

PART 3

from: Stewart, Hilary
1984

Cedar. Washington; Douglas and McIntyre

CEDAR: THE WOOD

THE WOODWORKER In a culture where so much of **AND HIS TOOLS** daily life depended on products made of wood, all men — for woodworking was solely the task of men — acquired a well-rounded knowledge of the art. By constructing plain boxes for general family use, making fishing and hunting gear, tools and other implements, as well as small dugout canoes, a man provided many of the necessary requirements of his family.

Major objects in wood and items of particular artistic merit were made by a craftsman specializing in one type of work. The master carver, who was highly regarded and enjoyed a prestigious place in society, received payment in food, clothing and other items for his work. When a specialist was commis-

sioned by someone in another village to make a canoe, carve a pole or complete a lengthy task, he and his family went to live in the household of his employer, usually a chief, who provided all their food.

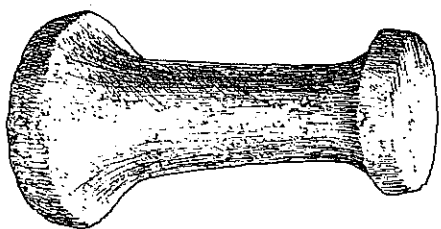


A young boy who showed an interest in and a natural talent for woodworking was encouraged by a specialist to watch and copy his work — the typical method of Northwest Coast schooling. In addition, the young carver would seek a spirit helper through magical practices, since no one could succeed in anything important without the guidance of a specific power. An especially talented carver was considered to be supernaturally endowed with his gift or to have inherited it from an ancestor. Apprenticed under a good carver, the novice learned to make and handle quality tools. He was instructed in their use and practised until he became advanced enough to work on a major project such as a pole, with the master carving one side and the pupil copying the design on the other side.

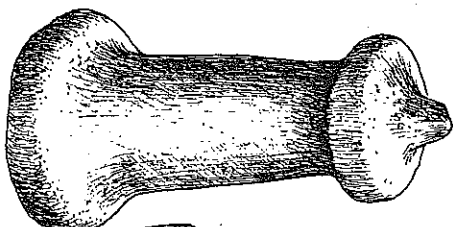
In modern times, as the revival of woodworking continues to flourish along the Northwest Coast, several top

Photograph by Richard Renshaw-Bauchamp. Courtesy British Columbia Provincial Museum, PN 16035-24A
Kheykhanius, a carver, seated on a cedar bark mat, he is holding a finished cedar bentwood bowl and demonstrating the method of using a curved knife. In the foreground are a stone palette and paintbrushes. Kwakwaka'wakw, no date. Courtesy Field Museum of Natural History, Chicago, 13572

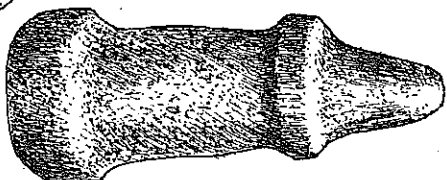
HAND MAULS - STONE



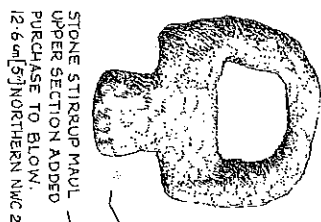
FLAT TOP MAUL
20 cm [8"] CS 2



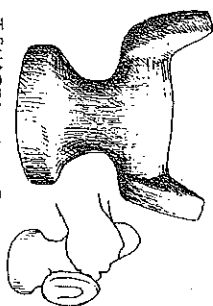
NIPPLE TOP MAUL
18.4 cm [7 1/2"] CS 2



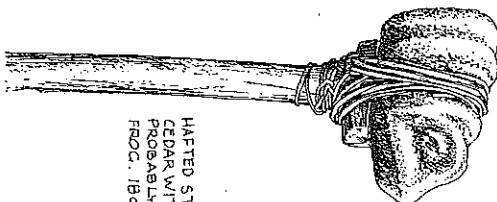
CONICAL TOP MAUL
24 cm [9 1/2"] NWC 2



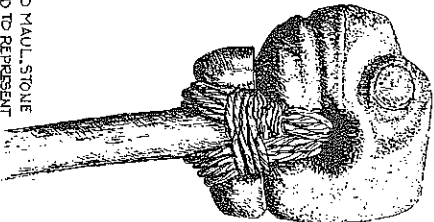
STONE STIRRUP MAUL
UPPER SECTION ADDED
PURCHASE TO BLOW.
12.6 cm [5"] NORTHERN NWC 2



T SHAPED MAUL OF
STONE, FINELY FINISHED.
12.5 cm [5"] HA 2



HAFTED STONE MAUL WITH
CEDAR WITHE LASHING.
PROBABLY REPRESENTING
PROC. 18 cm [7"] TL 27



PERFORATED MAUL, STONE
HEAD CARVED TO REPRESENT
ANIMAL, LASHED TO HAFT
WITH CEDAR WITHE. 15.9 cm
[6 1/4"] HA 1

artists are taking on one or more apprentices. This helps speed the project on hand and gives valuable experience to the young carvers. The renowned artist and carver Bill Reid took a youthful Robert Davidson as his apprentice; a decade later Davidson instructed several apprentices when he carved four house posts and the facade of a Haida plank house built in Masset, Queen Charlotte Islands, as a memorial to the great Haida master artist Charles Edenshaw. (Unfortunately, this work was destroyed by fire in 1981.) Following a new concept of the apprentice system, experienced carvers teach students at the Gitenmax School of Northwest Coast Indian Art in Ksan, a replica Giksan village at Hazelton in British Columbia.

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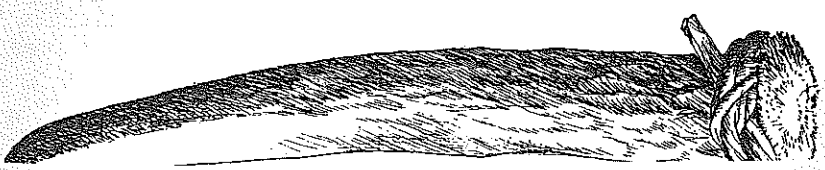
For scores of generations of Northwest Coast woodworkers, the marvel of the cedar tree was that it could be worked in so many ways with a minimum of tools. Uncomplicated though most of these tools were, their very simplicity speaks of knowledge and experience refined over a long time span.

A man's tools, especially those used for carving, were very personal items. He made each to fit his own hands

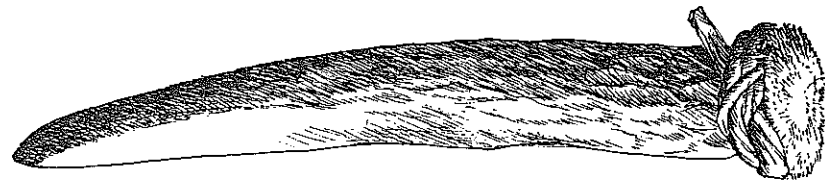
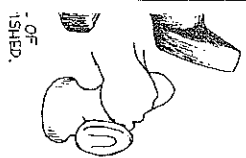
and his own way of working, sometimes devising a special tool for a particular need and, with the pride that stems from creativity, he often sculptured the handles with intricate crest figures.

Three basic tools — the hammer, the wedge and the adze — and a number of other special tools — contributed to the development of a major woodworking industry that became established along the entire Northwest Coast, wherever the cedar grew.

Hammers A simple, early form of maul was the hammer stone, a waterworn cobble chosen for its shape, hardness and resistance to cracking or chipping. Unmodified, the oval stone was grasped in the hand, and either end could be used for pounding. Later, two types of stone hammers characterized the north and the south. While the southern peoples used the hand maul (held directly in the hand), the northern nations, Tsimshian,



A fallen cedar
splitting, down
is nearly 2.7 m
rotted. Jerry's



SPLITTING WEDGE
OF ALDER WOOD.
GROMMET OF CEDAR
WITH 49.5 cm [19 3/4"]
NWC 4



LARGE WOODEN
WEDGE WITH CEDAR
GROMMET.
57.8 cm [22 3/4"] WNC 12



WEDGE WITH WITHE
GROMMET 35 cm [13 3/4"]
NWC 9



WEDGE OF ELK
ANTLER BEAM.
36.8 cm [14 1/2"] CS 12



WOODEN WEDGES,
ABOUT 3,000 YEARS OLD.
LEFT WEDGE GROMMETED
WITH CEDAR WITHE. CS 65



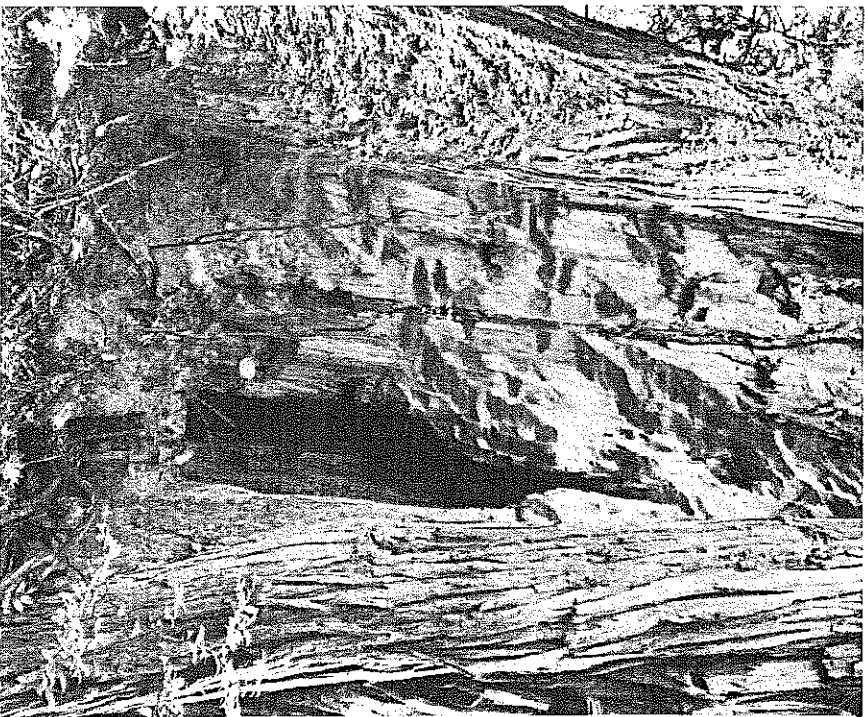
Haida and Tlingit, devised a heavy-duty implement — the hafted maul, which was a heavy stone head lashed onto a long haft. Using a hafted maul, a man could deliver a blow with great force, much like a sledge hammer. Many of these stone mauls were sculpted with bird or animal figures, which may have represented the woodworker's spirit helper.

Wedges Wedges, which were hammered into cedar logs to split them into planks, had to withstand heavy abuse. Tough, fine-grained yew wood provided the best material for their manufacture, though other woods such as spruce, maple and crabapple were often used. The wedgemaker scorched the wood to increase its hardness, rubbed tallow into the heated wood to stop it from warping, and twisted a grommet of cedar with around the top end to prevent hammer blows from splitting it. The opposite end he bevelled, to allow it to be driven into the wood.

