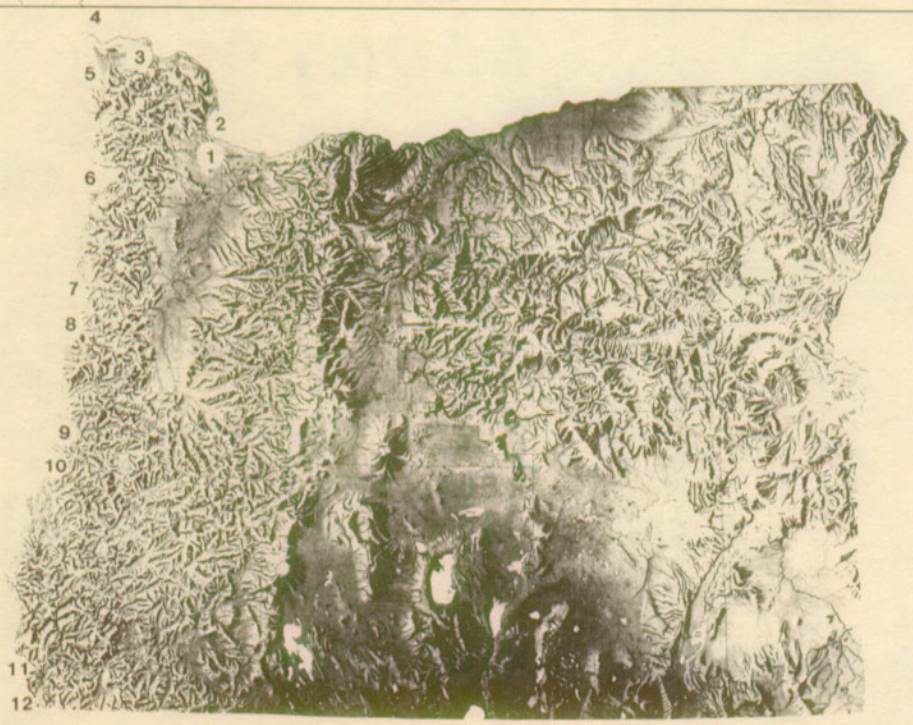
Chapter 4

Pacific Coast and Lower Columbia River

Native cultures of the Oregon Coast and Lower Columbia River belonged to the greater Northwest Coast area, which extends from Yakutat Bay, Alaska, on the north to Cape Mendocino, California, on the south (Figure 4.1). The Pacific Coast and Lower Columbia River, though at first glance quite different environmental settings, share many plant and animal species that were important to human subsistence and industry. Correspondingly, the traditional cultures which grew in these two settings exhibit many common characteristics and a shared history.

The Lower Columbia was occupied by Chinookan people. All speaking closely related languages, the Chinook, Clatsop, Cathlamet, Skiloot, Multnomah, Clackamas, Cascades, and Wasco extended from the river's mouth upstream as far as The Dalles, where the Northwest Coast and Columbia Plateau culture areas touched. The Clatsop range also extended for some miles south along the coast, from the river mouth as far as Tillamook Head. Beyond them lived the Nehalem, Tillamook, Nestucca, Salmon River, and Siletz people, all speaking languages of the Salishan phylum. Farther south were the Yaquina and Alsea, and beyond them the Siuslaw and Lower Umpqua. Adjacent to the Lower Umpqua people were the Hanis and Miluk. All of these people spoke languages belonging



Key to Sites

1 – Meier
2 – Sauvie Island, Cholick, Merrybell
3 – Eddy Point, Ivy Station
4 – Fishing Rocks
5 – Palmrose, Avenue Q, Par-Tee
6 – Tillamook
7 – Yaquina Head
8 – Seal Rock, Whale Cove
9 – Tahkenitch Landing
10 – Umpqua-Eden
11 – Lone Ranch Creek
12 – Pistol River

Figure 4.1 Map showing site locations in the Pacific Coast and Lower Columbia River region.

to the great Penutian phylum. Beyond them the Upper Coquille, Kwatami, Tututni, Chetco, and Tolowa, all speaking closely related Athabaskan languages, extended into northern California. The high degree of linguistic diversity in this cultural area is striking.

Northwest Coast culture was most elaborated in the north, where the deeply fjorded coasts and numerous offshore islands of British Columbia and southern Alaska created a sheltered natural setting of extraordinary biotic richness. The natural abundance, readily harvested in the protected waters of the region, supported a considerable human population that gathered in large settlements. Along the straight, open Oregon Coast, directly exposed to the energy of the north Pacific, protected bays and estuaries were far fewer; correspondingly, both the relative richness of the natural harvest, and human population density, were much less. The Lower Columbia River Valley was, however, an important exception to the general Oregon pattern. Its protected and highly productive inland waters supported a dense population in numerous villages. These extended from the river mouth upstream through the Portland Basin and Columbia Gorge as far as The Dalles, just east of the Cascades.

All groups shared a broadly similar way of life, though local variations definitely existed. The roots of this marine/riverine culture can currently be traced about 8000 years into the past, but the earliest evidence is very thin, and much remains to be learned through further investigation.

Ethnographic Life Way

Ethnohistoric accounts of the coastal and river people show that their annual round was much the same throughout the region. South of the Coquille River mouth, a broad coastal plain and warmer climate contrast with the drowned coastline and cooler climate of the north. But people depended on the same range of plants and animals, and the seasons for exploiting individual species were about the same everywhere, governed by the rhythms of nature. The Alsea, dwellers of the north-central coast, obtained their subsistence in ways common throughout the region:

> Chinook salmon entered the coastal rivers in midsummer, followed by coho and dog salmon in the early fall. The steelhead trout, which is often grouped with salmon, was an additional sea-run fish prized for its flesh that was taken in the late fall through winter months. Smelt, herring, flounder, perch, and lamprey eels were also harvested as available throughout the year. Clams, mussels, crabs, and sea anemones were collected by the women from estuaries, tide pools, and bays.

Sea mammal hunting was apparently confined to offshore rocks where seals and sea lions congregated; there they were clubbed or harpooned. Whale hunting was considered too dangerous, according to informants interviewed by Drucker (1943), although the occasional beached whale was highly prized for the oil rendered from its blubber.

Although their land was rich in game, the Alsea did not extensively exploit this source of food. Hunting was considered "an adventuresome way of augmenting the fish diet (Drucker 1943: 83)", and was not pursued with the same vigor as fishing. Deer and elk were stalked along trails or at small forest clearings, especially during the summer when the animals were in fine flesh. Dogs were occasionally used in the hunt to hold an animal at bay until the hunter was within bowshot. Pitfalls were sometimes excavated to capture elk, a prized game animal, but the time required for preparation of the pits limited their use considerably. Less attention was given to other game, although it is reported that beaver were dug out of dens and clubbed, and that small fur-bearing mammals were shot with the bow. Quail and grouse were caught in basket traps, and waterfowl were shot. Children used a slip noose to catch seagulls, and seagull and cormorant ("shag") eggs were collected as a food resource.

A wide range of plant foods including roots, greens, berries, fruits, seeds, and nuts gave additional variety to the diet. Camas was dug in great quantities from summer through fall, with the surplus being prepared for winter storage. Roots of plants such as skunk cabbage and ferns were harvested in the spring. Salmonberries, blackberries, huckleberries, and strawberries, which grew in profusion along the coast, were important food supplements. Each was collected in its proper season, along with various greens. Acorns were also harvested in small quantities back from the coast. Tobacco was grown at sheltered plots away from the village; it was mixed with dried kinnikkinnik leaves for smoking. (Minor et al. 1980: 86).

Broadly speaking, a bi-seasonal subsistence cycle was practiced by all Northwest Coast cultures. From early spring through fall, village members would disperse into small temporary camps near resource areas, living on what they obtained and processing stores for winter. There were of course comings and goings between the village and its satellite camps; the main village was probably never wholly abandoned, but its population must have been much depleted at busy times. In late fall through winter,

the whole populace reassembled in the main village. This was predominantly a time of repairing and manufacturing equipment, with some fishing, hunting, and collecting of shellfish to supplement dwindling winter stores.

Dwellings, very similar in type throughout the region, were large houses of wooden planks built over excavated pits. Size varied according to the number of people in a group, with multiple-family occupation the rule. An early description of Chinook long houses by Franchere provides a graphic account of this regional house type, though it must be remembered that the unusual population density and wealth of the Chinooks fostered the construction of larger buildings than were common elsewhere in the coastal zone of Oregon:

> Their houses, constructed of cedar, are remarkable for their form and size: some of them are one hundred feet in length by thirty or forty feet in width. They are constructed as follows: an oblong square of the intended size of the building is dug out to the depth of two or three feet; a double row of cedar posts is driven into the earth about ten feet apart; between these the planks are laid, overlapping each other to the requisite height. The roof is formed by a ridgepole laid on taller posts, notched to receive it, and is constructed with rafters and planks laid clapboard-wise, and secured by cords for want of nails. When the house is designed for several families, there is a door for each, and a separate fireplace; the smoke escapes through an aperture formed by removing one of the boards of the roof. The door is low, of an oval shape, and is provided with a ladder, cut out of a log, to descend into the lodge. The entrance is generally effected stern foremost (Franchere 1967:247-248).

Historic accounts all agree that the native settlements practiced a high degree of local autonomy. Each major village, with its satellites, was politically independent of all others; while there was naturally intercourse between settlements, there was no overarching organization of authority. Relations between villages essentially were maintained as relations between separate nations. Common interests were served, and alliances formed, through trade relationships and marriage.

Far-reaching similarities in material artifacts link historic and prehistoric cultures. A large inventory of tools and equipment was in use, including many items of perishable material not often found archaeologically. Hunting tools, fishing tools, woodworking tools, and objects of ornamentation and ceremony all attest strong continuity between past and present.

Natural Landscape

The Oregon Coast and Lower Columbia Valley form a natural unit in many respects. They share the same cool, mild climate, with abundant rain and a narrow temperature range, and much the same spectrum of plant and animal species. Wooded hills are dominated by the Douglas-fir, which occurs both in vast unmixed stands, and in mature forest mixed with western hemlock, western red cedar, and other coniferous species. Sitka spruce is common in the coastal fog belt. Along streams the deciduous red alder, bigleaf maple, and Oregon ash are common. Various ferns, salal, huckleberry, salmonberry, and other low-growing plants constitute the dense understory vegetation of the region. Terrestrial fauna includes elk, deer, bear, jackrabbit, brush rabbit, beaver, various squirrels and other rodents, raccoon, otter, and various members of the weasel family. Many kinds of waterbirds and inland species are to be found there as well, the region being in the heart of the Pacific Migratory Flyway.

Fishes were of course abundant throughout the area, and present in great variety. Salmon were of primary importance to both coastal and riverine peoples, but many other anadromous species, including steelhead trout, eel, and sturgeon were also prized. Strictly marine fishes, such as ling cod, halibut, flounder, and various small rockfish were taken as well. Sea mammals, especially seals, were available both along the coast and in the interior rivers during the salmon season, when they followed migrating fish upstream. Finally, shellfish of both fresh and marine waters were abundant and could be gathered in quantity at many places.

These similarities in the natural resource base no doubt account for the general sharing of a common fishing, hunting, and gathering technology among the native peoples of both river and seashore. Broadly speaking, Northwest Coast culture in general is an adaptation to this biota, available in varying abundance from Cape Mendocino in California to Yakutat Bay in Alaska. Local geography has great effect, however, on the relative abundance and accessibility of key resources in different areas. A major contrast is evident in the general richness of the Lower Columbia Valley as compared to the Oregon Coast.

The 170 miles or so of the Lower Columbia River, from The Dalles to Clatsop Spit on the Pacific, is particularly rich in fish. Five species of anadromous salmon funnel into the river from early spring to early fall, headed for spawning grounds throughout thousands of miles of streams in the vast Columbia drainage. Smelt and eels similarly run upriver.

Being newly derived from the sea, the fish of the lower river are in the finest condition. Additionally, various freshwater fishes are available on the Lower Columbia the year around. The open coast, by contrast, is swept by strong seas and has few large estuaries and protected bays that concentrate aquatic species in the way the Lower Columbia does. The coastal rivers flowing into the Pacific are short, with tributary systems and spawning grounds of comparatively limited extent. Their salmon harvest—though potentially rich—simply does not compare with that available along the Lower Columbia. These factors had their effect on the relative wealth and numbers of the human population, which was at least several times as densely concentrated along the Lower Columbia as along the Pacific shore. It has been estimated that some 22,000 people lived along the Lower Columbia in early historic times, as compared with only half that number along the entire Oregon Coast (Kroeber 1939:133, 136).

Time and Environmental Change

The present relationship between land and sea, with its corresponding local patterns of plant and animal distribution, seems to have been established about 3000 years ago. River valleys drowned by the sea to form long, deep estuaries are a dominant feature of the modern environment. The native cultures strongly reflected this setting, dependent as they were on its particular food and industrial resources. To trace the development of these cultures it is therefore necessary to explore not only the archaeology, but also the dynamic history of the natural environment.

