# DOMESTIC LIFE

## DWELLINGS

All permanent houses (Plates 2, 3, 4) were constructed of split cedar planks supported on a heavy framework of cedar timbers. The gable style was invariably used for these structures, the flat or slightly sloping shed roof being reserved for temporary summer dwellings. Details of construction varied considerably, as did gross size. The most common will be described first.

A site was selected which would receive as much sunshine as possible and be relatively protected from strong winds. The rectangular ground plan was laid out so that the long dimension would align with the prevailing winds. Depending upon the affluency of the builder and the number of families to be accommodated, the dimensions varied between a minimum of fourteen by twenty feet and a maximum of perhaps forty by one hundred feet. Except at the extremes a width to length ratio of about one to three was fairly consistently maintained. The ground was excavated over the whole area to a uniform depth; three and one-half feet was perhaps the average, with a range of eighteen inches either way. Holes were then dug for the posts which were to support the single ridge pole. These were placed along the median line about twenty feet apart. Thus the smallest house required but one at either gable end; the largest demanded five or six, spaced equidistant. These posts were not unworked logs, but heavy split timbers of rectangular cross-section, each with notched top to receive the ridge pole. The height varied between twelve and eighteen feet. The ridge pole was often allowed to project beyond the gable ends a short distance. Corresponding rows of uprights were placed along each edge of the excavation, forming supports for heavy rafters. These extended five to seven feet above the surface of the excavation. Roof plates were not used. The rafters were held in place laterally by longitudinal poles spaced about three feet apart, and secured with root lashings. Withes of spruce root were preferred; cedar root was second choice. This completed the structural framework.

Cedar planks, about two inches thick and averaging two feet in width (but sometimes reaching five and one-half feet[1]) were sunk into the ground around the four edges of the excavation. These vertical planks were secured at their upper ends to the gable rafters and to the longitudinal eave poles. This was accomplished by laying secondary poles on the outside of the planks parallel to the inner stationary members and lashing the two together with thongs passing through holes in the planks, or between the cracks. Sometimes a similar exterior lashing pole extended along the ends from eave to eave.

The roof consisted of similar but somewhat thinner planks laid parallel to the rafters in a double course, the second course covering the cracks of the first. These were secured similarly to the wall planks, with exterior poles tied through the planks to the rafters or longitudinal roof poles. A single course of roof planks provided with overlapping grooves sometimes substituted for the double thickness. An

[1]Coues, p. 754.

opening over each proposed fireplace was obtained by short roof boards at that point, or loose ones which could be moved.

A doorway was provided in one end of a small house or each end of a large one. It was a small oval opening at ground level or slightly above, through an especially wide plank. It is uncertain whether or not the door was placed slightly off center, in order to avoid the end ridge post. The end post may have been set in a few feet from the wall; or, in some cases at least, the end post itself seems merely to have been a wide, especially thick plank forming part of the wall. In the latter case the doorway was carved through this plank. The door was a section of plank sufficient in size to cover the opening, suspended by a thong. It was opened by swinging to one side; when let fall it automatically closed. It was commonly hung on the outside; the inside of the wall plank containing the opening was painted so that the aperture formed part of the design. The figure might be that of a man with the passageway between his legs, or a human face with the doorway forming the mouth. A ladder consisting of a notched log reached from the doorway to the excavated floor level.

Secondary construction inside the building provided platforms for sleeping and for storage. Paralleling each side wall, but removed by about four feet, a row of vertical posts was erected with each post corresponding in position to the eaves posts. In small houses the row was sometimes carried around the end wall opposite the door. At the tops these posts were lashed to the rafters. Horizontal poles were now secured from these secondary posts to the structural posts at the eaves, about two feet above the floor. A second series was sometimes added at the level of the eaves or somewhat lower. Planks were laid upon these supporting poles, forming a sleeping platform at the lower level and a storage platform at the upper. The space under the beds was also used for storage.

If the house were a large one partitions were provided. These consisted of a single range of planks secured in the ground at their lower ends and fastened to a cross beam in the fashion of the wall planks. The upper edge of the partition was irregular but no plank extended far above the eave levels. Corner compartments for pubescent girls were constructed likewise. Partitioning was always across the building, never lengthwise. Seldom more than a single median partition was erected. An opening was left for passage from room to room; this was essential when two or more partitions were used in order to provide access to the exterior doorway.

