

## The Aleut Kayak As Seen By Its Builder And User And The Sea Otter Hunt

**Joëlle Robert-Lamblin, 1980**

Original - Le kayak aleoute vu par son constructeur et utilisateur et la chasse a la loutre de mer. Tome 20, Fascicule 1, Objets et Mondes. Dieppe: Musée de l'homme, Mus. Nat. d'Histoire Naturell. Unpublished English translation Library, Canadian Museum of Civilization, Ottawa.

### **The Aleut Kayak**

The Aleut kayak (generally designated in literature by the term baidarka), because of the perfection of its design and construction, was greatly admired by the foreign seamen who explored this part of Alaska during the eighteenth and nineteenth centuries.

According to Sauer (vol 1, p 296),

“the boats of Ounalaschka are infinitely superior to those of any of the other islands in these waters. If great regularity of proportions and a high level of craftsmanship constitute the beauty of a structure of this kind, it can be said that these boats are very beautiful and I admit that they seemed to me to be of the highest perfection”,

and Veniaminoff, a Russian orthodox missionary who lived in Unalaska from 1824 to 1834, wrote,

“The Aleut baidarka is such an accomplished piece of work of its kind, that a finished mathematician would not be able to add much or even anything to the perfection of its sea going qualities” (Jochelson translation, 1933, p 24).

In fact, when we consider the climate of the Aleutian Islands, which are known for their mists, fogs, rain, winds and storms, and for the strength of the marine currents which flow between the islands of the archipelago, and realize in addition that the Aleuts felt no hesitation about traveling by kayak on hunting or vendetta expeditions from one end of the chain to the other, and even as far as Kodiak, it becomes obvious that these were quite remarkable craft and that they themselves possessed exceptional abilities as seamen. The Aleuts are islanders, and since the sea is never frozen at this latitude, their chief means of

transport was the kayak.

“What the sled is to hunting on ice, the kayak is to hunting in open water. Few crafts, among uncivilized peoples... are comparable to the slender and graceful kayak, known in Alaska as the “baidarka” (Kaj Birket-Smith, p 98).

Yet today, not one kayak remains in the Aleutian Islands. One by one, the villages abandoned this type of craft, beginning in the period 1910-1920. It disappeared totally from the Akutan region, according to the older people in the village (1), around 1930, to be replaced by dories or motor boats, and later by outboards. Its disappearance seems to be linked partially to the extermination of the fur bearing animals whose skins were used to cover the kayaks, and partially to the final prohibition of the sea otter hunt after 1911 (a form of hunting which required the use of the kayak).

Full size and scale model examples of this now abandoned means of transportation are preserved in museums in various countries of the world (Russia, the United States, the Netherlands, Denmark, Germany, France, etc) and a number of technological descriptions have already been published by museologists (see the bibliographical references to Liapunova, Adney and Chapelle, Zimmerly).

My intention is not to go over all the existing literature, but to add to it from information collected primarily from one informant who had learned how to build his own kayak and who, more than forty years later, still recalled perfectly all the details of this construction. The interesting aspect to me in this case was the viewpoint of the kayak's builder and user, rather than that of the museum worker who merely describes and measures the object itself, divorced from its context.

Among the Aleuts, down through the generations, the knowledge of the shapes, proportions, properties and technical qualities of the different woods suitable for boatbuilding, and of the various skins, etc, was refined and developed for optimum efficiency; and this knowledge was transmitted by oral tradition from maternal uncle to nephew or from father to son.

Here I shall be reporting primarily the information which I received from Bill Tcheripanoff, a 69 year old man whom I saw daily during my stay on Akutan Island in 1971. I later compared them with those in the existing literature on kayaks in museum collections, and was able to see how the body measurements memorized by this old man agreed and conformed, in general, with the metric data published by museologists.

### **The Different Types Of Aleut Kayaks (Baidarka or Bidarka)**

The term baidarka is a word of Russian origin, the diminutive of baidara (2), which itself was used among both the Aleuts and the Kamchadals to designate the large skin covered boat (the Eskimo umiak) used for group transport or intertribal war expeditions.

There are three known types of Aleut kayak, or baidarka: those with one, two and three openings.

The one man kayak (iqax in Aleut) was the most common form at the time of the discovery of the Aleutian Islands by Russian colonizers. The accounts of the first explorers Steller, Cook, etc mention this type of kayak (fig 2) most frequently.

The two man kayak (ulluxtadaq (3) in Aleut), which was still rare in the early nineteenth century, is mentioned by Cook, Levasheff and Langsdorff as being reserved for village chieftains with a "servant" to operate it, or is described as being used to train young men in hunting and navigation, under the direction of an experienced hunter. It appears to have come into more general use at the expense of the one man kayak. Jochelson and Liapunova believe that the development of the two man kayak was related to the introduction of firearms in place of the harpoon: while the harpoon requires the use of only one hand, the rifle requires both, and since its kick may well tip the kayak, a second person is necessary to stabilize the craft. Personally, I do not consider this argument decisive for two reasons: first, in a number of other Arctic regions, the introduction of the rifle as hunting equipment did not bring about any fundamental change in the structure of the kayak, and secondly, firearms were not very generally used by Aleut kayak hunters, as will be seen below, p 15. Instead, I believe that during the nineteenth century, hunting expeditions became increasingly longer and more distant, and required more rapid travel; and the Aleuts have assured me that kayaks with two paddlers moved much more swiftly than those operated by one man (figs 3 and 12).

The three man kayak (ulluxtaq (3) in Aleut) is unanimously considered a later creation, linked to the presence of the Russians, and used to carry administrators, traders or priests from island to island. The foreigner then occupied the central position between the two paddlers (fig 4).

## Construction of the Kayak

### Material

Driftwood and the skin of sea mammals are the only elements used in the construction of a kayak. The use of bone pegs to fasten the pieces of wood disappeared during the nineteenth century and was replaced by another system of attachment: thongs made from the tendons of whales (or sea lions) wrapped around the pieces to be joined or passed through holes drilled in each of the two pieces and tied.

Because they are treeless, the Aleutian Islands offer no other boatbuilding materials except wood carried from North America, Japan or Siberia by ocean currents and washed up on their shores. Various North American conifers were the primary materials used by the Aleuts for their known strength, lightness, flexibility, etc (4).

The sea mammal skins used to cover the kayaks were essentially the skin of the sea lion (Eumetopias jubata Schreber), which is thick and tough, or, if this was not available, for smaller craft (one-man kayaks), the skin of the common seal (Phoca vitulina L). This however, is smaller and not as strong.

### Shape

The Aleut kayak differs from the other types of kayak found in neighboring regions - Kodiak or southern Alaska - by the unusual shape of its prow and stern (fig 3).

The bifid, and usually curved and raised, shape of the bow of the kayak (fig 8b) often surprised foreigners. In addition to the symbolic aspect of this shape, which to the Aleut represents the sea otter (5), there was certainly a functional reason as well. According to Laughlin, the fork was designed to allow the narrow anterior portion to act as a breakwater. In order to prevent floating seaweed from becoming caught in the slot of the stem, a small

piece of wood was attached across the opening (fig 2).