During the glacial period, when much of the earth's water was locked up in great ice sheets on the land, worldwide sea levels were lower than they are now. The Oregon coastline then lay farther westward than it does at present. With postglacial warming, which was well underway by 11,000 BP and reached a peak between 8000 and 4000 BP, water stored as ice on the continents melted back into the oceans. This resulted in a worldwide rise in sea level of 300 to 400 feet.

The date at which Oregon's Pacific coastline became stabilized near its modern level is becoming more closely known through paleoenvironmental research. Logically, sea-level stabilization should date from the time when a climatic regime comparable to today's was finally established. According to pollen studies over a broad area of the Northwest, this transition took place some time around 4000 BP (Hansen 1947; Heusser 1960; Flint 1971). Geological evidence adds to this picture. For example, sediment cores and other evidence from Alsea Bay show

that before about 7500 years ago the present Alsea River estuary was occupied by a high gradient stream. By 5000 years ago, rising sea level had drowned the channel, forming a deep-water estuary. Since that time the present shallow-water environment has formed as sediment borne down the rivers was dropped in the slow waters of the estuary (Peterson et al. 1984).

The history of sea-level rise goes far to explain the scarcity of evidence for very early human occupation along the Oregon Coast. Sites that might have existed along the shoreline in early postglacial times would have been surf-beaten and destroyed by the sea as it rose to its present level. A similar fate would have befallen any early sites too near the mouth of the Columbia River, as its waters rose in concert with the level of the sea. Even since the time of sea-level stabilization, archaeological sites have surely been destroyed or hidden by ongoing erosion of headlands and shorelines, shifting of sandspits, and local subsidences. But environmental dynamics did not affect only the archaeological record, they also affected the lives of prehistoric human residents directly, as evidence to be recounted below will demonstrate.

Cultural Chronology and Time Markers

Earliest human occupation in the region probably dates back to the Clovis Paleo-Indian period, or fluted point horizon, of about 11,500 BP. The base of a Clovis fluted point found on the surface at Siltcoos Lake on the central Oregon Coast, and several other fluted points found in far western Oregon and Washington, show that these early people occupied the coastal zone. Human presence after this period is demonstrated by the Youngs River Complex, known by surface finds made near the mouth of the Columbia. Characterized by large lanceolate, leaf-shaped, and stemmed projectile points, this complex is estimated to date between about 10,000 and 5500 BP. The time range is suggested on the basis of dates from the Plateau for similar specimens, which there span the early Windust, Cascade, and Tucannon phases. On the southern Oregon Coast a "Bluff Site" complex, including comparable types as well as other specimens, probably spans a similar period, and may have persisted longer (Minor 1989a: 4-6).

A more finely divided cultural sequence spanning the last 2500 years has been developed for the Lower Columbia Valley, based on ^{14}C-dated excavations at sites near Portland (Pettigrew 1981). Diagnostic point types from the Portland Basin are very similar to specimens from the Oregon Coast, allowing the same chronology to be used in both areas.

The Merrybell Phase, 2500-1750 BP, is marked by side-notched, corner-notched, and lanceolate points of medium size, with broad stems. These were probably used as atlatl dart points. The Multnomah I sub-phase, 1750-700 BP, is marked by small, triangular corner-notched points having narrow stems; these are clearly arrowpoints. The Multnomah II sub-phase, 700-200 BP, is marked by small, side-notched projectile points of a distinctive type recognized throughout the west as Desert Side-notched. Small, unnotched, triangular points also accompany this type. The Multnomah III sub-phase, 200-100 BP, is recognized by the appearance of Euro-American trade goods in aboriginal assemblages.

These projectile point types are illustrated in Figure 4.2. The fact that they were shared so widely along the Columbia River and Pacific Coast of Oregon reflects the continued interaction and sharing of mutually usable information and ideas that would be expected among people relying on the same kinds of natural resources and practicing the same kinds of economic activities. For example, in ethnographic times the Tillamook of the north coast arranged marriages with their Clatsop and Alsea neighbors, so that kinship networks spanned considerable distances, even crossing language barriers. Historically, too, Tillamook parties raided southward down the coast to capture slaves, who were traded to Clatsop, Chinook, and Chehalis peoples along the Lower Columbia (Beckham 1977).

Tahkenitch Landing

About midway between the towns of Florence and Reedsport is Tahkenitch Landing, which gives evidence of human occupation on the central Oregon Coast going back some 8000 years (Minor and Toepel 1986). Its discovery was a major breakthrough, for prior to that the earliest datable evidence for the coastal zone was only about 3000 years old. The locality is now a canoe landing within the U.S. Forest Service campground at Tahkenitch Lake, in the Oregon Dunes National Recreation Area. Government Land Office surveyor's notes from 1858 record a native canoe landing in the same place, and a village on the opposite shore of the lake. This section of the coast is the traditional territory of the Lower Umpqua, a Penutian-speaking group.

Tahkenitch Lake now fills the old estuary of a small river flowing out of the steep, rugged Coast Range. The Tahkenitch Landing site occurs along the base of a small sandstone knob slightly elevated with respect to the adjacent flats. A shell midden containing artifacts is about 150 feet wide

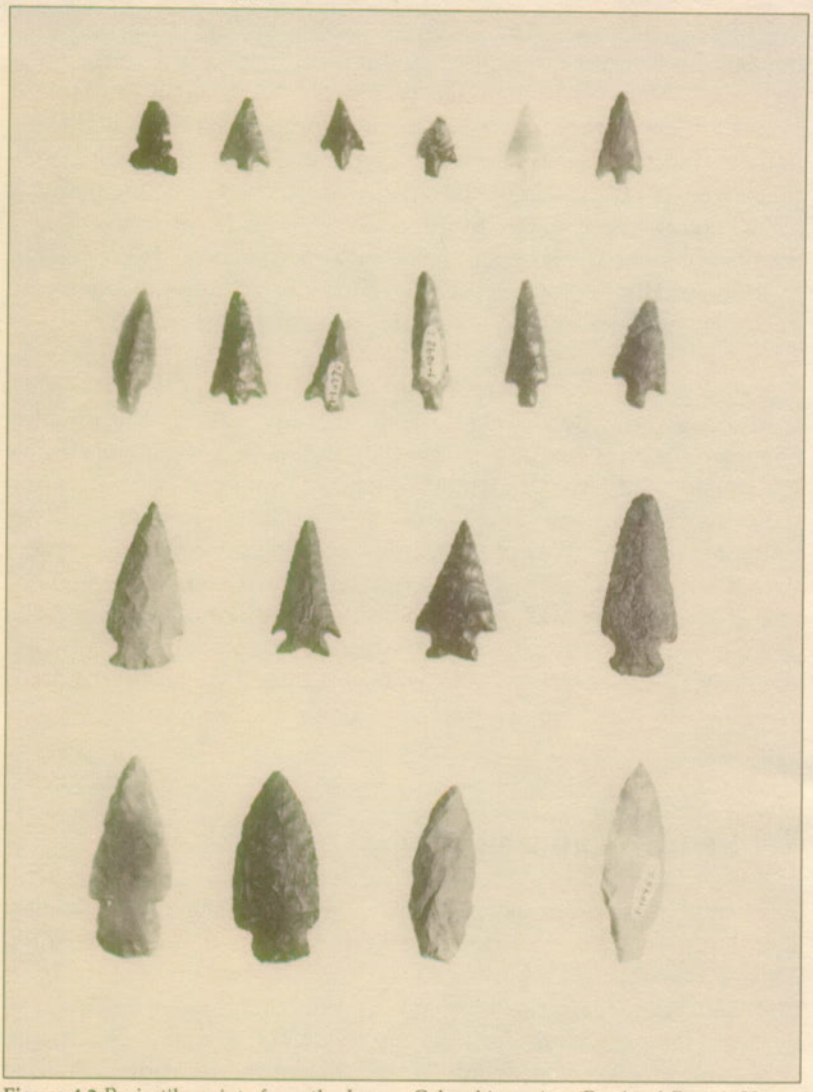


Figure 4.2 Projectile points from the Lower Columbia region (Portland Basin). Upper rows, Multnomah phase; bottom rows, Merrybell phase.

and 500 feet long. The abundant marine shells show unequivocally that the current fresh-water lake did not exist at the time the archaeological deposit was formed; the estuary was then directly open to the sea. The coastline now lies about a mile west of the site, and in early postglacial times, when meltwater from the world's icecaps had not yet brought the global ocean to its present level, the Pacific shore would have been more distant yet.

The archaeological deposits at Tahkenitch Landing reached to a depth of six feet in the main trench. The lowermost artifact-bearing layer contained no shellfish remains, but was followed by layers containing much shell and many artifacts. These in turn were capped by a thick bed of dune sand that was devoid of both artifacts and shell. The earliest occupation, called Component I, is dated by ^{14}C determinations of 7960 BP and 6880 BP. The bones of sculpin, tomcod, hake, and flatfish indicate fishing in an estuarine environment. A ^{14}C determination of 5100 BP for Component II dates a continuation of fishing, and the inception of intensive collecting of bay clams and bay mussels in what was still an estuarine setting. Six ^{14}C dates ranging between 3160 and 3040 BP place in time the Component III deposits, which contained the greatest bulk of shell, bone, and artifacts. All ^{14}C dates were obtained on charcoal.

Tahkenitch Lake subsequently formed as the estuary was dammed by windborne sand. The immense Oregon Dunes stretch for miles along the coast between the Umpqua River mouth and Heceta Head. They grew as the rising postglacial sea cut into ancient stabilized sediments and released vast quantities of sand to be moved and piled up by the prevailing wind. The disappearance of marine shells from Tahkenitch Landing about 3000 years ago indicates that this process had by then created Tahkenitch Lake, turning the locality into a freshwater environment (McDowell 1986). This change led to abandonment of the Tahkenitch Landing site, the uppermost layer of which is clean dune sand, devoid of any but trace indications of human visitation.

The artifacts from the major Component III occupation at Tahkenitch Landing, dating around 3100 BP indicate a range of activities. Several projectile points and a number of quite large knives, scrapers, and other items of flaked stone were probably hunting and butchering tools. More numerous were cobble hammerstones and sandstone abrading tools, probably used in fashioning associated wedges, awls, tube beads, disc beads, and a whistle made from a section of bird bone. A number of unshaped or spheroidal clay objects, and several fragments of steatite smoking pipes, were also found. A few cutting, pounding, and abrading tools associated with the earliest dates from the site did not differ notably from those found associated with the later dates. The less utilitarian bone, antler, and shell artifacts were not, however, found in early context. Cultural features were found only in Component II; they included a concentration of whale bones, a cluster of bones and rocks associated with a piece of a wooden post, and a cluster of rocks associated with large sea mammal bones.

No evidence of dwellings was found at Tahkenitch Landing, but very substantial human activity there is implied by the various artifacts, and by abundant marine shells and animal bones from the midden (see below). Structural remains could well exist in some other part of this extensive site, much of which remains unexplored. At CU62, on the southern Oregon Coast near the mouth of Pistol River, limited excavations in an area nearly destroyed by highway construction uncovered part of a packed clay floor in an apparent pithouse depression. A ^{14}C date of 3000 BP from an associated charred beam shows that substantial architecture did in fact exist along the coast within the time range of the later Tahkenitch Landing occupation (Cressman 1977:194-195).

Quantitative analysis of bulk midden samples from Tahkenitch Landing showed that clams (horse clam, bent-nose clam, littleneck clam) were by far the most abundant species represented there, followed by bay mussels. Other species represented in small amounts included acorn barnacles, horse barnacles, razor clams, limpets, and crabs. The bulk of the remains identified are of marine bay species, and their enormous volume at the site is a measure of the shellfish harvest's great importance to its occupants (Barner 1986).

The huge quantity of vertebrate faunal remains excavated at Tahkenitch Landing was studied using a sampling procedure to reduce the bulk to manageable proportions. Even with this measure taken, some 28,000 specimens of fish, birds, and mammals were identified (Greenspan 1986). Fish remains dominated the assemblage overwhelmingly, comprising over 95% of the total identified specimens. Birds were next in abundance, nearly 3%; and mammals included slightly less than 2%. The lowest levels of the excavation yielded relatively more birds and mammals than did the later levels, but fish were still heavily preponderant. In order of abundance the dominant fishes in the midden as a whole were sculpins, tomcod, herring, surfperches, flounders, and hake. But while these species account for the great bulk of the identified specimens, salmon, greenlings, lingcod, and sturgeon were also represented. The most numerous birds, in order of abundance, were ducks, cormorants, loons, shearwaters, grebes, murres, and gulls. A few other forms were also represented. The best-represented mammals were cetaceans (whales, dolphins, and porpoises), seals, and deer. The whale bones represented either sperm whale or a kind of baleen whale.

The vertebrate fauna reinforces shell midden evidence that the Tahkenitch Landing people concentrated their fishing and hunting in the immediate vicinity. All the species found could be obtained in an estuarine

environment, except that the few bones of large whales most probably represent scavenging of animals beached along the Pacific shoreline. The considerable representation of hake in the assemblage could be taken to suggest, however, that people may have fished to some extent in the open ocean as well; hake rarely enter estuarine environments, more commonly schooling near the ocean bottom.