A rectangular fireplace excavation was made at the center of each room. The dimensions averaged six feet wide, eight feet long and twelve inches deep. Around the edges were placed heavy squared timbers to retain the fire and ashes within the enclosure. The rest of the floor surface was covered with cedar planks, cattail mats, or both.[2]

Houses so constructed appeared to Broughton to be more comfortable than those of the Nutka.[3] He especially cites the greater inclination of the roof. This not only provided better drainage, but together with the excavation resulted in a

[2]Luscier; Bertrand; Thwaites, vol. 3, pp. 208, 274, 356 f.; Franchere, pp. 247 f.; Ross, pp. 98 f.; Coues, p. 754; Dunn, pp. 135-37; Townsend, p. 257; Vancouver, vol. 2, p. 77.

minimum of side wall exposure where winds might penetrate. From the exterior the eaves of these houses were but two or three feet above the ground. From a distance the shape appeared to be that of an inverted V.

Broughton also mentions a "thatch of bark" over the plank roofing.[3] In some cases the entire roofing consisted of layers of bark, and in summer the walls of temporary structures were likewise of bark. Cedar bark was most commonly used.[4]

Townsend describes a house, seen at a Chinook village on the north side of the Columbia near the mouth, which was provided with a cedar bark roof and lined inside with mats.[5] Surprisingly, the fireplace extended as a ditch, twelve inches deep and four feet wide, the entire length of the building. The large, rudely carved and painted figure on a board, which he states occupied a conspicuous place in the house, was doubtless one of the "power boards" used in spirit dances.[6]

Horizontal wall planking and longitudinal roof planking was not unknown but was relatively uncommon. Franchere, however, describes this type without qualification. He also states that a door was provided for each family, which would require openings in the side walls.[7] Doors in side walls and gable corners are noted by Lewis and Clark for the Kathlamet near Tenas Ilahee Island. These houses, however, were constructed entirely above the ground. The fireplaces were placed in the end opposite the corner doorway.[8]

The houses described and illustrated (Plates 3, 4) by Swan show a combination of features described above, but there is little doubt that white influence had already been felt. This is suggested especially by the great overhang of the roof and the height of the eaves above the ground. The wall planks are vertical but the roof planks run longitudinally. The doorway is the traditional oval opening with swinging door. No excavation is mentioned but a double level is created by a five or six inch high platform extending into the room from the raised sleeping quarters. The fire is on the ground surface, not confined in a pit.[9] Some of these features were doubtless regional variations.

These habitations were used only during the winter; in the spring they were dismantled and only the frames were left standing. The planks were stored or used for the erection of the large flat or shed-roofed summer structures.[10] The cattail mats were extensively used for temporary summer shelters for single families. These were of gable type, the mats being supported by a light framework tied together. When mats were carried on summer excursions a separate canoe was used for them to prevent possible damage. House planks were transported from one place to another on a lighter consisting of two canoes. The canoes were placed parallel to each other and the planks themselves were laid across.

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[3]Vancouver, *loc. cit.*
[4]Cf. Ross, p. 98.
[5]Townsend, p. 257.
[6]See the spirit dance.
[7]Franchere, *loc. cit.*
[8]Thwaites, vol. 3, p. 208.
[9]Swan, pp. 110 f.
[10]Cf. Ross, pp. 98 f.

## SWEAT HOUSES

Two types of sweat houses were built, a plank structure and the typical Plains hemispherical hut. The plank house was built over an excavation about five feet square and two feet deep. Short planks were extended from two edges of the pit to form an inverted V with the ridge two and one-half feet above the ground surface. The treatment of the gable ends and doorway is uncertain. One to three persons were accommodated in such a hut. Stones were heated outside, brought in, and water poured on them to produce steam.[11]

The Plains type structure was comparable in size and likewise built over an excavation, which was round and only about twelve inches deep. The frame consisted of willow poles bent, crossed over each other, and secured in the ground at the pit edges. Old mats, grass or plank fragments covered the frame to support the earth with which the entire hut was covered. A small round entrance at ground level was covered with a hanging mat. A shallow round depression at the center of the pit served to hold the hot rocks. The rest of the floor surface was covered with bracken fern.

Bark of the Douglas fir was preferred fuel for heating the rocks since it permitted concentration of heat.

