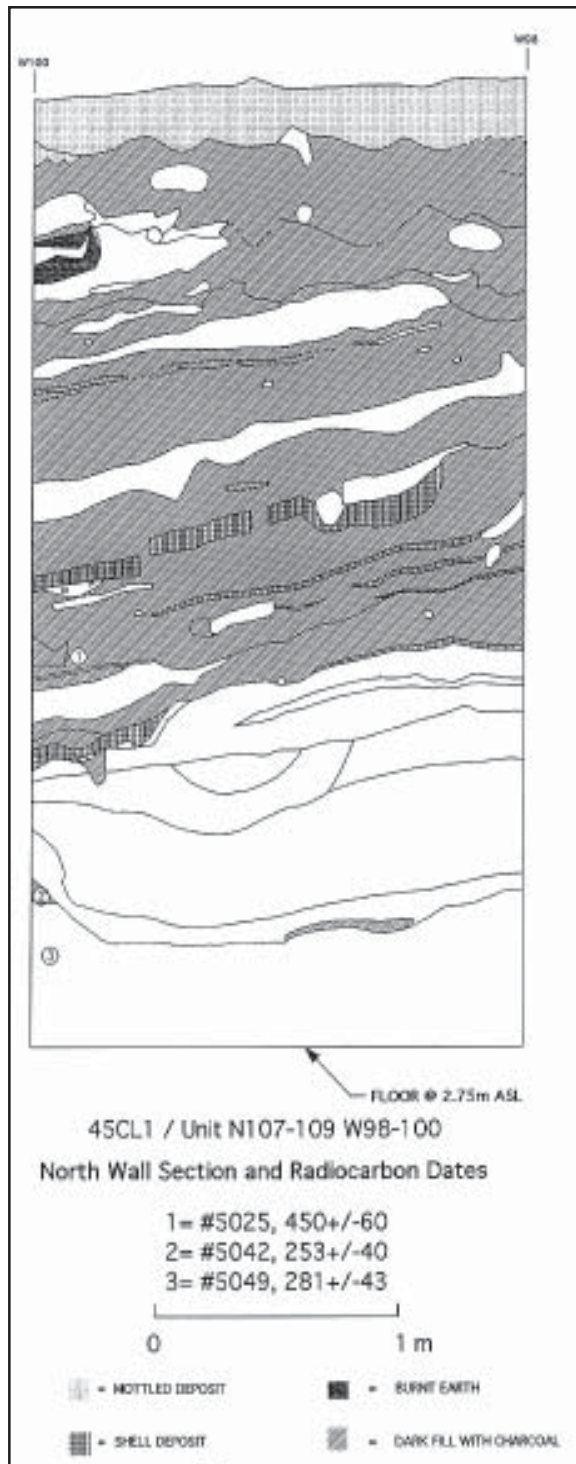


FIGURE 14.
N107-109/W98-100 NORTH PROFILE.

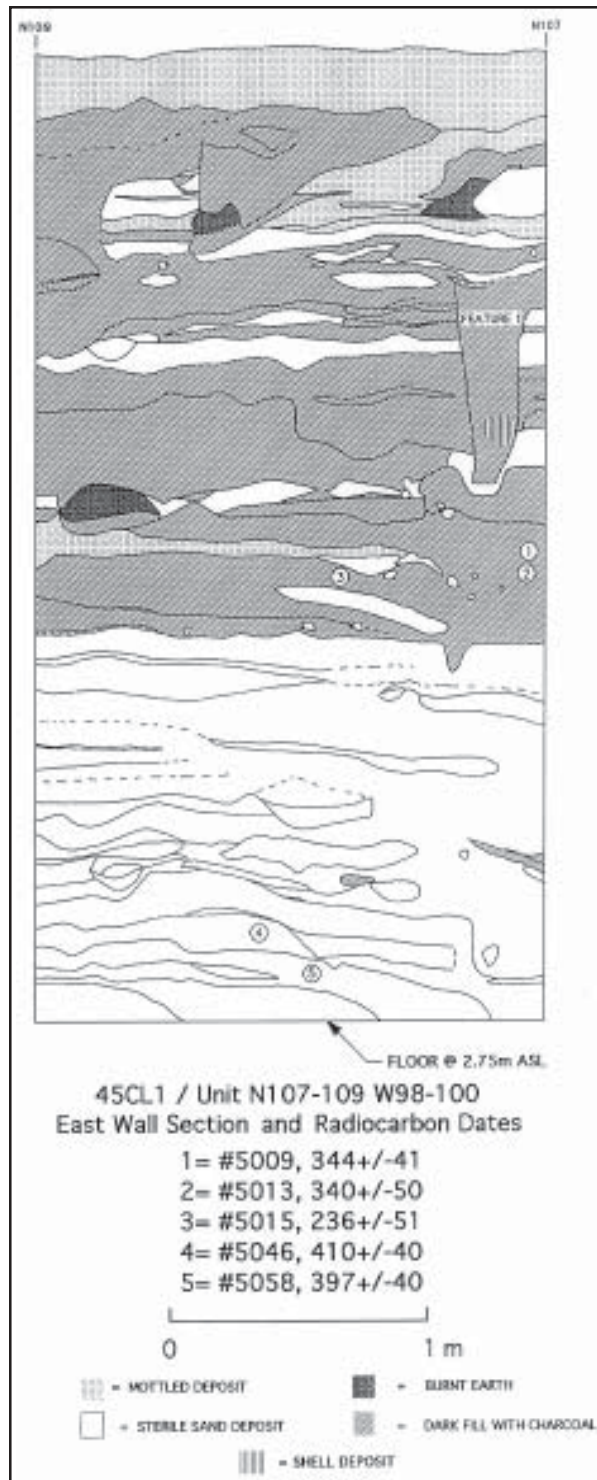


FIGURE 15.
N107-109/W98-100 EAST PROFILE SHOWING FEATURE 1.

proximately 27 cm across. There is obvious evidence that the initial placement of this post bore a considerable amount of weight in that it displaced its basal strata downward 10 centimeters. This post is not certainly identified with a house, but one of our hypotheses is that there are the remains of a buried house in this unit.

Smaller plank and post features are found distributed both within houses and in areas of activity around the houses. At times, these features are associated with others, such as Feature 48, a small post placed into Feature 11, a cobble oven.

Planks and posts are sometimes found in association with an obvious wall trench feature, such as Features 87a-g, in N44-45/W89-93, Feature 166 in Unit N136-138/W94-96, or Feature 96, in N164-168/W 88-89. However, not all of the house walls are so clearly defined. The west wall of the house through which the N159-160 trench was placed was not as easily discernible as the east wall. Several groups of post and plank features, in Units N159-160/W91-95, and N59-160/W95-99, were possible candidates for the wall. It is likely that the house was rebuilt several times, and all were related to one or another wall. The riverine orientation of the town would have caused this area to be more affected by cultural disturbances, thus obscuring the wall trench. Finally, flooding episodes may have played a greater role in obscuring the riverward side of the house.

Again, it should be noted that not all of the wall trenches were associated with house depressions. Both units N136-138/W94-96 (Feature 166) and N79-181/W101-103 (Feature 126) contained wall trenches that were in no way indicated by surface topography (Figure 15).

Hearths and Hearth Dumps

Hearth features were exposed in central units in the house depressions. Unit N159-160/W87-91 revealed hearth remnants which were in fact detected earlier by auger (Feature 19). Unit N161-164/W88-89 included a hearth complex which was not excavated in 1994 due to time constraints (Feature 64). The hearth material in W87-91 was previously detected by Auger 92-30. These features were identifiable by the dominant amounts of orange-colored ash, grey ash, fire-

cracked rock, and the high charcoal content within these ashy sediments. Given the limited exposure of the 1x4 meter units and the time constraints involved, neither of these hearths were fully defined.

In 1995, two large hearth complexes in subdepression D of Depression 1 were exposed. One of these, in the south wall of unit N151-153/W86-88, consisted of five superimposed hearth bowls filled with fine grained pyroclastic material. There was no associated evidence of a hearth box, however. The other was an intact bowl of ash, charcoal, and fine pyroclastic materials about six meters north of the first. This feature also lacked evidence of a hearth box. These features conformed to many of the details of hearths exposed at the Meier site and other sites in the area. First a clay bowl some 50 cm. in diameter was built, and then lined with either clean beach sand or sand-sized pyroclastics. The fire was then built. Ash and other materials accumulated in the bowl until either a new bowl was built atop the accumulated ash or the whole was thrown out and replaced.

In 1996, two more hearths were excavated in House 1 (see *Excavations 1996*). This brings the total of hearths excavated in House 1 to five. One of these, Feature 478, was sand-lined, had several distinct layers, and also appeared to have had a hearth box, the first such found at Cathlapotle. A less-developed hearth was found some meters north of this hearth.

A central hearth was exposed in Depression 4. This feature lacked the clarity of those in Depression 1, and appears to have been built directly on the ground, while those in Depression 1 were built in hearth bowls.

What we refer to as “hearth dumps” are ash deposits roughly 15-35 cm across and 5-10 cm deep. These features of orange ash and charcoal have been found primarily in Units N159-160/W95-99, and N159-160/W99-103 (Features 12 and 16, among others). Note that these units are in the debris field west of House 1. These deposits showed little or no evidence of basin construction, nor any indication of reuse. Little fire-cracked rock was associated with these features. Calcined bone fragments were often present. An alternative hypothesis was that they are the remains of ephemeral fires, but their appearance and location are more indicative of refuse disposal.

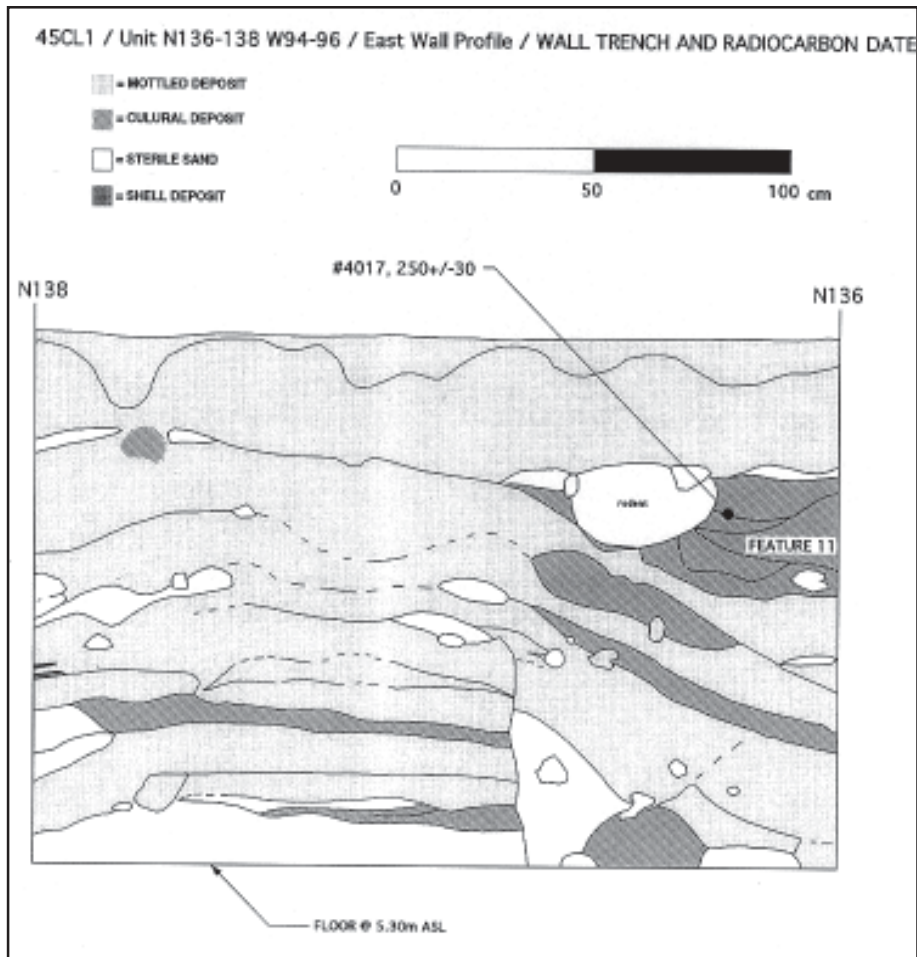


FIGURE 16.
UNIT N136-138/W94-96 EAST PROFILE SHOWING BURIED WALL TRENCH.



FIGURE 17.
HEARTH FEATURE 478 SOUTH PROFILE, UNIT N174-176/W88-90, HOUSE 1

Rock Ovens

Small rock ovens are ubiquitous in units excavated in the midden lobes and front debris fields. These features are generally small, ca. 1 meter or less in diameter, containing a pile of charcoal stained cobbles and fire-cracked rock. This pile is circular, and usually only one or two cobbles thick. There is sometimes a sheet of cobbles extending away from the oven. This sheet is always charcoal-rich, and one cobble thick. Three features discovered at 45CL1 during the 1994 season fall into this category. These features are dense concentrations of fire-cracked rock and charcoal. Unlike hearths, where ash is the principle component, these rock ovens contained only a minor amount of ash material. Two of the features, Feature 80 in Unit N179-181/W101-103, and Feature 11 in N136-138/W94-96 were each more than a meter across.

It is interesting to note that both of these features were located above and in close proximity to buried wall trenches (Features 166 and 126 respectively) (Figures 16 and 17). The third rock oven, Feature 54 in Unit N168-172/W88-89, contained fire-cracked rock, charcoal, and charred bulb remains. Features 52 and 77, in close proximity to this feature, both produced camas

bulbs. Feature 54 was much smaller than the other two, at approximately 50 cm across, and was located just 14 cm below the modern surface. Material from this oven (TX 8292) was dated 9 ± 41 BP, which we find troublesome, but it may indicate that the oven represents cultural activity that postdates the occupation of Cathlapotle.

Pits

Numerous pits were discovered during the 1994, 1995 and 1996 excavations. Pits varied between 10 cm and approximately 1 meter in diameter, and most are round or ovoid in plan view. Most were located within the house depression units, but this was not exclusively true. The N159-160 trench through the house depression detected the presence of pit corridors between the central hearth complex and structural supports, and the walls of the structure. This is a common architectural design in Northwest Coast plankhouses (Ames, et al 1992). Pits at 45CL1 contained dark “reworked pit fill” characteristic of Wapato Valley pit fill (Ames, et al, 1992), as well as artifacts, caches of material, and faunal material.



FIGURE 18.
POST FEATURE DURING EXCAVATION, UNIT N180-182/W90-92.

The majority of the pit corridor complex on the west side of the depression was excavated in 1993 as part of that summer's testing program, and was not at that time assigned feature numbers. However, Features 72 and 73 were remnants of these features which extended into Unit N159-160/W87-91. The rim of this pit appeared to have been lined with wood or some other flora, as there was a discrete charcoal strip bounding the pit. This phenomenon was also discovered in Unit N164-168/W88-89, Feature 65. The eastern pit complex included Features 135, 167, 173, 174, 187, 188, and 190. Feature 190 contained in excess of thirty cobbles or cobble fragments, cobble tools, and groundstone artifacts, as well as one anthropomorphically incised piece of pumice. It may have been related to the cobble feature detected in the 1992 auger (92-28) noted above, which would have been quite close to the south profile of the trench.