The stern of the kayak (fig 8a) has a truncated shape. Under the skin covering, the sternpost is formed by an almost vertical plank extending from the gunnels to the keel, with a piece of wood mortised into the centre and running perpendicularly back from that point.

Since Aleut territory covered such a vast range (2000 km long), there were local variations in the shape and proportions of the kayaks. The kayak described here can be classified as the Unalaska type, which Veniaminoff and Sauer considered superior to all the rest.

### **Dimensions**

There are no standard measurements for the kayak or for the various instruments used in the hunt: they were "custom made" by and for their user for the best possible performance. This explains the variations in the dimensions of the museum objects, which are due largely to differences in the height and body proportions of the individuals who made them.

It will be noted that the body measurements used for the kayak and for the harpoon all relate to the upper portion of the human body: the trunk, arms, hands and fingers (figs 5 to 8, 10 and 16-17). In fact, once in his kayak, only the hunter's upper body is still mobile, and it is essential that a number of objects, in particular the paddle and thrower, be easy for him to handle.

The details on the construction of the two man kayak shown in figures 6 to 10 were provided to me by Bill Tcheripanoff, and I have been able, with the units of measurement which he used and his own body measurements, to reconstitute a full scale plan of the kayak.

The dimensions thus obtained total length 5.80 m, and maximum width 56 cm are among the smallest given by Zimmerly (average length 6.62 m, and average width 59 cm, for a sample of 5 kayaks) and by Liapunova (average length 6.30 m, average width 70 cm) for this type of craft.

Since the methods of measuring depth differ from one author to another it is impossible to make any comparisons. The depth of Bill's kayak, at the opening was 48 cm.

## Stages In Construction

### Frame: Ulmax

The framework of the kayak (fig 7) is composed, longitudinally, of the following pieces:

- a). two gunnels, sturdy pieces of wood, rectangular in section, connecting the stem to the stern and ensuring the craft's solidity.
  
- b). a "jointed" (internal) keel, in two or three sections, to give the kayak a certain flexibility and greater strength in rough waters. The two or three pieces of wood constituting the keel were fitted together by a mitered joint in which it was customary, I am told, to place an eagle feather and held together by a thong. Bill Tcheripanoff's keel was composed of only two pieces of wood and the joint, chuteg, between the two sections was located just ahead of the second opening; long, light, slender laths or stringers usually round in section, located below the gunnels, on each side of the keel: a total of 6 to 10; and, along the medial portion of the deck, a central stringer (in several parts) resting on the beams, and producing the ridged profile shown in figure 7.

Transversely, the frame is composed of: a number of light, slender ribs, made of wood previously made flexible by soaking in water (for approximately five days) and then tightly curved using the teeth. "Some people soak the wood in boiling water to curve it, but my father didn't like doing it that way, because it made it more likely to break", Bill Tcheripanoff points out.

The ends of the ribs are mortised into the gunnels and attached by thongs to the inner side of the keel and to the stringers. In a two man kayak, there are approximately forty ribs, spaced at intervals equivalent to unit of measurement 11 in figure 5, or only about 14 cm apart; approximately ten curved transverse bars, or beams, of strong wood, form the deck. They are mortised into the gunnels and hold them the proper distance apart.

Finally, the wooden circles forming the openings are placed on the completed framework. Each is made of a long, slender piece of the same wood as the ribs, soaked and curved to form a slightly oval hoop; this is attached to the gunnels and the beams by thongs and will no longer be visible once the skin covering is placed on the kayak.

## Skin Covering

While the preparation of the wooden framework is men's work and the preparation of the skin covering women's work, the final phase of installing the covering on the frame is a joint activity in which both the hunter and the women in his family participate. The sealskins and sea lion skins have been scraped and washed, the hair removed, and the skins stretched and sewn end to end, with threads made of tendon, by the women. The part that will cover the front of the kayak is prepared so that it has only to be slipped, wet, over the frame, with the seams on the inside. The final seam, which runs along the middle of the deck from the first to the second opening and from there to the stern of the kayak, remains on the outside and is sewn by members of both sexes.

Once the women begin (6) to sew the skins, the hunter, the future user of the boat, must become extremely vigilant, because a single woman's hair even the tiniest one caught in a seam will be enough to bring him bad luck on the hunt or at sea. Similarly, during this operation, the women are never to wipe their hands on their clothing, or on anything but an object specially designed for this purpose, and known as kidguseq, which is made of grass and is buried by the men immediately after use.

According to Bill Tcheripanoff, four whole skins are used to cover a two man kayak: either all sea lion, qowaq, or three sea lion skins for the front and one sealskin, issox, for the back. The seams must be placed in areas where the hunter will not lean his weight on the frame and thus possibly rip them open. Additional smaller pieces of skin complete the covering on the top and sides of the kayak.

Finally, the leather cover is coated with boiled seal oil, which seals the pores and makes it waterproof; it may even become translucent enough to reveal the framework within or to allow a passenger lying inside the kayak to see the reflections of the water quite clearly. This oiling operation must be repeated frequently, approximately once a month, to prevent the skin from tearing or leaking. The entire covering must be changed every year, although the frame can be repaired and will last for several years.

## **Equipment**

The deck is set up to hold the instruments required for navigation, hunting and deep sea fishing. Arranged in front and back of the hunter and attached by leather straps are: the various kinds of harpoons or spears used for different kinds of game (otter, seal, sea lion, whales, birds) each bearing a special mark identifying the owner, the thrower, club, a knife in a wooden holder and, in some cases, lines for halibut or cod.

In addition, as shown in figure 6, there is an individual container for drinking water, a buoy for each paddler made of the inflated stomach of a seal or sea lion to be used in case of damage to the kayak, a wooden bailer (as shown in figure 9) or a simple sponge.

## **The Paddle**

Finally, the essential element of the kayak is the paddle, which serves to propel it, to steer it, to maintain its balance when it is not moving and to right it when it has capsized. This is why it has been said that the worst misfortune that can occur at sea is to lose a paddle.

The kayak paddle, made of strong, light wood, usually has two elongated blades with pointed tips (fig 10); however, Cook notes that some kayaks were also equipped with single bladed paddles (fig 2).

## **Interior of the Kayak**

The interior has no particular arrangement. A simple cushion of dried grass, covered with an old, folded sealskin, serves as a seat; and a few stones may be distributed the length of the boat as ballast. For an expedition, the hunter would also add a lamp, additional harpoon heads, in case some were lost or damaged, blubber with which to grease the leather or plug a hole in the covering of the kayak. Occasionally, the interior space could be occupied by a passenger stretched out on his back between the legs of the second paddler, or by up to 350 kg of cargo, according to Heizer (1960, p 133).

## **Decoration**

Finally, various decorative elements are used to beautify the craft and its equipment; paintings on the wooden portions, an ivory figurine attached to the deck by a strap (probably serving as a good luck charm), and, very often, small bird feathers or animal hairs, or multicolored glass beads or small bits of wool in various colors (imported from Europe) were caught into the stitches of the seam down the middle of the deck.