As an alternative to wood, a section of the thick beam of an antler, usually elk (wapiti), bevelled at one end, also made a tough, serviceable wedge. These are often found archaeologically, providing evidence of woodworking at sites where wooden wedges have long since rotted away.



A fallen cedar at the beach edge shows clear evidence of multiple plank splitting, done while the tree was still standing. The face measurement is nearly 2.7 m (9'), and the heavily overgrown upper end is now badly rotted. Jerois Island, Barkley Sound. 73



This cedar tree may have had its base chopped by adzing to obtain kindling. Jervis Island, Barkley Sound. 73

Adzes and Chisels Woodworkers along the coast wielded several different types and sizes of adzes to cut and shape wood. Most universal was the elbow adze, so called because of its shape. The most southern peoples used an elbow adze with a stone head on a short haft, while Coast Salish, Westcoast and Kwakiutl peoples used a long-handled implement. The northern woodworkers had a heavy-duty version, with a wedge-shaped stone head lashed to a haft longer and thicker than the southern elbow adzes; this hefty tool could be wielded with both hands. Since the blade edges of museum specimens never appear to be at all sharp, this tool may have served the purpose of splitting cedar rather than cutting and shaping it; one early account, in fact, refers to it as a "splitting adze."

Since metal-bladed adzes have been used on the coast for several hundred years, very little is known of the use of adzes with stone blades, and to date no examples of wood worked with stone-bladed adzes are available for study. An adzed plank was discovered at an archaeological excavation at the Pitt River site (DhRq 21), but it could not be removed for lack of time. Since the plank might have been a few thousand years old, it is possible that the adzing had been done with a stone-bladed tool.

A woodworker used the large-sized elbow adze for rough shaping and chopping, such as removing branches from a log, carving out the basic shape of a canoe or the initial stages of roughing out the figures on a pole. This adze was also used on other materials: a piece of elk skull found at an old village site had the adzed stub of the antler beam still attached — the rest likely made into a wedge.

Contemporary carvers use a wide range of elbow adzes, particularly for large works, and almost always make their own tools. Kwakiutl carver Roy Hanuse prefers alder wood for the haft because it is soft to carve while still green and when dried retains the spring necessary for proper use. He uses an elbow adze with a wide blade for general use and roughing out; for finer work, he switches to an adze with a narrow blade which, he says, "can be bounced along down the surface of the wood." This rebounding helps to set up the steady rhythm that creates a uniform texture as the adze moves down the grain in parallel, overlapping rows. Handling the adze with such apparent ease takes a great deal of practice.

Used only by the woodworkers from Vancouver Island southward, the D adze, so named for the shape of its haft, generally had a blade narrower than that of the elbow adze. Many of the old D adze hafts were carved to represent creatures, either minimally or quite elaborately. The protuberance on the blade end of the haft was functional; when wielding the tool, the ball of the user's hand pressed down onto the projection to add to the force of the strike.

The carpenter used the D adze for finer work and for finishing. Worked with precise, repeated strokes in a continuous line, the adze created a textured groove. Several of these grooves, side by side, were sometimes used to create simple designs. Sometimes an object was fine-



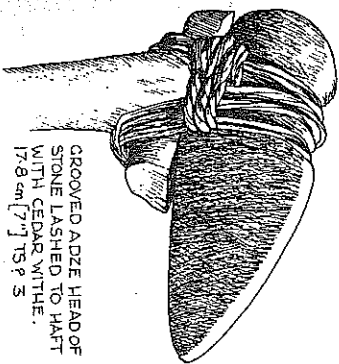
ELBOW ADZE
LASHED TO
WITH CEDAR
[20] TL 12



7 adze for
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one or the
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of elk skull
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ade into a

uver Island
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re carved to
elaborately.
It was func-
user's hand
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A black and white line drawing of a human foot and ankle. The foot is positioned with the heel towards the top left and the toes towards the bottom right. A thick, textured bandage is wrapped around the ankle and extends up the lower calf. The bandage is secured with several horizontal straps or ties. The drawing uses cross-hatching for shading and texture.



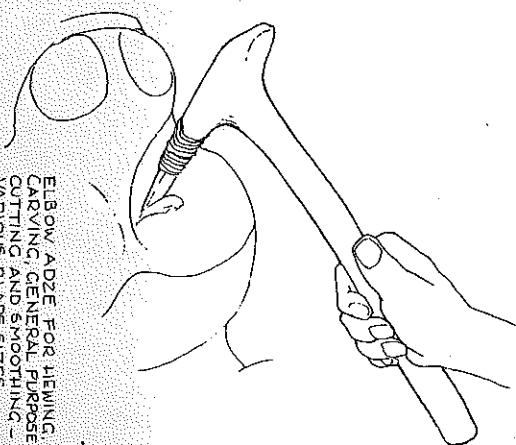
UNFLAKED GROOVED ADZE
29 cm [11 3/4] TS 2

CONTEMPORARY ELBOW
MADE WITH STEEL BLADE
BOLTED TO ALDER HAFT,
WASHED WITH NYLON
CORD. 40 and 5/8" OWNED

NORTHERN ADZE BLADE ON HAFT
 NOTE LASHING GROOVES ON
 BOTH - STONE BLADE 23" [1 1/2']
 HAFT 56" [22 1/2"] NWC 3

HAFT CUT FROM
 TRUNK AND BRANCH
 OF TREE, OFTEN ALDER.

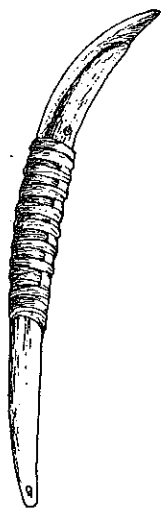
HAFT CUT FROM
TRUNK AND BRANCH
OF TREE, OFTEN ALDER



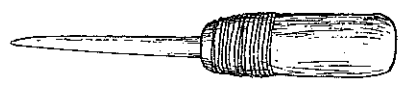
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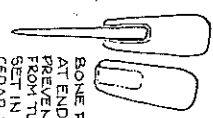
ANTLER CARVER'S BLADE. COLUMBIA COURTESY SEUM OF



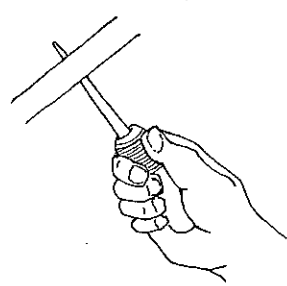
CARVER'S CURVED KNIFE, METAL BLADE WITH ANTLER HANDLE. 19 cm [7 1/2"] NWC 4



DRILL WITH BONE POINT, ROTATED BACK AND FORTH, WITH PRESSURE. 15.2 cm [6"] W/C 45



BONE FLAKE AT END TO PREVENT IT FROM TURNING. SET IN SPLIT CEDAR HAFT, LASHED WITH BEAR CUT.



finished by adzing to achieve the characteristic ripple effect so often seen on poles and house beams; indeed, in early times most cultural groups considered a pole was not finished unless it was textured all over in this manner. Northern woodworkers, who did not have the D adze, used the metal-bladed elbow adze for fine finishing.

A third type of adze, the straight adze, was similar to the D adze except that the blade was aligned with the knuckles instead of being set off and had a knuckle guard of leather or wood.

Another important cutting tool for the woodworker was his chisel, which generally had a long shaft topped by a grommet or crown of cedar withe to prevent it from being split. While adzes bit into the wood with a swinging motion of the carpenter's hand, the chisel had a different action. Holding the chisel in place against the wood, the woodworker drove it in a short way with a hammer, angled it back, then drove it along to remove a thin chip of wood. He could also drive the chisel more deeply into the wood to create a groove or to split off wood in recessed areas of carvings, where the adze could not reach.

Chisels used in felling large trees had a haft up to 1.2 m (4') in length to reach deep into the trunk. Before the

introduction of iron, cutting tools had blades of a fine-grained stone (in the south, generally nephrite) or bone. The nephrite could hold a reasonably sharp edge and be reshaped on a grindstone when dulled. The bone of elk is extremely tough and can be honed to quite a sharp edge.

When I tried roughly hollowing out a cedar bowl using a maul and a bone-tipped chisel I had made, I was surprised by the blade's strength and cutting ability. Early ethnographies also mention chisels with blades of mussel shell (*Mytilus californianus*), but in experiments with such a tool I found the blade to be not nearly strong enough: after several blows, the thick shell cracked and broke. The hafted shell blade does, however, make a sharp tool for scraping and shaving wood, a method I found practical in shaping and smoothing various types of wood. Sharp-edged tools of flaked stone would have served the same purpose.

Other Tools For decorative woodworking, the carver probably employed a curved, split beaver-tooth knife. The introduction of metal gave rise to knives that had a similar blade, but with varying widths and curves. Clenching the wooden handle in his fist almost horizontally, the carver drew the knife towards him with long, sure strokes. Among other things, he used this tool for making spoons, ladles and bowls, for hollowing out the back of a mask and for making the sharp or gentle curves of three-dimensional carving. This specialized tool made it possible to create the beautiful, subtle curves characteristic of Northwest Coast carving and sculpture.

Fine carving required small, sharp scrapers, either hafted or hand held, for shaving and shaping cedar. Easily controlled, scrapers allowed precise shaping for such items as yellow cedar pegs, arrow or spindle shafts and paddles. Originally the blades of scrapers were quartz, obsidian, sharpened bone, mussel shell, beaver teeth and probably other materials. With the coming of iron, carvers and woodworkers discovered the advantages that metal had over stone and adapted the metal to their carving needs.

Fine-pointed quartz tools, called gravers, allowed the carver to incise fine lines into wood or to score marked lines.

To make holes in wood, the woodworker used a sharp,

pointed bone awl or stone drill bits. He pierced the soft wood with the awl and rotated it back and forth while applying pressure. By directing the awl diagonally through the grain, the wood did not split. This work was surprisingly fast, taking about fifteen seconds to drill through 10 mm ($\frac{3}{8}$ ") of cedar. To drill larger and deeper holes, he rotated a shaft, tipped with a serrated stone drill bit, between his hands, though he mainly used this tool on woods harder than cedar.

To keep his bone and stone chisel and adze blades sharp, the woodworker used abraders of sandstone.

Although the native woodworker's tool chest held no measuring tape or yardstick, he had, nevertheless, a system of measurement that worked quite adequately. Instead of centimetres and metres, or inches and feet, he used finger, hand and arm widths and lengths. More important than standard measurements was accuracy in making, for instance, a bentwood box. The carpenter achieved that with sticks cut to the length and width that he required for the sides of the box and perhaps a gauge for the kerfs to ensure the necessary precision. An artist often used cedar bark templates for perfect symmetry in a flat design, but when it came to matching the two sides of a canoe, the craftsman relied on many years experience and a deep, innate sense of the nature and spirit of the remarkable cedar.