Manifestly, fish are the most important animals in the Tahkenitch Landing assemblage, and beyond a doubt the major harvest of the site's occupants. It is particularly interesting therefore that the artifact assemblage yielded no fish hooks, gorges, or spears. Commenting on this situation, Greenspan (1986: 71) observes that:

> The quantities of fish remains, as well as the range of sizes and heavy emphasis on small fish, suggest an indiscriminate fishing technique, such as small-gauge nets or stone tidal traps. Stone traps were a widespread and highly effective fishing technique all along the Northwest Coast. Stone-walled structures were built in the intertidal zone in bays or inlets or at the mouths of rivers. As the tide rose, fish would be carried towards the shore and swim over the top of the traps. The fish would become trapped behind the stone walls as the tide receded (Stewart 1977: 118-123).

This suggestion has the further appeal of rendering explicable the sheer quantity of fish remains found at Tahkenitch Landing, by identifying a plausible means through which fish could be taken in mass quantities.

This important site provides an essential key to the culture history of the Oregon Coast. The ancient shoreline is long gone. But Tahkenitch Landing carries evidence of a coastal lifeway far back in time, and identifies one kind of natural setting in which further evidence of early human activity can be found.

Umpqua-Eden Site

Evidence of coastal occupation is comparatively abundant from 3000 BP onward. With relative stabilization of the coastal environment after this time, loci of human activity are better preserved and more readily found. The finds from these sites overlap with the Tahkenitch evidence, and display the basic cultural pattern out of which grew the ethnohistorically known cultures of the coast. The Umpqua-Eden Site, south of Tahkenitch, and other sites both south and north along the coast, illustrate the nature and further growth of this basic pattern.

The Umpqua-Eden Site, near the mouth of the Umpqua River, has given evidence of an occupation that began quite early and continued down to the historic period (Ross and Snyder 1979, 1986; Lyman 1991: 102-174). A ^{14}C date of 2960 BP from the base of the shell midden establishes contemporaneity with the major period of activity at Tahkenitch Landing around 3000 years ago. Additional ^{14}C determinations of 1970 BP, 870 BP, 620 BP, 440 BP 350 BP, and 240 BP date later occupations (Lyman 1991: 107, 111). Euro-American use of the site, perhaps related to historic Fort Umpqua across the river, is represented by nails, hinges, window glass and other household goods. Most of the artifacts and faunal remains date between about 2000 years ago and historic times, but both earlier and later occupations seem to be of generally similar character. The stratigraphic complexity of the site, and the probability of some degree of mixing within the deposit, precludes any detailed exploration for subtle changes over time in the character of the occupation (Lyman 1991: 171-174).

Umpqua-Eden is situated on a high river terrace that overlooks, at low tide, extensive mud flats offering a variety of shellfish. The site midden was made up of mollusk shells, most commonly bay mussel, horse mussel, bent-nose clam, butter clam, and cockle. Present in lesser quantities were little neck clam, gaper clam, and horse clam. The midden also yielded a very large collection of fish bones; species recognized include flounder, greenling, surf perch, herring, sculpin, salmon, and sturgeon. Birds were also heavily represented. Ducks of various kinds were most common, with herons, cranes, swans, gulls, and murres also indicated. All are birds of watery habitats. Numerous sea mammal bones from the collection were predominantly those of harbor seal, with sea lion and fur seal also represented. Many fragments of the distinctive cancellous bone common to seals, sea lions, and whales were identified as whale bone because of the robustness of the pieces. The bones of deer and elk heavily dominated the collection of terrestrial mammal remains, both animals being about equally represented. Other terrestrial species identified were grizzly and black bear, cougar, lynx, dog, raccoon, sea otter, mink, fisher, muskrat, beaver, and several kinds of small rodents (Ross and Snyder 1986; Lyman 1991: 126-171).

The varied and abundant fauna from Umpqua-Eden reflects the environmental diversity and rich productivity of the immediate vicinity. It implies that a broad range of hunting, fishing, gathering, and food-processing activities were mounted from the site, which served as a focal point of residence and industry. Lyman (1991: 135-170) analyzes in detail the extensive butchering and processing of large terrestrial and sea mammals that was carried out at the site. A small river island nearby, where seals still haul out in numbers, was no doubt a continuing source

of these animals. Salmon may also have been obtainable in the very near vicinity. In a quite similar estuarine situation on the Lower Coquille River to the south of Umpqua-Eden, a long pole-and-willow fence was built across the river as a fish weir. This weir obstructed the passage of salmon and guided them through narrow openings where they could be netted or speared, or taken in large openwork basketry traps (Draper 1988). Such weirs were commonly used on the west coast (Stewart 1977), and it would not be surprising if future research turned one up near the Umpqua-Eden Site.

The artifact assemblage from Umpqua-Eden is varied and interesting (Figures 4.3, 4.5). Hunting and fishing pursuits are attested by flaked stone projectile points, bone fishhooks, harpoon points, barbs from fishing spears, and notched or grooved stone net weights. Flaked stone knives and scrapers suggest butchering and hide working, while bone awls and pins, and stone scrapers, suggest hide tailoring. Bone and antler wedges and chisels indicate woodworking. Cobble hammerstones would have served in various tasks, from butchering to lithic tool manufacture and the driving of antler wood-splitting wedges. A siltstone pipe and fired clay pipes are suggestive of tobacco smoking. Incised and ornamented seal and elk teeth give evidence of personal artistry and ornamentation.

The hard-packed earthen floors of two quite small houses were uncovered at the site. Both of the smaller structures were rectangular, one measuring about 10 by 12 feet across, the other slightly less. The first-mentioned house had postholes and grooves around the periphery of its clay floor, suggesting that planks were set on edge against vertical supports to form walls. A firehearth outlined by vertically-set stones occurred near the center of the floor. The date of this structure is not known. The smaller structure exhibited a large pit in the center, and numerous smaller postholes placed irregularly around it, some distance from the walls. The posthole patterns do not readily suggest the nature of this unit's superstructure. A ^{14}C date from the floor was 620 BP. The small size of both these units indicates they were single-family dwellings. Also present at Umpqua-Eden, but only partially excavated and very briefly reported, were traces of a much larger semisubterranean long house of plank-walled construction. Its creation marked the very end of the site's prehistoric occupation, as shown by stratigraphic evidence. This structure, roughly 25 feet wide and 90 feet long, probably resembled quite closely the large communal house of the Lower Umpqua Indians shown in a 1858 edition of Frank Leslie's Illustrated Newspaper (Figure 4.4) (Ross and Snyder 1986; Beckham 1977: 65).

The evidence from Umpqua-Eden helps to establish continuity in the coastal lifeway over some 3000 years of time. It picks up from earlier evidence at Tahkenitch Landing that shows intensive reliance on the estuarine zone as far back as 8000 years ago. The faunal, artifactual, and dwelling remains from Umpqua-Eden clearly indicate that it was an important sedentary village community. But interpretation is limited by the extensive later damage done to the site, as well as by incomplete reporting of the archaeology done there. Later sites along the southern

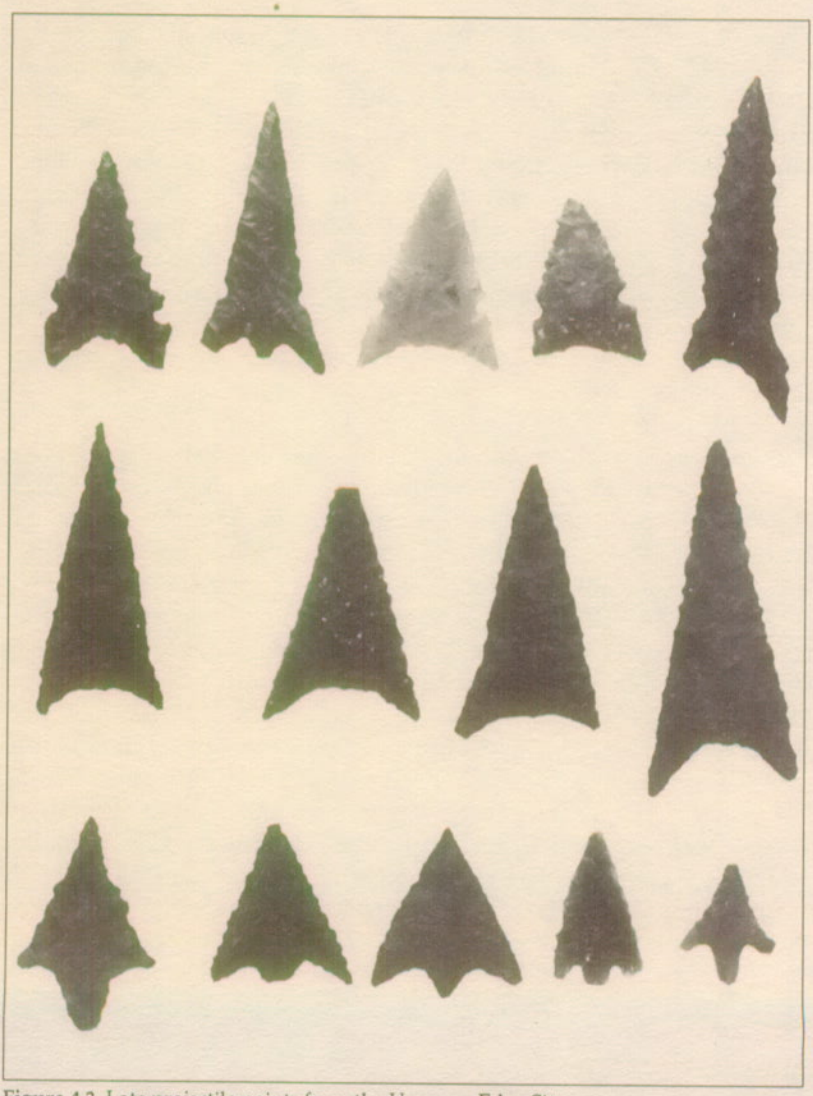


Figure 4.3 Late projectile points from the Umpqua-Eden Site.

Figure 4.4 Historic Lower Umpqua house shown in Frank Leslie's Illustrated Newspaper, 1858 (courtesy of Oregon Historical Society, #ORH 176450).

coast show in considerably more detail the mature pattern of large village settlements that is only hinted at by the little-investigated late remains at Umpqua-Eden.

Lone Ranch Creek

On the far south coast is the Lone Ranch Creek site, a shell midden that was up to 10 feet deep in places (Berreman 1944). Excavated long ago, the site was never ^{14}C dated, but projectile points offer clues to its age. Points from the lowest levels were all of leaf-shaped types that may date to 3000 BP or earlier. Higher in the midden were small stemmed arrowpoints like some known from the later Multnomah subphases of the Portland Basin, which suggest an age range for the major occupation of perhaps 1000 to 500 BP. Since no objects of Euro-American manufacture were found at Lone Ranch Creek, it is evident that the site was abandoned some time before contact around 200 years ago.

Four houses were identified in the excavations. They had packed clay floors and well defined firepits, the floors having been excavated to a depth of about two feet below ground surface. The charred remains of vertical plank walls indicated substantial wooden houses of basically the historically-known type. These houses indicate the permanence of the settlement, as do the 32 human burials encountered at various places during the excavations.

Figure 4.5 Bone fish hooks from the Umpqua-Eden Site. Approximately 2 times actual size.

Hunting technology included flaked stone projectile points and scrapers. Fishing and sea mammal hunting is suggested by fishhooks, harpoon points, and spear points of bone, and by net sinkers of ground stone. Grinding slabs attested the milling of seeds or nuts.

Manufacturing at Lone Ranch Creek was indicated by several kinds of specimens. Bone awls and needles suggest hide tailoring. Stone mauls, adzes, drills, and arrowshaft straighteners, along with bone gouges, suggest woodworking activities. A few fragments of baked clay, which appear to represent pieces of ceramic pipes, indicate either limited pottery manufacture or trade from a ceramic-producing region. Ornamental objects of shell were fairly numerous. Beads and pendants of *olivella* shell, and other ornaments made of abalone and *dentalium*, were recovered in the excavations. Since the natural habitat of *dentalium* is restricted to the coast of British Columbia, these specimens apparently indicate long-distance trade.

Faunal remains from Lone Ranch Creek included the bones of deer, elk, seal, sea lion, and whale, as well as unidentified fishes. There were also huge quantities of mollusk shells, which largely composed the midden itself. Over 50 species of marine shellfish were identified. It is not known that the historic people of the south coast actively hunted whales, but creatures occasionally beached or washed up on shore were exploited for the wealth of meat, oil, and whalebone they provided. Possibly the archaeological specimens had a similar origin.

Pistol River

The historic Tututni Athabaskan village of Chetlessentan, not far from Lone Ranch Creek, sat on a bluff high above the ocean at the mouth of the Pistol River. Excavated on a large scale, the site gives a quite full picture of its inhabitants' lifeway, overlapping the transition between prehistoric and historic times. The historic village was burned and destroyed in 1856 during the Rogue River War. Its remains are underlain by shell deposits that contain artifacts to a depth of over seven feet in some places. Small triangular arrowpoints found throughout the midden suggest that its occupation probably corresponds to some or all of the Multnomah subphases of the Lower Columbia sequence, a time range of about 1750-100 BP.

