Chapter 6

What the Plants Had to Say

Plant food constitutes the staff of life for many people throughout the world. In the Lillooet region, plants may not have held this importance since salmon was so central to the diet. But plants were still extremely important in traditional cultures for their vitamins, minerals, calories, and medicinal qualities. Plants were also critical for building shelters and making technological items essential in procuring salmon and other foods. Fibers and poles were necessary to create nets, while obtaining roots required digging sticks and plant matting for cooking in pits. Plants were also used to make life more comfortable and pleasurable in forms such as mats, dishes, clothing, bedding, and smoking. Thus, there is an entire technological realm in which plants were used.

What can be recovered from this great diversity of plant use at most archaeological sites? Many archaeologists never bother to ask the question, but simply assume that plants decay in the earth and that no remains have been preserved with the exception of charred pieces of wood left in hearths that can be radiocarbon dated. There are other problems with looking for prehistoric plant remains: removing and processing sediment samples increases excavation time and effort; the bags become heavy and cumbersome; finding someone to analyze them can be difficult; and devoting scarce excavation funds to search for plant remains may mean sacrificing other kinds of analysis for an enterprise with uncertain payoffs-or at least ones that are not immediately visible. Thus, few projects except those dealing with problems associated with the origin of agriculture systematically use plant recovery techniques in excavations.

At Keatley Creek, I thought there might be good reason to hope for some plant preservation. The region is semi-arid, which favors preservation; the insides of the housepits would have also provided a protected environment where plant materials might survive; and the use of fires for cooking would have also favored the charring of plant materials, thereby greatly increasing the likelihood of preservation. Contrary to what many people might expect, most archaeological sites actually have good potential for recovering and analyzing plant remains precisely because of this charring and preservation effect. This operates to preserve minute parts of plants such as seeds, just as charring preserves small pieces of wood. Archaeobotanists, also known as paleoethnobotanists, study the plant remains used at prehistoric sites. They generally use only charred materials in their analyses, thereby eliminating small plant parts that may have been introduced by natural agents such as mice, voles, and seeds falling through cracks, insect holes, or other spaces in the soil. However, the rim deposits at Keatley Creek turned out to be extraordinarily dry microenvironments that preserved uncharred plant materials deposited as part of prehistoric housecleaning activities.

Thus, I planned to systematically sample the floors and the other deposits of housepits to see if there were important differences in the way plants were used across the floors, and from house to house. Sampling the roof and rims for botanical remains also helped to better understand their formation processes (see chapter 3). An added advantage of sampling the floor sediments was that it enabled us to look for small fragments of bone and stone to indicate precisely where activities took place. We also used such samples for chemical analysis of the soils. However at the beginning of the project, there was no assurance that we could successfully identify living floor deposits, much less extract botanical information that would be useful for determining social and economic organization within housepits. I was encouraged by Dana Lepofsky, who was present on my first field crew. She was a specialist studying prehistoric plant remains and went on to analyze the many thousands of plant remains we recovered from the site.

Botanical Formation Processes

Ethnographically, pithouses were used only in the wintertime, and in fact, the entire *raison d'etre* of pithouses makes sense only in terms of winter conditions. According to Teit, people were anxious to get out of the crowded pithouses in the spring. We have found no archaeological indication they were used in the summertime when camping under shade trees would have been more pleasant. The only plants that would have been available for use during the winter in the immediate surroundings of Keatley Creek were firewood, conifer branches for bedding, small cactus leaves, and any dried berries such as rosehips that still remained on the bushes. Based on knowledge of the geographical distribution and seasonality of plants recovered at Keatley Creek, we can conclude that the vast majority of plant food remains recovered at the site probably were transported there during the summer in a dried state from distant locations such as the mountains or the river terraces. In the late fall, just prior to occupying the pithouses for the winter, many technological materials were probably also brought to the houses, including conifer branches, grass, and incidental plants used for bedding; materials for making mats and baskets such as reeds and birch bark; materials for repairing the pithouse roof (conifer needles, bark, poles); materials for making bows, arrows, string, rope, nets, hoops, and other objects; materials for making clothes and armor (sagebrush bark and birch bark), and firewood. Wastes from many of these materials were probably thrown out onto the rim in an uncharred state; occasionally some of these items became charred and the smaller bits became incorporated into the floor sediments where we recovered them.