* * *

It is popularly thought that early explorers of the late eighteenth century were the first to introduce iron to the coast, but it is clear that iron was known and used long before that. An archaeological excavation at Ozette, in Washington, unearthed rusted iron tools that dated from about 500 years ago, but from where the metal came has not been ascertained. One speculation is that it may have originated with some iron-age source in Siberia and slowly worked its way down the coast through a series of trade exchanges. This could possibly account for the woodworking tradition in the north being more highly developed and extensive than that in the south. Another speculation is that iron may have drifted ashore on wood from the wrecks of ocean-going Asian ships.

When Capt. James Cook arrived on the Northwest Coast in 1778, the native peoples seemed to have few

tools that were not tipped with iron. He recorded: "Their great dexterity in works of wood, may, in some measure, be ascribed to the assistance they received from iron tools. For as far as I know, they use no other; at least, we saw only one chisel of bone." Some reports say that the iron blades were the width and thickness of a barrel hoop, which suggests shipboard origin — Spanish or Russian explorers, perhaps, who sailed the coast some years before Cook.

For quite some time after European tools became accessible to native woodworkers, they continued to prefer their own style of implements and the familiar ways of working with them. For instance, an iron axe head was used as the blade of a D adze, files were made into curved knife blades and trees were felled in the old ways in spite of the availability of the axe. Alexander Walker, an ensign on the fur-trading ship *Captain Cook*, visited Yuquot (Friendly Cove) in 1786 and in his journal noted: "They are much dissatisfied with the shape of our tools, that they generally altered it after buying them." He also wrote: "A chisel, five inches long, and very broad towards the end, they preferred over all our tools, even to a Saw, Hatchet or Sabre, although we had instructed them in the use of these Instruments."

It is not surprising that the native carpenter felt more at ease using the tools he knew so well than those of European origin, for his culture had a long history of expertise in woodworking, and there were elders to advise and guide him when he needed it.

TECHNOLOGIES

As a result of working with the versatile cedar for thousands of years, generations of woodworkers devised and perfected various technologies for felling and transporting trees, splitting and cutting planks, joining pieces of wood together, steaming and bending wood and sanding finished products, as well as patching and repairing damaged wooden objects.

Felling Trees

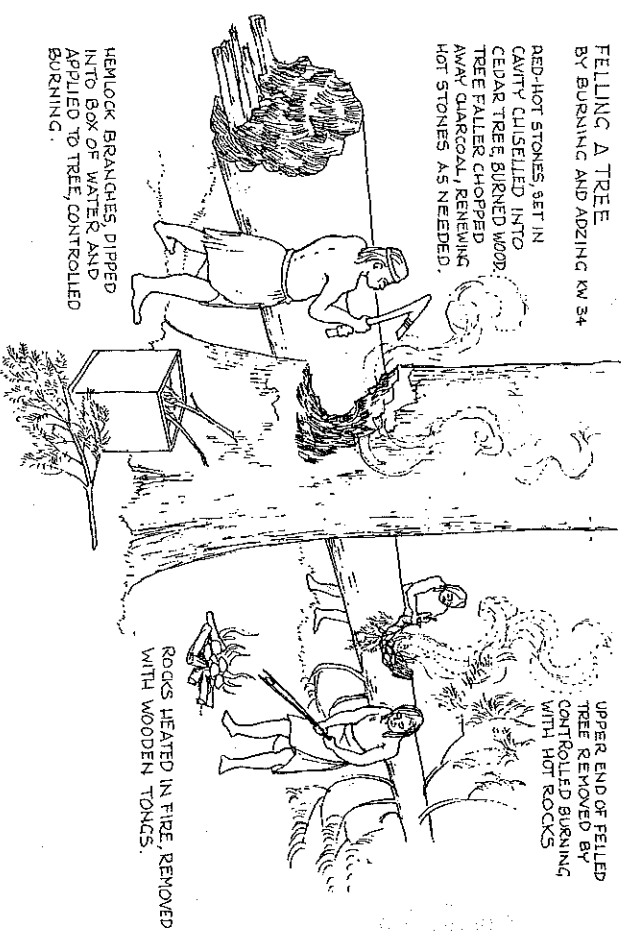
In early times, when a drift log of good cedar landed on a beach fronting an Indian village, it was a welcome gift — but drift logs could not supply all the needs of a village, so it was necessary to fell trees. Large cedar trees were valuable, particularly to people who required them for huge canoes and big plank houses, and wealthy families laid claim to good stands of cedar near



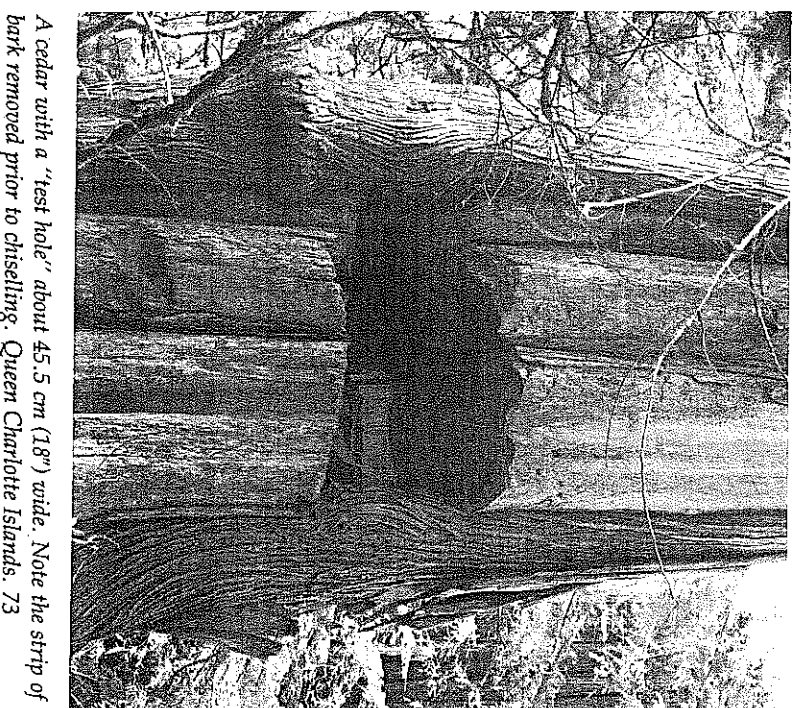
A cedar with bark removed

rded: "Their
me measure,
d from iron
; at least, we
say that the
of a barrel
Spanish or
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came acces-
d to prefer
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FELLING A TREE
BY BURNING AND ADZING KV 34
RED-HOT STONES, SET IN
CANY CHISELLED INTO
CEDAR TREE, BURNED WOOD
TREE FELLER CHOPPED
AWAY CHARCOAL, RENEWING
HOT STONES AS NEEDED.
HEMLOCK BRANCHES, DIPPED
INTO BOX OF WATER AND
APPLIED TO TREE, CONTROLLED
BURNING.



UPPER END OF FELLING
TREE REMOVED BY
CONTROLLED BURNING
WITH HOT ROCKS
ROCKS HEATED IN FIRE, REMOVED
WITH WOODEN TONGS.



A cedar with a "test hole" about 45.5 cm (18") wide. Note the strip of bark removed prior to chiselling. Queen Charlotte Islands. 73

water. A family without such rights had to pay the owner of a stand for the privilege of cutting and using his trees.

As there were specialists in every major field of endeavour, so there were men particularly skilled at felling trees. The time preferred was late summer to early spring, as felling a tree when the sap was up hastened the rotting of the wood. Also, it was important to find the right cedar tree for the purpose required: house construction, canoe, mortuary pole and so on. Straight, clear-grained wood was generally preferred, and a trunk with a minimum number of limbs would provide wood largely free of knots. A Westcoast canoeemaker ritually fasted and prayed for success in choosing the right tree. For the best trees, he looked in the darker parts of the forest, hoping to find one not too far from a river or the sea, though evidence shows that on occasion trees were cut several kilometres inland.

Many large, old cedar trees on the coast bear a deep rectangular or square hole chiselled well above the flare of the trunk's base. Today these are referred to as "test holes," and several ethnographic accounts explain that if such a hole proved that the wood inside was rotten, the tree was not felled. Because of the renewed interest in early woodworking technologies, the function of these holes is now being questioned. A Haida from Skidegate,

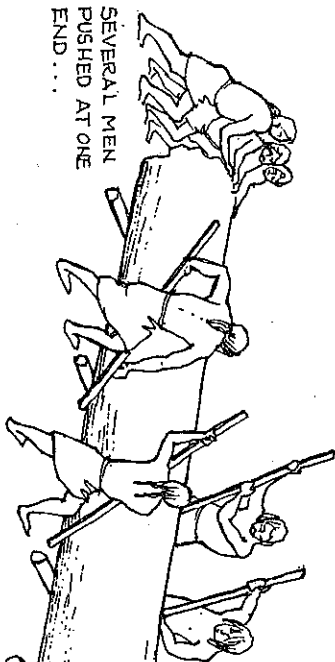
FELLING A TREE BY BURNING WC 66



FIRE BURNED THROUGH BASE OF
TREE, WET CLAY ON TRUNK ABOVE
CONTROLLED FIRE.

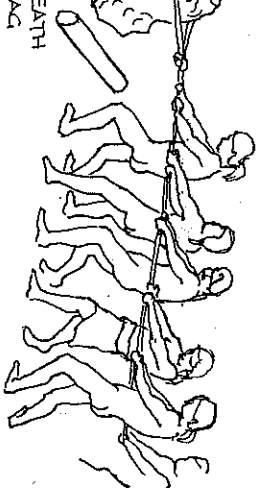
MOVING A LOG TO WATER'S EDGE. WC 43

SEVERAL MEN
PUSHED AT ONE
END...



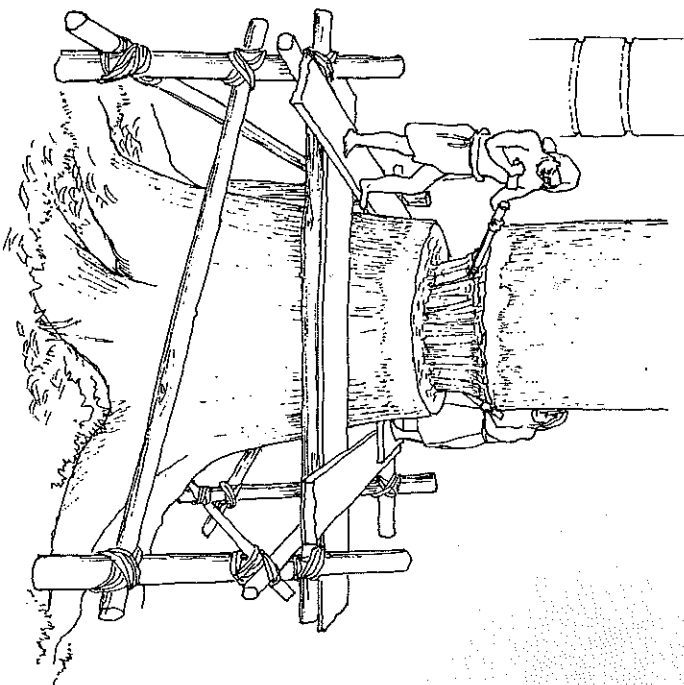
... OTHERS USED POLES TO LIFT
AND MOVE THE LOG FORWARD...