The red paint, composed of a mixture of ochre and blood, or entirely of cod's blood, was not only decorative but indelible, and helped to protect the wood. Generally, the frame of the kayak, the shafts of the harpoons, the thrower and the paddle were painted red. However, there are also some elements in black paint (made from octopus ink), particularly on the blades of the paddle (fig 11) and the curved portion of the thrower which is held in the palm of the hand. According to informants on Umnak, red symbolizes death and black man's power (strength). It is interesting to compare this observation with the multicolored figures on Aleut hunting headgear, where the hunter and his kayak are generally depicted in black and the instruments used for hunting and fishing in red or yellow ochre (Ivanov, p 499).

## **Essential Qualities of a Kayak**

The completed kayak should combine the following qualities lightness, strength, maneuverability, speed and elegance.

### **Lightness**

The Aleut kayak is very light. It had to be easy for its user to carry when putting it into or taking it out of the water, and on portages; in fact, the Aleuts often took shortcuts across spits of land, carrying their boats with the right arm through the opening (and the left hand holding the paddle) or with the head in the opening of the overturned kayak. The two man kayak was often carried on the shoulders of the two paddlers.

## **Strength**

Designed to face seas which are generally rough and stormy, the Aleut kayak is both strong and flexible. The frame was built to retain a certain degree of elasticity, with its "jointed" keel in several sections and the system by which the various pieces of wood were joined together. The leather covering too had to be strong, since a tear could be fatal for the navigator.

## **Speed and Maneuverability**

Long, narrow, shallow and tapering in front, the Aleut kayak was both very easy to maneuver and very rapid in pursuing fleeing game or covering long distances. Cook noted, on one of his journeys, that the kayaks accompanying his vessel, the Resolution, easily kept pace with it at a speed of 7 miles per hour. Sauer too has stated that in good weather a kayak with a single paddler could cover more than 10 miles per hour. A two man kayak offered even better performance.

## **Elegance**

"The men's pride and pleasure seem to be in their canoes, which are kept exceedingly clean and neat" (Cook 1967, p 1444). In order to attract game, which is said to be sensitive to beauty, every hunter took great pains with the elegance and decoration of his craft, as he did with his hunting instruments and clothing (figs 13 and 19). The sea otter, in particular, could be attracted by decorative elements on members of the male sex (the hunter and his kayak).

## **Life and Sex of the Kayak**

It is interesting, in fact, to note, in this connection, that in the Aleut oral tradition, the kayak is not an object; it is a living being, male, a hunting partner which attempts to identify itself with its master and would like to share his married life. Their fates, indeed, are bound up together, and their lives end at the same time: they disappear at sea together or, on land, share the same grave.

## Handling The Kayak

### Learning to Handle the Kayak

The process of learning to paddle and hunt in a kayak began very early in the life of an Aleut boy: by the age of 6-8. Under the guidance of an experienced hunter his maternal uncle, grandfather or father the boy would begin with physical training intended to develop the muscles of the back, neck, shoulders and arms, to train him to maintain a sitting position, with his legs extended, for ever longer periods (this is why, Bill Tcheripanoff points out, people did not have cramps during long trips in the kayak) and to harden him to the cold by having him bathe every day in the sea. The child also practiced shooting at a target, so that later he would be able to harpoon game.

As an adolescent, the would be hunter continued his training in a two man kayak; at this time he learned to launch and land the kayak, to paddle against the current, to right the kayak with his paddle if it capsized, to repair damage, to recognize game and to approach it, etc.

### Seamanship

The skill of the Aleut navigators, their courage in the face of the raging elements and their physical strength have been admired by many foreign observers.

Lütke writes:

“The sea is their true element. Seeing an Aleut with his bandy legs, his body bent forward, waddling along like a duck, and then alone in his baidarka, which looks more like a trough than a boat, controlling it among huge waves with extraordinary skill and activity, it is difficult to believe that it is the same man” (p 235).

Sauer notes:

“The sea was very rough... (it) was crashing violently on the reefs and against the rocks. The islanders, seeing that we were astonished by their skill and agility, sought to display them to yet better advantage by passing through the breakers. There the

waves covered them to the shoulder, and they paddled their baidars (their kayaks) amidst the waters, playing within the waves more like amphibious animals than human beings" (p 1, p 297).

Veniaminoff too observes:

"The Aleut master their bidarkas with the greatest skill: no wind no matter how strong no roughness of the sea, not even a shock caused by a casual force, when the Aleut is aware of it, are able to capsize him, if only he has the paddle in his hands" (Jochelson translation, 1933, p 25).

Dressed in a hooded waterproof garment which extends to the knees (kamleika in Russian, chigidax in Aleut), made of horizontal strips of seal or sea lion intestines finely sewn together and drawn tight around the wrists and face (fig 13), the navigator puts on his "kayak apron" and thus becomes one with his craft: the sea water cannot enter. The "kayak apron", chukax, is a sort of very fine and very flexible tunic made of sealskin (or intestines), one end of which fits over the hoop of the opening while the other is tightened around the man's chest and held over his shoulder by a leather strap.

Thus installed and covered, the hunter has only his face and hands exposed. Bill Tcheripanoff recalls that the hands had to be kept constantly moving over the handle of the paddle to keep the fingers from becoming numb with cold.

The hunter's face was often protected from the sun's glare and from spray by a type of headgear worn over the hood of the kamleika: a conical hat (fig 19) or visor (fig 13) of very light wood or birch bark, richly decorated with multicolored paintings, sea lion whiskers, glass beads and pieces of ivory, described in great detail by Ivanof.

The hat, chagudax, made of a single piece of very thin wood, steam curved into the shape of an elongated cone 25 cm high and 40 to 50 cm long and sewn up the back, weighed 200 to 300 g. It was much less common than the visor. It was reserved for men of high rank: chieftains, great hunters or members of the special caste of whalers. They were of considerable value. In trading, they were worth one to three slaves (generally Eskimo koniag), and since slaves themselves were rare, they were considered extremely valuable. The following anecdote may be of some interest in this connection: the first white men to

meet Aleuts, on September 5, 1741 (members of the Bering expedition), asked them for one of their hats, which they traded for one rusty kettle, five needles and some thread. (the scene is recounted by Steller, p. 134).

Tireless seamen, the Aleuts were capable of spending 18 to 20 hours at a time in their kayaks without landing or resting. Their sense of direction was equally remarkable, enabling them to travel in these regions where coastal landmarks are so frequently shrouded in mists or fog. The paths of migrating birds served as one of their guides.

The voyages which they undertook in their frail vessels covered considerable distances; they were capable of traveling from one end of their territory to the other, a distance of 2000 km, or even to Kodiak and Sitka. The French explorer Alphonse-Louis Pinart, then only 18 years old, himself experienced this type of navigation: accompanied by Aleuts, he covered a distance of more than 1000 nautical miles in 64 days, from Unalaska to Kodiak, in 1871 (fig 14).