Distributions Across the Floor

The most striking pattern of botanical remains Dana Lepofsky found in the housepit floors was a concentration of Douglas fir and pine needles, grass seeds, and chenopod seeds around the edge of the floors near the rims (Figure 6.1). Some of this made a

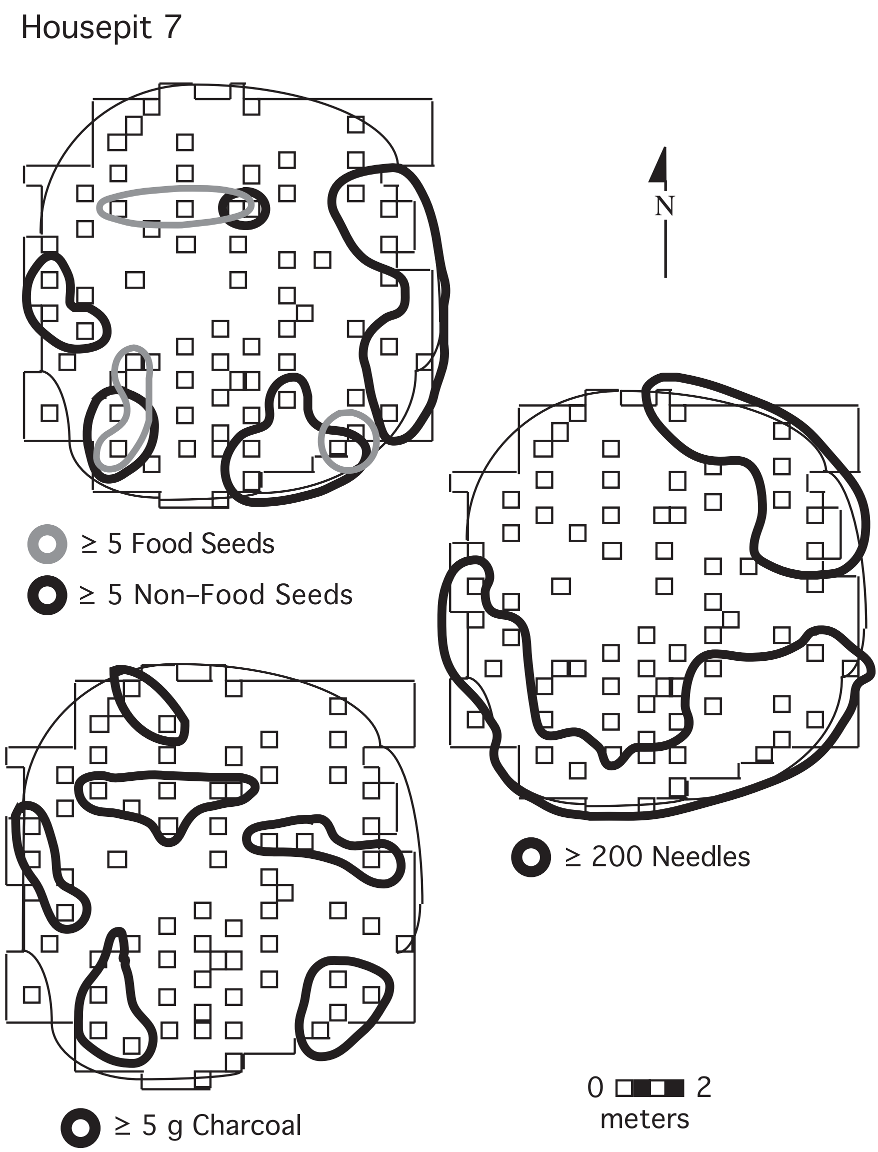

Figure 6.1. *Distributions of charred food seeds, non-food seeds, conifer needles, and charcoal across the living floor of Housepit 7. Non-food seeds are primarily composed of chenopod and grass seeds that were included together with pine and Douglas fir boughs as part of the bedding used near the walls of the house. These results clearly show that both the right and the left sides of the house were used for sleeping. The restricted occurrence of food seeds seems to indicate special preparation and storage areas for some plant foods. The small squares in these diagrams represent the sampled squares upon which these distributions are based. From Lepofsky et al. (1995).*