In 1995, a complex of storage pits along the east wall of Depression 1 was exposed. These contained a startling array of artifacts, including at least one knife or dagger blade, other iron blades, an argillite bead and a large cache of groundstone, including a slate disc about 50 cm. in diameter. Such groundstone caches were also encountered at the Meier Site.

As noted previously, the position of these storage pits contrasts with those at the Meier Site. There the storage pits were beneath the floor and did not extend beneath the sleeping platform. At Cathlapotle they appear to have been entirely beneath the platform and extended to the house wall. We have often encountered the rim of a pit very close and just below a wall trench.

One pit which merits discussion due to its typicality is Feature 143 located at 2.9 meters ASL in Unit N107-109/W98-100. Approximately 75 cm across, it was excavated into beach sand deposits and contained pitfill and artifacts. Charcoal from this feature was dated at 397 ± 40 BP. It may have been an expedient storage pit excavated into shoreline sands during a period of river level fluctuation.

In 1996, pits were again exposed in locations different from those at Meier, but in situations that can now be predicted at Cathlapotle with some accuracy.

Cache Features

Six cache features were excavated at 45CL1 during the 1994 season and numerous others were exposed



FIGURE 19.

FEATURE 1 UNIT N 107-109/W 98-100 LARGE POSTMOLD CROSSCUTTING ALLUVIAL SAND.

by the 1995 and 1996 excavations. Of the 1994 caches, five were composed of lithic material, and one was composed of faunal material. Cache features were differentiated from pitfill and simple material dispersion by identifying directly adjacent groupings of like or similar materials. Another probable cache, in Unit N159-160/W83-87, was detected in Feature 135, but not given a separate designation. It consisted of pumice pebbles approximately 3-5 centimeters across.

Three of the lithic caches were found in unit N106-107/W77-81. This unit was situated to examine the east berm and slope of a suspected house depression, and confirmed the presence of a plankhouse in the depression. All three cache features (Features 5, 98, and 104) consisted of cryptocrystalline silicate (CCS) cores and associated flakes. Feature 104 also included hammerstones in association with CCS material, which was visible crushed into the use-edge of one of the hammerstones.

The other two lithic caches (Feature 111 in Unit N136-138/W 94-96 and Feature 185 in Unit N164-168/W88-89) were not cores. Feature 111 was a cluster of CCS flakes and Feature 185 was a cluster of CCS core fragments and microdebitage that had slumped into a

small postmold (Feature 184).

The faunal cache (Feature 113 in Unit N159-160/W79-83) was located within the eastern extreme of the house in depression D of depression 1. It consisted of three metapodials placed side by side. Two of them were shaped into chisels at one end, while the third was girdled in preparation for creation of a chisel.

As described above, a groundstone cache was exposed in Unit N160-162/W88-90 in 1995 (Feature 190). This cache included the chipped basalt disc, a sandstone club, net weights and other items.

Shell Lenses

The remains of fresh water shell were found quite often at the site. Some of these deposits consisted of a few pieces, usually mixed in with other faunal material. Such isolated instances were noted in level records, but not featured. Other deposits were substantial, vertically and horizontally, and these were featured. Feature 53, in N 75-77/W 76-78 was a deposit which excavation revealed to stretch across approximately three quadrants of the unit. It contained a fifty-fifty mix of shell and dark soil. This unit had been placed



FIGURE 20. PORTION OF SOUTH PROFILE N159-160/W79-107 TRENCH SHOWING STRATIFIED CULTURAL AND ALLUVIAL DEPOSITS.



FIGURE 21.
FEATURES 78 AND 105 PLANK FEATURES IN N168-172/W88-89.

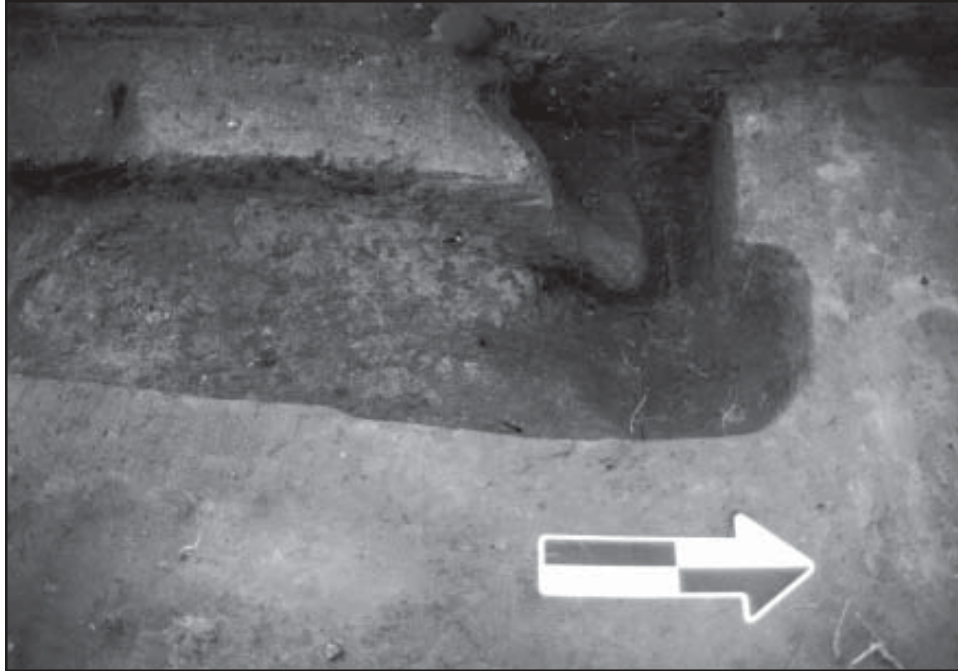


FIGURE 22. DETAIL OF FEATURE 105, SHOWING THAT IT WAS CONSTRUCTED OF LARGE, VERTICAL TIMBERS.

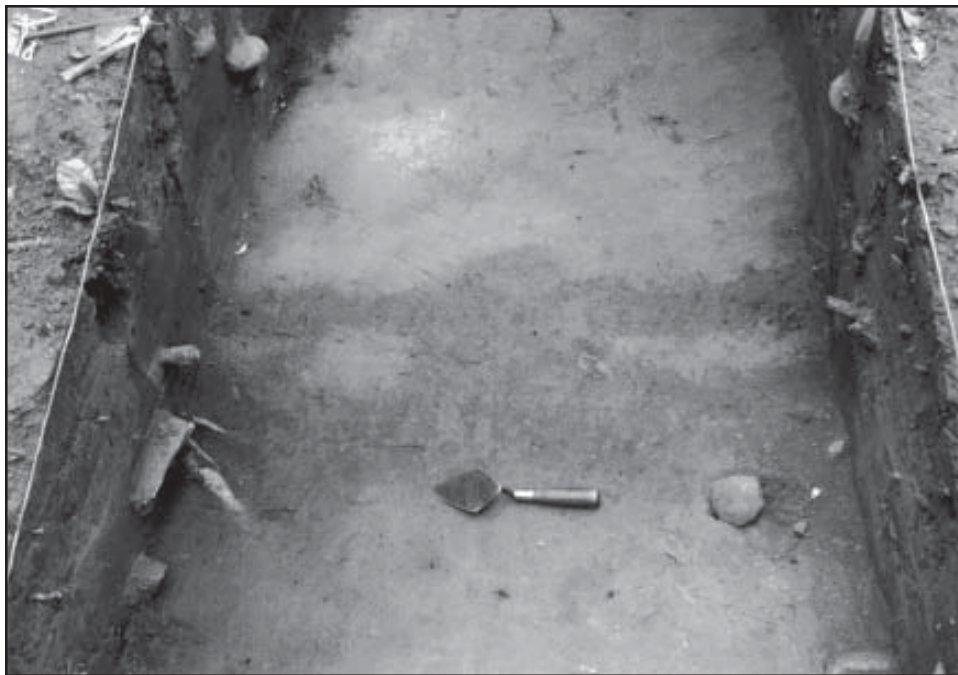


FIGURE 23. PLAN VIEW OF PLANK AND POST FEATURES ON THE EAST SIDE OF HOUSE 1 IN UNIT N159-160/W79-107.



FIGURE 24.
CROSS-SECTION OF PLANK AND POST FEATURES SHOWN IN FIGURE 23.



FIGURE 25. PLANKMOLD REPRESENTING CENTRAL RIDGEPOST SUPPORT TIMBER
IN N159-160/W79-107, DEPRESSION 1.



FIGURE 26.

FEATURE 75 POSTMOLDS IN ASSOCIATION WITH FEATURE 71 AFTER FURTHER EXCAVATION.



FIGURE 27. WALL FEATURE ASSOCIATED WITH THE NORTH END OF DEPRESSION 4.
DARK LINE IS WALL; DARK FILL IS PIT FILL.



FIGURE 28.
WALL FEATURE ASSOCIATED WITH DEPRESSION 4 IN EAST PROFILE.



FIGURE 29. WALL FEATURE ASSOCIATED WITH DEPRESSION 6.
PIT AT TOP MAY NOT BE ASSOCIATED WITH THE STRUCTURE.



FIGURE 30.
WALL FEATURE ASSOCIATED WITH THE EAST SIDE OF DEPRESSION 2.

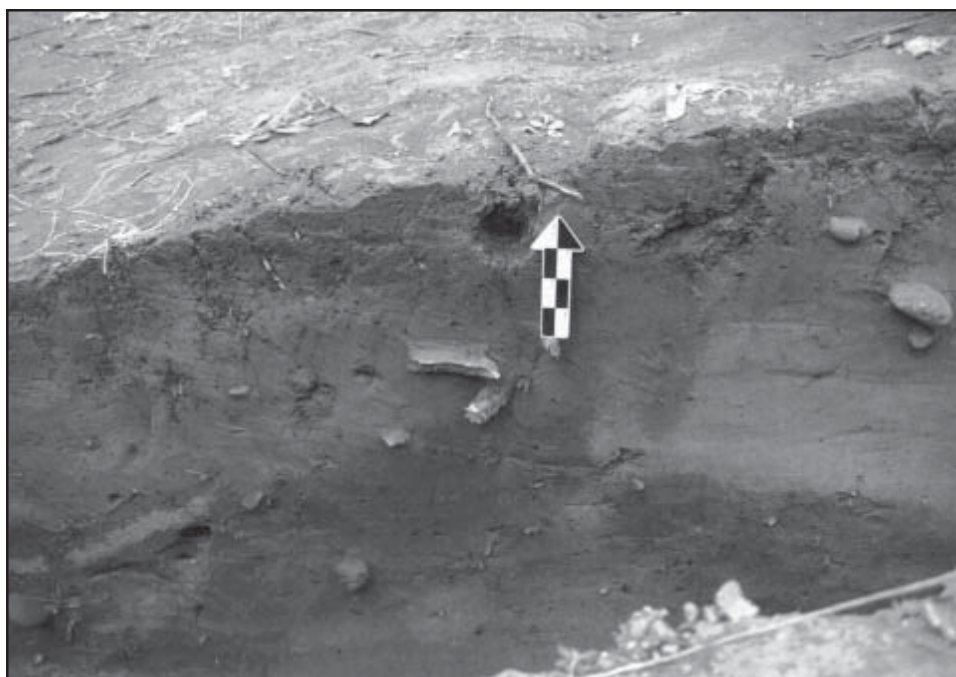


FIGURE 31.
PLANK MOLD ON THE EAST SIDE OF DEPRESSION 1 IN NORTH PROFILE.

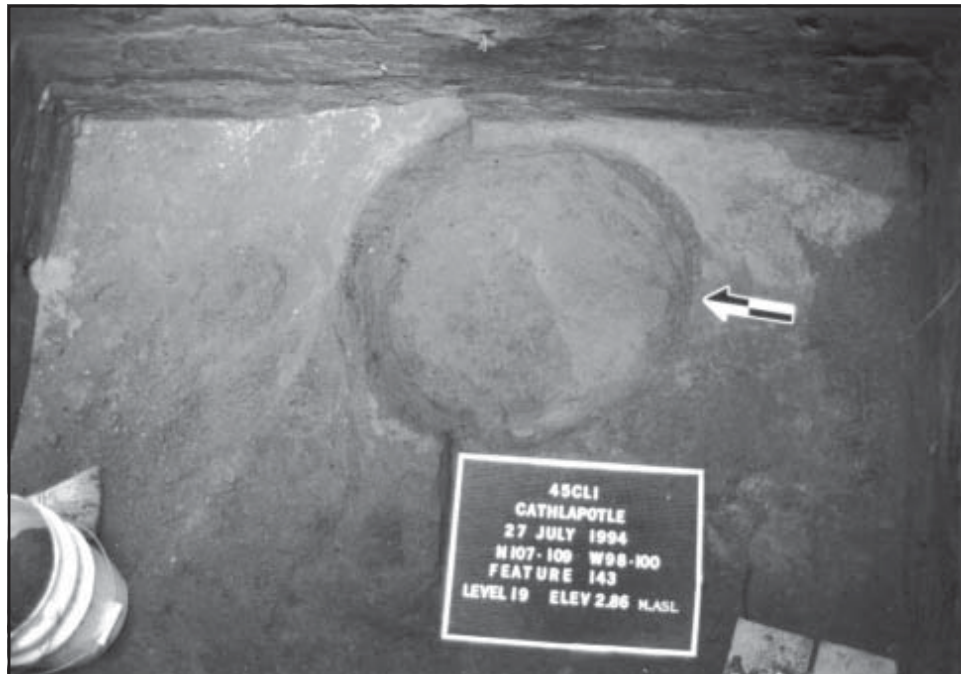


FIGURE 32.
PIT EXPOSED IN BEACH SANDS, 2.86MASL, UNIT N107-109/W98-100.

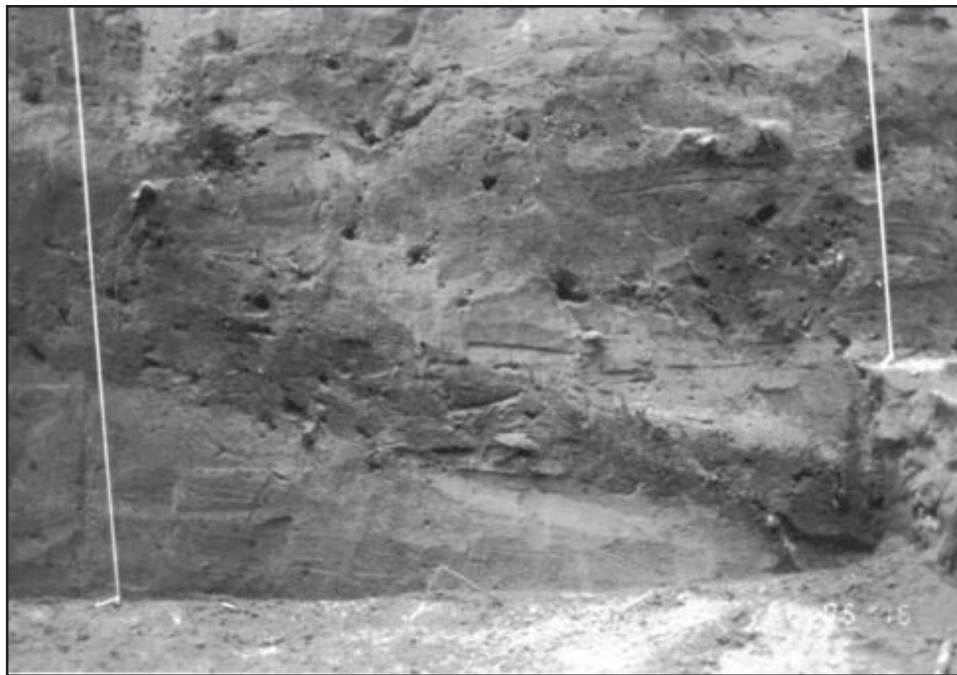


FIGURE 33. CONTACT BETWEEN CULTURAL (TOP) AND ALLUVIAL DEPOSITS IN
WESTERN EXTENT OF N159-160/W79-107.