SHORT POLES BENEATH
LOG LESSENER DRAG



SIXTY OR MORE MEN PULLED ON
A HEAVY-DUTY ROPE, HAULING
LOG DOWN INCLINE TO SEA.

FELLING A TREE WITH CHISEL, WEDGE AND MAUL CS 38

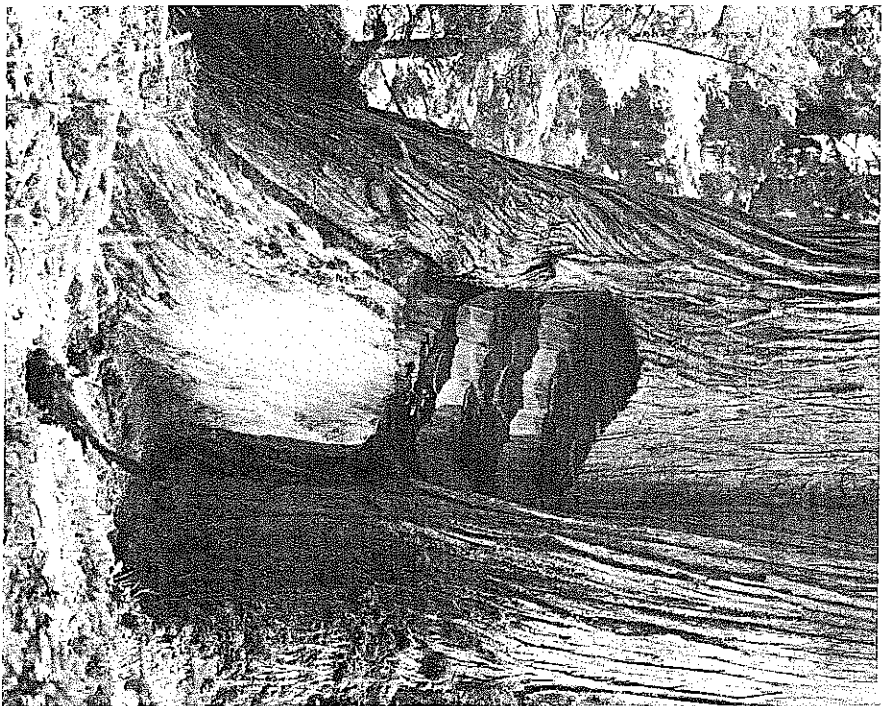


TREE RINGED WITH TWO CHISEL CUTS, WOOD
BETWEEN SPLIT OUT WITH WEDGE AND MAUL.
PROCESS REPEATED UNTIL TREE FELL.



An unusual adze
base of a large, old
The width of the
Islands. 73

(Richard Wils
working sites
there are too m
ities to be test
small core of
hole was mac
his doubt. A
word for the
the test hole
the cut might
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size, though
ity. Another



An unusual adzed cavity appears in three equidistant places around the base of a large, old cedar; it may have been the start of felling this tree. The width of the cavity at top is about 61 cm (24"). Queen Charlotte Islands. 73

(Richard Wilson) Wanagun, who is studying early wood-working sites on the Queen Charlotte Islands, thinks that there are too many trees in good condition for all the cavities to be test holes. The two trees I examined had only a small core of rot, which could have developed since the hole was made (possibly even because of it), supporting his doubt. Although the literal translation of the Haida word for the hole is "feeling the heart" — appropriate for the test hole — Richard has other theories. One is that the cut might identify the owner of the tree to ensure that no one else felled it. Since the holes do vary in shape and size, though some are extremely wide, this is a possibility. Another theory is that the cavity marked the tree for

the faller, since the man who chose the tree was not necessarily the man who felled it.

There are also some other ways to test a tree for rot. Jeoff White of Old Masset, a man in his seventies and grandfather of present-day carver Jim Hart, said that he judges the condition of the wood by studying the crown of the tree: dead wood at the top indicates rot in the heartwood. Veteran canoe-maker eighty-four-year-old David Frank of Ahousat, on the west coast of Vancouver Island, also told me about his method of testing a cedar for soundness. "I walk all around that tree, hit it with a piece of wood, and I listen to the sound it makes. If it's got some rot in it, then it's gonna be hollow inside, and it's gonna make a different sound. I listen to the tree — it tells me." When questioned about the holes cut in cedars, he said they were "to see if the tree was rotten. The hole was chiselled on the side opposite the sun . . . with some people making up to three holes to test how far the rot went up."

Another theory is that the test hole could have served to check on the quality of the cedar's grain, a particularly important factor in canoe making. Perhaps further study and research will fully answer the enigma of the test hole.

Before starting the task of felling a cedar, the faller respectfully addressed the spirit of the tree with a prayer, asking for the trunk to topple in the direction he wished. David Frank said that he would calculate the direction so that the cedar's fall was cushioned by hitting other trees on its way down, to prevent the trunk from landing too heavily and cracking. Care also had to be taken to ensure that the tree would not become hung up in another.

One method of felling the tree was by burning. The faller set red-hot rocks inside a chiselled-out cavity — the test hole? — to burn the wood. Under his direction, workers, often slaves, then chiselled and adzed out the charred wood. With a back cut chiselled out, the great cedar let go, falling to the ground where the faller had asked it to. A similar burning technique involved setting fire to the base of the tree and using wet clay to prevent the rest of it from catching fire.

Another method of cutting down a tree entailed building a scaffold and platform around the trunk, just above the flaring base. The woodworkers removed sufficient bark to enable them to chisel two parallel grooves, about

30 cm (12") or more apart, around the trunk. The men then used wedges and stone mauls to split out the wood from between the grooves. They repeated the chiselling and wedging process to cut away the trunk, making sure the lower chisel cut remained horizontal, while the upper one was chiselled downward at a forty-five degree angle. When these cuts became too deep for the chisel to reach into, the men switched to one with a longer haft; then one man held the chisel while another wielded the stone maul.

Among the Makah, only a chief who owned many slaves would attempt to fell very large cedars. The method there was to encircle the tree with as many slaves as possible, each with an adze. No doubt supervised by an expert tree faller, relays of workers chopped away at the trunk, beaver style, until the tree fell. In the early nineteenth century, during his two years as a captive of the Yaguot, John Jewitt wrote: "The felling of trees, as practiced by them, is a slow and most tedious process, three of them being generally from two to three days in cutting down a large one."

Once a tree was felled, the next step entailed removing the upper portion by setting red-hot stones on the trunk at the place where the top was to be cut off by controlled burning and chopping. The workers then removed any limbs on the trunk and adzed off the bark and sapwood. If the log was exceptionally large and intended for a canoe, it was hollowed out before being taken out of the forest.

Skidding out the log, especially a large one, was another major undertaking. Men drove a series of long poles under the log to act as a skid in hauling it out. About sixty men pulled on cedar bark ropes tied around the log, while others pushed from the opposite side. Still others used poles to lift and propel the log forward on its downward journey to the water. The time involved in this procedure depended on the size of the log, the nature of the terrain and the distance to the water; on average, it took two hundred men a total of twenty-four hours.

Once the log was in the water, several canoes, each with two paddlers, lined up in single file to tow the massive cedar back to the village; the men paddled in unison for greater power. They beached the log at high tide and put rocks beneath to prevent it from rolling back; there it

was trimmed and shaped. If the log was for house construction, two to three hundred men and women used a system of ropes and sloping planks to haul it up the incline to where the house was being constructed.

As I walked among the remains of the twenty-four houses in the old village of Tanu, on the Queen Charlotte Islands, I thought about the process of felling, bucking, skidding, towing and hauling the massive beams and posts. When I stood beside one of these giants, now thickly moss covered and sprouting spruce seedlings, the immensity of its size was a far greater reality than the actual measurements: close to 13.7 m (45') long, with a diameter of about 91 cm (3'). I could not even guess at the weight, but the thought of the amount of physical labour and teamwork involved in acquiring and raising this single beam stirred my imagination. Near the Yakoun River, in the northern Charlottes, there are several areas with evidence of a great deal of early woodworking activity, including canoe blanks. The stumps of huge cedar trees and their discarded tops, now draped with yellow-green moss, ferns and sprouting vegetation, remain in the silent forest — monuments to the skilled, audacious tree fallers of another era.

Splitting Planks The single most useful woodworking technique took advantage of the cedar's special characteristic — its ability to be split easily and in one continuous plane for great lengths, thus giving maximum return for minimum effort.

Splitting planks was skilled work, and some men specialized in it. After a tree was felled and the top portion removed, the plankmaker trimmed the upper end to an even, vertical surface. From his wedge bag, he took up a "marker" wedge and repeatedly hammered it in a short way, moving it along each time to make a horizontal groove across the face of the top end, four finger-widths above the centre of the log. He always split the log from the top towards the base to ensure an even thickness all the way.

Next, the woodworker drove in a series of wedges along the grooved line, placing them quite close together and hitting each in succession, so that they penetrated the end of the log, splitting it open. When the crack widened sufficiently, the woodworker inserted a round "spreading stick" (wider than the diameter of the log)

SPLITTING

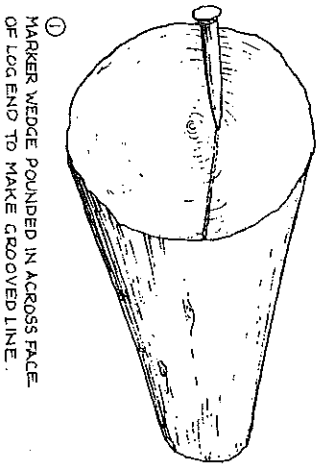
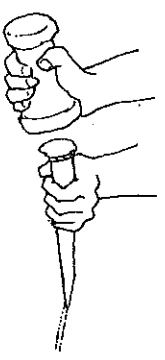


①
MARKER
OF LOG

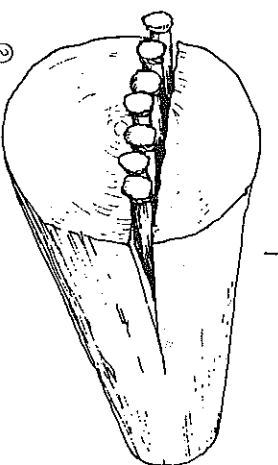


②
SPREADING
CONCAVE
7
SPLITTING

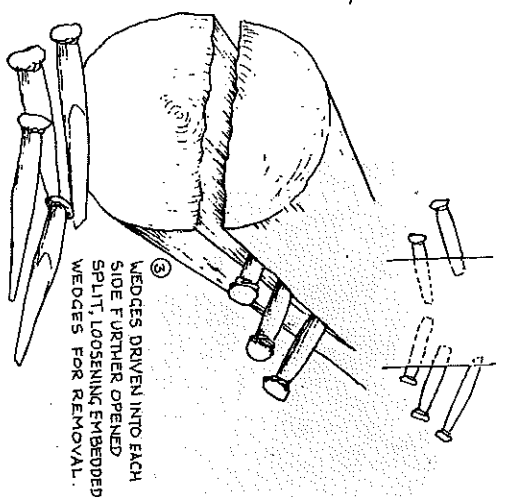
SPLITTING OFF PLANKS. KW * 34



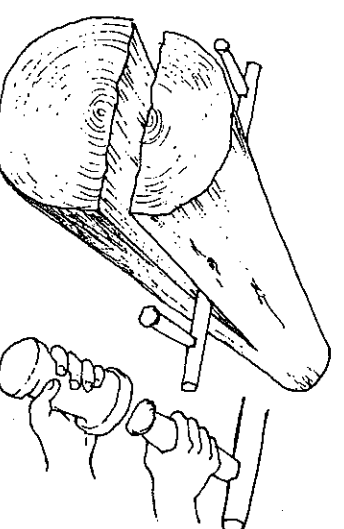
① MARKER WEDGE POUNDED IN ACROSS FACE OF LOG END TO MAKE GROOVED LINE.