Sweat houses were owned by families; men and women used the same structure at different times. There was no prescribed hour for sweating; the houses were not extensively used. Sweating was thought to cure minor ailments and Mrs. Luscier made vague reference to the sweat house as a place for praying. Special songs accompanied sweating; their content is unknown. The sweat bath was always followed by a plunge in cold fresh water; the huts were so located as to make this possible.

The sweat house was in no sense a club house or gathering place. It played only a minor role in Chinook life.

In addition to steam baths, Swan mentions sweating by rolling up in blankets near the fire and drinking hot herb tea. He attributes sweat houses to the Columbia river groups but states that he never saw one on Willapa Bay.[12]

## THE DOMESTIC GROUP

The average domestic group consisted of about four families, their slaves, and visitors.[13] Each family, consisting of man and wife, dependent children, and related elderly persons without other connections, together with their slaves occupied a distinct portion of the house, sometimes separated from other families by plank partitions or hanging mats. Certain areas of the house were doubtless preferred over others but these details are unknown. Slaves belonging to the various families may at times have been grouped in the less desirable parts of unpartitioned houses. With few exceptions the families making up a household were fairly closely related; according to Lewis and Clark, "the greatest harmony appears to exist among

[11]Dunn, pp. 115 f.
[12]Swan, p. 180.
[13]Cf. Thwaites, vol. 3, p. 274.

them."[14] Newly married couples commonly established first residence in the house of the man's father. This introduces the matter of house ownership. Uncertainty prevails, but title to each house seems to have rested with the head of one of the occupant families. Other occupants may have felt a certain right to residence there as a result of labor or materials contributed in the construction of the building, but the formal ownership was doubtless recognized in the name of the highest ranking occupant and his family. This would necessarily have been the case for a Chinook would not long have remained in the house of a lower ranking person. Visitors were often present, but visiting was not as free and common as further up the Columbia.

Nearly all of the early writers remark upon the freedom from oppression and drudgery enjoyed by the Chinook woman in her household.[15] The possession of numerous slaves, upon whom devolved the more arduous and disagreeable tasks, accounted in part for this condition, but in part only. A distinct feature of the culture was the enviable degree of independence and the domestic and political freedom enjoyed by women.[16] Lewis and Clark comment that the men

> collect and prepare all the fuel, make the fires, assist in cleansing and preparing the fish, and always cook for the strangers who visit them. They also build their houses, construct their canoes and make all their wooden utensils. The peculiar province of the woman seems to be to collect roots and manufacture various articles which are prepared of rushes, flags, cedar bark, bear grass or waytape. The management of the canoe for various purposes seems to be a duty common to both sexes, as also many other occupations which with most Indian nations devolves exclusively on the women. Their feasts of which they are very fond are always prepared and served by the men.

Some of the men engaged in these tasks were perhaps slaves, though Lewis and Clark were quite aware of the badge of the slave, the unflattened forehead. But they were doubtless quite unaware that some of these "duties" would have been vigorously defended by the men as sex prerogatives, particularly the preparation of feasts and serving of guests.

The domestic relationships between masters and slaves seem to have been of a very healthy order. Intimate accounts are lacking but the indications are all in the direction of tranquil and unoppressive relations.[17]

Activities within the household centered largely around meals and their preparation, the fashioning of articles and tools, and amusements. The two former are described below.

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[14] *Idem*, p. 360.

[15] Cf. Thwaites, vol. 4, pp. 187 f.; Ross, p. 92.

[16] See p. 55. "Notwithstanding the survile manner in which they treat their women they pay much more respect to their judgment and opinions in many respects than most Indian nations; their women are permitted to speak freely before them, and sometimes appear to command with a tone of authority; they generally consult them in their traffic and act in conformity to their opinions." (Thwaites, vol. 3, p. 315.)

[17] See slavery.

## PREPARATION OF FOOD

Cooking methods included boiling, broiling, roasting, and steaming. Almost all foods were subject to boiling either individually or in combination. Vessels used consisted of dugout wooden containers, bark containers, and baskets. The use of baskets for this purpose may have been a recently introduced or a regional trait; cooking baskets are not mentioned by Lewis and Clark, while Swan speaks only of them.[18] Mrs. Luscier specifically denied the use of baskets.

In boiling food, water was first placed in the container, then the heated rocks, and lastly the food. Rocks were removed from the fire with tongs and dipped into a separate container of water to remove the ashes before being placed in the cooking water. While cooking the food was covered with a small mat.[19] It was stirred with a small wooden paddle.

