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CHANGES IN THE SEDNA MYTH AMONG THE AIVILIK

EDMUND S. CARPENTER

The spiritualistic system of the Aivilik Eskimos requires no dichotomy between "natural" and "supernatural", but is linked practically with nature, although it implies occasional states of ecstasy which can be celebrated only in the language of myth. The Aivilik experience no need for postulating an order which operates by laws greater than, if not in opposition to, those which are apparent in the visible world.

All elders agree on the existence of spirit-beings, and their agreement is possibly only on the supposition that this has been demonstrated. However, belief in non-human personalities does not depend alone on the authority of elders; hosts of facts are completely incompatible with the non-existence of ghosts and the like. The Aivilik go far beyond mere faith. They encounter daily proof of the existence of such beings, many of whom they have actually seen.

Analysis of their spiritual beliefs reveals a pantheon of three orders based on function rather than graded power: first, there are the spirit forces on earth; next, a mid-pantheon of spirits above the earth, generally personifications of nature-forces; and finally, there is *Sumna,* protectress of sea mammals. In recent years *Sumna* has been replaced in this prominent role by the Christian deity, an upper, single force controlling the universe, and has been relegated to the role of the Evil One who personifies all the sins and vices held lowest in the esteem of the Aivilik.

Occasional prayers, threats and offerings, addressed to the unseen, or at least rarely seen, spirit world, commence on earth and run upward to the Supreme One. Specific rites fall loosely into three groups according to their function of bringing man into rapport with particular spirit forces. Thus, certain rites are addressed to the spirits of slain beasts, others to the souls of dead men. Next there is a mythology involving nature-forces intermediary between human society and the universe at large, for in Aivilik thought, all storms and winds, thunder and lightning, sun and tides, depend on the controlling powers of spirit beings. And third, a declining number of *angakok,* or medicine-man, are performances, characterized by seances where power and knowledge are derived from beings not earth-bound, and dominated by the idea of an ecstatic trip to the depths of the ocean, are still held. The remaining rites fall loosely under the general rubric of communications with the Christian deity, who, in his indefinable supremacy, resides in the sky dome.

Traditionally, this pantheon had no graded hierarchy, either spiritual or spatial. *Sumna* was an inmate of the sea; other deities resided in the firmament; still others roamed the earth with man. All differed, but were essentially of equal status. Since the introduction

of Christianity, however, the space above the earth has been divided into various concentric circles, with the uppermost considered the habitation of God. Today this orientation sways between the spiritual and the spatial, with the stress slightly, though unintentionally, more on the second than the first. But this must be accepted with caution, or at least with the understanding that we are dealing with later interpolations deliberately calculated to conform to Christian dogma.

Most prominent of all spectral creatures are *Sumna,* mistress of the nether world, and her husband, to whose lot dead Aivilik fall. *Sumna* was once a coy maiden who refused all suitors until at last a petrel won her heart by false promises. Embittered by her new life of discomfort and abuse, she conspired with her father to flee her island home. When the petrel discovered his loss he pursued them in a kayak and humbly begged to be allowed to embrace his children. "How could a bird have human children?" they mocked, and the petrel hung his head and fell behind. Almost immediately a giant gull appeared and, swooping down on the umiak, kept repeating, "How could a bird have human children? How could a bird . . . ?" Each time he dived closer and closer, the beat of his wings turning the calm sea to storm. The terrified father, intent on saving his own life, cast *Sumna* overboard. But she resolutely clung to the gunwale. In desperation her father cut off her fingers, joint by joint, and they fell into the water to become the animals of the sea. Still she clung to the Umiak, until at last her father struck out her left eye. Then she sank to the lower world where she lives today as protectress of the sea animals and guardian of the souls of the dead. All Aivilik who have seen her agree that she is a Cyclopean creature, *toogoyuktuk* in color (blue-green, no semantic distinction being recognized). For reasons unknown and by means unexplained, her husband is now a huge and hairless dog, who, Cerberus-like, guards the doorstep of her estate, keeping the living out and the dead in.

The traditional relationship between *Sumna* and man is clearly demonstrated in the following incident. Some years ago when game was scarce, an Aivilik family consisting of an old man, his two mature sons, and their families, was forced to separate and hunt in distant parts of Southampton Island. Months later, when the extended family was reunited, the elder son learned of the drowning of his brother. Yet he knew that the young hunter had led a good life—had been respectful to both beasts and deities. His death was obviously unjust. And so, announcing, "I am sure who took him," he picked up a walrus penis bone (symbol of obscenity and effective bludgeon), and walked across the water out of sight. When he reappeared, his brother was walking on the water behind him. The rescuer related that he had gone beneath the sea, stepped over the growling dog on *Sumna's* door-step, and entered her house. There he threatened her with the club until she released his brother.

In former days, the Aivilik had no end of stories like this. When, in spite of respect paid to animals, they found themselves starving

because *Sumna* withheld the game, hunters went below, threatened her, twisted her arm, and demanded that she supply them with animals to hunt. Or if man himself was at fault, an *angatkok* might placate this handless creature by combing her tangled hair. In either case she would yield, for she was by no means an absolute and implacable ruler. Rather, *Sumna* and man were members of the same society—the society of life—and were governed by the same rules of conduct.

Though never expressly formulated, the constitution of this society forbade the spiritual killing of any member. *Sumna,* man and all other members, were bound by this covenant of respect for life. The life of man or beast could not be taken without justification. Violation of this sacred constitution by any member was subject to rigid punishment. Whenever hunters offended the souls of animals by neglecting to observe the post-mortem rites which would assure the animals immortality, *Sumna's* retaliation—starvation, freezing, drowning—was ineluctable. And whenever *Sumna* violated this covenant by taking the life of an innocent hunter, they in turn never hesitated to rebuke or punish her.

For the Aivilik, then, deistic powers did not surpass man's but merely prevailed in specialized fields. *Sumna,* for example, was quite limited in her range of knowledge and was easily deceived by man. Far from being superhuman, she shared with him all the ordinary human attributes of sensation and emotion—pain, weakness, unhappiness, joy, and so on. She was pleased with offerings and with thanks; she was ashamed if accused by men of having acted unjustly; she was angry when men tried to cheat her, insult her, or withhold from her wards prescribed offerings from the chase.

The myth of *Sumna,* then, reflected a belief in the unity of all life. Clearly, this was no idle tale prone to revision or rejection. On the contrary, it was deeply infused with, indeed based upon, emotional attitudes of great strength and practicality. This is borne out by the way in which Aivilik converts to Christianity have failed to wipe the slate clean of spirits. Today there is recognition of the existence of a god superior to and more powerful than *Sumna;* and there is recognition of Jesus as the Son of God who came to save the world from sin. But there is no acceptance of the idea that *Sumna* and the old spirits do not exist. The missionary says they are false, and the Aivilik accept this as meaning that they are evil and deceitful or simply outworn and inefficient. But the Aivilik still believe that the ancient spirits exist and can interfere in the affairs of men if allowed to do so. In fact, some hold that *Sumna,* angered at her rejection, punishes her former adherents by famine. This is the standard explanation for the recent depletion of game animals. It is thought that she is restrained from further revenge only by the powers of the new deity.

Christianity, then, does not stand alone in the new spiritual order. Catholicism has, in a sense, not destroyed but merely enlarged the native pantheon. The priest strives to root Christianity in native soil in accordance with the dictum of Gregory the Great, viz., to eradicate

only the specifically pagan and leave everything useful undisturbed. Such is not the case, however, with Anglican converts who are pledged to avoid "untruth", meaning the dangerous exercise of poetic imagination in pagan myth and allegory.

To both Catholic and Anglican converts, *Sumna* has become synonymous with the Devil and is now referred to as the "Evil One" or the "Goddess of Evil". This transition has not been sharply contested by the missionaries. For one thing, Christians, though they cannot dispute with God, traditionally at least, can bargain with the Devil. Furthermore, *Sumna's* home, being located below and regarded as a prison for offenders' souls, is easily construed as Hades.

Yet even as the Devil or Evil One her role is still paramount. Not only is she frequenly seen, but in recent years she has been attacked twice. In the winter of 1949-50 an Aivilik hunter, his wife and mother, were travelling north by dog sled when they found their trail blocked by a great white phantom that bobbed on the snow before them. In actuality, it was a hydrogen-filled radio-sonde balloon that had been sent aloft by a government weather station. But to the terrified natives it was a manifestation of everything evil, consummated and expressed in a form which stood less than thirty feet before them. Frantically the hunter fired—again and again, but his bullets merely pierced the rubber, permitting just enough gas to escape to keep the balloon bobbling wildly. In desperation he drew his knife, sprang forward, and destroyed it. Until accurately identified, the torn balloon was triumphantly exhibited as the Devil in every camp on the Island.

About six years earlier the United States Air Force installed a blinker on Bear Island just off the south coast of Southampton. Evarshar, thinking it was the Devil *Sumna,* harnessed his team and went out on the ice where he shot out the beacon.

In aboriginal Aivilik thought, there does not appear to have been any such division of spirit forces into those of "good" and "evil", at least, in our sense of the words. There were ghosts and curses, familiars, and charms. But all these came under the head of Power rather than Will, and a deity evilly disposed one moment could always be propitiated or coerced into a favorable attitude the next.

Under Christian influence, however, deity attributes have become more stable, and have tended to divide the spirit world into opposing camps. Certain evidence argues for the presence in the new pantheon of a Goddess of Good whose name is too holy to be pronounced. Aivilik are obliged to refer to her by periphrases and even periphrases of periphrases. At times she is merely called *Pakima,* "above". This circumlocution, plus the confusion of a syncretic religion, makes it difficult to say more. That she resides in the sky realm, all agree but beyond this few will venture an opinion. To what extent, if any, this deity originated in, or was influenced by, Christian theology, it is difficult to say. I suspect that the Goddess of Good is actually a combination of the Virgin Mary and *Sela,* "weather"—controller of nature. Nevertheless, she is a very real thing to the modern Aivilik.

Her presence has introduced into their thought the element of dualism which interprets the cosmic process as a struggle between Good and Evil principles where the issue has not yet been decided. Although Christian orthodoxy insists that the issue was decided, once and for all, by Jesus on Calvary, dualistic heresy persists in the convert's mind and is symbolized in his mythology. Thus, all Aivilik believed Monapik when he recently told of having come upon the Goddesses of Good and Evil as they fought over the soul of a dying woman. Inasmuch as the woman had observed during her lifetime the ancient taboos, it was the Goddess of Good who won possession of her soul.

Today most Aivilik like to burn candles in little bowls of ruby glass before statues of a clear-skinned young woman dressed in blue with stars about her head and a child in her arms. The attributes of this member of the Christian family are remarkably close to those of *Sumna*, Goddess of the Sea Animals, who was worshipped before Christianity reached this land. For *Sumna* was the fruitful sea itself, sister of *Sela* who symbolized the natural order. Behind both lay a profound and healthy respect for fertility and life. Aivilik converts, in kneeling at the altar of the new deity, continue to worship those virtues which their forbears considered divine.

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ARCHAEOLOGICAL EXCAVATIONS AT KOTZEBUE, ALASKA

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INTRODUCTION

The Kotzebue area is situated at the mouth of Hotham Inlet on a narrow peninsula which forms the eastern shore of Kotzebue Sound (Fig 1). The present village of Kotzebue stretches along a series of gravel beaches at the northwest corner of the peninsula. To the southwest of the village are miles of alluvial tundra plain and behind the village to the southeast is a large saltwater lagoon with a narrow inlet at its northern extremity. Between the lagoon and the beach are several brackish and fresh water lakes.

At first glance the Kotzebue area does not seem suitable for a village of any size. Fresh water is difficult to obtain during the summer, and driftwood, for building and fuel, is not plentiful. The sea coast is also low and the water shallow so that the village is in danger of damage by moving ice and high water. However, the region affords good year-around hunting and fishing. Today sea mammal hunting is best in the vicinity of Cape Blossom with the hair seal, bearded seal and white whale being the most important. Walrus and the larger whales are seldom utilized because they almost never come into the shallow water of Kotzebue Sound. Fishing is particularly good at all times of the year with salmon, white fish, herring, tom cod, shee fish and pickerel being the most important to the natives. Large land animals are not plentiful in the area today but the archaeological evidence suggests that in the past caribou frequented the coastal region in great numbers. Ducks and geese are plentiful at certain times of the year and the low tundra country around Kotzebue affords a great variety of plant food in the spring and summer. Today the people solve their fuel and building problem by bringing boat loads of driftwood from the mouth of the nearby Noatak river. Snow for drinking purposes also can be brought by boat from certain sheltered places along the coast where it stays until late in the summer.

Hotham Inlet, which receives the combined waters of the Kobuk, Noatak and Selawik rivers, escaped the observation of Kotzebue during his trip, in 1816, into the body of water bearing his name, and was discovered by Captain F. W. Beechey, R. N., of H. M. S. *Blossom* in July of 1826. He named it for Sir Henry Hotham, K. G. B., a Lord of the Admiralty (Beechey, 1831, p. 342).

An estimate of the population of Hotham Inlet may be obtained from Captain Beechey's report as he mentions that 150 men in boats approached the ship's barge at one time to trade. This was in July of 1826 and when the barge returned to the same area in September, not a single tent was left of the large tent village that had apparently existed there earlier in the summer. (Beechey, 1831, pp. 351, 441).

The tent village referred to by Beechey was probably located at the site of the present village of Kotzebue where, 55 years later, E. W. Nelson observed and described a similar settlement (Nelson, 1899, pp. 260-262). The area was also visited in 1884 by Captain M. A. Healy commanding the Revenue Steamer *Corwin* and an illustration of the summer camp at Kotzebue is included in his report (Healy, 1890, opposite p. 49).

Thus the historical records substantiate ethnographic information which describes the Kotzebue area as a trading center where many boatloads of inland Eskimo gathered each summer to trade with the coastal peoples who came from as far away as the head of Norton Sound, Shismaref, Cape Prince of Wales, King Island, the Diomede Islands, Point Hope and East Cape, Siberia (Rainey, 1947, p. 267). The permanent village at Kotzebue today is less than fifty years old and dates from the establishment of trading posts and a school there.

Kotzebue was completely overlooked as an archaeological site until 1941 because there were no obvious ruins there, neither recent house pits nor the type of midden heaps characteristic of coastal whaling sites. Because of the discovery of obscure house pits at Point Hope (Larsen and Rainey, 1948, pp. 14-15), Giddings came to Kotzebue in 1941 prepared to look for similar ruins. His excavations there were undertaken in conjunction with extensive archaeological investigations along the Kobuk River carried on during the summers of 1940, 1941, and 1947 (Giddings, 1944, 1952).

Apart from its value for the reconstruction of cultural manifestations in an area where no previous work had been done, the archaeology of the Kobuk River sites is of particular interest because wood from the sites has been dated by a tree-ring chronology. Giddings divided the river into lower, middle and upper sections in which are located the five major sites that he excavated. Ambler Island, located in the upper river section, has been dated at 1750 A.D.; whereas Ekseavik, dated at 1400 A.D., and Ahteut, at 1250 A.D., are further west in the middle river section. The lower river includes Kotzebue where Giddings defined two phases of culture referred to as Old and Intermediate Kotzebue and dated at 1400 A.D. and 1550 A.D. respectively (Giddings, 1944, 1952, pp. 107-109).

At Kotzebue Giddings excavated five houses at the site called Intermediate Kotzebue and three at Old Kotzebue. These sites are of particular interest in that they can be expected to show combinations of coastal and inland traits. Among the questions raised is the problem of whether a river mouth site normally reflects an inland environment. That is, whether the material from Kotzebue can be considered as transitional between the coastal and inland types of culture, or merely a coastal extension of a woodland culture.

During the summer of 1951, the author carried on further excavations at Kotzebue in the hope of obtaining more information concerning the earlier occupation there with a view to learning more about the cultural position of prehistoric Kotzebue with regard not

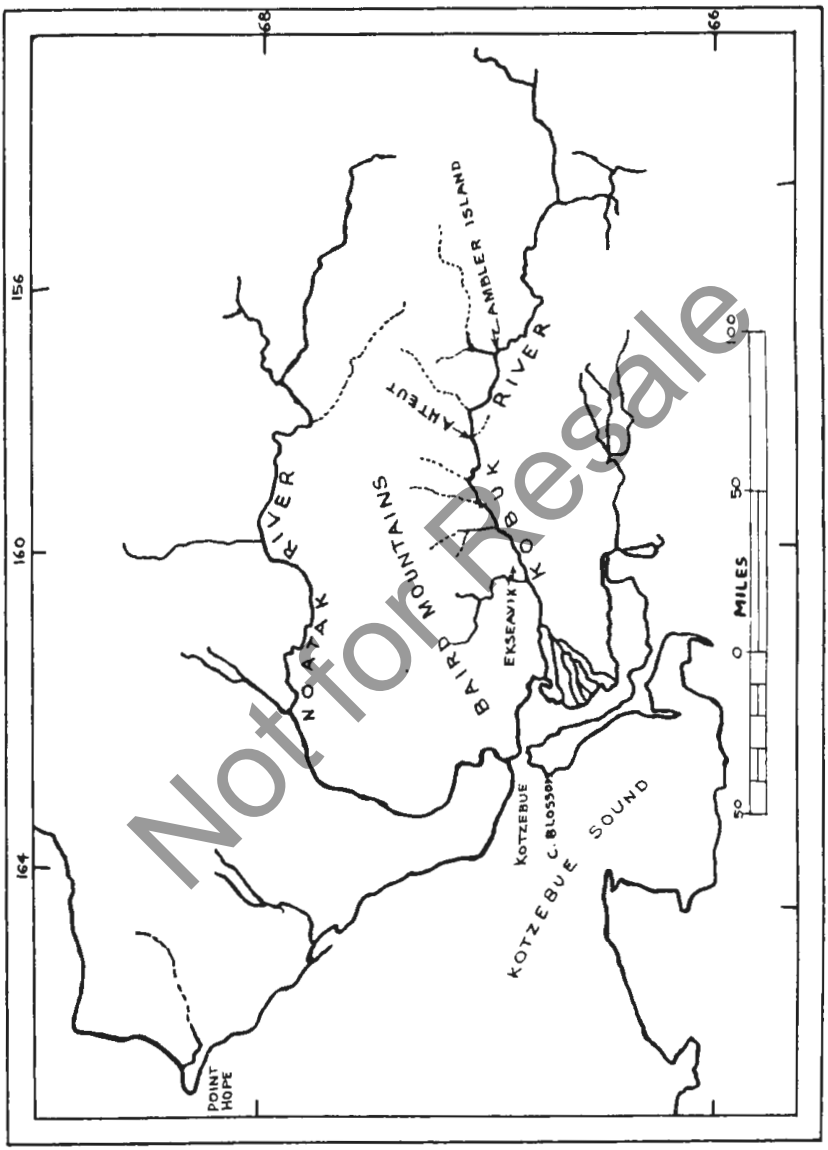

FIGURE 1. MAP OF THE KOTZEBUE SOUND REGION (Map redrawn from Giddings, 1952)

only to the Kobuk river sites but to other coastal sites as well. (VanStone, 1952)[1]

Excavations were begun on June 28th and during the first ten days, eight house pits were opened. After that excavations were carried on alternately in each house to allow time for thawing. Once the sod layer was removed, the ground thawed rapidly and by August 31st, the end of the field season, floor level had been reached in all houses.

Analysis of the Kotzebue collection established the fact that artifacts from the various houses were similar enough so that the entire collection could be considered as a single unit.