FIGURE 34.
MIDDEN, SHELL AND STERILE DEPOSITS IN UNIT N75-77/W76-78 SOUTH OF DEPRESSION 2.



FIGURE 35. PIT FEATURE 490 DURING EXCAVATION, UNIT N157-159/W90-92.
NOTE THAT PIT CUTS INTO STERILE SAND MATRIX.



FIGURE 36.
SECTION VIEW OF SAND-LINED HEARTH FEATURE 478, UNIT N174-176/W88-90, HOUSE 1.



FIGURE 37. SECTION VIEW OF SAND-LINED HEARTH, UNIT N180-182/W90-92.
NOTE LESSER DEVELOPMENT OF THIS HEARTH COMPARED TO THAT IN FIGURE 34.

at the location because of the amount of shell discovered in Auger 93-15. Feature 153, in N159-160/W103-107, was a dense shell deposit which extended some 20 centimeters into the unit from the south profile. It appears to represent the dumping of material along the beach. Several lenses of shell were also discovered in Unit N107-109/W98-100 during 1993 testing at that unit, but were not assigned feature numbers. These are visible in the north profile of that unit (Figure 14).

In 1995, extensive shell lenses were exposed in the N52 trench. These lenses were close to the bottom of the trench, and were discontinuous across the profile.

Radiocarbon Dating

Twenty-nine radiocarbon dates have been returned on charcoal samples from 45CL1 (Table 5 and Figure 38). The samples sent for dating were chosen in an attempt to identify the horizontal and vertical chronology of the site. Four of the dated specimens were from the 1992 auger testing. The other twenty-five were from the 1994 excavations. All dates were submitted to the University of Texas radiocarbon laboratory, and are corrected for C13. The reported dates were calibrated to the solar calendar using version 3.1 of the University of Washington, Quaternary Research Laboratory's radiocarbon calibration program (Stuiver and Reimer 1993). Results are reported in the table for the highest probability age for one or two standard deviations.

Probabilities range from as low as .44 to as high as 1. In all discussions, however, the single standard calibrated age range is used. While it would be appropriate in some cases, no dates have been averaged. The suite of dates spans a period from ca. 427 BC to the modern age (Table 5). The earliest date (TX 8286) comes from charcoal recovered from what appears to be a levee feature cut by the construction of house 1. The date may be problematic, but there are presently no grounds to reject it.

One sample (TX8284) returned a date 781 years into the future. We cannot explain this, but we can certainly discard the date. A second sample (TX 8292) provided a date of 9 ± 41 BP. This too we find unlikely. The rest of the suite appears coherent and so probably represents the true age span of the sample cultural occupation.

Four dates (TX 7742, 7745, 7744, and 8293) fall into a time span between ca. AD 910 and AD 1410, with the latter three dating ranging from AD 1180 to 1410. The first three of these samples were recovered during the augering program from the south end of the site. Two (TX 7742 and 7744) were recovered in stratigraphic order from the same auger. The last of these dates, 8293, was recovered from a house feature excavated in 1994. We are suspicious that it may be a sample of "old wood." We believe the consistency of the other three, particularly the stratigraphic order of the two, indicates they are reliable dates, and may date the initial settlement of the site.

The dates also fail to indicate that there were any lengthy breaks in the occupational history of the site. Given the dynamic nature of the landform, as evidenced by the number of flood episodes visible in the profiles, it is clear that the site was considered a desirable place to live, as it was continually reoccupied following flood events.

There is evidence that the site is horizontally stratified. Three of the five earliest dates (TX 7742, TX 7745, and TX 7744) were recovered from auger holes placed at the south end of the site near the location of Unit N44-45/W89-93. This evidence is reinforced by the greater topographic irregularity, particularly with regard to the shape of the depressions and the clarity of the berms that surround them, at the south extent of Site Ridge.

The clearest evidence that the Lake River channel was a dynamic environment during occupation of the site is the series of dates from the deepest of the units, N107-109/W98-100. The stratigraphy of this unit clearly reveals multiple flood episodes as well as significant cultural activity, and the dates from the unit are indicative of a turbulent depositional history. The oldest date in the unit, TX 8277 (450 ± 60 BP) was recovered from cultural deposits between 4.20 and 4.0 meters ASL. The sediment from which this specimen was taken consisted of dark pit fill. Lenses of fresh-water shell, representing several depositional events, were located in adjacent strata. Approximately one meter beneath that sample, a charcoal and fire-cracked rock feature (Feature 100/TX 8278) which was observed in the profile produced a date of 253 ± 40 BP. The intervening strata were interbedded flood and/or

TABLE 5.
RADIOCARBON DATES FROM 45CL1.

Note: AG = Auger, BS = cm Below Surface, mASL = Meters Above Sea Level.

Specimen	North	East	m ASL	Level	Lab #	Date	Sigma	Calibrated	1-Sigma Date	Probability Age Range	
2016	179-181	101-103	5.70	8	TX8270	180	40		N/A	AD 1733-1790	0.45
4017	136-138	94-96	6.30-6.10	3-4	TX8271	250	30	AD 1657		AD 1643-1670	0.75
4041	136-138	94-96	5.90-5.81	7	TX8272	340	50	AD 1569		AD 1502-1604	0.82
4059	136-138	94-96	5.60-5.30	10-12	TX8273	240	40	AD 1660		AD 1642-1677	0.50
5009	107-109	98-100	4.50-4.38	12	TX8274	344	41	AD 1578		AD 1548-1606	0.50
5013	107-109	98-100	4.58-4.38	12	TX8275	340	50	AD 1569		AD 1502-1604	0.82
5015	107-109	98-100	4.34-4.31	13	TX8276	236	51	AD 1661		AD 1746-1806	0.43
5025	107-109	98-100	4.20-4.00	14	TX8277	450	60	AD 1444		AD 1411-1502	0.93
5042	107-109	98-100	3.35-3.20	17	TX8278	253	40	AD 1656		AD 1635-1676	0.60
5046	107-109	98-100	3.11-3.07	18	TX8279	410	40	AD 1462		AD 1441-1510	0.86
5049	107-109	98-100	3.20-3.00	18	TX8280	281	43	AD 1647		AD 1518-1577	0.50
5053	107-109	98-100	3.17	18	TX8281	434	60	AD 1448		AD 1424-1513	0.85
5058	107-109	98-100	3.00-2.90	19	TX8282	397	40	AD 1474		AD 1446-1514	0.76
12,019	159-160	83-87	-	9	TX8283	428	38	AD 1449		AD 1433-1489	0.97
13,006	159-160	87-91	5.60	3	TX8284	781	38	-		-	-
13,022	159-160	87-91	5.49	5	TX8285	166	40	-		AD 1721-1785	0.44
15,023	159-160	95-99	5.65	7	TX8286	2346	53	BC 396		BC 427-366	0.60
15,034	159-160	95-99	4.59	14	-	-	-	-		-	-
16,012	159-160	99-103	-	4	TX8288	356	37	AD 1596		AD 1561-1640	0.64
16,033	159-160	99-103	5.60-5.75	6	TX8289	295	37	AD 1643		AD 1519-1574	0.60
16,038	159-160	99-103	5.60-5.45	7	TX8290	260	38	AD 1654		AD 1643-1672	0.64
16,050	159-160	99-103	5.30-5.45	8	TX8294	350	50	AD 1591		AD 1522-1633	0.66
18,005	159-160	103-107	5.48	5	-	-	-	-		-	-
19,013	168-172	88-89	5.91	2	TX8292	9	41	-		-	-
19,020	168-172	88-89	5.88	3	TX8293	727	58	AD 1287		AD 1212-1307	0.87
45	AG 92-19	-	BS 203-212	-	TX7742	910	210	AD 1160		AD 930-1290	1.00
46	AG 92-17	-	BS 99-100	-	TX7744	740	140	AD 1270		AD 1180-1410	1.00
44	AG 92-19	-	BS 195-203	-	TX7745	720	150	AD 1270		AD 1170-1410	1.00
27	AG 92-12	-	BS 40-43	-	TX7743	200	60	AD 1670		AD 1650-1820	0.87

beach sands. This apparent inversion indicates that the channel of Lake River was advancing and receding dramatically, perhaps seasonally, while the site was occupied. Nevertheless, the nine dates from the unit are all within the range of dates recovered at the site, and seven of them have overlapping sigmas.

The 166±40 BP date recovered from N159-160/W87-91 (TX 8285) supports the hypothesis that the house depression bisected by this trench is from the historic era. The specimen comes from material associated with the central hearth complex of the house.

Another specimen (TX 8270) toward the north end of the site, taken from a fire-cracked rock and charcoal-packed oven feature (Feature 80) in Unit N179-181/W101-103, produced a similarly recent date of 180±40 BP. This unit also produced one of two wall trench features not associated with visible surface depres-

sions. The limited exposure produced by this 2x2 meter unit rendered problematic any assessment of the relationship between the dated feature and the structural feature.

A group of dates (TX 8288, TX 8289, TX 8290, and TX 8294) from Unit N159-160/W99-103 essentially overlap between 356±97 and 260±38 BP, and are probably debris left by habitation or reconstruction of a house adjacent to the west slope of Site Ridge.

Artifacts

The 1991-1995 artifact assemblage is large (n = 6591) and diverse (Figures 40-59). The field categories entered into the database are defined and briefly discussed below. These definitions are designed as field categories; they are not intended for detailed artifact analysis. Only those classes entered into the data base are

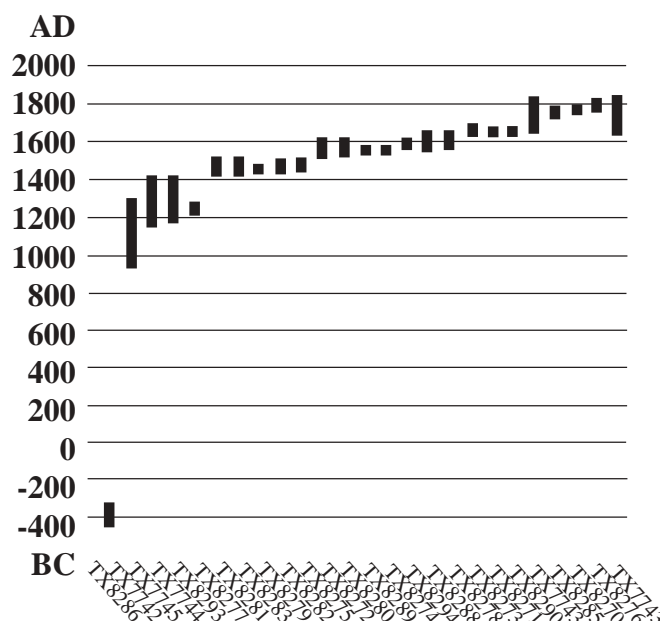


FIGURE 38.
RADIOCARBON DATE RANGES (ONE SIGMA) FOR 45CL1. DATES ARE CALIBRATED.

defined below, and we discuss only the 1991-1995 assemblage. The 1996 assemblage contributed a numerically- and proportionately-typical sample to the database. That is, the 1996 sample, still being examined and cataloged, does not appear to have been in any way unusual, and the 1991-1995 sample may be consulted as an adequate introduction to the general characteristics of the entire assemblage.

With regard to artifact typology, we expect assemblage diversity to increase with ongoing analysis and examinations. New classes will be added as necessary. The specific artifact classes are listed under general categories which represent gross morphofunctional types. While artifact counts change as analysis continues, the numbers here are useful for general comments. In the following discussion, the type percentages represent the proportion of each class in the 1991-1995 assemblage, not within each general category (Figure 39).

Chipped Lithic ($n = 3792$; 57%)

These are stone artifacts that are modified by flaking. Chipped lithics include fine-grained flaked stone artifacts and (generally larger) coarser-grained cobble tools. The morphofunctional classification used here is

based heavily on that devised by Hamilton (Hamilton 1984) for use at the Meier Site.

Biface ($n = 494$; 8%)

A biface is substantially flaked on both surfaces, but does not have a hafting element present. Most bifaces are projectile point midsections, tips, and preforms, although some have other functions, such as the “mule-ear” knives (see below).

Projectile Point ($n = 1088$; 18%)

These are bifaces with a hafting element present, although they are too small to reasonably be considered knives. Usewear analysis on a sample of these artifacts will help to identify nonprojectile tools in this category.

Knife ($n = 21$; .4%)

These are relatively large bifaces, usually chevron (“mule-ear”) or pentagonal in form. Some large, hafted bifaces are defined as knives because their form does not appear functional as a projectile (e.g., asymmetrical haft or blade shape created by repeated resharpening).

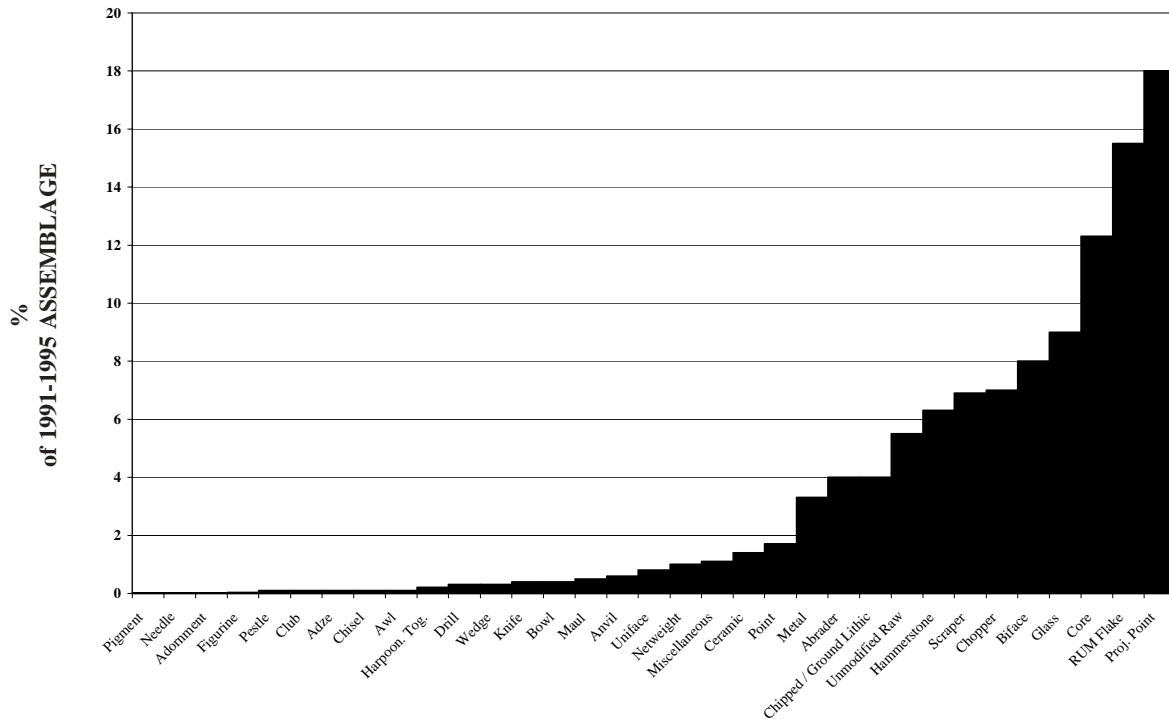


FIGURE 39.
PERCENT COMPOSITION OF 1991-1995 ARTIFACT ASSEMBLAGE.