great deal of sense on the basis of ethnographic analogy, for Teit recorded the traditional sleeping areas as being against the walls either on mats or on elevated benches, as well as the use of Douglas fir boughs and grass for bedding. Many dried needles and grass seeds from this bedding must have fallen to the floor only to become carbonized or completely consumed by fire when the housepit roof was burned. However, the occurrence of chenopod seeds was unexpected since no mention of this plant is made ethnographically either as a food or as a material used for other purposes. Yet, its distribution largely coincided with the fir needles and grass seeds and constitutes the single most common type of seed remain found in the housepits. At this point, it seems this common weed may simply have been obtained as an incidental plant growing among the grass gathered for bedding.

The strong pattern of charred conifer needles near the walls of the houses makes a great deal of logical and ethnographic sense. More important, it demonstrates once again that the floor deposits identified in the field were not simply mixed deposits-which could never be used to infer activities or social organization within the houses. The concentrations of the needles clearly indicated where the sleeping areas were located within the houses. More importantly, in the case of the largest housepit we excavated (HP 7), the needles demonstrated that these sleeping areas extended almost all the way around the floor. This in turn, reinforced the conclusion that *both* sides of the house were used by families as domestic areas where people slept, cooked, ate, and performed other common domestic tasks.

An analysis by William Middleton of enriched chemical elements in the soils of the floors produced similar patterns to those of the plant materials and points to an essentially identical conclusion. For instance, phosphorous, potassium, calcium, and magnesium often become concentrated in areas where people have lived because decaying plant and animal materials, ash from fires, as well as human wastes, impregnate the soils with these elements, all of which are relatively insoluble and remain at locations where they are deposited. The distribution of some of these elements (potassium, phosphorous) on the floor of Housepit 7 probably reflects eating activities or the spread of wood ash around hearth areas (Figure 6.2). Other elements such as magnesium and calcium are more concentrated around single hearths and may represent specialized activity wastes, such as the breaking up of bones or the discard of small bones from soups or fish (Figure 6.2). It is important to note that these element concentrations show no indication of different activities having been performed on the right versus the left side of the house. The concentrations of these elements are associated with hearth and perimeter areas on both sides of the house, indicating that food processing and consumption took place on both sides of the house. In fact, the concentrations of chemicals match the concentrations of small bone fragments almost exactly (refer to Figure 7.3). Patterns where one side of a house is used for special activities do occur, however, in some of the smaller housepits, such as Housepit 9 (Figure 6.3), which reflects a very different kind of social and economic organization.

There are few indications of plant-processing activity areas in the large house. One might have expected plants to be cooked and used, and some bits accidentally charred, around every hearth. But the only real concentration of food plant seeds oc-