The artifact descriptions that follow have been grouped under eleven headings; house construction, fishing, land hunting, sea hunting, tools and manufactures, travel and transportation, skin working and tailoring, food preparation, personal adornment, communal activity and pottery. There is also a chapter on tree-ring dating. Under each of the above headings, the artifacts are first described and then compared with similar artifacts from other archaeological sites in the arctic. Supplementing the descriptions and illustrations is a trait list which lists all the identifiable artifacts and the house in which each one was found.

HOUSE CONSTRUCTION

When Giddings went to Kotzebue in 1941 he discovered that most of the beach stretching to the southwest from the outskirts of the present village, contained cultural remains and estimated the existence of over 200 house pits representing several time horizons (Giddings, 1952, pp. 19-20). The excavations carried out by Giddings have been outlined briefly in the introduction.

The author confined his excavations to an area about one-half mile in length, a good part of which was located in back of the present village. Here were found many house pits close together. A few of these were located in the open, but most were covered by a continuous matting of low willows and alders through which it was difficult to make one's way and which were so thick as to make it impossible to recognize house pits without cutting the vegetation. Even after brush had been cleared, the pits proved to be shallow and so poorly defined that in none of the houses excavated was it possible to determine the orientation of the tunnel until after excavation of the main body of the house was well underway. Frozen ground was encountered just below the sod in most places but there were indications that many of the houses thawed completely every summer. As a result, wood preservation, especially in the case of wooden artifacts, was poor while the preservation of antler, bone and ivory was only fair. In spite of the generally poor ground condition, a surprisingly large number of house logs proved sound enough to use for tree-ring dating.

[1]The archaeological investigations at Kotzebue were sponsored by the Department of Anthropology of the University of Pennsylvania. The author wishes to express his sincere thanks to Dr. Loren C. Eiseley for the opportunity to carry out the field work and to Dr. J. L. Giddings, Jr., for valuable advice and criticism during the preparation of this paper. Mr. Charles Jensen of Kotzebue was the field assistant and his careful, methodical work added greatly to the success of the undertaking. The author also wishes to express appreciation to Mr. Wendell Oswalt who read the manuscript and offered valuable suggestions and to Mrs. Harold Leinbach for secretarial assistance. The photographs and text figures in this paper are the work of Mr. Richard Smith.

A total of eight houses were excavated and they are individually described in the paragraphs below. However, it can be mentioned first as a general statement, that all of the houses opened to the south, probably in consideration of the prevailing winds which, today, come from the west and the northwest.

House 1 (Fig. 2)

This house differed from all the others in being nearly square. As in the others, the best preserved wood was found in the tunnel, due probably to its greater depth. Two corner posts and one other post were all that was discernible in the main body of the house so that the method of roof construction could not be determined. The floor was hard packed and easy to follow and a fireplace, outlined by fire burned rocks was located directly in front of the tunnel. Another fire darkened area was located in the southeast corner of the house. House floor was two and one-half feet below the present level of the ground with the tunnel being eleven inches deeper. Tunnel construction was found to consist of vertical split timbers held in place by a horizontal log at the bottom and probably also at the top. Two vertical logs at opposite ends of each side of the tunnel acted as the main supports. The tunnel had an entry chamber which was formed by a series of vertical logs placed in a a circle with an opening at the end. The floor of the entry chamber sloped upward abruptly to a point just a little over two feet below the surface at the entrance. Dimensions: house length, 14 feet; house width, 14 feet; tunnel width, 3½ feet; entry width, 4 feet at its widest point.

House 2 (Fig 3)

This was a rectangular house, the greatest length running at right angles to the tunnel. There was very little preserved wood in the main body of the house but two corner posts were determined as well as two posts that may have been associated with four post center construction. Floor level was not easy to determine but a fire darkened area associated with fire burned rocks was located at about the center of the house opposite the tunnel opening. The floor seemed to be about two feet below the present ground surface with the tunnel being one foot deeper. An interesting feature was that the step-up from the tunnel into the house proper occurred about eight feet from the point where the tunnel joined the main body of the house, a series of four vertically placed logs forming the step. Although wood preservation in the tunnel was not good, a series of four logs lying at right angles to the tunnel were noted near the entrance and may have been a part of the roof structure. There was no entry chamber nor did the tunnel floor rise near the entrance Dimensions: house length, 16 feet; house width, 10 feet; tunnel length, 20 feet; tunnel width, 3½ feet.

House 3 (Fig. 4)

This house was not clearly visible from the surface and wood preservation was poor both in the main body of the house and the tunnel. It was a rectangular dwelling with the greatest length at right angles to the tunnel. Floor level was difficult to determine in some places due to the fact that beach gravel had washed in over the house at some time. A central fireplace, consisting of an area of ash and two fire burned rocks, was located opposite the tunnel opening. On the floor in the southeast corner was found a series of parallel logs that may perhaps have represented a section of a wall of vertical logs that fell over. At the point where the tunnel entered the main body of the house there were three split timbers lying flat on the house floor. These may represent the remains of a split timber floor but if such is the case, it is difficult to understand why the floor should have been preserved only at this particular spot. The floor was about two and one-half feet below the present level of the ground with the tunnel being six inches deeper. Construction features of the tunnel were similar to those of House 1 except that the vertical timbers were not split. As was mentioned previously, wood preservation in the tunnel was not good and in addition earth pressure on either side had pushed the vertical logs until the two sides almost met in places.

Tunnel floor rose about six inches near the entrance but there was no entry chamber. Dimensions: house length, 14½ feet; house width, 10 feet; tunnel width, 4 feet; tunnel length, 18 feet.

House 4 (Fig. 5)

This house was the most clearly visible from the surface of any excavated since it had the thinnest covering of scrub willows. Like most of the others, it was rectangular in shape the greatest length running at right angles to the tunnel. Very little preserved wood was found in the main body of the house but three corner posts could be determined. Floor level was easily recognizable and an area of ash with three fire burned rocks was located directly in front of the tunnel opening. The floor itself was about two and one-half feet below the present surface with the tunnel being eleven inches deeper. Tunnel construction was found to consist of a series of vertical logs driven in at intervals outside the horizontal logs. Earth pressure had forced the horizontal logs out of their proper relation to the vertical ones. The tunnel widened at its entrance to form an entry chamber which contained no preserved wood to indicate construction; the floor rose to within two feet of the surface at this point. Dimensions: house length, 16 feet; house width, 10 feet; tunnel length, 12 feet, tunnel width, 3 feet; entry length, 4½ feet; entry width, 5 feet at the widest point.

House 5 (Fig. 6)

The greatest length of this rectangular house was at right angles to the tunnel. Two posts were all that could be located in the main body of the house and these were not associated with the corners. Floor level was easily followed and a large fireplace consisting of fire-burned rocks and ash deposit was centrally located. The floor level was about three feet below the present surface of the ground with the tunnel being one foot deeper. The step-up into the main body of the house recalls House 2 in that it was located about 5 feet from the place where the tunnel joined the house. A series of three vertical logs, one of them a large root fragment, formed the step-up at this point. The tunnel timbers were better preserved in this house than in any other excavated. Construction was like that in the preceeding house except that better preservation gave a much clearer picture. There were four horizontal logs on each side, being held in place by six vertical supports placed at intervals, three on a side. Two of these formed part of a series of three vertical logs located at the entrance of the tunnel. There was no entry chamber but the floor sloped up perceptibly at the entrance. Dimensions: house length, 15 feet; house width, 9½ feet; tunnel length, 20 feet; tunnel width, 3½ feet.

House 6 (Fig. 7)

This house proved to be unusually sterile with regard to details of construction and artifacts recovered. Located closer to the Sound than any other excavated, it was apparently subject to periodic floodings which left large deposits of beach gravel. The main body of the house, nearly square in shape, was completely devoid of preserved wood and its outer walls could only be determined by tracing a fairly well defined floor level to its outer edges. A fire darkened area showed that the fire place was located directly in front of the tunnel opening. The floor was two and one-half feet below the present surface of the ground with the tunnel being seven inches deeper. No logs remained that would suggest tunnel construction; the floor rose slightly toward the entrance but there was no entry chamber. Dimensions: house width, 12½ feet; house length, 12 feet; tunnel length, 12 feet; tunnel width, 3 feet.

House 7 (Fig. 8)

This house was rectangular and had its greatest length at right angles to the tunnel. Preservation in the main body of the house was, as usual, poor but three corner posts were located. Two parallel logs were discovered on the west side of the house, one against the south wall and the other midway between it and the north wall. They were about six feet in length and may