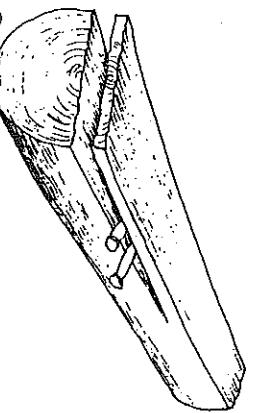
② WEDGES DRIVEN DEEPLY INTO LOG ALONG GROOVE CAUSED WOOD TO SPLIT.



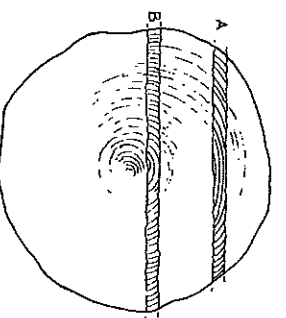
③ WEDGES DRIVEN INTO EACH SIDE FURTHER OPENED SPLIT, LOOSENING EMBEDDED WEDGES FOR REMOVAL.



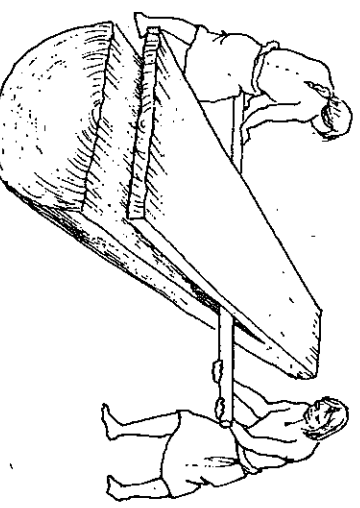
④ SPREADING STICK, DRIVEN ALONG WITH CONCAVE TIPPED WEDGES, FACILITATED SPLITTING.



⑤ WITH TOP SPLIT OFF, PROCESS WAS REPEATED TO MAKE PLANKS OF DESIRED THICKNESS.



A. TANGENTIALLY SPLIT PLANK, PREFERRED FOR BOX SIDES.
B. RADIALY SPLIT PLANK, OFTEN USED FOR BOX AND BOWL BASES.

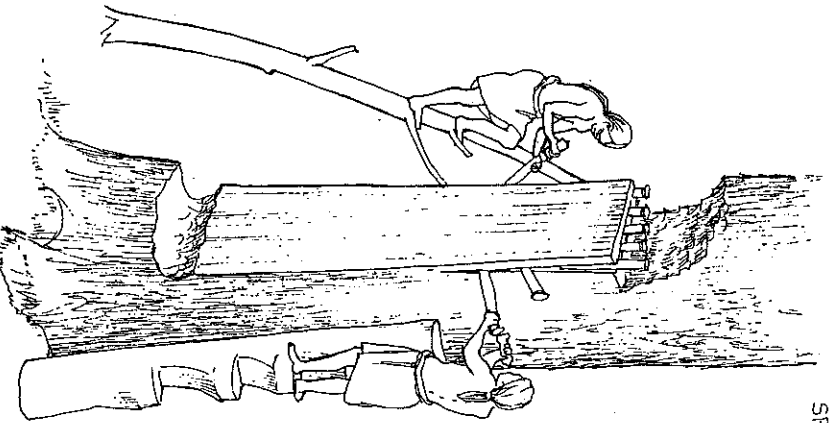


⑥ IN ANOTHER METHOD, TWO MEN LEVERED OFF PLANK WITH CROSSBAR.

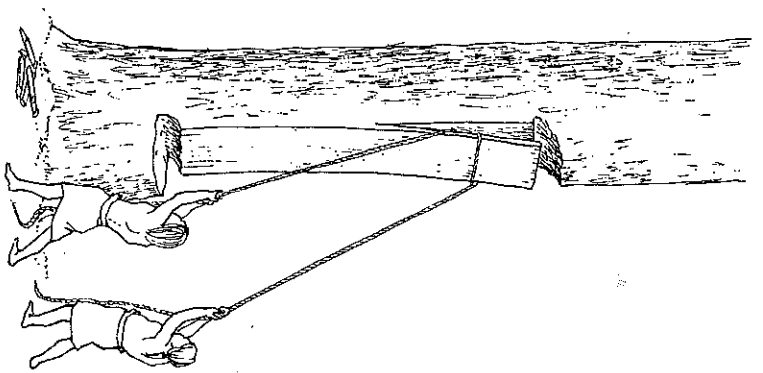
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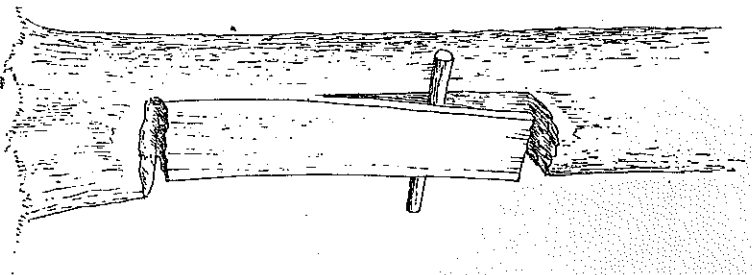
SPLITTING PLANKS FROM A STANDING TREE.



CHISELLED CAVITIES IN TREE TRUNK ALLOWED FOR WEDGES TO BE DRIVEN IN AT TOP, PLANK TO COME AWAY AT BASE. KW*34

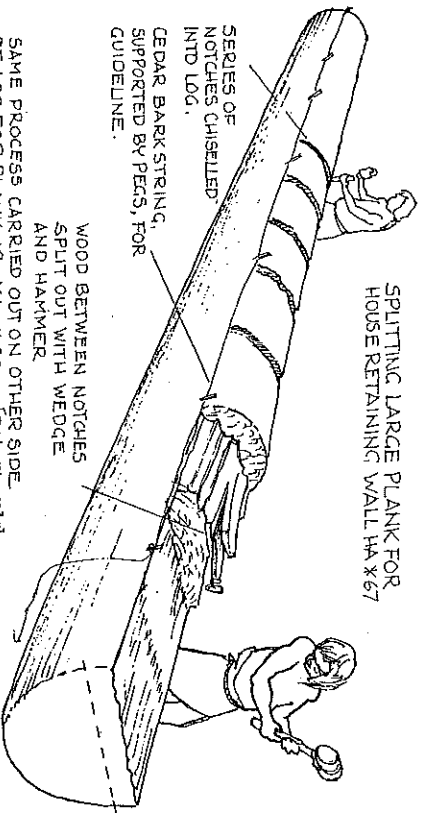


PULLING ON ROPE HELPED TO SPLIT PLANK AWAY FROM TRUNK. WC X PERS.COM, RON HAMILTON.



SLOW, BUT ENERGY-SAVING, METHOD OF SPLITTING PLANK: AFTER INITIAL WEDGING, CROSSPIECE WAS INSERTED AND LEFT. WIND AND WEATHER COMPLETED WORK OF SPLITTING OFF PLANK. WC X 59

SPLITTING LARGE PLANK FOR HOUSE RETAINING WALL HA X 67



SERIES OF NOTCHES CHISELLED INTO LOG. CEDAR BARK STRING, SUPPORTED BY PEGS, FOR GUIDELINE.

WOOD BETWEEN NOTCHES SPLIT OUT WITH WEDGE AND HAMMER.

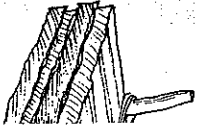
SAME PROCESS CARRIED OUT ON OTHER SIDE OF LOG FOR PLANK 12m x 1m x 20cm [39' x 3' x 7 1/2"]

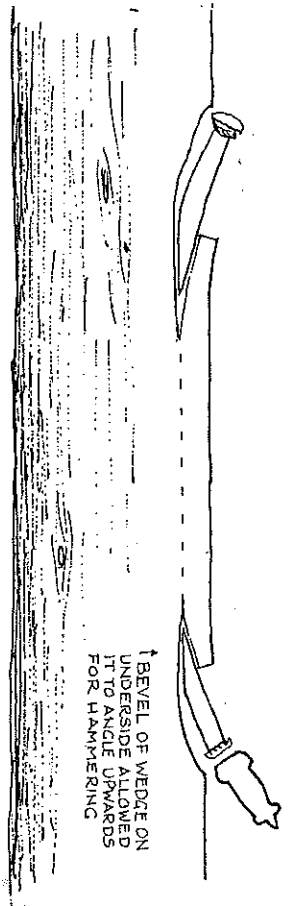
TO SPLIT A S REQUIRED, R

STRAIGHTEN PLANKS. KW

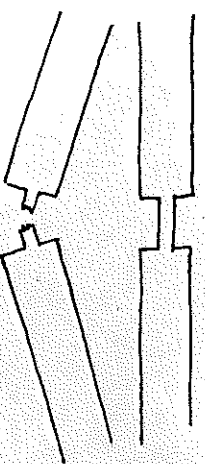
LASI

WARPED PL WITH ROCKS



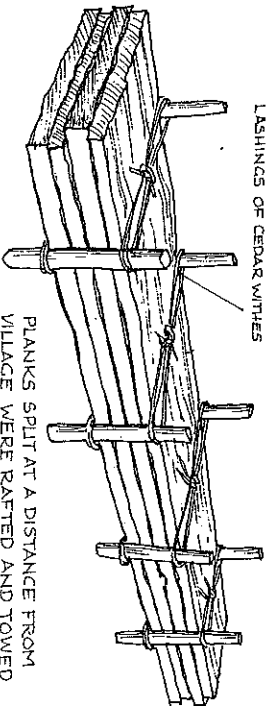


TO SPLIT A SHORT PLANK FROM FALLEN LOG: CAVITIES CUT AT DISTANCE PLANK REQUIRED, ROW OF WEDGES DRIVEN IN AT EACH END. KW

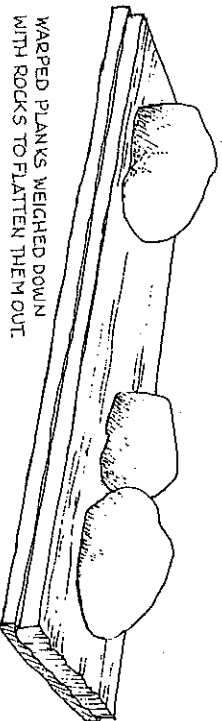
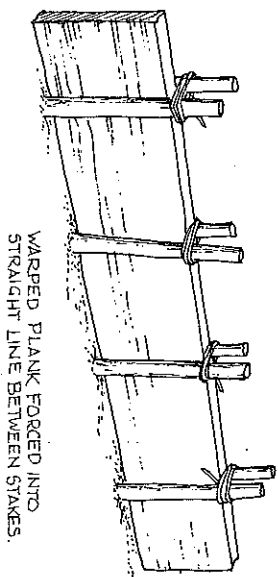


TO CUT A CEDAR PLANK: GROOVE CHISELLED ON EACH FACE, ACROSS THE WIDTH, THEN PLANK BENT UNTIL IT BROKE. WC

STRAIGHTENING WARPED PLANKS. KW



PLANKS SPLIT AT A DISTANCE FROM VILLAGE WERE RAFTED AND TOWED BACK BY CANOE.



across the horizontal opening. One man on each side then drove the stick along by means of a maul and wedge that was concave at one end so as to fit the stick's shape. This extended the split the full length of the log.