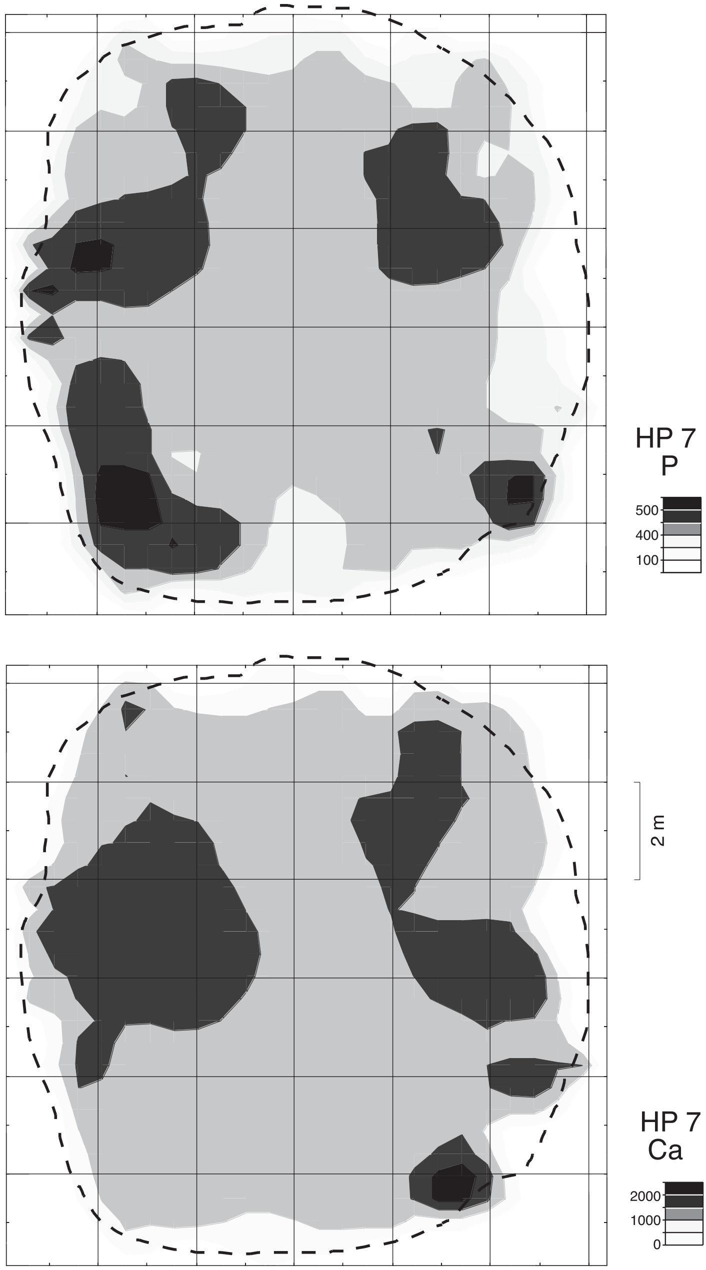

Figure 6.2. *Concentrations of phosphorous (top) and calcium (bottom) in the floor sediments of Housepit 7 as determined by William Middleton. Phosphorous becomes concentrated due to food wastes and ash being incorporated into the soils, while calcium becomes concentrated due to bone fragments and other calcium-rich materials becoming incorporated into the floor. Note, again, similar concentrations on both sides of the house associated with food preparation areas around hearths and eating areas near the walls. These distributions are based on the same soil samples as the botanical distributions.*

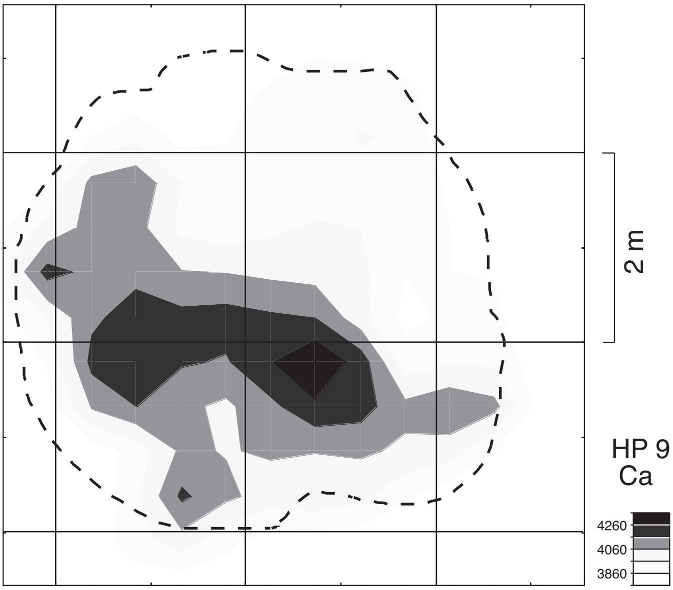

Figure 6.3. *In contrast to the symmetrical distribution of waste-related chemical elements on both sides of the Housepit 7 floor as seen in Figure 6.2, William Middleton found that small houses exhibit a very different organization indicating that only a single activity area was present for processing and probably consuming food as is evident in the distribution of calcium across the floor of Housepit 9, shown here. These distributions indicate a much more communally oriented house organization than the segmented and hierarchical domestic areas of the large housepit.*