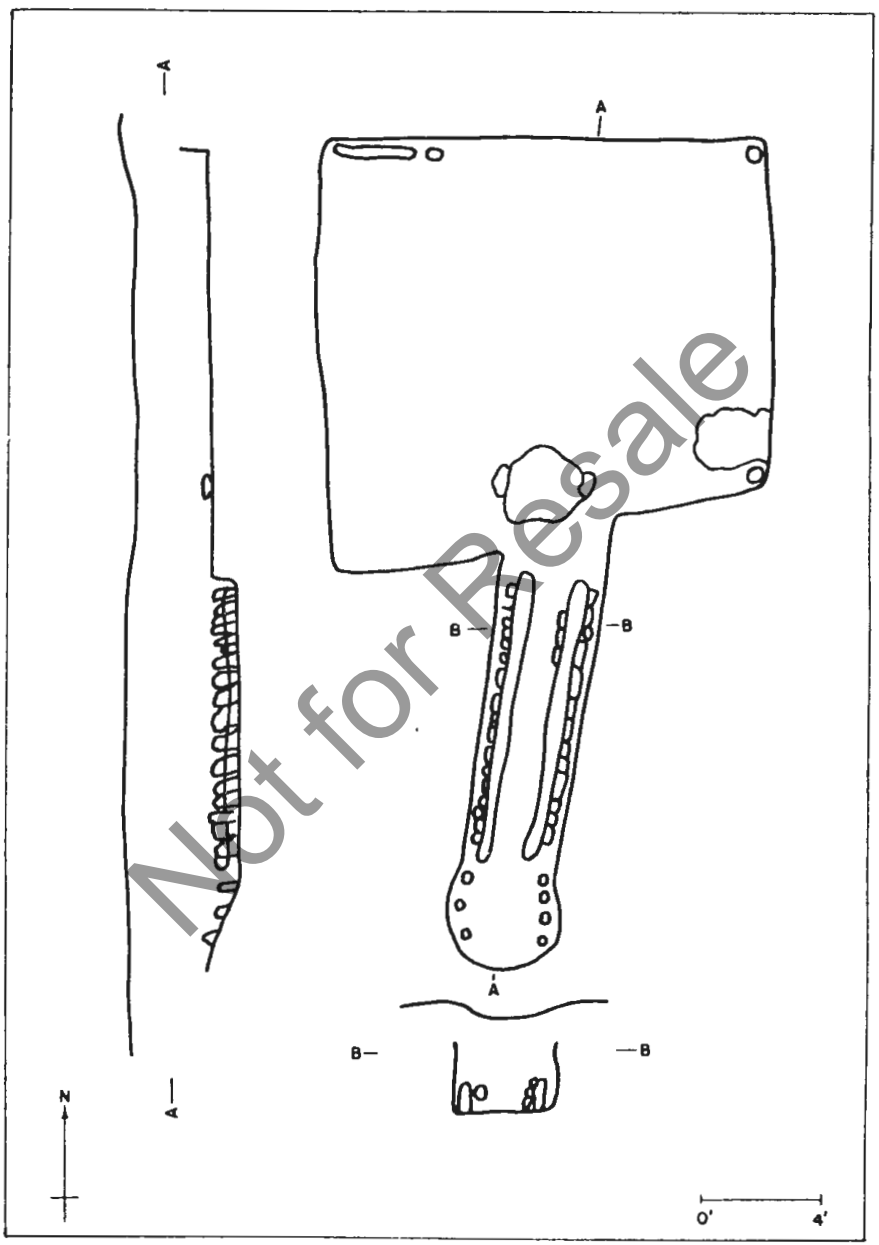

FIGURE 2. HOUSE 1

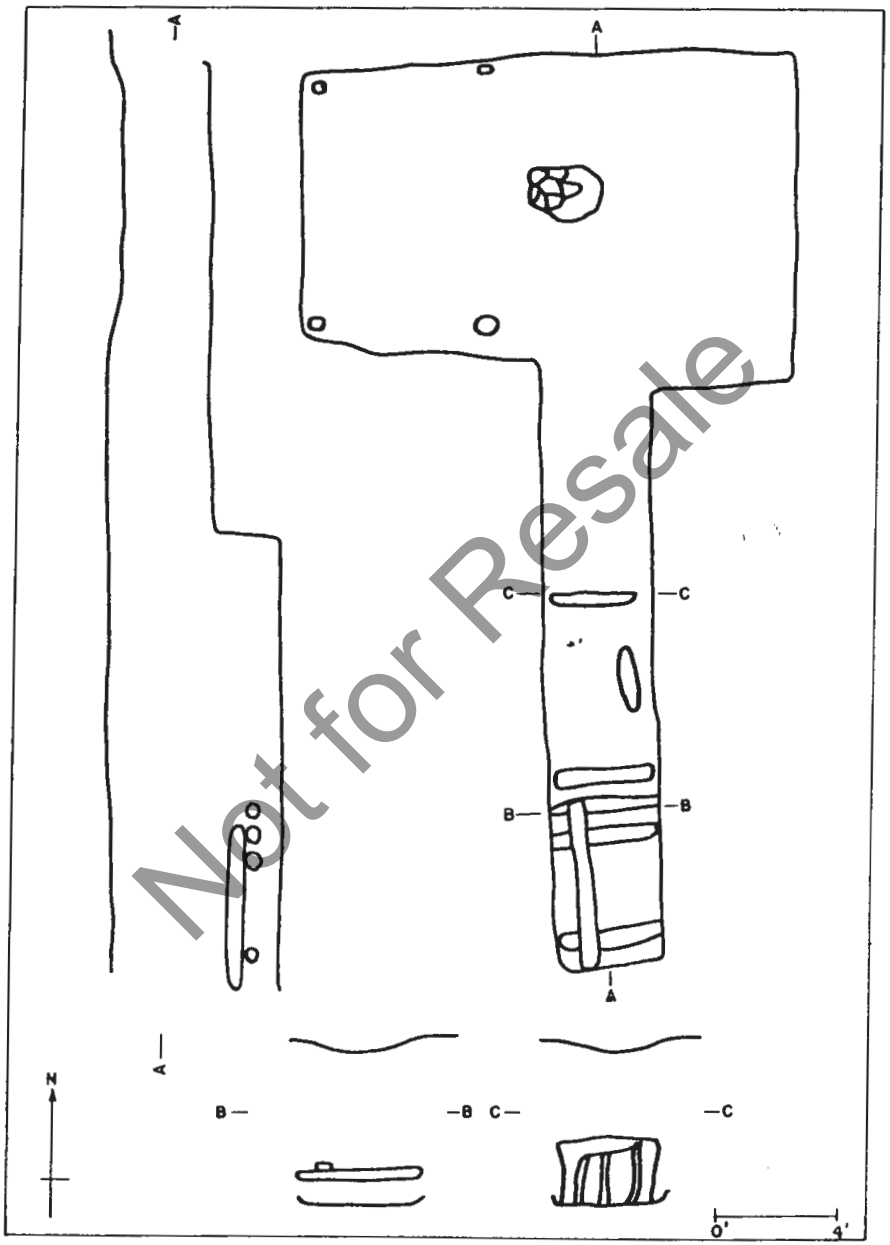

FIGURE 3. HOUSE 2

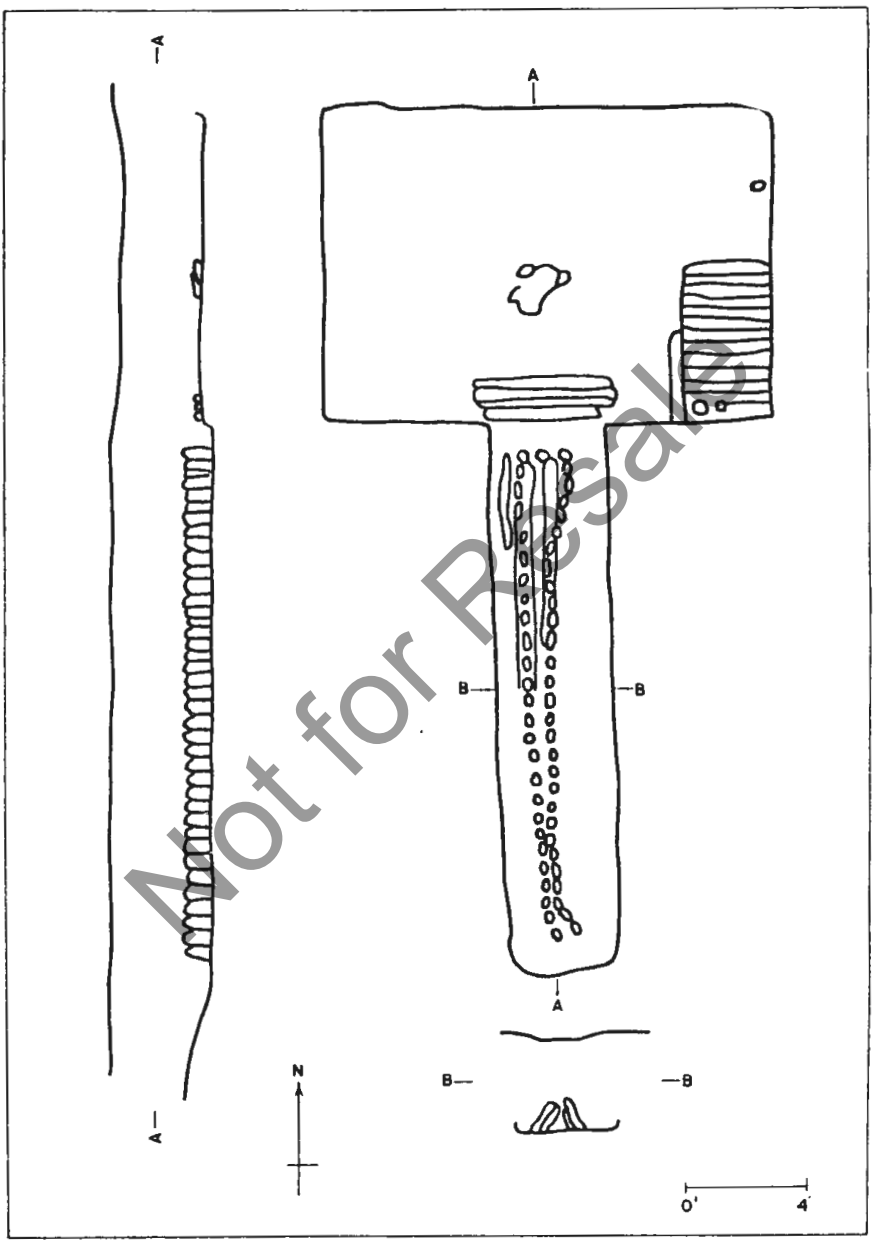

FIGURE 4. HOUSE 3

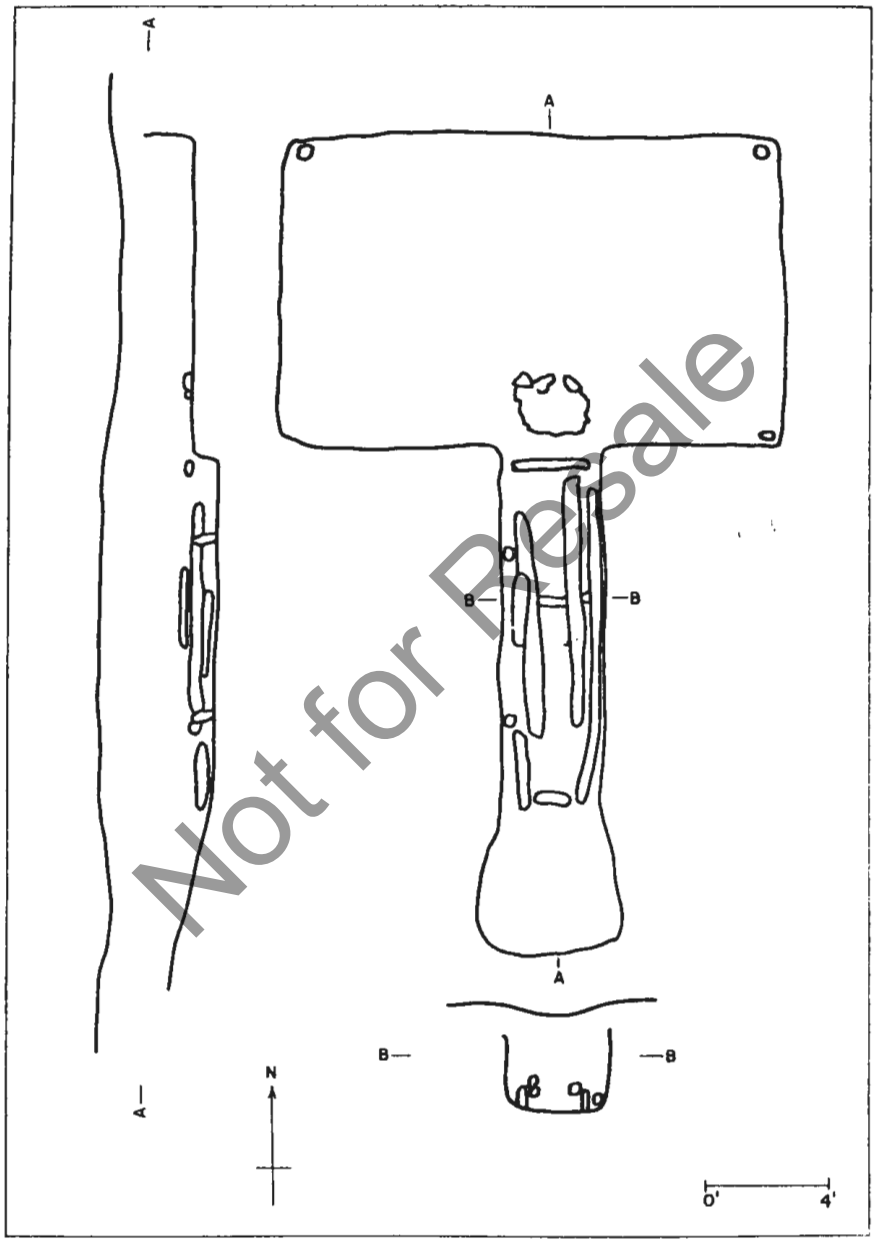

FIGURE 5. HOUSE 4

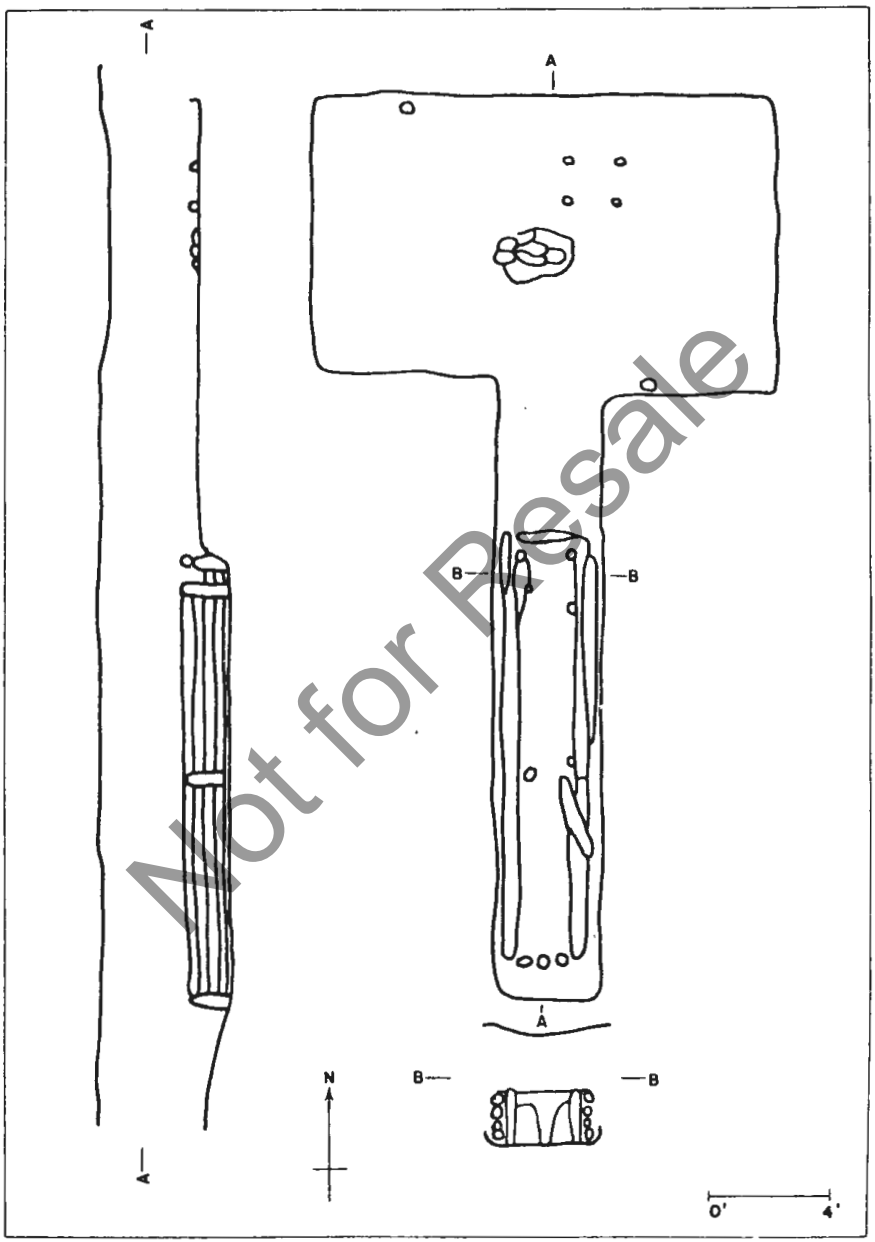

FIGURE 6. HOUSE 5

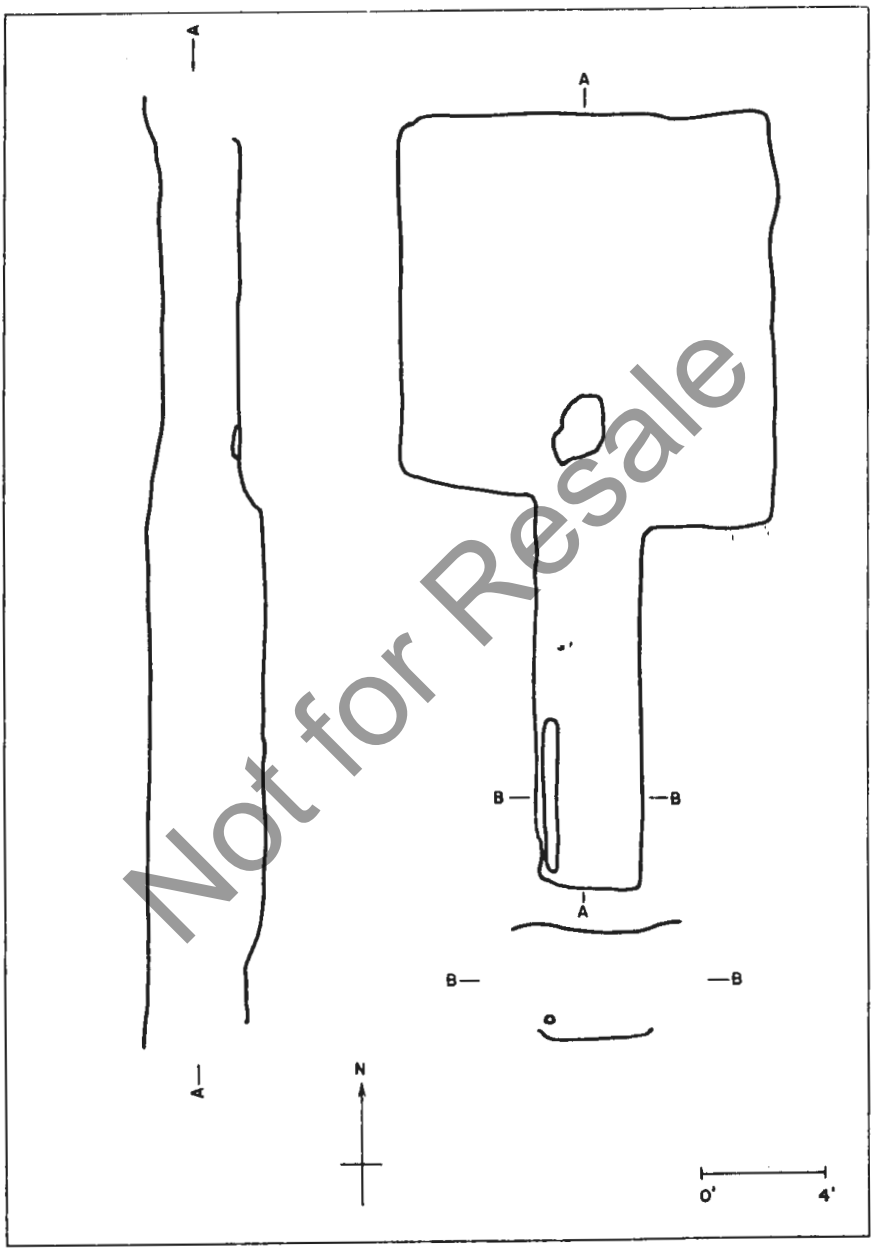

FIGURE 7. HOUSE 6

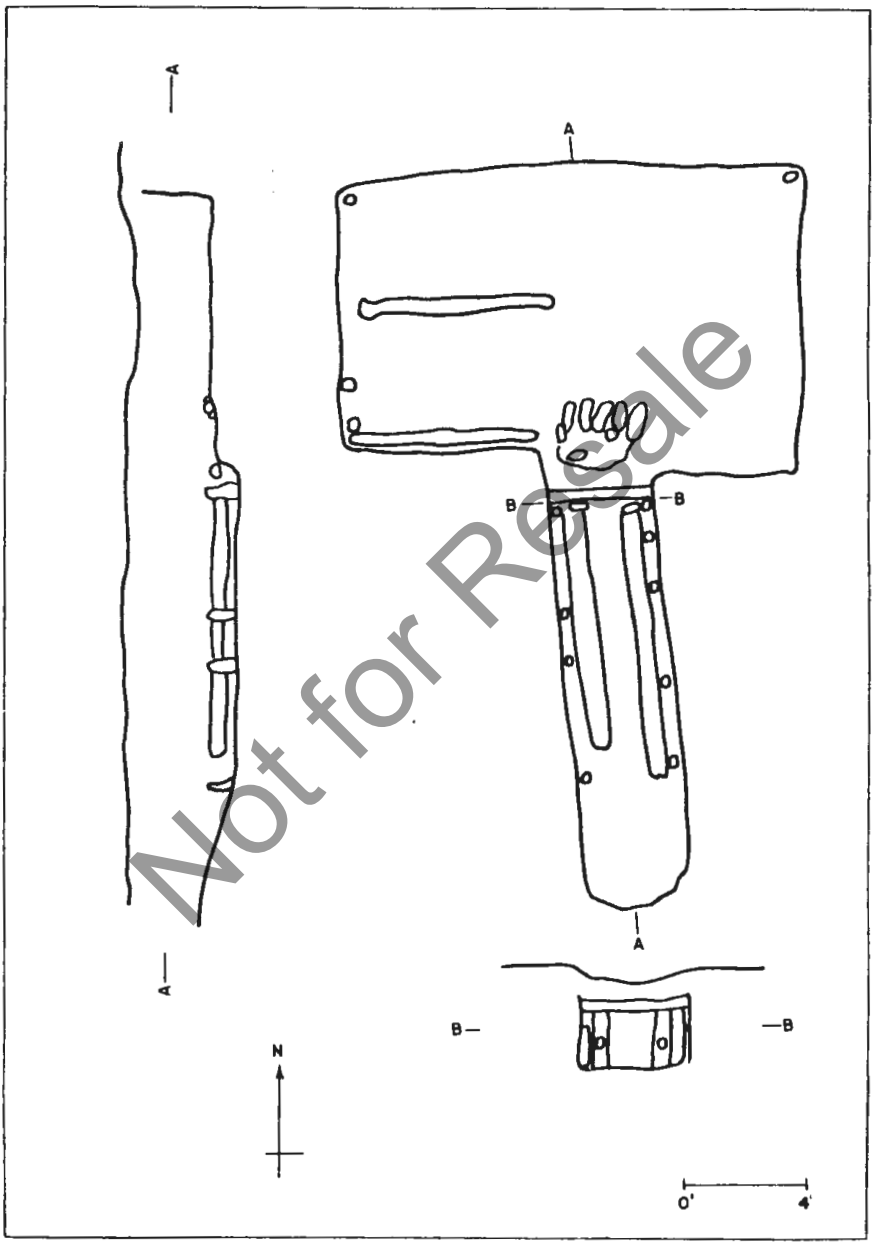

FIGURE 8. HOUSE 7

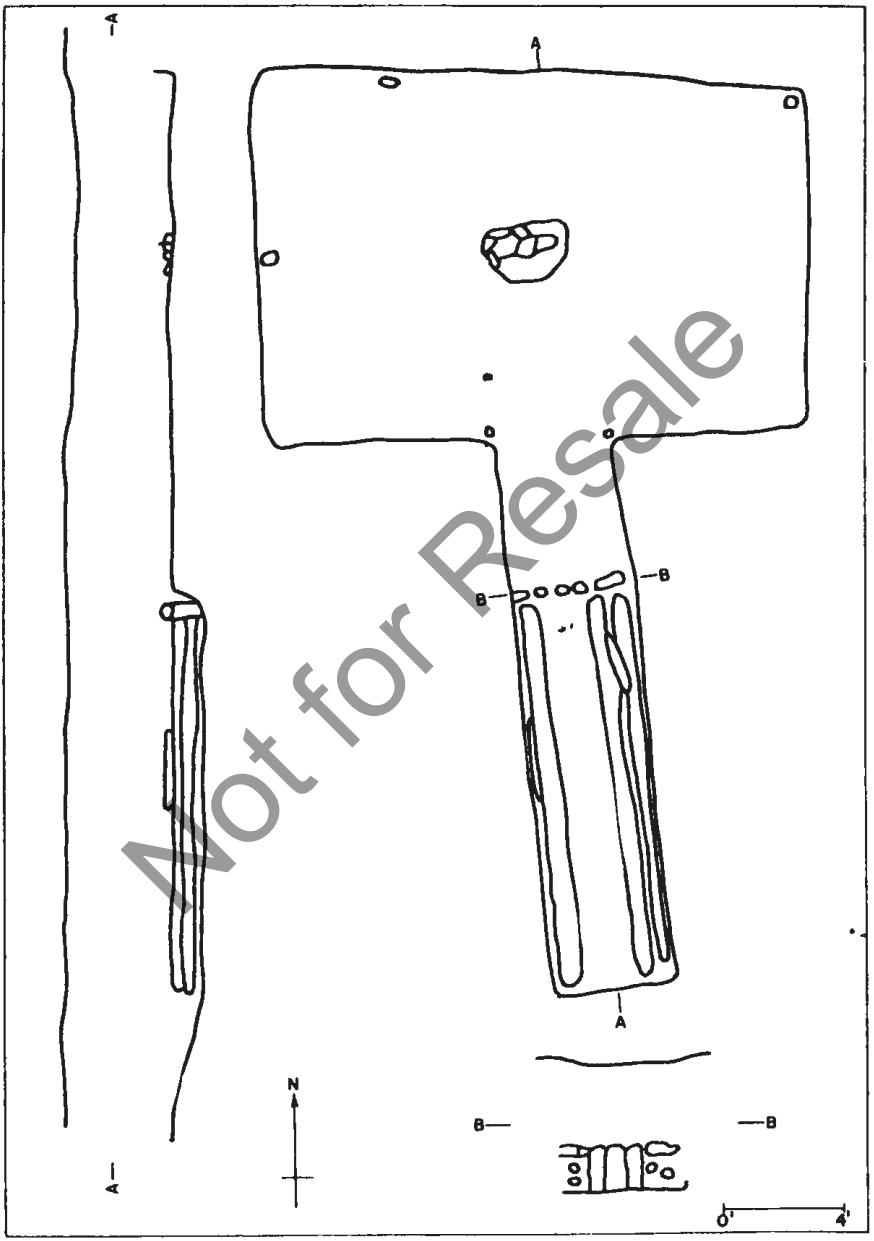

FIGURE 9. HOUSE 8

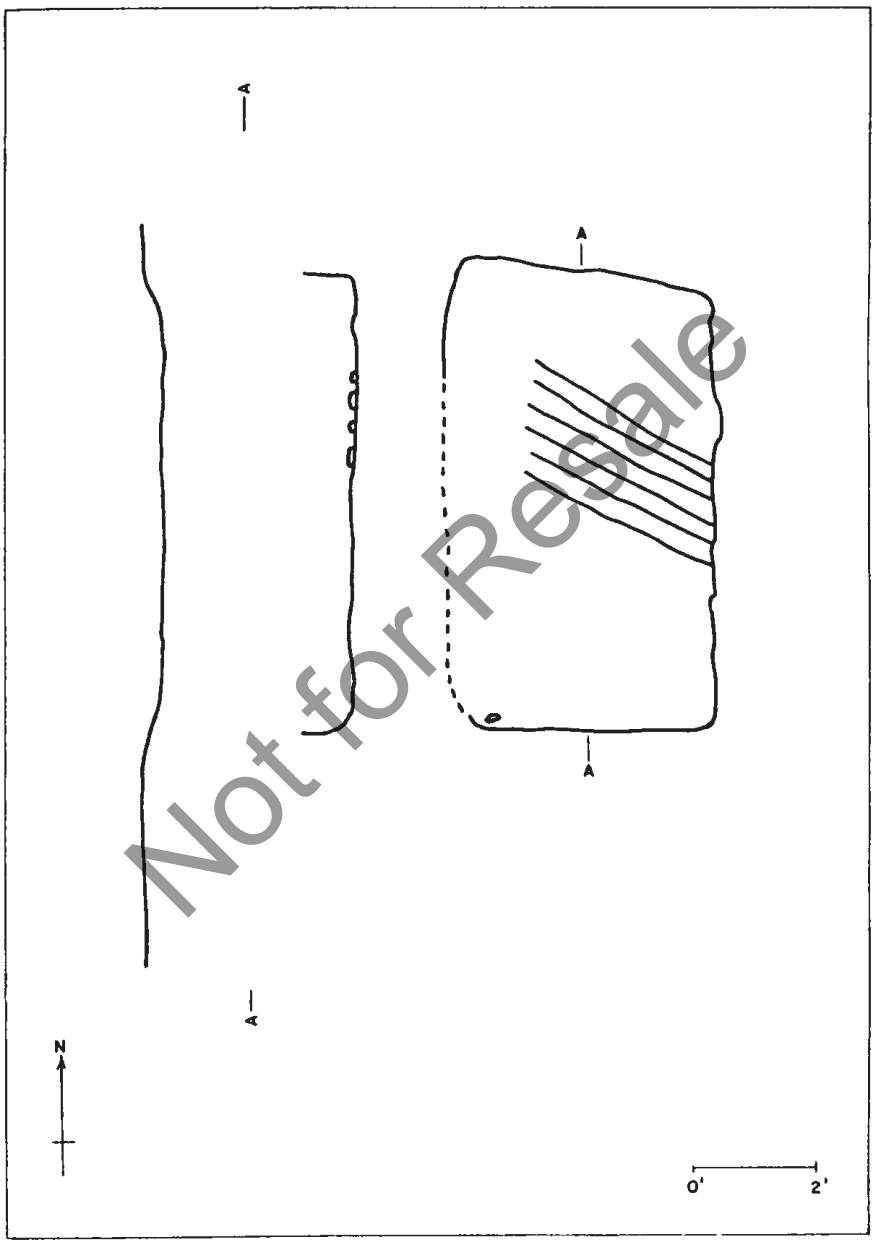

FIGURE 10. CACHE PIT

have had to do with wall or platform construction. Floor level was fairly easy to determine and a well defined fireplace of ash with fire burned rocks was located directly in front of the tunnel opening and very close to it. The floor was about two and one-half feet below the present surface and the tunnel was one foot deeper. Tunnel construction was of the usual type, with horizontal logs being held in place by vertical supports, in this case four supports on each side. The step-up into the main body of the house consisted of two vertical logs with a horizontal crosspiece. The tunnel floor sloped up near the entrance but there was no entry chamber. Dimensions: house length, 15 feet; house width, 10 feet; tunnel length, 14 feet; tunnel width, 3½ feet.