After removing and turning over the upper section of the log, the woodworker split a plank from it by repeating the process, inserting wedges at whatever thickness he required for the plank. This gave him a radially split plank, with the grain crossing the thickness of the board, suitable for the base and lid of a bentwood box. A plank taken farther away from the log's centre — tangentially split — was generally used for the sides of the box because it would bend more easily.

Ensign Walker admired the results of this technique and wrote: "The Trees are cut down and formed into Planks by means of Wedges. They are split into Boards of a great breadth and length. Considering the rudeness of the method, they are wonderfully straight and even."

Not all planks were wonderfully straight and even, but the woodworker knew how to straighten warped or twisted planks. In one method he laid the uneven plank on a flat surface and placed heavy rocks on it in strategic places, in another, he stood the plank on edge and forced it between pairs of stakes driven into the ground in a



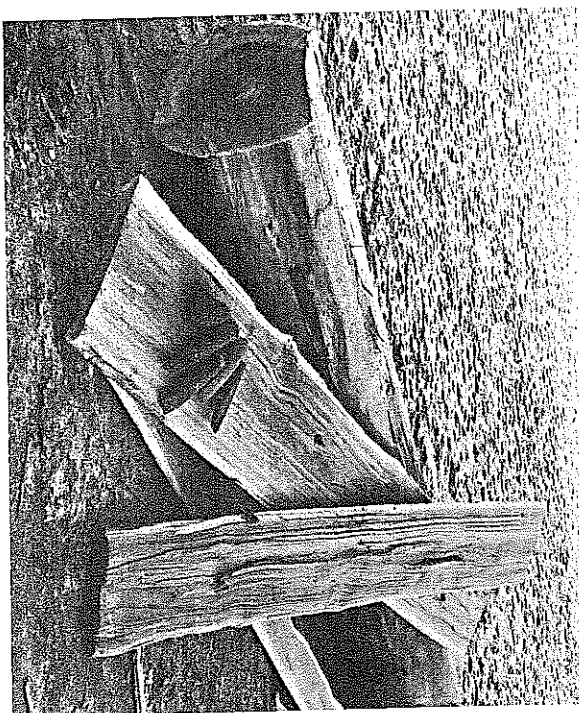
The author splitting planks from a beached log of red cedar, using yew wood wedges and a stone maul. Photograph by Vickie Jensen, courtesy of the photographer.

straight line. In both methods he left the wood thus under pressure until it dried to its corrected shape.

The nineteenth-century missionary Myron Eells was impressed by the size of the planks he saw in the Puget Sound area: "One was two and a half feet wide, and forty feet long, and another three and a half wide and twenty long. Such boards were split by wedges and trimmed by hewing."

I wanted to experience splitting planks, so I took five yew wood wedges I had made and a stone hand maul (found in a friend's garden) down to the beach. From among the host of drift logs, I chose a red cedar 4.9 m (16') long, with a 61 cm (2') diameter and no visible knots. At the end of the log I drove four wedges all the way in, hitting each in succession. This opened up a cleavage plane but also left the wedges deeply embedded in the wood. However, pounding a fifth wedge in at the side opened the cleavage enough to release the other four.

From then on the splitting progressed by driving a wedge deeply into each side of the cleavage, and following this with another ahead of it. Each time, the forward wedge widened the crack, releasing the other from the



The result of a few hours work. Photograph by Vickie Jensen, courtesy of the photographer.

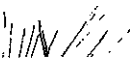
grip of the wood. Each pounding was followed by several seconds of cracking sounds as the fibres of the wood let go and split apart a few more centimetres, releasing the cedar's pungent scent. After considerable work I had the top slab of the log split off. The next day I returned with a friend, and we split off two planks, using wedges for the first, and a combination of wedges and the spreading stick for the second. Our hand mauls had seemed inefficient for driving the spreading stick along the cleavage plane, and I could see that for a thick plank, a northern hatted maul would have been an advantage. I also observed the damage to these wooden wedges and understood why ones of elk antler would have worked well. Thoughts on such ancient tools were interrupted, and the twentieth century quickly brought back into focus, as a tall young man with a large chainsaw slung over his shoulder came up and offered his help.

Joining Wood The ability to drill fine holes allowed for two techniques of joining wood. In one method, the carpenter drove yellow cedar pegs through drilled holes and cut off the surplus length flush with the wood before sanding it smooth. Although mainly used for joining the

WOODEN
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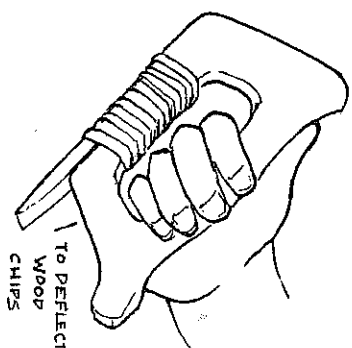
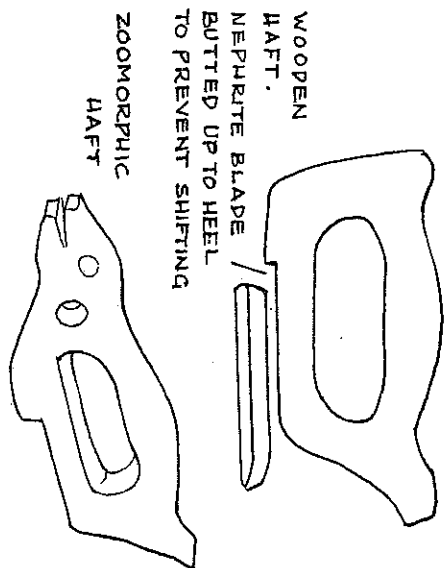
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Stewart, Hilary
1981

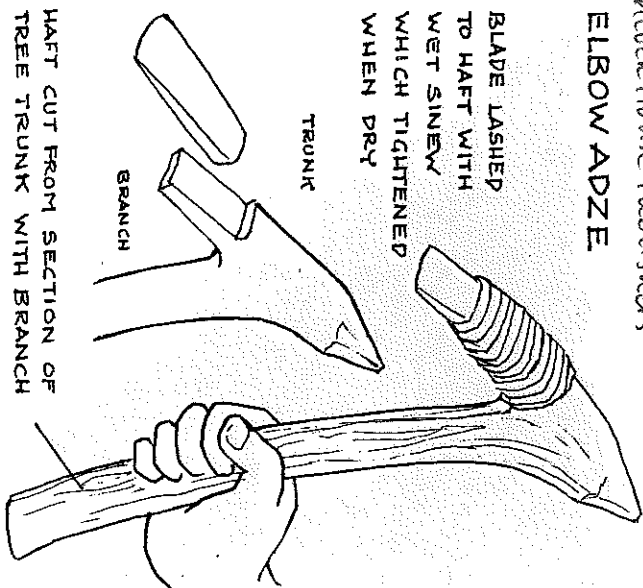
Artifacts of the NWC Indians. Vancouver; Hancock House Publishers.

ADZES AND CHISELS

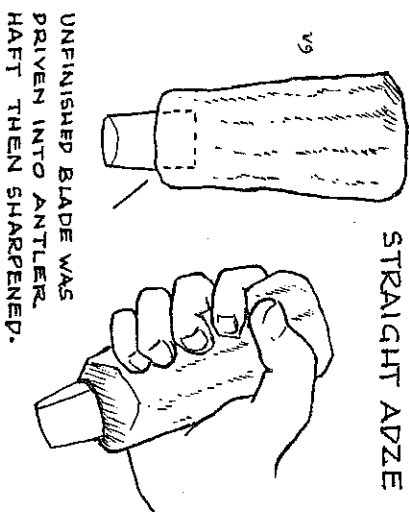
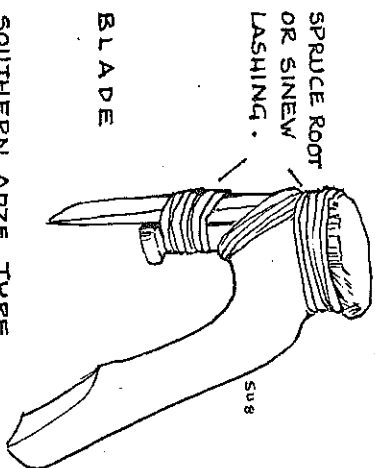
D ADZE



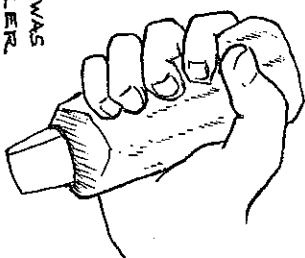
ELBOW ADZE



U ADZE



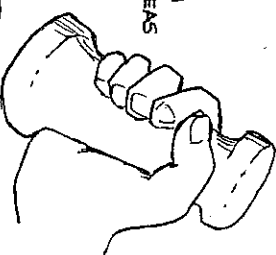
STRAIGHT ADZE



HAFT CUT FROM SECTION OF
TREE TRUNK WITH BRANCH

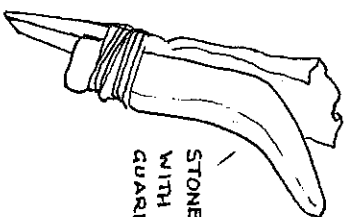
CHISEL

USED WITH A
MAUL TO REACH
INTO DEEP AREAS
FOR CARVING

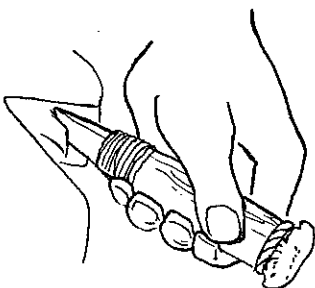
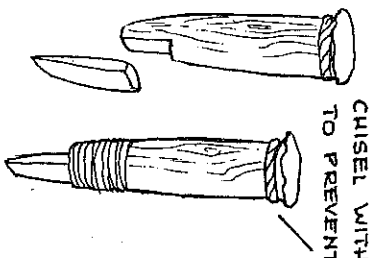


SOUTHERN ADZE TYPE
OF THE PUGET SOUND AREA,
USED LIKE THE D ADZE.