If a sudden storm arose, several kayaks would attempt to attach themselves together, facing the waves, in order to offer greater resistance to the winds and currents by forming a sort of raft. One of Bill Tcheripanoff's stories concerns a memorable storm in the Unimak Pass (7) in 1896, during which a large number of hunters traveling to Sanak for the otter hunt disappeared. Bill's father managed to attach his kayak to that of another hunter, and they spent five days and five nights there in their kayaks with no food.

## **Damage**

The buoy played an important role in case of an accident at sea or damage to the skin of the kayak. The float was then placed inside the boat to prevent it from sinking until the hunter could reach land, or else the man would attach it to his own body and jump into the water to attempt emergency repairs. A piece of seal or whale blubber was always kept on hand for possible repairs to a rip which could be sealed from the inside, together with a needle and tendon thread.

Place of the expedition leader in a two man kayak. According to information which I received from a number of Aleuts, the owner of the kayak sat in the front opening; as "commander of the boat", he gave the navigating instructions and acted as chief hunter.

The man seated behind him his son-in-law, son, brother, a hunter in training or hunting partner was expected to steer the boat and to keep it stable when not moving (fig 15). However, he also had harpoons within reach and could use them.

### **The Sea Otter Hunt**

Before their discovery by the Russians, the Aleuts enjoyed the benefits of an extremely rich marine environment in terms of aquatic mammals (whales, sea lions, eared seals, seals, sea otters) and it was this ecological wealth which had permitted and encouraged their population growth. The extent of the Aleut population in the mid eighteenth century which was exceptional for a group of Arctic hunter gatherers is attested to by archaeological and ethno-historical research (16,000 people, by Kroeber's estimate).

The sea otter was one of the most highly regarded forms of small game among the Aleuts. Not only was its meat considered excellent eating and its fur used to make the finest and warmest women's garments, but this animal, which was considered almost human, held a very important place in Aleut culture and mythology.

Unfortunately, it was the presence of this species, whose habitat covers a very limited area of the world, which led to the influx into this region of the Russian or Siberian traders drawn by the very lucrative fur trade, and to the near extermination of the native human population.

The sea otter (*Enhydra lutris*) is a small, carnivorous sea mammal of the family Mustelidae, adult males measuring 1.50 m long and weighing approximately 35 kg. Its extremely restricted habitat includes the reefs, islets, rocks or shores north of the Kurils, along the east coast of the Kamchatka Peninsula, the Aleutian Islands and the shore of the North Pacific as far as California. Its thick, glossy and extremely soft fur, which may be rust colored, brown or sometimes almost black, was, from the early eighteenth century, a valued item in Russian Chinese trade to satisfy the demand of the mandarins of Peking.

The Aleuts considered the behavior and body structure of the sea otter as almost human and, in their legends, attributed to this animal a human origin (see below). In fact, the otter has short forelegs, ending in five digits, which it uses like hands. In addition, it is one of the rare animals which, like man and the chimpanzee, is capable of using tools. For instance,

swimming in its favorite position, on its back with its head raised out of the water to look around, the otter uses a flat stone to crush the shells of the cockles, mussels, sea urchins or crabs which it has caught and arranged on its abdomen as if on a table, then carries the food to its mouth with its forepaws.

The otter is playful and loves to clown. The female is devoted to its young, which she carries on her abdomen and defends courageously from danger. Its cries are almost human.

### **The Legend of the Otter, Chngatux**

The almost human behavior of the sea otter is explained in Aleut mythology by the human origin of this animal. From village to village, there are different versions of the legend, which is reported by a number of authors (Choris, Golder, Heizer or Petroff) and which was repeated to me as well during my stay in 1971; but the principal theme remains the same: the first otters were born when a man and woman who had been involved in an incestuous relationship threw themselves into the sea.

According to some versions, a brother takes advantage of his sister under cover of darkness. When, by means of a trick, she learns her lover's identity, she leads him to the top of a cliff, from which they leap into the sea. Where they fall, their parents, who had set out in pursuit, see two otters appear.

In other versions, a husband discovers the liaison between his wife and nephew (or between his wife and brother-in-law). The husband invites his rival to a feast, during which he cuts off his head before his wife's eyes. The woman then takes her lover's head and throws herself off a cliff into the sea. In the very spot where the "offending couple" vanish, the husband sees two sea otters appear.

### **Rites of Preparation for the Hunt**

Having been born from a "forbidden" relationship between a man and a woman, the otter has a horror of anything which may recall its origins. A hunter who hopes to approach and harpoon an otter must therefore abstain, before the hunt, from all contact with women, for the otter will detect the scent of the woman and flee. Although the otter is very short sighted, it is known to have a very highly developed sense of smell.

According to two informants from Ummak Island, the hunter would avoid his wife for three months before setting out to hunt the sea otter. The taboos relating to women extended to all the clothing or instruments to be taken on the hunt, and even to the utensils from which the man ate: under no circumstances was she to touch his bowl, spoon or plate.

The hunter, in turn, had to be extremely cautious, as has already been pointed out in connection with women's participation in the construction of the kayak; he had to be sure that no woman's hair was caught in the seam of the kayak cover, or fell on his hunting clothes.

All sorts of purification rites involving washing, as well as feasts or ceremonies reserved exclusively for men, were included in the preparations for departure, in order to guarantee the hunters a safe and successful hunt. According to Veniaminoff, if the taboos and rituals were not observed, the hunter might well find himself surrounded by otters splashing his kayak and his face in derision, without being able to capture a single one (quoted by Hrdlička, p 138).

Finally, in order to attract this type of game, which is sensitive to beauty, the hunter took the greatest care to embellish his boat, his tools and his clothing. Nineteenth century observers in fact were amazed at the contrast between this concern for everything having to do with the hunt and the "disgusting filth" of the Aleut settlements in which everyday activities took place.

### **Hunting Techniques**

The naturalist Steller, who accompanied the Bering expedition in 1741, observed that at that time (that is, at the time of the discovery of the Aleutian Islands by Westerners) sea otters were abundant (8) and had no fear of man. He describes these animals coming to shore to feed and rest and willingly approaching the campsites. Yet it was only a few decades later that the otter, systematically pursued under the pressure of the Russian fur traders, became a hunted and extremely wary animal, avoiding the shores and resting only on offshore beds of floating seaweed which acted as a kind of raft.

The hunt became more difficult for the Aleuts, who found themselves impressed into service by the Russian traders, or who wanted to trade the sought after furs for European products: tobacco, beads, metal, clothing, flour, sugar, tea and, of course, alcohol. They were forced to undertake ever longer, more distant and perilous expeditions.

