

## VI TECHNOLOGY OF RESOURCE EXPLOITATION

This section describes the methods, tools, and facilities used by the Tahltan people to procure, process, and store the different kinds of resources available within their territories. Data on traditional methods and technology of resource exploitation are not available in equal detail. Some aspects of traditional subsistence activities have been recorded in detail through direct observation and oral accounts by current Tahltan elders during the course of the present research and used to supplement data gathered from early

ethnographies.

The Tahltan maintained a complex technology in order to exploit large quantities of seasonally abundant resources. Procurement strategies emphasized the use of a variety of complex tended and untended facilities such as fences, weirs, traps, snares, and nets which could be adapted for a wide range of different kinds of resources. Efficient harvesting also required a detailed knowledge of habits and characteristics of the different species of animals, fish, birds, and plants available.

### Hunting Techniques

The Tahltan used several different techniques for hunting mammals and birds. Facilities such as caribou fences, snares, traps, and nets were used to capture gregarious species during periods of aggregation as well as more dispersed and solitary animals. Dogs and implements such as bows and arrows and spears were also used in hunting.

#### Fences and Drives for Caribou

In fall, and again in late winter/early spring when there is a thick crust on the snow, caribou move in large groups between alpine tundra and forested valleys. At these times of the year caribou were easily captured by means of fences erected at strategic points along well known migration routes. In open areas, fences three to four miles long, but sometimes as long as eight or ten miles, extended from river banks to prominent headlands. They were constructed of posts, interlaced with deadfall and branches. Openings were left at regular intervals along the fence in which hide snares were set. Several

families cooperated in driving caribou towards the fences. After struggling with the snares, caribou became severely weakened and were easily dispatched with a spear.

Each clan had several fences. They were the communal property of the clan in whose territory they were built. The snares in the fence were made and set by individuals. The meat was shared among all the families which used and helped to maintain the fence. The skins belonged to the persons owning the snares in which an animal was caught, but skins might be given away to anyone in need (Teit n.d.).

When a herd of caribou was sighted in a different area, snares were set between trees growing a suitable distance apart. Swift runners drove the caribou between two flanks of people towards the patch of timber where the snares were set. Caribou were also driven through defiles in the hills where good shooters were stationed. They were sometimes chased into patches of deep snow where the animal became stuck and speared. Caribou were not killed in open water at river crossings, being difficult to retrieve (Teit n.d.).

### Use of Snares

Snares were used to capture a wide range of different animals and birds. Large, thick snares, made of four strands of unsoftened caribou or moose hide (rawhide or babiche), twisted and looped to form a strong noose, were used to capture larger animals. Snares were set in fences and in a line between trees towards which caribou were driven. They were also set along trails which moose, deer, sheep, or goats were known to frequent. Bears were commonly captured with thick snares attached to heavy tossing poles which prevented their escape.

Several smaller mammals were also captured by means of snares. Lynx were caught by means of hide snares attached to tossing poles which were set along trails or in areas where they hunted rabbits. A dead rabbit was often placed close by as bait. Beaver were often caught with snares, with stone weights attached, which were set in shallow waters along pathways to the beaver's dam or to the shore. The area around the snare was sprinkled with castoreum stored in containers made of caribou antler (illustrated in Emmons 1911:73).

Large numbers of marmots and ground squirrels, or gophers, were hunted from mid-August to mid-September when they were fat just prior to hibernation. They were captured by means of hide snares set at the entrances to underground burrows.

Rabbits were most commonly captured with snares made of twisted sinew. These were attached to willow springpoles along runways (shown in Figure 7). During periods of extreme cold or heavy snowfall in winter, small pine trees were cut down close together to form a kind of corral. Rabbits were allowed to make runways and to feed on the pine for two or three days. Then snares were set along the runways.

Grouse and ptarmigan were generally caught with snares of twisted willow bark or sinew of caribou or moose. Snares were attached to a bent willow or a pole stuck into the ground along trails used by grouse. In hunting ptarmigan, snares were set in a line in a patch of shrub willows. Bunches

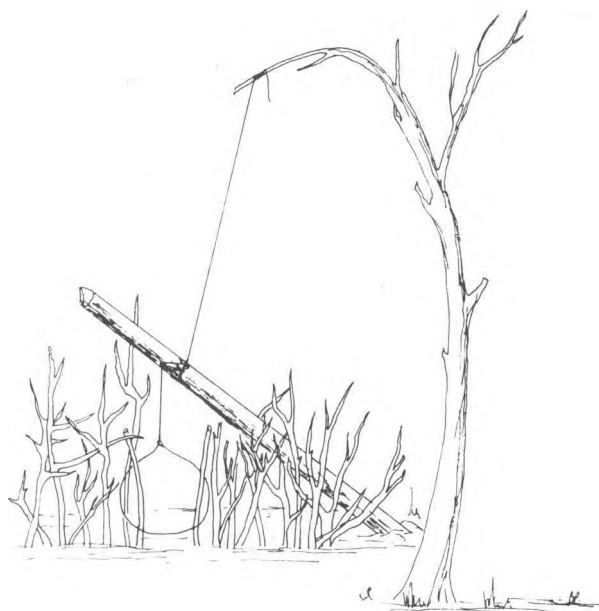


Figure 7. Snare with tossing pole used for rabbits

of ptarmigan were chased towards the snares by women and children while singing a coaxing song to them. Ducks and geese were also caught with snares set in shallow waters of marshes and lakes (Teit n.d).

Snares made of twisted sinew or fine strips of babiche, used for capturing birds and smaller mammals such as rabbits and marmots, were stored on rectangular shaped wooden reels with deep notches. Having a supply of snares ready for use, it took little time to set several of them.

### Nets

Nets were commonly used to capture beaver. Beaver nets were made of babiche, four to seven metres in length, with a 12 to 15 cm mesh just large enough for the head of the beaver to pass through. Nets were set in either clear water or under the ice in winter across well travelled routes from the beaver's house to its dam or to feeding areas. When set under the ice, several holes were made in the ice in a straight line. The net was spread out by pushing a long pole under the ice, to which the end of the net was attached. The ends of the net were secured to poles

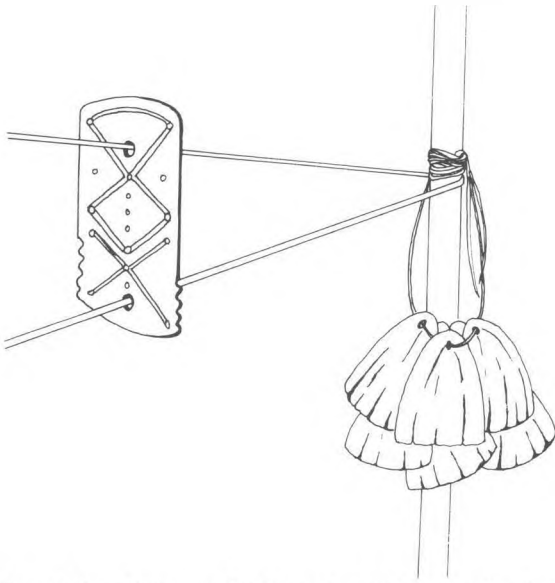


Figure 8. Bone swivel and rattle used at the end of beaver net

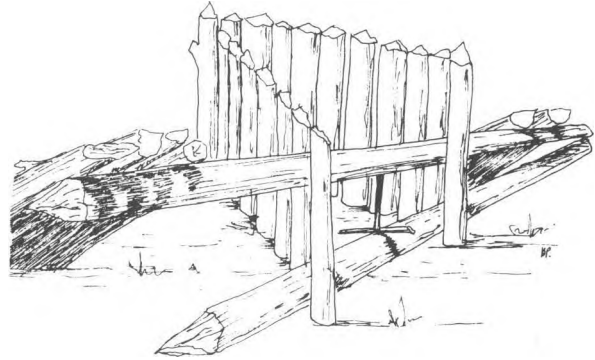


Figure 9. Deadfall trap used for carnivores

set into the ice or to opposite banks of the stream. A long, strong, drawstring, looped through the outer meshes of the net around the four sides, passed through a bone swivel, as shown in Figure 8, with the ends tied to a stout pole. A wind charm, or rattle, made of several split halves of dried caribou or moose hooves, was also tied to the pole to give warning when a beaver was enmeshed. When a beaver was caught, the two ends of the drawstring were pulled through the bone swivel to close the net and bring the beaver to the surface. The hunter often made a temporary camp on the shore while waiting for a beaver to get caught in the net. The beaver's dam might be opened up or its house broken into to bring the beaver into the net (Emmons 1911: 74-75, Teit n.d.).

### Traps

Deadfall traps, similar to that shown in Figure 9, consisted of several large poles arranged to trap an animal under a heavy weight after the balancing lever had been triggered. Traps were used to capture solitary carnivores such as marten, wolverine, and fox which were used for their fur only. Animals were attracted to

the trap by means of bait such as rotten fish eggs, castoreum, or a dead rabbit or grouse placed inside the corral arrangement.

### Stalking

Large, solitary animals such as moose, deer, sheep and goats were generally stalked and killed with bow and arrows or spears (described under hunting implements below). Knowledge of seasonal habits and location of animal beds and trails was used to locate animals. Hunters usually worked in pairs when stalking.

### Use of Dogs

Formerly, dogs were used a great deal in hunting. Although small in size, measuring about 40 cm high and weighing only about five kg (Crisp 1956:38), they were trained to track animals and keep them at bay. Particularly useful in hunting bears and keeping them at bay until they could be speared or shot with bow and arrow, these dogs gained reknown as the Tahltan Bear Dog. In winter, bears in their dens were sometimes located with dogs, where they were speared. Dogs were also used in hunting porcupine. This slow moving animal is easily killed with a club.

## Hunting Implements

### Bows

Good bows were made of young alpine fir (*Abies lasiocarpa*) wood, although temporary bows were also made of young spruce (*Picea glauca*) and birch (*Betula sp.*). They were about one and a half metres in length and five cm thick, slightly tapered at the ends. The bow was carved flat on the inner surface and rounded on the outer surface. In its manufacture, the middle part of the bow was heated and rubbed with beaver castor to toughen the wood. The whole length of the bow was covered with a caribou or moose hide covering which was tied at intervals along the front or outer surface of the bow to keep it in place. Formerly no skin covering was used, until a man once broke his bow while it was fully drawn and the end flew back and pierced him so that he died (Emmons 1921:65-66, Teit n.d.).

Bow strings were made of wet sinew from the back of caribou which was twisted and rolled on the thigh. Occasionally bow strings made of babiche were used. Good bows were only strung when nearly ready to shoot.

Bow points, made of goat or sheep horn, caribou bone or antler, or obsidian, were attached to the upper end of the bow with sinew lashing (see Figure 10) and thus used as a spear for dispatching wounded animals. The bow point was longer than arrow points but not as long as regular spear points. It had a proportionately narrow base and shallow notches (Emmons 1911:65-66, Teit n.d.).