Uniface (n = 46; .8%)

A uniface is a chipped lithic artifact substantially flaked on a single face. Some of these items may be finished implements, while others may be items deposited before manufacture completion. Use-wear analysis will be used to address this point.

Scraper (n = 418; 6.9%)

Scrapers are normally unifacial and always exhibit patterned retouch with a steep edge angle. This category is composed primarily of end scrapers and “thumb-nail” scrapers that were most likely hafted and were probably used for hide scraping.

Drill (n = 16; .3%)

These are artifacts with a long, narrow projection showing modification that was used for perforating. Lithic drills were probably used to perforate harder materials (such as bone, antler, and wood) than bone and antler perforation tools.

Retouched / Used / Modified Flake (n = 929; 15.5%)

“RUM” flakes exhibit minimal modification either from use or manufacture (e.g., used flakes, minimally worked

flake tools, and early stage preforms), but modification does exist, or is suspected. This general category is used for expedient classification in the field. Laboratory study, including usewear analysis, separates the members of this category into more meaningful categories, such as “scraper” or “shaver.”

Chopper (n = 34; .7%)

Flaked cobble with use wear (and therefore, not a core). Choppers are commonly made of basaltic rocks, whereas most smaller chipped lithics are made of some variety of cryptocrystalline silicate such as chert.

Core (n = 746; 12.3%)

These are lithic artifacts with flakes removed but exhibiting no shaping consistent with that of a functional tool or preform. These items also exhibit no obvious use-wear. Most of these cores are bipolar- and amorphous-percussion cores. The bipolar technique may have been heavily employed because of the relatively small size of raw cryptocrystalline silicate nodules in the area; such nodules are best opened with a bipolar blow.

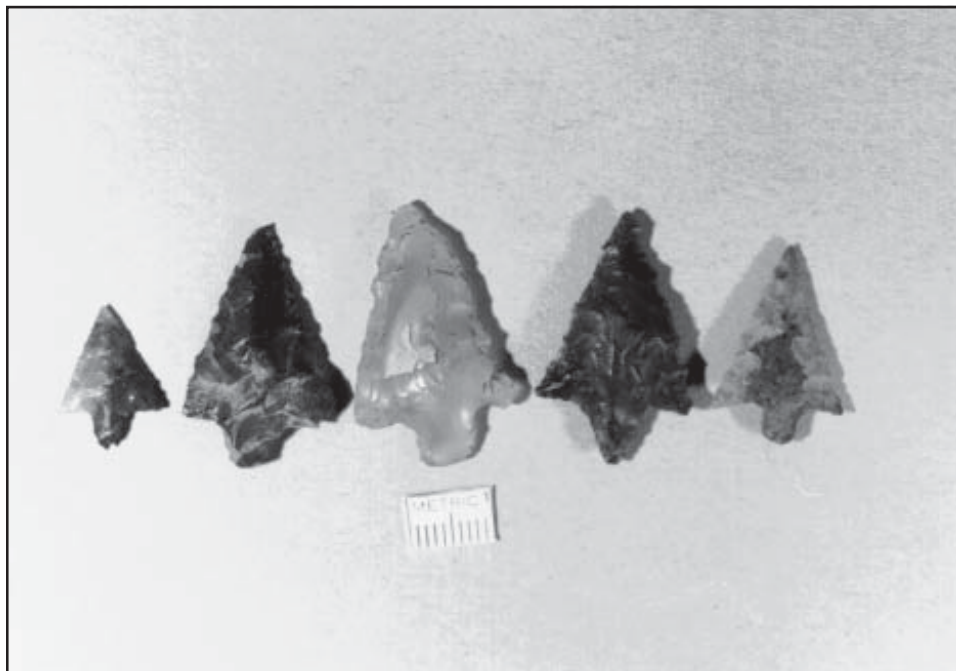


FIGURE 40. SMALL, STEMMED PROJECTILE POINTS.

***Ground Lithics* (n = 781; 12%)**

These are stone artifacts that are modified by grinding (smoothing showing abrasion or polish) or pecking (pock marks from shaping or use).

***Abrader* (n = 244; 4%)**

An abrader is an abrasive stone that has grooves, facets, or ground surfaces indicating use for grinding, polishing, and sharpening other tools. These are primarily made of pumice cobbles and tabular sandstone slabs.

***Anvil* (n = 37; .6%):**

Anvils are relatively large cobbles with use-wear, usually pock marks or pecking, in the center of at least one face. Most of these are for bipolar lithic flaking.

***Hammerstone* (n = 375; 6.3%)**

A cobble with battering that shows use as a percussor. These include minimally pecked cobbles and heavily battered cobbles. Girdled cobbles are included when they show such wear on an end. Many of these (the pecked varieties) were used for freehand percussion and bipolar lithic flaking.

***Maul* (n = 28; .5%)**

These are elongate cobbles with relatively flat working ends (in comparison to a pestle), often exhibiting pounding use-wear (pecking, crushing and flaking). “Nipple-top” mauls are included in this category.

***Pestle* (n = 5; .1%)**

Elongate cobble with at least one rounded end exhibiting a grinding type of use-wear.

***Bowl* (n = 26; .4%)**

Cobble or boulder with a ground basin (mortar). These include pumice bowls.

***Figurine* (n = 2; .03%)**

Artifact shaped into an intended form with no apparent utilitarian function, and probably not dress adornment.

***Club* (n = 4; .1%)**

Large, heavy, elongate stone or bone that could be swung with force. Some may be ceremonial, while others may be utilitarian fighting clubs. To complicate matters, some clubs were both ceremonial and utilitarian, cached and revered between episodes of real use.



FIGURE 41.
SMALL, SIDE-NOTCHED PROJECTILE POINTS.

Netweight ($n = 56$; 1%)

Cobble that is altered to facilitate attachment to a cord. Varieties include perforated, girdled, and notched. Girdled cobbles with battering on an end are classified as mauls.

Adze ($n = 4$; .1 %)

Tabular artifact with a bevelled bit that is usually ground and polished into shape. Also known as a celt. Adzes, often made of nephrite or some related stone, were used in woodworking. Adzes at the Meier Site were heavily resharpened, indicating their high value.

Pigment ($n=0$; 0%)

Soft colored stone with abraded facets. These are usually of red or yellow ochre. While some ochre may have been used as pigment, some may have been used in the treatment of hides, the on-site processing of which is strongly suggested by the presence of end-and thumbnail-scrappers.

Chipped and Ground Lithics ($n=271$; 4%)

These are stone artifacts modified by both techniques described above (flaked, pecked, and ground). The functional classes are common to those listed for ground lithic.

Faunal Artifacts ($n = 395$; 6%)

These are bone, antler, and shell artifacts that are tools, tool making detritus or decorative items. Any bone that exhibits intentional modification such as incising, striations, smoothing, or polishing is cataloged.

Cataloged faunal remains do not include bones fractured for marrow, bones with butcher marks, or bones gnawed by animals unless they also show intentional modifications. However, all antler is cataloged as faunal remains.

Many bone items classified as artifacts by students are ultimately de-artifacted, and likewise many faunal items are pulled from general faunal bags (and artifacted) when they are recognized by specialists as tools or other artifacts.

Chisel ($n = 5$; .1%)

A chisel is usually made from a section of long bone (e.g., cervid metapodial) and has a bevelled, slightly pointed bit. They were used in woodworking.

Wedge ($n = 20$; .3%)

A wedge is usually made from a section of antler shaft and has a bit that is bevelled in section view and slightly

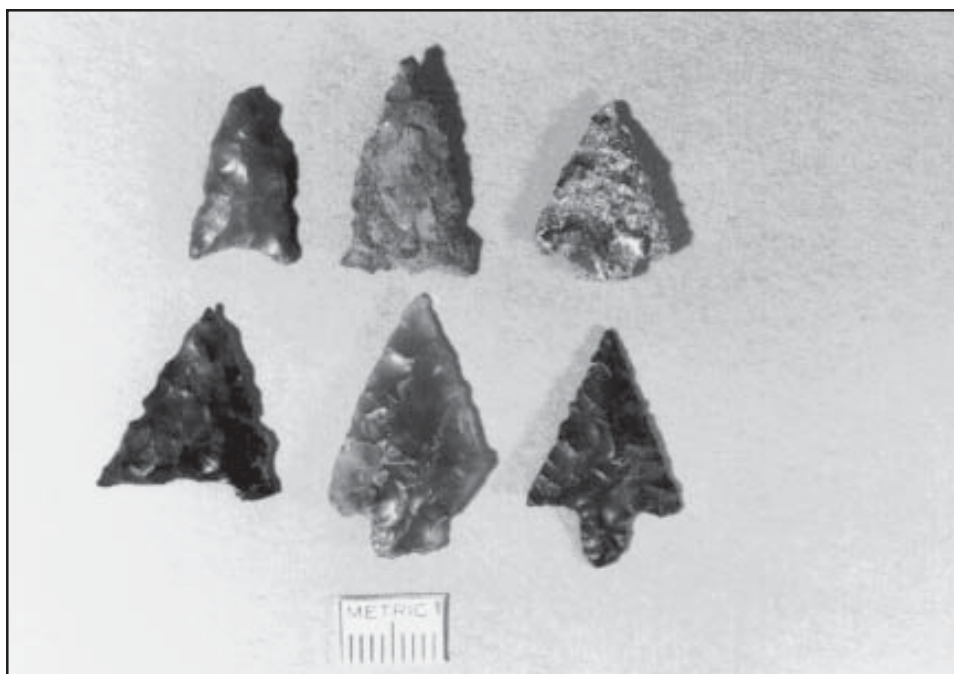


FIGURE 42.
SMALL STEMMED AND SIDE-NOTCHED PROJECTILE POINTS.

curved in plan view. Wedges would have been used for splitting cedar into planks as well as other tasks.

Needle (n = 1; 0%)

These are long, narrow, pointed artifacts made of bone, with an eye on the proximal end. Needles were probably used for drawing twine or cordage through pliable material.

Awl (n = 41; .1%)

Long, narrow, pointed artifact with no eyelet that usually broadens slightly at the proximal end. These were probably used for perforating.

Point (n = 104; 1.7%)

Cylindrical, pointed artifact that does not broaden at the proximal end. These include bipoints for composite harpoon points.

Harpoon Toggle (n = 10; .2%)

A barb for composite harpoon points. These are often transversely severed with a set of abutted grooves, one for inserting a point and the other for inserting a foreshaft. Two are paired and lashed on opposite sides of the point.

Worked Bone (n = unknown)

This is a temporary “catchall” category including all bone objects with evidence of having been worked (e.g., grooves, polish, striations, smoothed facets) that could not be placed in the above classes. Many are girdled metapodial ends (tool making detritus) and small fragments of tools.

Adornment (n = 1; 0%)

Artifact shaped into an intended form with no apparent utilitarian function, but with probable decorative intent.

Antler (n = unknown)

Another “catchall” category of antler objects that could not be identified as tools. All antler and antler fragments were cataloged. This category includes whole antlers as well as unmodified antler fragments.

Floral Remains (n = 6; 0%)

These are botanical items that appear to be shaped or modified. This category might include cordage, carved wood (e.g., pegs, handles, points) and various seed and nut beads. The floral artifacts have not been typed.

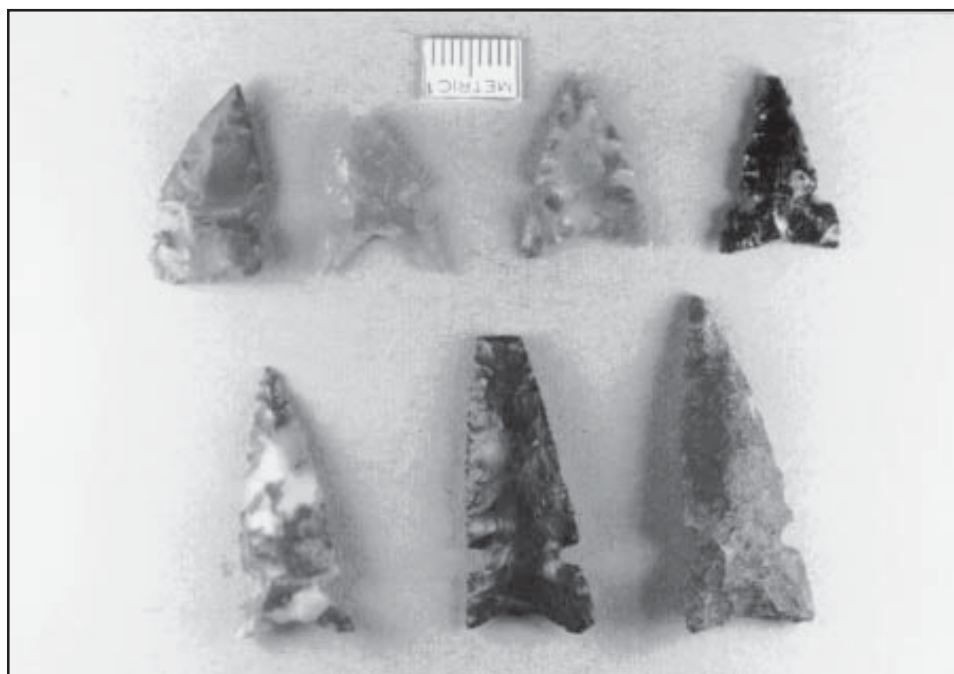


FIGURE 43.
SMALL AND LARGE SIDE-NOTCHED PROJECTILE POINTS.

Metal ($n = 215$; 3.3%)

All metal objects were cataloged. They include both utilitarian and decorative items. Metal objects are primarily iron and copper, but not exclusively. Twelve of these iron objects have been examined by X-ray, which enables analysis of the original shape within the corroded surface. Items identified with X-ray include a firearm barrel, a projectile point, a composite harpoon point, three knife blades, two square nails, two adze blades and a bead-sized tube (Heupel n.d.).

