tribal government, the funding agencies that sponsor such research, and the academic community where the free exchange of information is held as a first principle, with success defined in terms of published output.

In conclusion, language is the key. People are known by the language they speak. The biological necessities of finding food and shelter depend on detailed cultural knowledge of the natural environment, knowledge stored and transmitted by language. Human social life in all its complexity requires language, while moral commitment and spiritual satisfaction come through the inspiration of the spoken word. Let us now explore these further avenues of Indian life on the middle Columbia River.

4

Ecology

tiičám, "land"

MOUNT HOOD rears its head above the busy Celilo Falls fisheries across the roaring Columbia from the village of sk̓in. From the ancient pit house rings on the greasewood flats where Toppenish Creek joins the Yakima River, Indian ancestors looked west to the icy dome of pátu, "snow peak," as Mount Adams is known at Yakima. The soft outline of the Blue Mountains southeast from the Walla Walla River (from walawála, "little rivers") provided a less dramatic vista for the citizens of Umatilla, Walla Walla, and Snake River villages. Between the extremes of baked-dry riverside flats and cool mountain forests, the people of the mid-Columbia found the full range of resources they needed to sustain their lives and their culture year after year for many centuries (see fig. 4.1).

In summer the low valleys are hot as furnaces with temperatures regularly rising over 100°F (40°C), yet in sight of the perpetual ice of the dozing volcanic summits. Cool huckleberry meadows near timberline provide a refuge from this heat when the mid-summer fish runs slacken. The low valleys receive on average as little as seven inches (175 mm) of precipitation annually. They lie in the rain shadow of the Cascade range which wrings moisture from the Pacific fronts. By contrast, Paradise on Mount Rainier's southwest shoulder averages 50 feet of snow (equivalent to 150 inches of rain) each year and has recorded 100 feet. The air, cooled at high altitude, then descends the east slope of the range, warming and consequently drying out as it falls, absorbing moisture from the land like a sponge. Only well east toward the Rocky Mountains is there a hint of the convectional summer rainfall pattern characteristic of the Great Plains, Southwest, and Eastern Woodlands. The lack of summer rainfall may help explain the fact that agriculture—with the exception of an occasional patch of tobacco (Davies 1980:47)—was unknown in the Plateau.

The encircling mountains also trap cold air at ground level in winter. For

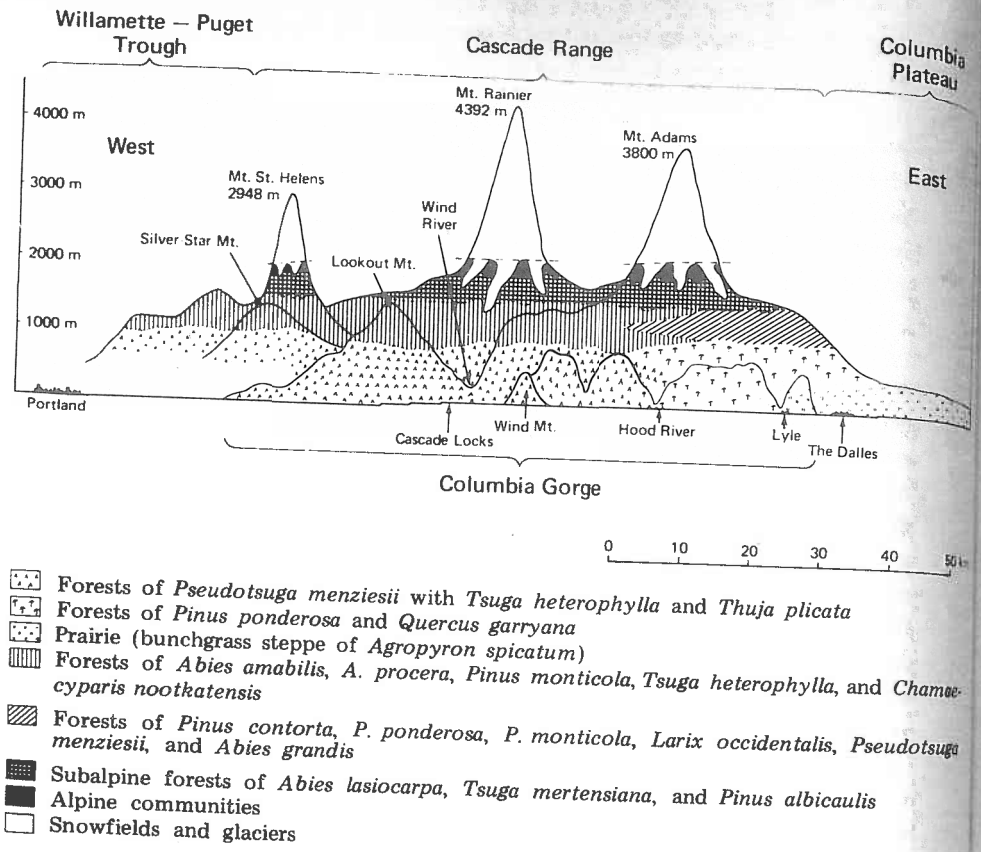


Fig. 4.1. Habitat transect of the Cascade Range (Franklin and Dyrness 1973:311).

weeks on end a monotonous subfreezing overcast reigns, nourishing depression in the people confined to their lodges. Fresh foods are virtually unavailable. No migrant salmon appear between late October and late April, just a few steelhead and resident whitefish which may be caught by hook and line through the ice. The only edible plants at this season are a few tuberous perennials, notably the large-fruited mariposa lily (nuunás; *Calochortus macrocarpus*), found by careful searching amongst the sagebrush near winter villages such as náwawi at the mouth of Alder Creek, where Delsie Selam and Sara Quaempts grew up. This land would support very few people by hunting and gathering were it not for their stores of dried roots, salmon,

berries, and venison prepared during many long hard days of spring, summer, and fall, then carefully cached in cellars (wulčí) and in special baskets.

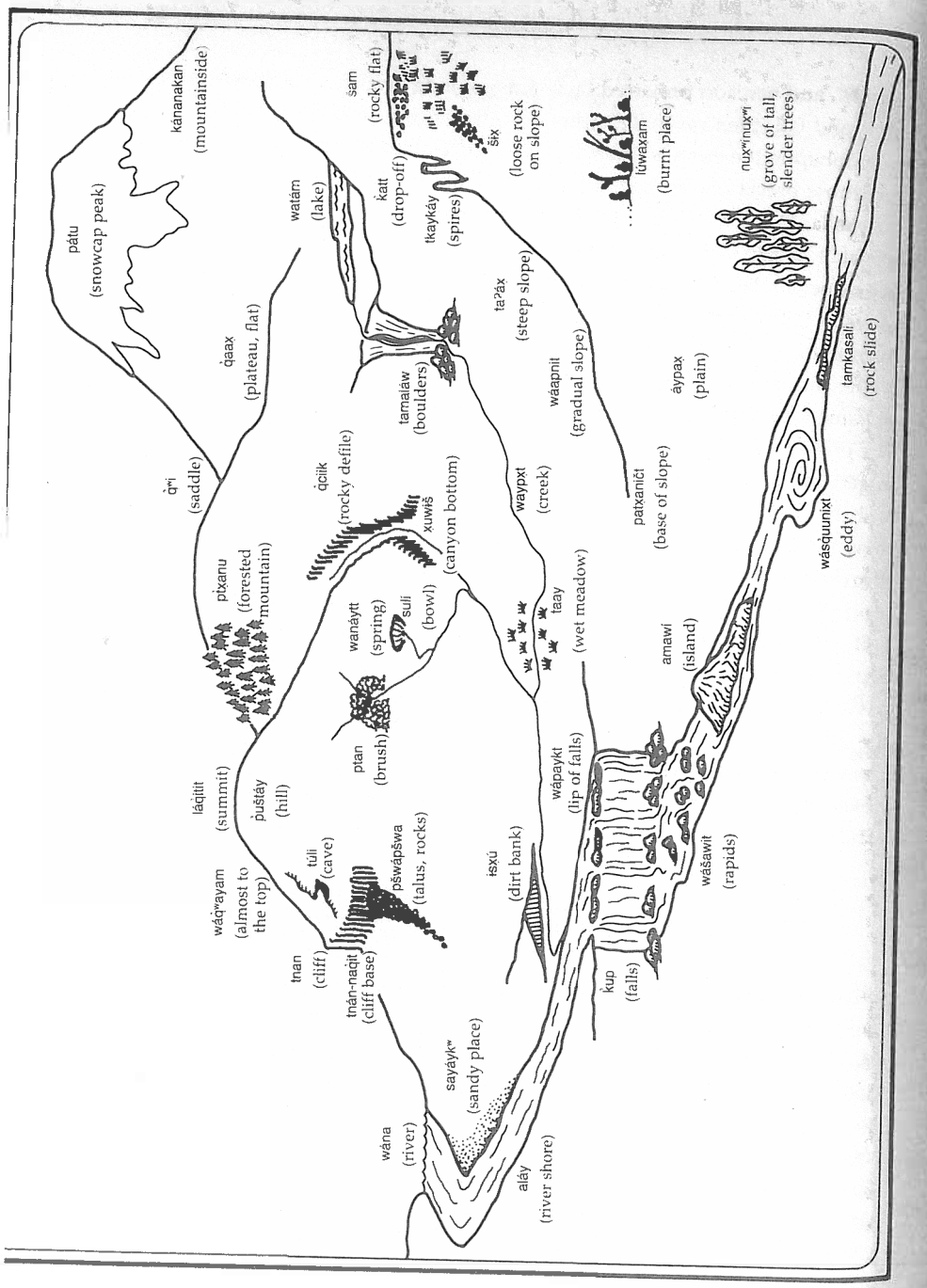
In Sahaptin the earth is tiičám. It is the source of life, the nurturing Mother, on whose breast one's bones are laid at death, in the words of the prophet Smohalla. Death is familiar to the Indians here still. Funerals are the most frequent of ritual performances. Everyone attends or should, as virtually everyone is related to the deceased and owes them this last demonstration of respect. The earth harbors so many of their dead, pulling the living like a magnet to remain close to that special earth.

The sun (an) is Father; water (čuuš), the first sacred food. It is drunk as a sacrament to begin and end each wáašani feast. The winds are each named. The prevailing westerly wind is hulí, which may also be used to refer to wind in general. Myths recount epic battles between the frigid North wind (átya) and the Chinook wind (wináaway), a strong southerly flow of air that can thaw the frozen land in hours and provide relief from the midwinter chill (Beavert 1974:10–24). Hot dry east winds (tx̣áwna) in spring can burn the precious roots, cutting the harvest short. Winds are powers to be reckoned with. Steep temperature gradients in winter and spring between coast and plateau send air rushing through the Columbia Gorge and the lower passes to sweep across the dusty central plain. Indians here may burn the wood of the pallid evening primrose (kaluẋ-mí áčaš, "blueback salmon's eyes"; *Oenothera pallida*)—the blooms of which freckle the sandy slopes at low elevations at the end of spring—as a prayer to halt the forceful play of the winds.

The Columbia River Indians' Knowledge of Nature

The precontact Indians of the middle Columbia—in common with hunter-gatherers everywhere—survived by virtue of a detailed, encyclopedic knowledge of their environment. We have noted their appreciation of the basic elements on which life depends. Prominent landforms and habitats were also named (see fig. 4.2).

Such landforms are useful indicators of the location of plant and animal resources. For example, waláas, a plant (as yet unidentified) that produces balls of "Indian chewing gum" on its roots, grows only on steep clay banks, a habitat called ɨšx̣ú in Sahaptin. Specific floral associations may also be indicated explicitly in plant names, as in pɨx̣anu-pamá ttax̣š, "mountain wil-



low" (*Salix scouleri* and/or *S. monticola*). More often it is simply taken for granted where resource species may be found. For example, bitterroot and Canby's lomatium are found in productive abundance usually on šam terrain (lithosols); wáǩamu, or x̣maaš (camas), favors vernal meadows (taay).

Columbia River Indians also named hundreds of specific places. Their ethnogeography differs systematically from the Euro-American in certain telling ways; for example, they did not usually name mountains and rivers as such. For non-Indians, a focus on specific mountains and rivers as things of importance implies a cartographic perspective, one in which the observer is placed above the landscape as if in flight. The Indians' land-based perspective named instead specific places on a mountain or along a river *where things happened.* It was a practical rather than a purely abstract geography, naming culturally significant places, the sites of important events or activities, whether of the present or of the myth age.

The Columbia River was called nčí-wána, which means simply "big river," a name I have borrowed for the title of this book. Indian names adopted by the early western explorers for other major rivers, such as the Yakima, Klickitat, Umatilla, Walla Walla, Wenatchee, Okanogan, Sanpoil, Spokane, and Colville, were names for specific villages or other landmarks on or near those rivers, not names for the rivers themselves. Such names did not exist in the Indian lexicons. Mount Adams and Mount Hood were both called pátu, a generic landform designation rather than a name for a specific peak, though today the term is used as a proper name for Mount Adams, which has acquired special significance for the Yakima Indians as a symbol of their tribal lands and identity. Mount St. Helens and Mount Rainier, by contrast, were given proper names long ago. That for St. Helens, lawílayt-łá, literally, "the smoker," described its active volcanic state, while that for Rainier, taxúma, was likely borrowed from a Coast Salish language.