### Arrows

Teit (n.d. fieldnotes) indicates that all arrow shafts were made of saskatoon berry wood (*Amelanchier alnifolia*) and were about 75 cm (2 1/2 ft) long. Sandstone abraders were used to smooth arrow shafts. Shark skin, obtained in trade from the Tlingit, was also used to smooth shafts. Shafts were painted red and black with various designs and also oiled with fish oil. The end of the arrow was feathered. Two

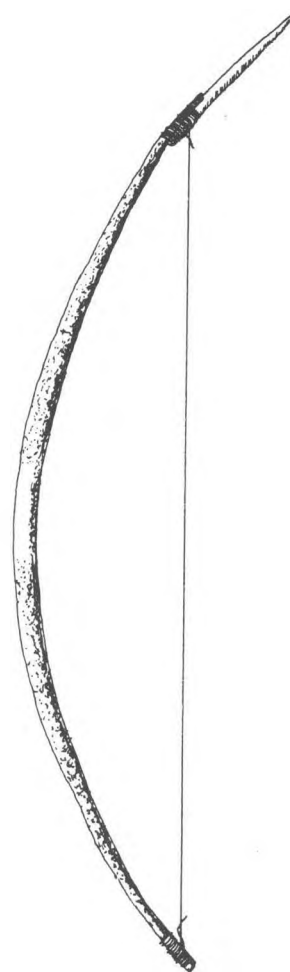


Figure 10. Tahltan bow with antler point (1.5 m long)

feathers were used on arrows for birds and small game, while three feathers were considered best for large game. Feathers were secured with a sinew lashing. Hawk, owl, and grouse tail feathers were used (Emmons 1911:67, Teit n.d.). Tahltan tradition indicates that the use of wing feathers of the golden eagle on arrows, as taught by the wolf people, was believed to bring good luck in hunting (Teit 1919:250).

Arrow points of bone, antler, and obsidian were used. Both leaf shaped and notched points were used. Points were

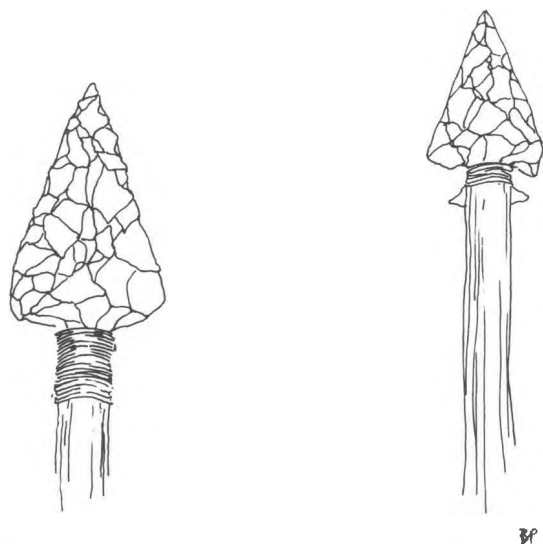


Figure 11. Attachment of point to arrow shafts

usually set into the split head of the shaft and secured with fine sinew lashing and spruce gum (see Figure 11). Sometimes they were lashed to the arrow shaft without seizing so that after entering the animal the point detached itself and worked into the flesh. No shell points, foreshafts, or poison were used on arrows (Emmons 1911:67, Teit n.d.).

Arrows for grouse, ptarmigan, waterfowl, rabbits, and other small game were carved from a single piece of wood with blunt heads as shown in Figure 12.

#### Quivers

Quivers for carrying arrows were made of dressed caribou or moose hide in the form



Figure 12. Blunt headed arrow for birds and small game

of a single cylindrical pouch. It was sewn along the sides and the small round piece at the bottom. It usually held ten to twelve arrows. Feathers lined the bottom, three or four inches deep, so that the arrow points were not damaged. Some quivers were decorated with designs in quill or bead work, fringed, and painted with red ochre. It was carried on the back by means of a strap, while the bow was carried in the hand (Emmons 1911:67, Teit n.d.).

#### Spears

Spears were used for both hunting and warfare. The spear point was made of goat horn or obsidian. It was similar to the bow point, but much longer, fitted into the end of a stout shaft about two metres long, and lashed with hide rope. Cases for protecting the points were made of wood, split in half, hollowed out to conform to the shape of the point, and grooved on the outside to accommodate the hide lashing (Emmons 1911:67-68, Teit n.d.).

### Skinning and Butchering Game

Larger animals, such as caribou and moose, are skinned and butchered into major body parts at the kill site. Small animals, such as beaver, marmots, and ground squirrels, are generally brought back to the camp (either a temporary camp or a

more permanent habitation site) for skinning and butchering. Animals are skinned before cutting them open. This ensures that hair is kept away from the meat and that excess blood does not get on the hair or fur.

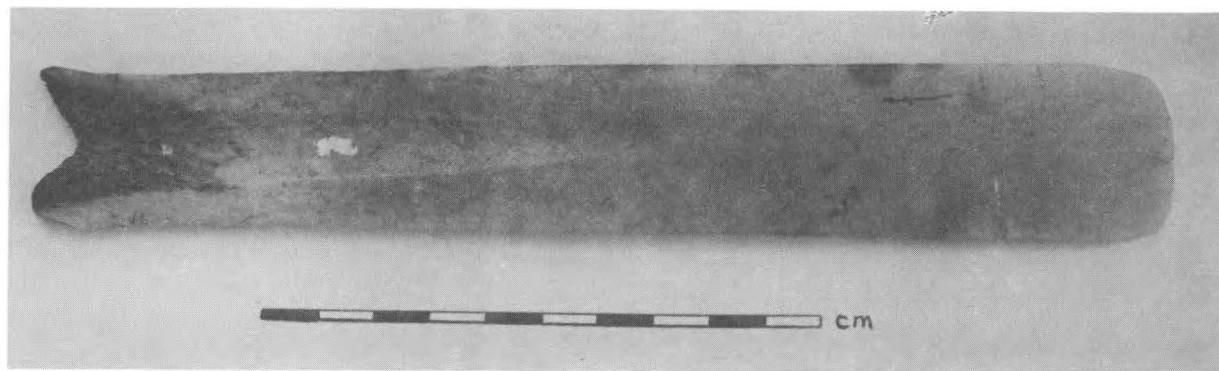


Figure 13. Bone skinning knife

### Knives

The traditional skinning knife is made of caribou antler, a rib of caribou or moose, or a longitudinal flat section of lower leg bone of caribou, moose, or bear, which is sharpened at one end and sometimes serrated (see Figure 13). These are often decorated with incised lines and geometric patterns, and coloured with red ochre.

Rib bones of caribou and moose, sharpened along one edge, were traditionally used for butchering meat. Knives with obsidian blades were also used, especially for butchering and skinning large game. The blade was hafted into a short handle of wood, horn, or antler, by means of sinew or hide lashing (Emmons 1911:68, Teit n.d.).

### Skinning and Butchering Large Animals

If a large animal is captured and killed late in the day during the winter, with not enough daylight to complete the work of butchering, only the lower limbs of the animal are skinned out since they freeze very quickly. The animal is then completely covered with a mound of snow; the heat of the animal is thus retained so that it will not freeze overnight. The hunter returns early the next morning to carry out skinning, butchering, and transporting back to camp.

After skinning out the legs, the skin is cut from the anus to the throat along the mid-line of the belly, and then around the

throat to the back of the neck. From the mid-line of the belly the skin of one side is separated from the body around to the back using the long skinning knife. By leaving a small amount of flesh (one cm) attached to the skin, the animal is skinned more quickly, with less danger of cutting the skin, and makes defleshing of the hide somewhat easier at a later stage. The animal is then rolled over onto the side already skinned and the skin is separated from the other side starting again from the belly section.

After the skin is completely removed, the animal is butchered into large sections by disarticulating major joints. First the forelegs and then the upper limbs are disjointed. The head is cut off by separating two of the middle cervical vertebrae. The abdominal cavity is opened and the intestines are removed and cleaned. Other organs are removed and the interior of the cavity is washed with snow or wiped out with leafy branches. Two longitudinal sections or 'sides' of ribs are cut away by separating ribs from vertebrae and breast bone at joints. The back is separated into three or four transverse sections.

With the body of the animal cut into more compact sections, the hide is used as a temporary toboggan to transport it back to the camp or village. The hide of large animals is cut into two equal pieces. Holes are cut at intervals along the edge through which a hide rope is passed. Placed with hair side down, sections of the animal are packed on the skin which is

laced up tightly. The bundle is thus easily pulled along the snow in the direction of the hair. It slides downhill easily and the hunter may even ride on top. If animals are killed when there is little or no snow on the ground, sections are packed on the back in large pack bags made of tanned skin or of netted babiche (Emmons 1911:51, Teit n.d.). Unless restricted by great distance, the entire animal is taken back to camp and put to some use or other.

Meat for drying is cut in strips, 10 to 20 cm wide and 30 to 40 cm long, mainly from the shoulders, hind quarters, and back sections, and placed on poles suspended about two metres above the campfire.

#### Skinning and Butchering Small Animals

In skinning small game animals such as beaver, marmots, and ground squirrels, the lower limbs (hands and feet) are cut off. A cut is made along the mid line of the belly from anus to chin. Using the bone skinning knife (Figure 13) the skin is separated from the flesh and fat first on one side around to the back and then the other. Working around the legs and tail, these are slipped out of the skin, or in the case of the beaver a cut is made around the base of the tail. The skin is separated from the head by cutting around the ears, eyes, and mouth, at which point the entire skin is removed from the body. The skinning of a beaver takes between a half and one hour, while the skinning of marmots and ground squirrels takes only a few minutes.

Small game animals such as beaver and marmots are split for drying whole in such a manner as to remove the backbone and other larger bones and leave the belly flesh intact. The head and sometimes the tail of the animal is removed. With the body of the animal lying on its belly or ventral surface, meat is cut away from the dorsal surface of the backbone, pelvis, and ribs, to about the midline of the ribs. A longitudinal cut is made on both sides of the rib cage at this mid point. Legs are disarticulated from the pelvis and shoulder blades. The backbone, with attached pelvis

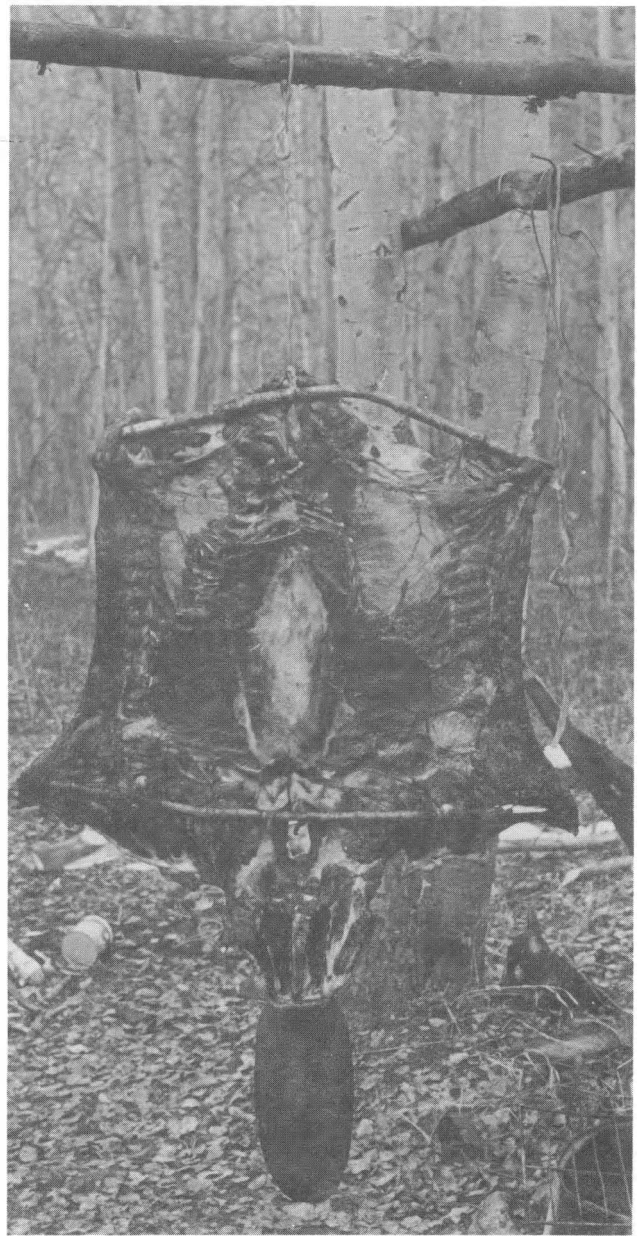


Figure 14. Split beaver hanging to dry over the campfire

and sections of ribs, and shoulder blades are removed along with the guts, leaving the legs, frontal sections of ribs, and breastbone attached to the intact belly flesh. The flesh is spread out straight with small sticks and suspended above a smoky fire so that it turns in the wind as seen in Figure 14.