Most metal artifacts are copper. Common copper items include rolled beads, flat sheets, pendants, wire rings, and wire bracelets. More unusual metal objects include a brass phoenix button and uniform frog.

Ceramic ($n = 91$; 1.4%)

All ceramic items were cataloged. Ceramic items are limited to trade beads and a few pieces of porcelain, at least one of which is shaped into a scraper.

Glass ($n = 610$; 9.4% through 1995, >1000 total)

All glass items were cataloged. These are usually glass trade beads and some worked bottle fragments. A detailed description of the beads will be provided by Gretchen Kaehler in her MA thesis.

Unmodified Raw Material ($n = 356$; 5.5%)

These are stone items that are deemed adequate for making tools but have no apparent modification. Chunks of cryptocrystalline silicate, vesicular basalt, pumice, and river cobbles are among the stone raw materials cataloged.

Miscellaneous Artifacts ($n = 74$; 1.1%)

These are items that appear to be intentionally formed or of individual importance, but cannot be placed within the above categories, such as very recent .22-caliber and shotgun shells.

Artifact Summary Comments

Detailed analysis of most artifact classes has not been completed. The numbers will change as the data is refined and artifact analysis continues. Nevertheless, some general patterns can be discerned. Much of the discussion is admittedly impressionistic, based on field observations and past experience analyzing the Meier Site (35CO5) material, rather than systematic analysis. The Meier Site assemblage is used as the primary comparative sample for the following discussion because it is most familiar to these writers (and is from a similar context).



FIGURE 44.
PUMICE BEADS.

In general appearance, the artifact assemblage appears to be similar to that of the Meier Site (see Ames 1994, Hamilton 1994, Wolf 1994, Smith 1996, Davis 1998). More specifically, the artifact assemblages are similar in the following aspects: morphofunctional types, relative type frequency artifact within classes, artifact raw materials, and production strategies. A significant exception is the much higher frequency of historic items in the Cathlapotle assemblage.

A total of 6591 artifacts were catalogued between 1991 and 1995 (inclusive). Table 8 lists 5619 (85%) of these, which have been subclassed into morphofunctional types. This table is meant to give an impression of the count of various artifact types per excavation unit, but as it does not include the 1996 material its use should thus be limited.

Chipped stone artifacts are by far the most common, comprising 57% of the total assemblage. These are followed by chipped and ground lithic, ground lithic, and bone/antler (faunal remains), each of which comprise 8%-12% of the assemblage. Unmodified raw material is also a significantly large class, suggesting caching or stockpiling of stone. The majority of chipped lithics are projectile points (arrow points), retouched/

used/modified flakes, bifaces (primarily arrow point preforms), scrapers and cores. Other common lithic artifacts are hammerstones and abraders. All remaining morphofunctional classes contain less than 20 items each (1% of the assemblage). Figure 39 summarizes the percentage contribution of each main artifact class to the 1991-1995 assemblage (note that this figure does not include beads, $n=1267$, including 1996)).

Lithic Assemblage

The lithic assemblage at Cathlapotle suggests an expedient production technology facilitated by stockpiling raw materials. The primary raw material for most lithic tools is alluvial cobbles. Caches of river cobbles have been found in the bench area of the house depressions (a feature inferred but not observed at the Meier Site). These cached alluvial cobbles of cryptocrystalline silicate, basalt, and quartzite were probably collected from various gravel sources throughout the Wapato Valley and possibly beyond, at gravel locations where canoe access made collection easiest (Hamilton 1994). These cobbles provided most of the raw material used for fine-grained chipped stone tools, chipped and groundstone cobble tools, and cooking stones. Fine-grained chipped stone technology appears to have been based on the expedient reduction of allu-



FIGURE 45.
ANTLER HANDLE.

vial cobbles using a combination of bipolar and percussion technologies to make flake blanks for a variety of curated (primarily end-scrapers and arrow points) and expedient flake tools.

Significantly, the pumice and sandstone abraders, probably used in bone/antler tool manufacture and maintenance, are essentially identical to those in the Meier site assemblage. A number of perforated pumice cobbles were also recovered. This artifact type was not found at the Meier Site. However, they were found in abundance at site 45CL43 on Bachelor Island just across Lake River from Cathlapotle (Steele 1980). These artifacts are referred to as pumice bangles (Steele 1980) but their function is apparently unknown.

Arrow points are the most common formed chipped stone artifacts. These are primarily small side-notched and stemmed varieties. With reference to Pettigrew's typology for the Lower Columbia River Region, the side-notched points are Type 12 and the stemmed points are primarily Types 7, 8, 9, and 10 (Pettigrew 1977). In contrast to the Meier Site where stemmed varieties are predominant, side-notched points are most common at Cathlapotle. This comparison may be premature, however, because our Cathlapotle sample is bi-

ased toward shallow deposits and deposits in the northern portion of the site. The projectile point types correlate with Multnomah Phase (AD 200 - 1835) as do all other tool types found (Table 6). Only one broad-necked point (Type 2) common to the Merrybell Phase (600 BC-AD 200) has been identified. No other tool types common to the Merrybell Phase, such as stemmed drills, flaked cylindrical bipoints, flaked crescents, peripherally-flaked pebbles, and atlatl weights have been identified.

Bone Tool Assemblage

Like the stone tool technology, the bone technology is comparable at Cathlapotle and Meier. Two obvious technological similarities are the manufacture of wedges and chisels. At both sites, elk antler was cached for wedge material. As a result of manufacturing chisels and possibly awls, high frequencies of metapodial ends with deep grooves circumventing the shaft were deposited at the site.

While the chipped stone assemblage is characteristically expedient, the bone tool assemblage shows attributes of curation. This pattern is consistent with that found at the Meier Site (Hamilton 1994, Davis 1998).

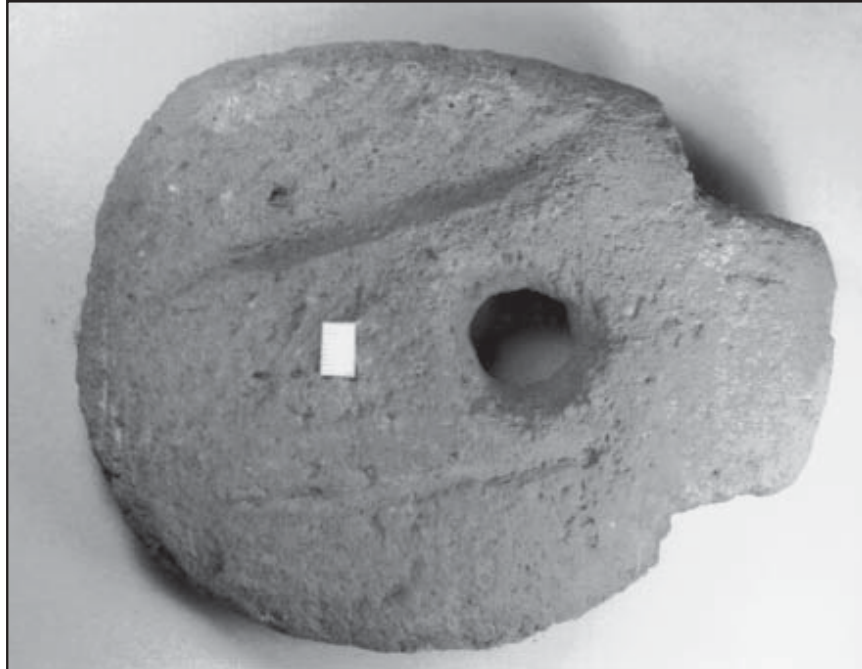


FIGURE 46.
PERFORATED, GROUND PUMICE OBJECT. SCALE=1CM.

The effort and craftsmanship required in manufacturing wood working tools (eg. antler wedges and metapodial chisels) and composite harpoon gear (eg. bipoints and toggles) is relatively high. And, although the production effort is high, these tools are maintainable and strong, capable of withstanding heavy and long term use.

Artifact Preservation

The preservation of bone is excellent at Cathlapotle and comparable to the Meier Site. Cathlapotle has the potential to provide a representative sample of the taxonomic diversity (mammalian, avian, reptilian and fish species) deposited at the site. Unfortunately, botanical remains, like at Meier, are limited to smaller remains including fragments of wood and basketry, seed and bulb tissue and charred material. It certainly does not have the excellent preservation of a classic wet site. A few small worked botanical artifacts have been identified but not typed. The preservation is excellent for flotation analysis (Stenholm n.d.).

Historic Trade Items

Beads are common at Cathlapotle -- as noted, more than 1,000 glass beads have been recovered. One preliminary study has classified and reported on the beads,

particularly the glass beads, as part of an MA thesis (Kaehler n.d.). In her classification, Kaehler primarily used the extensive comparative collection at Fort Vancouver as well as consideration of existing regional bead chronologies. Kaehler was able to identify very informative elements in the assemblage.

The historic trade beads span the entire Fur Trade period. Glass trade beads comprise the bulk of the bead assemblage. The glass bead assemblage has almost twice as many drawn beads as wound. A significant proportion of beads are of the type that suggest introduction into the site during the 1840s or later. Two beads in the collection could not have been circulated until the 1860s. This is the latest temporally-sensitive chronological marker we have for the site. The beads suggest that 45CL1 was used until at least the 1860s.

A critical pattern emerging, at least in the northern portion of the site, is that glass trade beads (the most common historic artifact type) are limited to the upper portion of the deposits.

In Unit N107-109/W98-100, which so far contains the most beads of any unit at the site, a flood stratum defines the lower limit of trade items. Additional analysis



FIGURE 47.
PERFORATED NET WEIGHT FRAGMENT.

is necessary to generalize this pattern for the site. Nevertheless, the artifacts and radiocarbon dates reveal that the cultural sediments represent, vertically, the transition from Chinookan precontact through Euro-American settlement of the region.

The sequence of cultural deposits alternating with alluvial deposits should be fine-grained enough to contribute significant data relating to sociocultural and economic transformation during this relatively short period of rapid change in the history of the Wapato Valley and Greater Lower Columbia River Region. Recent results from Kaehler are encouraging and indeed suggest that beads will be a useful chronological marker when a chronology has been established.

Fossils

It is not unusual at prehistoric sites to find petrified wood that has been culturally altered: it was present at the Meier Site in the form of raw material for lithic tools (Hamilton, 1994). Petrified wood has also been recovered, in corresponding circumstances, from the Cathlapotle Site. However, the fossil assemblage at 45CL1 is more extensive. Flaked, fossilized bone was recovered, and is being analyzed as part of the faunal

assemblage in the hopes that the bone can be identified and possibly sourced geologically.

In addition to the fossil wood and bone, two other fossils were recovered. Neither of these pieces shows cultural modification, and they are not adequate raw material for most lithic tools. The first was recovered from the nonfeatured pit complex in Quad D of N159-160/W91-95 during the 1993 field season. It consists of three trace fossils in a discoid piece of grey sandstone, and was originally interpreted as being an abraded. As of this writing, this specimen has not been identified.

The second fossil (Artifact 4117) was recovered from Unit N136-138/W94-96 during the 1994 field season. This item was identified in the field as *Metasequoia* by two individuals familiar with the flora of the Slanting Leaf Beads Locality, Bridge Creek Flora, John Day Formation. This was confirmed by comparison to known *Metasequoia* specimens and by reference to Guide to Oregon Fossils (Orr & Orr 1981). The fossil is visible on one face of a weathered, possibly heat-affected piece of mudstone measuring 3 cm by 2.5 cm by .4 cm.



FIGURE 48. VARIOUS HISTORIC ITEMS; COPPER RING, THIMBLES, COPPER TUBE, PORCELAIN, GLASS BEADS, MUSKET BALL, UNIFORM BUTTONS AND FROG AND CHINESE COIN.

Metasequoia is present in fossil deposits in the Collawash flora of the Upper Clackamas River valley, at some distance up the Willamette and Clackamas Rivers from 45CL1 (Orr & Orr 1981). Fossil plant localities are listed the Longview-Kelso area, and along the Toutle River, by Livingston (1983), but are not described in detail. Another possibility, although geographically remote, is the Slanting Leaf Beds site, near the John Day River. The appearance of the fossil is consistent with samples recovered from that site, given its weathering and discoloration.

Artifact 4117 was recovered from strata which also produced metal trade items, and trade is one possible explanation for its presence at 45CL1. It is unlikely that its presence at the site is due to geomorphological processes, given the relative location of possible sources, and the fact that it was not recovered from flood sediments. Whether or why fossils entered the regional exchange economy of the Northwest is a question which might be addressed if nonlocal fossil specimens continue to appear at the Cathlapotle.



FIGURE 49.
METAL DAGGER OR KNIFE BLADE.

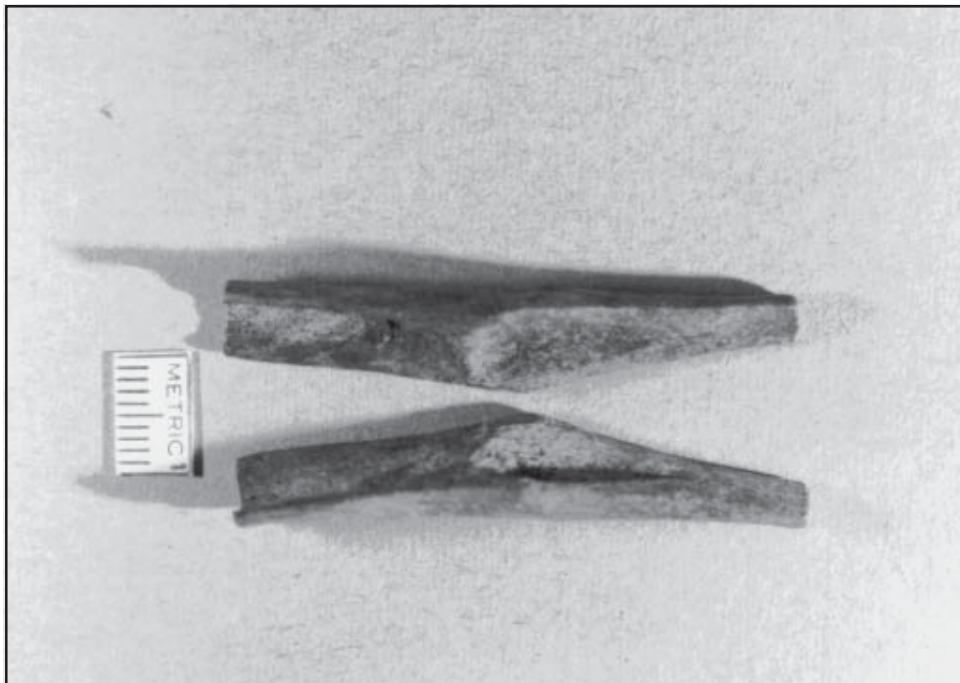


FIGURE 50.
PAIR OF TOGGLING HARPOON VALVES, RECOVERED TOGETHER.



FIGURE 51.
BONE PENDANT OR FIGURINE FRAGMENTS.