The degree of elaboration of geographic names in the Indian languages clearly reflected the cultural importance of an area. At the great Celilo Falls fishery dozens of rocky points and ephemeral islands were named (see fig. 5.3 in chapter 5). Each was a valuable fishing station, its time and manner of use governed by the seasonal rise and fall of the Columbia. Traditionally, such points might have been owned by a resident family who erected scaffolding there each year to serve as a fishing platform. Permission to use these facilities—the real limiting resource here being not the salmon but the good fishing places—had to be requested of the owners. The owners felt bound to share their bounty with both relatives and strangers. Strangers

were allowed to catch one fish; elders who came to watch the action were also due a fish as a common courtesy (for the Upper Chinookans at The Dalles, see Spier and Sapir 1930:175).

Indian place names give rich clues to the ecological perceptions of the people (cf. Boas 1934). Many names refer to plants or animals characteristic of the place. For example, the lower Crab Creek area north of Priest Rapids was called taxús-as, which is to say "[place] of Indian hemp" (Relander 1956:312). Though Indian hemp might be found in many low-lying areas closer to home, the hemp there grew higher and straighter, and the long strands produced were prized for the strength of the twine made from them. So special was this resource area that violent conflict (otherwise uncommon) occurred between Wanapam Sahaptins and Columbia Salish over access to the hemp (Relander 1956:312).

Áyunaš was a camping place near Mount Adams visited each August by Indians drawn from many miles around. James Selam recounts traveling there by horse and wagon as a child in the 1920s. In August 1983 we retraced a portion of his route, the track now scarcely discernible under the forest growth. Áyunaš means "lovage place," named for a valuable medicinal root (áyun; *Ligusticum canbyi*, fig. 4.3). The best berrying grounds were nearby at kalamát meadow, a center also for summer social activity, for visiting, trading, horse racing, and gambling. A deep trace of the Indian horse-racing track is still evident, now partially obscured by the passage of backpackers' boots. The place has become a registered historic landmark. Kalamát means "yellow pond lily" (*Nuphar polysepalum*). To my surprise I found a few pond lilies growing in a shallow pool in the meadow, though pond lilies are unusual at such a high elevation (4,500 feet). These plants were not important food for Sahaptins (though the Klamath Indians relied very heavily on them). Perhaps their unexpected occurrence on such a high tarn enhanced the mnemonic value of kalamát as a place name.

Many place names refer imaginatively to prominent landmarks. The Yakima village at Union Gap was called paxutakyúut, literally, "head-to-head," as the steep brows of the ridge cut through here by the river suggest two people in close consultation. The large Sahaptin village on the north bank of the Columbia River at Celilo Falls was formerly called sk̓in, literally, "cradle board," an allusion to the shape of a prominent rock nearby; it is now called "Wishram Station" (a misnomer, as the Upper Chinookan village named wíšxami in Sahaptin [or nixluídix in the Kiksht language of its own inhabitants] was situated several miles downstream, somewhat above The Dalles).

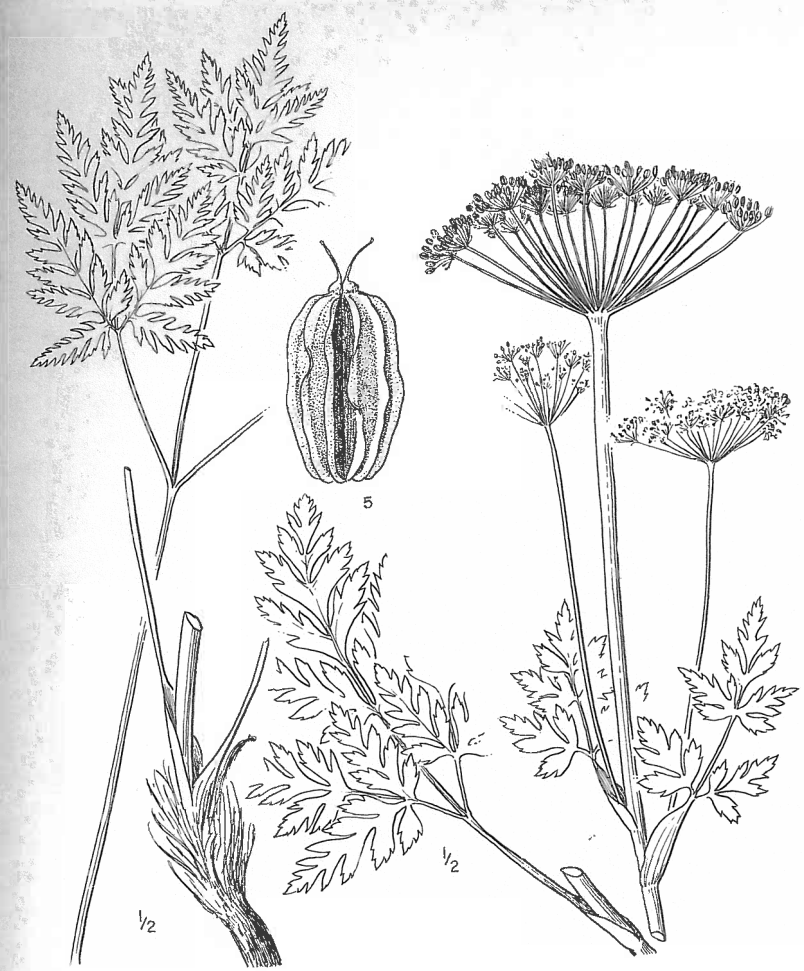


Fig. 4.3. Lovage (*Ligusticum canbyi*; **áyun**).

The ribald humor of the Columbia River Indians is seen at play in such place names as simtay-wáakuł, literally, "resembles pubic hair," for a triangular patch of riparian woods at the head of a tributary stream of Satus Creek southwest of Toppenish. The high point of Toppenish ridge south of White Swan is known as čáynač, or "groom" (see fig. 4.4). From certain vantage points, the sensuous curves of the ridges below the peak, silky with golden

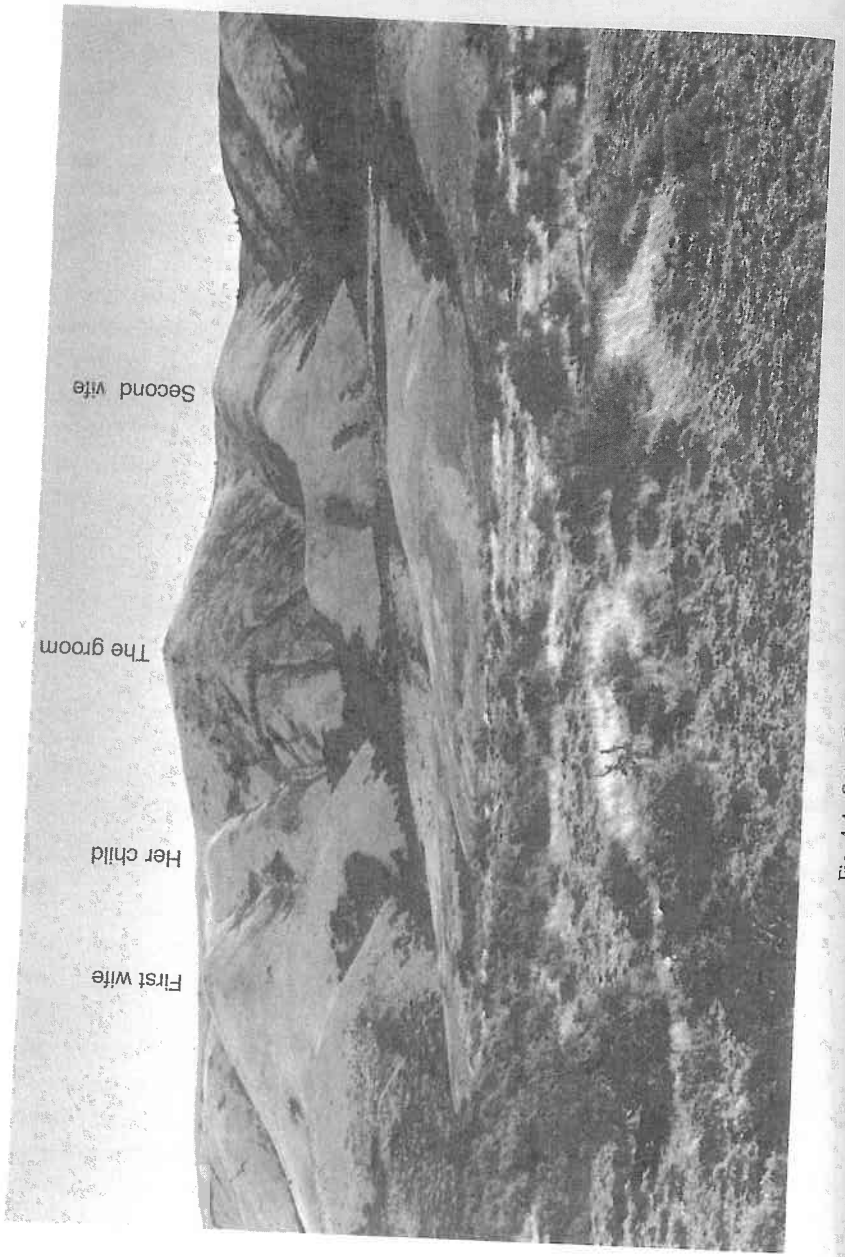


Fig. 4.4. Satus Peak, the "groom" with his brides.

summer grass, suggest a young man flanked by two graceful and naked wives, the "younger" with babe at breast. Such features, imaginatively perceived, might be brought to life in myths (e.g., Beavert 1974) that account dramatically for the feature's creation. Their's is a vivid landscape, still alive for the elders.

The sheer weight of geographical terminology as a component of Sahaptin vocabulary suggests a long period of stable residence on this stretch of river. Clearly indigenous Sahaptin geographic terminology exists for features south as far as Fox Valley (called ɨmáayi) and the Metolius River (from Sahaptin mɨ́túla, "spawned-out" or "dog salmon") in central Oregon (cf. Suphan 1974a, 1974b), north to the Wenatchee River ("come out quickly," see Table 5, p. 75) in Interior Salish territory, west nearly to old Fort Vancouver, where a meadow is called alašík ("turtle"), and east to the Palouse. Such indigenous terms sketch the boundaries of the land frequented by Sahaptin speakers. An interesting example of the use of place name origins to discover prehistoric language shifts is in Kinkade (1967). He notes that Methow geographic terms are largely of southern Okanaganlinguistic affinity and argues for a rather recent replacement of an Okanagan dialect there by the Methow dialect of Columbia Salish.

Such inferences from Indian place names to historic migrations must be supported by careful comparative linguistic analysis, as superficial resemblances of inaccurately transcribed place names have given rise to mistaken conclusions in the past. The most notorious example is James Teit's theory (1928) that Salish speakers occupied the Columbia River down to near The Dalles in the immediate precontact period. In Teit's scheme the Columbia Salish were but recently displaced on the mid-Columbia by Sahaptin speakers, who had in turn been pushed north by pressure from expanding Numic populations in the Great Basin. The equation by Teit of the "pisch quit pás" of Lewis and Clark (Thwaites 1959 [1904], 3:137)—identified with a village a few miles below and opposite the Umatilla River mouth—with the "pisquouse" of the 1855 treaty—the latter a Columbia Salish self-designation—compounded the error (Rigsby 1965:221–28). "Pisch quit pás" might be a poor attempt at spelling Sahaptin pɨ́šxu-pa, literally, "rabbitbrush place" (after a common local shrub, *Chrysothamnus* spp.), which might appropriately describe the terrain about the village of the so-called "Pisch quit pás" of Lewis and Clark, a name no longer recognized by local Indians. Though the mystery of the "Pisch quit pás" remains unsolved, it provides no support for a theory of Salish occupation of the Columbia River below Priest Rapids.

Flora and Fauna

As an ethnobiologist I have pursued a primary interest in the nature and scope of Sahaptin knowledge of their native flora and fauna. An ethnobiological investigation is deceptively simple at first glance. One compares the native name for a plant or animal with the Latin of the biological scientist (appending an English equivalent, if such exists). If every speaker (user) of a language, whether English, Latin, or Sahaptin, used words in the same way, and if everyone, regardless of cultural training, recognized the same categories of living organisms, the task would be reduced to the matching of labels. According to Edward Sapir, a founder of anthropological linguistics, people do not live "in the same world with [just] different labels attached" but rather in different worlds conditioned by the unique perspective acquired in learning their native language. (As noted above, this assertion of linguistic relativity has come to be known as the Sapir-Whorf hypothesis, after Sapir and his pioneering colleague, Benjamin Lee Whorf.)

Ethnobiological evidence, however, sharply qualifies this relativistic position. Close agreement between folk and scientist in the naming of plants and animals is evident. Natural species have an undeniable reality which it can be dangerous to ignore and which it is certainly useful to recognize. On the other hand, there are simply too many species of plants, birds, and insects to justify naming them all, even in the language of modern science (Raven, Berlin, and Breedlove 1971). It is thus of great interest to learn which species are recognized and which ignored or casually dismissed by the folk biologists of a culture, in this case, by the Sahaptin folk biologist.