House 8 (Fig 9)

This was a rectangular house with the greatest length at right angles to the tunnel. Wood preservation was poor but five posts were located including one on each side of the tunnel opening; this would suggest the possibility of four post center construction. Floor level was difficult to determine but a centrally located fireplace was easily identifiable. The floor seemed to be about three feet below the present ground surface with the tunnel being one foot deeper. Preservation of the horizontal logs used in tunnel construction was good but all the vertical supports were missing. The step-up into the house proper occurred about four and one-half feet from the point where the tunnel joined the main body of the house, being similar in this respect to Houses 2 and 5. Three vertical logs were found in the tunnel at this point with two short horizontal ones connecting them with the tunnel wall. There was no entry chamber. Dimensions: house length, 18 feet; house width, 12 feet; tunnel length, 18 feet; tunnel width, 4 feet.

In addition to the eight houses, a small cache pit, located very close to House 2, was excavated (Fig. 10). It was rectangular in shape and although wood preservation was poor, two corner posts were located as well as the remains of a split timber floor. This cache contained a great quantity of bones as well as many artifacts.

ANALYSIS AND COMPARISON

In spite of the generally poor preservation of most Kotzebue houses, it is possible to make a few remarks concerning method of construction. Roof and wall forms are the most difficult to determine but there was evidence of four-post center construction in two of the houses while one house contained logs placed so as to suggest that the walls may have been vertical timbers held in place by horizontal ones at the top and bottom. Split-timber flooring was indicated in one house and in the excavated cache pit, while all other houses had floors of hard packed gravel. There was a central fireplace, usually stone lined, in every house.

In the six houses in which tunnel construction could be determined, two consisted of vertical timbers held in place by horizontal logs (Figs. 2, 4) while the others were characterized by horizontal logs on either side held in place by vertical logs driven in at intervals outside the horizontal ones (Figs. 5, 6, 8, 9).

A peculiarity of tunnel construction in three houses was that the step up from the tunnel occurred before the point where the tunnel joined the main body of the house (Figs. 4, 6, 9). A similar situation existed in two houses excavated by Giddings in the Kobuk-Kotzebue region, House 5 at Ahteut and House 4 at Kotzebue (Giddings, 1952, Fig. 15; Fig. 19). This unusual aspect of tunnel construction brings to mind problems connected with the excavation of house tunnels at

the Ipiutak site at Point Hope. Here, shallow oblong depressions were noticed to the west of some of the houses and when excavated, they proved to have floor levels exactly like those in the main body of the houses and filled with the same type of refuse. However, in no case was it possible to connect these entrance passages with the floor levels of the houses (Larsen and Rainey, 1948, p. 189; Figs. 54b, 55-57). A possible explanation for this in light of the evidence from the author's Kotzebue houses would be that tunnel construction in these Ipiutak houses was also characterized by a step up well in front of the main body of the house but that their greater age had resulted in the complete obliteration of this shallower area of cultural deposit.

All of the main features of Kotzebue house construction, such as rectangular ground plan, four post center construction, the central fireplace, split log flooring, house walls of vertical poles and tunnels composed of upright and horizontal logs, are known over a considerable time period in the Kobuk-Kotzebue region (Giddings, 1952, pp. 11-34). However, such specifically inland traits as deep tunnels, rear chambers and lamp alcoves, reported by Giddings for the Ekseavik and Ahteut sites (1952, pp. 25-32), were not present in the author's Kotzebue houses. Certainly four post center construction and the central fireplace can be said to have considerable depth in time in this area and are basic to the woodland type of house construction.

The essential resemblance between the Kobuk-Kotzebue house and Ipiutak houses has been pointed out by Giddings and by Larsen and Rainey (Giddings, 1952, pp. 33-34; Larsen and Rainey, 1948, pp. 44-50). The latter have shown that houses with four post center construction and a central fireplace are "distributed from the Mackenzie to the southern limit of the Eskimo territory and . . . may rightly be designated as the typical Alaskan house" (Larsen and Rainey, 1948, p. 50).

FISHING

Net sinkers form the largest single category of artifacts in the collection. Sinkers of bone and antler can be divided into types according to the method used in drilling the holes for attachment to the net. The first type, of which eleven are made of whalebone and eight of antler, has a hole at each end drilled through laterally (Pl. 1, 3, 6). Twenty-three specimens, all of antler, are notched near each end and drilled from the notch to the end so that the drilled hole is approximately parallel to the long axis of the sinker (Pl. 1, 1). A third type, which is represented by two specimens of whalebone and two of antler, presents a combination of the above types. One hole is drilled laterally while the other is notched and drilled after the fashion of the second type (Pl. 1, 4). A unique bone specimen is made from half of an intervertebral disk from a white whale (beluga). It has a hole at each end drilled through laterally near the flat edge (Pl. 1, 2). There are two stone net sinkers in the collection which are rectangular in shape with two sets of opposite notches (Pl. 1, 5).

The importance of fishing through the ice is attested to by the occurence of thirty-two **fishing ice picks** in the Kotzebue collection. All are made of antler and complete specimens range in length from 11 cm. to 39 cm. The picks are made of the split half of an antler tip and are either scored for lashing or wedge cut at the proximal end in order to form a smooth contact

with the wooden shaft (Pl. 1, 7). Several specimens have drilled holes near the proximal end, presumably as an aid to hafting.

Barbed points of the leister type are mostly small suggesting that they may possibly be **fish arrow prongs.** There are thirteen of these and all are made of antler with the exception of one specimen of walrus ivory. The barbs on these small specimens range from one to seven in number (Pl. 2, 3, 11, 12).

Four implements of this type are large enough to have been used on a thrusting shaft and are true **leister prongs** (Pl. 2, 1, 2). They are all of antler, average about 16 cm. in length, and have pointed tangs, some of which are scored for lashing. It should be pointed out that the group of leister prongs may be bird spear prongs and visa versa. Twenty barbless prongs of antler appear to have been scored for hafting as **center prongs** for the three pronged fish spear (Pl. 2, 13). They are shoulderless with a plain conical tang. Two ivory center prongs have multiple opposite barbs but they could be associated with bird spears or arrows as well as with fishing equipment (Pl. 2, 7, 8).

Five **gorges** made of antler are sharpened at both ends and grooved in the center for line attachment (Pl. 2, 16). These may have been used as gull hooks rather than for fishing.

Three **Pickerel lure-hook shanks,** two of bone and one of mammoth ivory, are shaped like a fish with eyes and gills shown. The eye sockets were hollowed out, apparently to receive insets. A small drilled hole for suspension is located toward the back of the shank, and a larger drilled hole to receive a barb runs through the head at right angles to the eye socket (Pl. 2, 9, 10).

Larger hooks were probably used for catching shee fish and three antler **shee lure-hook shanks** occur in the collection (Pl. 2, 4, 5). Like the pickerel lure-hook shanks, these are fish shaped and have drilled sockets for inset eyes. They have a drilled hole for the barb at right angles to the eye sockets. Instead of a realistic fish tail, these specimens taper to a point at the proximal end. A longitudinal groove runs the length of the tapered section and meets an incised groove that circles the specimen. The line is probably tied around this groove and runs up the tapered section, to which it may be lashed. A small and unfinished shank of the type described above may have been used for grayling (Pl. 2, 19). In addition to the complete specimens there are four blanks for pickerel or shee fish lure-hook shanks (Pl. 2, 6). Two are of walrus ivory, one of bone and one of mammoth ivory.

Barbs for pickerel or shee lure-hook shanks are either straight (Pl. 2, 17) or slightly curved (Pl. 2, 18) and round in cross-section. These were set in a hole drilled through the head at such an angle as to point the barb upward toward the tail. (see Pl. 2, 4). There are seven of these in the collection, four made of antler and three of walrus ivory.

Line sinkers are plummet-shaped and drilled at the tapered end for attachment to the line. There are also drilled holes at the opposite end for hook attachment (Pl. 2, 14, 15). Two specimens are of bone, one of walrus ivory and one is made from a mammoth tooth fragment.

An **ice scoop rim** fragment is of antler (Pl. 2, 20). It is a thin, curved strip of split antler perforated near the center at about 3 cm. intervals. On the convex side of the specimen a shallow gouged line groove runs from each perforation to the edge.

ANALYSIS AND COMPARISON

Judging from artifact numbers, fishing appears to have been the most important means of subsistence to the Kotzebue people with salmon being taken during the summer runs and shee fish caught through the ice in winter. White fish were probably present in great numbers in the salt water lagoon in back of the site as they are today and numerous fresh water lakes in the vicinity contain pickerel. There is evidence in the Kotzebue site to indicate the use of a variety

of fishing implements including nets, the three pronged fish spear, leister pronged spears, fish arrows, gorges and the hook and line.

Netting must have been a common method of taking fish, since net sinkers are plentiful in the collection. Sinkers of bone, antler and stone are prominent in all the Kobuk sites with those of stone being most important at Ahteut, the earliest site and of little significance in Kotzebue houses dating approximately 1550 A.D. and in the later sites (Giddings, 1952, p. 40). Notched stones, presumably used as net sinkers, also occur at early sites in Kachemak Bay (deLaguna, 1934, p. 122, pl. 16) and at an Ipiutak related-site in Chagvan Bay (Larsen, 1950, p. 181). Net sinkers first appear on St. Lawrence Island during the Punuk period (Collins, 1950, p. 554). Mesh gauges and shuttles, implements associated with netting in the Kobuk-Kotzebue region after 1550 A.D. (Giddings, 1952, p. 41) are not present in the author's Kotzebue collection but their absence does not seem to have curtailed the use of nets to any great extent.

Split antler ice picks for fishing, the recent use of which is described by Nelson for the St. Michael area (Nelson, 1899, p. 174), are found in all the Kobuk sites (Giddings, 1952, p. 40) and an ice pick illustrated by Mathiassen from the Naujan site may have been used for fishing (Mathiassen, 1927, I, Pl. 4, 3). However, the range of this artifact type is difficult to determine because in most sites they are not easily distinguishable from harpoon ice picks.

It is also difficult to compare the fish arrow prong over wide areas because it has not been distinguished from the leister prong by most authors. Giddings mentions them for all the Kobuk sites except Ambler Island (Giddings, 1952, p. 41) and they have a recent distribution along the Bering Sea coast (Nelson, 1899, pp. 160-161). Barbs of the leister type small enough to be used as fish arrow prongs also occur on St. Lawrence Island during the Punuk period (Collins, 1937, Pl. 33, 20-21), during the Tigara phase at Point Hope (Larsen and Rainey, 1948, Pl. 89, 21-22), at the Fox Creek site on the lower Yukon River (deLaguna, 1947, Pl. 26, 27-31) and at Hooper Bay Village (Oswalt, 1952a, p. 54).

It is possible that specimens identified as leister prongs may have been used as bird spear side prongs and those from the Kotzebue site are of the same type as side prongs from recent Bering Sea collections (Nelson, 1899, Pls. LIX, 1, LXVIII, 1). Archaeologically, leister prongs similar to those found at Kotzebue occur along the Kobuk River at Ambler Island, Ekseavik and, with the addition of a barb near the base, at Ahteut (Giddings, 1952, pp. 36, 39). The type is also found on St. Lawrence Island where it is similar to an illustrated Old Bering Sea specimen (Collins, 1937, Pl. 33, 18) but is otherwise more characteristic of southern sites, occuring at Pavik in Bristol Bay (Larsen, 1950, Fig. 55, A, 5), in the Aleutians (Jochelson, 1925, Pl. 24, 5-6), in Kachemak Bay (deLaguna, 1934, Pl. 42, 21), at Hooper Bay Village Oswalt, 1952a, p. 54) and along the lower Yukon River (deLaguna, 1947, Pl. XV, 19). The same general type but with lashing hole near

the base is found at the Okvik site (Rainey, 1941, p. 494) and in the Recent-Prehistoric period on St. Lawrence Island (Geist and Rainey, 1936, Pl. 42, 3, 4).

Evidence for the occurrence of the three pronged fish spear at the Kotzebue site is present in the form of twenty barbless prongs of antler which appear to be center prongs for this implement. However, none of the characteristic fish spear side prongs and barbs were recovered. The three pronged fish spear is illustrated by Nelson and Murdoch for the Bering Sea region (Nelson, 1899, Pl. LXVII, 3; Murdoch, 1892, Fig. 278) and center prongs have been identified from the site at Hooper Bay Village (Oswalt, 1952a, p. 55). Fish spear barbs, though not found at Kotzebue, have been more frequently recovered than center prongs though often they are incorrectly identified as blubber hooks or meat hooks. There is a definite resemblance between these two implement types and three pronged fish spear barbs, and it is probable that small ones are barbs while larger specimens have been used as some type of hook. In southern Alaska barbs are found at Port Möller (Weyer, 1930, Fig. 25; Hrdlicka, 1945, Fig. 209) and in Kachemak Bay sites (deLaguna, 1934, pp. 92-93) while in the north they are found at the Ipiutak site at Point Hope (Larsen and Rainey, 1948, p. 78), on St. Lawrence Island from Old Bering Sea I through the Recent-Prehistoric period (Rainey, 1941, p. 498; Collins, 1937, p. 138, Pl. 75, 19; Geist and Rainey, 1936, p. 159), at Point Barrow (Mathiassen, 1930, Pl. 9, 10) and in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, p. 36). The type also occurs in eastern Thule sites (Mathiassen, 1927, I, pp. 41, 157-158).

Center prongs with multiple opposite barbs similar to those from the Kotzebue site are found on St. Lawrence Island from Punuk times through the Recent-Prehistoric period (Collins, 1937, Pl. 74, 4; Geist and Rainey, 1936, Pl. 42, 6) and also occur at Kotzebue in houses dating approximately 1550 A.D. (Giddings, 1952, p. 54), and in the Aleutians (Jochelson, 1925, Pl. 24, 42).

The gorge was probably used primarily for fishing in the Kotzebue area and is present in Giddings' collection from that region (Giddings, 1952, p. 36). This implement type resembles closely the simple form of "gullhook" best known from the Thule culture (Mathiassen, 1927, II, p. 35). Giddings has suggested that it should be classed with fishing equipment when found at inland sites (Giddings, 1952, p. 41), but it should be pointed out that gulls range inland extensively in the Kobuk-Kotzebue area.

Pickerel and shee fish lure-hook shanks in realistic fish forms appear to be restricted to the Kobuk-Kotzebue area where, in addition to their occurrence in the author's Kotzebue collection, they are reported from Ekseavik and in Kotzebue houses dating around 1400 A.D. (Giddings, 1952, p. 38). Less realistic but typologically similar is a form of hook from Point Atkinson (Mathiassen, 1930, p. 11) and from Paimiut on the lower Yukon River (Nelson, 1899, p. 180).

Plummet-shaped fish line-sinkers from the Kotzebue site are

similar to specimens present on St. Lawrence Island from Old Bering Sea I through the Modern period. The Old Bering Sea and Punuk examples tend to be lighter and taper at both ends while those belonging to the Recent-Prehistoric and Modern periods are heavy and often have suspension holes on either side so that a number of hooks can be hung from the same sinker (Rainey, 1941, p. 498; Collins, 1937, pp. 140-143, 226; Geist and Rainey, 1936, pp. 99, 137, 155; Nelson, 1899, Pl. LXIX, 28, 31). The latter type also occurs in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1953, p. 36) and is reported from the modern period at Point Barrow (Murdoch, 1892, Fig. 273).

Ice scoop rims are used to remove freshly formed ice from a fishing hole after the hole has been made with an ice pick. Baleen rims are present on St. Lawrence Island from Old Bering Sea through the Modern period (Collins, 1937, pp. 171, 240; Geist and Rainey, 1936, pp. 128, 150, 167) while specimens of antler are reported from Hooper Bay Village (Oswalt, 1952a, p. 54), St. Michael (Nelson, 1899, Pl. LXVII, 9) and Kotzebue houses dating approximately 1400 A. D. (Giddings, 1952, p. 38).

LAND HUNTING

There are sixty-one complete or nearly complete **arrowheads** from the Kotzebue site, forty-nine of which can be classified according to the shape of the tang. These range in size from 7 cm. to 17.5 cm.; seven are made of walrus ivory and the rest of antler.

Type 1, the most common type, has a sharp shoulder and plain conical tang. There are sixteen of these, all of which are oval to ovate in cross section (Pl. 3, 1-6, 18, 19).

Type 2 heads, five in number, have a sharp shoulder and a conical tang with a slight bulge (Pl. 3, 14, 16, 20).

Type 3 includes eleven specimens, all made of antler, that have sharp shoulders and conical tangs with two small opposite knobs or four small knobs (Pl. 3, 17; Pl. 4, 1-4).

Type 4 arrowheads are sharp shouldered and have a conical tang with collar (Pl. 3, 7-9, 11). There are five of these, two of which are socketed at the end to receive a flint arrow point (Pl. 3, 11). The sockets are formed by splitting the tip of the arrowhead and gouging out a place for the blade. The blade is then held in place by lashing around the opposite sides. A fragmentary specimen with an unidentified tang also shows this blade slit arrangement.

Type 5 consists of three arrowheads with sharp shoulders and spatulate tangs (Pl. 4, 12). This style of tang arrangement appears to be unique for the Eskimo area.

Type 6 heads, three in number, have sloping shoulders and plain conical tangs (Pl. 4, 11, 13).

Type 7 includes three arrowheads that have sloping shoulders and conical tangs with a bulge (Pl. 3, 10; Pl. 4, 6, 10). One of these is extremely large, being 29.5 cm. in length, and has three small barbs in the center on one side and a blade slit in the tip. The end of the tang is hooked slightly, perhaps as an aid to hafting (Pl. 3, 10).

Type 8 heads have shoulderless wedge-shaped tangs. There are two of these, one of which is notched at the tip to receive a blade (Pl. 3, 15; Pl. 4, 5).

Two unusual tang types are represented by one specimen each. One of these has a sloping shoulder and conical tang that is very thin and elongated while the other has a shoulderless conical tang (Pl. 3, 12, 13).

The great variety of barb arrangement on Kotzebue arrowheads is shown in

the illustrations. In no case was it possible to correlate the arrangement of the barbs with tang shape.

Decoration on the arrowheads, when it occurs, usually takes the form of straight incised lines. However, one on specimen (Pl. 3, 16) the decoration consists of a series of short parallel lines with radiating spurs. Ownership marks occur on fourteen specimens (see Fig. 11).