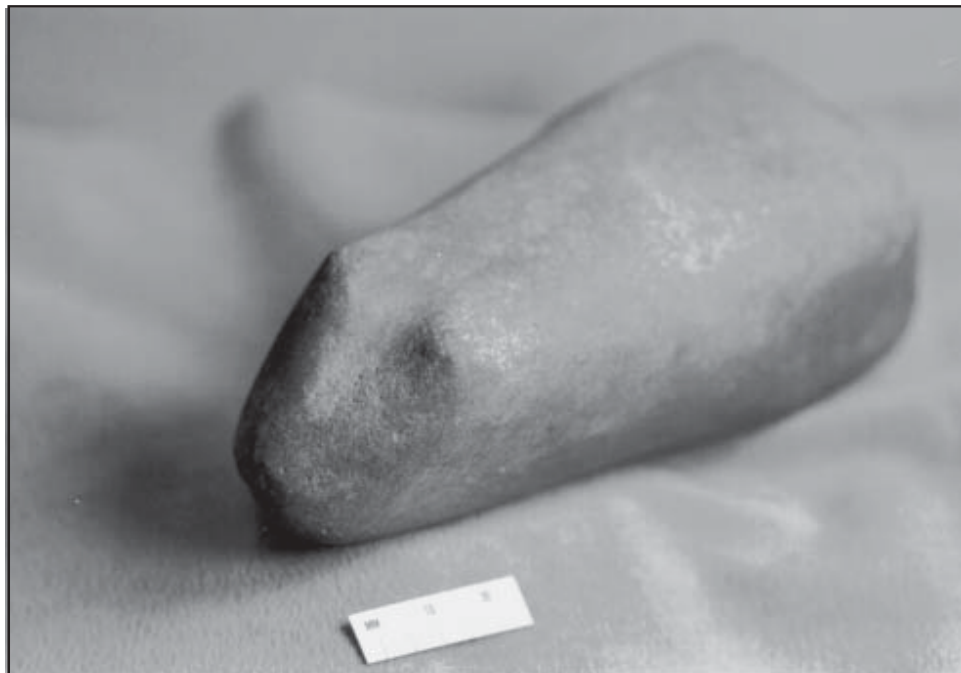


FIGURE 52.
ZOOMORPHIC FIGURINE.



FIGURE 53.
ANTHROPOMORPHIC FIGURINE.



FIGURE 54.
BONE BARB.



FIGURE 55.
PLAN VIEW OF METAPODIAL CHISEL



FIGURE 56. IRON ADZE BIT (LEFT) DATING TO AD 1400-1500.
TO RIGHT IS A GROUND STONE ADZE BIT FROM THE MEIER SITE.



FIGURE 57.
SHOTO CLAY OBJECT.



FIGURE 58.
ROLLED COPPER BEADS, RING AND TUBE.

CONCLUSIONS

Topography and Horizontal Zonation

The knowledge we have gained from exploring and mapping the surface topography -- and making extensive subsurface tests with soil probes, augers and excavation units -- gives us confidence in our interpretations of the Site Ridge landform. The large depressions are clearly structural remnants. Some may be truncated or filled in to a degree by cultural and other activity, but the general arrangement of the Cathlapotle houses can be discerned. And we may be certain of the identity of these remnants as the Cathlapotle village based on our thorough investigation of the historical data and the wisdom and experience of Mr. Jim Carty.

The 1994 testing provided valuable data on the formation of topographic features and cultural deposits. Testing showed that the rear berm has a low density of cultural material and features relative to other zones at the site. The testing of two additional oval depressions supports the hypothesis that the two rows of oval depressions are plankhouse pits. The two units (and the 1993 unit) in the frontal westward slope showed that the debris fields are widespread and contain, in addition to flat, gently sloping cultural deposits, a number of features, particularly ovens and structural features. Of particular interest is the discovery that the debris fields contain buried house deposits. One unit (N75-77/W76-78) placed on a large berm between houses shows that these berms are midden accumulations that may provide information regarding house building events. An auger probe adjacent to this unfinished unit indicates that these deposits are very deep.

The 1995 excavations expanded our stratigraphic sample significantly, and opened excavations within a second structure, House 4. Sampling within House 1 developed significant details about house construction and layout that contrasted with other excavated structures in the region. The sample of exterior excavations was expanded with two additional midden units, and the western extent of the N52 trench. It became very clear that there were deeply buried structures at the site for which there are no surface indications. Given the potential depth of House 7, discovery and

sampling these structures is well beyond the scope of the current project.

While the 1996 excavations focused on sampling within established houses, one unit illustrated the potential extent of the debris field west of House 1. This debris field is an interesting, and potentially informative, large-scale feature. Figure 59 indicates the relative positions of the main large features across the site.

Radiocarbon dating, the presence and nature of historic items, and the general appearance of the assemblage all place Cathlapotle easily within Ames' "Late Pacific" and "Modern" phases (Table 6).

Feature Preservation

The feature preservation is excellent at Cathlapotle. The features observed include structural, subsistence and other household features. Among them are various fire features (ephemeral fires, central hearths, ovens, and ash dumps), plank and post molds, burnt planks, wall trenches, storage pits, shell lenses and artifact caches.

This excellent preservation is likely related to the higher rate of alluvial deposition at Cathlapotle than at Meier. Among the positive effects, higher depositional rates have led to a deeply-stratified site with separation of sequential events, less intrusive reuse of the subsurface deposits, and less intensive mixing of the sediments. The above mentioned stratigraphic evidence for a discrete component of trade items is just one example. In the house deposits at Cathlapotle we have found caches of lithic raw material and cores (and flakes) in the bench areas.

Architectural features are also well preserved. House wall features were found at the edge of every oval depression tested. Although expected, and probably once present, neither of these feature types were observed in situ at Meier. Additionally, a set of intact central hearths and central post molds were identified at Cathlapotle. Cathlapotle clearly has the potential to provide more precise temporal, spatial, and architectural information than was possible at Meier.

TABLE 6.
CULTURAL CHRONOLOGY OF WAPATO VALLEY AND VICINITY.

AGE BP	AMES (1991)	PETTIGREW (1990)	MINOR & TOEPEL (1981)	CLIMATIC SEQUENCE
	Northwest	Portland Basin	Willamette Valley	
0	MODERN	MULTNOMAH 3	LATE ARCHAIC	LATE POSTGLACIAL Cooler, moister; modern.
500	LATE PACIFIC	MULTNOMAH 2		
1000		MULTNOMAH 1		
1500	MIDDLE PACIFIC	MERRYBELL	MIDDLE ARCHAIC	MIDDLE POSTGLACIAL Maximum warmth and dry.
2000				
2500	EARLY PACIFIC	X	EARLY ARCHAIC	EARLY POSTGLACIAL Cool, moist & increas- ingly warm and dry.
3000				
3500	ARCHAIC	X	PALEO- INDIAN?	
4000				
4500	PALEO-INDIAN	X		
5000				
5500				
6000				
6500				
7000				
7500				
8000				
8500				
9000				
10,000				
10,500				
11,000				
11,500				

Artifact Assemblage

Analysis beyond general field categories has yet to be completed on the artifacts from Cathlapotle. At least 7000 artifacts have been recovered at this writing, not counting the far greater counts of debitage and faunal items that have yet to be quantified. Generally, the assemblage appears to have many of the same artifact types reported from sites elsewhere in the Wapato Valley (e.g., 35CO5). Additionally, field observations indicate that the lithic tool and bone tool technologies at Cathlapotle are similar to the Meier Site technologies. Specifically, the fine-grained lithic technology is based on the collection and storage of locally occurring alluvial cobbles that are expediently reduced

for the manufacture of a variety of flake tools and small arrow points. In contrast, the bone tool technology is best described as curated, characterized by long lasting tools made with more effort. Unfortunately, perishable plant material (wood, matting, and cordage) is not as well preserved, leaving little in the form of tools or basketry.

The artifact types at Cathlapotle are common to the Multnomah Phase (AD 200-1835). Few artifact types common to the Merrybell Phase (600 BC- AD 200) (Pettigrew 1977:323) have been identified in the assemblage. This is consistent with radiocarbon dates that span the period AD 1200-1800. There is a prominent assemblage of historic trade items.

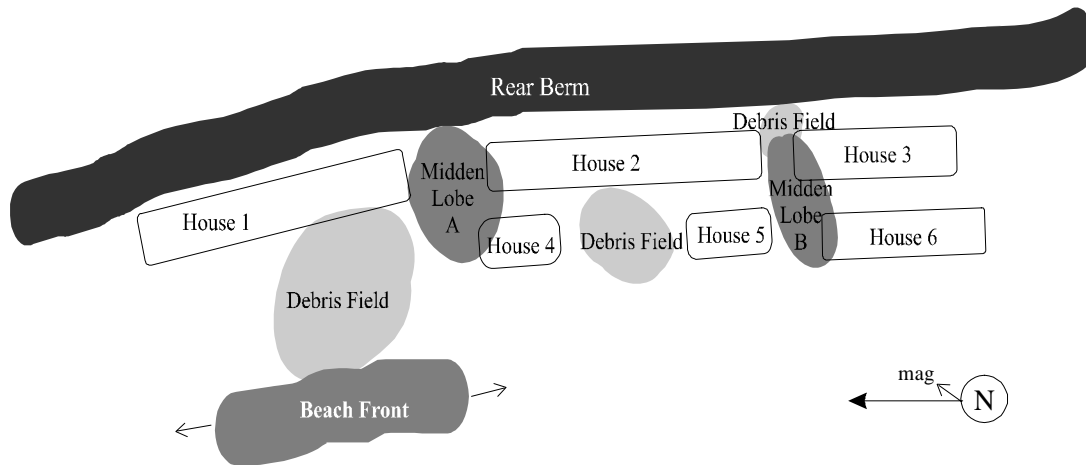


FIGURE 59.
SCHEMATIC ILLUSTRATION OF MAJOR SITE FEATURES.
SEE TOPOGRAPHIC MAPS FOR SCALE (FIGURES 7, 8, 9).

Artifacts are differentially distributed throughout the site. The heterogeneous nature of artifact densities is a result of a myriad of possible cultural site formation processes related to town activities such as food processing and storage, refuse disposal, and house construction. Spatial analysis will be a component of many studies of the Cathlapotle data.

Faunal Assemblage

Analysis of fish, bird, mammal, and other animal remains from Cathlapotle is ongoing (Table 7). Our investigations focus not only on the standard measures of diversity and taxonomy, but also on such problems as taphonomy and seasonality. The generally-excellent preservation at Cathlapotle makes such a wide-ranging research program possible.

In their preliminary report on the 1994 mammalian, reptilian, and avian remains, Church and Lyman concluded that a larger sample of faunal material than was collected in the 1994 field season was necessary to accurately describe the taxonomic diversity and richness of the archaeofaunal assemblage (Church and Lyman, n.d.). Furthermore, an analysis of Meier Site materials revealed that significant spatial variation in faunal taxa could be expected at Cathlapotle. These considerations guided some of our decision-making regarding sampling in 1995 and 1996 excavations (see above). Lyman and Church are currently studying the

1995 and 1996 excavations to evaluate our sampling strategy.

Church and Lyman's report on the 1994 fauna provides some interesting (but preliminary) information. The assemblage contains a total of 18 genera. These include large, medium, and small mammals. No reptilian remains have been observed, but a larger sample is expected to produce at least turtle. In the 1994 sample (see Table 7), the highest number of identified species (NISP) is elk (*Cervus elaphus*: n=441) followed closely by deer (*Odocoileus* spp: n=399). All other taxa identified to the genus level have less than 70 NISP. These are primarily medium sized mammals, although black bear (*Ursus americanus*) is a significant exception with an NISP of 24. Eight of the taxa exhibit evidence of butchering. This number is expected to increase as analysis proceeds. As discussed, the richness and diversity of faunal remains is anticipated to increase with sample size.

The 18 genera identified in the faunal sample are typical of other Portland Basin sites (compare with Table 3), but the Cathlapotle assemblage is unique in that wapiti (elk) remains outnumber deer remains. The assemblage difference may be explained in many ways including ecological, subsistence, taphonomic and sample bias or any combination of these. Additional analysis and a larger sample are necessary to adequately determine the causes of the disparity.

TABLE 7.
SUMMARY OF AVIAN AND MAMMALIAN FAUNAL REMAINS FROM CATHLAPOTLE (45CL1)
IDENTIFIED TO AT LEAST TAXONOMIC GENUS.

TAXONOMIC NAME	Common Name	NISP	Butchery	Gnawed Marks
<i>Aves</i>	bird	(176)	-	-
<i>Sylvilagus bachmani</i>	brush rabbit	1	-	yes
<i>Aplodontia rufa</i>	mountain beaver	16	-	-
<i>Castor canadensis</i>	beaver	43	yes	-
<i>Peromyscus</i> spp.	deer mouse	1	-	-
<i>Ondatra zibethicus</i>	muskrat	50	yes	yes
<i>Erethzion dorsatum</i>	porcupine	1	-	-
<i>Canis</i> spp.	coyote / wolf / dog	10	-	yes
<i>Canis latrans</i>	coyote	24	-	-
<i>Vulpes vulpes</i>	red fox	2	-	-
<i>Ursus americanus</i>	black bear	24	yes	yes
<i>Procyon lotor</i>	raccoon	69	yes	-
<i>Bustela vison</i>	mink	3	-	-
<i>Lutra canadensis</i>	river otter	10	yes	-
<i>Felis concolor</i>	cougar	5	yes	yes
<i>Lynx</i> spp.	bobcat / lynx	3	-	-
<i>Phoca bitulina</i>	harbor seal	2	-	yes
<i>Odocoileus</i> spp.	deer	399	yes	yes
<i>Cervus elaphus</i>	wapiti (elk)	441	yes	yes

Butler and Corcoran have produced a brief report on the 1994 Cathlapotle fish remains (Butler and Corcoran n.d.). According to a preliminary analysis, the fish remains are differentially distributed across the site, with sampling methods controlled. The highest density of fish remains is in unit N75-77/W76-78, the midden accumulation berm between Depression 2 and Depression 3, where excavators encountered veritable “beds” of fish bone.

The assemblage is comprised of a variety of taxa common to archaeological sites in the Wapato Valley (Saleeby 1983). The prominent taxa are salmon, sturgeon, and smelt. Also represented are stickleback (*Gasterosteidae*) and minnows (*Cyprinidae*). Butler and Corcoran suggest that, based on vertebral measurements, the Cathlapotle salmonids were very large.

In sum, it is clear that the Cathlapotle fauna are varied, abundant, well-preserved, and deserving of specialist attention. At this writing, one MA thesis is addressing the Cathlapotle fish, while one PhD. dissertation is underway with analysis of the mammalian fauna.

Botanical Assemblage

Although wood and fiber tools are not well preserved, 45CL1 has excellent preservation of smaller plant remains (Table 8). In a preliminary report, Nancy Stenholm states that Cathlapotle has the largest carbon percentage of any site analyzed in her 20 years of research (Stenholm n.d.). The flotation samples have a high of 25% carbon with an average of 6.5% (Table 8), the largest average of any site in the Pacific Northwest.