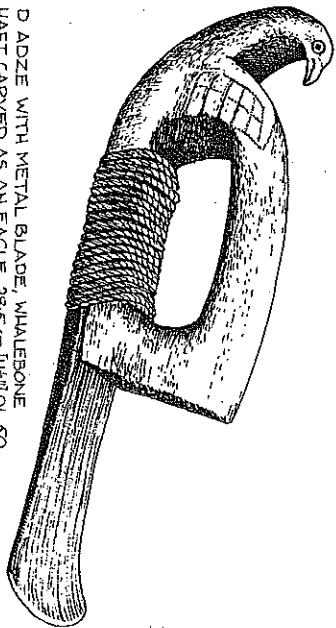
STONE HAFTED ADZE
FOUND ONLY IN THE
MOST SOUTHERN PORTION
OF THE NORTHWEST COAST,
MOSTLY IN OREGON.



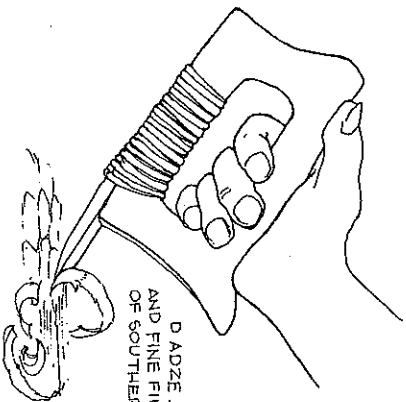
STONE HAFT,
WITH RIBBON
GUARD OF HIDE



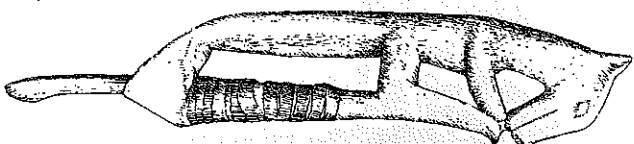
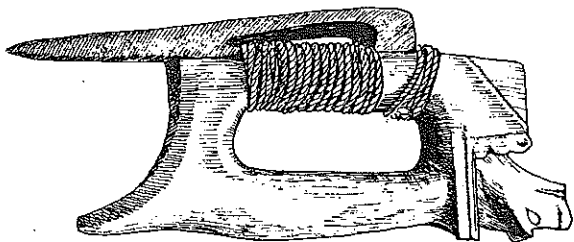
D ADZE WITH METAL BLADE, WHALEBONE
HAFT CARVED AS AN EAGLE. 28.5 cm [11 1/4] OL 50



D ADZE, FOR CUTTING, SHAPING
AND FINE FINISHING WOOD. A TOOL
OF SOUTHERN AREAS.



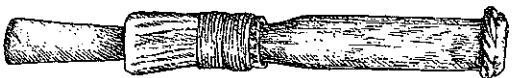
D ADZE, WOODEN HAFT
CARVED TO REPRESENT
BEAR COMING OUT OF BOX.
METAL AXE HEAD FOR
BLADE 15.2 [6] LONG. MK12



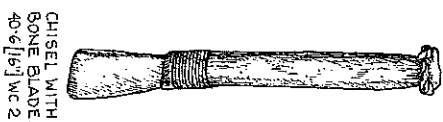
STRAIGHT ADZE WITH ANTLER
HAFT. UNLIKE D ADZE, CARVER'S
GRIP WAS ALIGNED WITH BLADE.
PROBABLY FROM LOWER COLUMBIA
RIVER AREA. 21.5 cm [8 1/2] COURTESY
UNIVERSITY OF OREGON MUSEUM OF
ANTHROPOLOGY.



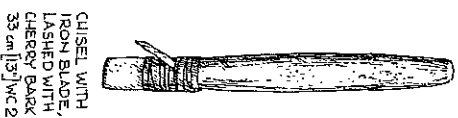
CHISEL WITH STONE
BLADE, WOODEN
SHAFT, CEDAR,
WITH LASHINGS.
33.6 cm [13 1/2] WVC 32



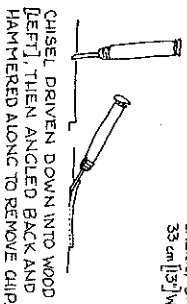
CHISEL WITH METAL
BLADE, SET IN ELK
ANTLER SLEEVE -
LASHED WITH TWINE -
CEDAR WITH CROMMET.
45.6 [18] CS 2



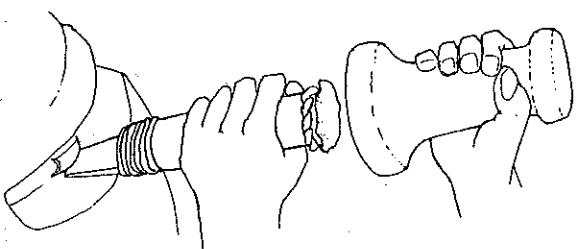
CHISEL WITH
BONE BLADE.
40.6 [16] WVC 2



CHISEL WITH
IRON BLADE,
LASHED WITH
CHERRY BARK.
33 cm [13] WVC 2



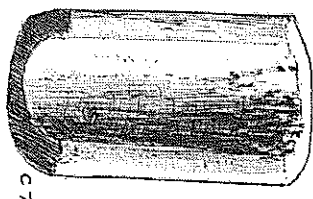
CHISEL DRIVEN DOWN INTO WOOD
[LEFT] THEN ANGLED BACK AND
HAMMERED ALONG TO REMOVE CHIP.



CHISEL, USED WITH HAND
MAUL, FOR CUTTING, HOLLOW-
ING, AND REACHING INTO
RECESSED PLACES. VARIOUS
BLADE SIZES AND HAFT LENGTHS.

DRILL
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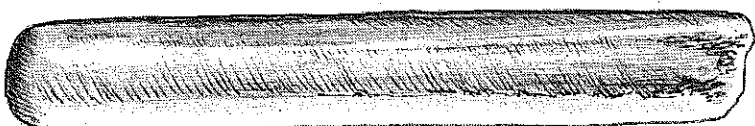
ADZE AND CHISEL BLADES



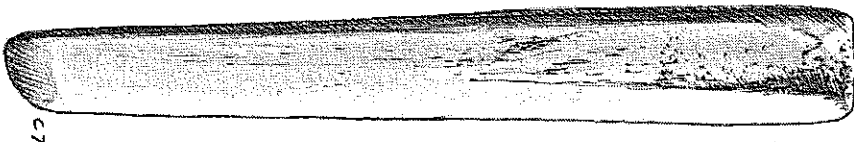
c7



c7



B69

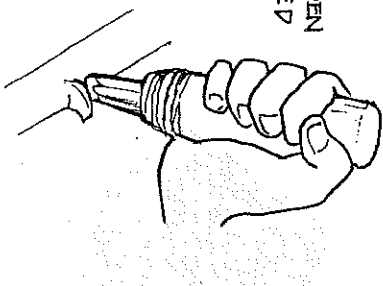


c7

9.5
529.5
529.5
52

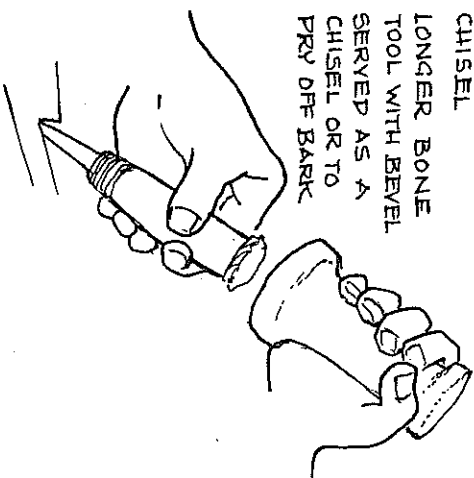
ADZE

SET INTO WOODEN
HAFT, BEVELLED
BONE WAS
USED AS AN
ADZE.



CHISEL

LONGER BONE
TOOL WITH BEVEL
SERVED AS A
CHISEL OR TO
PRY OFF BARK

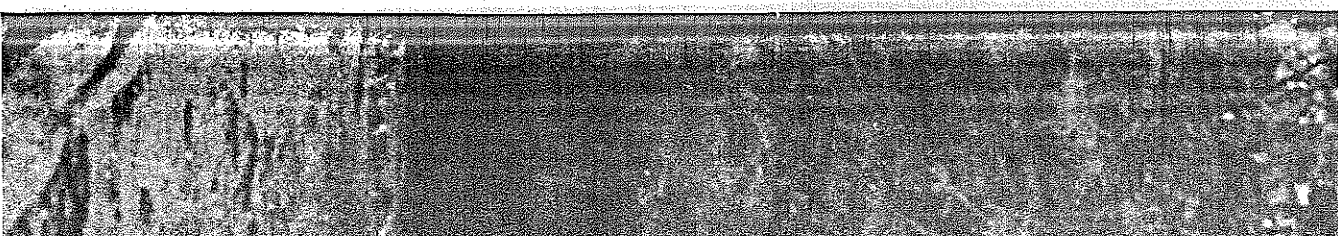


THIS CHISEL-LIKE
TOOL COULD ALSO
HAVE BEEN A
WEDGE.

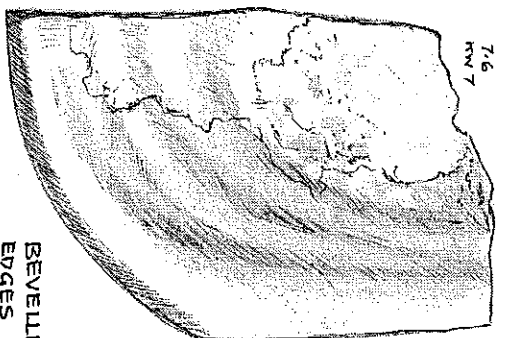
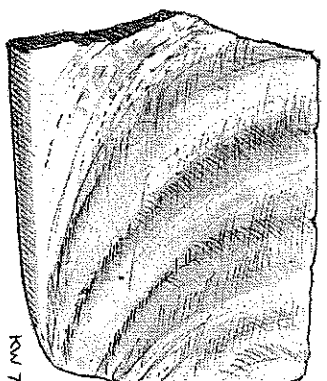
14.0
5214.0
52

V9

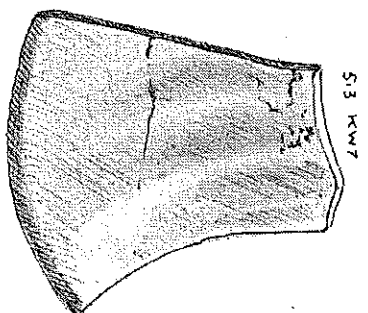
Although lacking the strength of a nephrite blade, the adze and chisel of bone nevertheless had its place in the woodworker's tool kit. Made by sectioning and grinding to shape, the bit was sharpened on an abrader and, like its counterpart in stone, was resharpened when it became dulled from use.