Bill Tcheripanoff's knowledge of this subject came essentially from his father (Mathew, who lived from 1865 to 1934), since the sea otter hunt was finally banned in 1911. In the last quarter of the nineteenth century, the best hunting grounds were the rocks south of Unimak, the Shumagin Islands and, especially, the many small rocky islets and seaweed banks located in the Sanak Islands group. It was in this Sanak hunting area, which covers barely 180 m<sup>2</sup> and in whose shallow waters the otters can easily find the shellfish on which they feed, that most of the hunters from the entire archipelago converged towards the end of the nineteenth century, in search of the precious game which by then had disappeared from the rest of the region.

The otter hunters were away from their villages for several months at a time, between May and the end of August, and lived in camps without female companionship, except perhaps for one or two elderly women who handled the domestic duties, and often without fire, for fear that the smell of smoke would frighten away the otters. Hunting conditions were at their best in May and June.

### **Hunting with the Harpoon**

Despite the introduction of firearms at the end of the nineteenth century, the silent harpoon remained the preferred weapon for hunting otter, which have an extremely keen sense of hearing. For the same reason, the kayak - also silent - remained the only means of approaching this wary creature; and Westerners (Russians, and later Americans), unable to adapt to this type of hunting, were forced to deal with Aleut hunters in order to obtain furs.

The harpoon thrower, which was made of wood and painted red and black (see above, p 11), is an important part of the weapon: it increases the force and distance of the throw. To be completely effective, it must be properly fitted to the hand, and therefore it was made to the dimensions of the user's hand (fig 17). "I'll take your hand measurements and make you a thrower; it'll be narrow, because your hand isn't very big", Bill Tcheripanoff told me. If the hunter were left handed, the thrower would be reversed.

W. Laughlin estimates that a goad hunter could hit a target accurately with his harpoon from a distance of 40 meters.

The harpoon: the detachable bone head, with its three barbs, would separate from the middle section of the harpoon when it entered the animal's body, where it would be caught by its barbs; but it remained attached to the shaft of the harpoon by a line of braided tendons approximately 1.20 m long (fig 16).

The shaft, composed of a piece of light wood, painted red, and a piece of bone, would then straighten up and emerge vertically from the water (the heavier bone portion remaining submerged). The wounded animal was thus slowed down, unable to escape by diving, and easy to locate (fig 15). Bill Tcheripanoff claims that the harpoon was as good as a rifle and that it had the additional advantage of preventing the quarry from sinking. However, it required long training to throw the harpoon with strength and accuracy. In the past, children practiced by throwing a ball of grass ever longer distances.

### **The Technique of Encircling**

This was a collective form of hunting which was used when the weather was calm and there was little or no fog two conditions rarely combined in these regions. A fleet of perhaps a dozen kayaks, spaced 50 to 100 meters apart, would set out in search of the precious game, under the direction of an expedition leader. As soon as an otter was spotted by one of the hunters, he would raise his paddle in silence and indicate the direction to be taken. All the kayaks then formed a huge circle around the spot where the otter had come up for air (it breathes normally approximately every ten minutes), then, as it grew winded by this pursuit and began to appear more frequently to catch its breath, the circle would tighten around it. Finally, when it was within harpoon range, the closest hunter would throw his weapon, and the others would follow (fig 19). Once immobilized, the animal was dispatched by a blow from a club. It was only on the return to land that the expedition leader, in the presence of the hunters, could identify the owner of the game. According to Petroff, it was the head of the harpoon (bearing the hunter's personal mark) which had mortally wounded the animal which determined its owner and, to Hooper's great astonishment, there was rarely any dispute over the assignment of the game. The skin was cut at the otter's hind legs, then pulled from the animal's body and allowed to dry with the fur turned inside.

### **The Technique of Hunting During a Storm**

This required a great deal of courage on the part of the hunter who dared to venture out in his kayak, on a stormy sea, in search of otters which had taken shelter from the storm on small islets. Under cover of the howling wind and waves, the hunter could then land without being heard and approach and club the otters.

### **The Technique of Surf Shooting**

As described by Elliott, this is related to the introduction of the rifle in the late nineteenth century, when Alaska became an American colony (in 1867). American traders distributed rifles to a number of young natives to enable them to hunt otter at sea, in bad weather so that the animals would not hear the sound of the rifle. But this type of hunting involved some losses, since if the animal was killed instantly, it would sink.

### **The Return of the Hunter**

On his return from a successful expedition, the otter hunter was required to perform certain necessary rites in order to guarantee other equally successful expeditions. Before entering his home, he would throw the clothing and instruments which he had used during the hunt into the sea, so that the relatives of the slain otters, on finding them, would assume that the murderer in turn had drowned. In this way, the hunter was protected from the avenging spirits of the sea otters. Next, he would rub his hands with grass, wash his face, put on new clothes prepared by his wife during his absence, and only then could he enter his home. The return was then celebrated by the whole community, but the hunter never related the adventures encountered on his travels and hunts in front of the women, and they never asked him about them. Each sex, men and women kept its repertory of stories and songs secret.

### **The Disappearance Of The Sea Otter And The Decline Of The Aleut Population**

Following the return of the survivors of the Bering expedition, the news of the great wealth in fur bearing animals of the islands discovered spread quickly through Eastern Siberia. Numerous expeditions of traders and hunters were hastily prepared, attracted by the substantial profits to be gained from the pelts, particularly the sea otter skins so highly

appreciated in China. In 1746, seventy Russian vessels left Kamchatka for the Commander and Aleutian Islands.

Poniatowski describes the crews of these small vessels as follows:

“The crew, of fifty or more men, was formed of outlaws, escaped convicts, exiles, most of them so sentenced for theft or vice, criminals and unscrupulous adventurers, overseen by a half dozen Cossacks, expected to maintain order with their fists and whips and, if necessary, with their guns, all under the command of one officer, often an exile himself” (1978 edition, p 48).

It was these rough and brutal men who took up the Western penetration of the Aleutian archipelago and subjugated the population to the Court of Russia, demanding a tribute of furs on behalf of the Tsar. They indulged, for amusement, in scenes of incredible cruelty and brutality, decimating entire villages, holding women and children hostage, or forcing the Aleuts to hunt for them under perilous conditions. The Aleuts resisted and revolted on a number of occasions, but they were no match for the Russians with their firearms. Along with the massacres and forced labor, these foreigners brought the ravages of the diseases they carried with them: smallpox, measles, whooping cough, venereal disease, etc, all of them previously unknown among the Aleuts.

Thus the Aleut population, so prosperous at the time of its discovery (approximately 16,000 individuals in 1741), dwindled, according to Sarycev’s estimates, to 2500 individuals fifty years later.

The Imperial Government at St Petersburg, which was repeatedly informed of the situation of the Aleuts, attempted to halt these massacres, but the islands were far away and the activities of the Cossacks difficult to control.

Coxe, in 1781, writes in the foreword to his book:

“The (Russian) vessels rarely return without having massacred a large number of islanders... Is it then such a great advantage for Russia to subjugate these poor tribes and to wrest a few pelts from them? It must be acknowledged that the Russian seamen are inhuman and that they slaughter the people of the islands where they

land on the slightest pretext.”