I have so far recorded names in Sahaptin for approximately 240 basic kinds of animals and for 215 of plants. This is not an overwhelming total, as subsistence farmers in Mexico, Peru, and the Philippines are known to catalog 500 to 1,000 in each kingdom (see Brown 1985 for a cross-cultural summary). The size of the Sahaptin inventory is nevertheless impressive compared to that of the average modern-day Euro-American and is in keeping with the diversity of the local biota, their dependence on hunting, fishing, and gathering for subsistence, and the degree of attrition the language has suffered as a result of Euro-American contact and domination (Hunn and French 1984).

The botanical expertise of the traditional mid-Columbia Indians is best exemplified by their recognition of the many species of "lomatiums," plants all classed in Latin in the genus *Lomatium*, literally, "winged seeds." Hitchcock and Cronquist's regional flora (1973) lists forty species of lomatiums, which constitute nearly 50 percent of all the native species of the Umbelliferae, a large family including such familiar plants as carrots, parsley (hence the name "desert parsley" for some lomatiums), celery, dill, and coriander. The genus *Lomatium* includes a total of some eighty species found throughout the western half of the United States and the southern edge of Canada. Botanists consider it a difficult group to analyze taxonomically. Unlike other genera of comparable size and complexity such as the willows (*Salix*) and lupines (*Lupinus*), the various lomatiums are refreshingly stable, rarely if ever hybridizing in nature. The difficulty scientists have had with the genus—which is apparent in the errors of classification that have crept into Cronquist's expert summary[1]—is perhaps primarily because many *Lomatium* species are restricted in range, being rare and little known relict populations.

Sahaptin-speaking Indians had no such difficulty learning to distinguish and name these species. Fourteen "folk species" are named in Sahaptin (see Table 6), including two "varieties" each of *Lomatium canbyi* (Canby's lomatium), *L. farinosum*, and "*L. gormanii.*" In the last instance the Indians distinguished between Gorman's lomatium proper and Piper's lomatium (*L. piperi*, fig. 4.5), a distinction Hitchcock and Cronquist judged too subtle to be worthy of scientific recognition. Sahaptin speakers who know both plants—now restricted to a few elderly women—find the distinction not all that subtle. To them Piper's desert parsley is mámin and is considered a choice root food, a necessary ingredient of high quality root cakes (sapíl). Gorman's lomatium (the name applied here in the restricted sense) is called sasamíta and is considered food fit only for "ground hogs" (that is, marmots). Mark Schlessman's doctoral thesis (1980) confirms the Indians' judgment in documenting numerous fundamental (if not obvious) differences between these two species.

The summit of Dalles Mountain commands a sweeping view of the Big

1. Cronquist's treatment of the genus *Lomatium* in Hitchcock et al. (1961) should be amended as follows: *Lomatium farinosum* should now include *L. hambleniae* as *L. farinosum hambleniae* (Schlessman 1978); *Lomatium gormanii* should be restricted to those plants with papillate ovaries and seeds, and the smooth seeded plants should be recognized as *L. piperi* (Schlessman 1980); *L. orogenioides* should be renamed *Tauschia tenuissima* (Schlessman 1980); the range of *L. tuberosum* should be extended to include the Priest Rapids area of Benton, Grant, and Yakima counties, and it should be noted that the illustration on page 567 is of *L. columbianum*, not *L. tuberosum*; finally, a new species, *L. quintuplex* must be added (Schlessman and Constance 1979).

TABLE 6

Lomatium Species of Cultural Significance (Hunn and French 1981:90)

Scientific name	(PNRR*)	Sahaptin name/s	Uses	Distribution
L. canbyi C. & R.	(38/39)	sikáywa, sikáwiya (NW)	Staple, tuber eaten,	Lithosols, n. w. Nev.
Type A		lúkš (CR)	boiled or dried	n. to Douglas Co.,
		lamúš (NE)	whole or as "finger	Wash., where over-
Type B			cakes"	laps Type B
		škúlkul (NW, CR, NE)	Staple, tuber eaten,	Lithosols, Douglas to
L. columbianum			baked underground	Spokane Cos.,
M. & C.	(0/17*)	axúla (yk)	Plant avoided	Wash.
				Talus slopes, locally,
L. cous (S. Wats.)				Yakima Co., Wash.,
C. & R.	(16/16)	x̣áwš (NW, CR, NE)	Staple, tuber, eaten,	to Hood River Co.,
			boiled or dried	Oreg.
			whole or as "finger	Lithosols, Whitman
L. dissectum (Nutt.)			cakes"	Co., Wash., s. and
M. & C.	(12/15)	čalúkš (NW, CR, NE)		w. through Blue
			Medicine for people	Mtns. to e. base Ore-
			and horses, fish	gon Cascades
			stupefactant, hide	Talus slopes, through-
			tanning agent,	out
			shoots and young	
			roots eaten by Salish	
			and Nez Perce Indians	
L. farinosum (Geyer				
ex Hook.) C. & R.	(0/0*)	nikaptát (NE)	Tubers eaten	Lithosols, c. Columbia
				basin of Wash. e.
var. *farinosum*				
var. *hambleniae*	(2/14)	maxšlí, maxšní (NE)	Tubers eaten	Lithosols, w. of var.
(M. & C.) Schlessman				*farinosum* to e. base
				Wash. Cascades s. to
				Yakima Co., local,
				Wasco Co., Oreg.
L. gormanii (Howell)	(4/13)	sasamíła, sasamíłaya,	Tubers eaten (NW) or	Lithosols, e. c. Wash.
C. & R.		łałamít'a (NW, CR, NE)	avoided (CR)	w. rarely to e. slope
				Cascade Mtns., rare,
				n. Oreg.
L. grayi C. & R.	(16/21)	x̣ásya (NW)	Sprouts are the first	Talus slopes, through-
		latítlatit (CR)	"Indian celery" avail-	out
		atuná (NE)	able in late winter,	
			root eaten formerly	
L. macrocarpum	(26/33)	púła (NW, CR, NE)	Tuber eaten formerly	Lithosols and slopes,
(H. & A.) C. & R.				throughout
L. minus (Rose)	(4/6)	nak'únk (jd, um)	Tuber eaten formerly,	Basalt drainage chan-
M. & C.			boiled	nels, n. c. Oreg.
L. nudicaule (Pursh)	(28/30)	x̣amsí (NW, CR, NE)	Peduncles and leaf	Dry open areas,
C. & R.			shoots eaten fresh,	throughout
			seeds used as insect	
			repellent, perfume,	
			and medicine	

TABLE 6 (*continued*)

Scientific name	(PNRR*)	Sahaptin name/s	Uses	Distribution
L. piperi C. & R.	(28/31)	mámɨn, mámɨɬs (NW, CR, NE)	Favorite, tuber eaten, mixed with *cous* or *canbyi* to make "finger cakes"	Lithosols, e. slope Cascade Mtns
L. triternatum (Pursh) C. & R.	(4/30)	ɬáqimaš (te, ty)	Formerly used as food and medicine, ignored by other Sahaptin speakers	Dry open areas, throughout

Lomatium species clearly named by Sahaptin speakers. Indian language orthography follows Rigsby (n.d.). Distribution of native terms coded as follows: NW, Northwest dialect cluster; CR, Columbia River dialect cluster; NE, Northeast dialect cluster; jd, John Day dialect; te, Tenino dialect; ty, Tygh dialect; um, Umatilla dialect; yk, Yakima dialect. Uses and habitats cited are the most typical only. Information on uses by Salish and Nez Perce Indians is from Marshall (1977), Turner et al., n.d., and Turner, Bouchard, and Kennedy (1980). Plant nomenclature follows Hitchcock et al. (1961).

*PNRR = Positive Naming Response Ratio. This is the ratio of instances of confident recognition and naming of individual specimens by individual informants to all instances in which an informant was shown a specimen of *Lomatium*. In cases citing no positive naming responses, the referential range of the Sahaptin term is inferred from secondary data.

River above the famed Celilo Falls fishery. It was no doubt a goal of spring root-digging expeditions by nearby Indians in centuries past. *Lomatium piperi* and *L. gormanii* grow here side by side without hybridizing and may be closely compared when blooming in late March and April.

The second instance of Sahaptin taxonomic refinement is the case of *Lomatium farinosum*, which is divided into two named varieties. Maẋšní has yellow flowers and a western distribution; nikaptát has white flowers and the more easterly range. The first term applies to the scientific variety *hambleniae* (treated as a distinct species by Hitchcock and Cronquist), while the second names the variety *farinosum* (Schlessman 1978).

Maẋšni is widely known to modern-day Sahaptin root diggers, by name if not by firsthand experience, though its range is largely restricted to the lands traditionally exploited by Kittitas and Priest Rapids groups. It is a rather small plant with a tuberous root that averages just 3.5 grams (compared to the 12-gram average weight for roots of *Lomatium canbyi* and *L. cous*). Children are sent to dig for it on the windswept, thin-soiled flats where it grows in greatest abundance, while adults focus their efforts on more productive and more highly valued species. The white-flowered variety grows east of Priest Rapids and the Grand Coulee. The Nez Perce call it laqáptat (likely the source of the Sahaptin name) and collect its roots as a secondary food item (Marshall 1977:52). Mary Jim, born and raised on the lower Snake River, is the only person I met who knows both, having been raised on the borderline between the ranges of the two varieties.

The third instance in which Sahaptin-speaking Indians surpass the professional botanist in discriminating lomatiums remains something of a mystery. The species "split" in this case is Canby's lomatium, known as a key food source by Indians from northeastern California to southern British Columbia. Its value is rivaled only by "cous" (that is, *Lomatium cous*), made famous by Lewis and Clark. (Cous is the most abundant edible lomatium in the northern Rocky Mountain area and is valued next to camas and bitterroot throughout its range. See fig. 5.12.) Canby's lomatium is known by many Indian names, having gained recognition in at least six Indian languages (see fig. 4.6 and Table 7), but Northeast Sahaptin speakers are unique in dividing Canby's lomatium into two distinct folk species, škúlkul and lamúš (see also Washington n.d. [1976]). The first is described as the larger, its foliage more fern-like, its tuber distinctively shaped. Most important, the oil content of the škúlkul root is high, making sun-drying difficult. For this reason škúlkul must be baked underground after the fashion of

Fig. 4.5. Piper's lomatium (*Lomatium piperi;* **mámin**) (labeled *L. gormanii* in Hitchcock et al. 1961:557).

Fig. 4.6. Canby's lomatium (*Lomatium canbyi;* **lukš**).

TABLE 7
The Many Names of Canby's Lomatium

Columbia River Sahaptin	lukš (+ škúlkul)
Northwest Sahaptin	sikáywa (+ škúlkul)
Taitnapam Sahaptin	sikáwiya (+ škúlkul)
Northeast Sahaptin	
variety A	lamúš
variety B	škúlkul
Nez Perce	q̓eq̓íit (Marshall 1977:48–49)
Upper Chinookan	wa-q̓ʷát
Klamath	"ɬhe-hăs" (Coville 1904:102)
Harney Valley Northern Paiute	cana cuka, literally, "sweet cous" (Couture 1978:43)
Columbia Salish	c̓əxʷəl̓úsaʔ (Kinkade 1981)
Okanagan-Colville Salish	c̓exʷl̓úsa (Turner, Bouchard, and Kennedy 1980:64)

camas. Lamúš, smaller and less oily, is dried whole by stringing on a cord of Indian hemp. Mary Jim asserts that škúlkul and lamúš may be found side by side on Badger Mountain and about Soap Lake, root-digging grounds shared by Northeastern Sahaptins and the Okanagan Salish. As yet I have been unable to obtain definitive collections of these variants and thus cannot say what objective basis exists for the Indians' distinction.

Whatever the biological basis for the recognition of škúlkul, the practical implications of making the distinction are clear. A more elaborate and labor-intensive mode of preparation is called for by škúlkul, which (as in the case of camas, as we will see) precipitates a social event. The underground oven (tamáyč) requires cooperative efforts of adults of both sexes. Thus, preparing the plant for storage or consumption requires careful planning and coordination. The payoff may well have been both "economies of scale" in the production of winter food supplies and social "profits" derived from mutual assistance.

Škúlkul's reputation as a distinctive and valued food of the Wanapum or Priest Rapids people may explain Lewis and Clark's "Sokulk" tribe, which they placed on the Columbia River above the Yakima's mouth. The intriguing resemblance between "Sokulk" and škúlkul, first noted by Relander (1956:28), suggests that the "Sokulks" were Priest Rapids people. In the 1980s škúlkul is

still known as a specialty of the Wanapum people worth a trip to Priest Rapids. The abundance of lukš—as Canby's lomatium is known in the area from Yakima south—is irrelevant. It is no substitute for škúlkul.

Lukš—note another odd linguistic coincidence; škúlkul is lukš spelled backwards, then duplicated—is one of three or four root staples of the traditional mid-Columbia Indian diet. It is abundant on lithosols—"bald" patches of exposed basalt with just a thin grout of soil among the rocks—and flowers with the first hint of spring, usually in early March, though unusual weather conditions may stimulate a precocious flowering in January. It is a perennial that has adapted to survival on thin soils in a land alternately frozen, then baked. It succeeds here by storing energy as starch in a tuberous swelling of the root a few inches beneath the ground surface. These plants can "sleep" through the summer drought period as well as through the winter freeze, then draw on their energy bank account to finance a burst of new growth, a mantle of finely dissected leaves that hug the ground, out of the wind but receptive to the sun's energy. The root's store of energy combined with the photosynthetic efforts of the new leaves provide the force for flowering and seed production. By April or early May the seeds are ripe as the leaves turn to the task of replenishing the root's "tanks" for the plant's next period of dormancy.