Table 8 (from Stenholm n.d.) indicates the percent composition of some botanical assemblages of the Wapato Valley, including preliminary figures for a sample from Cathlapotle, which has a rather low score for conifers and a rather high score for hardwoods; this has yet to be investigated in detail.

The abundance of botanical remains should provide significant data in determining such aspects of subsistence as the plant resources used, functions of processing features, and seasonality. The flotation samples produced at least 30 plant taxa, including tissue and

TABLE 8.
THE BOTANICAL ARRAYS (% BY WEIGHT) OF WESTERN WASHINGTON SITES
BY FLORAL CATEGORY.

Site Name	Site Number	FLORAL CATEGORY			
		I	II	III	IV
Cathlapotle	45C11	32	58	9	1
White Lake	45K1421 & 45K1438A	14	49	14	24
Allentown	45K1421	63	17	17	3
Duwamish No. 1	45K123	67	11	12	10
West Point Plant	45K1428	69	20	3	8
West Point Plant	45K1429	71	19	2	8
Daishowa Mill	45CA415	68	24	2	6
North Nemah Bridge	45PC101	82	9	6	6
Chester Morse Lake	45K1125	77	14	1	7
Burton Creek Rockshelter	45LE266	86	14	1	5
Laysar Cave	45LE223	37	25	2	36
Naches Lithic Scatter	CR05-07-31	94	2	1	4

I = Conifer, II = Hardwood, III = Edible Tissue, IV=Other Material

charred specimens. The seeds and roots thus far analyzed suggests four seasons of collection, storage, and use. As expected, the botanical materials also indicate use of a broad range of habitats within the Wapato Valley and uplands.

The most apparent taxa absent in the sample is wapato, a plant that is assumed to have been heavily used by people in the Wapato Valley. It is unclear why wapato has not been found at 45CL1. Probably for similar reasons, Wapato is also noticeably missing from most, if not all, archaeological assemblages of the Wapato Valley.

Research Plan

The Cathlapotle project is seen as having at least two phases. Phase I was the preliminary testing phase of the Cathlapotle Site. This included locating the site, testing it, and then carrying out extensive and statistically-representative excavations. Phase I was concluded with the end of the 1996 excavation season. Phase II will incorporate and organize the many spe-

cialist analyses currently addressing the Cathlapotle data. Most analyses are either MA or PhD projects; they are thorough, but laborious. We feel the need to stress that this report contains preliminary Phase I results only. Nevertheless, these results are sufficient to meet management needs and to develop a long term research plan. We believe we have shown that 45CL1 is an extraordinary archaeological site, deserving of special attention and programs.

Management and Scientific Goals

Site-Specific Goals. The Phase I archaeological investigations at 45CL1 were initiated by the United States Fish and Wildlife Service to :

1. Locate Cathlapotle. Given the evidence presented, 45CL1 is the only viable candidate.
2. Determine the horizontal and vertical extent of the site. The site is approximate 15,000 square meters in area and varies between 1.5 and 2 meters deep.

3. Establish the stratigraphic integrity of the deposits. The site is deeply and intricately stratified. The stratigraphy is a complex combination of cultural stratigraphy produced by the construction and occupation of the houses and related activities and a dynamic alluvial regime. Stratigraphic reversals appear to be common.

4. Evaluate the condition of the site and its contents. Aside from some minor surface disturbance due to collecting and road building across its extreme northern end, the site is in extraordinarily good condition. Microstratigraphy representing dividing walls within the once standing houses is present, for example.

5. Establish the site's age. The site spans a period from ca. AD 1000 to perhaps the 1860s. We have firmly demonstrated that the site spans a period from well before the contact period well into the nineteenth century. Cathlapotle provides an unparalleled vantage point from which to study archaeologically the effects of contact on one Native community.

6. Map the site in detail. This has been done, though the present 20 cm contour map needs to be revised to a 10 cm contour.

Related Topics

1. We have clearly shown that the depressions are the remains of houses, not the results of alluvial dynamics.

2. It is clear that the topographic features at 45CL1 relate to functional differences in site usage. We have also demonstrate that there are buried features that have no surface indications. The excavation data and the faunal analyses, particularly of the fish, show that the deposits are extremely heterogeneous.

3. We have established the basis for construction of a depositional and site formation model for 45CL1 that can be tested and evaluated in further excavations, and that can be used to explicate our results.

4. We have initiated a major program in radiocarbon dating. It is clear that geological correlations across the site without benefit of radiocarbon dates or time-stratigraphic markers is extremely risky.

5. The extraordinary faunal and floral records will permit a detail reconstruction of the community's subsistence economy. The presence of trade goods, such as iron and possibly fossils, will allow exploration of regional trade.

Outreach Goals

The project has already begun its outreach activities. These involve presentations at Tribal Council and general tribal meetings, letters, and site visits by members of the Chinook Tribal Council. We have given several lectures in the Ridgefield Community and the Portland-Vancouver metropolitan areas, as well as to the Lewis and Clark Trail Heritage Foundation, and we have actively encouraged site visitations.

It is in the areas of Culture History and Environmental Reconstruction that the project can make the most immediate public contributions, both to the public at large, but more specifically to the area's Indian people.

Implications for Future Work

Culture History: Chronology and Sequence

The available chronological and stratigraphic data indicate that it may be possible to isolate three temporal components in some parts of the site: one dating well before contact, one dating to the contact period, and one postdating contact. It may be possible to further subdivide these three periods, depending on the clarity of stratigraphy in portions of the site we have yet to test.

However, the complex stratigraphy may preclude finer subdivisions except in very well controlled circumstances. Be that as it may, this will provide an exceptionally fine-grained chronological sample of the last 1000 years. The site assemblages contain a wealth of time-stratigraphic markers (trade goods) that can be used to date particular portions of the site.

Culture History: European Contact

The effects of European contact, including disease history, the timing of the diffusion of trade goods and the impact of the fur trade, is one of the major issues in the archaeology and history of North America. Cathlapotle

spans that period. We can see the abrupt appearance of glass beads in the deposits. The site is located a short distance downstream from Fort Vancouver, a major Hudson's Bay Company post in the first decades of the nineteenth century. The Hudson's Bay fort has been the subject of continual archaeological research by National Park Service personnel and contractors. It is richly documented in the ethnohistorical record.

The Hudson's Bay archives in Winnipeg, Saskatchewan, have not yet been consulted, but it is possible they may contain extensive information on the site. In our preliminary tests, trade goods are clearly concentrated within a 70 cm thick zone, suggesting it may prove possible to construct a chronology of the entry of trade goods into the Lower Columbia region.

Environmental Reconstruction

Alluvial Chronology

At present, there is no alluvial chronology for the Lower Columbia River. Such a chronology is crucial not only to archaeologists and others working with alluvial deposits in the region, but also for any form of long-term environmental planning. The Cathlapotle deposits should permit construction of such a chronology for at least the last millennium.

Environmental Reconstruction

Pollen cores have been collected from lakes some distance north of Cathlapotle. The area surrounding the site has a number of small permanent lakes which can provide usable pollen cores for reconstructing the evolution of the local vegetation. Faunal and floral preservation at the site is excellent.

The wealth of floral and faunal remains will permit a very detail reconstruction of the biota in the site's catchment area. It is already clear that unusual combinations of flora are entering the site.

Economy

Subsistence

To belabor a point, the extraordinary preservation of ecofacts will permit us to reconstruct the town's sub-

sistence base with considerable clarity. We already have enough data at hand to ask some critical questions. For example: where is the wapato, which is supposed to have been the starch staple. Our deposits appear rich in camas, but no wapato has been recovered here or elsewhere in the basin. Answering that question will require answers about the nature of wapato, site formation processes and so on. Since the site's people appear to have been sedentary hunter-gatherers, their subsistence practices are of considerable theoretical interest.

Additionally, changing subsistence practices, including the relative roles of salmon and other resources in the diet, are major issues in Northwest Archaeology. This sample, coupled with that from the Meier Site, will provide large samples of dietary remains from two permanent settlements in the Wapato Valley which have significantly different site catchments. The potential for a relatively fine-grained chronology suggests it may be possible to monitor relatively short-term subsistence changes, and perhaps even the subsistence effects of contact.

Regional

The Wapato Valley is known to have been on a major trade route running along the Columbia which links the coast with the interior, particularly with the major trade fair at The Dalles, east of the Columbia Gorge. Early European travelers commented on the importance of trade to the people of the Lower Columbia River and their trading skills. Such trade is probably quite ancient. Regional trade in obsidian throughout the Northwest extends back at least 9000 years (Carlson, 1994). Burials predating 7000 BP at Marmes Rockshelter in eastern Oregon contain relatively large numbers of *Olivella* shells, which had to be traded in from the coast.

We already have several lines of evidence for regional interaction at Cathlapotle. An obsidian-sourcing assay conducted by Northwest Research Obsidian Studies Laboratory, in Corvallis, Oregon, has placed the geological origin of some Cathlapotle obsidian to south-central Oregon; some is likely to have come from Northern California (Skinner pers. comm. to E.A. Sobel).

Additionally, the presence of what may be precontact

iron at Cathlapotle is clear evidence of its participation in a far-flung trade system. Cathlapotle also certainly played a role in the fur trade as it developed in the late eighteenth century and early nineteenth century. The presence of trade beads and Chinese porcelain support this theory.

In sum, we expect to examine a wider array of exotic materials with which to document the extent and nature of regional trade during the period of the site's occupation. We also want to explore how the households at the town were integrated into this larger economy during the past millennium, and to what extent they were dependent on it.

Settlement and Land Use Patterns

Village / Towns

Cathlapotle was a multihouse town. Lewis and Clark observed 14 houses and some 900 individuals in March, 1806. We have mapped six large surface depressions that are the remnants of houses. Aside from the Meier Site and 35MU57, there have been no extensive excavations of a Chinookan town below the Columbia Gorge. Salvage excavations at 45SK11 exposed a series of small plankhouses dating to the seventeenth and eighteenth centuries. However, Cathlapotle was a major town. 45CL1 may be one of the best preserved native townsites in the northwest United States.

Household Archaeology

Understanding the organization and evolution of households is a key methodological step in understanding the economy, social organization, etc., of the Northwest's inhabitants. The presence of six large structures on the site's surface will permit us to sample several houses to explore the social and economic status of each house's inhabitants, as well as that of the town as a whole.

Non-Site Areas

We intend to explore — using augering, limited excavations and a variety of geophysical techniques in an effort to locate features away from the main site. Such features could include subsurface ovens, processing

localities, limited occupation sites, etc. Our intention here is to determine how the landscape around the main town was used and to what purposes. This activity, taken in conjunction with those listed immediately above, will provide a basis for interpreting the results of much more limited data collection projects.

As part of this effort we anticipate an ongoing survey effort of the entire refuge.

Site Formation Processes

Virtually all major Northwest Coast residential sites are shell middens, which are notoriously complex and difficult to excavate and interpret. Cathlapotle and the other sites in the Wapato Valley are alluvial sites but are otherwise similar to other Northwest Coast residential sites. The study of the site formation processes at Cathlapotle will permit us to continue the development of models of the site formation processes at work in these residential sites (see Ames et. al 1992).

Theoretical Issues

The project was initiated on the theoretical grounds that a well-documented study of sedentary complex hunter-gatherers would be theoretically very significant. Complex hunter-gatherers (or affluent foragers) are important because they exhibited a variety of sociocultural and economic traits once thought the exclusive province of agriculturalists. These traits including social stratification, complex and bulky technologies, specialization, environmental manipulation, intensive practices of food production, and some degree of sedentism. This is in marked contrast to the usual picture of hunter-gatherers as being very mobile with light, flexible technologies and small fluid social groups. Despite their theoretical importance, complex hunter-gatherers cannot be studied directly, since none presently exist, though they may have been widespread in the past. Indeed, some have argued that they were instrumental in the evolution of agriculture (Hayden, 1991). Hunter-gatherer mobility, including sedentism, is a central problem in hunter-gatherer theory. The Meier Site, Cathlapotle, and other sites in the area provide a situation where there is an archaeological record of exceptional quality from a period which ends with an extensive ethnohistoric record, so the two lines of evidence can be used to complement each other.

Hunter-Gatherer Sedentism

The inhabitants of the Wapato Valley appear to have been sedentary hunter-gatherers, which makes their archaeology of considerable theoretical interest. They also had quite high population densities for hunter-gatherers. The basic theoretical goals of the project involve determining how hunter-gatherers sustain long-term sedentism.

Social Archaeology

The Chinookan people of the Valley, like other Northwest Coast people, were socially stratified. Excavations at the Meier Site demonstrated that it is possible to document aspects of the inhabitants' social and economic organization. We intend to test and expand these insights at Cathlapotle.

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APPENDIX 1
1991-1995 ARTIFACTCOUNTS PER EXCAVATION UNIT

APPENDIX 1.
COUNT OF ARTIFACT TYPES PER EXCAVATION UNIT, 1993-1995, INCLUSIVE.

	N44-45 W89-93	N56-58 W70-72	N75-77 W76-78	N106-107 W77-81	N107-109 W98-100	N136-138 W94-96	N159-160 W83-87	N159-160 W87-91	N159-160 W87-91	N159-160 W91-95
.22 Caliber Shell	0	0	0	0	2	0	0	0	0	0
Abrader	11	0	27	12	10	13	2	5	6	0
Adze	0	0	0	0	0	0	0	0	0	0
Anvil	1	0	0	8	1	1	0	2	0	0
Awl	1	0	4	4	4	2	0	0	1	0
Axe	0	0	0	0	0	0	0	0	0	0
Barb	0	0	0	0	0	0	0	0	0	0
Bead	2	2	1	26	115	10	2	27	106	17
Biface	1	0	25	14	10	12	6	19	10	1
Bowl	0	0	1	2	0	1	1	1	1	0
Bullet	0	0	0	0	0	0	0	0	0	0
Button	0	0	0	0	0	0	0	0	0	0
Chisel	0	0	0	0	1	0	2	0	0	0
Chopper	0	0	0	2	3	0	0	1	0	0
Club	0	0	1	0	0	0	0	0	0	0
Cobble	2	0	5	6	1	1	3	4	1	3
Core	24	0	26	80	36	29	18	26	5	1
Drill (Lithic)	0	0	2	0	0	0	0	0	0	0
Figurine	0	0	1	0	0	0	0	0	0	0
Fossil	0	0	1	0	0	1	0	0	0	1
Uniform Frog	0	0	0	0	0	0	0	0	0	0
Graver	0	0	0	0	0	0	0	0	1	0
Hammerstone	9	0	16	53	9	7	0	22	0	3
Harpoon Toggle	0	0	0	0	3	1	0	0	14	0
Knife	0	0	1	1	1	0	0	0	0	0
Manuport	2	0	3	11	0	1	0	3	0	0
Maul	0	0	1	1	2	0	0	1	3	0
Mortar	0	0	0	0	0	0	0	0	0	0
Nail	0	0	0	0	0	0	0	0	0	0
Needle	0	0	0	0	1	0	0	0	0	0
Netweight	0	0	4	1	5	0	0	1	0	0
Peg	0	0	0	0	0	0	0	0	0	0
Pendant	1	0	0	0	2	1	0	0	0	0
Pestle	1	0	1	0	0	1	0	0	0	0
Phoenix Button	0	0	0	0	0	0	0	0	0	0
Pipe Fragment	0	0	0	0	0	0	0	0	0	0
Point (Bone / Antler)	0	0	6	0	1	0	0	0	0	0
Projectile Point (Lithic)	12	0	52	32	95	28	4	14	24	8
RUM Flake	38	0	50	34	18	24	10	37	16	2
Ring	0	0	0	0	0	0	0	0	1	0
Scraper	18	0	11	11	35	13	3	8	8	1
Sheet (Copper)	0	0	0	0	0	1	0	0	0	0
Shoto Clay	0	0	0	0	0	0	0	0	0	0
Test (Lithic)	0	0	0	0	0	1	0	0	0	0
Thimble	0	0	0	0	0	0	0	0	0	0
Uniface	1	0	0	1	1	1	0	4	0	0
Wedge	1	0	3	0	1	1	0	1	0	0

APPENDIX 1, CONTINUED.
COUNT OF ARTIFACT TYPES PER EXCAVATION UNIT, 1993-1995, INCLUSIVE.