Broiling was a favorite method of preparing salmon and some meat. The fish were split dorsally, opened out and held in this position by thin cedar skewers placed laterally. A cedar stick, to be used as a spit, was pointed on one end and split at the other. The extended fish was inserted in the split portion with tail end opposite the point. Beach grass served to tie the open extremity together, whereupon the pointed end was forced into the ground near the fire so that the top inclined toward it. Clamshells were placed on the ground below to catch the oil as it dripped. The spit was turned from time to time. The head was cooked in similar fashion, but usually separately. Meat was broiled in the same way except that the spit was simply a stick pointed on both ends.[20]

Certain roots, for example lupine and wapato, were roasted on glowing embers. Fowl and porcupine were often roasted whole by covering with hot embers.[21]

Clams, oysters and crabs were steamed by being held above the water in a covered container of boiling water. The rocks for boiling, together with crossed sticks, supported the shell-fish. Steaming was also accomplished with a shallow earth oven. The oven was heated before the food was put in but no fire was built on top. The food was wrapped and covered with skunk cabbage leaves, bracken fern, or old mats. Steaming resulted from water being poured in limited quantity on the food. Elderberries were cooked in this way.

The liquid remaining in the cooking utensil after boiled food had been removed was highly relished. Soup was made from meat bones or from moss which had been used to absorb the blood when game was butchered, then dried and stored. Liquid foods were commonly drunk from clam shell spoons. Marrow was extracted from bones and eaten. Dried elk and deer meat was pulverized and mixed with seal grease but not with other products. Roots of the bracken fern were singed and eaten or roasted. When dried they were mixed with fish eggs. Shell-fish, in addition to being steamed, were roasted, boiled, or dried and boiled. Seeds and nuts, with the

[18]Thwaites, vol. 3, pp. 353 f.; Swan, p. 164.
[19]Cf. Boas, *Chinook Texts*, p. 233; Franchere, p. 248.
[20]Thwaites, vol. 3, pp. 353 f.; Swan, p. 108.
[21]Bailey comments that "the strong body odor of the animal [porcupine] is conveyed to the flesh in skinning, but the Indian method of roasting them whole, quills and all, in a camp fire until nicely done, and then breaking open the charred crust and eating out the juicy flesh may be far superior to the frying-pan method." (Bailey, p. 231.)

exception of the acorn, were little used. Acorns were buried in the mud for leeching before being used. Eggs of all kinds were eaten except perhaps those of the sea gull. Tea was made from blackberry leaves. Blood of game was drunk but whether raw or cooked is uncertain. Insects were not eaten, nor were barnacles. Dog meat was inconceivable as food. Mrs. Bertrand remarked at the question, "Why, a dog is like a human being." Meat and fish were not eaten at the same meal. Salt was not used.

Meals ordinarily were served three times a day, early in the morning, at noon, and at sunset. Regardless of the hour, a meal was served soon after guests arrived. Also, when game or fish was brought in a meal was prepared immediately. Special cattail mats were spread on the floor at meal time. Upon these were placed smaller mats for dry foods, wooden platters and bowls for boiled fish and meats, ladles and spoons for service, and shredded cedar bark napkins.

In preparing salmon for drying the fish was split down the back so that the head, backbone, and tail were separated from the rest of the body. The head and tail were cut from the backbone and strung together for drying. The flesh of the backbone was eaten immediately. The ventral portion was laid open with cedar skewers and slashed evenly so that as great an area would be exposed as possible. Thus prepared the fish was hung from poles near the ceiling of the house or upon specially constructed scaffolding.[22] When dried, and incidentally smoked, the salmon was taken down and stored in baskets for later use or for barter. Pulverized salmon was prepared for storage and trade by partially broiling, then drying. After this the flesh was pounded, mixed with a small amount of water, and squeezed in the hands, forcing it out between the fingers until it became a homogeneous mass. It was then dried in the sun and packed in small baskets. The product was called sq̓we·'tsəm. Salmon eggs were dried and stored in salmon skins.[23]

Swan describes the preparation of sturgeon: The fish "is opened, care being taken to save all the blood, which is put into a kettle with some choice cuts, and then boiled. The head, like that of the salmon, is esteemed the best part, and is either boiled, or cut in strips and broiled or roasted before the fire. The pith of the back bone is considered a great luxury. . . . The rest of the fish is then cut in thin strips and dried in the smoke."[24]

Meat was dried by cutting it into small pieces and suspending it on an open-work platform over a slow fire.