Enter the Indian in search of food. If the root can store energy for the plant, it can store energy for people as well. And so it does, unwittingly. However, for maximum benefit it is important to know the plant's life cycle well. The root is packed with carbohydrates throughout its dormant period. But at this time it is in hiding, the leaves and seeds having blown away in the dry winds that sweep the Columbia Basin each spring. During the early phase of its growth cycle the root goes "soft," expending much of its stored resources to generate the plant's early spurt of growth. At maturity of the seeds the roots again reach their full capacity, while the plants remain conspicuous. The soil at this time is neither too muddy nor yet baked too hard for easy digging. These optimal conditions for harvest last but a few days at a given locality, as hot east winds in a matter of hours can dry the tops and blow them away, "burn" the roots, and bake the soil to hard pan.

Timing of the harvest is thus critical, as is a careful reading of microhabitat effects on plant growth. Plants mature first on sunny south-facing slopes (án-kni, "sun-ward") and are retarded in their development on shady northfacing slopes (šqíš-kni, "shade-ward"). This opens the harvest "window" a bit wider at each digging site. For an adequate annual harvest,

however, a strategy of seasonal upslope mobility is employed. Lukš—and its companion pyaxí (bitterroot, *Lewisia rediviva* [Portulacaceae], fig. 4.7)—may be ready for harvest in early April at 500 feet (150 m) elevation, where it is readily accessible from riverside fishing villages, and is still harvestable in late June at 6,000 feet (1,800 m) elevation on mountain ridges several days' journey from the river. Camps were traditionally established progressively further from and higher above the river from April through June, thus extending the harvest so that a family of four might collect a supply of dried roots sufficient for 60 percent of its winter caloric needs (Hunn 1981; see Table 8 and Table 9).

Lomatiums provide more than calories. The nutritional new year begins with the first "Indian celeries." Along the mid-Columbia and in the Yakima Basin, sprouts of Gray's lomatium (*L. grayi*, fig. 4.8) fill this role. The cultural value ascribed to Gray's lomatium, like that of Canby's, is reflected in the profusion of names applied to the plant. Columbia River Sahaptins call it latít-latit (literally, "little flowers"); Northwest Sahaptins call it x̣ásya; while in northeastern dialects it is known as atuná, a term applied to the plant's (barely) edible root in the other dialects.

At flowering these plants highlight many a dry arroyo with their gray-green, fragrant foliage crowned by golden umbels. The common English vernacular name, "spring gold," captures this aesthetic appeal. By flowering time, however, the plant's food value has dropped sharply as the ascorbic acid (Vitamin C) rich shoots become dry and fibrous. As the plant's economic role is transformed so is its name. Latít-latit becomes wáʔwinu, no longer the source of that delicious, spiced salad centerpiece at the thanksgiving feast held in its honor each year in March at the Rock Creek longhouse.

The "Indian celery" role is played by other lomatiums in other sections of the Plateau, reflecting complex phytogeographic patterns. Nez Perce Indians gather the rare and localized *Lomatium salmoniflorum* from rocky talus slides in the Snake River canyon for their first fresh greens, often as early as February (NP: ilq̓úulx̣; Marshall 1977:48–49). This species is found only between the Palouse and the Salmon rivers. Thompson and Okanagan Indians, who live north of the centers of abundance of Gray's lomatium, harvest the underground shoots of fern-leaved lomatium (*Lomatium dissectum*), a widespread species normally restricted to medicinal uses because of its toxicity. The underground shoots are apparently safe, though readers are warned that the root of this species is a potent fish poison.

By April Gray's lomatium is past its prime, but the bare-stemmed

lomatium (*L. nudicaule*) is now flowering virtually everywhere in the Cascade foothills (fig. 4.9). Both flower stalks (x̣amsí) and leaf petioles (pt̓íšpt̓iš) are eaten. X̣amsí is featured at the April salmon-and-root feasts held throughout the Plateau. It is relished by Indian children today as a seasonal snack. The key nutrient in these sprouts and stalks is Vitamin C, a water-soluble vitamin readily lost when foods are cooked or stored for extended periods. Vitamin C may have been a nutrient in short supply in late winter for Plateau peoples who had subsisted for several months on a diet of dried foods. X̣amsí stalks contain up to 67 milligrams/100 grams when harvested early in the flowering cycle—the Indian preference. A sample of mature stalks contained only 11 mg/100 grams (Benson et al. 1973). Such "spent" stalks are called ašwaníya, literally, "slaves," which is to say they are worthless, inedible.

Fig. 4.7. Bitterroot (*Lewisia rediviva;* **pyax̣í**).

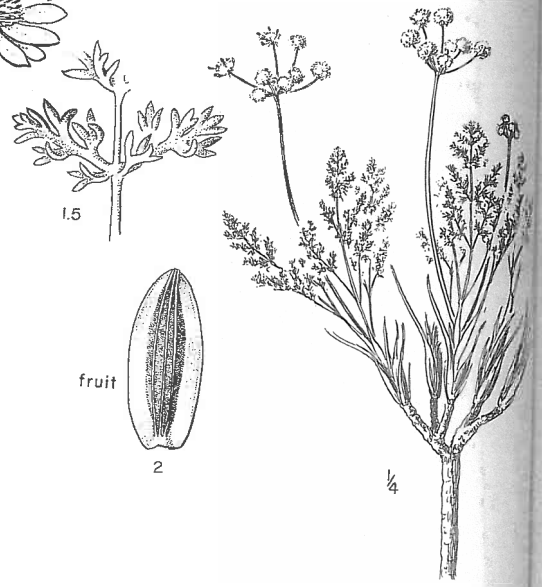


Fig. 4.8. Gray's lomatium (*Lomatium grayi;* **latít-latit**).

TABLE 8

Estimates of Plant Food Harvest Rates (kg/woman/day), Total Harvests (kg/woman/year), and Caloric Yields (kcal/person/day) (from Hunn 1981:130–31)

Species	Estimated Daily Harvest	Harvest Period/ Days	Total Annual Harvest	Kcal Yield	Locale
Spring:					
Lomatium canbyi	30	30–40	1050	800	Sanpoil[1]
Lomatium cous	22.7–34.1	ca. 40	1136	988	Nez Perce[2]
	33.3*	ca. 30	999	869	Umatilla[3]
Lewisia rediviva	30.3*	ca. 60	1818	1121	Umatilla[3]
	6.5	7	45	28	Kutenai[4]
Early Summer:					
Camassia quamash	36.4–40.9	14–21	677	524	Nez Perce[2]
	18.2–22.7	14–21	358	277	Nez Perce[2]
			2160	1672	Flathead[5]
Late Summer-Fall:					
Vaccinium spp.		28–42	63.9–80.2	31	Tenino-Wishram[6]
			98	42	Umatilla[3]

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Sources: 1. Ray 1933, 2. Marshall 1977, 3. Hunn and French 1981, 4. Hart 1976, 5. Geyer 1845–46, 6. Perkins n.d. [1838–43].

*Based on extrapolation to 8-hour days. If the average spring root harvest suppled 900 kcal/person/day for the year, the camas harvest added 400 kcal, and berries another 50, the plant food contribution would total 1,350 kcal, or 67.5 percent of needs.

Before leaving the subject of the lomatiums I should note also their medicinal value. It is often the case that the same plant families which are major sources of human food are also rich in toxic plants with high concentrations of physiologically active chemical compounds. Such is the case for the Solanaceae, the family of the white potato, tomato, and chili pepper. This

TABLE 9

Contribution of Root Foods to the Diet of the Mid-Columbia River Indians: Plant Food Proximal Analyses Used, per 100 gm (from Hunn 1981:130–31)

Species	Water (gm)	Protein (gm)	Fat (gm)	Carbohydrate (gm)	Kcal
Lomatium canbyi					
av. 6 dried root samples[1]	11.68	2.58	1.48	82.41	352
same, adjusted for water content	71.9	0.9	0.47	26.22	112
1 fresh sample[2]	71.9	0.8	0.12	25.9	108
Lomatium cous					
1 fresh sample[2]	67.9	1.0	0.4	30.0	127
Lewisia rediviva					
1 fresh sample[2]	76.6	0.7	0.1	21.6	90
Camassia quamash					
1 fresh sample[2]	70.0	0.7	0.23	27.1	113
Vaccinium spp.					
blueberries, raw[3]	83.2	0.7	0.5	15.3	62

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Sources: 1. Washington n.d. [1976], 2. Benson et al. 1973, 3. Watt and Merrill 1963.

family also gives us tobacco, deadly nightshade, jimson weed, and belladonna, plants that have the power to alter dramatically how our bodies and minds function, with potentially fatal consequences. Consider also the Leguminosae, the family of the garden pea, chickpea, soy bean, and many varieties of common beans. Yet sweet peas, vetches, and lupines may be poisonous.

The lily family gives us onions, leeks, and garlic, and provides the Plateau Indians with many nutritious bulbs and corms, notably the staple camas (wáƙamu or xmaaš; *Camassia quamash*, fig. 4.10) and numerous supplementary

foods. Yet death camas (*Zigadenus* spp.) and false hellebore (*Veratrum* spp.) can be deadly. Both of the latter are known to Sahaptins for their medicinal values, mimún (false hellebore) used as a hair rinse for lice, and alapíšaš (death camas) to treat skin sores. (See Appendix 4.)

The Umbelliferae provide yet another example of this ethnobotanical duality. In the past Plateau peoples obtained a substantial fraction of their annual food energy in the form of *Lomatium* roots, but were exposed as well to

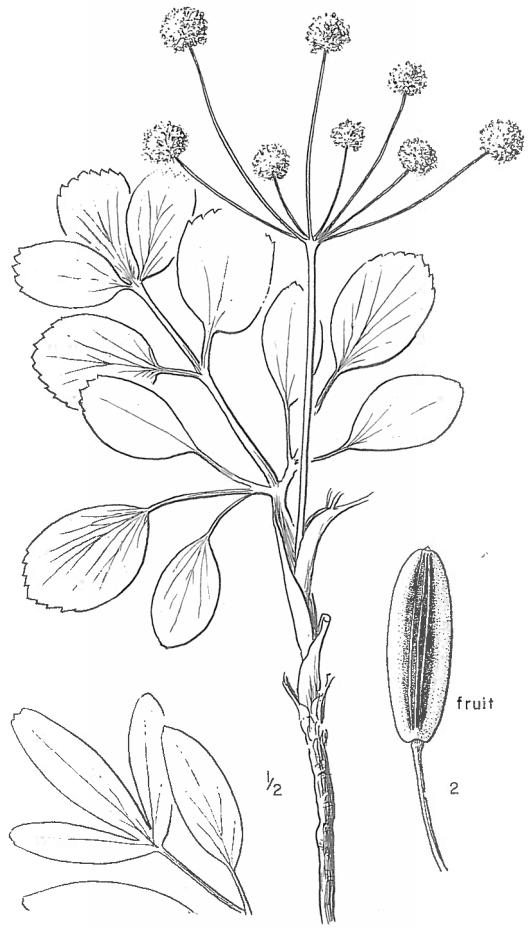


Fig. 4.9. Bare-stemmed lomatium (*Lomatium nudicaule;* **xamsí**).

Fig. 4.10. Camas (*Camassia quamash;* **xmaaš** or **wáǩamu**).

a threat of sudden, violent death if they were so careless as to confuse deadly water hemlock (alamíla; *Cicuta douglasii*) with foods such as cow's parsnip (txu; *Heracleum lanatum*) or water parsley (*Sium suave*). Sahaptin speakers today have no special term for plants of the umbel genus *Angelica* though these are common and quite edible. Perhaps the plant's seductive resemblance to deadly water hemlock, from which it is not readily distinguished, discouraged further experimentation on their part.

Even the genus *Lomatium* has toxic species, most notably, the fern-leaved lomatium (čalúkš; *Lomatium dissectum,* fig. 4.11). Though eaten sparingly in the sprouting stage by Interior Salish Indians, as I noted above, it is respected as a powerful medicine from California to Canada and from the Pacific to the high plains east of the Rockies (Meilleur, Hunn, and Cox n.d. [1989]). Its primary medicinal applications are external. The root is mashed and the pulp applied as a poultice to draw out infection. It may be effective as well as a bactericidal agent. It is considered effective against saddle sores in veterinary medicine. An infusion is drunk for symptoms of cold and flu or applied as a hair rinse for dandruff. At Warm Springs the root is used in processing buckskin (D. French, personal communication).

Columbia River and Yakima Indians use the root as a fish poison. A quantity of the root mashed on streamside rocks will shortly reduce the resident fish to a state of stupefaction. This technique is workable only in small, quiet streams with still pools where the poison will have time and sufficient concentration to operate. James Selam claims that this technique allowed the selection of preferred fish while sparing the rest, as the fish soon recover from the effects of the poison as it is flushed from the stream.