### Use of Animals For Raw Materials

Besides their primary use as food, animals also provided raw materials for the manufacture of many tools and implements used by the Tahltan as well as clothing and a variety of other items. Table 6 summarizes the major uses and relative value of the raw materials provided by different kinds of animal resources. Caribou and moose are comparable in terms of their importance and usage within the traditional subsistence economy. All parts

of these animals were used in some way, either as food or as raw materials.

#### Use of Skins

Moose and caribou skins, tanned in the manner described below, were particularly important for making articles of clothing, the styles of which are described in detail by Teit (1956), as well as a variety of bags which were used as containers for storage

Table 6. Uses and Relative Value of Raw Materials Provided by Animal Resources.

Resource	Raw Material	Uses (Emmons 1911, Teit n.d.)	Value Score
caribou/moose/ deer	skin (tanned) babiche sinew antler bone	clothing, containers for storage and transportation snares, fish and beaver nets, snowshoe netting, cordage thread for sewing, snares, twine skinning knives, butchering knives, hide scrapers, awls, points, barbs, wedges, bark pryers, digging sticks, handles	.5
sheep/goats	skin hair sinew horns	bedding, rugs, water containers cordage for fish bags thread, snares, twine bowls, spoons, snowshoe brakes, spear points, handles	.4
bears	skin bone teeth	bedding, rugs variety of tools including hide scrapers tools, charms, necklaces, headdresses	.3
beaver	skin teeth castor	bedding, rugs, headgear smalltools such as drills and knives scent used as bait	.3
porcupine	quills	used in decorative embroidery	.1
marmots/gophers hare	skins teeth	clothing, robes small tools	.2
lynx/fox/marten	skins	robes, headgear	.1
birds	feathers bones	feathering arrows, lining parfleches, ceremonial uses small tools, implements	.2
salmon	skin	containers for storing meat, fat	.1





Figure 15. Bone awl used in sewing

and transportation of goods. Sewing is done with sinew from the back and legs of moose or caribou, and sometimes from sheep or goats. Very fine fibres of this tendinous tissue are separated and rolled on the thigh to produce long threads. The Tahltan did not traditionally use bone needles for sewing. Bone awls, similar to the one shown in Figure 15, are used to make tiny holes in the skin through which the stiff sinew thread passes easily.

The skins of moose and caribou were also used in the manufacture of babiche. Hides were defleshed, dehaired, and scraped on both sides but were not softened by tanning and dressing. They were cut when wet into one continuous narrow strip with a knife made of an obsidian blade or flake hafted into a handle of wood, bone, or antler. Babiche was used for making nets, snares, ropes, snowshoe netting, and netted game bags.

### Hide Processing

Throughout North America where the hunting of mammals provided the major subsistence base, furs and hides were processed by all groups and used for a variety of purposes. Yet there are very few detailed accounts of the entire hide working process or the tools and facilities used in each stage. As curator of Ethnology at the U.S. National Museum in the 1880's, Otis Mason reported on the hide processing tools housed in the museum at that time and compiled descriptions of the process, gathered from the literature to date. The brief and summary nature of most of the accounts prompted him to secure a more detailed description of Navaho skin dressing from a friend, Dr. Shufeldt, working with the U.S. Army in the Navaho area at the time (Mason 1889:574).

A study of available accounts of hide working indicates that, while some variation in techniques and different materials are used by different groups, the process, facilities, and kinds of tools used are similar throughout large areas of North America. Among the ethnographies on Indian tribes in British Columbia, one of the most

detailed accounts of hide processing is provided by Emmons for the Tahltan Indians (Emmons 1911:80-84). The statement made by Emmons in 1911 that "practically the same methods of treatment are employed today as in the past, and while an occasional iron tool may be found in use, implements of bone and stone, aboriginal in form and workmanship, are preferred" is as apt today in 1982 as it was at the turn of the century. While carrying out ethnoarchaeological investigations among the Tahltan people over the past few years, this author has the opportunity to observe the continued use of traditional methods and tools by Tahltan women in processing hides, which are described here.

The hides of moose, caribou and deer were defleshed, dehaired and softened thoroughly on both sides for use in the manufacture of clothing, bags and cordage. The skins of goats, sheep, bear and other fur bearing animals were dressed in a similar manner on the flesh side only for use as robes, bedding and rugs.

While the procurement, skinning and initial butchering of large game animals is

largely carried out by men, the entire process of hide preparation is carried out exclusively by women, as is true throughout most of North America where hunting procures a major portion of the subsistence base (Driver and Massey 1957:343-4). Girls learn the art of hide processing about the age of 10 - 12 from their mother or aunt by way of observation, imitation and continued participation with them.

Traditionally, most hide working was done at spring and fall hunting camps, shortly after large numbers of animals had been captured. Today, hide processing is carried out in the yard beside or behind houses in the village. Depending on the number of hides being processed at a time, hide working activities may require up to 200 square metres of activity area. Hides procured during mid-winter may be left frozen in the snow, which keeps them fresh, until they can be worked on in warmer spring weather. By mid-March daytime temperatures become comfortable for extensive outdoor hide working which continues until June when attentions turn to preparation for the summer fishing season.

#### Defleshing/Dehairing

Skins are easier to deflesh when they are fresh, with about one cm. of flesh left adhering to them. In early spring hides are covered with snow to keep them damp. Skins which have dried out are soaked in water and rolled up for a few days to soften them up again. The traditional method of defleshing and dehairing hides (Emmons 1911:81, Teit n.d). employed by Tahltan women was similar to that used by other groups. The skin was draped over a post about a metre high which was firmly planted in the ground in a slanting position. all particles of flesh are removed with an instrument made from an upper leg bone of moose, caribou, or bear as shown in Figure 16. The scraping end of the tool is serrated. The skin is scraped with a downward motion and with some pressure on the tool.

Having been kept rolled up for several days while damp, the hair on the skin naturally tends to loosen. The hide is draped over a large smooth post which rests against a tree. The hair is scraped off with a lower leg bone of moose or caribou, from which a thin longitudinal section has been removed to give two edges, one of



Figure 16. Bone scrapers for defleshing and scraping hides



Figure 17. Beamer for removing hair from large hides

which is sharpened, as seen in Figure 17. This beamer is used with two hands in a similar manner as a spokeshave with a downward movement.

Today most women prefer to remove the flesh and hair from skins while they are stretched on the stretcher frames. A thin strip of hair (5 cm. wide) is removed from around the entire outer edge of the hide so that slits can be made (3-5 cm. long) at regular intervals along the edge. The hide is then attached to a square or rectangular stretching frame made of poles with corner bracing by means of hide rope. The frame may be twice the area of the unworked hide, thus requiring up to 25 metres of hide rope, approximately one cm. wide. The hair is generally cut off the hide with a metal knife and takes one to two hours. The stretcher frame is turned and the flesh is removed with a knife or the traditional serrated bone deflesher. The animal hair may be found piled in close vicinity to the work area. Moose hair has been observed used as filling or stuffing within a cloth cover for mattresses. Hides which have been defleshed during the fall or winter are covered with bear grease in order to preserve them until they can be worked again. Defleshing takes one to two hours.

### Scraping

After the hair and flesh have been removed from the skin, it is soaked in water. In the evening it is laced onto the

stretching frame and allowed to freeze overnight. At first light the next morning the hide is scraped while still frozen to remove remaining hair and the outer cuticle of skin, as shown in Figure 18. While this outer cuticle of skin can be scraped off dry in warmer weather, it is much easier to remove when frozen in early spring. This process takes three to four hours. Traditionally the heavy chisel-like fleshing implement (Figure 16) was used for scraping off the cuticle. Presently, metal files with curved and sharpened ends are frequently used for this purpose.

### Soaking

The traditional tanning agent still used for softening hides is the brain of the animal being worked. One moose brain is sufficient to tan a large moose hide. The brain is tied up in a small bag and cooked slowly in water until it permeates the water, giving it a 'soapy' feel. This is added to the water in a large container in which the folded hide is placed until the hide is completely covered. Today metal washtubs are used for soaking hides. Formerly large vessels for soaking hides were made of birch or spruce bark, sewn together with spruce roots and glued with pitch. These were placed in pits dug into the ground of the same size, approximately one metre in length and a half metre deep. A cover is placed over the container to keep out dirt, and the top is weighted



Figure 18. Scraping frozen hides

down to keep dogs from getting at the hide. Women are very careful to keep the hide clean at all stages, since dirt which got on the hide during the working process would leave the hide black and be difficult to remove if it became impregnated. The hide is soaked in the brain water for at least four days. Every day it is taken out of the water to be wrung and stretched.

#### Wringing

A wringing post, one to one and a half metres high, is made by chopping down a small poplar tree 10 to 15 cm in diameter. Formerly trees were chopped down with stone axes hafted and used in a similar manner to modern steel axes (Teit n.d.). The top of the post is cut to a point. One end of the wet hide is attached to the post by looping the slits along the edge over the point in alternate directions. A small pole, approximately one and a half metres in length and five to seven cm in

diameter, with bark removed, is looped through the slits in the opposite end of the hide. The hide is wrung by turning the pole in one direction, as shown in Figure 19, until the hide is twisted into a tight knot close to the wringing post. The pole is secured against the post and left for a few minutes so that the brain water drips out of the hide into a container below. The pole is unwound and then turned in the opposite direction. The same process is repeated, looping the pole through the other side or length of the hide so that most of the moisture is wrung out of the hide. The 'soapy' brain water is retained and used again.