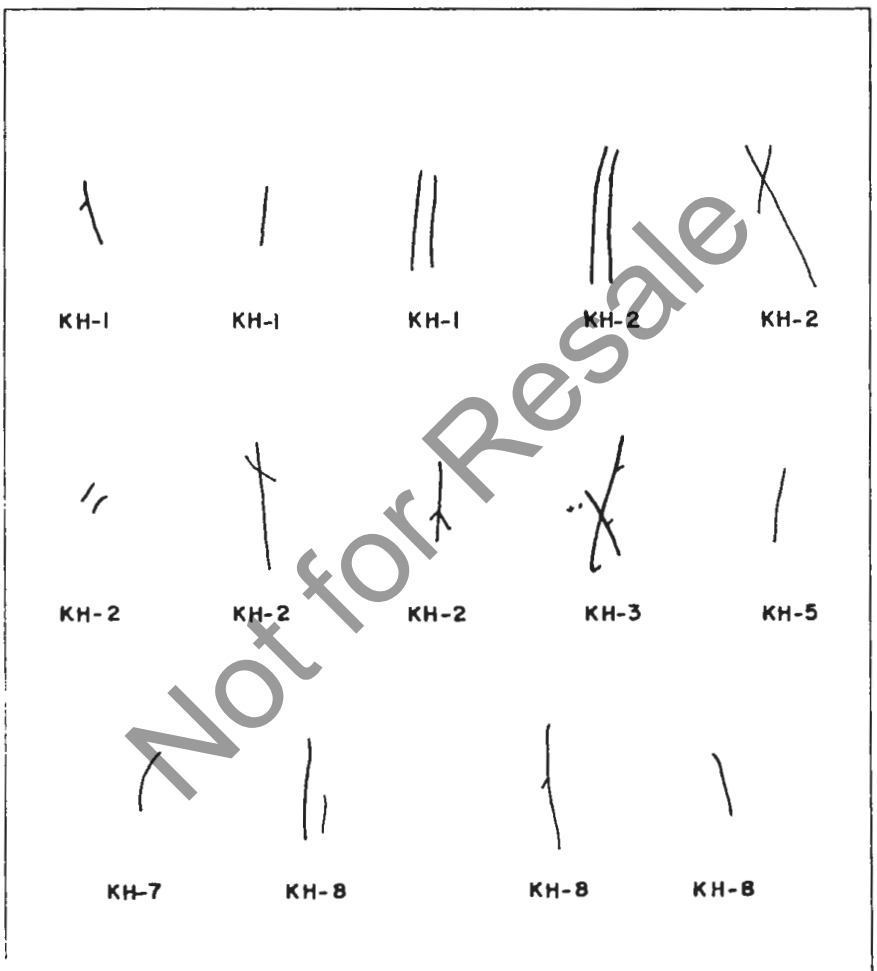

FIGURE 11. OWNERSHIP MARKS ON KOTZEBUE ARROWHEADS

Blunt arrowheads are made of antler, and with one exception, have multi-faceted tips. Four specimens have wedge-shaped tangs (Pl. 5, 2), three bifurcated tangs for fitting over the wedged end of a shaft (Pl. 5, 3) and three have no tang but are drilled for capping a shaft (Pl. 5, 1). One of these has a lobed tip (Pl. 5, 4).

In addition to the above, there is another type of artifact that has been

termed a blunt arrowhead but the identification is doubtful. There are four of these and they have an elongated tang, scored for lashing, which broadens out into a blunted end that is roughly triangular in shape (Pl. 5, 7).

One wooden **bow** fragment is not complete enough to show the form of the whole bow. The nock has square shoulders and appears to be rounded at the tip, while the bow itself is flattened as though adapted to sinew backing (Pl. 4, 7).

Sinew backing is further indicated by the occurrence of **bow braces.** There are five specimens, all of antler, two of which have cable grooves. One of these has roughly pointed ends (Pl. 5, 13) while the other has squared ends (Pl. 5, 5). A third is short and decorated with incised lines and spurs (Pl. 5, 6).

Three **sinew twisters,** two of bone and one of walrus ivory, terminate at either end in shallow lips on opposite sides. One of the bone implements has an oval suspension hole near one end (Pl. 4, 18).

There are two **shaft straighteners** in the collection, one of antler and the other of mammoth ivory. The antler specimen widens at one end and is bifurcated; just below the bifurcation a rhomboid hole has been cut. The other end is grooved to hold a beaver tooth; the entire surface of this implement is covered with parallel incised lines (Pl. 4, 9). The other shaft straightener is plain and has a round hole drilled near a triangular shaped end (Pl. 4, 8).

Two **bird spear side prongs,** one of antler and the other of walrus ivory, have a shallow lashing knob at the distal end. The ivory specimen also has a lashing slot just above the knob and multiple opposite barbs (Pl. 4, 20).

Three small, delicate **bird spear center prongs** of walrus ivory have multiple opposite barbs and a flattened tang (Pl. 5, 16). One antler implement is of the same general type but much larger, being 13 cm. in length (Pl. 4, 19).

Two small, stemless **arrow points** are of blue chert (Pl. 4, 16) and a larger one is of black chert (Pl. 4, 17). A chalcedony arrow point is sharply ridged on each face and has a short rounded stem (Pl. 4, 14). A black chert specimen is sharply ridged on the faces in a similar way but has a large, rounded stem (Pl. 4, 15).

ANALYSIS AND COMPARISON

Judging from artifact numbers, land hunting appears to have been second in importance only to fishing as a means of subsistence for the Kotzebue people. To judge from the bone counts, caribou were by far the most important of the animals hunted, and whatever the hunting method, the killing must have been done mainly with arrows and lances.

The variety in arrowhead tang shapes is noteworthy, ten different types being represented in the collection of which eight are comparable with specimens from other sites. The most common type, sharp shoulder and plain conical tang, is widespread throughout Alaska beginning with the Birnirk period at Point Barrow (Wissler, 1916, p. 420; University of Pennsylvania collections) and the Punuk period on St. Lawrence Island (Collins, 1937, Pl. 34, 8). In southwestern Alaska the type occurs at Hooper Bay Village (Oswalt, 1952a, p. 53), at Pavik on the east side of Bristol Bay (Larsen, 1950, p. 178) and from the Tena, Fox Creek and Ghost Creek sites on the lower Yukon River (deLaguna, 1947, pp. 131, 152). It is represented in the University of Alaska collections from the Recent-Prehistoric period on St. Lawrence Island, in the Kotzebue Sound area at the Ekseavik and Kotzebue (1550 A. D.) sites (Giddings, 1952, pp. 45-46), and in northern Alaska at Point Atkinson in the Mackenzie delta region (Mathiassen, 1930, p. 10) as well as the Birnirk site already mentioned. In addition, Nelson illustrates modern specimens

of this type from the lower Yukon River, Point Hope and St. Lawrence Island (Nelson, 1899, Pl. LXI b).

A second type, sharp shoulders and conical tangs with a slight bulge, seems to be a slight modification of the above type and distribution is confined to northern Alaska and Canada. It occurs in late sites at Langton Bay and Baillie Island (Wissler, 1916, pp. 429-431), in the Tigara site at Point Hope (Larsen and Rainey, 1948, p. 176) and at the Ekseavik and Kotzebue (1550 A. D.) sites in the Kobuk River region (Giddings, 1952, pp. 45-46). At the last named site, it is the most common tang type that is represented.

Much more widely distributed throughout the arctic but still largely confined to northern sites are arrowheads with sharp shoulders and conical tangs with two or four knobs. Tangs with two knobs are reported for the modern period along the Kobuk River (Nelson, 1899, p. 159), and the Ambler Island and Kotzebue (1400 A. D.) sites in the same region (Giddings, 1952, pp. 43, 45). Further north and east they occur in late sites at Cape Smythe, Franklin Bay, Victoria Island and Baillie Island (Wissler, 1916, pp. 420, 429-431), and at Point Hope they belong to the modern phase (Larsen and Rainey, 1948, p. 179); still further east they are found as a typical eastern Thule trait in the sites at Naujan, Ponds Inlet and Maleruálik (Mathiassen, 1927, I, pp. 35, 154, 313).

Conical tangs with four knobs are reported from the Ambler Island site (Giddings, 1952, p. 43), in the Tigara phase at Point Hope (Larsen and Rainey, 1948, p. 176) and possibly from the Punuk period on St. Lawrence Island (University of Alaska collections).

It will be noted from the above comparison that opposite knobbed tangs, characteristic of the eastern Thule culture, are largely restricted in their western distribution to sites of the later periods. The two exceptions to this are their occurrence at Giddings' Kotzebue site (1400 A.D.) and in the author's Kotzebue collection (1315-1571 A.D.). It is interesting that these are the only early occurrences of this type and Giddings has pointed out that their presence in the Kotzebue Sound region at an early date modifies Collins' conclusion that knobs were introduced into Alaska by a late return migration of the Thule people (Collins, 1937, p. 324). Instead it would seem that knobs were a part of Thule culture at the time of its original eastward migration (Giddings, 1952, p. 50).

The earliest occurrence of arrowheads with sharp shoulders and conical tangs with lashing collars is at the Ekseavik site (Giddings, 1952, p. 46). The type is also present at Ambler Island (Giddings, 1952, p. 43), the Point Atkinson and Barter Island sites near the mouth of the Mackenzie River (Mathiassen, 1930, pp. 10, 23) and in the Tigara phase at Point Hope (Larsen and Rainey, 1948, p. 176).

Arrowheads with sloping shoulders and plain conical tangs are older and more widely distributed, being present on St. Lawrence Island from Old Bering Sea through the Modern period (Collins, 1937, pp. 135-137, 323-324; Geist and Rainey, 1936, p. 98) and in the upper levels

of the Port Möller site on the Alaska Peninsula (Weyer, 1930, p. 268). The type also occurs in Birnirk collections from Point Hope and Point Barrow (Larsen and Rainey, 1948, p. 169; University of Pennsylvania collections) and at the Ekseavik and Ahteut sites, as well as in late manifestations at Point Atkinson (Mathiassen, 1930, p. 40) and Baillie Island (Wissler, 1916, p. 431).

Sloping shoulders and conical tangs with a bulge are generally associated with arrowheads belonging to the Thule culture and of all the tang types in the Kotzebue collection, it is the most widely distributed. In addition to its occurrence at the Naujan site in Repulse Bay (Mathiassen, 1927, I, p. 35), the type is also found on Baillie Island (Wissler, 1916, p. 431), on St. Lawrence during the Punuk period (Collins, 1937, p. 323), in the Kobuk River region at Ahteut (Giddings, 1952, p. 47), at Point Hope in the Western Thule phase (Larsen and Rainey, 1948, p. 173) and at Point Barrow in the Birnirk site (University of Pennsylvania collections).

Shoulderless arrowheads with wedge-shaped tangs are very limited in their distribution. The type appears to be present in the Thule site at Naujan (Mathiassen, 1927, I, Pl. 10) but its only other occurrence is at Ambler Island (Giddings, 1952, p. 43). However, arrowheads with sharp shoulders and wedge-shaped tangs, though not present in the author's Kotzebue collection, are an important type on St. Lawrence Island during the Recent-Prehistoric and Modern periods (Geist and Rainey, 1936, p. 98; Nelson, p. 159).

The last of the arrowhead types in the Kotzebue collection important for comparative purposes are those with shoulderless conical tangs. These generally belong to the early periods of Eskimo prehistory, being present on St. Lawrence Island during the Old Bering Sea phase, (Rainey, 1941, p. 496; Collins, 1937, p. 135) and at Point Hope in the Ipiutak site (Larsen and Rainey, 1948, p. 63). However, a late occurrence is also reported from St. Lawrence Island during the Modern period (Geist and Rainey, 1936, p. 136).

Kotzebue arrowheads show a much greater variability in the blade than in the tang, so much so that the barb arrangement cannot be considered significant for comparative purposes.

Three types of end notching are found in the Kotzebue arrowhead collection. One specimen has a blade slit, a type that is widespread in Alaska in the earliest cultures (Rainey, 1941, p. 496; Larsen and Rainey, 1948, Pls. 1, 32, 33) and has persisted through the Modern period (Nelson, 1899, p. 159). A second type is socketed, the socket being formed by slitting the tip of the arrowhead and gouging out a place for the blade. End notched arrowheads of this type are found in Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, p. 45), at Cape Smythe in the Point Barrow District (Wissler, 1916, p. 424) and are mentioned for the modern period at Point Barrow and Point Hope (Nelson, 1899, p. 159; Murdoch, 1892. Fig. 186a). The third type is open notched, a type best known in dart heads from the Aleutian Islands (Jochelson, 1925, Pl. 23), but also occurring in the Ekseavik site along the Kobuk River (Giddings, 1952, p. 46).

Probably the most significant thing about the Kotzebue arrowheads is the great variety of tang types that are represented. Nearly all the types that can be used for comparative purposes are widespread both in time and space throughout Alaska and to a limited extent the eastern arctic as well. The occurrence of such a wide variety of tang types in a site in which the earliest tree-ring bark date is 1315 A. D. and the latest 1571 A. D. would seem to suggest that changes in the shape of arrowhead tangs, in some areas at least, is not reliable for chronological purposes. It also suggests a basic instability in this artifact category and it can be assumed that the various forms did not adequately fulfill the purpose for which they were intended. That is, no tang type was sufficiently effective to establish itself as the dominent form.

Blunt arrowheads with wedge-shaped tangs for killing birds and small animals are present in the Kobuk River region at all the sites except Ahteut (Giddings, 1952, pp. 43, 45, 46) and occur in such widely separated proto-historic sites as Hooper Bay Village (Oswalt, 1952a, p. 53), Point Barrow (Mathiassen, 1930, Pl. 7; Wissler, 1916, p. 427) and Point Atkinson (Mathiassen, 1930, Pl. 3). Specimens with bifurcated tangs are present on St. Lawrence Island during Punuk (Collins, 1937, p. 222), at the Kotzebue (1400 A. D.), and Ekseavik sites (Giddings, 1952, pp. 45-46). The type is also found in a late site at Pavik in Bristol Bay (Larsen, 1950, p. 178), on Barter Island and at Point Atkinson (Mathiassen, 1930, pp. 10, 23). Nelson has reported it for the Modern period in the lower Yukon River and Norton Sound regions (1899, Pls. LXI b, LXI c). Most widely distributed in time and space are blunt arrowheads with drilled sockets. These are found in the Old Bering Sea I, Ipiutak and Near Ipiutak cultures (Rainey, 1941, p. 496; Larsen and Rainey, 1948, pp. 67, 163) and have come down to recent times where they are reported from the Recent-Prehistoric and Modern periods on St. Lawrence Island (Geist and Rainey, 1936, pp. 98, 137; Nelson, 1899, p. 159) and a protohistoric site at East Cape, Siberia (Mathiassen, 1930, p. 74). The type is also present in the Aleutians (Jochelson, 1925, p. 92) and in Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, p. 45).

Flint arrow points are common archaeologically in northern Alaska and are particularly characteristic of all phases of Kobuk River culture. Of the types in the Kotzebue collection, stemless forms occur in Kotzebue houses, excavated by Giddings, dating around 1550 A. D. (Giddings, 1952, p. 45), and points with large rounded stems resemble Ekseavik type A (Giddings, 1952, p. 47) and are found in the Tigara phase at Point Hope (Larsen and Rainey, 1948, p. 176) and the modern period in the Norton Sound region (Nelson, 1899, p. 159). The same instability characteristic of arrowhead tang types seems to apply to this category.

Nothing can be said of the Kotzebue bow, but sinew backing is indicated by the presence of bow braces and sinew twisters. This complex is present along the Kobuk River from Ekseavik times (Giddings, 1952, p. 51) and the sinew twister was introduced to St. Lawrence Island during the Punuk period (Collins, 1937, p. 223). Shaft

straighteners, the only other implement associated with the bow and arrow complex, are too sporadic in their distribution to be of value for distribution studies.

Ownership marks on arrowheads are reported for northern Alaska from post-Birnirk sites (Wissler, 1916, Fig. 35) and are present at Giddings' Kotzebue site and at Ekseavik (Giddings, 1952, p. 51). Of the marks on the author's Kotzebue arrowheads, no two are alike and twelve are placed on the base just above the shoulder while two are on the blade.

Bird spear center and side prongs are similar to those used with fish spears and it is difficult to tell them apart. At any rate, they are so nondescript in form and widespread in distribution that comparison has little value.

SEA HUNTING

There are seven complete and two fragmentary **harpoon heads** in the Kotzebue collection. All are of antler with the exception of one walrus ivory fragment. Two of the complete specimens have closed sockets and blade slits running parallel to the line holes. One of these is hexagonal in cross section and plain (Pl. 5, 9) while the other has a slight constriction below the line hole and is decorated with incised lines (Pl. 5, 12). A third specimen with closed socket is like those described above except that the blade slit runs at right angles to the line hole.

Two complete harpoon heads have open sockets, lashing slots and blade slits that run parallel to the line holes. One of these is hexagonal in cross section and, just above the line hole, is decorated with ticked lines in the form of triangles (Pl. 5, 10). Two other specimens with open sockets are very different in shape and size. One is short and stubby with a lashing groove and no blade slit (Pl. 5, 11) while the other is long and slender with drilled lashing holes and multiple opposite barbs (Pl. 5, 8). A shallow groove running from near the tip to the line hole on one side of this specimen, terminates in a Y pattern. Of the fragmentary specimens, one shows a closed socket and stubby spur (Pl. 5, 20) while the other is open socketed with lashing slots and spurred line decoration (Pl. 5, 22).

Three **toy harpoon heads,** two of antler and one of walrus ivory are different from any of the full sized heads. One is a blank for an open socketed type (Pl. 5, 19); a second specimen is closed socketed with opposite barbs (Pl. 5, 18) while the third one is closed socketed and barbless (Pl. 5, 17). Neither of the last two have line holes.

There are three **harpoon foreshafts,** all of antler and all drilled for line attachment. Two are round in cross-section with tangs in the shape of a blunted cone (Pl. 5, 14) while one is flattened with a rectangular, wedge-shaped tang (Pl. 5, 15).

Harpoon socket pieces show three distinct tang types. Six specimens, five of antler and one of walrus ivory, are hollowed out to fit over the end of a shaft and all of these are drilled to receive a round foreshaft. Five are plain (Pl. 6, 3) while one has a raised ridge at the socket end and is decorated with four incised bands. This specimen also has a rectangular slot at the proximal end for securing the socket piece to the shaft (Pl. 6, 6); three round holes serve a similar purpose on another specimen.

Wedge-shaped tangs, scored for lashing are seen on two socket pieces. One of these, made of antler, is short and thick with a round hole to receive the foreshaft (Pl. 6, 1); the other is of bone and is long and slender. It is also drilled to receive a round foreshaft and has a hole drilled through the tang to aid in hafting (Pl. 6, 9).

A bifurcated tang occurs on one antler specimen which is plain and drilled to receive a round foreshaft (Pl. 6, 13).

Several incomplete socket pieces occur in the collection. One of these has eleven incised bands near the socket end (Pl. 6, 5); another made of walrus penis bone, is thickened near the socket end (Pl. 6, 4) while a third specimen of bone has a single incised line in the same place (Pl. 6, 2).

An interesting feature of several socket pieces is the occurrence of longitudinal marks along the outside of the specimens indicating that a small chisel or beaver tooth tool was employed in their manufacture.

A **dart socket** piece of walrus penis bone is broken above the tang. It is drilled to receive a round foreshaft (Pl. 6, 18).

An ivory **finger rest** for a harpoon shaft is curved and flat based with two holes for lashing to the shaft (Pl. 5, 21).