Little is known of the biochemical basis for this toxicity. A preliminary study by Rachel Cox at Reed College (1983) has verified the plant's power to stun and kill fish and has isolated a chemical fraction from the root with coumarin-like properties as most likely containing the active ingredients. Cox describes its effect on fish—mosquito fish (*Gambusia affinis*) and fingerling silver salmon (*Oncorhynchus kisutch*) studied under laboratory conditions—as follows:

> "It took less than one minute for the fish [*Gambusia*] at 1.0 g[ram]/l[iter] (raw, undried root) to show symptoms of intoxication. Affected fish displayed an interesting behavioral fluctuation. At first they were extremely hyperactive, exhibiting furtive bursts of energy, jumping out of the water, displaying overactive gill motion, and frequently hitting against the sides of the bowl. Subsequently, they would slow down, begin to lose equilibrium, float with bellies

> up, and sometimes begin to sink. . . . appeared dead, but when nudged gently, they could be coaxed back to hyperactivity. (Cox 1983:50–51)

Another *Lomatium* valued as an Indian medicine is the bare-stemmed lomatium. The seeds of this plant are valued to the point of being a hot trade item on Vancouver Island well northwest of the species' natural limits in the Fraser River delta and along Puget Sound shorelines (Turner and Bell 1973). The highly aromatic seeds have a powerful anise odor and are used on the middle-Columbia as "moth balls" to protect precious ceremonial regalia from the ravages of insects.

Two other lomatiums are considered to be poisonous by my Indian consultants. *Lomatium columbianum*, a robust species found in a limited area from near the eastern end of the Columbia Gorge north to the Naches River west of Yakima, superficially resembles the fern-leaved desert parsley. Josephine Andrews calls it aχúla and recounts how her grandmother cautioned her that it was a "bad plant." *L. columbianum* contains columbianin, another chemical compound of the coumarin group notable for their effect as smooth muscle relaxants (Call and Green 1956). Still mysterious is the case of the plant known as háti, described as deceptively similar in outward appearance to the staple food root χawš. I learned of this plant quite by chance while on a root-collecting expedition to the traditional Blue Mountain haunts of my John Day and Alderdale consultants. We camped at Anson Wright county park, once an Indian campsite now used as a base of operations for the spring harvest of pyaχí and χawš. The campsite was pleasantly quiet with little traffic on the state highway that climbs past into the mountains. Set at the base of a north-facing hill covered with ponderosa pine and Douglas fir, the camp has a sweeping view of hillsides carpeted with grass and wildflowers. Along the willow bordered stream we glimpsed an otter in the early morning and James caught a red-sided shiner (p̓ała-lí) with a short line and hook baited on the spot with χamt̓úy—a caddisfly larva we discovered beneath a rock in the stream.

Elsie Pistolhead interpreted the conversations of a nearby meadowlark that sang from the phone lines on the roadside. Meadowlark is a truth-sayer as well as a tease, a key character in Coyote stories. That evening Mrs. Pistolhead carefully set out soap and matches to appease the "stick Indians" (Sasquatch-like creatures that may romp through camp by night). Elsie Selam and Sara Quaempts, reminiscing, told how as young girls they had learned to avoid confusing χawš (*Lomatium cous*), primary object of local root

digging efforts, with the notorious háti. A girl one time came down the hillside opposite, digging stick in hand and wápas bags full. She proudly presented the contents of her bag to her elders only to be rebuked for bringing down a load of háti. As with aχúla I was able to learn only that it was a bad plant, not the precise cause of its ill repute. I spent hours scouring that hillside—rather too steep for the women to negotiate at their age—and found besides *Lomatium cous* two other similar *Lomatium* species not otherwise nomenclaturally accounted for in Sahaptin. These were *L. donnellii*, which was common on the hillside, and *L. vaginatum*, of which but a few specimens were found. Háti apparently refers to one or the other or both of these plants; however, I know of no evidence that they are either inedible or toxic. It may simply be that the Indian people recognized them as different from the well-known and loved χawš, but had insufficient opportunity to test their potential as food. A strongly reinforced aversion to things "familiar but different" may have survival value where foods and poisons are similarly packaged.

Plateau Indians survived as hunters and gatherers for ten thousand years in a land of strong contrasts by virtue of their encyclopedic knowledge of the local environment. Their knowledge of lomatiums demonstrates that their perceptual and analytical capacities are on a par with those of a modern-day professional botanist. Yet their knowledge of their local ecosystem is in certain key respects quite unlike what the modern professional ecologist or wild-plant enthusiast might choose to learn about the same biogeographical terrain. Literally hundreds of species of "wildflowers" that grow here are known to the Indians as "just flowers" (áwtya ay latít). Some few wildflowers are named on the strength of their peculiar beauty or conspicuousness, as is the case for the scarlet gilia (*Gilia aggregata*), called in Sahaptin "hummingbird's food" (qmámsali tkʷátat), the shooting star (*Dodecatheon* spp.), literally "curlew's beak" (k̓ʷayk̓ʷaynmí núšnu), and the diminutive first-of-spring gold star (*Crocidium multicaule*, see fig. 4.12), which as papc̓iláw plays an important role in the myth of "Coyote's eyes."[2]

By contrast, the showy native wild iris (*Iris missouriensis*) goes unrecognized by many Sahaptin speakers (though it is consistently referred to as

2. The flower in this myth is sometimes referred to in English as "buttercup." At Warm Springs the cognate term papc̓ilú is sometimes applied to *Crocidium*, sometimes to the sagebrush buttercup, *Ranunculus glaberrimus*. Both flowers contribute a splash of color to the rocky flats frequented by the root diggers in early spring.

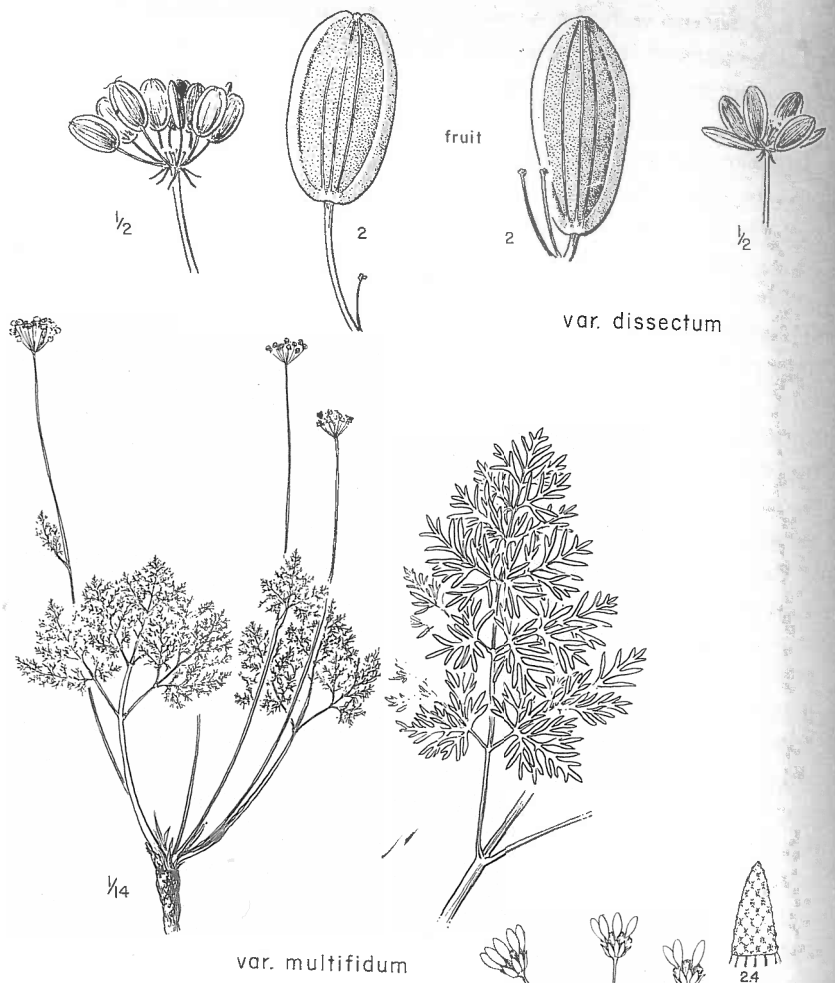


Fig. 4.11. Fern-leaved lomatium (*Lomatium dissectum;* **čalúkš**).

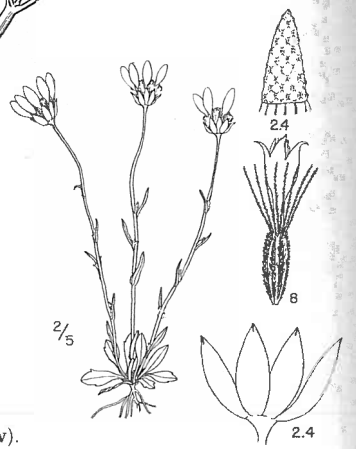


Fig. 4.12. Gold star (*Crocidium multicaule;* **papċiláw**).

nuunas-wáakuł, "mariposa lily-like," on the Warm Springs Reservation [D. French, personal communication] and may once have been employed to treat smallpox [Gibbs 1978 [1854]:14]). Nor do the windflowers (*Sisyrinchium* spp.) or violets (*Viola* spp.) have standard names. Showy buckwheats (*Eriogonum* spp.) dominate the sagebrush hills in June as fully as the lomatiums do in April, yet none is named.[3]

We might see in this dismissal of so many pleasing plants as "just flowers," a hard-nosed practicality deficient in aesthetic sensitivity. However, I question the validity of such a judgment. I know the Indian people have a deep reverence for their homeland. I suspect rather that survival placed a premium on knowlege of utilitarian value and a price on knowledge motivated solely by a compulsion to name every living thing. James Selam would never say that a plant "has no use," for he firmly believes that every plant and animal has both a name and a significant role to play in the overall economy of nature. This is an article of his faith. It is just that, in his view, he was born too late and never had the opportunity to learn the true names of these "nameless" organisms.

The Sahaptin Way of Making a Living

Hunting and gathering is an ancient way of life. Our Australopithecine ancestors were hunter-gatherers more than three million years ago. However, a careful study of hunting-gathering as practiced by contemporary humans, as for example the Plateau Indians, proves that the hunting, fishing, and gathering of these Indians differ dramatically in virtually every important respect from the foraging of apes. Some important points of comparison include: tool use, transport, processing of food, sharing and the division of labor, range of food items utilized, and the cultural context of production. While chimpanzees have been shown to construct a few crude implements, such as "termiting sticks" and overnight nests, their technological skills are far surpassed by such "lower animals" as beavers, bower birds, and bees. The technological repertoire of modern hunter-gatherers—like that of our own upper Paleolithic ancestors (I refer here to the peoples of Europe, Asia, and Africa of 35,000 to 10,000 years ago)—is often described as "simple," even as "crude." In comparison to the machinery of the indus-

3. David French reports (personal communication) that tall buckwheat (*Eriogonum elatum*), a conspicuous but scarcely "showy" wild buckwheat, is known as paq̓ilakaš, "basket-covering plant," at Warm Springs.

trial era those may be apt terms. On closer examination, however, the "crude" tools of hunter-gatherers, such as the boomerang of the Australian aborigines or the Eskimo (Inuit) igloo, often reveal complex underlying conceptual plans. The boomerang is a triumph of aeronautical engineering in a single carved piece of wood, while in the igloo the principle of the true arch is applied in three dimensions to construct an ephemeral shelter of packed snow. (Were you not taught that the Romans "invented" the arch?) Igloos were also commonly improved by an attached subterranean air-lock entryway and skylights of translucent ice for indirect lighting.

Precontact Plateau peoples hunted with bow and arrow. Three thousand years ago they did without this tool, which seems so much a part of being Indian to us. They relied then on the spear-thrower or atlatl, named for its Aztec counterpart. The impact of this particular technological revolution must have been felt throughout Plateau society, though the archaeological record indicates a very gradual transition from atlatl to bow and arrow (Cressman 1977:105–8).

A strong bow and a true-flying arrow are not simple to make or use. Appropriate materials must be selected. On the Plateau oak was most often preferred for the bow, with the bowstring of elk sinew, carefully extracted and treated for this application. It should neither stretch nor break under great strain. Arrows were characteristically of serviceberry wood (*Amelanchier alnifolia*), light and straight, but hard. The bush itself was called kayáasu-waaš in Northwest Sahaptin dialects, literally, the "arrow bush."

Tiny obsidian arrow heads were fashioned by flaking from an obsidian core (obtained in trade from near Bend, Oregon, in an area dominated by enemy Northern Paiutes), then retouched by pressure with an elk antler flaking tool on a protective pad of elk hide, then hafted with Indian hemp bindings sealed with pine pitch. This was an industrial operation that every boy once knew how to perform to perfection. It now can be replicated by only a few old-timers. The bow and arrow has gone the way of the atlatl before, replaced by guns, and with it has gone the old knowledge.

Though hunting is strongly emphasized in most descriptions of hunting-and-gathering economies, the pursuit of big game such as deer, elk, and bear actually contributed but a small fraction to the mid-Columbia Indian food energy budget, somewhere in the order of 10 percent of total calories. Gathering of plant foods and fishing were responsible for the remaining 90 percent. In the global context of human prehistory, fishing technology represents a relatively recent innovation in comparison with that of hunting and gathering. Fishing nets may be less than twice as old as agriculture as a means to exploit more effectively the resources of the natural environment for human sustenance.

There is evidence of complex fishing gear in use on the Columbia River at The Dallas seven to nine thousand years ago. Weights for use with seine nets and points that may have been used on a harpoon or leister (fig. 4.13) for spearing large fish are known from excavations east of The Dalles and date to that period (Cressman et al. 1960:115, 118–19). Lewis and Clark found local fishermen employing such diverse techniques as weirs—elaborate traps of willow and stone (fig. 4.14) broaching the full width of small tributary streams—dip and set nets, baited bone chokers on a hemp line, and fish spears with detachable points of various sorts (Thwaites 1959 [1904], 4:326, 327, 335, 338). A complete list would include as well, fish poisons and gill nets woven to the specific dimensions of the fish sought (cf. Rostland 1952). It is not surprising that native terminology for fishing is highly elaborated, as shown by the sample of Sahaptin terms in Table 10.