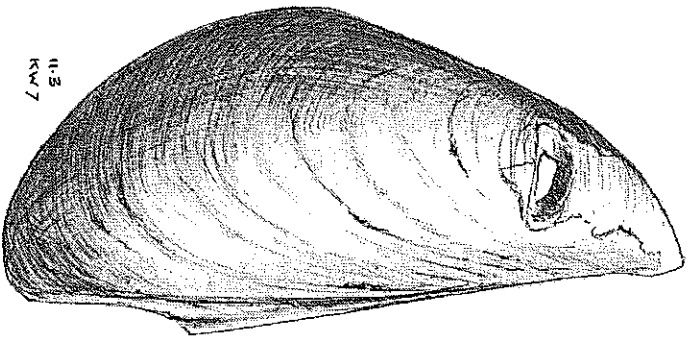
MUSSEL SHELL BLADES



CUT EDGES EACH SIDE

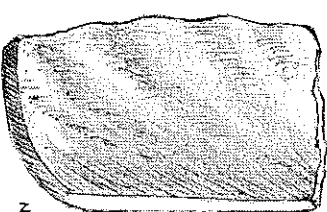
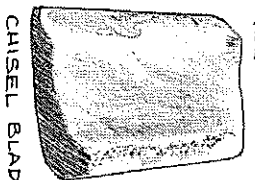
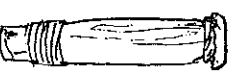


BEVELLED CUTTING & SCRAPING EDGES MADE BY GRINDING ON AN ABRASIVE STONE.

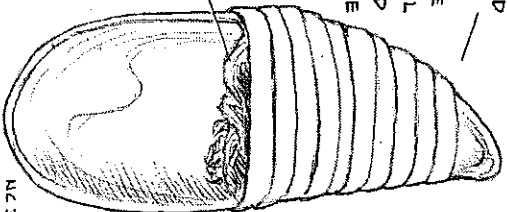


LOP THEN DEVICES.

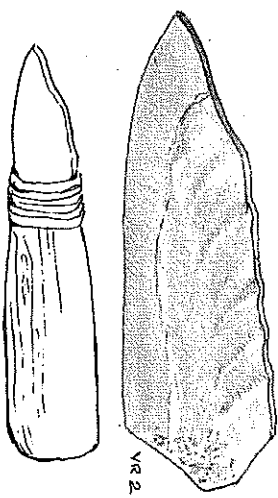
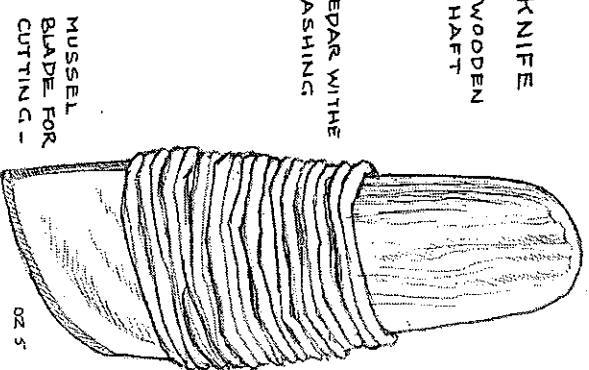
berosa. LITEREP M TIDE.



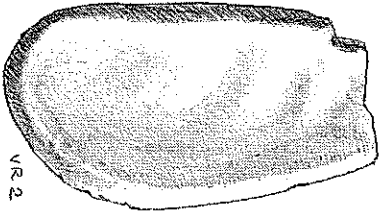
WHOLE SHELL USED FOR SCRAPER - FOR COMFORTABLE HAND GRIP, MUSSEL SHELL WAS BOUND WITH SPLIT SPRUCE ROOT.



INSIDE FILLED WITH SHREDDED CEDAR BARK.



TWO BLADES THAT WERE PROBABLY END WASTED.



The California, or sea mussel, flourishing in the clean clear waters of a totally unpolluted coast, provided not only excellent food but abundant raw material for making sharp edged blades for tools and weapons. The thick heavy shell was ground on an abrader to produce a sharp bevelled edge. These blades made efficient chisels, adzes, knives and scrapers. The entire shell, with only a spruce root wrapping for a handle, was also used as a scraper.

nt shells ing, sec- ne as for qualities

From: Mitchell, Don
1990

Prehistory of the Coasts of Southern BC and Northern Washington.
Handbook of N. American Indians Vol. 7 NW pp. 356.

villages and camps were chosen for their particular advantages of winter shelter or resources access.

Substantial excavations have been undertaken at Yuquot Village in Nootka Sound (Dewhirst 1980), the Shoemaker Bay site at the head of Alberni Inlet (McMillan and St. Claire 1982), and the vicinity of Hesquiat Harbor (Calvert 1980; Haggarty 1982) (fig. 1).

Only at the Shoemaker Bay site is there evidence for more than one major culture type during the past 5,000 years. Components at all other sites fall into what are here referred to as the West Coast culture type, which is present by at least 2800 B.C. at Yuquot and A.D. 140 at Hesquiat Harbor. It lasts until contact. The Shoemaker Bay sequence starts before 1100 B.C. and ends sometime after A.D. 850.

West Coast Culture Type

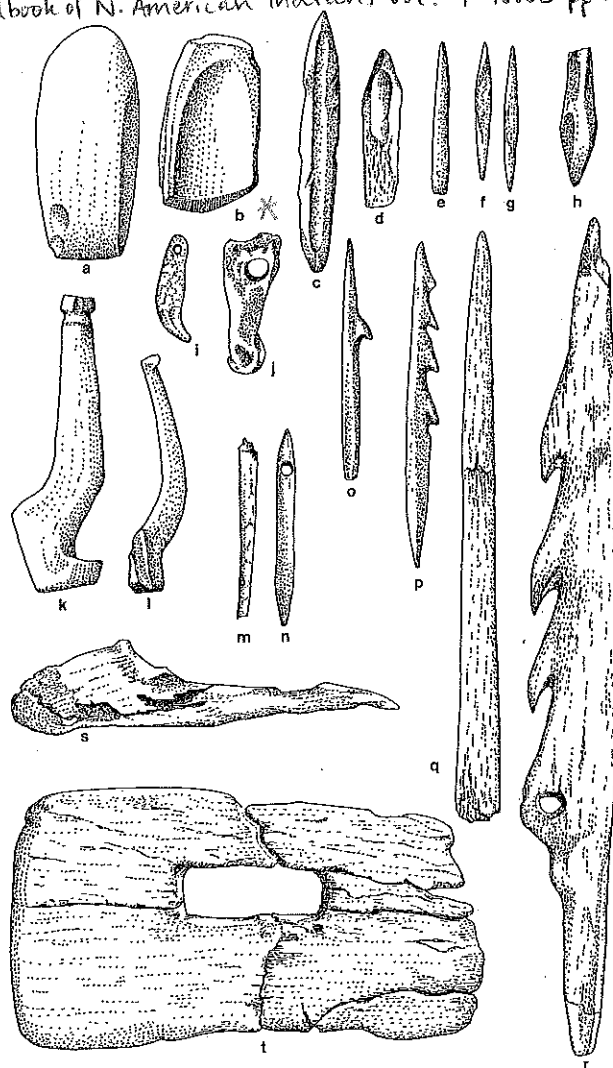
Distinctive archeological characteristics (fig. 13) (after Dewhirst 1980; Haggarty 1982) consist of: ground stone celts; ground stone fishhook shanks; hand mauls; abrasive stones; unilaterally barbed bone points; single barb points; bone fishhook shanks; unilaterally and bilaterally barbed bone nontoggling harpoon heads; bone single points; bone bipoints; large and small composite toggling harpoon valves of bone or antler, small ones with two-piece "self-armed" variety with ancillary valve; sea mammal bone foreshafts; bone needles; bone splinter awls; ulna tools; whalebone bark beaters; whalebone bark shredders; perforated tooth and deer phalanx pendants; mussel shell celts; and mussel shell knives.

One of the obvious distinguishing characteristics is the near absence of any flaked stone artifacts or flaking detritus. Even ground stone items are comparatively infrequent. The only common stone artifacts are abraders, presumably used to produce the numerous categories of ground bone tools and objects.

Items recovered from a large historic burial cave at the head of Hesquiat Harbor (Bernick 1985) include yellow cedar bark robes, some with fur collars; both twined and sewed tule mats; checker weave and twilled cedar bark mats; small checker weave cedar bark pouches and larger rectangular storage baskets; and cordage. The cordage, of cedar bark, cedar withe, and kelp, is of two- and three-strand construction.

Thorough study of the Hesquiat Harbor faunal remains (Calvert 1980; Haggarty 1982) and partial analysis of Yuquot materials (Clarke and Clarke 1980; Fournier and Dewhirst 1980; McAllister 1980) disclose use of a wide range of food sources but some obvious emphasis on certain species, but Hesquiat Harbor is an atypical segment of the west coast. Hesquiat territories include few salmon streams, and those few are well below average productivity.

In Hesquiat Harbor, by element count or minimum



after Dewhirst 1980: figs. 46, 68, 167, 177, 106, 108, 187, 232a, 235f, 127, 119, 97s, 97r, 109, 203f, 152a, 215, 93d, 99b.

Fig. 13. Artifacts characteristic of the West Coast culture type: a, round-polled narrow celt; b, sea mussel shell celt; c, self-armed valve; d, ancillary valve, probably used paired for composite harpoon heads, but lacking the distinctive foreshaft channel; e, thin wedge-based point of bone for double-pointed fishhooks; f-g, spindle-shaped bone points for composite fishhooks; h, ventral face of channeled antler valve for composite toggling harpoon head; i, perforated hair seal canine; j, perforated deer phalanx; k, rectangular-based stone fishhook shank; l, curved-stem bone fishhook shank; m-n, eyed needles or shuttles; o, unilaterally single-barbed point for sharp-angled composite fishhook; p, unilaterally barbed arrowpoint; q, tapered whalebone harpoon foreshaft; r, large whalebone unilaterally barbed harpoon head with line hole; s, deer ulna awl; t, whalebone bark shredder. Length of a, 7.6 cm; rest to same scale.

number of individuals, fish evidently ranked first among the nonshellfish resources; and of these, rock fishes were dominant. Of lesser importance were salmon, herring, and dogfish; however, in some site assemblages herring dominated, followed by salmon and midshipmen. Among the mammals, whales, seals, and porpoises were all important with coast deer placing after these. Birds commonly taken included albatross, loons, gulls, geese,