With one end of the hide looped over the wringing post the hide is pulled out at the sides and ends to stretch it while still damp. The hide is then hung over a pole (5 - 10 cm in diameter, 3 metres long) suspended from two tress. This pole also has the bark removed to keep the hide clean. The hide is left to dry slowly over



Figure 19. Wringing the hide

a couple of hours. Drying too quickly will leave the hide hard and stiff. Approximately one hour is spent wringing and stretching each hide. The process of soaking, wringing, and stretching is repeated three to four times before the hide is soft and pliable. Several hides are usually processed at the same time during this stage. A woman might process 20 to 30 hides during the year to fulfill average needs of her family for softened hides.

#### Dressing

When the hide is soft and pliable and ready to be dressed, it is attached to the stretching frame while still damp. Care is taken to keep the hide clean. With the frame resting at an angle against a pole suspended at two metre level from two trees, the top corners of the hide are attached first, holding the rest of the hide up off the ground, then the bottom corners are attached. Hide ropes in manageable

lengths are laced through the slits along the edge of the hide and pulled around the frame. Stretching the hide into the proper shape is very important. After the four sides have been attached to the frame the ropes are then tightened all around until the skin is tight when pushed against with some force. The hide is left on the stretcher until almost dry. Dressing is done on clear days since it is important that the hide does not get wet again from rain before the entire process is completed or it will become stiff and hard. The frame is put in a shady place so that the hide will dry slowly. Hot sun will dry the hide too quickly and make it stiff.

With the frame leaning against the pole in almost vertical position, one half on the hide is dressed at a time using a stone tool, which has a dulled working edge, hafted to a pole handle approximately one metre in length, as shown in Figure 20. This tool is usually made from a coarse grained basalt pebble, the manufacture of which is



described below. The dressing tool is used with two hands, one grasping the hafted stone pushes with some force against the skin, the other hand grasping the end of the handle pulls towards the body as illustrated in Figure 21. The tool is worked against the hide in a downward or sideways motion. This dressing action completes softening of the skin by taking off remaining cuticles of flesh, thins it, and makes it more porous so that smoke can penetrate it. The stretching frame is turned so that all edges and both sides can be worked. Approximately two hours of continuous effort is required to dress a small hide (young moose, deer or caribou), while four hours are needed to soften a large moose hide by a woman of full strength. Dressing may take up to twice as long for older women or when it is done at a more leisurely pace. Hides taken from



Figure 20. (right) Hafted stone tools used for dressing hides

Figure 21. (below) Dressing the stretched hide



animals killed in the fall are thicker and take longer to process at all stages. After removing the dry soft hide from the stretching frame, the outside edges are trimmed off and the hide is ready to be smoked.

### Smoking

Smoking preserves the hide and keeps it from becoming hard when wet. A cylindrical shaped frame of light willow poles is constructed over a small fire pit, which averages 50 cm in diameter and 60 cm in depth, for smoking hides as shown in Figure 22. The frame is high enough so that the hide will not touch the ground (approximately two metres high). Smoking is done on a clear day when there is no breeze to take away the smoke and takes about two hours or more depending on how deep or rich the colour is desired. Dry pine cones and the inside white wood of a rotten cottonwood log are used for smoking, giving the hide a rich golden brown colour.

### Manufacture of Stone Dressing Tools

Although anthropologists tend to assume that stone working traditions are no longer being employed in contemporary Canada, recent observations by this author indicate that Tahltan women are still manufacturing their own stone dressing tools. These tools are made of a coarse grained basalt which is abundant in the Stikine area. Relatively thin pebbles, oval or elongated in shape, are collected by women during the course of other procurement activities and kept until needed for manufacturing new tools. This kind of behavior in procurement of raw materials has been described by Binford as an embedded strategy (Binford 1979:259).

The manufacture of new tools and resharpener of old ones are carried out at the beginning of the hide dressing stage, so that several tools are hafted and ready for use. Dressing stones are manufactured using a bipolar technique, similar to that described by earlier ethnographers (Emmons 1911, Teit 1900) and scholars who are currently conducting replicative experiments



Figure 22. Hide smoking frame and pit

(Flenniken 1980, Hayden pers. comm.). The basalt pebble is held edgewise on a large anvil stone and is struck with a hand held hammer stone. If the pebble is well struck each half can be used as a tool. Using direct percussion, flakes are removed from the edges by means of a hammerstone or by striking the split pebble directly against the anvil stone as seen in Figure 23. Flaking thus creates a dulled working edge. A sharp edge is considered undesirable for softening hides since it would tear the skin. All tools have cortex remaining on their dorsal surfaces. The manufacture of a new tool takes about ten minutes.

Dressing stones appear to have a long life span. Two or three hides can be dressed with a tool before it requires



resharpening. Although the stone material is abundant and the method of manufacture fairly simple, many stone dressing tools appear to be highly curated. Several tools observed in 1979 and 1980 are reputed to be over 100 years old. When first starting to work on hides, a woman is given her first tools by an aunt or her mother. These are kept and handed down again as heirlooms. With continued use and resharpening, tools become smaller in size and may differ in shape from newly manufactured tools. Measurements of several stone hide working tools are presented in Table 7.

All of the split pebble tools observed being manufactured and hafted into pole handles are used in dressing or softening of hides during the initial processing of large skins as described above. However, within every woman's workbag or collection of tools there are one or two smaller stone dressing tools which are best described as cortex spall or flake tools. These are hand held and used for dressing smaller skins which require little work to soften them. They are also used to resoften articles of clothing or robes after washing or cleaning. Traditionally, clothing was washed in urine. After drying, they were often whitened with chalk and then rubbed with the hand held dressing stone (Teit n.d.). The two types of stone tools used for dressing skins are illustrated in Figure 24. The middle tool in Figure 24 still has tiny bits of skin adhering to it, although it has not been used for forty years. After continued use, tools generally develop highly polished edges. Hand held dressing stones traditionally used in conjunction with a chalk whitening agent probably had a much shorter use life than tools used in the initial processing of hides.

Ethnographic observations on the manufacture and use of stone tools in hide processing activities are useful for interpretation of tools found in archaeological contexts. Based on brief descriptions provided by Teit (1900, 1909) and Morice (1893), Ham (1975) identified cortex spall tools from sites in the Chilcotin River area as hide working tools

Table 7. Measurements of Several Stone Hide Working Tools (mm).

	Length	Width	Thickness
1.	124	72	18
2.	139	78	22
3.	136	81	30
4.	120	80	18
5.	110	82	32
6.	110	69	32
7.	126	73	28
8.	117	75	20
9.	110	74	21
10.	114	75	18
11.	113	74	22
12.	115	91	18
13.	120	80	12
14.	123	78	20
15.	110	56	19
16.	112	69	17
17.	112	58	16
18.	110	75	24
19.	108	78	16
20.	98	75	10
21.	89	69	18
22.	127	71	18
23.	138	86	24
24.	130	92	26
25.	141	61	22
26.	120	62	16
27.	163	75	20
28.	78	69	18
Range	78-141	56-91	10-32
Average	117	74	20

and indicates that they have a wide distribution in archaeological sites in the southern interior plateau area. Coulson (1971) conducted an analysis of 577 cortex flake tools from the Fountain Site (EeR1 19), a winter village site above the Fraser River in the vicinity of Lillooet, B.C. Although their use as hide working tools was only tentatively suggested, many of the attributes recorded for these tools (Coulson 1971:17-22) are very similar to those of tools observed by the present study.



Figure 23. Flaking the hide dressing stone

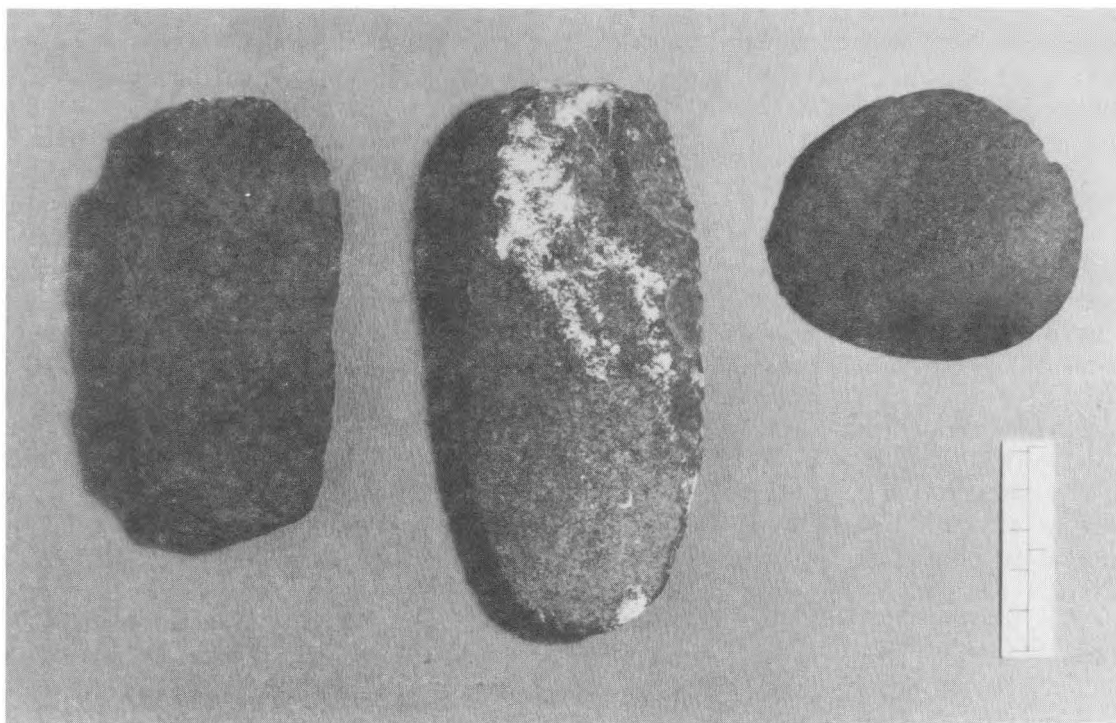


Figure 24. Two types of hide dressing stones

## Fishing Techniques

The Tahltan used a variety of methods to procure anadromous salmon and fresh water fish, including the use of weirs, basket traps, gill nets, dip nets, gaffs, and spears, depending on the location of fishing activities and the quantities taken.

### Weirs

Weirs were used to capture large quantities of salmon and fresh water fish during periods of migration to spawning grounds. They were constructed in shallow waters of rivers and streams along which fish passed.

Weirs were constructed of light spruce poles placed horizontally three to four inches apart and lashed to more stout vertical poles with red willow withes. Withes when soaked in water and heated over a fire become very pliable so that tight knots can be made. Teit (1906:344-345) observed a weir at the turn of the century composed of a fence with two boxes for constraining the fish. Finely balanced twigs attached to the entrance of the first box close after the fish pass through. The fish, unable to escape, pass on to the second box where they are taken out with a gaff hook. Several hundred fish could be caught in the weir in a few hours.