The Seasonal Round

ánam, "winter"

The winter season offered ample free time for tool construction and maintenance. James Selam made a three-quarter-scale model dip net for the Yakima Nation Cultural Heritage Center Museum during the winter of 1976 and invited me to photograph the steps involved (see figs. 4.15 and 4.16). A full-sized dip net (twanú) has a fifteen-foot handle trimmed from a Douglas fir sapling. The hoop is formed of two pieces of vine maple or Douglas maple (twanú-waaš, literally, "dip net plant"), which has strong, flexible wood. The hoop-halves are bound together with Indian hemp (taxús) twine and strengthened at the base with a brace of ocean spray (pix̌wayč-pamá, literally, "for [the] dipnet brace," *Holodiscus discolor*) wood, a local "iron wood." The net is knotted of Indian hemp twine using a net gauge to fix the size of the mesh and a bobbin to hold the supply of twine. This twine is laboriously fashioned by women during the long winter confinement, as described in Delsie Selam's text (see chapter 3). The net is closed by a drawstring pulled tight by the weight of the trapped fish, preventing its escape.

Dip-netting involves drawing the hoop through the water with the cur-

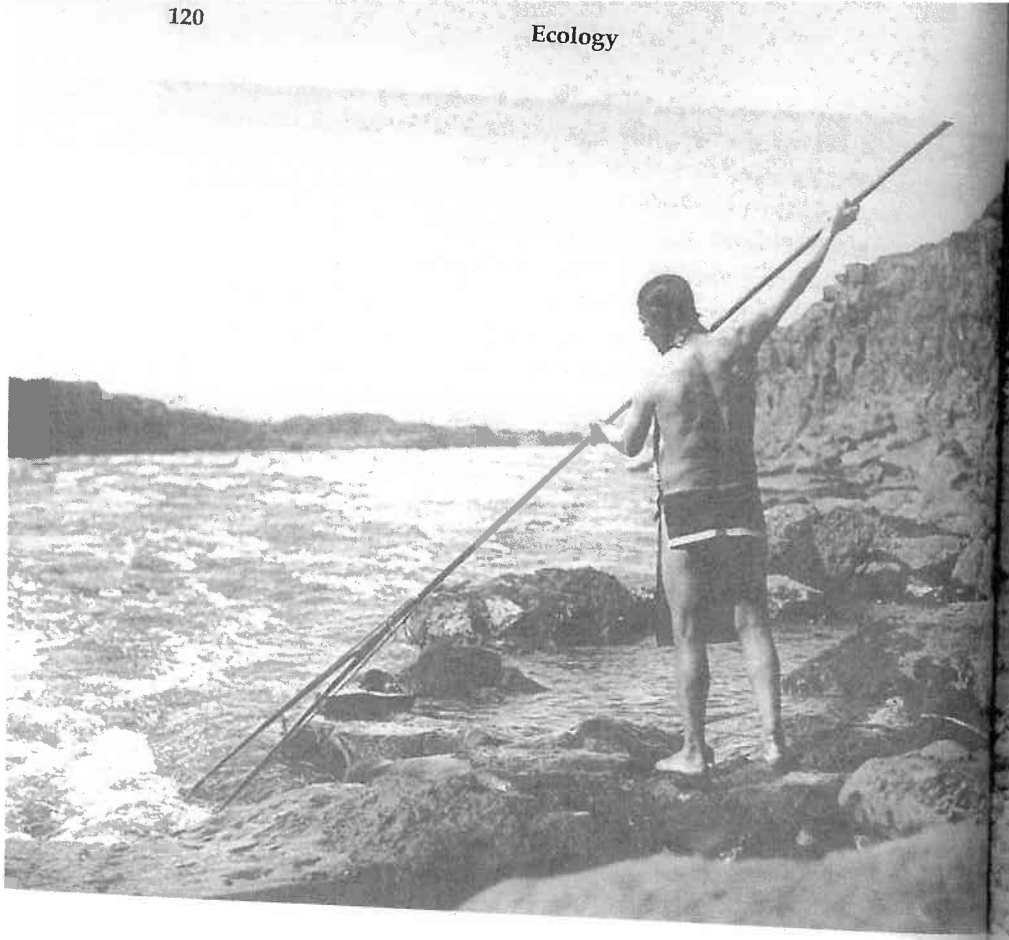


Fig. 4.13. A Wishram Indian fishing with a two-pronged spear (Curtis photograph, University of Washington Libraries, neg. 209).

rent and pulling the net up when a fish is felt in the net, because the turbulent water obscures the fisherman's vision. This same net can be used as a set net by holding it in an eddy until a fish is felt. "Roping fish" involves this same net, but held just out of the water at the base of a fall. The fisherman tries to catch the fish that fall back in their attempts to leap the falls.

Traditionally, winter was also a time for visiting and the time for mythtelling, a time of heightened spirituality associated with the winter shamanistic performances. Visiting had not only social but also ecological significance, as visitors shared information essential to the planning of next

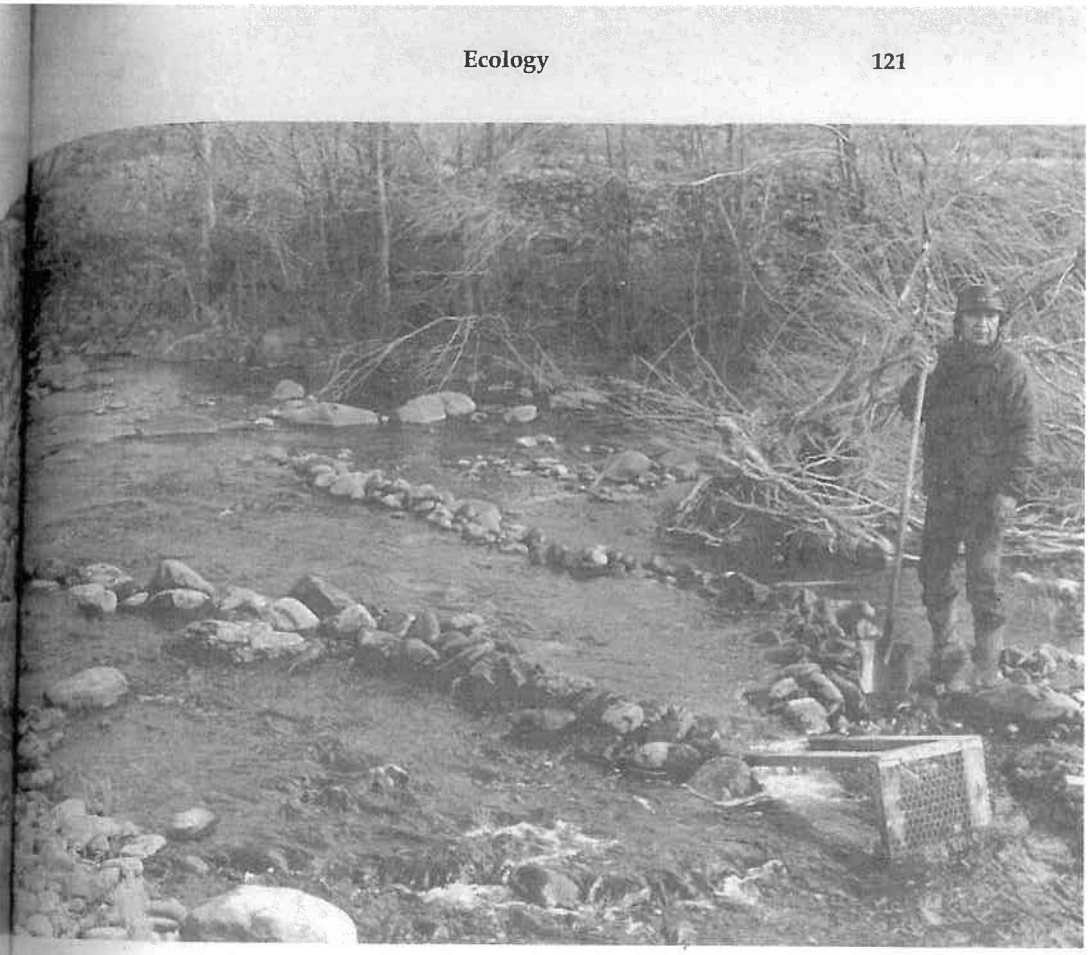


Fig. 4.14. A stone weir for suckers in Rock Creek.

summer's harvest strategy. Visiting also served as a mechanism to redistribute food surpluses and to compensate for local shortages, as visiting has always been the occasion for feasting. Generous hosts won wide regard.

wawáxam, "spring"

Most traditional accounts of the local Indian economy note the coming of the spring Chinook salmon as the long awaited event that brought winter to an end. Yet long before their arrival at The Dalles—normally at the end of April—Columbia River Indian women were hard at work stockpiling next

TABLE 10
Sahaptin Terminology for Fishing

I am fishing.	npíwi-ša=aš
I am fishing with hook and line.	wacílak-ša=aš
fishing pole	wacílak-as
fish hook	q̓íya
I am gaff-hooking.	q̓íyak-ša=aš
I am snagging fish.	wawa-q̓íyak-ša=aš
I am fishing with a bone choker.	šapá-ʔaxč-ša=aš
I am dip-netting.	twalúu-ša=aš
dip net hoop	twanú
vine or Douglas maple	twanú-waaš
dip net pole	sunúus
I am "roping" fish in smooth, shallow rapids.	á-twaxumk-ša=aš
I am "roping" fish at a waterfall.	sapá-wiilata-ša=aš
I am fishing with a fixed net at a fish jumping place.	sapá-xup-waalata-ša=aš
I am seining fish.	išɬm-laytk-ša=aš
I am catching fish at a weir.	sapá-x̣aluu-ša=aš
fish weir	sapa-x̣aluu-ɬáwas
fishing scaffold	sapa-x̣ʷluu-s
I am spearing fish.	tayx̣áy-ša=aš
fish spear	tayx̣áy
I am fishing by torch light (with a spear).	tapwalkʷ-ša=aš
I am fishing with a set net.	tápatuk-ša=aš

year's root supplies. The gathering activities of the women required knowledge, skill, and technological expertise equal to that needed for hunting and fishing. Women also, as we shall see, contributed at least half the total food supply.

Gathering has been vastly underrated by anthropologists in the past. It has been dismissed as an activity scarcely removed from that of apes and other animal foragers. Each ape gathers his or her own food. It is then eaten

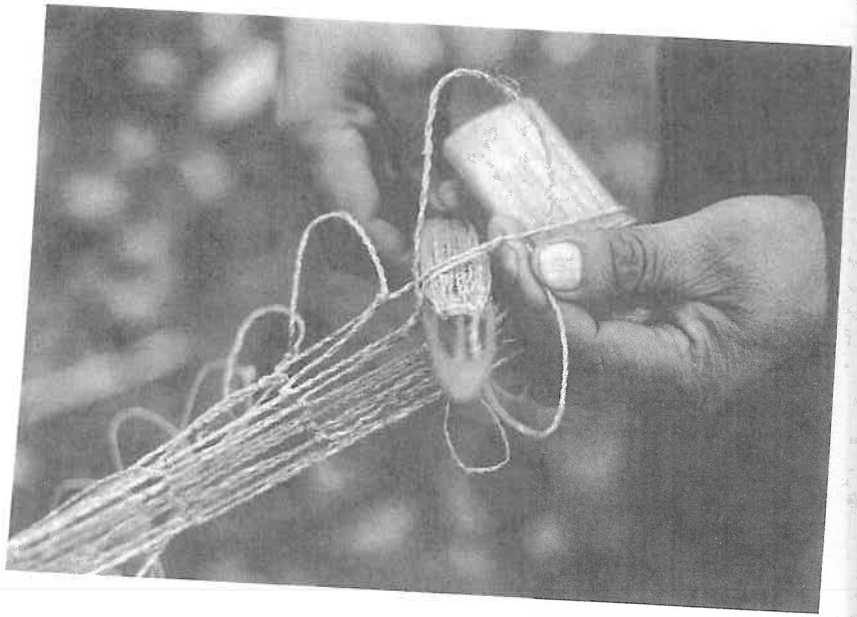
on the spot without further ado. Human gathering—and that of the Plateau Indians is no exception—involves complex planning. Gathering begins with a decision as to which foods to gather and where to go to look for them. These decisions are constrained by the larger planning framework of the seasonal round. Digging bitterroot would not be contemplated in the fall. Not only is there no bitterroot available, but the family is otherwise engaged fishing on the river or gathering huckleberries high in the Cascades, far from bitterroot habitat. Nor should one dig bitterroot in the spring until the proper thanksgiving rituals (ká?wit) have been performed; a failure to show respect for the Earth's gifts of food would guarantee poor future harvests. Given the appropriate season, the pursuit of bitterroots involves choosing an area where quantities of this and other roots at the proper stage of maturity might be found.