curs in the north central sector of the house with more minor occurrences near a hearth in the southwest part of the floor, and near a probable storage location close to the wall (see Figure 6.1). Whether this is because one or two domestic groups collected and used more plants, or because one person was an herbalist for the entire house, or because only one family prepared special plant foods used in feasts, or because all the women gathered at one location to prepare their plant foods cannot be determined at this point. Some sort of specialized activity area, if not specialization, is definitely indicated by these remains. The size of the largest seed-related activity area and the small total number of seeds involved are both indicative of the work area of a single, occasionally active, individual specialist, rather than a large group of women working communally. A similar specialized concentration of food and nonfood seeds occurred on the floor of the medium-sized housepit we excavated.

Subsistence

Food plant remains are remarkably scarce in the housepits we excavated, including the rims. This may simply be a matter of careful and almost complete consumption on the parts of inhabitants, but typically, small children are careless with food, and it would seem likely that occasional amounts would have been spilled near the fires and charred. The rarity of charred food remains may also be due to the infrequent use of fires within the housepits (see chapter 4). The rarity of food remains might also be due to dogs consuming food that fell to the ground, except that dogs do not appear to have been kept inside housepits ethnographically (Teit, 1917, p. 46; 1912a, pp. 250, 256, 307; 1912b, p. 325), and almost none of the bones on housepit floors exhibit gnaw marks from dogs. Some food remains, such as the lilies and mountain potatoes, may not be represented archaeologically simply because their starch-like bulbs and corms do not preserve very well. Moreover, these root foods, like most other plants, were generally precooked or processed elsewhere, thus leaving fewer remains at winter pithouse villages. The rarity of food remains may also have been due to a limited amount of consumption of stored plant foods during the winter. It would have been very difficult to transport any large quantities of plant foods from the mountains to the village at Keatley Creek, especially since valuable dried deer meat, hides, and flaking stone needed to be transported as well. On the other hand, the sources of Saskatoon berries (service berries), kinnikinnik berries, and rose hips would have been much closer, and these are the most commonly occurring charred food remains recovered at Keatley Creek (Table 6.1). Few of the food remains can be attributed to the summer mountain food-gathering areas. At this point, there is no compelling reason to expect that large quantities of berries and bulbs were being eaten during the winter. I would estimate the total amount of these foods brought down from the high mountains to be about half of the total amount gathered there, or about 20–40 g per family, especially since women had to carry the family foods, belongings, and camping gear when traveling (Teit, 1917, p. 37). The same amount of onions and berries from the river terraces might have been stored for the winter (see Turner, 1992). The high number of plant taxa in the houses indicates that there was a substantial use of plants, but processing and preservation biases may have limited the absolute number of food plants recovered archaeologically.

Technology

It is in the technological domain where plant remains are the most abundant. In addition to the major structural elements used in the construction of the house roofs (chapter 4), and the bedding materials already noted, there were many pieces of charcoal scattered throughout all types of housepit deposits. Most of this charcoal undoubtedly came from the burning of wood in hearths. Analysis of this charcoal clearly showed that people were using the pine and Douglas fir wood from the mountain slopes behind the site for firewood. They were not using many of the cottonwood or other deciduous trees from the creek bed.