Oil was rendered and stored in wooden vessels.

## BOXES, BOWLS AND SPOONS

The Chinook household was supplied with a variety of receptacles made of wood, horn and shell. Wood-working technique appears to have been limited to fashioning articles from a solid piece of material. Kerfing, bending and joining of boards, typical of wood-working among more northerly groups, apparently was unknown. Yet a wide range of forms was produced, mainly variants of three funda-

[22]See Plates 2, 3.
[23]Luscier; Swan, pp. 11 f., 165 f.
[24]Swan, p. 246.

mental shapes: the square box, the bowl, and the platter. Some were provided with well-fitted covers. All, according to Lewis and Clark, were "extremely well executed."

The square dugout box of cedar was used mainly for carrying and storing water and for cooking; the larger ones were provided with hand-holes. Bowls and bowl-shaped vessels were made less consistently of cedar than the boxes. Alder, maple, ash and yew (*Taxus brevifolia*) were favorite supplementary materials. In addition to bowl-shaped or round-bottomed vessels of various sizes, small, round, flat-bottomed cups were made to be used for oil. Platters were long and shallow, with almost straight sides but rounded ends. Those designed for feasting often were elaborately carved, painted, and inlaid along the edges with shells.[25] The ends of some were raised and ornamented with animal figures. Others were carved very much in the shape of a canoe. These elaborate dishes were often named. On the occasion of an especially large feast actual canoes were sometimes used for cooking food.[26]

Hemispherical horn bowls with raised, rectangular "ears" (Figure 14) were widespread in western Washington and the Columbia valley. Those possessed by the Chinook were quite certainly of their own manufacture. These were invariably decorated with geometric designs (Figure 15), the simplest being rectangular perforations in the raised portions with incised outlining.

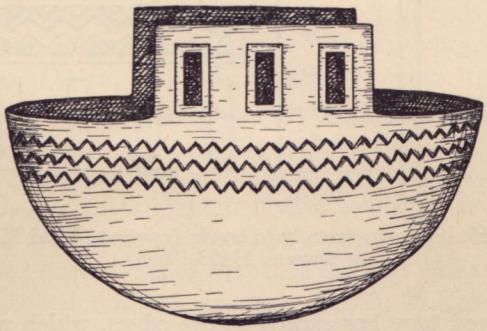

FIG. 14. Horn bowl.

The commonest spoon was merely the shell of the clam. More elaborate spoons and ladles were carved of alder, yew, or maple; or were molded from horn. These had large, wide bowls and were provided with short, perforated handles, sometimes ornamented. Elaborately carved spoons of musk-ox horns were received in trade from the north.[27]

Large ladles and food stirrers were made of wood.[28]

## BASKETRY AND MATTING

Chinook basketry (Plate 5) was dominantly in the twined technique, with a considerable amount of twilling. Checker-work, particularly with cedar bark, was important but secondary. Checker-work mats were small; all large mats were made

[25]Cf. canoes.
[26]Cf. p. 94.
[27]Swan, p. 163.
[28]Luscier; Thwaites, vol. 3, pp. 274, 353 f.; Swan, p. 163; Dunn, p. 138.