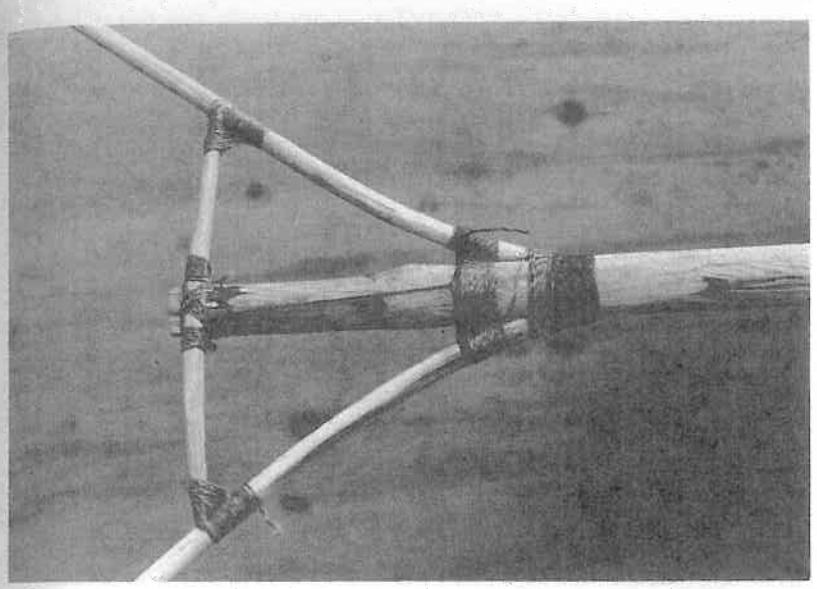
Sara Quaempts describes the plan her people at Alderdale followed each spring when she was growing up. The winter lodges at náwawi were dismantled and all the people moved up along the creek to the first major tributary canyon, a place called aykʷs-mí tánawt, "cottontail's burrow." In early spring this canyon bottom caught the sun's limited heat and deflected the cold winds. Water was readily available and the thick sagebrush of the creekside flats provided ample firewood. The women climbed to the ridges above to dig bitterroot and lomatiums, which they cleaned and prepared for drying each evening back at camp. When the local supplies were exhausted, after perhaps a week's time, the people moved camp further upstream to the next tributary canyon, to a campsite named pnáy-pnay, "many pestles." The process was repeated here and again at x̣ʷiyayč-mí, "sweat lodge place," two miles farther up the canyon. The supplies of dried roots were then hauled back to náwawi for storage in semisubterranean cellars. This process was repeated with local variants by the residents of each riverside winter village.

When the spring Chinook salmon runs began, the women attended to the cleaning and drying of the men's catch. Later in May, as the river rose in spring flood and the fishing sites were covered, mid-Columbia families packed their gear and set off, the men riding, the women generally walking, leading the pack animals (before A.D. 1750, of course, they did without these helpful companions) to the first of another series of familiar way stations that would lead eventually to the camas meadows of the high Blue Mountains.

James Selam's family, for example, was accustomed to camp first at Olex, about twenty miles southeast of their winter village of táwaš at Blalock, on

Fig. 4.15. James Selam making a dip net.





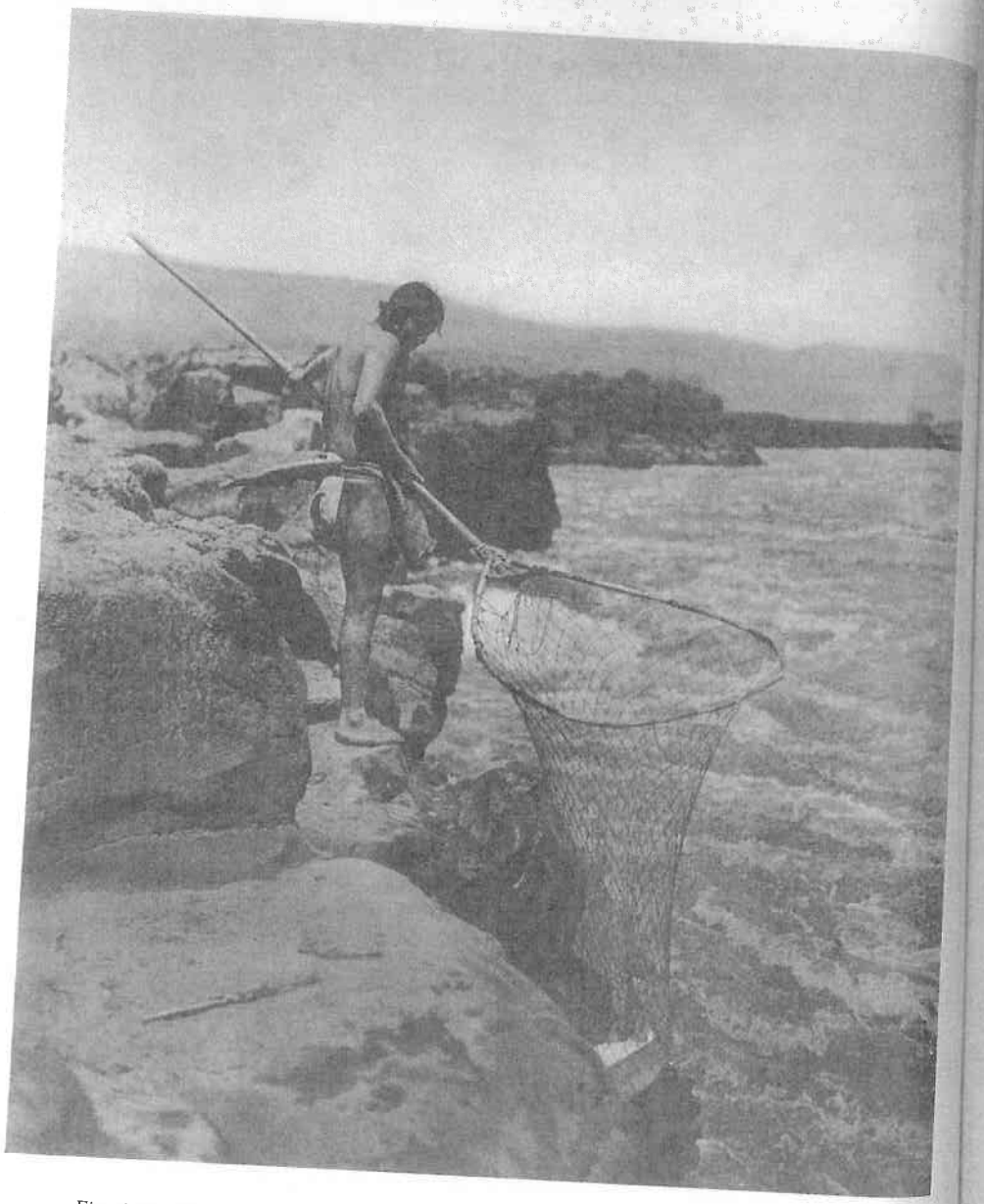


Fig. 4.16. Dip netting in pools, Wishram (Curtis photograph, University of Washington Libraries, neg. 208).

the Columbia just above the John Day River mouth and nearly opposite Rock Creek, Washington. Bitterroot and Canby's lomatium roots were abundant here. As the season progressed they camped next at Condon, then at Fossil, each stop some twenty miles farther south. Beyond Fossil they descended to the John Day River at Spray, then moved up the North Fork to Monument (a corruption, according to James Selam, of the Sahaptin place name, mánmɨnt) where they intercepted a spawning run of "eels" (that is, the anadromous lamprey *Entosphenus tridentatus*). Here they might join forces with families from winter villages at Roosevelt (nɨšxúawi) or Alderdale whose routes moved south farther to the east, up Willow or Butter creeks, to Heppner or still further east through Pilot Rock and Ukiah. Here the bitterroots grow among the yellow umbels of x̣awš, a cousin of Canby's lomatium.

The patches of thin šam soils favored by bitterroot and the tuberous lomatiums are common but dispersed, making large encampments at this season impractical. At Fox Valley, Oregon (ɨmáayi), however, the abundant camas mature in late June, bringing many families together for the cooperative effort of the harvest of this favorite bulb. Such gatherings were attended by hundreds, perhaps even thousands of Indians (Ross 1956 [1924]:22–30; Marshall 1977:111, 159). Famous camas meadows include those at Kittitas and at Glenwood in the Cascade foothills of Washington and near Kamiah, Idaho, at the base of the Bitterroot Mountains. The concentrated abundance of vegetable food at such times and places provided a welcome opportunity for socializing, highlighted by the intense excitement of gambling and horse racing, and for the business of regional politics and of mate matching.

In the early days of this century the mid-Columbia Indians modified their traditional path through the Blue Mountains in order to visit the frontier town of John Day for the Fourth of July rodeo—a modern multi-cultural equivalent of their traditional summer gatherings. The contemporary Indian pow-wow may have roots in these ephemeral regional gatherings, occasioned by extraordinary environmental largess. Camas did not provide the only context for such events. We see large, diverse colocations of Indian people at the summer fish runs at Celilo Falls and The Dalles and at Kettle Falls and again at the early spring lomatium concentrations across the Columbia opposite the mouths of the Okanogan and Sanpoil rivers (Ray 1933). Fur trading posts and missions provided comparable material opportunities and motivations, which proved a mixed blessing to these Euro-American entrepreneurs and an unmitigated disaster to the Indians.

The roots collected during the spring, if not eaten on the spot, were dried, cached, then transported to the winter village sites upon the families' return to the river for summer fishing. Horses greatly facilitated this labor, as a single family might have to transport over 1,500 pounds of dried roots over distances of more than one hundred miles to add to their winter supplies. Of equal significance in the labor equation, however, is the fact that the roots were first dried, then transported. This reduced the weight of their loads by two-thirds.

šátam, "summer"

In late June or early July the Big River drops, exposing the summer runs of blueback and Chinook salmon and summer steelhead to the eye of the fisherman. Women put their roots aside in order to clean and dry the quantities of fish being pulled from the river.

Fish runs are at their peak for short periods of a few days or a week with slack time between; during these breaks the women could take time off to gather the early ripening fruits of golden currant (*Ribes aureum;* xan), gooseberry (e.g., *Ribes lacustre;* pínuš; see fig. 4.17), dogwood (wiwál, fruit of lucaní), serviceberry, and chokecherry. The currants and dogwood berries ripen first, in June of most years, and as with the first Indian celeries, the first suckers, the first roots, and the first salmon, they are ritually welcomed before the general harvest begins. In the late 1970s this ká?wit cermony for dogwood fruits and golden currants was being revived by Indian congregations at Horn Dam on the lower Yakima and at Satus longhouse.[4]

Chokecherries (*Prunus virginiana;* tmiš, fig. 4.18) remain a great favorite of older Indian women. Today they are frozen for later consumption, in place of the traditional process of grinding (pits and all—exposure to air eliminating the toxic cyanide compounds characteristic of pits of *Prunus* fruits, cf. Timbrook 1982) and drying in the sun.

Henry Perkins, a Methodist missionary posted at The Dalles, was frustrated by the Indians' peripatetic ways, as his fledgling congregation up and left him en masse in mid-August 1842 (Perkins n.d. [1838–43]). They were heading for the huckleberry fields in the high Cascades. Many stayed away

4. David French notes (personal communication) that there is much variability among Sahaptins as to preferences and terminology for currants.

Fig. 4.17. Swamp goosberry (*Ribes lacustre;* **pínuš**).

Fig. 4.18. Chokecherry (*Prunus virginiana;* **tmiš**).

until cold weather in October brought snow to the high country camps. Today the automobile or pickup truck with camper top makes such extended dislocations unnecessary. Early August remains the occasion for the first-foods celebration in honor of the Indians' number one fruit, the black mountain huckleberry (*Vaccinium membranaceum,* known in Sahaptin as wíwnu). This feast is the obligatory prelude to a series of day, overnight, or weekend trips to the productive berry fields, the knowledge of which is part of an Indian family's inheritance. A serendipitous consequence of this phase

of the seasonal migration is that it provides an excuse to escape the summer's most intense heat, when for many days the land bakes at over 100°F on the riverside flats and in the rock-rimmed canyons.

špam, "fall"

James Selam fondly recalls his family's annual trek to "Indian Heaven," as the stretch of subalpine forest, high meadows, and mosquito-infested tarns between Mount Adams and Mount St. Helens in the Gifford Pinchot National Forest is known. The family needed three days to cover the distance by horse and wagon from Celilo Falls where his family owned fishing sites. They stopped overnight west of Goldendale, at Glenwood, and again at Goose Lake, where they stashed their wagons. They climbed on foot and horseback to their campsite at áyun-aš near kalamát, as the meadow with the historic Indian racetrack was known to his people. In August of 1983 we retraced this last portion of his route. James was like a kid again, poking here and there about the meadow's edge for signs of tepee frames or sweat lodge hearths, but we saw little that could be taken as evidence of the intense activity focused here in centuries past, except the deep trace of the horse racing track itself, which ran east to west across the meadow.

The meadow was clearly less extensive than formerly, as could be seen by comparing photos taken there at the turn of the century (Jerman and Mason 1976). Lodgepole pine saplings were sprouting up all around the meadow margins, consuming the open space. This is an inevitable consequence of fire suppression, which has been the law of the land in the national forests for several decades now. An old-time ranger I met at the Naches Ranger Station recalled how he used to rave at the Indians for their "carelessness" with fire, as frequent fires were attributed to them during the late summer season. What the ranger failed to appreciate was the fact that fire is one of the Indians' most powerful tools of food production. Fire creates sunny openings in the forest, creates edges that foster the rapid spread of nutritious herbs and shrubs, most notably the black mountain huckleberry and related species, blueberry and grouseberry (Minore 1972:68). Such zones of increased natural productivity draw deer and elk within the hunter's range as well. Though knowledge of the traditional use of intentional burning to create favorable habitat has been all but forgotten by contemporary Plateau Indians, evidence assembled by Henry Lewis (1973, 1977) shows that the

ecological role of fire was known and manipulated in complex ways by Indians from California to Canada.