Over 30 house depressions were observable at the Pistol River Site, as the archaeological manifestation of Chetlessentan is called (Heflin 1966). Archaeological work in some of them is concisely summarized in a recent synthesis:

> As described by Heflin, the aboriginal houses at the Pistol River Site were built around rectangular depressions ranging from 2 to 4 feet in depth, and averaging about 12.5 feet by 15 feet in size. The corner posts and vertical wall planking of these structures were made of cedar. Most of the houses probably had gabled roofs of cedar, bark, or thatch. Floors within these houses consisted of hard-packed clay, gravel, or beach sand. Stone encircled fire pits were located near the center of the rear of these houses (Beckham and Minor 1980: 30-31).

The character of this village as a stable and long established settlement is also indicated by the fact that over 20 human burials were found in the excavations. Some were encountered beneath the floors of houses, others within the midden itself. Artifacts found with the human remains included such traditional items as pine nut beads, stone beads, and

dentalium shells, and such Euro-American trade specimens as glass beads and brass buttons.

A wide range of artifacts from the site attests diverse activities by its occupants (Figures 4.6-4.10). Flaked stone arrow points and knives, bone spearpoints, and harpoon foreshafts indicate hunting of terrestrial and marine species. Bone fishhooks, bipointed fish gorges, and an abundance of notched net sinkers made from river cobbles and pebbles give evidence of fishing. Plant food processing is indicated by ground stone pestles, hopper mortar bases, and bowls. Manufacturing activities are reflected by mauls, cobble chopping tools, adze handles, elk antler splitting wedges, flaked stone drills, scrapers, gravers, and actual craft products themselves: bone head-scratchers, hairpins, nose and ear pins (these identified from historical analogues), whalebone clubs, a stool and a bowl made from whale vertebrae, and a bear figurine and numerous tubular pipes of fired clay.

Contact with Euro-American traders and settlers is shown by a series of items. Glass trade beads and brass uniform buttons were found with burials. From the house depressions and midden deposits came such items as the lock from a muzzle-loading rifle, an iron knife, iron and copper bars, square nails, copper pendants, a ceramic trade pipe, and a single Chinese coin.

The vegetal component of the villagers' diet, which surely must have been extensive, is now attested only by the processing tools mentioned above. But bones and shells show more directly the animal species involved. Land mammals included deer, elk, and the predatory bobcat; sea mammals included sea lion and whale; fish vertebrae and bird bones were present, but not identified to species. In addition, some 20 kinds of mollusks were represented among the myriads of shells that made up the site midden; most prominent were marine mussels, which could be easily obtained nearby.

On the central and northern coast, native cultures developed in parallel with those farther south, similarly growing out of the basic early substratum represented at Tahkenitch Landing. Considerable research activity in the north has produced rich and informative records from several sites.

Yaquina Head

Roughly 100 miles up the central Oregon Coast from Tahkenitch is Yaquina Head, a major promontory located a short distance north of

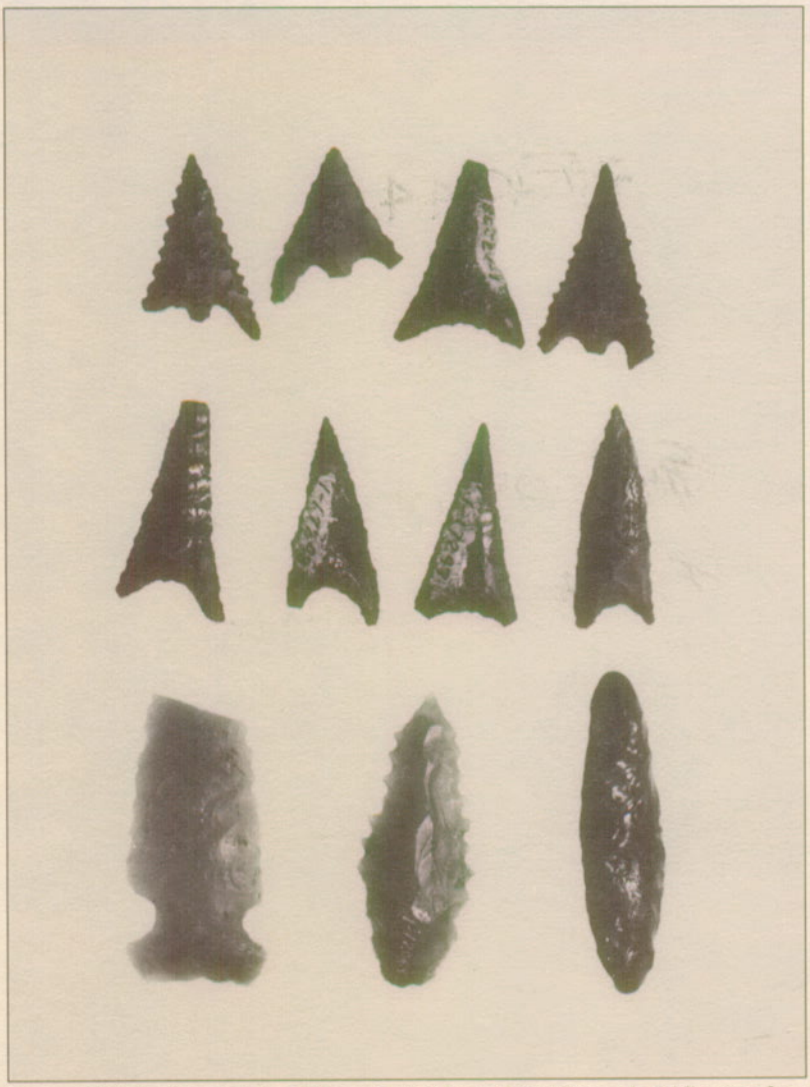


Figure 4.6 Projectile points from the southern Oregon Coast. Top and middle rows, Late period; Bottom row, Early and Middle periods.

Yaquina Bay and the city of Newport. An archaeological site near the tip of the high, mile-long headland is bounded on three sides by a sea cliff that drops 70 or 80 feet to the beach below. At present, access from the site to the seashore is made very difficult and dangerous by the steepness of the cliff. But geological evidence suggests that at the time of the archaeological occupation, a climbing sand dune built up from the beach against the headland probably afforded more ready access. A small dune atop the headland appears to be a remnant of this earlier feature. Excavations that

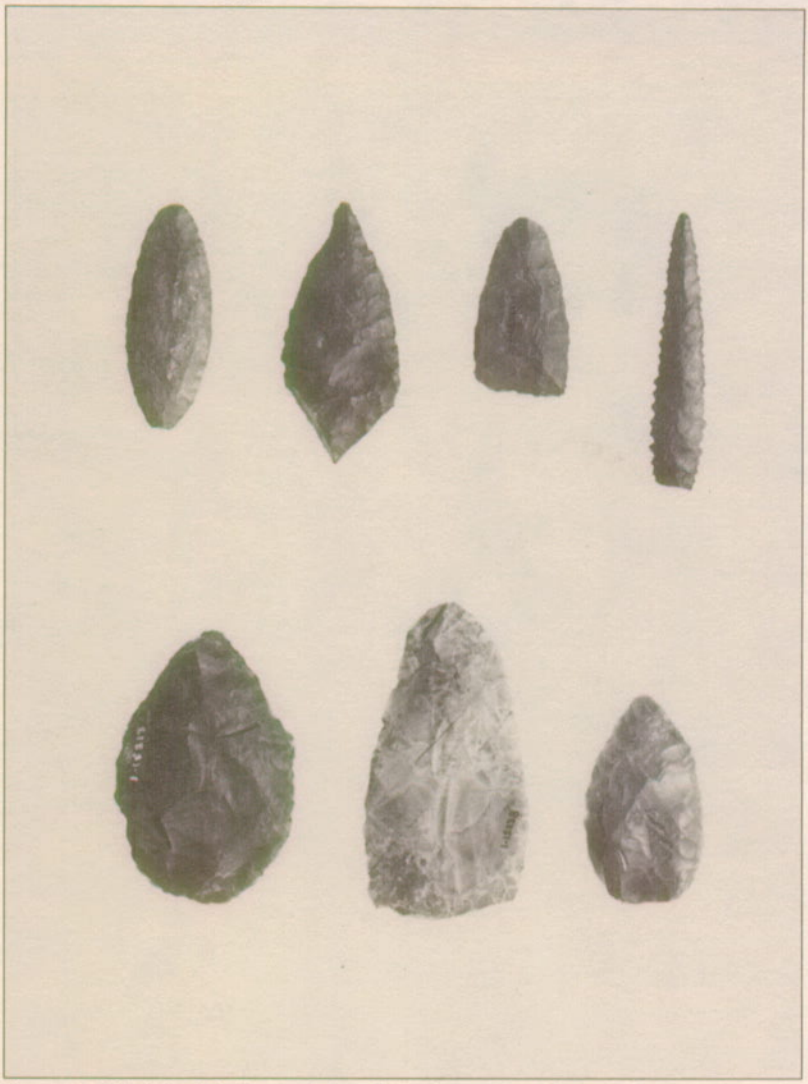


Figure 4.7 Bifacially flaked stone knives from the southern Oregon Coast.

sampled a broad area revealed buried artifacts, sea shell, and animal bones to a depth of five feet or more. Over a dozen ^{14}C dates associated with cultural remains show that human occupation began at the tip of Yaquina Head by 4000 years ago, was relatively intense between about 3700 and 2600 years ago, and ceased by about 2000 years ago. This occupation overlaps significantly in time with that of Tahkenitch Landing (Minor, Toepel, and Greenspan 1987; Minor 1989b, 1991).

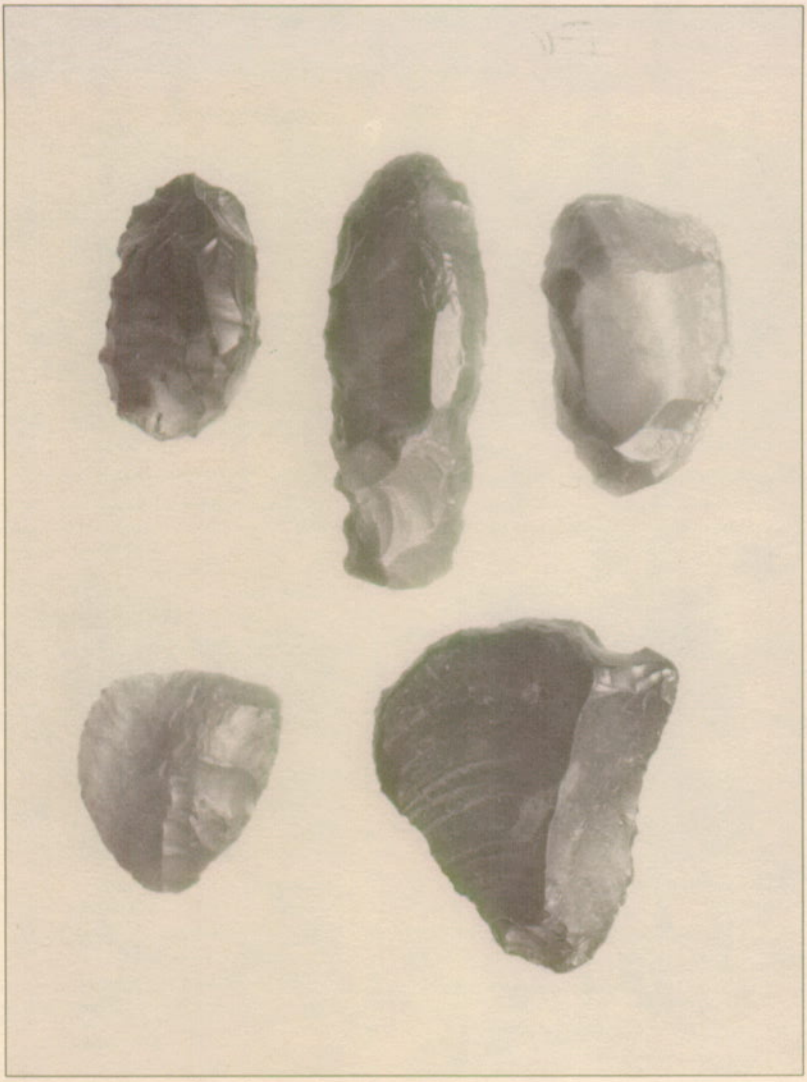


Figure 4.8 Scrapers from the southern Oregon Coast.