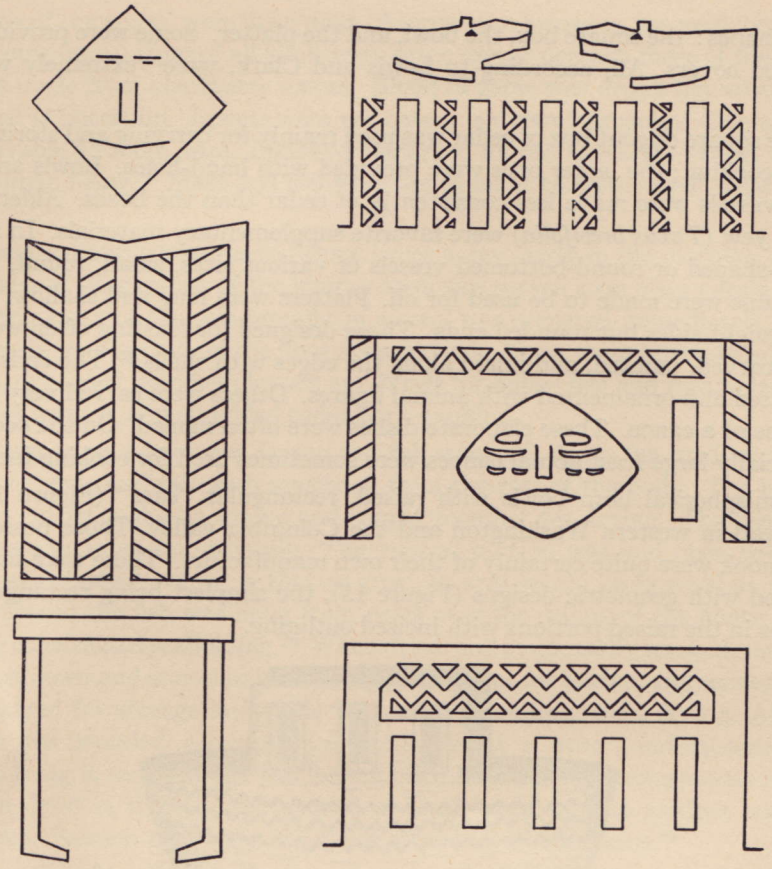

FIG. 15. Designs from horn bowls (compare Field Museum specimens 19692-19698).

of cattail rushes sewed together except at the edges, which were braided. Coiling was not known.

It is somewhat difficult at this date to establish the types around which variation occurred and to judge the importance of each. Lewis and Clark emphasize the water-tight twined basket of cedar bark which they state was found in capacities "from that of the smallest cup to five or six gallons."[29] They add that these were truncated cones in form, the small end being the bottom, and that dyed bear-grass, (*Xerophyllum tenax*) (q̓wɪla·'lstip), a product imported from up the Columbia near the Cascade Mountains, was used for ornamentation. Swan, on the other hand, describes only baskets of spruce root, willow bark and bear-grass.[30] Mrs. Luscier placed spruce root foremost as a basketry material and among the baskets I obtained from her (now in the Washington State Museum; see Plate 5), those of spruce root were most prominent while none of water-proof construction in cedar bark

[29]Thwaites, *loc. cit.*
[30]Swan, p. 162.

was represented.[31] This may be a matter of regional variation but it should be remembered that woven cedar bark hats, in the same construction, were formerly common not only in the Columbia river region but also on Willapa Bay. In both areas these disappeared long ago. Also, Douglas writes of baskets woven from the roots of bear-grass (his *Helonias tenax*) and adds that cedar root was similarly used, but he does not mention the use of cedar bark.[32]

Openwork baskets both of spruce root and cedar bark were extensively used for carrying shell-fish and salmon and for storing dried salmon. The trapezoidal spruce root clam basket of the northern coast was well represented here (Plate 5, D).

A description of the baskets illustrated on Plate 5 may serve for typological description: (A) A finely twined basket of spruce root, water-tight. This is not twilled, though the arrangement of the design gives that impression. It was used for packing pulverized salmon for trade; when filled a cover was sewed over the top. This basket, called mɑxu'i', served as a standard measure (depth, 12 inches; diameter, 8 inches) and was transferred along with the contents when traded. (B) Openwork basket of cedar bark (o'ṗqɑnx̣). Used for storing and trading dried salmon and dried clams; standard measure (depth, 10 inches; diameter, 15 inches). (C) Twined storage basket of small rushes, *Juncus* sp. ? (q̣a·'qtsux), called cmu·'xɬnɯɬ, "small-mouthed basket." Used for storing salal berries, blackberries, and others. Depth, 9 inches; diameter, 14 inches. This basket was made by putu·'lutc. (D) Openwork basket of spruce roots (qlo'muɬ'ya'unəks ?). This is the trapezoidal clam basket mentioned above. Hung on the back while gathering shell-fish. Sometimes used to carry salmon. Depth, 8 inches; width, 12 inches. (E) Trinket basket of twined rushes. Depth, 4 inches; diameter, 5 inches. (F) Twilled basket of flat spruce roots (sa·'pənux). This basket, used for dried salmon heads (spła·''lat) and ordinary dried salmon (x̣et'sa·'ius), was another standard measure (depth, 7 inches; width, 8 inches). (G) This bag of cattail trimmed with bear-grass is of the type used for carrying, storing, and trading dried meat. It is identical in construction with the cattail mats (described below) except that it is doubled and two edges are braided together. The ornamentation is of bear-grass. Depth, 20 inches; width, 24 inches.