### Gaffs

The gaff was and still is a popular fishing implement (see Figure 26). It was generally used in swift shallow streams and at weir locations. It consisted of a light pole about five metres long armed with a detachable hook made of caribou antler (Emmons 1911:86), which was attached to the shaft by means of one metre of hide line. Gaffs in current use (shown in Figure 27) are similar in construction except that hooks are made of iron.

### Basket Traps

Long cylindrical basket traps, similar to that shown in Figure 25, were used at

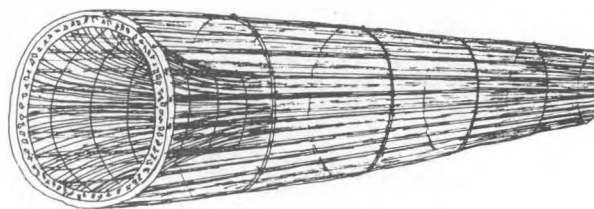


Figure 25. Cylindrical basket trap used for salmon

narrow river passages for catching large numbers of fish. They had inverted cones at the mouth of the trap through which the fish passed. The traps were weighted down in the water with rocks placed inside. When filled with fish, they were lifted up by means of strong ropes attached at several points. Basket traps were particularly useful for catching salmon at sites in the lower portion of the Grand Canyon of the Stikine, a few miles above Telegraph Creek.

### Gill Nets

Gill nets made of twisted sinew, babiche, or shredded willow bark were used for fishing in lakes. These were about two metres wide and six to ten metres long with a mesh size of five cm. Carved wooden floats were attached to the thicker upper net rope and suitable sized rocks, often wrapped in hide, were attached to the lower line.

After a ban was placed on Indian use of weirs for catching salmon in the early part of this century, gill nets were adapted for use in the back eddies of larger fast moving rivers during the 1920's. People continued to tie their their own nets of various mesh sizes using spools of twine obtained from the Hudson's Bay Company. Although plastic netting needles are most common today, netting needles and gauges carved of wood are still in use. Presently, second hand nets obtained from commercial fisheries are cut down to suitable size for river nets, generally 10 to 12 metres long. Gill nets are set out into the river by means of booms, large spruce or pine poles about



Figure 26. Gaffing salmon in shallow waters



Figure 27. Gaff pole with detachable hook



nine metres in length. Nets are run three or four times a day during the peak sockeye runs, since any more than 200 lb. of fish in a net makes it too heavy to haul in.

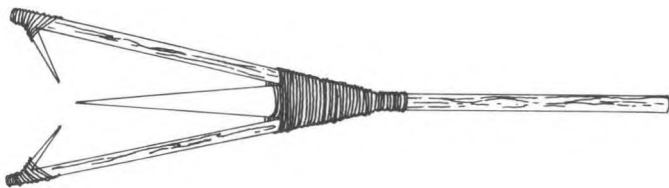
### Dip Nets

Dip nets, similar to the one shown in Figure 28, were made of the same materials as gill nets for use along creeks and at weir locations.

### Spears

For lake fishing through holes in the ice a three pronged spear was used. It consisted of a 15 foot long (4.5m) pole to which is attached a central bone point and two wooden arms with bone barbs at either side as shown in Figure 29. All attachments are made with sinew lashing. Salmon eggs were used as bait to attract fish to the hole where they were speared. Holes in the ice were cut with chisels of antler or horn (Emmons 1911:87, Teit n.d.).

Another type of spear consisted of a blade made of mountain goat horn, about seven cm long, pointed at both ends and sharpened along one edge. A line of twisted sinew or hide passed through a hole about the center and was secured to a four metre pole. One end of the toggle like blade fitted into a socket in the end of the shaft. When the blade was driven into a fish it was released from the end of the pole, and the strain on the line tended to turn the blade at an angle to prevent its withdrawal from the fish (Emmons 1911:87).



82

Figure 29. Three pronged spear used for ice fishing

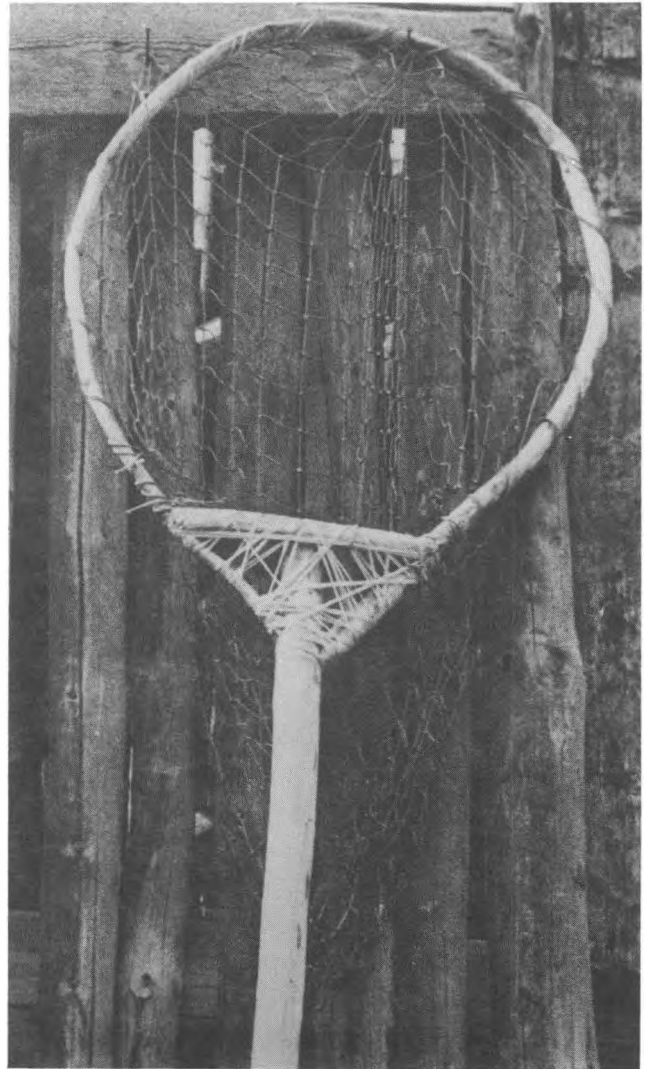


Figure 28. Dip net used in fishing

### Hooks and Lines

Long lines of shredded and twisted willow bark with a series of hooks attached were set out from lake shores for catching freshwater fish. They also had several floats and small sinker stones attached. Individual lines with a single hook, float, and sinker were attached to poles about two metres long which were either hand held or set in the bank along creeks or lake shores. The hooks attached to these lines had bone barbs lashed to short wooden shanks and were baited with salmon eggs or bits of meat.

### Processing of Salmon

While the actual procurement of salmon is carried out by men, butchering and preparation of salmon for drying is the responsibility of women. Salmon are eviscerated along the river bank as soon as they are taken out of the water. A slit about five to seven cm long is made from ventral to dorsal surface just forward of the tail. This slit gives a good hold on the slimy fish for completion of gutting as well as for carrying back to the smokehouse and for suspending either on nails or small poles,

With the fish laid on its side or back, a cut is made from each gill to the tip of the lower jaw. A slit is then made from the anus to the throat and the guts are taken out in one piece and thrown back into the river. Blood is scraped away from the inside of the cavity and the fish is scrubbed clean in the stream or river. The fish is then hung on a tree nearby to dry partially while the rest of the catch are being eviscerated.

With larger fish, such as some of the larger sockeye and the spring salmon, the heads may be cut off and strung on a pole through the eye. No part of the fish is discarded except the guts. Fish heads are considered a delicacy, and all bony parts of the fish not consumed by people are fed to the dogs. Larger fish may also be butchered by a second method. After cutting off the head, a slit is made from the anus along two sides of the belly to the throat area, giving a separate belly piece. After eviscerating and cleaning, the salmon are carried to the smokehouse where they are hung on poles or nails close to the smudge until the outside skin and flesh is dry to touch, usually several hours or one day.

The next stage in processing the salmon is splitting them for drying on the racks. Placed on a workbench, the fins are cut off the fish and put into a scrap bucket for the dogs. After the heads are cut off, a cut is made along both sides of the backbone which is thus removed along with the tail. Heads, backbones, and tails are hung to dry on separate poles about two

cm in diameter.

The salmon is then placed on an A frame cutting board as seen in Figure 30. Starting from where the backbone was removed, a large fish knife, generally with a curved blade kept very sharp, is used to split the flesh of each side through to the belly edge but leaving the flesh attached to the skin at this edge. The flesh is then spread out like leaves in a book and scored so that the air and smoke can more effectively dry the whole salmon (as seen in Figure 31). If the fish is especially large or fat, thin fillets are cut from the side before splitting. These are called 'enacaga' and eaten as snacks when thoroughly dried.

The split salmon is hung over one of



Figure 30. Splitting salmon on the A-frame cutting board

the lower rack poles close to the smudge with the flesh side up. The salmon are inspected several times a day to check for fly eggs and shifted on the rack pole to ensure even drying. If fly eggs are found, they are cut out immediately or the fish will spoil very quickly. The low fires in the smokehouses are tended during the day and a good smoke is produced with green willow, aspen, cottonwood, or alder.

When the fish are partially dry--somewhat hard and dry to the touch--they are suspended on poles and hung from a higher rack in the smokehouse. As the fish become dry in about two weeks they are suspended from the highest rack in the smokehouse until the end of the season.

At the end of the fishing season, the dried salmon are brought down from the racks in the smokehouse, taken off the poles, and piled outside as shown in Figure 32. They are tied up in bundles of 15 to 20 fish according to variety, and transported to storage facilities.



Figure 31. (right) Scored salmon hanging to dry  
Figure 32. (below) Bundling dried salmon for storage





### Butchering knives

Knives used in recent years for butchering fish have curved steel blades, averaging 12 to 14 cm in length. Metal was introduced to the Tahltan by Tlingit traders prior to direct European contact. Today people do not remember how knives with blades of obsidian were manufactured or used, only that they were. However, some information on the construction of knives was gathered by Thorman at the turn of the century from a Tahltan elder named "Gilyeh". As shown in the reconstruction, Figure 33, Thorman notes that obsidian flakes were set into a curved bone or wooden handle and sealed with conifer pitch. Sinew lashing was also used to secure the handle (Thorman n.d.). Similar in shape to knives in current use, this type of knife was probably used for butchering and splitting salmon for drying. Fish knives were mainly used by women and may

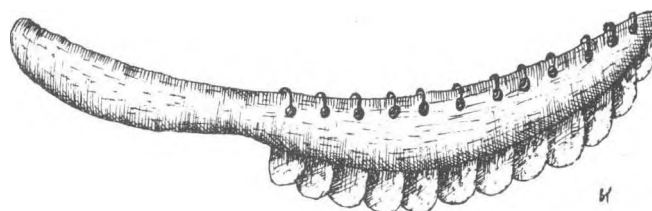


Figure 33. Reconstruction of knife with obsidian flakes (based on Thorman n.d. notes and sketches)

have been manufactured by them as well. Based on replication experiments and ethnographic analogy, Flenniken (1980) argues that microlithic knives retrieved from the Hoko River site in Washington were made and used by women for processing fish.