The artifact assemblage represents a wide range of activities, including food procurement, food processing, and tool maintenance and manufacturing. Flaked stone projectile points, fragments of bone harpoon heads, and a possible fish gorge suggest land hunting, sea-mammal hunting, and fishing. Probable food processing tools included flaked stone knives, cobble choppers, and a grinding stone. Tool manufacture and maintenance is particularly well-attested. The making and refurbishing of stone tools is indicated by numerous lithic cores and

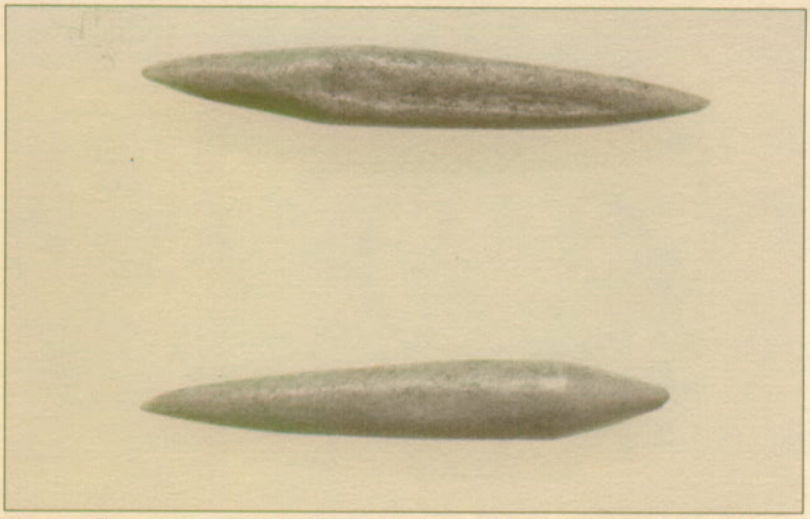


Figure 4.9 Bone points, probably of composite harpoon heads, from the southern Oregon Coast.

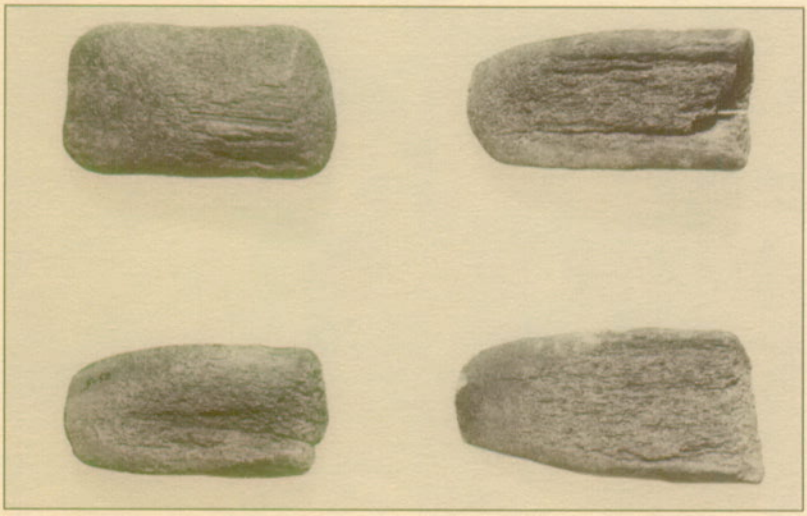


Figure 4.10 Elk antler and whalebone splitting wedges from the southern Oregon Coast.

abundant flaking debris. Stone knives and scrapers suggest hide working. Woodworking is implied by wedges and chisels of bone and antler, as well as hammerstones perhaps used to drive the wedges. The making of basketry, and sewing of hides, is indicated by bone awls and needles. A small tool made of antler may be a shuttle used in net-making. The manufacture of such bone and antler tools is suggested by gravers, many sandstone abraders, and hammerstones, which could have served in breaking up the bones used as raw material. Personal items and

adornments were also found, including a figurine made of antler, a bone pendant, a piece of carved whale bone, numerous bone and shell beads, and two whistles made of bird bone.

The abundance and variety of specimens found, several human burials, and the large extent and considerable depth of the deposits, all suggest that the site was a quite stable settlement. It was perhaps a village, occupied as a base of operations the year around. One housepit outline was seen in the profile of an eroding bank at the edge of the sea cliff, but the structure could not be documented in detail. In another place an extensive layer of dark, compact earth—littered with numerous artifacts, bones, charcoal, and fire-cracked rocks—was initially thought to be a house floor. But continued excavations failed to find any distinct boundaries that might indicate walls. Lacking more definite evidence, the feature was finally labelled as an activity area rather than a house floor.

Large areas of shell midden at Yaquina Head show that shellfish were exploited throughout the life of the site. The rocky intertidal zone at the base of the sea cliff is ideal habitat for sea mussels, the shells of which largely made up the midden. Because the byssal threads by which mussels attach themselves to rocks also tie the mussels themselves together, these shellfish are readily collectable in quantity. Barnacles were also common in the midden, while cockles, piddocks, clams, and other kinds of shellfish were identified in small quantities.

Vertebrate faunal remains were also abundant in the Yaquina Head site. Over 22,000 specimens were recovered from the excavations. Fish bones were by far the most abundant, followed by those of birds, marine mammals, and terrestrial mammals. Among 18 species of fish, the most common were hake, greenlings, sculpins, herring, and tomcod. Among 24 species of birds, most common were shearwaters, various kinds of ducks, and fulmars. Among 10 kinds of marine mammals, seals and sea lions were heavily dominant, with dolphins and larger whales also represented. Within the terrestrial mammal assemblage, deer and elk greatly predominated; also present were rabbits, beavers and other small creatures. The impressive diversity of the shellfish and vertebrate faunas shows that the Yaquina Head people had a very broadly based food economy, and thus one that should have been generally stable despite vicissitudes that might affect various individual species from time to time. As summed up by Greenspan and Wigen (1987: 65-66):

> Fish were obtained from the nearshore rocky intertidal zone, from the nearshore rocky reefs, and probably from habitats farther from

shore. Birds were obtained from terrestrial, shoreline, and marine habitats, including, evidently, the outer coastal zone. Marine mammals were obtained both on shore and from offshore rocks, and possibly from open, outer coastal waters as well. The presence in the cultural deposits of the remains of sea mammals, offshore birds, and fish commonly found on offshore reefs, suggests that seagoing watercraft were most likely employed in the subsistence activities carried out from this site. The vertebrate faunal remains from Yaquina Head contain many indicators of the season of occupation; these data strongly suggest that the site was inhabited throughout the year.

About 2000 years ago the people of Yaquina Head left this highly favorable site, and it was never occupied again in any significant way. Most probably the abandonment was due to erosional destruction of the route or routes that gave access from the high headland to the productive shore. Without access to a suitable living area, the richness of the locality would have availed people little. It has been hypothesized that access between beach and headland was originally afforded by a climbing sand dune, and that erosion of the base of this dune by the sea ultimately led to its destruction. Although this hypothesis remains to be fully demonstrated, the plausibility of the suggested process is shown by the fact that elsewhere on the Oregon Coast today, climbing dunes in analogous situations exhibit marine erosion of their bases, and in general unconsolidated sediments along the shoreline are being eroded back at a significant rate. At Cape Perpetua a current erosion rate of four to five inches per year is documented, and at the Houser site in the Oregon Dunes National Recreation Area, dune movement between 2500 and 3000 years ago caused the rerouting of a creek.

Whale Cove

Several miles north along the coast from Yaquina Head, Whale Cove was occupied in part at the same time as the Yaquina site, with later occupation near the end of historic times. The earliest deposits at Whale Cove were layers of burned and unburned marine shell, which yielded ^{14}C dates of 3010 and 2830 BP. A following layer of dark earth devoid of shells was dated at 610 BP, and an upper shell layer was dated to 330 BP (Lyman 1991: 244). Clues observed in a trench profile after excavation suggest that a semisubterranean house floor may have been present in the later deposits, but this was not further investigated. A small assemblage of flaked stone artifacts included projectile points, cutting/scraping tools, and the cores and flakes related to their manufacture and maintenance.

Cobble choppers, hammerstones, abrading stones, manos, and grinding slabs also occurred. Pointed bone specimens, eyed needles, and awls were relatively numerous, suggesting that sewing and perhaps basket-weaving were important at the site. Bone and antler wedges and chisels, also comparatively numerous, imply a certain prevalence of wood-working activity as well. Whistles and beads of bone, some incised with ornamental markings, also occurred.

Some 20 species of shellfish made up the bulk of the midden deposits. All the common kinds mentioned in preceding accounts were identified from Whale Cove, but their relative proportions were not analyzed quantitatively. Fish remains were also recovered, but not identified or quantified. Terrestrial and marine mammals were, however, studied in detail. The fauna included several species of rodents in addition to bear, raccoon, deer, elk, whale, sea otter, seals, and sea lions. Among these, deer, elk, and harbor seal were predominant. In the earliest levels of the site, deer and elk predominated heavily over sea mammals; in later levels this pattern was reversed, with harbor seals being much more common. Other terrestrial and marine mammals participated in the same pattern. Lyman (1991: 277) suggested possible social and environmental factors that might have been responsible for this change, but no definite conclusion could be reached.

Seal Rock

Very near Whale Cove, Seal Rock adds to the documentation of long-term cultural continuity on the Oregon Coast. This site, a large shell midden on a dune near present-day Seal Rock State Park, was described by Dorsey (1890: 229) as the northernmost historically-occupied settlement of the Alsea tribe. The archaeological deposits have yielded ^{14}C dates of 375 and 160 BP, and the remains of a small plank house built there in the 1850s show the site to overlap the transition from prehistoric to historic times. These facts support Dorsey's identification (Snyder 1978; Clark 1991: 178). From the abundance of pinniped bones in the archaeological deposits, and a substantial assemblage of bone harpoon points, Snyder (1978) identified the site as a major center for exploiting the sea lion rookery at nearby Seal Rock, a prominent feature of the central Oregon Coast. Further analysis of the collection by Lyman (1991: 214-237) strongly supports this interpretation. His study of the sea lion skeletons indicates intensive butchering of the carcasses, and even the breaking of holes in the skull for extraction of the brain.

In addition to their special focus on the sea lion rookery, the occupants of Seal Rock exploited a wide variety of other resources, as shown by marine shells, bird bones, fish bones, and the bones of mammals ranging from hares and rabbits to deer and elk. Projectile points, knives, and scrapers, as well as grinding stones, give evidence of food processing. Hammerstones, adzes, bone and antler wedges, drills, gravers, and abrading stones suggest various kinds of tool making. In short, the evidence indicates the by-now familiar range of hunting, gathering, fishing, food processing, and manufacturing attested over some thousands of years at various sites along the coast, here continuing well into the historic period.

Palmrose, Avenue Q, and Par-Tee

On the far northern coast, the Palmrose, Avenue Q, and Par-Tee sites have given evidence of occupation spanning a long period between about 3850 and 850 years ago. These sites are at the southern edge of the sandy Clatsop Plains, which extend from the mouth of the Columbia southward to Tillamook Head. Geomorphic studies show that these plains, made up of sediment carried down by the Columbia River, have been actively growing and extending the edge of the land seaward since the Pacific began to stabilize near its current level about 4000 years ago (Rankin 1983; Peterson et al. 1984).

Palmrose is a large, deep shell midden roughly a half-mile inland from the present shore near the town of Seaside. Excavations there revealed part of a large rectangular semi-subterranean structure much like the wooden long houses seen by Lewis and Clark on the Lower Columbia in 1805-1806. Evidence of at least three floors within this structure indicated repeated rebuilding, and a series of 21 ^{14}C dates clustered in three periods—roughly 2600-2400 BP, 2200-2100 BP, and 1850-1650 BP. These dates show that the historic house type, or something very close to it, has long been used on the Oregon Coast. An isolated date of 3840 BP, not associated with the structure, may date the first human use of the location (Phebus and Drucker 1973, 1977; Connolly 1992).

The Avenue Q Site, close by in modern Seaside, is another large, deep shell midden. Excavations there have been extremely limited, but nevertheless demonstrate a long period of human occupation. A ^{14}C date of 3280 BP was obtained at the bottom of the midden, and 10 other dates suggest occupational episodes at roughly 2550-2350 BP, 1700-1500 BP, and 1350-850 BP. The Par-Tee Site, another midden not far from Palmrose,

has been ^{14}C dated between about 1700 and 1050 BP. Houses there are said to have been circular, semi-subterranean structures.

These three sites produced similar cultural inventories. Although they have not been reported in detail, characteristic items were medium to large stemmed and notched projectile points, atlatl weights, stone mortars, hand mauls, antler digging stick handles, abrading stones of pumice, antler splitting wedges, composite bone harpoon points,shark-tooth pendants, and many pieces of worked and decorated bone or antler. This array of specimens, combined with the large size of the sites themselves, suggests that most probably all three were substantial villages. No house remains were detected at Avenue Q, but the excavations were far too limited to rule out their presence.

Of great interest, a number of carved bone and antler artifacts from Palmrose and Avenue Q show motifs closely similar to those of the Marpole Phase of Northwest Coast culture in southern British Columbia. These similarities show clearly that close contacts were being maintained over great distances up and down the coast by about 2500 years ago. These contacts presage the historic situation, when Chinookan peoples were famed traders who routinely canoed as far north as the Gulf of Georgia, and as far east as The Dalles of the Columbia River (Connolly 1992).

A detailed analysis of mollusk shells from the Palmrose and Avenue Q middens shows that the occupants of these sites harvested almost exclusively horse clam, butter clam, and littleneck clam. These are all species that live in the sheltered waters of bays and estuaries, which is of interest because such habitats no longer occur near these sites. This and other evidence suggests that quiet marine backwaters once present nearby were ultimately filled and eliminated by the sand dunes that dominate the vicinity today. Also of interest is that analysis of the growth rings of the mollusk shells show the season of death—that is, the season when the shellfish were collected—was primarily during the late winter to early spring months. The shellfish were largely harvested during the leanest season of the year, when winter stores were most likely to be depleted (Barner 1992).