A possible **throwing board peg** of walrus ivory has a rounded body with an oval head extending at right angles to one end. The body is inserted in a hole at the distal end of the throwing board and the head forms a catch to hold the dart shaft in place (Pl. 5, 23).

A **bladder mouthpiece**, 1.2 cm. long, has a wide lashing groove around its circumference and an incised band with radiating spurs around the hole (Pl. 5, 24).

Harpoon dart heads are large or small and of different forms; five are made of antler and three of walrus ivory. One of walrus ivory and one of antler are assymetrically barbed and have a slight shoulder with wedge-shaped tang. The line holes are either gouged or drilled and located on one side near the base (Pl. 6, 8, 11); the basal end of a broken ivory dart head also belongs to this type. An antler specimen has three barbs on one side and is shoulderless with a wedge-shaped tang; a drilled line hole is located on one side near the base (Pl. 6, 12). A heavy ivory dart head has powerful opposite barbs and a wedge-shaped tang. The line hole is a gouged slot located in the center near the base (Pl. 6, 10). Two basal fragments of antler have sloping shoulders and conical tangs. One of these is roughly triangular in cross-section and has a crudely gouged line hole located to the side near the base (Pl. 6, 16).

An unusual specimen is very small, delicate and may be the head of a salmon arrow. It is symetrically barbed with the barbs parallel to a gouged line hole which is located near the base. The tang is shoulderless and tapered with a rounded end (Pl. 6, 17).

Snow goggles may be considered as objects connected with sea hunting; two pairs are made of pieces of curved antler hollowed out to fit over the face. Narrow slits are cut for the eyes. Small holes at either end provide fastening places for a thong to go around the head (Pl. 6, 19).

There are two antler **lance blade receivers** in the Kotzebue collection. One is straight sided, barbless and deeply hollowed out for receipt of a flint lance point. A lashing lip extends around the side opposite the blade slit and there is a gouged line hole at the proximal end (Pl. 6, 15). Giddings has suggested that implements of this type may be part of a killing lance for harpooned beluga and larger seal (Giddings, 1952, p. 54). A composite specimen narrows at the proximal end and is scored for lashing. A small hole is drilled 3.8 cm. from the distal end, into which a peg is inserted to keep the lance blade in place (Pl. 6, 14).

A large **lance blade** of jasper is unfinished but would probably have been stemless with a rounded base (Pl. 6, 7).

ANALYSIS AND COMPARISON

Sea hunting equipment is not plentiful in the Kotzebue collection and this means of subsistence appears to have been of less importance than at most coastal sites in northern Alaska. However, the specific group of traits making up the harpoon assembly is present and can be

shown to be closely allied with that of the Thule culture sites of the eastern arctic. The relative scarcity of sea hunting equipment, harpoon heads in particular, may indicate a greater emphasis on the netting of seals.

Closed socket harpoon heads with the blade slit running parallel to the line hole are locally developed along the north coast of Alaska. On St. Lawrence Island the basic style is particularly characteristic of Old Bering Sea I (Rainey, 1941, p. 480 [Type B]), Punuk (Collins, 1937, p. 206), and the Modern period (Geist and Rainey, 1936, p. 89 [Type A]). It is also mentioned for the proto-historic and historic periods along most of the arctic coast (Murdoch, 1892, p. 221; Nelson, 1899, p. 148; Mathiassen, 1930, pp. 8, 21, 33). The closest parallels to the Kotzebue specimens are from Ekseavik, Giddings' Kotzebue houses dating approximately 1400 A. D. (Giddings, 1952, pp. 54-55), Cape Smythe in the vicinity of Point Barrow, and Baillie Island (Wissler, 1916, pp. 417, 419).

An open socket harpoon head with a lashing slot and no blade slit is similar to Mathiassen's Thule Type I (Mathiassen, 1927, I, p. 24). A variation of this type is found as far south in Alaska as the Yukon Island I and III phases in Kachemak Bay (deLaguna, 1934, p. 80). In the north, however, they appear to be restricted to the western Thule phase on St. Lawrence Island (Geist and Rainey, 1936, p. 93 [Type 7]), and a site containing mostly Thule types at East Cape, Siberia (Mathiassen, 1930, p. 72).

Harpoon heads resembling Mathiassen's Thule Type II (Mathiassen, 1927, I, p. 24) are widespread in Alaska but the particular variation with multiple opposite barbs and drilled lashing holes that occurs at the Kotzebue site is found only from a relatively late period at Point Hope (Mathiassen, 1930, p. 55). Both the Point Hope and Kotzebue specimens have a Y pattern just above the line hole, a trait that is characteristic of central Thule harpoon heads. Collins has suggested that drilled lashing holes were unknown in Alaska until relatively recent times and that it was one of the traits brought west by a return migration of the Thule peoples (Collins, 1937, p. 309). The presence of this trait at the Kotzebue site well before the prosposed late return migration indicates that it may well have been part of the Thule culture at the time of the original eastward movement.

Open socket harpoon heads with a lashing slot and blade slit parallel to the line hole resemble Mathiassen's Thule type III (Mathiassen, 1927, I, p. 25). They are present on St. Lawrence Island from Old Bering Sea I and are particularly characteristic of the Punuk culture (Collins, 1937, p. 118; Geist and Rainey, 1936, pp. 90-91, 201; Rainey, 1941, p. 476). Elsewhere in northern Alaska the type is present at the Ekseavik and Ahteut sites (Giddings, 1952, pp. 55-56) and in late collections from Point Hope and East Cape, Siberia (Mathiassen, 1930, pp. 85,72). In southern Alaska a variant is reported from the Port Möller site on the Alaska Peninsula (Weyer, 1930, p. 267).

Harpoon foreshafts can be compared on the basis of tang shape,

those with tangs in the shape of blunted cones being particularly widespread in the arctic in both late and early sites. In the Kobuk-Kotzebue region they are characteristic of Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, p. 53). Foreshafts with wedge-shaped tangs, one of which occurs in the author's Kotzebue collection, are confined mostly to such widely separated early sites as those in Kachemak Bay (deLaguna, 1934, Pl. 41, 12, 3), the Okvik site on the Punuk Islands (Rainey, 1941, p. 490), the Ipiutak site at Point Hope (Larsen and Rainey, 1948, p. 75), Ekseavik (Giddings, 1952, p. 54), and modern Chugach culture (Birket-Smith, 1953, p. 181).

Harpoon socket pieces are also traceable through tang shapes. Specimens with bifurcated tangs are in the Thule tradition (Mathiassen, 1927, I, p. 28) and seem to be wide-spread throughout both southern and northern Alaska. In the south they are found from Yukon Island III in Kachemak Bay (deLaguna, 1934. p. 195), modern Kodiak (deLaguna, 1934, p. 195), Neo-Aleut levels on Umnak Island (Laughlin and Marsh, 1951, pp. 80-84), in Jochelson's Aleutian material (Jochelson, 1925, Pl. 22, 1-3; Pl. 23, 19-24; Pl. 26, 19, 34) and in the Yukon-Kuskokwim area (Nelson, 1899, p. 147). In the north, in addition to their presence in the author's Kotzebue collection, the type occurs in the Ipiutak site (Larsen and Rainey, 1948, p. 74), the Old Bering Sea phase on St. Lawrence Island (Collins, 1937, p. 321), Ekseavik (Giddings, 1952, p. 56) and modern Point Barrow (Wissler, 1916, p. 436).

Socket pieces with wedge-shaped tangs are also characteristic of eastern Thule sites (Mathiassen, 1927, I, pp. 33-34; Pl. 83) and are equally widespread but with a greater concentration in northern Alaska. The earliest occurrence of this type in the north is at the Okvik site (Rainey, 1941, p. 488) and it is also present in the Punuk and Modern periods on St. Lawrence Island (Collins, 1937, p. 218; Geist and Rainey, 1936, p. 98), in Kotzebue houses dating approximately 1400 A. D. (Giddings, 1952, p. 54), the Tigara phase at Point Hope (Larsen and Rainey, 1948, p. 176), Point Barrow (Mathiassen, 1930, p. 35; Wissler, 1916, p. 436; Murdoch, 1892, Fig. 222), Point Atkinson in the Point Barrow District (Mathiassen, 1930, p. 8) and sites further east at Barter Island (Mathiassen, 1930, p. 22) and Baillie Island (Wissler, 1916, p. 433). In southern Alaska the type is found in Kachemak Bay sites (deLaguna, 1934, p. 86) and in the Aleutians (Jochelson, 1925, Pl. 22, 4, 6).

More restricted in their distribution are harpoon socket pieces with hollowed out sockets at the proximal end. These seem to be particularly characteristic of the Kobuk River region, being present at Ahteut, Ekseavik and in Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, pp. 50, 53-54) as well as in the author's Kotzebue collection. The type is also found at Point Barrow (Mathiassen, 1930, p. 35) and in the eastern Thule sites (Mathiassen, 1927, I, p. 29). Since this is the prevailing type in the collection a relative stability of the form is suggested. This is taken to mean that harpoon socket pieces with

hollowed out sockets were the most successful while other types did not satisfactorily fulfill the purpose for which they were intended.

Three of the Kotzebue socket pieces have incised bands near the socket end, a trait that is also found at the Ahteut and Ekseavik sites (Giddings, 1952, pp. 54, 56).

A dart socket is so termed because it is quite small and of light construction, and therefore not suitable for the harpooning of large sea mammals. However, it is small enough to have possibly been used with salmon harpoon heads. The distinction between dart and harpoon socket pieces is normally difficult to make in most sites.

A single finger rest is of the thin, upright type that is widely distributed over the whole Eskimo area, as is the bladder mouthpiece.

The identification of a peg for a throwing board is based on the occurrence of a similarly identified specimen from a Kotzebue house dating approximately 1400 A. D. excavated by Giddings (1952, p. 54).

Harpoon dart heads have been shown to be generally more characteristic of southern Alaska than of the north where the toggle harpoon head is more important in all periods (Oswalt, 1952a, p. 51). At Kotzebue dart heads can be divided into three comparable types. The first, those that are assymetrically barbed with offset line holes and conical tangs, are the most restricted in their distribution being found only at Kotzebue in houses dating approximately 1400 A. D. and at Ekseavik (Giddings, 1952, pp. 54-55).

The second type, those with barbs on one side only and an offset line hole are more widely distributed, occurring in the south at Port Möller (Weyer, 1930, p. 265), in Kachemak Bay (deLaguna, 1934, pp. 83-84), at Platinum South Spit in Bristol Bay (Larsen, 1950, Fig. 55, B, 3) and at the Fox Creek site on the lower Yukon River (deLaguna, 1947, Pl. 26, 6, 8). In the north the type is found as early as Old Bering Sea I (Rainey, 1941, p. 494) and also occurs in the Ekseavik site where it may be associated with salmon fishing (Giddings, 1952, p. 39), the Tigara phase at Point Hope (Larsen and Rainey, 1948, p. 176) and at Barter Island (Mathiassen, 1930, p. 21).

The third type of harpoon dart head found at Kotzebue is characterized by one or more pairs of opposite barbs and a central line hole. This type is found at Naujan (Mathiassen, 1927, I, p. 27) but dart heads of any form are uncommon in eastern Thule sites. In southern Alaska the third type is found in the Paleo-Aleut levels at Umnak Island (Laughlin and Marsh, 1951, pp. 80-84), in Jochelson's Aleutian collection (Jochelson, 1925, p. 80), at the late site at Pavik in Bristol Bay (Larsen, 1950, Fig. 55, A, 2) and at Hooper Bay Village (Oswalt, 1952a, p. 49). In the north it is found on St. Lawrence Island during the Old Bering Sea and Recent-Prehistoric periods (Geist and Rainey, 1936, Pl. 77, 2; Pl. 42, 5; Pl. 54, 3), in the western Thule and modern phases at Point Hope (Larsen and Rainey, 1948, Pl. 98, 4; Wissler, 1916, p. 415), in Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, p. 53) and in ethnographic collections from the Bering Sea region (Nelson, Pl. LVII, b, 18).

A small symetrically barbed specimen from Kotzebue may be the head of a salmon arrow but resembles harpoon dart heads from Ekseavik, Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, pp. 53, 55) and Hooper Bay Village (Oswalt, 1952a, p. 49).

Snow goggles are characteristic of both the eastern and western arctic and are thus much too widespread in their distribution to be of value for comparative purposes.

Straight-sided, end-grooved lance blade receivers like the single Kotzebue specimen have been reported from the Tigara phase at Point Hope (Larsen and Rainey, 1948, Pl. 89, 15) and from Kotzebue houses dating approximately 1550 A. D. (Giddings, 1952, p. 54). Composite heads are unique for the Kobuk-Kotzebue region but the type occurs in the Recent-Prehistoric phase on St. Lawrence Island (University of Alaska collections).

TOOLS AND MANUFACTURERS

Of the twenty-six wood-splitting **wedges**, eighteen are of antler and eight of whalebone (Pl. 7, 3, 4). The whalebone implements tend to be the larger, ranging from 14.5 cm. to 21 cm. in length. Two specimens are made from net sinkers. The eighteen wedges of antler range between 9 and 17 cm. in length, and are made of whole sections of antler sharpened at one end by hewing with an adze on one or both faces. In most cases, one face appears to be more strongly hewed than the other showing an attempt on the part of the maker to straighten the natural bend of the antler.

Eight close-socketed antler **adze-heads** all conform to the same general type. They are provided with a flattened face for handle attachment on one surface and are either scored or notched on the sides for lashing (Pl. 7, 5, 7, 8).

There are three **adze handles** of antler, all of which are provided with a flat top to receive the head. One specimen (Pl. 7, 12). has a prominent lashing knob on each side; another has a central drilled hole and a third has two drilled holes (Pl. 7, 11).

Two **adze blades** of jade taper toward the proximal end for insertion in a socketed adze head (Pl. 7, 13). **Adze heads of jade** include one specimen that is short but very broad (Pl. 7, 9) and two that are too long for socketing in an antler head (Pl. 7, 10). These were probably lashed directly to a handle.

The eight one-piece **end bladed knife handles** present a variety of forms. Four of antler have a socket at one end that is wide and deep enough to receive a stemmed blade (Pl. 8, 5). Another plain antler specimen appears to have been double bladed as there is a very narrow but deep blade slit at each end. A sixth antler implement has a V shaped groove near the proximal end and is drilled for suspension (Pl. 8, 7). Two ivory specimens, provided with narrow slits, are drilled at the proximal end for suspension. One of these has a slit at one side near the blade socket (Pl. 8, 1).

Ten **side bladed knife handles** or crooked knives. nine of antler and one of bone, have a slightly curved blade slit at one end (Pl. 8, 6). These slits are very thin, ranging in width from .1 cm. to .3 cm. and are probably intended to receive metal blades.

There are five **composite knife handles** in the Kotzebue collection; three are of antler, one of walrus ivory and one of wood. The wooden specimen is half of a large bladed knife handle with the distal end hollowed out to receive a slate blade with a broad, thin stem (Pl. 8, 2). There is a lashing tip at the blade end and the opposite end is notched on the side for lashing. One antler knife half has a very thin blade slit, presumably for a metal blade. It has a lashing tip and is very narrow at the blade end but widens toward the proximal end where there is a drilled hole for suspension (Pl. 8, 4). An unusual antler specimen has a deeper rectangular slot in the blade hollow and an incised line

running the entire length of the implement (Pl. 8, 11). It may have been used as a handle for a slate lancet rather than a knife blade. Another unusual implement is a well made knife half of ivory with a thin blade slit, presumably for a metal blade, and a lashing knob. The end opposite the blade slit is curved and becomes round in cross section. If its companion piece were of the same shape, the handle would be bifurcated and look something like a pair of pliers. About 1.5 cm. from the blade slit there is a drilled hole for pegging the two halves together (Pl. 8, 3).

Slate **man's knife blades** are, with one exception, double edged and symmetrical (Pl. 8, 12); there are five of these. One knife blade is single edged with a squared off tang (Pl. 8, 8). The cutting edge of this implement is chipped rather than ground like the others. In addition to these specimens, there are eight blade fragments, the shape of which cannot be determined.

Ulu blades of slate include twenty-five specimens which are complete and twenty-three recognizable fragments. With regard to the shape of these implements, the one consistent element is the convex outline of the cutting edge. There is some degree of variability in this convexity but the majority of the blades have a semi-lunar shape. Four specimens have a definite tang, either symmetrical (Pl. 8, 18) or irregular (Pl. 8, 17). Five have no tang and are roughly flat across the top (Pl. 9, 9); three are rounded at the proximal end, one so much so that the specimen is almost completely round (Pl. 8, 16); four specimens are notched at the corners to aid in hafting but not enough so as to produce a true tang (Pl. 9, 4). The remaining blades, nine in number, are irregularly shaped and no definite tang shape can be determined (Pl. 9, 5). Three of the implements described above are perforated near the proximal end to aid in hafting. One has a drilled hole and it is interesting to note that before the hole was drilled, grooved lines were incised in such a way that the point of crossing could be used to steady the drill bit at the beginning of the drilling operation (Pl. 9, 9). This grooving was probably done with a stone saw. Two implements have been sawed on either side until the narrow strip of slate between could be easily chipped out to form an oblong hole (Pl. 9, 2).

An **ulu handle** of antler has a blade slit .5 cm. wide and a hole drilled through the top to aid in hafting (Pl. 8, 14). Another specimen of wood was found in position on a tanged slate blade (Pl. 9, 3). A very small ivory handle with a deep blade slit .7 cm. wide and 2.2 cm. long may be for a toy ulu (Pl. 8, 15). A drilled hole just above the blade slit is broken out and may have been intended as a hafting aid.

Three **end scrapers,** one of basalt and two of slate, are discoidal in shape at one end and may have been hafted as two-handed scrapers or beaming tools (Pl. 9, 1, 6, 8).

Side scrapers of flinty material include one carefully prepared specimen that is retouched on all sides and was probably used unhafted (Pl. 8, 13). The remaining twelve implements are crude flakes retouched about one edge or more (Pl. 8, 9, 10).

There are five plain antler sections in the collection, in one end of which is a gouged socket (Pl. 9, 10). These may be **scraper handles** but the identification is doubtful since no blades were found that would appear to fit them. Two additional specimens have gouged sockets in each end and may be double bladed handles.

A chert **hand drill** has a triangular hand grip from which the point projects (Pl. 9, 7). Use of a bow or strap drill is indicated by the presence of an antler fragment and a small wedge that have been used as drill bearings.

The only tool for working flint that occurs in the Kotzebue collection is the short **flaker point** of bone which is intended for insertion in a separate handle. There are four of these, one having a rectangular slot near the proximal end to aid in hafting (Pl. 9, 12, 13).

A bone **willow bark tool** has a spatulate tip and was used to strip the bark from young willow trees; this bark would perhaps be used as twine or for netting (Pl. 9, 18).

Whole or fragmentary **beaver teeth** (Pl. 9, 11) were used as wood working tool blades by fitting them in the ends of specially designed handles. There are three such teeth in the collection and two others which may be porcupine teeth and were undoubtedly used for the same purpose. There are four end-hafted **beaver tooth tool handles,** two being made of antler and two of walrus ivory (Pl. 9, 16, 17). All have one end deeply slotted for receipt of a tooth and one walrus ivory specimen is provided with a lip to aid in lashing the tooth into the slot. This implement is highly decorated with incised and spurred lines (Pl. 9, 17).

There are surprisingly few **whetstones** from the Kotzebue site and all are of the same general type. The five implements are made of shale and are roughly rectangular in shape being ground on one surface only (Pl. 9, 15). All the recovered specimens show signs of considerable use.

A round beach pebble of hard stone appears to have been used as a **pounding stone** as there is a circular worn area on one surface (Pl. 10, 5).