However, there was a surprise in some of the housepits. In a medium-sized housepit (HP 3), we encountered a row of carbonized boards, about 15 cm wide and one cm thick, arranged at the foot of one wall. Although I had known that James Teit reported

Table 6.1
Archaeobotanical Remains Recovered From the Floor of Three Housepits at Keatley Creek*

Scientific Name (Common Name)	*Part Found*†	*Frequency*			*Primary Use*‡
		Large HP (HP 7)	*Medium HP (HP 3)*	*Small HP (HP 12)*	
Acer cf. *glabrum* (maple)	C	1			
Alnus cf. *sinuata* (alder)	C	1			T
Amelanchier alnifolia (saskatoon)	S	40	27	2	F
Arcostaphylos uvaursi (kinnikinnik)	S	9	11		F
Artemesia tridentata (big sagebrush)	C	1			T
Betula papyrifera (paper birch)	C	1			T
? Boraginaceae (Borage Family)	S	1			?
Carex sp. (sedge)	S		1		T
Chenopodium sp. (chenopod)**	S	148	36	10	?
Cornus sericea (red-osier dogwood)	S	3			F
Ericaceae (Heather Family)	S	62	44	2	? F
Graminae (grass) **	S	77	9		T
———	O	79	115		T
Juniperus sp. (juniper)	C	1			T
Opuntia sp. (prickly pear)	S	2	12		F
Phacelia sp.	S	20	7		O

benches along the walls for sleeping, I had not expected to find actual boards preserved in the houses. A small section of plank was also recovered from the central area of Housepit 7. Surprisingly, these boards were made of cottonwood, a fairly soft wood, and perhaps the easiest to split with antler wedges and stone celts.

I had hoped to find parts of burned, wooden tools among the charred remains of the floor or in the rim deposits; however, people seem to have been conscientious about burning any available pieces of wood in their hearths. In the entire site, we recovered only a single piece of charred, worked wood. In Housepit 90, a small housepit, there was a segment that appears to have been part of a bow stave or a hoop for a fishing net.

I also hoped to find remains of basketry since baskets and birch bark containers were extensively used in the historic period. We did find innumerable pieces of birch

Table 6.1 (Continued)
Archaeobotanical Remains Recovered From the Floor of Three Housepits at Keatley Creek*

Scientific Name (Common Name)	*Part Found*†	*Frequency* Large HP (HP 7)	Medium HP (HP 3)	Small HP (HP 12)	*Primary Use*‡
Pinus ponderosa (ponderosa pine)	N	10078	7521		T
	C	64	27		T
Populus sp. (cottonwood)	C	1	2		T
Prunus sp. (cherry)	S	4			F
Psuedotsuga menziesii (Douglas fir)	N	18129	835		T
	C	219	87		T
	S		5		?
Rosa cf. *woodsii* (rose)	S	9	1		F
Scirpus sp. (rush)	S	1			T
Silene sp.	S		1		O
Smilacina stellata (solomon's seal)		2			F
Ribes cf. *inerme* (gooseberry)	S				F
Unidentified	C	62	24		-
Unidentified	S	94	16	2	-
Total N††	C	350	140	-	-
Total N	S	474	172	16	-

Note. *Miscellaneous plant parts, such as buds, bark, and other plant tissues are not included here. See Lepofsky *et al.,* 1995, for complete presentation of data.

†C = charcoal; S = seed; N = needle; O = other

‡F = food; T = technology; O = other; see Lepofsky *et al.,* 1995, for more detailed ethnobotanical descriptions.

**There is no ethnobotanical or paleoethnobotanical evidence that either chenopods or grass seeds were ever eaten in the Interior Plateau.

††Charcoal from only a small number of the total flotation samples were identified. No charcoal specimens from HP 12 were identified. From Lepofsky *et al.,* 1995.

bark in all types of deposits, but only a few of these had puncture holes where seams had been sewn together. Birch bark was also apparently used for many other things from lining storage pits, to lighting fires, to wrapping up small items for storage, to birch bark armor (Teit, 1912a, pp. 244, 340; 1912b, p. 319). Therefore, much of the birch bark we recovered may simply represent scraps from manufacturing or remains from other items. The only piece of coiled basketry that was recovered at the site came from an outlying protohistoric structure used about 200 years ago (Wittke *et al.* 2004). The historical Stl'alt'imx were renowned for manufacturing coiled baskets, but there is no evidence that this type of basket was widely used prehistorically. Birch bark containers were easier to manufacture and may have been more watertight. For this reason, they may have been more commonly used by most people. If coiled basketry existed in the Interior Plateau 1,000 years ago, it may have been owned and used exclusively by the wealthiest households and used only for special occasions, such as feasting, just as the best dinnerware in modern households is brought out only for special meals. Because of their great value, coiled baskets may have been highly curated and used as grave goods in high status burials, leaving little trace of their existence in housepits. Their great value would also explain why so many were produced and sold to white colonizers. Even today, these coiled baskets sell for many hundreds of dollars.