Baskets for water were similar to that described under (A) above. Basketry hats were made in a similar close-twined technique.[33] Checker-work baskets of rushes were known but were made less frequently than the twined type.

Spruce root (t̓aq̣e'xɑn') was steamed and then split into strips of proper size for basket work. Immediately before use it was soaked over night in water. Rough cedar bark (q̣we·'ɬ) was scraped, dried, and split in order to prepare it for use. Cedar bark of black color (sxwɩ'iuxɬ) was obtained by burying it in the mud.

Cattail (suwi'tc) mats served a wide variety of uses, including house covering, house lining, partioning, floor covering, bedding, eating mats, and flat bags. The cattail was cut during July and August, carefully dried, and stored in a dry place until fall or winter, when mats ordinarily were made. In the manufacture of a mat the separate pieces were cut the proper length, about three feet, and laid side by side.

[31]The group is too small to be anything more than suggestive.
[32]Douglas, pp. 261 f.
[33]See clothing.

Large and small ends were alternated so that an even edge would be obtained. A single row of twining along each side served to hold the pieces in place until the desired length was obtained. Then stakes were driven in the ground at the ends of the row to which the twining cords were made fast. A mat needle was threaded and thrust at right angles through the stems, beginning at one end near the edge of the row. Several elements were pierced at a time and the stitching was continued until the opposite end of the row was reached. Further stitching, in parallel lines about four inches apart, bound the cattails into a strong unit. The seams were flattened

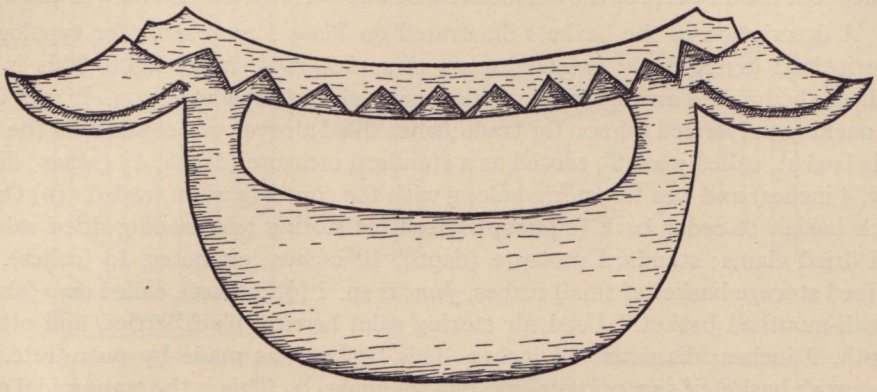

FIG. 16. Mat creaser (after Field Museum specimen 19640).

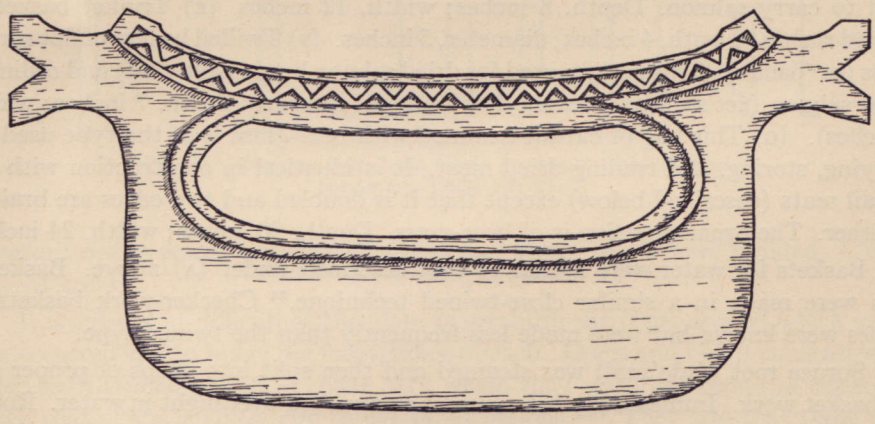

FIG. 17. Mat creaser (after Field Museum specimen 19636).

by means of a mat creaser with a grooved edge (Figures 16, 17). The mat edges were trimmed and bound by braiding with elements of contrasting colors, or colored grasses were introduced into the braiding.[34]

Mat needles were made of wood (Figure 18, c) or bone (Figure 18, B). The wooden needle (ɬa·'lcɑt') was made of hard-wood and curved somewhat. Length varied greatly; the needle illustrated measures fourteen inches by three-eighths, while another one measured in the field was thirty-six inches long and curved much

[34]Swan, p. 161 f.; Luscier.

more than the shorter one. Both of these were roughly triangular in cross-section but one of yew wood in the Washington State Museum is squarish and medium in length, seventeen inches long.