The use of the **stone saw** at the Kotzebue site is indicated by groovings on slate ulu blades and the working of mammoth teeth. The one specimen, which appears to be complete, is small, being only 14 cm. in length, and very thin. The material is a sandy schist and the implement is bluntly V shaped in cross-section (Pl. 9, 14).

Three **mauls** of slightly pecked beach rock have central three-quarter grooves which indicate the method of hafting (Pl. 10, 4).

There are ten complete or nearly complete heads of **picks,** possibly used to dig edible roots; nine are made of beluga and walrus ribs and one of walrus ivory. Five bone specimens are provided with three lashing grooves or slots on one edge, and a wide, flat scored face on the other for attachment of the handle (Pl. 10, 2). Four bone implements have been sharpened as picks but show no lashing grooves for hafting. Perhaps these were used unhafted (Pl. 10, 3). The one ivory specimen is incomplete but is scored along one edge for hafting.

Three **two-handed scrapers** are made of caribou metacarpals and metatarsals which have been cut in a lateral plane, and sharpened along both edges (Pl. 10, 7). One implement shows the cutting but apparently has not been sharpened for actual use and may be an unfinished specimen.

The six **bag handles** represent a variety of forms. A wooden specimen is notched at either end and an antler handle of the same general shape has a deep groove along its convex surface to receive a line attached to the bag (Pl. 11, 3; Pl. 12, 20). Another antler specimen has deep notches and lashing lips at either end (Pl. 11, 6). A small implement of antler is similar in shape to the one previously described but has drilled holes and lashing grooves at opposite ends (Pl. 11, 4). A bone handle is concave like the others and has drilled holes at opposite ends (Pl. 11, 5). A unique implement of antler has rectangular lashing slots at either end and is decorated on its upper edge with a series of carved "whale tail" designs (Pl. 10, 6).

A large bone fragment, narrowed at the end to form a rough handle, appears to have been used as a **stake pounder.**

Although no red pigment appears on any of the stone tools, one piece of **red ochre** was recovered. This is an irregular lump but does not appear to have been rubbed on any of its surfaces.

Two **blades for shovels** are made of walrus scapulae, one being notched while the other is scored for hafting. One of these is provided with two gouged holes just below the neck to aid in hafting (Pl. 11, 8). Another shovel blade of antler appears to be a composite type and consists of three sections, all of them with drilled holes along each side for lashing together. The pieces may not all belong to the same shovel (Pl. 11, 7). A second antler specimen is simply a large fragment that has been flattened at one end. This blade is not very broad and its identification as a shovel must be considered doubtful.

The practice of working fossil **mammoth tooth** is found at the Kotzebue site. A number of large tooth fragments appear to have been sawed with a stone saw (Pl. 11, 2). Since mammoth tooth is extremely brittle, it would not seem to be a

satisfactory material from which to manufacture artifacts. This probably accounts for the fact that only one finished implement of this material was recovered, a fishing line sinker described elsewhere.

One section of an adze cut mammoth tusk occurs in the collection (Pl. 11, 1) and various objects made of this substitute for walrus ivory are described in the appropriate sections.

ANALYSIS AND COMPARISON

Antler and bone wedges for splitting logs are plentiful in the Kotzebue collection and widespread in distribution throughout western North America (Birket-Smith, 1929, II, Tables A, 90, B, 59). Antler specimens predominate at Kotzebue as they do in all the Kobuk sites (Giddings, 1952, p. 78), at Ipiutak (Larsen and Rainey, 1948, p. 87) and along the lower Yukon River (deLaguna, 1947, pp. 132, 169).

Adze heads with closed socket and flattened face for handle attachment are thought to be older and more widely distributed than those with a bed for the blade (deLaguna, 1947, p. 158). In addition to being the only type from the Kotzebue site, they are also found in all the Kobuk sites except Ahteut (Giddings, 1952, p. 77), at the Ipiutak site (Larsen and Rainey, 1948, pp. 84-85), in miscellaneous collections from Point Hope and Point Barrow (Mathiassen, 1930, Pl. 8, 14; Pl. 13, 3), from the Yukon Island III period in Kachemak Bay (deLaguna, 1934, Pl. 19, 6), and from Dorset and Thule sites in the eastern arctic (Leechman, 1943, p. 154; Mathiassen, 1927, I, Pl. 20, 1-4). Closed socket heads similar to those in the Kotzebue collection but with drilled holes for handle attachment are the predominant type in all periods on St. Lawrence Island (Collins, 1937, p. 334; Geist and Rainey, 1936, pp. 157, 139, 103) and are present in modern Point Barrow collections (Murdoch, 1892, Figs. 135-138) and from along the lower Yukon River (deLaguna, 1947, p. 157).

Adze handles from the Kotzebue site are of a common Eskimo type and small adze blades that taper toward the proximal end for insertion in heads are known from all cultural stages where the socketed adze head is found. Heavy adze blades lashed directly to the handle are almost universal in distribution among the Eskimo. For a discussion of adze blades see deLaguna (1947, pp. 154-162).

One piece end bladed knife handles similar to those in the author's collection are reported from the Ambler Island, Kotzebue (1550 A. D.) and Ekseavik sites where, like most of the Kotzebue specimens, they have sockets large enough for stone blades (Giddings, 1952, pp. 66, 68, 71); from the Old Bering Sea, Punuk and Recent-Prehistoric phases on St. Lawrence Island (Collins, 1937, Pl. 23, 1; Pl. 38, 9, 10; Geist and Rainey, 1936, p. 158), from Point Atkinson and Point Barrow (Mathiassen, 1930, pp. 13, 41, 58; Murdoch, 1892, Figs. 105-106, 99a, 111) and from Naujan in the eastern arctic (Mathiassen, 1927, I, Pl. 17, 18).

Crooked knives do not appear on St. Lawrence Island until the Punuk period (Collins, 1937, Pl. 78, 1-3). In the Kobuk River region they occur at Ambler Island, Kotzebue (1550 A. D.) and Ekseavik (Giddings, 1952, pp. 66, 68, 71) and are generally well distributed along

the Alaska coast from Barter Island to Bristol Bay (Mathiassen, 1930, Pl. 5, 10; Murdoch, 1892, Fig. 118; Nelson, 1899, Pl. XXXVIII; Oswalt, 1952a, p. 57; Larsen, 1950, Fig. 55, 5). The type is also prominent in eastern Thule sites (Mathiassen, 1927, I, Pl. 18, 2-5).

The narrow width and slight curve of the blade slits in crooked knives suggest that they contained metal blades. The sources of metal available to the Alaskan Eskimo have not been fully determined but its presence is indicated since early St. Lawrence Island and Ipiutak times (Collins, 1937, pp. 303-305; Larsen and Rainey, 1948, p. 159).

The flat, wooden composite knife handle probably held a stemmed slate blade and is strikingly similar to specimens from Point Barrow (Murdoch, 1892, Fig. 99b), Hooper Bay Village (Oswalt, 1952a, p. 57) and Kotzebue houses dating approximately 1550 A. D. (Giddings, 1953, p. 68). More common in the author's Kotzebue collection are composite knife handles of antler or ivory slotted at the end to hold a small end blade. This type is found from Old Bering Sea I through the Modern period on St. Lawrence Island (Rainey, 1941, Fig. 18, 1-4; Collins, 1937, p. 231; Geist and Rainey, 1936, Pl. 23, 6), at Ambler Island, Kotzebue (1550 A. D.) and Ekseavik in the Kobuk region (Giddings, 1952, pp. 66, 68, 71) and from the historic period on the Bering Sea coast (Nelson, 1899, Pl. XXXVIII, 8). A variation of this type, in which the base is not completely split to form two halves, appears to be represented at the Kotzebue site by one broken specimen (Pl. 8, 4). This variation is particularly characteristic of the Okvik site(Rainey, 1941, Fig. 18, 5-7) and also occurs at Hooper Bay Village (Oswalt, 1952a, p. 57).

Double-edged man's knife blades are found in all stages of Eskimo culture but the single edged blade is less widely distributed. In northern Alaska the type occurs at Barter Island, Point Atkinson and Point Barrow (Mathiassen, 1930, pp. 13, 25; Murdoch, 1892, Figs. 106, 107), in the Tigara phase at Point Hope (Larsen and Rainey, 1948, Pl. 90, 19, 20) and at Ahteut (Giddings, 1952, p. 74), while in the south it is present in Kachemak Bay (deLaguna, 1934, p. 73) and along the Yukon River (deLaguna, 1947, Pl. XIV, 37). Single edged blades are also characteristic of eastern Thule sites (Mathiassen, 1927, I, pp. 53, 168).

Ulu handles from the Kotzebue site are not distinctive and the single type of ulu blade represented, that with a curved cutting edge, is widely distributed in Alaska from Kachemak Bay to Point Barrow and is also found in Canadian sites. Several blades have lashing slots that have been made with a stone saw. Specimens showing this type of workmanship have been reported from Kotzebue houses dating approximately 1400 A. D. (Giddings, 1952, Pl XIV, 3) and Point Atkinson (Mathiassen, 1930, Pl. 3, 23).

End scrapers hafted as two handed scrapers or beaming tools are limited in their distribution. The type is reported for the Chukchee (Bogoras, 1904-09, Figs. 144-146) and is found at the Ipiutak site where Type I particularly resembles the Kotzebue specimens (Larsen and Rainey, 1948, Pl. 15, 10); at the Birnirk site at Point Barrow (University of Pennsylvania collections), in the Kachemak Bay III period

(deLaguna, 1934, pp. 76-77, Pl. 34, 9) and at Hooper Bay Village (Oswalt, 1952a, Pl. 4, 2).

Side scrapers of chert all have convex working edges and specimens of this type are widely distributed in northern Alaska being present at the Ahteut, Kotzebue (1400 A. D.), Ekseavik and Onion Portage sites (Giddings, 1952, pp. 70, 71, 73, 122), in the Ipiutak, Near Ipiutak, Tigara and Modern phases at Point Hope (Larsen and Rainey, 1948, Pl. 16, 6-10, Pl. 81, 5-9, Pl. 90, 12-13, Pl. 94, 14, Pl. 95, 14) and in the Old Bering Sea period on St. Lawrence Island (Rainey, 1941, Fig. 32, 12; Collins, 1937, Pl. 41, 15-31, Pl. 42, 1-3). Giddings has pointed out that flint flaking as a major industry persisted until recent times from the north side of Seward Peninsula to Point Barrow but on St. Lawrence Island and the regions to the south, slate working almost wholly replaced work in flint after the Old Bering Sea period (Giddings, 1952, p. 76). The abundance of good flaking materials would certainly explain the persistence of the techniques in the Kobuk-Kotzebue region.

As mentioned previously, the identification of plain antler sections with gouged sockets as scraper handles is considered doubtful because of the absence of blades. The type is not present in any of the Kobuk sites but is reported by Nelson for the Bering Sea Eskimo (Nelson, 1899, Pl. XLIX) and is present in lower Yukon River sites (deLaguna, 1947, Pl. XIV, 48, pp. 186-187), at Hooper Bay Village (Oswalt, 1952a, p. 58) and among the Ingalik (Osgood, 1940, pp. 79-81). All of these scraper handles are curved except the Kotzebue specimens and those from Hooper Bay Village.

Chert hand drills with a triangular hand grip are characteristic of the Ambler Island, Ahteut and Ekseavik sites (Giddings, 1952, pp. 65, 70, 73); they are also found at the Ipiutak site where Type I particularly resembles the Kotzebue speciman (Larsen and Rainey, 1948, Pl. 20, 9-11). at Chagvan Bay (Larsen, 1950, p. 184), along the lower Yukon River (deLaguna, 1947, Pl. XIV, 15) and at Port Möller (Weyer, 1930, Fig. 20c).

Pressure flaking of flint at the Kotzebue site was accomplished by means of a short piece of animal rib or antler hafted into a groove at the tip of a handle. This type predominates in the Kobuk sites (Giddings, 1952, pp. 65, 69, 70) and is present at Ipiutak (Larsen and Rainey, 1948, p. 93), in the Okvik site, where only the handles have been found (Rainey, 1941, Fig. 20, 14-15), along the north Bering Sea coast in more recent times (Nelson, 1899, Fig. 26; Murdoch, 1892, Fig. 297; Mathiassen, 1930, p. 44), and at Naujan in the eastern Thule region (Mathiassen, 1927, I, Pl. 34, 9).

Willow bark tools similar to the single Kotzebue specimen are found archaeologically on the Kobuk River in the Ambler Island site (Giddings, 1952, p. 67); bark peelers in general have a wide distribution (deLaguna, 1948, pp. 408-409) with end hafted specimens being particularly described for the Ingalik (Osgood, 1940, p. 85). Nelson illustrates the type for the Eskimo the Yukon Kuskokwim delta country (Nelson, 1899, pl. XXXVIII, 21, 23), and Birket-Smith mentions them

for the Chugach Eskimos (Birket-Smith, 1953, p. 221). Archaeologically, end hafted specimens, in addition to their presence in the author's Kotzebue collection, occur in Giddings' Kotzebue houses (1400 and 1550 A. D.) and at the Ekseavik site (Giddings, 1952, pp. 68, 70, 72), at Nukleet on Cape Denbigh (Giddings, 1949, p. 85) and at Hooper Bay Village (Oswalt, 1952a, p. 57). At Kotzebue this implement was perhaps used mainly for chiseling out concavities in wood or antler, and many implements also show indications that finish whittling was done with beaver teeth. Similar evidence for the extensive use of beaver tooth tools for finish work has been determined for several phases of culture at Cape Denbigh in Norton Sound (Giddings, 1949, p. 85).

The most interesting fact about whetstones in the Kotzebue collection is their relative scarcity. The quantity of slate implements from the site seem to suggest that whetstones should be an important item of the material culture. The implement is widely distributed throughout the Eskimo area, being present wherever slate is worked.

The stone saw appears to have been a relatively recent innovation in the Kobuk-Kotzebue area, being present in Kotzebue houses dating approximately 1550 A. D. and at Ambler Island. Indications of its use in the form of sawed mammoth teeth is present at the former site (Giddings, 1952, pp. 66, 69). The type also occurs in the Kachemak Bay III period (deLaguna, 1934, p. 61), at Hooper Bay Village (Oswalt, 1952a, p. 58), in the Aleutian Islands, in Salish sites to the south and as far east as the Dorset sites (deLaguna, 1947, pp. 167-168). The presence of a sawed slot in an ulu blade from Point Atkinson (Mathiassen, 1930, Pl. 3, 23) suggests a more northerly distribution for the type than is otherwse indicated.

Digging implements identified as root picks are plentiful in the Kotzebue collection and widely distributed in northern Alaska, being present in all phases on St. Lawrence Island (Rainey, 1941, Fig. 22, 1-5; Collins, 1937, Pl. 49; Geist and Rainey, 1936, Pl. 24, 5, Pl. 43, 9), at all the Kobuk River sites except Ambler Island (Giddings, 1952, p. 79) in the Ipiutak and western Thule phases at Point Hope (Larsen and Rainey, 1948, p. 87, Pl. 75, 15) and in recent collections from the Bering Sea coast (Nelson, 1899, p. 75, Pl. 33b, 1, 3; Murdoch, 1892, Figs. 303-304). In southern Alaska the type appears to be confined to the Aleutians (Jochelson, 1925, Pl. 26, Fig. 44). Specimens described by Mathiassen for eastern Thule sites were probably used as mattocks and not root picks; the latter seem to be confined entirely to Alaska (Mathiassen, 1927, II, pp. 78-79).

Two handed scrapers of caribou leg bone are cut in the lateral plane to produce two working edges. Specimens of this type occur in the Ipiutak and Tigara phases at Point Hope (Larsen and Rainey, 1948, pp. 88-89, Pl. 89, 25), in all the Kobuk River sites (Giddings, 1952, p. 78) in the Birnirk and modern periods at Point Barrow (Mason, 1930, Pl. 3; Murdoch, 1892, Fig. 299), and along the lower Yukon River (deLaguna, 1947, p. 190). A single implement of this type from the

Old Bering Sea period on St. Lawrence Island is made from a dog femur (Collins, 1937, p. 166).

Scapula shovels are known from all periods on St. Lawrence Island (Rainey, 1941, pp. 512-3; Collins, 1937, Pl. 50, 6, Pl. 60, 12; Geist and Rainey, 1936, p. 105) and, in addition to their presence at Kotzebue, also occur in the Ipiutak and Tigara phases at Point Hope (Larsen and Rainey, 1948, p. 87), in Kotzebue houses excavated by Giddings dating approximately 1550 A. D. (Giddings, 1952, p. 69), in modern collections from Point Barrow (Murdoch, 1892, Fig. 30) and from eastern Thule sites (Mathiassen, 1927, II, p. 67). The majority of artifacts in this category exhibit greater stability of form than is noted for other categories of implements. Exceptions to this are the end bladed and composite knife handles, and the ulu blades. The instability of knife handle form may be due to the fact that each handle type was created to perform a special task. Variability in ulu blade form may indicate that the blade could be successfully hafted without careful attention to the shape of the tang.

TRAVEL AND TRANSPORTATION

Evidences of travel and transportation are confined to sledding. Preservation conditions at the Kotzebue site were not good enough to allow for the occurrence of very many perishable artifacts and this undoubtedly accounts for the absence of boat parts.

There are eleven flat **sled shoe** sections, ten being made of whalebone and one of antler (Pl. 7, 1, 2). Holes for pegging to a runner are drilled .5 to .9 cm. in diameter and are irregularly spaced. The width of the shoes vary from 2.3 cm. to 3.6 cm. and nearly all of the sections are thin, showing considerable wear.

Evidence of dog traction at the Kotzebue site is confined to the occurrence of one small ivory block, or **trace buckle**, used with a dog harness (Pl. 7, 6). This implement is somewhat pear-shaped with a hole through the larger end. At the other end, running at right angles to this hole, is a smaller one with a line groove on either side. It is through this end that a permanent line is attached while the larger hole is to receive a line for temporary attachment. It is decorated with incised and spurred lines, and closely resembles those described by Nelson (1899, p. 211) from St. Lawrence Island.

ANALYSIS AND COMPARISON

Sled shoes similar to those found at Kotzebue are reported from Giddings' Kotzebue houses (1550 A. D.) and the Ambler Island site (Giddings, 1952, pp. 59-61), for the Tigara and modern phases at Point Hope (Larsen and Rainey, 1948, Pl. 89, 31; Pl. 93, 12), at the Pavik site in Bristol Bay (Larsen, 1950, p. 178) and at Hooper Bay Village (Oswalt, 1952a, p. 66). All have drilled holes for pegging to a runner as do shoes of baleen, wood and bone from eastern Thule sites (Mathiassen, 1927, I, pp. 43, 160). Shoes of the same general type but with drilled holes and countersunk slots for lashing are present in the Recent-Prehistoric and Modern phases on St. Lawrence Island (University of Alaska collections). The Kotzebue sled shoes, as well as the others mentioned above, are not to be confused with ivory types that are Y shaptd in cross section with holes in a curved fore end for lashings which fastened the shoe to a wooden runner. The latter are present on St. Lawrence Island from Old Bering Sea I, through the Modern period (Rainey, 1941, Pl. 16, 6; Collins, 1937, p. 157; Geist and Rainey, 1936, p. 109).

Nelson illustrates modern Siberian Eskimo sleds with lashed on shoes and points out that the large sleds of the mainland Alaska Eskimos have had pegged-on shoes while the small hand sleds usually have the runners unshod (Nelson, 1899, pp. 205-208). Shoes of the lashed-on type appear to predominate on St. Lawrence Island although a few pegged-on specimens do occur (University of Alaska collections). Giddings has pointed out that the existence of a strong pegging tradition on the mainland may have inhibited the spread of the lashed on type from St. Lawrence Island (Giddings, 1952, p. 63).