Over 15,000 bones and bone fragments from limited excavations at Palmrose and Avenue Q represent terrestrial animals (Greenspan and and Crockford 1992). The faunal assemblage is highly diverse, including 25 species of birds, 23 species of fishes, and 14 species of mammals. In order of abundance, the most common fishes were skates, greenlings,

surf perches, hake, salmon, rockfish, flatfish, and sturgeons. The most abundant birds were murres, shearwaters, ducks, geese, and swans. Sea mammals included cetaceans, sea otter, sea lions, and fur seals. The dominant land mammals were deer and elk. Notably, animals of both marine and freshwater habitats were common at the Palmrose site, with most of the freshwater specimens being salmon. At Avenue Q, marine animals were heavily predominant, with specimens from fresh water a much smaller percentage. The animal remains show that the two sites, though separated by no great distance, had rather different economic specializations traceable to local habitat differences.

At Avenue Q, increasing freshwater animal remains in later levels suggest some degree of change in the local habitat during the time the site was occupied. This is congruent with the evidence previously mentioned, of quiet-water marine mollusks abundant in sites where no marine embayments exist today. Also, the earlier deposits were dominated by fishes of nearshore rocky reef habitats, such as surf perches, greenlings, and sculpins. In later levels, hake and skate increased considerably, suggesting an increase in offshore fishing.

The range and variety of species found at both Palmrose and Avenue Q indicates that terrestrial, freshwater, nearshore, and offshore habitats were all exploited. Further, the seasons of availability of various species span the annual round. The long-continued occupation of this area is, thus, easily understood as based in the economic security that such a diversified portfolio of subsistence resources provided. The observed cycles of occupation/non-occupation, and eventual abandonment of the archaeological sites late in prehistory, are just as clearly rooted in geologically-based phenomena that affected the productivity of their immediate local environments.

Geomorphic studies have given evidence of cyclical earthquakes and tidal waves (tsunamis) along the Oregon Coast in prehistory, caused by large-scale tectonic processes. The underlying mechanism is concisely summarized by Connolly (1992: 9):

> The Oregon Coast parallels the central portion of the Cascadia Subduction Zone, which lies a short distance offshore. Along this zone, the Juan de Fuca Plate is subducting under the North American Plate. Frictional coupling at the plate margins accumulates strain; as the edge of the North American plate is dragged downward at the subduction zone, a corresponding uplift occurs landward of the plate's edge. When the strain is released the result is uplift at the plate's edge and subsidence landward of the edge. The abrupt

vertical displacement of the sea floor produces tsunamis in conjunction with subsidence at the coastal margin.

Darienzo and Peterson (1990; also Peterson et al. 1988) have documented cyclic episodes of tectonic subsidence along the northern Oregon Coast. They report a series of buried salt marsh deposits in cores from Netarts Bay which exhibit sharp upper boundaries with overlying sand layers (tsunami-deposited sediment) on tidal mud flat deposits. Atwater (1987) reports similar evidence from Willapa Bay on the southern coast of Washington.

Buried peat layers separated by sand lenses at Netarts Bay demonstrate up to nine major and minor cases where coastal salt marsh vegetation was buried under sand carried in by tidal waves. A series of eight ^{14}C dates from these marsh deposits span the period 3300-370 BP (Connolly 1992: Table 2-1). These findings show the inherently dynamic nature of the coastal environment, and the continuing challenge it offered its prehistoric occupants.

Tillamook Site

Final prehistoric/early historic occupation on the northern coast is best represented at the Tillamook Site, located on the Netarts sand spit about seven miles southwest of the town of Tillamook (Newman 1959). The sand spit on which the site is located extends northward from Cape Lookout for approximately six miles. It completely protects the broad, shallow Netarts Bay from the sea except for a narrow channel at its northern end. The bay is noted as a producer of clams, crabs, perch, and flounder; seals are often observed there as well. At low tide, vast mudflats are exposed, and the archaeological site on the northern end of the spit is ideally situated to take advantage of the shellfishing opportunities.

Prior to excavation, a number of depressions, encircled by low rings of raised elevation, could be observed at the site. Complete excavation of three of these depressions, and partial excavation of two others, showed all five to contain the remains of semisubterranean dwellings. The low elevations surrounding the house pits proved to be accumulations of midden debris, principally discarded marine shells.

The best preserved and most informative structure was a long, rectangular house that had been built in a large shallow pit. The floor area, which was outlined by the rotted but still visible stumps of vertically set posts, measured 52 by 15 feet. Around its edges were found the remains of split

cedar planks, some of them up to 15 feet long. These had been set on edge against the roof support posts to form the structure's walls. Because there were no evident gable support posts at the ends of the building, and because of its relatively narrow width, it is inferred that the house had a shed roof rather than a gabled one. Both types are known among historic houses of the Northwest Coast. Clustered toward either end of the floor were many ash-and charcoal-stained firehearths, 18 in all. These occurred close together in groups, and clearly would not all have been used at the same time; many were only casually constructed and obviously not used on a routine basis. A number of postmolds found near the middle of the house were apparently not main structural members, but probably erected to support partitions within the building. One other house structure at the site was similar to this one in size as well as mode of construction, while the remaining three were considerably smaller but otherwise generally comparable.

The age of the Tillamook Site is established by three ^{14}C determinations, and by the occurrence of historic artifacts. From the lowest occupation level a ^{14}C date of 550 BP was obtained, and a date of 280 BP came from one of the firepits just described. The excavator rejected a third date of 150 BP as improbably recent, but in fact such a date fits very well with the finding of some nearly decomposed iron fragments, a copper pendant, and nearly 100 sherds of Chinese porcelain. These artifacts show that the prehistoric occupation continued into the era of Euro-American trade, which was well begun along the coast by the 1790s.

Aboriginal artifacts from the Tillamook site included small arrowpoints like those of the late Multnomah subphases on the Lower Columbia; bone barbs for a composite harpoon; flaked stone scrapers and gravers; and digging stick handles, wedges, awls, and needles made from the long bones or antlers of deer and elk. Some fragmentary objects of whalebone were also found. No faunal remains are reported, beyond the shells of which the midden was composed. Most of the mollusks were blue clam and cockle, with butter clam and bent-nose clam represented in negligible amounts.

A sophisticated restudy of the Chinese porcelains from Tillamook has shed interesting new light on their implications. Several lines of technical evidence suggest that the porcelains were of Chinese Ming or Ch'ing (Qing) Dynasty manufacture, made sometime between AD 1573 and 1722. This is well before the era of intensive Euro-American trade along the Oregon Coast, and the authors suggest that the specimens might actually have been salvaged by the Tillamook people from the wreckage of an early European merchant vessel. A likely candidate would be one

of the Spanish galleons on the regular Acapulco-Manila run, which was made annually across the Pacific for 250 years, from 1565 to 1815. The route of the Manila Galleon passed along the Northwest Coast, and the San Antonio, lost in 1604, or the San Francisco Xavier, lost in either 1705 or 1707 (accounts differ) with "a quantity of porcelain" on board, are two possible sources of the Tillamook porcelains (Beals and Steele 1981).

Large blocks and candles of beeswax, found in amazing quantity along the Tillamook shore, are further evidence of late prehistoric/early historic shipwrecks. As summarized by Woodward (1986), large quantities of beeswax from the north coast of Oregon were documented as early as 1813. One 1908 report estimated the quantity found there at about twelve tons, and said that some six tons had been shipped to Hawaii around 1847. Woodward also describes other finds of Chinese porcelain from the coast, including flaked projectile points and other tools made by local natives from porcelain fragments. Two ^{14}C dates on a sample of the wax were 280 BP and 300 BP, putting it in the same general time range as the porcelains. Possible sources of these exotic materials, other than the Manila Galleons, could have been Japanese or Portuguese trading vessels disabled in typhoons along the Asian shore, and carried to the west coast of North America by the Japanese Current. Many examples of such inadvertent drift voyages are documented for the 19th century. Continuing research may be expected to further illuminate this earliest Oregon contact with Old World cultures.

Fishing Rocks

At the farthest end of Oregon's northern coast is Fishing Rocks, actually on the Washington State side of the Columbia River mouth. This site is dated by ^{14}C determinations of 970 BP, 640 BP, and 520 BP, spanning the late prehistoric period. One date of 50 BP indicates recent historic use. The rich but small midden revealed no house remains. A number of pits and clusters of fire-cracked rock gave evidence of repeated campfires. Excavations yielded abundant marine shell and other faunal remains. Bentnose clam, razor clam, and blue mussel were the most abundant shellfish, with a dozen other typical coastal species also represented. Perch and rockfish were the most common fishes, with dogfish, salmon, and sturgeon also present. Predominant sea mammals were the sea otter, harbor seal, and Steller sea lion. Elk, deer, and beaver dominated the collection of land mammals. Birds were represented by some 14 species, with Cassin auklet accounting for the great bulk of the remains. The array of tools, familiar from other coastal sites, included projectile points, cutting and scraping tools, choppers, abraders, pointed bone awls, and

bone or antler wedges and chisels. Historic period artifacts included fragments of Chinese porcelain, chimney glass, and metal. The site gives clear evidence of repeated and productive use as a hunting and fishing camp, its limited extent suggesting occupation by small family-sized groups (Minor 1983: 99-111).

Lower Columbia River

As noted in the introduction to this chapter, the Lower Columbia valley was an especially rich and densely occupied zone. Many prehistoric sites are known to exist along the river, extending from its mouth upstream to the Columbia Gorge. In 1805, Lewis and Clark estimated that some 8000 people lived along the Columbia in just the 50-mile stretch between the mouth of the Willamette River at modern Portland, and the mouth of the Cowlitz River downstream. Some of the native villages were large enough to be called towns, and travelers on the river were never long out of sight of a settlement. Excavations in the area have so far been quite limited, but enough is known to show that the rich ethnohistoric culture recorded by 19th century Euro-American travellers has roots extending at least 3000 years into the past. The archaeological remains also show clearly the cultural affinity of the Lower Columbia with the coastal region generally.

Eddy Point and Ivy Station

Roughly 25 miles up the Columbia from its mouth at Astoria, sites at Eddy Point and Ivy Station near the town of Knappa represent occupations that overlap in time, to span the last 3000 years of prehistory and history in the Columbia estuary. Repeated use of Eddy Point over some 2000 years is indicated by a series of eight ^{14}C dates, the earliest at 3130 BP, the latest at 890 BP. These come from various levels within some seven feet of culture-bearing deposits. Ivy Station yielded one ^{14}C date of 1370 BP, and produced an abundance of historic porcelain, window glass, glass beads, metal buttons, nails, and other evidence to show that it was occupied well into the historic period.

Both sites produced rich faunal inventories. At Eddy Point, deer and elk were most abundant, with harbor seal also well represented. Fishes included salmon, sucker, sturgeon, and unidentified marine fish. Gaper clams and butter clams were attested, though not abundant. Currently, marine shellfish do not occur in the vicinity, and these were probably obtained downriver. Duck, goose, and swan were also identified. The fauna from Ivy Station is very similar.

All the major artifact categories are shared as well. Both Eddy Point and Ivy Station give evidence of flaked stone projectile points and various cutting and scraping tools. Bone and antler artifacts included parts of composite harpoon points, awls, chisels, and wedges, as well as ornamental specimens. Heavy stone items were mauls, pounding stones, and net sinkers. At neither site did the limited excavations reveal evidence of house structures. The excavator believes, however, that both probably were sedentary village settlements, in view of their rich and diverse remains and location in settings that were typical of historic villages (Minor 1983: 112-147).

Merrybell Site

Farther upstream, in the Portland Basin, excavations at Merrybell and other sites have established another local sequence that parallels in time and cultural content the one just described. In this work, chronological subdivision was a major focus of concern, and the result was a well-defined set of cultural phases that bring out some of the more subtle changes over time in artifact assemblages. This sequence has already been referred to in earlier pages, where it was cited as a general guide to coastal chronology in general. This research also gave additional perspective on village occupation and ecological factors relating to it (Pettigrew 1981; Saleeby 1983b).

The Merrybell Site, on Sauvie Island, gives early evidence of what seems to have been a major village occupation. Sauvie Island lies below the Columbia's confluence with the Willamette, and downstream from the great bend where the big river turns northward, below modern Portland. The island is long and narrow, flanked on one side by the Columbia River, and on the other by Multnomah Channel. The latter is a major stream that diverges from the Willamette several miles above its mouth and flows parallel to the Columbia for 15 miles or so before joining the big river.

Merrybell is situated on the edge of a former slough, extending along it for nearly a quarter-mile. An extensive area was dug by the Oregon Archaeological Society, yielding a large number of specimens. Subsequent stratigraphic excavations recovered a number of charcoal samples, which produced ^{14}C dates around 2900 BP for a lower level. Traces of structural remains were noted in these excavations but no well-defined dwellings were recorded. Only a few stone specimens were recovered from the very limited excavations in the lower level of the site, but remains from the upper level, along with specimens and ^{14}C dates from other sites near Portland, allowed the definition of a cultural phase named after the type site.