Smoking

About 1,200 years ago, stone pipes began to be left in archaeological deposits on the Plateau, and we recovered a number of stone pipe fragments at Keatley Creek. There is some debate as to exactly what people were smoking in these pipes. By the time the first ethnographers made their observations, tobacco was in use, but was it introduced by the fur trade or had it been present long before that time? If tobacco was smoked in prehistoric communities, it would constitute the best case for the use of a domesticated plant on the Plateau.

We observed charred residues adhering to the inside of pipe fragments just as charred crusts and residues build up in modern pipes. I submitted the prehistoric pipe fragments with residues for analysis to Wayne Jeffery, the head of the toxicology section of the Royal Canadian Mounted Police in Vancouver and to Dr. B. M. Kapur, the Director of Laboratories at the Addiction Research Foundation in Toronto. Both of these analysts used gas chromatography-mass spectrometry to investigate the residues. Although their results disclosed abundant organic compounds present in the pipe residues-while other stones from the same matrix showed almost no organic remains-none of the organic compounds corresponded to nicotine or any distinctive nicotine breakdown products. No alkaloids of any sort were present. Thus, it seems entirely possible that prehistorically, smoking on the Plateau involved the use of other substances such as kinnikinick, Indian lovage, and dogbane, plants that are still smoked in the region. Documenting smoking at the Keatley Creek site is important, since, ethnographically, smoking seems to have been confined to important people of the community, such as elites, shamans, and elders. Unfortunately, we did not recover any of the pipe fragments from floor contexts; they were all found in roof deposits, apparently discarded after they had broken.

Summary

Although plant remains are often ignored because they are so difficult to see and recover without special techniques, they provide invaluable information on the social and economic life of prehistoric dwellers of pithouses. They reveal not only what plant foods were eaten inside the pithouses, but also reflect transportation constraints, technology, seasonality, and other factors. The relative diversity of plant remains in various houses demonstrates that occupants of smaller houses used a far narrower range of plants than occupants of larger houses.

In the small house we investigated, there were fewer plant remains in the floor deposits, only 16 seeds compared to hundreds from the larger house floors. There is no indication of any specialized plant-processing area in the small houses. Moreover, statistical analyses showed that the greater diversity of plant remains in the large house was due to more than increased sample size (Lepofsky *et al.,* 1995). This seems to indicate that the occupants of smaller housepits differed significantly from the occupants of the larger houses in their use of plant materials. Economically, the occupants of the smaller housepits do not seem to have been as active or industrious in their use of plants.

The distribution of the remains of bedding materials indicates that people slept around most of the perimeter of the larger houses. This reinforces the conclusions from other analyses that domestic groups occupied both sides of the house and that differences between the two sides of the house are due to social and economic factors rather than the performance of different activities on the two sides of the house. Chemical elements associated with food wastes (phosphorous, calcium) also were concentrated near hearths and the wall on both sides of the house, confirming the basic conclusions from studying the plant remains.

Numerous remains of plants used for technological purposes (fire, house construction, bark basketry, planks) occur throughout the deposits and provide important insights into the nature of daily life. Evidence of some specialized areas for processing of plant foods in the larger houses, as well as evidence for smoking, provide more detailed glimpses into the past activities within the houses. The clear patterning in the distribution of plant remains and chemical elements across the floor deposits of the houses again demonstrates that we correctly distinguished floor deposits from roof deposits and that the floor deposits were relatively intact. They had not been hopelessly mixed with other sediments. If they had been, no patterning would have been apparent, and it certainly would not have concentrated Douglas fir and pine needles and grass seeds under the thickest parts of the overlying roof deposits, for those were the areas most deeply buried by the collapsing roof and therefore most protected from mixing.