Sauer too writes, in 1792:

“It is most unfortunate that the Aleuts are subject to the caprice and tyranny of the Russians who hunt in these lands; men infinitely more barbaric than any of the native peoples I have there encountered. I know of no way of wresting the Aleuts from the yoke of these hunters, for the authority of the Russian government can almost never reach their islands. Their only hope of deliverance from their oppressors lies, I believe, in the total destruction of the animals which they hunt; and I daresay that, given the quantity of these animals which they kill each day, these species will soon be annihilated” (vol 2, p 145).

The Aleut population, reduced by the end of the eighteenth century to 15% of the level it had reached before the appearance of the white man, continued to decline, for Hooper’s census in 1897 found only 1165 natives living in the archipelago.

The otter too experienced the same tragic fate. Between 1745 and 1770, catches totaled tens of thousands each year, but their numbers soon began to decline. Expeditions became less successful, bringing in barely a thousand pelts at a time; yet the extermination continued.

From Kamchatka (Okotsk or Petropavlosk), the skins were sent overland to Yakutsk, Irkutsk and then to Kiakhta on the Chinese border, where they were then traded for Chinese goods; from there, they went on to Canton or Peking. All along the way, they increased in value; while the Aleuts were “sometimes paid one leaf of tobacco for a day’s hard labor” (Sauer, vol 2, p 148), “an otter skin of ordinary quality, but in good condition, was sold for 20 rubles in Kamchatka, but for 40 rubles at Yakutsk, for from 50 to 80 rubles at Irkutsk and for as much as 150 rubles at the border” (Poniatowski, p 52).

In 1845, a number of provisions were introduced to protect the sea otter from total extinction; they created a number of protected areas to encourage the redevelopment of the otter population, or tended to limit hunting; as a result, by the time Alaska was ceded to the United States in 1867, the animal resources were already beginning to recover. However, as an American colony, Alaska was once again exposed to the greed of the fur

traders - American this time - and the search for furs experienced an intense revival between 1880 and 1890. According to Petroff, in 1880, many Aleut villages still lived exclusively on the otter hunt, particularly in the Krenitzin Islands group, where Akutan is located. It was the Aleuts' chief means of subsistence; otter skins could be purchased for \$30 to \$50 from the hunters and sold on the London market for between \$80 and \$100. However, in 1897, when Hooper made his report on the sea otter, its customs, habitat and distribution, he noted that the species was practically extinct in the Aleutian islands, including Sanak (9). He denounced the economic problems then facing the Aleut population, which was dependent on it, and urged that emergency regulations be imposed prohibiting netting and deep sea hunting from schooners, and allowing only the Aleuts the right to hunt the otter from their kayaks.

In 1911, an international agreement finally prohibited the sea otter hunt in every form. Thus the fate of the Aleuts has been bound up with that of the sea otter: since their first appearance in Western history, their decline has followed parallel curves; in the same way, the instruments which the Aleuts used to capture the sea otter, the kayak and the harpoon, were also to disappear.

The considerable role which the kayak and the otter played in Aleut culture is evident in the place which they still hold today in the oral tradition tales, legends and songs despite the fact that the otter hunt came to an end nearly a half century ago. The Aleut population, demographically and economically weakened, has turned in recent years towards modern life, adopting means of transportation which are easier to use, if less adapted to their climate, and abandoning hunting for commercial fishing and paid employment in the fish canneries.

## Notes

1. An Aleut from Umnak, who settled in Akutan in 1924, recalls that there were still kayaks in the village at the time of his arrival.
2. The word baidar is still used in a number of Russian dialects to designate a boat.
3. The root ullux means meat, flesh, the human body, and designates the opening where a man sits in a kayak. The symbol x is pronounced like the German ch in "noch" or "auch" and the symbol g like the German ch in "ach".
4. Among the coniferous woods washed up by the currents, Aleut informants distinguish primarily:
  - a. spruce (Abies sitkensis), which is the wood most commonly found. It was considered a strong wood and was used for the frame of the kayak and often for the paddle.
  - b. yellow cedar (Cupressus nutkanensis), which is a light, strong, durable wood with a fine texture, and can be curved without breaking after soaking. It was used for the ribs of the kayak, the opening, the water container and the thrower, but never for the paddle, "because it absorbs moisture"; red cedar (Juniperus virginiana), a light wood used for the shaft of the harpoon, the bailer, the knife holder, but never for the frame of the kayak, "because it is too light and it breaks".
5. According to Bill Tcheripanoff, it represents an otter swimming on its back, the anterior portion of the fork representing the head and the other portion the animal's forelegs. According to an informant from Umnak, the entire stem post represents the head of an otter with its mouth open.
6. The theme of women's power and the taboos relating to them in terms of the hunt is dealt with in another article, now in press.

7. The passage through Unimak Pass, between Ugamik and Unimak islands, has always been considered dangerous, because of its length (40 km at the narrowest point) and the strength of its currents.
8. In 1743, the survivors of the Bering expedition brought back a large number of otter skins to Petropavlosk, in Kamchatka.
9. During this period, the Aleut hunters were taken by schooner with their kayaks to Kodiak, to continue the hunt in the only region where these animals could still be found: southwest of Kodiak Island.

## Figures

FIG 1 - Map showing the traditional habitat of the Aleut population: the archipelago of the Aleutian Islands and the tip of the Alaska peninsula as far as Port Moller. The Pribilof Islands and the Commander (Komandorskiye) Islands were not inhabited until relatively late, towards the end of the eighteenth and the beginning of the nineteenth centuries respectively, by Aleut families transplanted by Russian colonizers (Map prepared by D Fouchier, Centre de recherches Anthropologiques, Musée de l'Homme).

FIG 2 - One man kayak shown in an engraving from Le troisième voyage de Cook, III, Paris, 1785, from a drawing by John Webber. In June 1778, an Aleut hunter from Unalaska, wearing a wooden visor decorated with sea lion whiskers and dressed in a chigidax, or waterproof garment, approached Cook's vessel, the Resolution, (Document private collection, photo Musée de l'Homme. J Oster).

FIG 3 - Different types of kayaks from the Aleutian Islands: one man kayak, with skin covering, fully equipped; and wooden frame of a two man kayak. In: Choris, Voyage pittoresque autour du Monde, plate VIII, Paris, Firmin Didot, 1822, (Document of the Société de Géographie, photo, J Robert-Lamblin).

FIG 4 - Scale model of a three man kayak (length 48 cm, width 6.2 cm). The frame, of red painted wood, is covered by a sealskin envelope, the upper seams of which are decorated with strands of red and blue wool (Collection Musée de l'Homme, Paris, M H 08,1.1.. photo J Oster).

FIG 5 - Units of measurement used by Bill Tcheripanoff in making a two man kayak and sea otter harpoon. The values of these measurements are given in centimeters: they represent the informant's body measurements.