### Use of Edible Plants

Surveys on hunters and gatherers indicate that in northern latitudes and highly seasonal climates edible plants were either exceedingly scarce or not important in the aboriginal diet of the groups who lived there (Hayden 1981a:357). Indeed, there is a general lack of attention paid to the use of plant foods in many ethnographies on northern groups. From the major ethnography published on the Tahltan (Emmons 1911), based on field work at the turn of the century, one would get the impression that very little use was made of plant resources. Under food, Emmons notes that "the soapberry was dried in the form of cakes for winter use. Certain roots as well as the inner bark of the black pine are also eaten" (Emmons 191:62-63).

Perhaps this lack of information concerning plant foods was due to a widely held belief that plant foods were unimportant among northern groups, or the fact that an ethnographer spent a limited period of time carrying out fieldwork, or only during the summer season when

attention was turned to other activities such as fishing. Field work carried out by Teit (n.d. fieldnotes) as well as the present research indicates that the Tahltan used a variety of different plants for food and for medicinal purposes.

The use of plant foods was probably much more extensive in prehistoric times than it is possible to document for the historic period. It is quite likely that the use of many traditional plant foods was quickly dropped in favour of starch foods such as flour, sugar and rice, introduced by Europeans during the first gold rush in 1874.

While plant foods may represent a small proportion (less than 10%) of the total diet when measured in terms of weight or volume, it is suggested that they were highly valued for their significant contribution to the diet in terms of essential nutrients, vitamins and minerals, as well as variation in taste, texture, and colour. Plant foods are divided into major categories of green vegetables, roots and

bulbs, fruits and berries, and cambium.

#### Green Vegetables

Included in this category are a wide variety of plants whose young shoots, tender stems, or leaves are available from early spring through early summer. These were generally gathered with the hands into birch bark baskets. Occasionally a small knife with obsidian blade or flake may have been used to cut the larger stems. Young tender shoots of such plants as bullrushes, cattails, solomon's seal, horsetails and other ferns appear in damp habitats as the snow melts in April, providing a welcome change to the diet. The tender stems of wild rhubarb and fireweed could be procured somewhat later in May and early June. Wild rhubarb stems are still relished and gathered in quantity today. Shoots and stems were usually eaten raw after peeling off the outer fibres. They were always eaten fresh, not being preserved for later use.

The tender leaves of nettles, dock, fireweed, petasites, sorrel and chenopodium ( a native of the area but related to the European introduced lambs' quarters) were gathered in spring and early summer. Most of these were boiled before eating and eaten fresh. The leaves of dock and mountain sorrel, commonly called sour grass, still gathered today, appear to have always been favorite green vegetables. While passing through the headwater valleys of the Stikine in 1824, Black noted that the Indian groups there were gathering sorrel in large quantities (Black 1955:117).

#### Roots

Under the general category of roots are included bulbs, corms, tubers and rhizomes, those plant parts which are analagous to roots and found in the ground. Roots were usually gathered in spring when they were tender and while the earth was still damp and easy to dig in. Simple, straight, wooden digging sticks, without handles, were used to aid in gathering roots. The end was sharpened and often firehardened (Emmons 1911; 49, Teit n.d.). It appears

that the bulbs of the bracken and other ferns, as well as the roots of silverweed, sweet vetch, Pedicularis, and perhaps Oxytropis, were all traditionally used by the Tahltan.

The roots of sweet vetch (Hedysarum alpinum), gathered in May and June and again in the fall, appear to have been a favorite plant food and are still gathered today, especially by young boys who often go out on hunting expeditions on their own. It is simply peeled and eaten raw. Black observed large quantities of these being gathered and eaten by the Indian groups whom he met in the headwater valleys of the Stikine in 1824 (Black 1955:33-34).

Fern rhizomes were gathered in early spring or fall. They are found along the lower Stikine, the Iskut River and other damp habitats at low elevations. These starchy rhizomes were baked in small pits dug in sandy soil, and lined with bark. The rhizomes were placed in the bottom and covered with bark and earth. A small fire was made on the top and the rhizomes were baked or roasted for several hours or overnight. They were often eaten with bear grease (Teit n.d.).

Other roots and bulbs such as rice root were often boiled before eating. They were also wrapped in birch bark and baked in hot ashes (Teit n.d.).

#### Fruits and Berries

Approximately 25 different species of berries or fruits are available in the Stikine River area throughout the summer and early fall. They are found in a variety of habitats at different elevations, from the dry river terraces along the middle Stikine to alpine meadows. The gathering of wild berries is still an important subsistence activity today; quantities of berries are gathered for making jams and preserves. An average of 60 litres of blueberries are gathered in a day of picking by groups of five or six people during expeditions of several days. Berry gathering activities do not appear to be regarded as work, but are considered in terms of outings enjoyed by all and welcome break from summer fish processing. While travelling, or during

other activities, people often stop to feed on fresh berries directly from the bushes for up to 20 minutes at a time.

Formerly berries such as strawberries and raspberries, which ripen in July, were only eaten fresh, being too juicy to preserve. Saskatoons and soapberries, which ripen in late July and August, were collected in large quantities and dried for later use. Cranberries and blueberries which are most abundant in subalpine zones, become available in late August and September. These were also dried in large quantities or preserved in bear fat.

#### Cambium

The sap or cambium, inner bark saturated with sap, of pine, poplars, and sometimes spruce and alpine fir, was collected in May and early June. Bark pryors of caribou antler tines were used to remove bark from trees. The sap was scraped into temporary bark cups and always eaten fresh. Sap scrapers were made of shoulder blades of sheep and other animals (Teit n.d.). Cambium was an important spring time food and is still enjoyed today. The scars on older trees, from which sap has been scraped, are clearly visible in many wooded areas.

Another nutritious source of vegetable food was used during the winter, when fresh plant foods were not available. Caribou stomach contents, consisting of fermented mosses and lichens, were regularly boiled and eaten during the winter (Teit n.d.).

#### Plants with Medicinal Uses

Several plants were not so much used as a food as for medicinal purposes. Some of the better known and commonly used

remedies are described here (from Teit n.d. and personal field observations).

The pitch of pine, spruce and alpine fir was commonly chewed soft, heated on rocks, and used as an antiseptic on open sores and wounds. Bark of spruce and alpine fir was dried, powdered and used externally to stop bleeding. The bark of these two trees was also sometimes boiled and drunk for chest colds. Spruce needles were crushed and put on bad burns. The pitch of alpine fir was also used for mosquito bites, and smeared around the eyes to prevent snow blindness.

Branches and berries of juniper were boiled and the decoction drunk as a tonic for cleansing the liver and blood. The leaves of Labrador tea were boiled and drunk as a tea for colds. The bark and sap of the mountain ash (Sorbus sitchensis) were boiled and the decoction drunk for lung troubles. The roots of the water lily (Nuphar polysepalum) were mashed and boiled and a poultice made for congestion and chest pains.

One of the most popular medicinal plants is Artemisia telesii, commonly known as 'caribou leaves'. The leaves were mashed with a little water, heated on rocks, and used as a poultice on cuts and open wounds. There are many stories told describing the miraculous healing power of this herb, which is still commonly used today. The leaves were also boiled and the decoction taken internally for infection, colds, and stomach ache.

The leaves and flowers of yarrow (Achillea millefolium) were crushed, heated, and mixed with water into a poultice which was also used on cuts and wounds. In making a poultice with yarrow or caribou leaves these were sometimes mixed with pine or spruce pitch to combine the antiseptic and healing powers for bad wounds.

### Technological Uses of Plant Resources

Wood and bark from all major tree and shrub species were used in building habitations and other structures, facilities such as weirs, traps, and fences, and in

manufacturing of tools and implements. The technological uses of different plant resources are summarized in Appendix 2. The tools used in woodworking activities

are described below.

Major camps and villages were located within forested areas where building materials were abundant. Firewood was also a basic requirement at all times of the year. Several cords of wood were needed for cooking and heating shelters during winter months. Sometimes trees were allowed to die by completely stripping bark from around them. This practice provided a supply of dry standing timber in subsequent years which was easier to chop for firewood.

#### Collection and Use of Bark

The collection of bark was an important springtime activity. It was carried out in May and June while the bark was saturated with sap and easy to peel off trees and poles. The bark of several different kinds of trees was collected during the same period and put to a variety of uses (Thorman n.d.).

Large sections of waterproof bark were collected principally from spruce and alpine fir trees. Trees 8-14 inches (20 - 35 cm) in diameter and free of lower limbs were found in the forest where they were protected from winds. The required tree had a bole 10 to 14 feet (3-4.3 m), smooth from the base to the first set of limbs. Incisions were made at the top and bottom of the section around the tree and down one side. Bark pryers of wood or antler were used to ease the bark off the tree bole. The bark was laid open and flattened, then folded for packing. Because

it was saturated with sap the bark was not damaged by folding. Lengths of bark weighed over 125 pounds (56 kg) and were heavy to pack, requiring the cooperation of several men (Thorman n.d.).

Lengths of bark in the green state were laid on the roofs of smokehouses as well as other shelters and lashed to supporting poles with willow withes, or ropes of willow bark or spruce root. Life of the bark on a roof was up to five years before it needed replacing. Usually a new layer was placed on top (Thorman n.d.).

Rectangular pieces of bark were also used for lining cache pits. Canoes were constructed of spruce bark on a rib frame of light poles. The bark was treated with resin and grease (Teit n.d., Thorman n.d.).

Birch bark was collected and used in the green state to make baskets sewn together with spruce roots. These were used for cooking with hot stones in water and as containers for food and water (Emmons 1911:48, Teit n.d.). Larger containers for soaking hides or for boiling food were made by lining a pit, up to a metre in length, with birch or spruce bark. Birch bark was also used for a variety of temporary cups, bowls, and trays.

Bark from willow as well as other shrubs, was collected in spring and twisted into twine and rope of varying thicknesses.

Sections of root from the wide spreading laterals, just below the surface of the ground, of spruce and alpine fir, were collected in spring, split and used as rope for binding. They were more water resistant than bark rope.

### Woodworking Tools

#### Axes

Large, stone axes (as shown in Figure 34) used for chopping trees were hafted at right angles to a straight pole handle and used in the same manner as modern axes. Although most axes were made of common fine grained basalt, the best axes were made of jadite imported from the Tlingit (Teit n.d.).