	N159-160 W95-99	N159-160 W99-103	N159-160 W103-107	N159-161 W70-72	N160-164 W88-89	N164-168 W88-89	N168-172 W88-89	N179-181 W101-103	N183-185 W78-80	N52-54 W99-101
.22 Caliber Shell	0	0	0	0	0	0	0	0	0	0
Abrader	3	1	8	1	0	1	4	0	1	3
Adze	1	0	0	0	0	0	0	0	0	0
Anvil	1	1	2	0	0	0	0	1	0	1
Awl	0	2	3	0	0	0	0	3	0	0
Axe	0	0	0	0	0	0	0	0	0	0
Barb	0	0	0	0	0	0	0	0	0	0
Bead	14	17	39	0	23	14	9	8	1	0
Biface	15	22	58	0	1	4	7	10	1	10
Bowl	0	0	2	0	0	0	0	1	0	1
Bullet	0	0	0	0	0	0	0	0	0	2
Button	0	0	0	0	0	0	0	0	0	0
Chisel	0	0	1	0	0	0	0	0	0	0
Chopper	2	0	0	1	0	1	0	0	0	2
Club	0	0	0	0	0	0	0	0	0	0
Cobble	2	0	2	1	1	3	0	3	1	2
Core	11	28	73	0	4	32	7	16	7	6
Drill (Lithic)	0	0	0	0	0	0	0	0	0	1
Figurine	0	0	0	0	0	0	0	0	0	0
Fossil	0	0	0	0	0	0	0	0	0	0
Uniform Frog	0	0	0	0	0	0	0	0	0	0
Graver	0	0	0	0	0	0	0	1	0	0
Hammerstone	2	3	12	0	2	4	3	8	9	2
Harpoon Toggle	0	0	2	0	0	0	0	0	0	0
Knife	0	0	0	0	0	0	0	0	0	2
Manuport	3	1	2	0	0	2	2	0	0	3
Maul	0	0	1	1	0	0	0	0	1	0
Mortar	0	0	0	0	0	0	0	0	0	0
Nail	0	0	0	0	0	0	0	0	0	0
Needle	0	0	0	0	0	0	0	0	0	0
Netweight	0	0	1	0	0	0	1	0	1	6
Peg	0	0	1	0	0	0	0	0	0	0
Pendant	0	1	1	0	1	0	0	0	0	0
Pestle	0	0	0	0	0	0	0	0	0	0
Phoenix Button	0	0	0	0	0	0	0	0	0	0
Pipe Fragment	0	1	0	1	0	0	0	0	0	2
Point (Bone / Antler)	1	0	0	0	0	0	0	1	0	7
Projectile Point (Lithic)	43	51	62	1	3	15	17	22	1	33
RUM Flake	13	25	73	0	3	15	15	10	3	9
Ring	0	1	4	0	0	0	1	0	0	0
Scraper	24	18	32	0	0	3	7	12	0	9
Sheet (Copper)	0	0	0	0	0	0	0	0	0	0
Shoto Clay	0	0	0	0	0	0	0	0	0	0
Test (Lithic)	0	0	0	0	0	0	0	0	0	0
Thimble	0	0	0	0	0	0	0	0	0	0
Uniface	3	4	6	0	0	1	1	2	0	0
Wedge	1	0	1	0	0	0	0	0	0	0

APPENDIX 1, CONTINUED.
COUNT OF ARTIFACT TYPES PER EXCAVATION UNIT, 1993-1995, INCLUSIVE.

	N52-54 W101-103	N52-54 W103-105	N56-58 W70-72	N70-72 W93-95	N120-122 W96-98	N124-126 W96-98	N128-130 W96-98	N132-134 W96-98	N136-138 W96-98	N138-140 W86-88
.22 Caliber Shell	0	0	0	0	0	1	0	0	0	1
Abrader	11	5	0	3	10	2	4	4	8	20
Adze	0	0	0	0	0	0	0	0	0	0
Anvil	0	0	0	0	0	2	0	1	0	1
Awl	0	1	0	0	2	0	0	1	0	0
Axe	0	0	0	0	0	0	0	0	0	0
Barb	0	0	0	0	2	0	0	0	1	0
Bead	2	1	2	0	21	15	20	16	0	13
Biface	7	4	0	7	16	5	9	19	6	34
Bowl	0	0	0	0	1	2	2	0	1	0
Bullet	0	1	0	0	0	0	0	0	0	0
Button	0	0	0	0	0	0	0	0	0	0
Chisel	0	0	0	0	0	0	0	0	0	1
Chopper	0	0	0	0	3	2	0	0	0	0
Club	0	0	0	0	0	0	0	0	0	0
Cobble	3	17	0	1	3	2	1	0	0	5
Core	4	11	0	3	7	7	8	0	4	25
Drill (Lithic)	0	1	0	0	0	0	0	1	0	0
Figurine	0	0	0	0	0	0	0	0	0	0
Fossil	0	0	0	0	0	0	0	0	0	0
Uniform Frog	0	0	0	0	0	0	0	0	0	0
Graver	0	0	0	0	0	0	0	0	0	0
Hammerstone	2	3	0	0	14	8	9	8	1	6
Harpoon Toggle	0	0	0	0	2	0	0	0	0	0
Knife	0	1	0	1	1	1	0	0	0	1
Manuport	2	0	0	2	1	1	0	5	0	0
Maul	1	0	0	0	0	1	0	0	1	1
Mortar	0	0	0	0	0	0	1	0	0	0
Nail	1	1	0	0	1	0	0	0	0	0
Needle	0	0	0	0	0	0	0	0	0	0
Netweight	0	1	0	0	1	3	0	0	1	0
Peg	0	0	0	0	0	0	0	0	0	0
Pendant	0	0	0	1	1	1	0	0	0	0
Pestle	0	0	0	0	0	1	0	0	0	0
Phoenix Button	0	0	0	0	0	0	0	0	0	1
Pipe Fragment	0	0	0	0	0	0	2	1	0	0
Point (Bone / Antler)	4	4	0	7	10	3	7	10	5	15
Projectile Point (Lithic)	18	17	0	31	35	10	30	42	16	49
RUM Flake	12	24	0	11	28	9	12	15	10	49
Ring	0	0	0	0	1	0	0	0	0	0
Scraper	14	14	0	8	24	8	4	7	4	15
Sheet (Copper)	0	1	0	0	1	0	0	1	0	0
Shoto Clay	0	0	0	0	5	2	14	4	0	2
Test (Lithic)	0	0	0	0	0	0	0	0	0	0
Thimble	0	0	0	0	0	0	0	1	0	0
Uniface	0	0	0	0	0	0	0	0	0	1
Wedge	0	0	0	0	0	1	0	0	0	1

APPENDIX 1, CONTINUED.
COUNT OF ARTIFACT TYPES PER EXCAVATION UNIT, 1993-1995, INCLUSIVE.

	N147-149 W86-88	N149-151 W84-86	N151-153 W86-88	N153-155 W86-88	N155-157 W84-86	N159-160 W107-111	N160-162 W84-86	N160-164 W87-90
.22 Caliber Shell	0	0	0	0	0	0	0	1
Abrader	6	14	11	9	5	0	7	2
Adze	0	0	1	0	0	0	0	0
Anvil	1	2	0	5	2	0	3	0
Awl	0	0	0	0	0	0	0	0
Axe	1	0	0	0	0	0	0	0
Barb	0	0	0	0	0	0	0	0
Bead	11	20	13	0	3	2	23	14
Biface	12	18	8	6	19	6	9	9
Bowl	0	2	3	2	0	0	0	0
Bullet	1	0	0	0	0	0	0	0
Button	0	0	0	0	0	0	0	0
Chisel	0	0	0	0	0	0	0	0
Chopper	3	1	0	3	0	0	2	2
Club	0	0	0	0	0	0	0	0
Cobble	5	15	5	4	5	0	47	6
Core	26	46	13	15	31	0	26	9
Drill (Lithic)	0	1	0	2	1	0	0	0
Figurine	0	0	0	0	0	0	0	0
Fossil	0	0	0	0	0	0	0	0
Uniform Frog	0	0	0	0	0	0	0	0
Graver	0	0	0	0	0	0	0	0
Hammerstone	4	35	11	19	9	0	25	2
Harpoon Toggle	0	0	2	0	0	1	1	0
Knife	0	4	0	0	1	0	0	0
Manuport	2	8	1	4	2	0	17	6
Maul	1	1	1	4	0	0	2	0
Mortar	0	0	1	0	0	0	0	0
Nail	0	0	1	0	0	0	0	0
Needle	0	0	0	0	0	0	0	0
Netweight	5	3	0	3	4	0	3	2
Peg	0	0	0	0	0	0	0	0
Pendant	3	0	1	0	1	0	0	0
Pestle	0	0	0	0	0	0	0	0
Phoenix Button	1	0	0	0	0	0	0	0
Pipe Fragment	0	0	2	0	0	0	1	0
Point (Bone / Antler)	8	11	4	4	7	1	5	3
Projectile Point (Lithic)	16	60	25	28	35	9	15	25
RUM Flake	30	77	44	11	33	1	19	37
Ring	0	1	0	0	0	0	0	0
Scraper	10	31	18	10	13	1	6	5
Sheet (Copper)	1	0	0	0	0	0	0	0
Shoto Clay	1	3	0	0	10	0	0	0
Test (Lithic)	0	0	0	0	0	0	0	0
Thimble	0	0	0	0	0	0	0	1
Uniface	0	0	0	0	1	0	0	0
Wedge	0	3	0	1	0	0	3	1

APPENDIX 2
INFORMAL EXCAVATION PHOTOGRAPHS



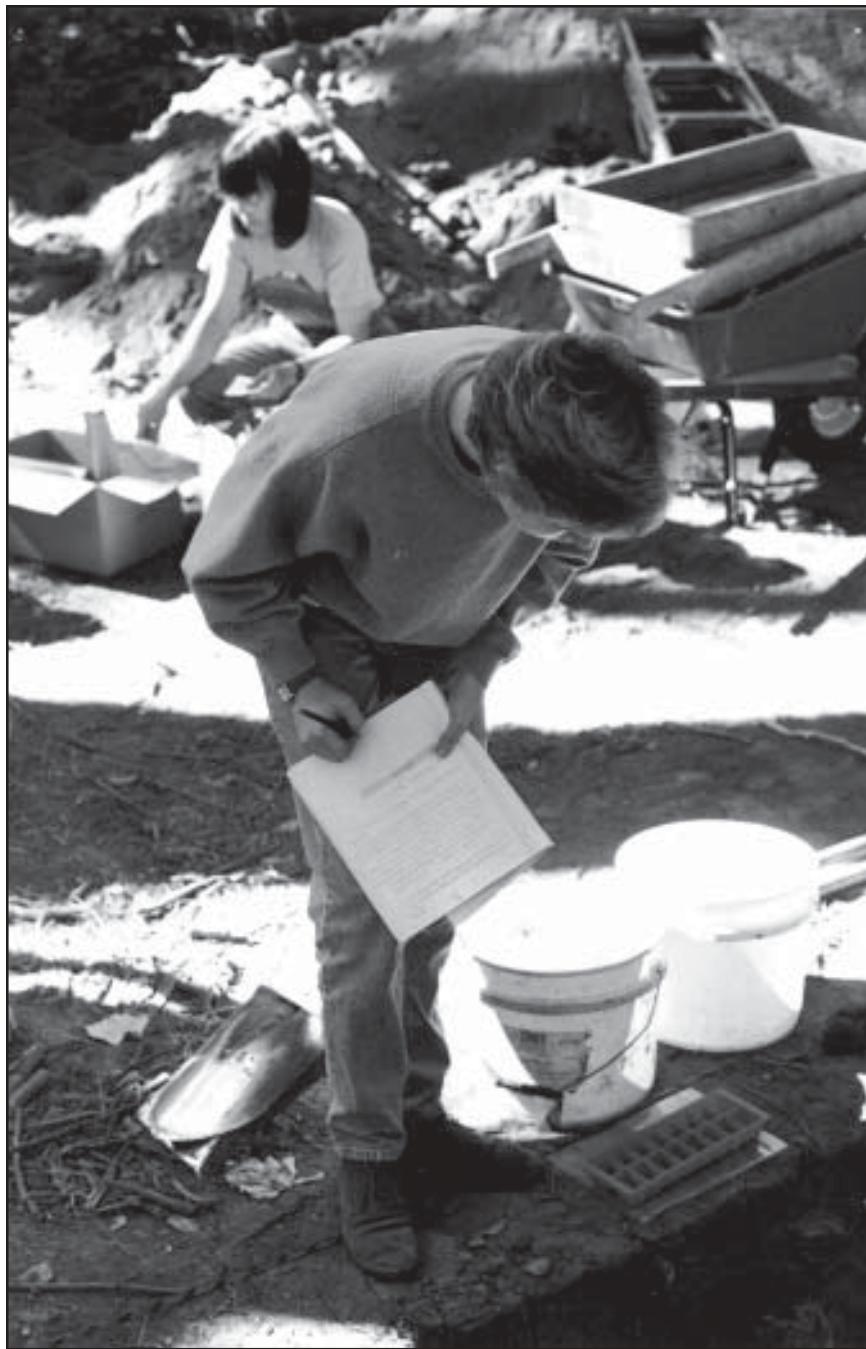
APPENDIX 2, PLATE 1:
1994 TRENCH DURING EXCAVATION.



APPENDIX 2, PLATE 2:
ASIDE FROM THE MOSQUITOS, THE DAPPLED SUNLIGHT AND HEAVY FOLIAGE PROVIDE A PLEASANT WORKING ENVIRONMENT.



APPENDIX 2, PLATE 3:
AT WORK AMONG THE COTTONWOODS OF SITE RIDGE.



APPENDIX 2, PLATE 4:
CAROLYN JOLLY TAKES NOTES DURING THE 1994 EXCAVATION.