1. distance between the tips of the middle fingers, both arms extended, that is, a "span";
2. distance between the tip of the middle finger of one arm, extended, and the tip of the chin, with the head turned in the other direction;
3. distance between the tip of the middle finger of one hand and the tip of the elbow of the other arm, bent;

4. distance between the tip of the middle finger of the right hand and the tip of the elbow of the right arm, bent, that is, a "cubit";
5. linear distance between the tip of the thumb and that of the middle finger, spread (right hand);
6. linear distance between the tip of the thumb and that of the index finger, spread (right hand);
7. width of three fingers: index finger, middle finger and ring finger (right hand);
8. width of two fingers: index finger and middle finger (right hand);
9. length of the first two joints of the index finger (right hand);
10. length of the first two joints of the middle finger (right hand);
11. linear distance between the tip of the thumb and that of the index finger, bent (right hand);
12. width of the chest. (Sketch D Fouchier, CRAMH).

FIG 6 - Details of the construction of a two man kayak.

1. side view of the two man kayak, ullux, and the seams of the four skins covering the frame.
2. Bailing system, uyuxqoleq, consisting of a skin tube tied shut.
3. the deck of the kayak, with hunting and navigational equipment attached by leather straps.

Sternman's equipment (hunting partner):

1. buoy (stomach of a sea mammal, inflated), sanxug
2. individual water container, wood, tangadquseq
3. wooden bailer, minmax
4. whalebone club, aneux
5. various harpoons or spears
6. thrower, asxux
7. bone paddle holder, anaxseq

Bowman's equipment (owner of the kayak):

1. buoy
2. water container
3. bone paddle holder
4. harpoons or spears
5. club
6. thrower

A passenger, or freight, could occasionally be transported inside the kayak between the two paddlers (Sketch D Fouchier, CRAMH, from descriptions and drawings provided by Bill Tcheripanoff).

FIG 7 - Cross section of the kayak, showing the structure of the hull and the profile of the deck (forming a medial ridge)

1. gunnels
2. keel
3. stringers
4. longitudinal
5. hoop of opening
6. beam
7. rib
8. leather envelope
9. central stringer (Sketch D Fouchier, idem).

FIG 8 - Detail of the prow, saningin, and the stern, ukunyulax,

- the stern post and the skin envelope covering it
  - the stem post, represented hereby a single piece of wood, but often composed of two parts, either mortised in or attached with thongs.
1. chukchadax
  2. changeq (Sketch D Fouchier, idem).

FIG 9 - Bailer (length 46 cm, width 17.8 cm). Two hollowed out pieces of wood are attached together by a small cord at the centre and at the two ends. At each end, there is an opening. Through one of these openings, the hunter sucks up any seawater which has entered his kayak, then plugs the other opening with his finger and throws the water overboard (collection of the National Museum of Copenhagen, Ethnographic Division, No P 538, photo J Robert-Lamblin).

FIG 10 - Double paddle, akadguseq, of light, strong wood. Measurements of length; the width may vary. The blades of the paddle have a medial rib on each side. (Sketch D Fouchier, CRAMH, from information supplied by Bill Tcheripanoff).

FIG 11 - Aleut hunter in a kayak, about to toss his harpoon, using a thrower. Scale model brought from Unalaska in 1872 by Alphonse Louis Pinart. The kayak is made of wood, covered with oiled, translucent skin, and the hunter's garment of seal intestines. On the deck of the kayak, attached by leather straps, are a number of wooden instruments painted red and, in some case, black as well: a long geometrically cut and sculpted piece, a paddle, a club, and seven wood and ivory harpoons. Length of the kayak: 42 cm. (Collection of the Musée municipal de Boulogne-sur-Mer, No 168, photo J Robert-Lamblin).

FIG 12 - Kayaks off the small trading centre of Unalaska in the early nineteenth century. In: Choris, Voyage pittoresque autour du monde, plate VII, Paris, Firmin Didot, 1822. (Document of the Société de Géographie, photo J Robert-Lamblin).

FIG 13 - Lithograph showing the physical characteristics and dress of the inhabitants of the Aleutian Islands. The man is wearing hunting dress: kamleika (a long, hooded waterproof garment made of horizontal strips of dried sea lion or seal intestines, sewn together) and wooden visor decorated with beads and sea lion whiskers. In: Choris, Voyage pittoresque autour du monde, plate V, Paris, Firmin Didot, 1822 (Document of the Société de Géographie, photo J Robert-Lamblin).

FIG 14 - A-L Pinart's traveling companions on his kayak tour of the Aleutian archipelago in 1871. The three man craft is probably the one in which the young explorer traveled (Iliouliouk, May 1871) (Document of the Société de Géographie, WF America 159 No 13, photo Bibliothèque Nationale).

FIG 15 - Sketch by Bill Tcheripanoff showing a sea otter hunt from a two man kayak. The otter is swimming on its back, dragging the shaft of the harpoon by which it has been wounded. In the kayak, it is the hunter seated in front who has thrown the harpoon, while the other hunter is steering and stabilizing the craft (Sketch drawn at Akutan, summer 1971).

FIG 16 -The sea otter harpoon: iglax, shape and dimensions as described by Bill Tcheripanoff.

1. wooden shaft, uyuchtax: 92 cm long
2. middle section, tumgwax, whalebone, attached to the shaft: 23 cm.
3. detachable bone head, saxsidax
4. line of braided tendons, umnax, connecting the tip of the harpoon to the shaft: approximately 1.20 m.
5. thrower, ásxux: 40 cm.
6. hole in the end of the shaft, designed to fit over the bone hook of the thrower.

FIG 17 - The harpoon thrower, ásxux: shape and dimensions as described by the same informant. The thrower is a wooden stick which acts as an extension of the hunter's arm, to increase the force and distance of throw.

- lower surface, which is held in the hand
- upper surface, which fits into the shaft of the harpoon
- longitudinal section
  1. bone or ivory hook designed to fit into the end of the harpoon shaft
  2. longitudinal groove, chilamaga, which keeps the harpoon on the thrower during the act of throwing; it must be accurately made if the harpoon is to be thrown properly
  3. opening through which the hunter places his index finger
  4. indentation for the thumb
  5. indentation for the other three fingers of the hand.

(Sketch D Fouchier from information provided by Bill Tcheripanoff)

FIG 18 - The principal informant for this study, Bill Tcheripanoff (born 1902), presenting the braided intestine of a seal, ready for cooking, a favorite dish among the Aleuts (Photo J Robert-Lamblin, Akutan, summer 1971).

FIG 19 - Aleut hunter's hat, made of light wood and decorated with multicolored paintings very realistically depicting various marine mammals (whales, beluga, sea lion, octopus, etc) and scenes showing kayak hunting. On the original lithograph, the colors black, red, light blue and light green reproduce the paints of mineral or animal origin traditionally used by the Aleuts. Two scenes showing the sea otter hunt, using the technique of encircling by a fleet of kayaks, are pictured: in one, the otter is swimming alone and in the other she is holding her young between her forelegs. In: Choris, Voyage pittoresque autour du monde, plate IV, Paris, Firmin Didot, 1822. (Document of the Société de Géographie, photo J Robert-Lamblin).