#### Adzes

Adzes were usually made of common basalt. Pebbles of suitable size and shape were split by percussion with a hammer stone, shaped by flaking around the edges with an antler tine flaker, and rubbed with a sandstone abrader. Fine and coarse sandstone is found in various parts of the country. Sandstone abraders were also used

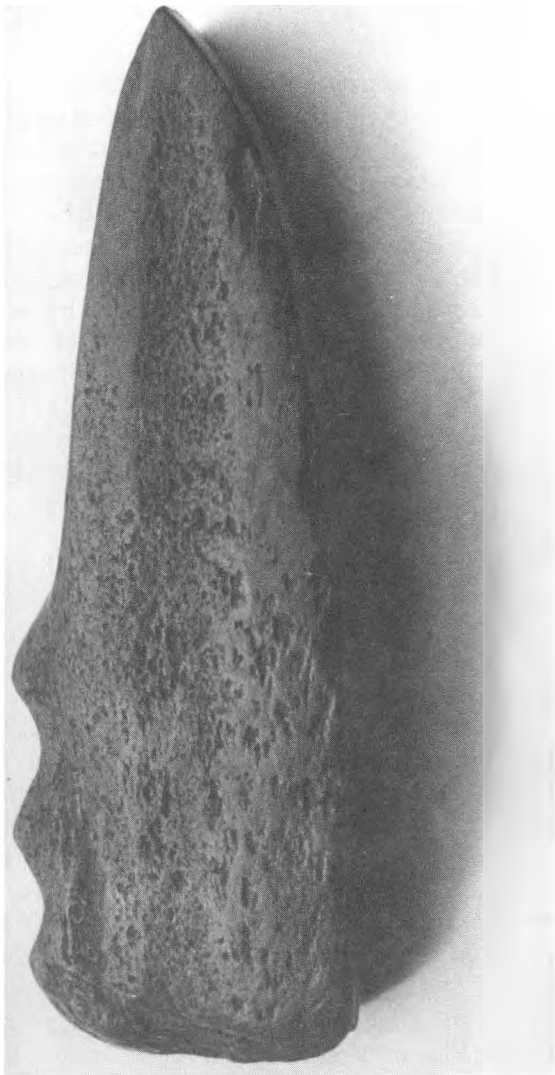


Figure 34. Stone axe used for chopping trees  
(20cm long)

for shaping and smoothing tools and implements of wood, bone, antler, and horn. Adzes were hafted to the distal end of a curved wooden handle (Teit n.d.).

#### Hammerstones

Small hammerstones were commonly suitable hand sized pebbles with one end smaller than the other. Stone hammers of suitable flat stone were lashed to a pole handle with withes and used for driving stakes and posts into the ground (Teit n.d.).

#### Wedges

Wedges used for splitting wood were made of wood, horn, or antler (Teit n.d.).

#### Drills and Awls

Holes in wood were usually drilled with sharp pointed teeth from a variety of animals, hafted into short handles. Awls, also used for making perforations, were of various sizes and made from goat horn or of bone from a variety of different animals (Teit n.d.).

#### Knives

Two kinds of knives were used for fine working of wood, as well as horn, antler, and bone. The curved knife (shown in Figure 35) was used for carving and incising and had a blade consisting of the incisor of beaver, porcupine, or marmot. The second kind of knife (see in Figure 36) had a straight blade of flaked obsidian and was used for whittling and thinning wood. Both kinds of blades were hafted into short handles of wood, bone, or horn by means of hide lashing (Emmons 1911:55, Teit n.d.).

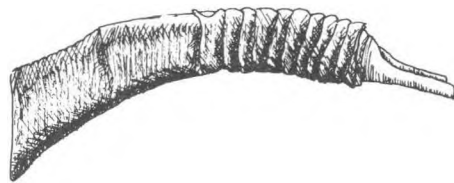


Figure 35. Curved knife with beaver incisor



Figure 36. Straight bladed knife

### Shelters and Other Structures

Habitation structures varied in size and manner of construction depending on location, time of year, and length of occupation as well as the number of people using them. A variety of other structures, such as sweat lodges, grave houses, and raised caches, which were built in the vicinity of camps or villages, are also described in this section.

#### Smokehouses

Large, permanent house structures, often measuring 12 m in length, were built in the summer fishing villages and used both as shelters and for drying large quantities of salmon. One of the earliest descriptions of the Tahltan smokehouse was recorded by Muir in August 1879. At the fishing village at the mouth of the Tahltan River

they were camping in large booths made of poles set on end in the ground, with many binding cross pieces on which tons of salmon were being dried. The heads were strung on separate poles and the roes packed in willow baskets, all being well smoked from fires in the middle of the floor. The largest of the booths near the bank of the river was about 40 feet square. Beds made of spruce and pine boughs were spread all around the walls, on which some of the Indians lay asleep, some were braiding ropes, others sitting and lounging, gossiping and courting while a baby was swinging in a hammock.

(Muir 1915:76-77)

Smokehouses standing at the Tahltan-Stikine confluence today (Figure 37) are the largest, oldest, and most traditional in their construction of all the smokehouses in current use. They resemble closely smokehouses photographed at the same location at the turn of the century (Emmons 1911: Plate XVIII, Jenness 1932:371). The structural framework consists of four corner posts with two

central higher posts at either end. These are rudely hewn spruce or pine poles about 25 cm in diameter, notched at the top to hold the beams which extend the length of the house and support the roof. The walls are generally pine poles, from six to ten cm in diameter, placed vertically into the ground or resting on a large base log set between the major support posts on all four sides. The wall poles were formerly fastened to horizontal support poles and side beams by means of red willow withes (*Cornus stolonifera*), spruce roots (*Picea glauca*), or ropes made of shredded and twisted willow bark.

The roof frame consists of several rafter poles, about 10 cm in diameter, laid from the ridgepole to the two side beams. Across these are laid smaller poles lengthwise about every 30 cm. These are all lashed together with willow withes. Strips of spruce bark, 30 to 40 cm wide and 1.5 to two m long make a waterproof covering. These bark slabs are held in place on the roof by lashing long thin willow poles on top of them. Willow and other leafy branches are laid against the wind side of the house to stop the wind from blowing dust inside. The doorway consists of a narrow opening at one or both ends with a moveable or hinged door made of poles or split boards.

Additional interior posts support cross beams on which rest the main drying rack poles. These are generally about two m above the floor. From the roof are suspended rack poles at two or three levels from which the fish are hung during the process of curing. Houses have at least four hearth areas, one in each quadrant. In recent times, day to day activities such as food preparation, eating, and other tasks are carried on within only a few smokehouses, since shelters in the form of cabins or tent frames are constructed at most camps. Fine weather conditions allow many activities to be carried on outdoors and much use is made of outdoor hearth areas.

Detailed data were recorded on the construction, age, and use of 23 smokehouses at contemporary fishing camps.



Figure 37. Traditional style smokehouse at Tahltan-Stikine confluence

The approximate age, and dimensions of these are summarized in Table 8. Smokehouses in current use range in size from 16 square m to 72 square m floorspace. Size and capacity of structures are related to age and the number of people using the facilities. Based on observations of recent use, it is estimated that the traditional smokehouse measuring 12 m per side, with a floorspace of 144 m<sup>2</sup> would have been occupied by four nuclear families, comprising a corporate or extended family group of approximately 25 people.

There has been a trend in recent times to build smaller structures which are used by smaller or nuclear family units. As other methods of preserving salmon have become popular, smaller quantities of fish are being dried in the smokehouse, although there is a renewed interest in traditional methods of fish processing and drying recently as confirmed by the construction of several new smokehouses in the last few seasons.

Observations have been made on the process of constructing a new smokehouse

in recent seasons. Although modern tools such as chainsaws and hammers, and nails are used in construction, the new smokehouses, such as No. 18 seen in Figure 38, incorporate many of the traditional elements of the larger and older smokehouses, including the large flat rocks which serve as foundations for major support posts, corner bracing, horizontal wall pole braces, and various rack features. In preparation for the construction of smokehouse No. 18, over 200 poles were cut and hauled. The actual building of the house was carried out in five days by three adult men. Details of smokehouse construction such as these are useful for reconstructing the work effort required for building the larger traditional smokehouse. Based on average diameter of poles used in current houses, it is estimated that the aboriginal house measuring 12 m per side would have required 800 poles to be cut and hauled. Using stone tools and traditional materials, the construction of the aboriginal house would have required the cooperative work effort of several adult



Table 8. Tahltan Fish Camp/Smokehouse Survey.

Location	Smokehouse No.	Approximate Age	Dimensions (in meters)
A Tahltan Stikine Confluence	1	50 yr. +	7.20 x 8.00
	2	50	8.25 x 8.75
	3	40	6.40 x 6.45
	4	50	5.75 x 5.75
B Tahltan Village	5	30	4.40 x 5.60
C Ten Mile Flat	A2 remains	40	4.50 x 7.00
D Nine Mile Flat	6	50	4.45 x 5.60
	7	40	5.20 x 8.75
E Seven Mile Flat	8	40	6.30 x 6.30
F One Mile Flat	9	1976	4.00 x 5.50
	10	15	3.80 x 5.10
	A1	unknown	4.50 x 6.75
G 1/2 mile north of T.C.	11	1973	3.45 x 5.25
	21	1979	4.65 x 5.75
H Casca	12	1974	5.10 x 5.30
I The Point	13	40 yr. +	3.80 x 9.00
J Hyland (Deep) Creek	14	1975 rebuilt	4.70 x 7.30
	15	50	4.00 x 7.30
K Dodjatin Creek 6 Mile Camp	16	20	5.40 x 6.50
	17	40	4.50 x 7.60
	18	1978	3.70 x 4.85
	19	1976	5.00 x 6.30
	22	1979	4.20 x 4.80
	23	1979	4.25 x 4.85
L Tsikhini Creek	20	40 +	approx. 5 x 6

men and would probably have taken two to three weeks for completion.

The dry interior weather conditions assure relatively long term preservation of wood structures. With regular maintenance well-built structures are still standing and functional fifty years after their original

construction. After structures are abandoned for regular purposes, many of them become storage areas for a while and subsequently collect a variety of discarded items such as old nets, floats, sinkers, axe heads, dip net and gaff poles, old clothing, bits of skin hide, tump lines, etc. After

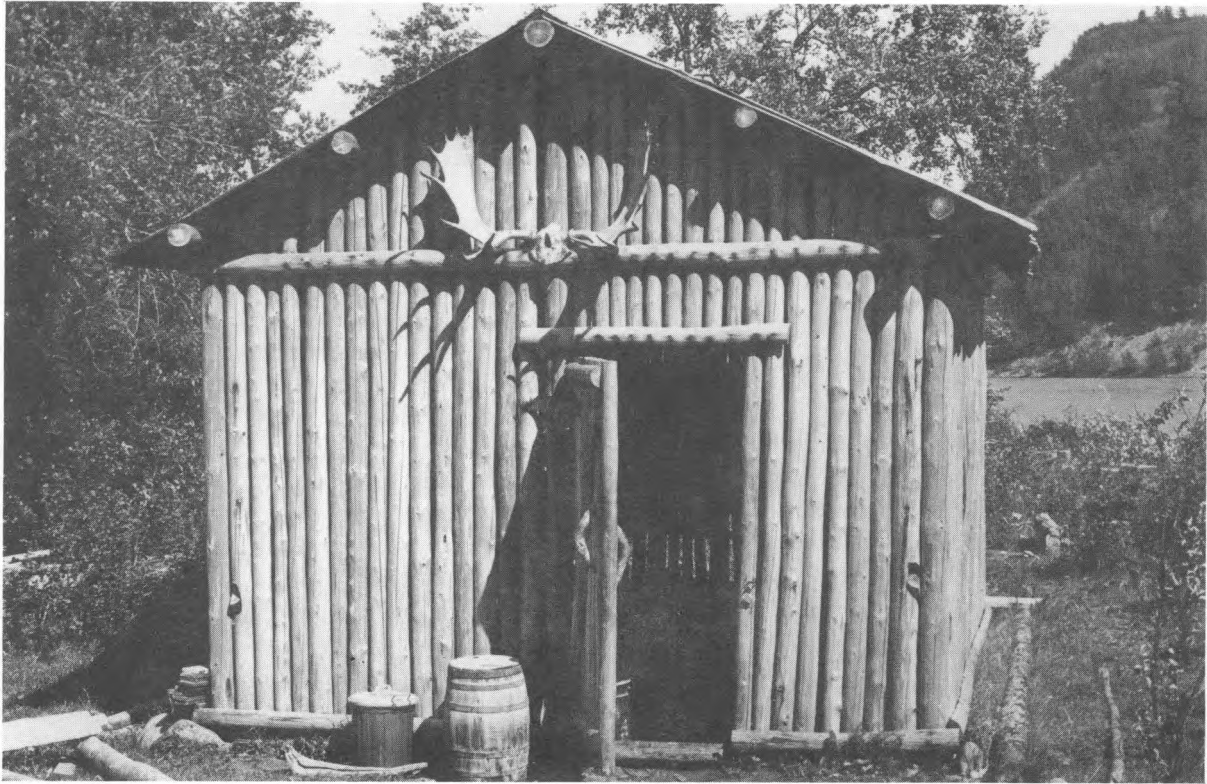


Figure 38. New smokehouse at a contemporary fishing camp

collapse, structures undergo more rapid decay with an organic layer building up on the smokehouse floor.