The Merrybell Phase is dated between 2500 and 1750 BP. Projectile points included medium-sized, broad-necked points used to tip atlatl darts, and small, narrow-necked arrowpoints. Shaped and grooved stones interpreted as atlatl weights were also present. Fish net sinkers were represented by large and small pebbles, either notched or showing evidence of having been wrapped about with cordage. There were also a few perforated specimens. Shaped and unshaped stone pestles indicated the processing of vegetal foods. Uniface knives and peripherally flaked pebble choppers were common, as were stemmed drills. These, along with small tabular stone axe or adze-heads, antler splitting wedges, and abrading stones made of pumice, sandstone, or hard igneous rock, were apparently tools for working wood, bone, and antler.

Hunting, fishing, and various domestic processing and manufacturing activities seem to be well represented by the Merrybell assemblage. Although faunal remains were poorly preserved, some survived, and the bones of deer, unidentified birds, salmon, minnows, suckers, and sturgeon show that those species, at least, were taken (Saleeby 1983a).

Cholick Site

At the nearby Cholick Site is represented the inception of the Multnomah Phase, 1750-100 BP, which followed Merrybell. This phase represents a cultural tradition that continued unbroken into the historic period, where it appeared as the lifeway of the Chinookan peoples described by Lewis and Clark. Three subphases are recognized: Multnomah I, 1750-700 BP; Multnomah II, 700-200 BP; and Multnomah III, 200-100 BP.

The Multnomah I subphase, as seen at Cholick, is similar to the Merrybell Phase in most details. But it differs in having a higher proportion of narrow-necked arrowpoints, a lower proportion of broad-necked dart points, and changes in the relative frequencies of certain other artifacts. Large cutting tools referred to as "mule-ear knives" first appear in Multnomah I. The end of this subphase is marked by a major episode of flooding in the Lower Columbia, the Cascade Landslide Flood. This followed upon a massive earth movement that blocked the narrow Columbia Gorge above Portland about 700 years ago:

> The Cascade Landslide created a temporary earthen dam, impounding the waters of the Columbia River near the site of Bonneville Dam in the Columbia Gorge. When the earthen dam broke, it caused a catastrophic flood downstream that destroyed many aboriginal settlements; it also may have caused major changes

> in the topography of river channels and land surfaces. As a consequence, villages may have been reestablished at new sites, in response to shifted salmon migration routes and alterations in the river and slough channels used for transportation (Pettigrew 1981:121).

At the Cholick Site this event is indicated by a thick stratum of silt, completely devoid of cultural remains, that occurs within the deposits not far above a ^{14}C date of 850 BP. With only one documented exception, the Cholick Site itself, those settlements in the Portland Basin known to have been occupied before the date of the Cascade Landslide Flood were not reoccupied thereafter; sites of the Multnomah II and III subphases, which postdate the flood period, appear in new locations.

Meier Site

The best single representative of the Multnomah II and III subphases is the Meier Site, a mile or so west of Multnomah Channel. Characteristic of both subphases are small, narrow-necked arrowpoints similar to those of Multnomah I, but also including new styles. Broad-necked points, which diminished steadily in numbers after the Merrybell Phase, were by these times quite rare. Other items presumably related to the hunt were flaked stone scrapers and some large cutting tools referred to as mule ear knives.

Aspects of the food quest were represented by bone points, barbs, and foreshafts—which seem to be parts of fish harpoons—and perforated stones interpreted as net sinkers. Vegetal food processing is indicated by stone mortar fragments, heavy shaped and unshaped pestles, and a perforated deer antler tine identical to those used historically as digging stick handles.

Manufacturing activities are represented by splitting wedges of bone and antler, abrading stones of pumice and hard igneous rock, and flaked stone graving tools, all probably used in woodworking; hammerstones and antler tine flakers, probably used in making flaked stone artifacts; and pointed bone splinters, that may have functioned as awls in the manufacture of leather and basketry items.

Objects of artistic, ornamental, or ceremonial importance were well represented at the Meier Site. Aboriginal craft work and concepts are portrayed by incised clay tablets, clay figurines, simple stone and bone sculptures of birds and other creatures, beads and pendants of ground stone and shell, and a perforated shark's tooth pendant. Euro-American

trade goods, attributable to the very latest part of the occupation, included rolled copper tube beads, glass trade beads, and some unidentified metal fragments.

The remains of a large plank longhouse have been partially uncovered by new excavations at the Meier Site (Ames et al. 1992). Six ^{14}C dates, and a few glass trade beads and pipe fragments, indicate that the house was built some 500 years ago, and occupied thereafter into historic times. This remarkable structure, estimated to be about 45 feet wide by 115 feet long, would have housed a very substantial extended family. The dwelling was repaired and rebuilt many times, its use-history demonstrated by a myriad of cross-cutting and superimposed postholes and plank impressions across its whole area. Clusters of overlapping postholes show that some main wall and roof support members had been shored up or replaced as many as 8 to 10 times over the life of the house. A profusion of firepits and storage pits, dug, filled, and re-dug many times by generations of householders over several centuries of occupation, covered the floor area. These pits yielded an abundance of fire-cracked rock and tens of thousands of bone fragments from elk, deer, salmon, sturgeon and other animals, the remains of food that was stored, cooked, and eaten in the house. It is calculated that at least 40,000 board feet of western red cedar went into the initial building (a modern 3-bedroom house requires 10 to 12,000 board feet of lumber). Periodic replacement of decaying supports and planking over a use-life of 400 years probably required half a million to a million board feet of lumber. This study, bringing out the astounding longevity of the Meier longhouse, and the major continuing investment required in its maintenance, offers an important new perspective on traditional household life in the region. The results of this continuing research, not fully available at the time of writing, will greatly enrich our knowledge of later prehistory in the Portland Basin.

Resources of the Sauvie Island Vicinity

Bones of some 40 different kinds of animals were identified from the above three sites in the Sauvie Island vicinity (Saleeby 1983b). The most common large animals were deer and elk. Bear, dog, raccoon, beaver, muskrat, duck, goose, swan, and crane were also represented. Fish remains included salmon, sturgeon, sucker, and minnow. Shells of freshwater mussels were recovered as well. In all, a dietary economy very like that of the historic Chinook is suggested.

An analysis of potential food resources in the Sauvie Island vicinity mapped the spatial distribution of various species, and charted their most likely seasons of procurement. This showed that the prehistoric people here enjoyed a sufficiently rich, varied, and accessible natural resource

base to permit year around occupation of sedentary villages. In this setting, there would have been no necessity for the seasonal movement so commonly seen among hunting-gathering societies elsewhere (Table 4.1, Figure 4.11).

Season	Resources	Habitat
SPRING	Salmon, Steelhead trout Sturgeon Smelt	Riverine
	Waterfowl	Lacustrine, Palustrine
	Sandhill crane	Palustrine, Grasslands
	Deer	Riparian, Grasslands
	Camas, Bracken fern Wild strawberry	Grasslands
	Wild strawberry, Wood sorrel	Conifer forest
	Horsetail	Palustrine
	Cow parsnip Wild celery Wood sorrel	Riparian
SUMMER	Salmon, Steelhead trout	Riverine
	Lupine, Kinnikkinnick Huckleberry, Oregon grape Salal berry	Conifer forest
	Skunk cabbage	Palustrine
	Cattail	Riverine, Palustrine
	Wood sorrel, salmon berry dewberry, thimbleberry blackcap, elderberry	Riparian, Conifer forest
	Oso berry	Riparian, Oak woodland Conifer forest
FALL	Salmon Freshwater mussels	Riverine
	Waterfowl	Lacustrine, Palustrine
	Sandhill crane	Palustrine, Grasslands
	Deer	Riparian, Grasslands Oak woodlands, Conifer forest
	Elk Bear Serviceberry	Conifer forest
	Acorns Hazelnuts	Oak woodlands
	Crabapple	Grasslands (edges)
WINTER	Sturgeon Smelt	Riverine
	Waterfowl	Lacustrine, Palustrine
	Deer	Riparian, Grasslands Conifer forests
	Elk Bear	Conifer forests

Table 4.1 Seasons during which various available food resources were most likely to be exploited in the Sauvie Island catchment sphere. Compare with Figure 4.11. (Saleeby 1983: Table 37).

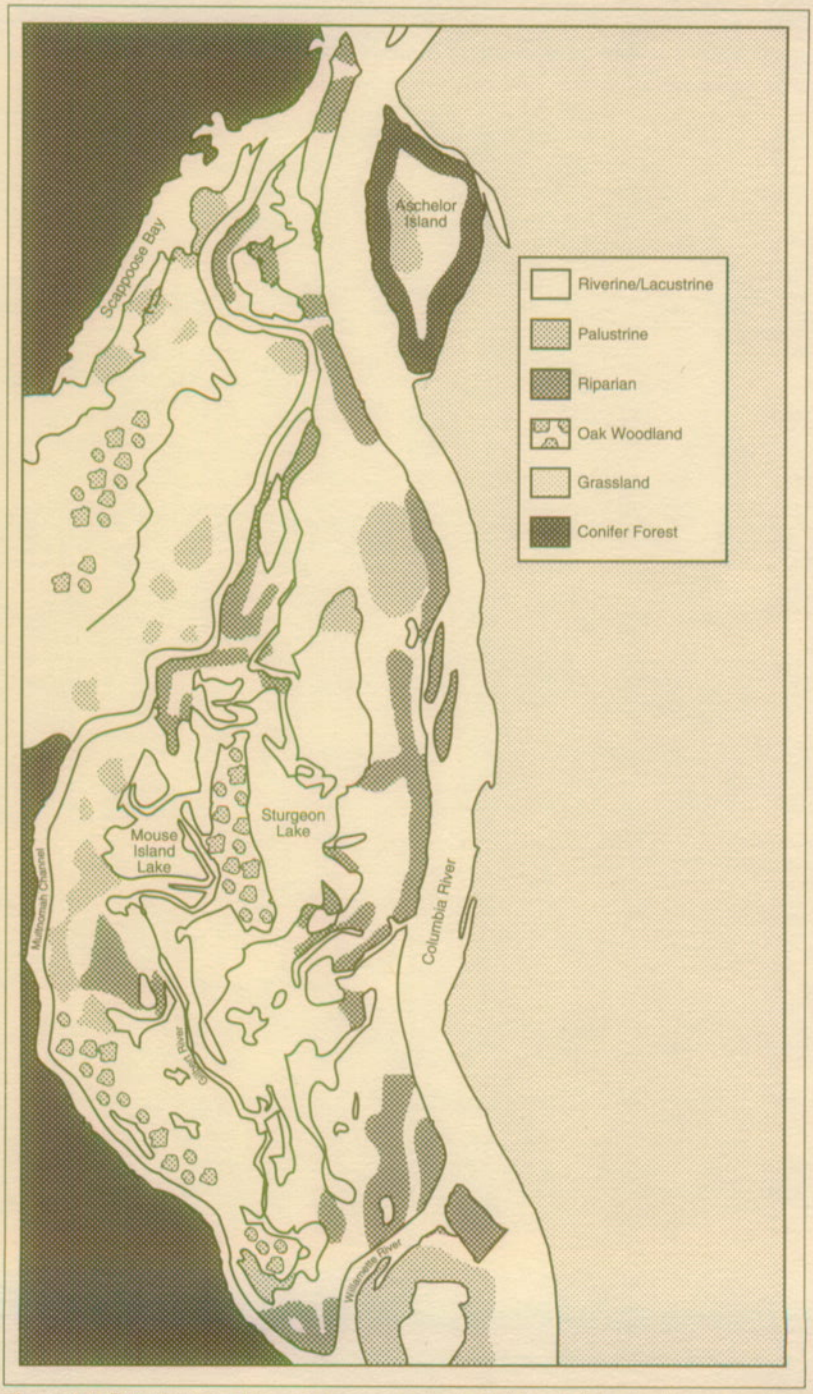


Figure 4.11 Distribution of natural resource zones in the Sauvie Island catchment sphere (Saleeby 1983: Map 9).

House Types of the Lower Columbia

As described in the Lewis and Clark diaries of 1805-1806, large multi-family rectangular plank houses were the characteristic native residence all along the Lower Columbia River. It was noted above that archaeological remains of such a house have been ^{14}C dated as early as 2550 years ago at the Palmrose site near the mouth of the Columbia, and it seems likely that comparable dates may one day be obtained for such structures in the Portland Basin. The remarkable plank house at the Meier site, just described, is a good representative of the historically-known type in that area.

But the prehistoric folk of the Portland Basin also made smaller semisubterranean dwellings and above-ground mat lodges like those of the Plateau. Excavations at the Ede Site, on the Columbia just west of Portland, exposed a shallow semisubterranean house with a saucer-shaped floor somewhat over 25 feet in diameter. Beneath this floor was found part of another. The lower floor was ^{14}C dated to 1690 BP, on charcoal from a firepit; the upper floor was dated to 1460 BP, on charcoal embedded in the floor itself (Minor 1989c). At the nearby Kersting site, circular semisubterranean houses were attested from the same level as a rectangular house that was dated by three ^{14}C determinations clustering around 2000 years ago.