## Bibliographical References

Adney (Edwin) and Chapelle (Howard)

1964 - The bark canoes and skin boats of North America. Washington, Museum of History and Technology, Smithsonian Institution, Bulletin 230.

Applegate (Samuel)

1893 - The Third or Unalaska District. In: Report on Population and Resources of Alaska at the Eleventh Census of the US: 1890. Washington, Government Printing Office, pp. 81-90.

Beaglehole (J.C.) ed.

1967 - The Journal of Captain James Cook Voyages of Discovery, vol. 3: The voyage of the Resolution and Discovery, 1776-1780, parts 1 and 2. London, Cambridge University press.

Birket-Smith (Kaj.)

1955 - Moeurs et coutumes des Eskimo. Paris, Payot.

Bushnell (David)

1928 - Drawings by John Webber of Natives of the Northwest coast of America 1778. Smithsonian Miscellaneous collections, vol. 80, nr 10, 12 p. et 12 pi.

Choris (Louis)

1822 - Voyage pittoresque autour du monde. Paris, Firmin Didot.

Collins (Henry)

1945 - The Aleutian Islands: their people and Natural History, War Background Studies, n°21 Smithsonian Institution.

Cook (James) see Beaglehole (J.C.) ed.

Coxe (William)

1781 - Les nouvelles découvertes des Russes entre l'Asie et l'Amérique. avec l'histoire de la conquête de la Sibérie et du commerce des Russes et des Chinois

Translated from the English, Paris, Hôtel de Thou.

Elliott (Henry)

1884 - Report on the Seal Islands of Alaska. In: the Tenth Census of the United States, t.8.

1886 - An Arctic Province : Alaska and the Seal Islands London, Sampson Low.

Heizer (Robert)

1960 - The Aleut sea otter hunt in the late nineteenth century. Anthropological papers of the University of Alaska, vol. 8, n°2, pp. 131-135.

Golder (Frank)

1905 - Aleutian Stories. The Journal of American Folk Lore, vol. XVIII, pp. 215-222.

1907 - The songs and stories of the Aleuts, with translations from Veniaminov. The Journal of American Folk Lore, vol. XX, pp. 132-142.

Hooper (Calvin)

1897 - A report on the sea otter banks of Alaska. Washington, Government printing office, 35 p.

Hornell (James)

1946 - Water transport Origins and early evolution. Cambridge University press.

Hrdlička (Ales)

1945 - The Aleutian and Commander Islands and their Inhabitants, Philadelphia, The Wistar Institute of Anatomy and Biology.

Ivanov (S.V.)

1930 - Aleut hunting headgear and its ornamentation. Proceedings of the Twenty third International Congress of Americanists. New York 1928, pp. 477-504.

Jochelson (Waldemar)

1913 - Scientific results of the ethnological section of the Raibouschinsky expedition

of the Imperial Russian Geographical Society to the Aleutian Islands and Kamchatka. International Congress of Americanists, London 1912, part 1, pp. 334-343.

1933 - History, Ethnology and Anthropology of the Aleut. Washington : Carnegie Institution of Washington, publication n° 432, Réédition 1968, New York, Humanities press.

Laughlin (William)

1967 - Human migration and permanent occupation in the Bering Sea Area. In, The Bering Land Bridge, David Hopkins ed., Stanford University press, pp. 409-450.

1975 - Aleut adaptation and evolution in, Prehistoric Maritime Adaptations of the Circumpolar Zone. William Fitzhugh ed., Mouton pp. 181-203.

1975 - Aleuts: Ecosystem, Holocene History and Siberian Origin, Science, 15 August, vol. 189, pp. 507-515.

Liapunova, (Rosa)

1964 - Aleutskie Baidarki. Akademia Nauk SSSR. Moscou Leningrad. Sbornik Muzeja antropologii I etnografii, 22, pp. 223-242.

Lütke, (Frederic)

1835 - Voyage autour du monde exécuté par ordre de Sa Majesté l'Empereur Nicolas 1<sup>st</sup>, sur la coryette Le Séniavine das les années 1826, 1827, 1828, Historic portion with an atlas lithographed from the original sketches of Alexandre Posteles and Baron Kittlitz, 2 vol. Paris Firmin Didot.

Marsh (Gordon) and Laughlin (William)

1956 - Human anatomical knowledge among the Aleutian Islanders. Southwestern Journal of Anthropology, vol. 12, n°1, Spring, pp. 38-78.

Menovshchikov (G.)

1976 - O Nazvaniyakh I Funktsiyakh Lokok Tipa Umiak, Aniak, Kaiak U Eskimosov I Aleutov. Sovetskaya Etnografiya, t.2, pp. 112-117.

Petroff (Ivan)

1880 - Population and resources of Alaska. 46th Congress, 3d Session, House of Representatives. ex Doc. n°40.

1884 - Report on the population, industries and resources of Alaska at the Tenth Census of the US: 1880. Washington, Government Printing Office, t.8.

Pinart (Alphonse)

1873 - Voyage á la cte nord-ouest d'Amérique d'Ounalashka à Kadiak (iles Aléoutiennes et péninsula d'Aliaska). Bulletin de la Société de Géographie, Paris, Déc., série VI, vol. 6, pp. 561-580.

1875 - La chasse aux animaux marins et les pêcheries chez les indigènes de la cte Nord-Ouest d'Amérique. Boulogne-sur-mer, Charles Aigre. 15 p.

Poniatowski (Michel)

1956 - republished 1978. Histoire de la Russie d'Amérique et de l'Alaska. Paris, Librairie académique Perrin.

Quimby (George)

1844 - Aleutian Islanders, Eskimos off the North Pacific. Chicago Natural History Museum, Anthropology leaflet n°35, 47 p.

Robert-Lamblin (Jolle)

1975 - Eskimo Ammassalimiut et Aléoutes Qigeron: différences écologiques, historiques, démographiques. L'Anthropologie, t.79, n°3, pp. 519-536.

1976 - Exploration de l'archipel aléoute (Alaska) par le Français Alphonse-Louis Pinart, en 1871-72. Bulletin de la Société suisse des Américanistes, n°40, pp. 19-27.

In press - "Woman's role and power within the traditional Aleut society. Conference on hunting societies. Paris, Unesco, 27-30 juin 1978.

Sauer (Martin)

1802 - Voyage fait par ordre de l'Impératrice de Russie Catherine II, dans le Nord de la Russie Asiatique, dans la mer Glaciale, dans la mer d'Anadyr et sur les côtes de l'Amérique, depuis 1785 jusqu'en 1794, par le Commodore Billings. Translated from the English, 2 vol, Paris, Buisson.

Steller (Georg Wilhem)

1926 - Von Kamtschatka nach Amerika (Bearbeitet von Dr. M. Hendrich). Leipzig Brockhaus.

Zimmerly (David)

1976 - Kayaks: their design and use. In, Wooden shipbuilding and small craft preservation. Washington: The preservation press national trust for historic preservation in the United States, pp. 71-74.

1978 - An annotated bibliography of kayaks. National Museum of Man, Ottawa, Canada, 27 p. typewritten.