"Indian Heaven" it was indeed. Cool nights, warm days, and hillsides covered with bushes loaded with grouseberry (*Vaccinium membranaceum* and *V. scoparium*, fig. 4.19), called wiwlú-wiwlu, "little huckleberries," and the sweetest of all, the low mountain blueberry whose Latin name tells it all, *Vaccinium deliciosum* (ililmúk).

Many berries no doubt vanished between hand and basket. The famous Klikitat cedar-root baskets, decorated with beargrass leaves and bitter

Fig. 4.19. Big huckleberry and grouseberry (*Vaccinium membranaceum, V. scoparium;* **wiwlú-wiwlu**).

cherry bark were used (and still are) in these tasks. The surplus berries were dried slowly over a fire kept smouldering in a rotten log (Filloon 1952). This method of drying the berries preserves the bulk of the Vitamin C content in the fruits, as our nutritional analyses indicate (Norton et al. 1984:223). As in the case of fish and roots, drying reduced the water content of the food drastically and thus its weight by 70 percent. H. W. Perkins notes in his journal the results of these efforts of the Indian women:

> "They are usually absent on these excursions, from four to six weeks; during which, each family lays in, for winter use, four or five pecks [ca. four to five gallons] of nice dried berries. These they mix from time to time with pounded salmon, & a good portion of salmon oil, & thus is prepared one of the best dishes of which an Indian can boast." (Perkins n.d. [1838–43], Book 1:10)

The huckleberry fields south of Mount Adams were not so far from the Columbia River that fishing was entirely neglected during August and September. In fact, the most important salmon run of all, that of the fall Chinooks from which the bulk of winter stores was produced, normally passed in early September (see fig. 4.20). Men rode down from "Indian Heaven" to the mouths of the Wind and Little White Salmon rivers to fish for fall Chinook and silver salmon, hauling the fish back to the huckleberry camps so the women could prepare them. Huckleberry season was also prime time for hunting deer and elk, which had retreated to the high country for the rut. The preferred prey in the Cascades was the black-tailed deer (*Odocoileus hemionus columbianus;* x̌alk), distinguished from the closely related common mule deer of the lower eastern slopes (*O. h. hemionus;* yáamaš) (see Table 11).

In October the winter villages were reoccupied while the last of the salmon were salvaged to augment the winter supply. It was this phase of the annual cycle that Lewis and Clark observed on their journey down the Columbia from the mouth of the Snake River to The Dalles between the sixteenth and twenty-fifth of October 1805. They had found the lower Snake River villages vacant, just caches of lodge poles set up on racks out of harm's way to mark their locations. The occupants were apparently off hunting, perhaps for antelope southward or for deer and elk up in the Blue Mountains. But the Columbia was feverish with activity. The explorers found that the salmon the Indians were processing left a lot to be desired. Many were múqʷayč, spawned-out carcasses of fall Chinook salmon which spawned along this stretch of the river, with perhaps some fresh mɬúla, the dog or "white" salmon (a term that may also refer to spawning salmon in general).

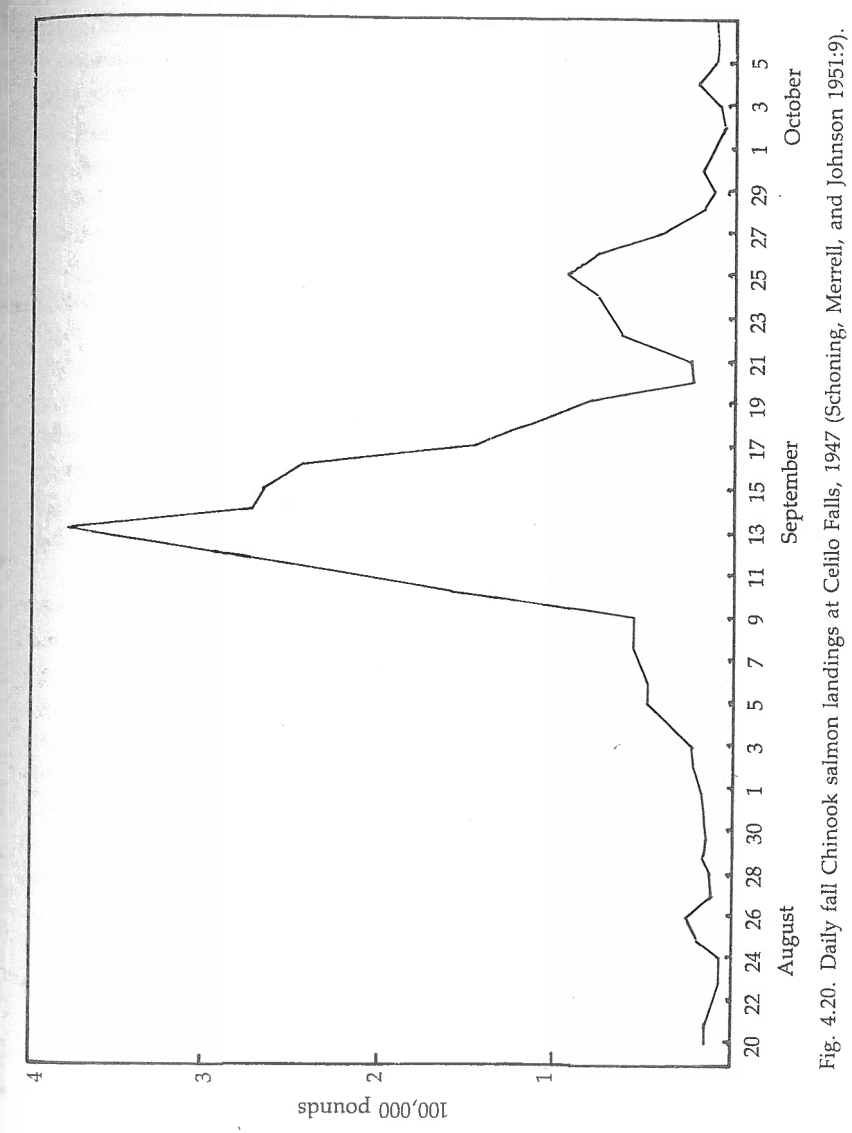


Fig. 4.20. Daily fall Chinook salmon landings at Celilo Falls, 1947 (Schoning, Merrell, and Johnson 1951:9).

Tales of a superabundance of salmon on the Columbia, of salmon so plentiful it was burned for fuel, are based on Clark's surmise (Thwaites 1959 [1904], 3:124). This seems unlikely, given the abundance of fast-burning sagebrush all along the river. The inclusion of fat-depleted and half-rotten fish in the diet—remarked upon by several early Euro-American travelers in the Plateau (see also Thompson in Merk 1968:40)—suggests otherwise: that the margin of safety for winter survival was not overly generous.

Population Size and Density

Lewis and Clark counted winter houses in the hundreds during their descent through Sahaptin territory, noting as best they could how many occupants shared each lodge. From this count a rough estimate can be derived of the Columbia River Sahaptin people present (an important caveat) on the river in late October 1805. These population figures are assembled in Table 11. Adding Lewis and Clark's estimates for the entire Sahaptin-speaking area east of the Cascades, we arrive at a figure of 12,765 people occupying an area of 31,000 square miles, an average of about two persons for every five square miles.

Such densities may be only half of the true precontact values, as two smallpox epidemics are known to have afflicted the middle-Columbia people before 1805—epidemics that may have spread inland from coastal trading ships bringing strange and deadly foreign pestilence with their new wealth or may have been brought back across the Rocky Mountains by bison-hunting parties. Based on losses reported for twenty "virgin-soil" smallpox epidemics by the epidemiologist C. W. Dixon (1962:325), Boyd has calculated the likely population loss in the Plateau between 1770 and 1805 at approximately 45 percent (1985:334). If his inferences are correct—and we have no better basis for inference at present—then Sahaptin-speakers originally numbered more in the range of 23,000 at a density of >0.7 per square mile. (Kroeber estimates 0.1-0.3/square mile for the Plateau, which is much too low [1939:134f].)

Even that density is but 5 percent of the present population of the area, a telling statistic for those who favor a return to the halcyon past. Though one person per square mile seems a thin population by modern standards, it is a high density for a hunting and gathering economy to support, especially given the interior location and moderately high latitude of the Plateau. We

TABLE 11
Plateau Population and Density Estimates

Group	L & C	Boyd	Area/sq mi	Density
Cayuse	438	788	7710	0.10
Nez Perce	4,627	8,329	24,000	0.35
Northeast Sahaptin	4,185	7,533	<9,590	>0.79
Columbia Sahaptin	3,900	7,020	12,660	0.55
Northwest Sahaptin	4,680	8,424	<8,839	>0.95
Southern Plateau Total	17,830	32,094	<62,799	>0.51
Plateau Sahaptin Total	12,765	22,977	31,089	0.74
Columbia Salish	3,200	5,760	12,225	0.47
Okanagan/Colville	4,361	7,850	25,350	0.31
Kutenai	829	1,492	19,300	0.08
Flathead	4,402	7,924	27,490	0.29
Coeur d'Alene	1,067	1,920	4,350	0.44
Northern Plateau Total	13,859	24,946	88,715	0.28
Columbia Plateau Total	31,689	57,040	153,774	0.37

Adapted from Boyd 1985 and the U.S. Army Corps of Engineers 1952.
Note: "L & C" are Lewis and Clark's estimates as interpreted by Boyd (1985). Boyd's estimates for the precontact period (before ca. 1775) are calculated for each group at 180 percent of Lewis and Clark's figures, allowing for a 45 percent population loss due to early smallpox epidemics. This loss figure is a conservative approximation based upon C. W. Dixon's average mortality for 20 virgin-soil smallpox epidemics (1962:325). Areas are estimated on the basis of drainage basin figures cited by the U.S. Army Corps of Engineers (1952, 1:50–51) with approximate adjustments for basins divided among more than one ethno-linguistic group. The relative rankings of major groups corresponds reasonably well with expectations based on densities of major root and fish species.

may compare this Plateau estimate with estimates of Great Basin Indian population densities published by Julian Steward (1938). These densities range from one person on two square miles in the Owens Valley of California (roughly comparable to the Sahaptin average) to one person per forty square miles on the southwestern fringe of the Great Salt Desert in Utah.

The lower densities in the Basin may best be accounted for by the absence of fish runs comparable to those of the Columbia. These fish are locally unearned resources in the sense that the salmon represent an organic concentration of nutrients derived from the solar energy that falls on the huge area of the Pacific Ocean where the salmon feed during the several years of their pelagic development.

Conclusion

In sum, the gathering, fishing, and hunting economy of the mid-Columbia Indians represents several million years of progress beyond the first known hominid economies. Tools—though limited in scale by the demands of portability and the familial basis of production for most tasks—allow highly efficient harvests of roots, fish, and game otherwise beyond human reach. Imagine catching a struggling fifty-pound salmon with your bare hands, digging tons of roots from stony ground with just your fingers, or hauling nearly a ton of dried roots home over a hundred miles of rugged terrain without carrying devices. Indian hemp nets and bags and cedar-root baskets allowed heavy loads to be carried over the average 600 to 1,000 miles traversed during a typical seasonal round.

Consider also the impact of innovative food processing techniques, all too readily passed over as "women's work." Without the knowledge of how to dry roots, fish, berries, and meat, local populations would have been reduced to the number that could be supported during the meanest season, the lean winter months (an expression of Leibig's Law of the Minimum). This would certainly have been but a small fraction of the populations actually achieved. Dried foods are not only light in weight and thus more efficiently transported, but they also may be kept for up to several years, stored in a carefully lined cellar (the wulčí), providing a margin of safety for the occasional year in which several key resources fail. The technologies of transport and of food preservation are thus among the critical pillars of the Plateau hunting-gathering way of life.

A final point must be stressed. The traditional Sahaptin economy was founded on cooperation between men and women in the tasks of feeding both parents and children. Among our ape brethren the males rarely contribute to feeding their own offspring. In fact, they probably do not know which offspring are their own, thus they are motivated by no genetic interest to

help in rearing them. The human family, such a basic social and economic unit on the Plateau, represents a radical departure from the ways of our primate ancestors. Males, through the cultural formalities of marriage ceremonies and marriage exchanges, recognize their equal genetic interest in their offspring and join with their spouses in a division of labor that is far superior in its productive capacity to what each could produce separately. Men hunt and fish, by and large, while women gather plant foods and process the men's harvest. Though we are able to measure the relative caloric contribution of each sex and weigh their relative efforts[5] and thus judge female (as here) or male the more productive, such calculations pit male against female in competition for production quota honors. This is misleading. Neither sex exploited the other in the Plateau (Ackerman 1982). Each held the other's work in high regard and *together* they saw to the continuation of their families and their traditions.

5. Early travelers and settlers frequently remarked on the laziness of the men and the industriousness of the women, but their perceptions may have been distorted by wishful thinking.