At sites near Skamania and Camas, farther up river, excavations revealed circular housepits containing projectile points like those of the Merrybell Phase (2500-1750 BP). These structures were said to closely resemble the traditional pithouses of the interior Plateau region. A bit farther upstream, near the outlet of the Columbia Gorge, the Caples site revealed oval semisubterranean housepits that were also said to suggest Plateau winter houses. Four ^{14}C determinations of 740, 490, 440, and 300 BP date this site.

In the same vicinity, a lower level of site 45SA11 gave evidence of shallow oval housepits suggestive of Plateau summer mat lodges, while from an upper level came evidence of substantial rectangular plank-walled dwellings. Eight ^{14}C dates between 465 BP and modern times establish the late prehistoric-early historic age of 45SA11. Its historic period occupation is further documented by abundant Euro-American trade goods, and descriptions of its appearance as a village of plank-walled houses in the Lewis and Clark diaries (Dunnell and Beck 1979; Minor, Toepel, and Beckham 1986; Warren 1959).

From these findings it appears that the architectural uniformity seen along the Lower Columbia by early historic explorers was only recently

established. Earlier occupants made use of at least three different house forms, apparently reflecting community and seasonal variations, as well as cultural relations with the Plateau region upriver.

Artistic and Symbolic Forms

Rock art sites are little-known along the Oregon Coast. Some are reported from the lower reaches of the Columbia, but rock art is not nearly as abundant as in the Plateau and Northern Great Basin. Why sites are so few in Oregon's coastal zone is not clear, since rock art is well-represented farther north, especially in British Columbia. The relative lack of information may reflect only a paucity of research on the subject, but it could be simply that the soft sedimentary rocks of the coast do not offer surfaces sufficiently erosion-resistant for rock art to survive over long periods. Surely future field work specifically directed to rock art will bring to light at least some more examples.

Perhaps the best-known rock art site in the Portland Basin is at Gentry's Landing, on the Washington State side of the Columbia. Here several groups of boulders scattered along the river for roughly 600 feet display a great number of pits and grooves ground into their surfaces. Most of the pits are simply small depressions. The grooves take several forms. Many are just straight lines, some are zigzags, and some represent sets of parallel hash marks or nested "V" or "U" forms. Some of the grooves have a pit at one end. A number of circles are also seen, some of them occurring in concentric sets. Occasionally two or three circles are joined together by a line drawn through their centers, and a few individual circles are bisected by a short line. No humanlike or animal forms seem to be represented. Clearly these carved rocks were developed over a considerable period of time, as indicated by the hundreds of individual elements represented, and their crowding and overlapping (Loring and Loring 1982: 16-21).

Figurines carved of stone or molded in clay are an important symbolic form that is well represented on the Lower Columbia and in southwestern Oregon as well, including the far south coast. Little is known about the occurrence of such objects in the intervening area, but again this must be at least partly due to very limited research on the subject.

A series of sites bordering Lake River, on the Washington State side of the Columbia River west of Vancouver, have yielded fired clay figurines and other objects (Stenger 1991). The figurines typically taper from a broad end to a rounded tip, and lack appendages. Some are anthropomorphic,

with faces represented by incised lines. Cut pieces of shell impressed into the clay before firing sometimes indicate hair or facial features. Other figurines, not of human form, exhibit punctated and incised decorative patterns. Occasional fired clay sherds, apparently representing vessel fragments, have also been found. These too are decorated with incisions or punctations. Smoking pipes and pendants complete the array of types. The specimens are believed to be of late prehistoric age, approximately the Multnomah II subphase (700-200 BP) in the Portland Basin chronology. Stenger (1991: 120) speculates about a Japanese origin for this tradition, but it must also be noted that the Lake River specimens have parallels much closer to home in southwestern Oregon (Mack 1991). Clearly a distinctive tradition, this fired clay industry merits further study and analysis of its place in Lower Columbia prehistory.

Bear, seal, owl, beetle, salamander, jay, woodpecker, otter, and salmon were known to the people of Oregon's southern coast as fellow creatures with special powers, who might become spirit helpers (Pullen 1990). Individuals who gained such guardian spirits could rely on their help in curing illness, in hunting and fishing, or in foretelling the future. Nellie Lane, a traditional doctor of the Lower Coquille community, described the role of spirit helpers in her training:

> I first dreamed about Grizzly Bear. He looked just like a person, but he was a bear. He told me, 'You're going to become a big doctor. I'm going to be your power; I shall stand behind you when you cure sick people. Tomorrow I don't want you to eat anything all day. I want you to walk around in the hills and practice this song all day." Then he sang his song for me. The next one I dreamt of was Yellowhammer. He looked like a person too. He said to me, "I'm going to be your power. When you sing my song you can cure people who are sick. When you think about me, then you can cure." These two kept coming back to me, telling me how to train myself, all the time. Once Coyote came to me. I said, "I don't want you for my 'power'." Coyote is mean, always doing mean things. He is kind of foolish too, sometimes. You know the stories about him. I didn't want him, because I was afraid he might make me do things like he does. Next I dreamed about Otter. He came to me and said, "I'm going to help you. You have to sing my song first when you want to cure someone who is sick. When you sing my song I shall be right there near you. Other people can't see me, but you will see me there helping you" (Drucker 1937: 280-281).

Stone sculptures, clay figurines, and occasional engraved petroglyphs found on the south coast suggest that people sometimes made

representations of their animal helpers. They also show that the traditions of these creatures stem from prehistoric times. Pullen (1990: 122-23) reports that a number of stone and clay bear effigies have been found by artifact collectors at places on the Siuslaw, Coquille, Umpqua, and Pistol rivers. Seal sculptures have been found along the Lower Coquille. A carved bone owl effigy was taken from the Umpqua-Eden site near the mouth of the Coquille. Water beetle petroglyphs occur near the falls at Scottsburg, on the Umpqua River. Steller's Jay seems to be represented on stone sculptures found on the Smith River and near Coos Bay, and a woodpecker sculpture is known from a site near the Coquille River mouth. A sea otter figure comes from the south fork of the Coquille River near Powers. Finally, salmon effigies carved from blue schist have been found on the lower Coquille and lower Rogue rivers. Pullen suggests that all these items were linked with beliefs handed down in oral tradition, and figured prominently in the rituals and ceremonies that brought people together for various religious and social purposes.

Future Research

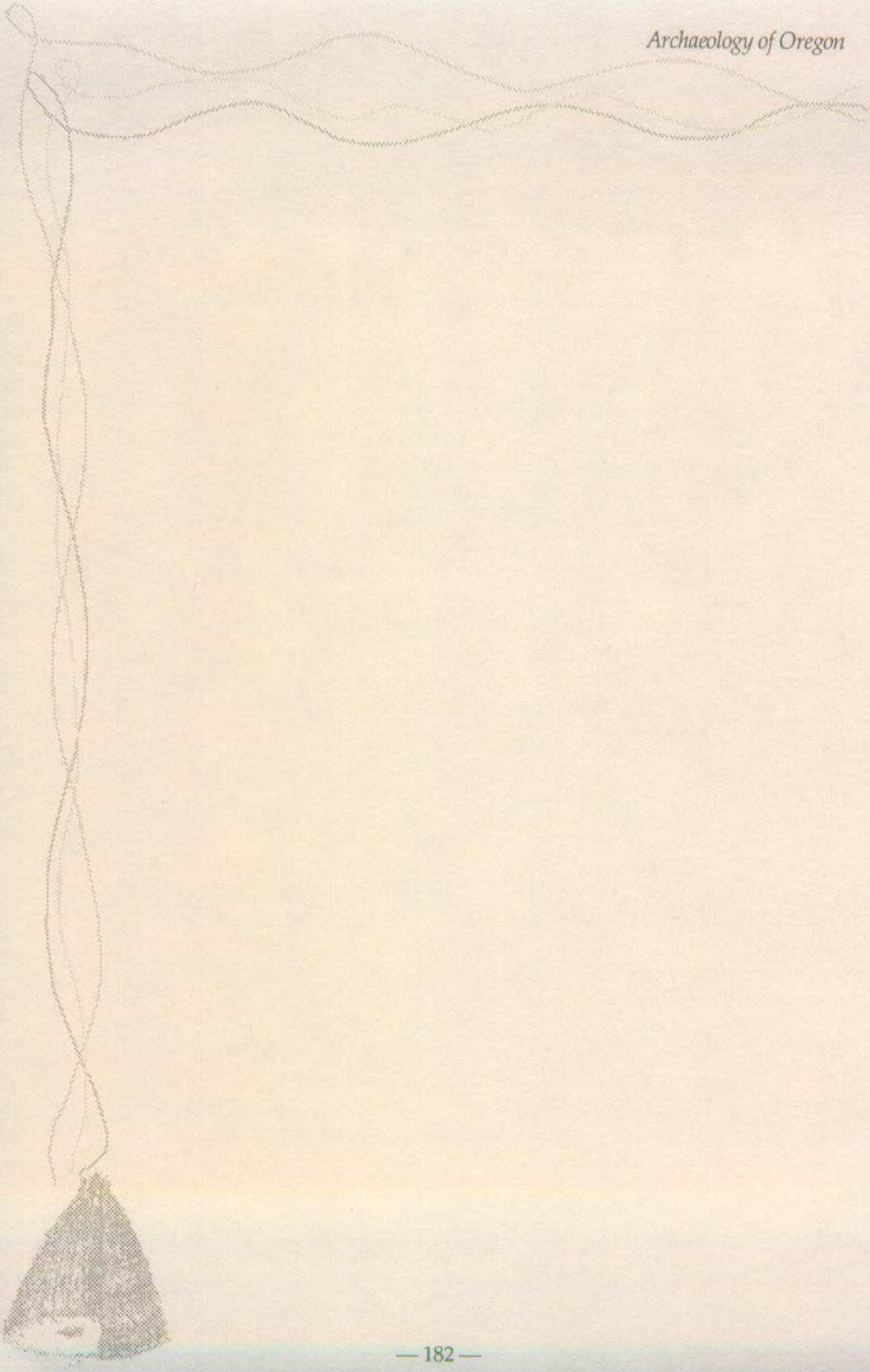
The stress placed throughout this chapter on continuity between prehistoric and historic cultures is warranted by many observed similarities in settlement pattern and material culture. But, as noted in previous chapters, it is easier to compare past and present in the material culture sphere than in the realm of societal organization. This caveat has particular force in western Oregon, where the native peoples described by Lewis and Clark and other early Euro-American travelers were disastrously stricken by measles, smallpox, and other Old World diseases. Their numbers had been dreadfully reduced by the time even the earliest historic chroniclers arrived in the area.

This kind of disruption would have had relatively little effect on the elements of material culture, technology, and interaction with the natural environment that are stressed in the present account. But epidemic disease would inevitably have had a powerful effect on societal organization. It is quite possible, even likely, that more complex social systems existed in prehistoric times than those implied by the ethnographic record. Archaeological information of the kind needed for definitive evaluation of this issue is still very limited, but the picture should become clearer as more research is carried out.

Thus, the nature of prehistoric social and settlement systems throughout the Pacific Coast/Lower Columbia region should be a major topic of future research. Dunnell et al. (1973) and Saleeby (1983) have addressed

the matter for the Lower Columbia area. Minor and Toepel (1983) analyzed patterns of aboriginal land use along the southern Oregon Coast. Draper (1988) has made an effort to determine the different types of sites occupied by residential and task groups in the same area, and to specify the relative permanency or mobility of community groups. In all these cases, the question of a major decline in native population at the opening of the contact period is critical.

Another realm of uncertainty is the full character of occupation before about 3000 years ago along the Pacific Coast and Lower Columbia. Human presence at least 8000 years ago is established by the evidence of Tahkenitch Landing, and people were undoubtedly in the region before that. At Ground Hog Bay and Namu, on the coasts of Alaska and British Columbia, coastal occupation predates 9000 BP (Dumond 1983). Evidence from this early time is extremely thin all along the west coast, however, and much research will be needed to provide a better picture. Oregon's current beach lines are young, reflecting a postglacial rise in sea level that stabilized at the modern stage only about 3000 years ago. Future studies in the region will have to attend to this archaeological fact of life by searching for evidence of earlier occupation on high coastal headlands, on off-shore rocks and islands, beneath coastal dune fields, along river estuaries, and at higher elevations in the coastal interior.

A virtual absence of evidence for prehistoric occupation in the Coast Range also demands further research. The steep, rugged terrain and dense rainforest vegetation no doubt inhibited travel and residence there to some degree, but it must be remembered that the same factors also limit the archaeological visibility of any evidence that might be there. It would surely be poor science to infer from our current archaeological ignorance that the area was not utilized by prehistoric people. It was certainly rich in attractive resources, and the extent of its actual use must be seriously examined by future research.

There may also be a future for underwater archaeology on the Oregon Coast. With adequate seafloor maps, diving archaeologists armed with a knowledge of factors governing site location may be able to find some of the evidence of early coastal occupation that must be there, on the ocean bottom, awaiting discovery.