#### Winter Houses

Large permanent houses, of double lean-to style, were constructed at major winter camps which were returned to on a regular basis (Thorman n.d., Teit n.d.). The house consisted of two rectangular or arc-shaped lean-tos open to each other and a central fireplace. In constructing the shelter, the surface soil was scraped away to a depth of 35 to 45 cm. Along the two sides, a back stop of one or two logs was built to the surface of the ground. On the top log were laid poles reaching to a ridgepole supported by two grounded posts. The flanks or ends were filled in with vertical or angled poles. The roof was covered with bark which had been stripped from trees ahead of time in the spring. Where the bark reached the ground was covered with a fill of forest rubble and

earth. The roof was also covered with coniferous branches so that when the roof became heavily laden with snow it could be shaken off. These large structures were solidly built and required minimal maintenance, with perhaps a new post or the roof bark being replaced periodically (Thorman n.d.). Based on observations of houses used in historic times, it is estimated that these structures averaged eight to ten m in length and five to six m in width, and housed 15 to 25 people. Teit (n.d.) notes that large lean-to style shelters over 30 m in length were used as communal houses during the protohistoric period at a site on the east side of the Tahltan River near the Stikine.

#### Temporary Shelters

Shelters in warm weather or for short stops while travelling were built in the single lean-to or teepee style. These were built more simply than the larger permanent structures, with only a few

poles and posts, and covered with bark, boughs, or untanned hides (Thorman n.d.).

For just an overnight stop while travelling, people often sleep in the open, cutting spruce or fir boughs to make a thick bed under a large conifer tree with the campfire close by.

#### Menstrual Lodges

Small lean-to shelters, large enough to accommodate one person, were used by women during menstruation and when giving birth. Young pubescents were isolated in these small lodges for up to a year during puberty training. Constructed in the same manner and with the same materials as other lean-to shelters, these lodges were located up to 100 m away from other habitations in camps or villages (Teit n.d.).

#### Gravehouses

Several styles of gravehouses were popular in prehistoric and early contact days. These contained boxes or trunks with the charred remains of the cremated dead. Grave houses were usually located on knolls or high terraces overlooking major villages. The older, traditional Tahltan style of gravehouse consisted of a crib of logs on top of which the remains were placed (Emmons 1911:36). In the decayed state, there would be nothing to indicate the size of these structures, although charred bone, as well as some grave goods would survive.

Two other styles of grave house are typical of Tlingit houses and probably adopted from the Tlingit in late prehistoric times. One of these was square in shape with a four sided peak roof, and one or two windows. The remains of a grave house of this style have been recorded in the old village at Tahltan. The roof has fallen over with walls collapsed to expose a metal trunk with some recognizable charred bones inside. The other grave house was rectangular in shape with a gabled roof. Grave houses were decorated with carved or painted family totems on the front as illustrated in Emmons (1911:34, 36). Rectangular grave houses are still

standing in the Telegraph Creek graveyard today (see Figure 39) and maintained on a regular basis.

#### Sweat Lodges

Sweat lodges, consisting of a dome shaped frame of willow poles, were constructed beside stream banks in the vicinity of all camps and villages. Some were large enough to accommodate ten people at a time. Small boulders were usually heated in a fire outside the lodge and then placed in a shallow depression in the center or to one side of the lodge. The frame was covered with bark or hides and steam was produced by pouring water on the heated rocks (Emmons 1911:38-9, Teit n.d.). Sweat lodges were used for general and regular cleansing as well as ritual purification. Sometimes men and women bathed in separate lodges and sometimes they bathed in the same lodge (Teit n.d.).

#### Caches

Raised log caches appear to have been introduced in historic times along with the construction of log cabins. These were built on posts above the ground so that wild animals and dogs could not get at them. They were entered by means of notched pole ladders which were removed and left on the ground when not in use. These caches, used for storing food and other gear, were located to the rear of each house in the village (Emmons 1911:38), and used in some locations up until very recently.

#### Dog Kennels

At least in historic times, dog kennels consist of low log structures, approximately two m in length and sometimes square, which are partially banked with earth or dug into slopes and give the appearance of small caves with only the front logs showing as seen in Figure 40. These are found in the vicinity of houses and might easily be mistaken for some other kind of structure or feature.



Figure 39. Gravehouse at Telegraph Creek



Figure 40. Dog houses built into a slope

### Methods of Cooking and Preparing Foods

Three principal methods of cooking food included roasting, baking in hot ashes, and boiling in birch bark baskets with hot stones. Fire was made with a drill stick on a flat base of wood with very fine wood shavings or bracket fungus used as tinder. Women generally used bow drills (Emmons 1911:49).

Sections of fresh meat from large game were usually roasted over the campfire on willow or poplar poles. With both ends sharpened, the pole was driven into the ground so that it leaned over the campfire at an angle. The heads of large animals such as caribou, moose, and bear, were roasted by suspending them over the campfire with an antler hook, which was attached to a horizontal pole supported above the fire.

Small game, such as rabbits and birds, were roasted whole on small poles over the campfire as shown in Figure 41. Fresh fish were also roasted whole, being secured to the split end of a pole with red willow

withes. Dried fish and meat were often toasted lightly over the campfire before eating.

Fresh fish and salmon roe were often cooked by wrapping them in bark and baking in hot ashes at the edge of the campfire. Rabbits, gopher, and birds were also baked in ashes, after gutting but with skin or feathers left on. Blood of large game animals was collected into birch bark containers and baked close to the fire until solid (Teit n.d.).

Chunks of meat or fish were commonly cooked by boiling in water in birch bark vessels with hot stones. Organs, such as liver and heart, from larger animals, as well as brains, hooves, and bear feet were always cooked by boiling before eating. Pits, about 60 by 70 cm, dug into the ground and lined with birch bark or spruce bark, were used for heating water and cooking large quantities of food with hot stones (Teit n.d.).

Some special foods were prepared by



Figure 41. Roasting meat over the campfire



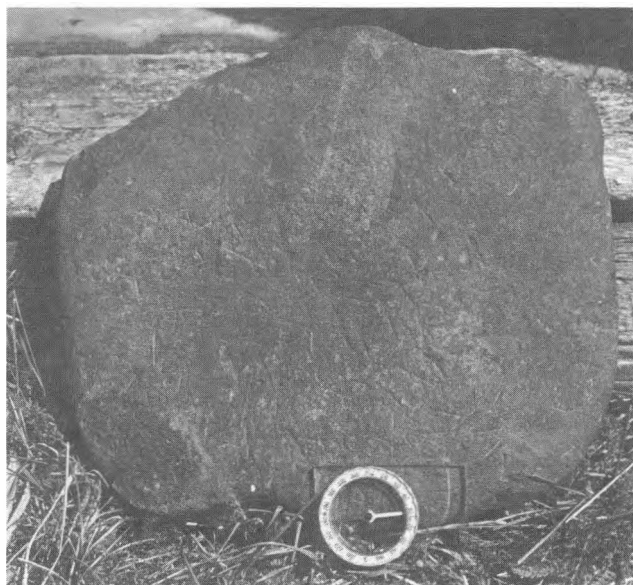
putrefaction rather than cooking. Salmon heads were buried in small pits, dug in the ground and lined with leafy branches and leaves of fireweed, for five or six days until they formed a head cheese. This was washed and eaten without cooking. Salmon eggs, placed in bark containers, were also buried in pits until a cheese formed (Teit n.d.).

Layers of fat from the larger game animals were pounded, boiled, and stored for winter use in bladders, stomachs, and intestines of large animals. Berries gathered in late summer and early fall were often mixed with the fat of bear caught at the same time.

Berries were most often preserved by boiling in birch bark vessels, and then mashed and spread out in bark trays to dry slowly into thin cakes. These were rolled up and stored in baskets. Dried berry cakes were often stored in cache pits along with dried salmon and meat. Dried berries were soaked in water before using.

Figure 42. (below) Flat mortar stone used for breaking marrow bones and pounding dried fish and meat

Figure 43. (right) Carved spoon of sheep horn (30 cm long)



Suitable sized stones with one end a little larger served as pestles or hammerstones to break marrow bones on large flat mortars (shown in Figure 42). Marrow was often stored in large animal bladders. Dried meat or salmon (with bones) was pounded up on large mortars, mixed together with fat, and stored in animal stomachs (Teit n.d.).

Trays and bowls made of wood or birch bark were used for serving food. The Tahltan carved dishes and spoons from sheep and goat horn, as seen in Figure 43.



### Storage Facilities

Cache pits, similar to the one shown in Figure 44, located in the vicinity of major camps and villages, were formerly used for storing quantities of dried food for periods of several months to two or three years. The Tahltan term for cache pits is "duwe'ged", meaning hidden in a safe place (Thorman n.d.). Thorman indicates that there were no less than 1500 pits from the Tuya River to a point four miles above Telegraph Creek, with an equal number along the Tahltan River up to and including Tahltan Lake. These pits were mainly used for storing large quantities of dried salmon. Tahltan elders indicate that pits were located in other areas, even up to timberline, and that quantities of dried meat, berries, and rendered fat were also stored in cache pits.

Rectangular pits, up to three by two

by two m in size, were dug in well drained areas with a hoe implement made of wood. The level floor of the pit was lined with dry boughs and small poles, and overlaid with dried leaves and branches to a depth of 30 cm. On this was laid a layer of dried spruce bark with the edges and ends turned up. Bundles of dried fish or other food were placed on the bark lining of the pit. They were then covered with a layer of bark on top. Only half the pit was filled with fish or meat, the rest being filled with dried branches, leaves, and poles, and covered with a mound of earth. Approximately two hundred dried salmon could be stored in a single pit. The work of preparing and filling the cache pits was done collectively by men, women, and children.



Figure 44. Cache pit used for storing dried foods