Bone needles were always relatively short, varying from eight to sixteen inches. They were also much straighter. Swan mentions the bone of the second joint of the wing of the heron (*Ardea herodias fannini*; Swan's "blue crane") as that utilized for the mat needle.[35] All needles were provided with distal eyes. Cord for sewing mats was made by twisting rushes very tightly, or of nettle or other fiber.

Mat creasers were likewise made of hard-wood or bone, more commonly of the former. They were quite carefully carved and decorated, varying around a fairly stable type as indicated by those illustrated. They averaged five inches in width.

Basketry dyes included alder, Oregon grape root, hemlock and mud.

Cordage was spun of nettle fibers, rushes, willow bark fiber[36] and other materials.

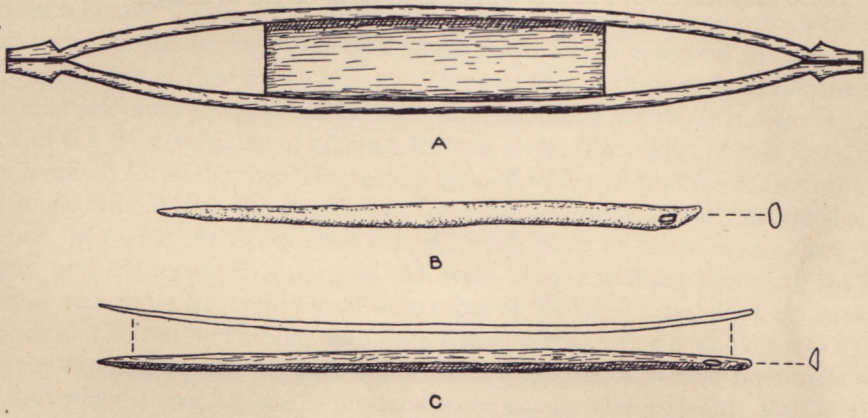


FIG. 18. (A) Shuttle for weaving nets (after Field Museum specimen 19713); (B) Bone mat needle; (C) Wooden mat needle.

## MISCELLANEOUS IMPLEMENTS

Mussel shell knives were used for cutting food, fibers, skins and perhaps wood. Simple drills were tipped with points of horn or flint. Beaver teeth were used as engraving instruments. Awls were made of bear bone or raccoon bone, six or seven inches in length. They were used for basket making, skin work, and general utility.

Adzes were of the straight type. In Lewis' and Clark's time these already were provided with iron blades. The handle consisted of a large block of wood. In use they grasped "just below the block with the right hand holding the top of the block, and strike backward against the wood with the edge. . . ."[37] It seems likely that the aboriginal blade was of shell or bone. Stone blades may have been known but stone never played a very important part in the culture of the Lower Chinook.[38]

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[35]Swan, p. 162.
[36]Cf. Boas, *Chinook Texts*, p. 220.
[37]Thwaites, vol. 4, p. 36.
[38]Cf. Smith.

Wedges of wood or horn were used in splitting planks, fire wood, and for the rough work in canoe manufacture. The wood used was the Oregon crab-apple (*Pyrus diversifolia*), an extremely satisfactory material. The horn wedges were fashioned of elk antler.[39] Mallets of spruce knots, hardened with oil and heat, are mentioned by Dunn.[40] He also writes of oblong stone hammers.[41]

Mortars, which were made only of wood, were circular in shape and sometimes ornamented. With them were used pestles of wood, or less commonly, stone. The latter were plain and tapering; those of wood were somewhat broadened at the base and served largely for berries.

Fire making was accomplished with the simple fire drill and perhaps by concussion. Twisted cedar fibers carried in a hollow bone served as a slow match. Tongs for removing cooking stones from the fire were made of two sticks bound together at the handle end.

Wooden net shuttles (Figure 18, A) were used in weaving seines and other large nets. These may have been recent and of European origin in design.

[39]Thwaites, vol. 4, pp. 19 f.
[40]Dunn, p. 138.
[41]Cf. Smith, p. 302.