Small ivory blocks, or trace buckles, of the type described by Nelson (1899, p. 211) and used with dog harnesses are, in addition to their occurrence at Kotzebue, present in Recent-Prehistoric and Modern collections from St. Lawrence Island (University of Alaska collections). A roughly similar type occurs at the Naujan site in the eastern Thule area (Mathiassen, 1927, I, p. 45).

The occurrence at the Kotzebue site of sled shoes and a trace buckle in a house containing wood which dates in the vicinity of 1570 A. D. is the earliest association of these types in the western arctic. The absence of direct evidence for dog traction from early sites in Alaska has long puzzled arctic specialists as there is abundant evidence for the occurrence of the trait at a very early date in northern Asia. Field and Prostov mention the discovery of bone harness parts and the carved figure of a harnessed dog from a site at the mouth of the Polui River that was probably occupied from before the beginning of the Christian era until at least the fifth or sixth century (Field and Prostov, 1942, p. 402). Zoltarev suggests that all the Ostyak and some of the Samoyed were dog breeders as early as the 15th century (Zoltarev, 1938, p. 22) while Birket-Smith in addition to pointing out that dog traction is old among the Paleo-Asiatics, mentions a Chinese source from the year 1259 A.D. that tells of dog sleds among the Kirgiz (Birket-Smith, 1929, II, p. 169).

Dog traction also appears to have considerable antiquity in the eastern arctic. In addition to the occurrence of sled shoes and trace buckles in the Thule site (Mathiassen, 1927, I, pp. 43, 45, 160), a specimen of the latter implement is reported for the Dorset culture in Inglefield Land (Holtved, 1944, p. 62). Also, Jenness calls attention to a statement in *Frobisher's Voyages* that in the sixteenth century, "the Eskimo of Frobisher Bay kept two distinct breeds of dogs, a smaller one for eating and a larger one for dragging the sleds" (Jenness, 1940, p. 392).

In attempting to reconcile the presence of dog traction at an early date in Siberia and the eastern arctic with its supposed absence from early St. Lawrence Island phases and other early sites in the west, Jenness makes the following statement:

> . . . . about the end of the Birnirk phase at Barrow . . . a larger, sturdier breed of dog was introduced in Arctic America from Siberia, where dog traction, if not earlier than reindeer traction. . . . . arose as a substitute. . . . .certain bands of these north Alaskan Eskimo trekked eastward, carrying their Thule culture with them; and in the eastern Arctic they encountered and merged with the Dorset peoples.

> Dog traction then became general throughout the whole of the Arctic, though St. Lawrence Island, being in a kind of back eddy, did not receive it until rather late (Jenness, 1940, p. 393).

The presence of dog traction at Kotzebue in 1570 would certainly not be out of line with Jenness' scheme.

Evidence for the occurrence of the built-up sled in the western arctic at an early date is three sled runner fragments from an Ipiutak house at Deering (Larsen, 1951, pp. 85-86; 1953, p. 605) and the presence of thin sled shoes and two wooden runner fragments in Giddings' Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, pp. 61-62). The largest of the Deering runner fragments is 2.5 meters in length but contains only one mortise for a stanchion (Larsen, 1953, Fig. 10, p. 86). Such widely placed stanchions would seem to suggest that the runner belonged to a sled considerably larger than those normally pulled by hand. Indications of bone or antler shoeing is lacking for the Deering fragments.

In considering the problem of large-scale dog traction at Kotzebue, Giddings stressed the absence of swivels, trace buckles and other harness equipment that is associated with extensive dog traction in the western arctic today, as well as the fact that the built-up sled, with which thin flat shoes are associated, has been drawn by hunters on the ice in recent times (Giddings, 1952, pp. 62-63; Nelson, 1899, pp. 206-07). However, the widespread distribution of dog traction in Siberia and the eastern arctic and its supposed absence from early sites in the west suggests the possibility that the absence of harness parts from archaeological sites need not necessarily mean the absence of even large-scale dog traction. In Europe the presence of sled shoes in an archaeological site is considered to be an indication of dog traction (Childe, 1939, p. 10). Also it is possible that wood or baleen could have been used for trace buckles, and sled shoes too for that matter, and if this were the case, there is very little chance that they would be preserved. In addition, Birket-Smith points out that a form of dog traction like that employed by the modern Central Eskimo would leave no trace archaeologically, as trace buckles are seldom used, trace swivels also rare, and whip ferules unknown (Birket-Smith, 1945, p. 233). It is on this basis that Rainey objects to the ruling out of dog traction for the early Bering Sea Eskimo, in whose sites dog bones are plentiful, "simply because certain modern or recent types of sled and harness parts are absent" (Rainey, 1941, p. 547).

Although the built up sled has not always been used with dogs, it is the type of sled generally associated with dog traction. With this in mind the author suggests that the presence of thin sled shoes, the built-up sled, and dog bones in Giddings' Kotzebue houses (Giddings, 1952, p. 61) indicates that dog traction was practiced in the Kotzebue region at least as early as 1550 A.D. The trace buckle from the author's own excavations serves to confirm this indication.

SKIN WORKING AND TAILORING

Thin discs of sandy schist or slate are similar to the Athabascan **tci-tho** described by Rainey (Rainey, 1939, p. 360) which was utilized in the dressing

down of moose hide. There are eight **tci-thos** from the Kotzebue site, six of sandy schist and two of slate (Pl. 12, 5). These are round to oval in shape, vary from 2.5 to 3.5 cm. in diameter and are ground flat on both faces.

There are twenty-six **awls** or bodkins such as might have been used in skin sewing. Sixteen of these are made of antler fragments that come to a point at one end (Pl. 12, 7) while six are of the bones of birds or small mammals and have sharp, slender tips (Pl. 12, 6). Three of the four ivory awls are unusual in that they have been worked on all surfaces. These specimens are small and straight with a sharp point and flattened near the proximal end (Pl. 12, 8).

ANALYSIS AND COMPARISON

The preparing of skins for the making of clothing was probably accomplished in part by means of tools that have been described in other sections. In this category would be implements such as the ulu, the various end and side scrapers, and particularly the two-handed scraper of bone. This latter implement was primarily a skin working tool, since deLaguna reports that "a two-handed scraper was used for removing hair from raw skins" in the middle Yukon region (deLaguna, 1947, p. 127).

A type of tool that can be definitely associated with skin working is the *tci-tho*, common in recent times among the Athabascans of interior Alaska (Osgood, 1936, p. 67; Rainey, 1939, p. 360). *Tci-thos* of the type described by Osgood and Rainey are merely flakes struck from large pebbles and retouched around the edge. This type of implement, often described simply as a boulder chip, is reported for all periods at Kachemak Bay (deLaguna, 1934, pp. 60-61) and is present in the Hooper Bay Village site (Oswalt, 1952a, p. 61) and along the lower Yukon River (deLaguna, 1947, pp. 127-128). Along the Kobuk River, boulder chips are far less numerous in the sites than are discs of schist or slate that have been worked bi-facially as well as on the edge (Giddings, 1952, pp. 80-82). This type of scraper, which is similar in shape to the Type 4 discoidal from the Ipiutak site (Larsen and Rainey, 1948, Fig. 23d), is the only form present in the Kotzebue collection.

Pointed bone and antler fragments referred to as awls or bodkins are too widely distributed to be of value for comparative purposes.

FOOD PREPARATION

The large **ladle** of mountain sheep horn has a deep, narrow oval bowl that flares at the distal end (Pl. 10, 1). The handle has a distinct curve and is perforated at the end for suspension. The total length of the specimen is 38 cm., the length of the bowl, 17 cm., and the depth of the bowl, 8 cm.

Fragments of two **wooden bowls** or meat dishes are not large enough to indicate the form of the whole vessel. One specimen was apparently oval in shape and consisted of one piece only, while the other may have been a composite type as the fragments include a flat, oval bottom piece. A large wooden rim may also be part of a composite bowl.

Spoons, of antler hollowed so that the bowls are extremely thin, are represented at the Kotzebue site by five specimens, four of which have oval bowls and straight handles of varying lengths (Pl. 12, 1, 3). A single specimen has an oval bowl that is flat across the end. At the point where the bowl joins the handle there are four protruding knobs symmetrically arranged. The handle itself is short and perforated for suspension at the proximal end (Pl. 12, 2).

A piece of bird bone, cut at both ends may have been used as a **drinking tube** (Pl. 12, 4).

ANALYSIS AND COMPARISON

All of the Kotzebue houses have a central fireplace, a fact which indicates that cooking included roasting and probably stone boiling although the identification of actual stone used in such boiling is impossible. However, most of the fireplaces included fire-blackened and cracked stones that might very well have been used for this purpose.

Ladles of mountain sheep horn similar to the one in the Kotzebue collection are especially common among the Haida, Tlingit and other northwest coast tribes where they often have elaborately carved handles (*Native Arts of the Pacific Northwest*, 1949, Pls. 90-92, 95). Similar specimens are present in University of Alaska collections from the Susitna River Indians and are also used at the present time by Eskimos in the Anaktuvuk Pass region (verbal communication with William Irving) and in Prince William Sound (Birket-Smith, 1953, p. 220). It seems likely that ladles of this type will be found wherever mountain sheep horn is available, and since the animals are plentiful in the Brooks Range, their horns could be traded to the Kotzebue people by interior groups along the Kobuk or Noatak rivers.

Wooden vessels are of two types. The first is a shallow, oval bowl made from a single piece of wood. The second type is a composite container with the bottom made of one piece of wood and the sides from another or from some other material. Vessels of the first type occur as early as the Old Bering Sea I phase (Rainey, 1941, p. 550) and are present at Ekseavik (Giddings, 1952, p. 85), at Hooper Bay Village (Oswalt, 1952a, p. 63). in ethnographic collections from the Bering Sea region (Nelson, 1899, Pl. XXXI, 5) and among adjacent Indian groups (Osgood, 1940, pp. 119-120; deLaguna, 1947, Pl. XXII, 7). It also occurs in eastern Thule sites (Mathiassen, 1927, II, p. 107). Bowls having flat bottoms with sides that fit against them are widespread through time and space in the western arctic (Rainey, 1941, p. 550; Collins, 1937, p. 350; Larsen and Rainey, 1948, p. 111; Giddings, 1952, pp. 84-85; Oswalt, 1952a, p. 63; Nelson, 1899, Pl. XXXI, 6, Pl. XXXII, except 7; Birket-Smith, 1953, p. 202) as well as being present in the eastern Thule culture (Mathiassen, 1927, II, p. 107).

Spoons with oblong bowls, either squared or rounded at the end, are the only type found at Kotzebue and in the Kobuk River sites (Giddings, 1952, p. 85); these are also illustrated by Jochelson (1925, pl. 26, 19) from the Aleutian Islands. Similar spoons are present in Bering Sea ethnographic collections (Nelson, 1899, Pl. XXX, 3), from Kachemak Bay and Port Möller (deLaguna, 1934, p. 201), from the Fox Creek site on the lower Yukon River (deLaguna, 1947, Pl. XXV, 11), at Hooper Bay Village (Oswalt, 1952a, p. 63), in the Ipiutak phase at Point Hope (Larsen and Rainey, 1948, Pl. 23, 5) and at the Naujan site in the eastern Thule region (Mathiassen, 1927, I, Pl. 28, 9).

PERSONAL ADORNMENT

Labrets are one piece plugs of ivory, no two of which are alike. One is a thick, heavy specimen, slightly oval in cross section. It is distinctly concave at the inner end and has a thick retaining lip (Pl. 12, 13) and is flat at the inner end

(Pl. 12, 15). A third labret, is similar to the one just described but is extremely small, being only 1.2 cm. in length and .2 cm. in center diameter. The retaining lip is again thin and the inner end flat (Pl. 12, 17). Small labrets like this one may have been worn by young men just beginning to use this type of facial ornamentation. A fourth specimen, heavy and nearly square in cross-section, flares at one end to form a retaining lip (Pl. 12, 14). An elongate, drop-like ornament, provided with a thin lip and a flat base (Pl. 12, 16), can be considered as a labret though differing greatly in shape from most forms of this artifact.

Combs include two specimens of wood and two of ivory. One wooden comb has six teeth, four of which are broken while the other has seven, only one of which remains intact. Both have handles that widen slightly toward the end and then narrow sharply to form a triangular tip, the sides of which are slightly concave (Pl. 12, 22). One ivory specimen has a rectangular handle and an indeterminate number of teeth, all of which are missing. Decoration consists of several crude incised lines. The second ivory comb is complete except for one broken tooth and has a fairly long handle, the sides of which curve in and then out. A long wedge-cut at the end of the handle gives a bifurcated outline (Pl. 12, 21). Decoration on this implement consists of two engraved bands running around the comb just above the teeth Spurs extend from a lower edge of these bands. On one side, two curved incised lines with spurs on the outer edge, extend from the top band to near the top of each fork of the bifurcated handle.

A distinctive form of slender drop **pendant,** lobed at the blunt end in such a way as to look exactly like small blunt arrowheads, is represented by three specimens of ivory. One pendant, 3.2 cm. long, is eight lobed, drilled at the pointed end for suspension, and decorated by two bands of parallel grooves around the middle circumference. These bands are joined by a pair of grooves winding around the specimen (Pl. 12, 11). A similar pendant is 5.7 cm. long, four lobed, and has a groove around the pointed end for suspension (Pl. 12, 9). The third specimen is 3.4 cm. in length and is similar in every way to the one just described except that the decoration consists of a series of tiny drilled holes placed indiscriminately toward the widened end (Pl. 12, 10). A unique pendant of mammoth ivory seems to represent some animal, perhaps a seal, and is slotted at one end for suspension (Pl. 12, 28).

Two **brow band** fragments are made of antler. One is very narrow, being only .5 cm. in width, and is decorated with a single incised groove near one edge with four spurs extending from it to the furthest edge (Pl. 12, 27). The other is an even smaller fragment 1.5 cm. in width, an actual size drawing of which is shown in Figure 12.

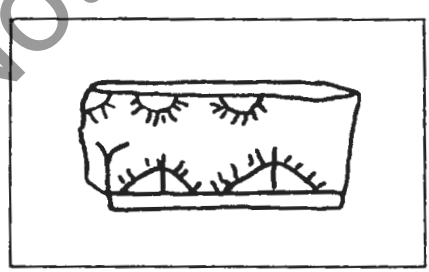

FIGURE 12.

ANALYSIS AND COMPARISON

Labrets appear to have considerable antiquity in the western arctic, particularly in southern Alaska where they are present in early Aleutian phases (Laughlin and Marsh, 1951, p. 82) at Kachemak Bay sites (deLaguna, 1934, pp. 109-112) and at Port Möller (Weyer, 1930,

p. 265). In northern Alaska labrets are absent during the entire cultural sequence on St. Lawrence Island but are present in the Ipiutak phase at Point Hope (Larsen and Rainey, 1948, p. 114). Paired lateral labrets, the only type in the author's Kotzebue collection, are found along the Kobuk River at the Ambler Island and Ekseavik sites and in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, pp. 87-88). An elongated drop-like ornament from Kotzebue that is thought to be a labret (Pl. 12, 16) is similar to a specimen from Ekseavik illustrated by Giddings (1952, Pl. XVIV, 10) and to labrets from Kachemak Bay (deLaguna, 1934, Pl. 18-19). In more recent collections from coastal Alaska, paired lateral labrets are quite common, being present in sites from the Aleutians north to Point Barrow and east to Point Atkinson (Jochelson, 1925, p. 97; Nelson, 1899, Pl. XXII, 19-22; Murdoch, 1892, p. 145; Mathiassen, 1930, pp. 47, 66; Pl. 4, 13-14).

Hair combs are widespread throughout the Eskimo area (Birket-Smith, 1929, II, Table A, 65). Specimens with handles that widen toward the end and then narrow sharply to form a triangular tip seem to be confined to the Kotzebue site where, in addition to their presence in the author's collection, they occur in houses excavated by Giddings dating approximately 1400 A.D. (Giddings, 1952, p. 85). Combs with bifurcated handles have been found at Ekseavik (Giddings, 1952, p. 89) and Point Atkinson (Mathiassen, 1930, Pl. 4, 8) as well as at Kotzebue.

Drop pendants from Kotzebue are in the same tradition as those from the eastern Thule site of Naujan (Mathiassen, 1927, I, Pl. 30, 1-15) although the distinctive form seems to be restricted to the Kobuk River region where it occurs at Ekseavik and in Kotzebue houses excavated by Giddings dating approximately 1550 A.D. (Giddings, 1952, pp. 88-89).

Brow bands are widely distributed throughout Siberia and the eastern and western arctic (Birket-Smith, 1929, II, Table A, 61).

COMMUNAL ACTIVITY

Thin sections of antler with the edges squared off and two holes drilled at each end and in the center, represent **plate armor** (Pl. 12, 18, 19). There are twenty-three of these sections in the Kotzebue collection, twenty of which are from House 2.

A very small, double-edged slate knife fragment may be a **lancet,** or doctor's knife (Pl. 12, 12).

An antler **drum handle** has a deep notch cut into one side for rim attachment (Pl. 12, 23). On the sides back of the notch the handle is scored for lashing. The object is oval in cross section and wedge shaped at the proximal end. A **toy drum handle** of bone measuring 7 cm. in length, is notched and scored like the specimen described above. It is round in cross section and rounded at the proximal end (Pl. 12, 24).

Four rectangular bits of smoothed antler and one similarly shaped specimen of wood may have been used as **gaming pieces.** All are plain and average 2.4 cm. in length and 1.2 cm. in width (Pl. 12, 25, 26).

ANALYSIS AND COMPARISON

The presence of plate armor in a Kotzebue house dating approximatly 1450 A.D. indicates the earliest occurrence of this trait on the mainland of Alaska. Giddings also describes armor in his Kotzebue

collection but only from later houses dating approximately 1550 A.D. The trait is definitely Asiatic in origin being an important cultural item of the Chukchee and Koryak (Bogoras, 1904-09, pp. 162-168; Jochelson, 1905-08, pp. 562-563) and first appears on St. Lawrence Island in Punuk times continuing in use until well into the Modern period (Collins, 1937, pp. 325-326; Geist and Rainey, 1936, pp. 142-159). Plate armor appears to have been used generally in the vicinity of Bering Strait (Nelson, 1899, p. 33) and southward but is not found north of Seward Peninsula except at Kotzebue.

The identification of small, double-edged slate blades as lancets is based on the occurrence of similar implements from the Ekseavik site and Kotzebue houses, excavated by Giddings, which date approximately 1400 A.D. (Giddings, 1952, p. 91). Mathiassen illustrates a small slate lancet from a Barter Island collection and describes a similar specimen from Point Barrow (Mathiassen, 1930, Fig. 3, p. 41).

Evidence for ceremonial activity is restricted to the occurrence of drum handles. The tamborine drum with lateral handle is widespread among the Eskimo and is considered to be an Asiatic trait that spread into Alaska in relatively recent times (Birket-Smith, 1929, II, p. 201). In spite of the fact that a toy handle occurs in the Okvik collection (Rainey, 1941, Fig. 24, 19) and unusual drum parts are included in Collins' Old Bering Sea finds (Collins, 1937, Pl. 14, 3, 4; Pl. 55, 5), the drum is not common in archaeological sites until the Punuk period on St. Lawrence Island (Collins, 1937, p. 239). It is also present in sites of the later periods of eastern Thule culture (Holtved, 1944, II, p. 58).

Antler and wood rectangles may have been used as dice for gambling. The occurrence of dice among Arctic and sub-Arctic peoples is generally rare (Birket-Smith, 1929, II, p. 204), although similar specimens identified as gaming pieces have been reported for Ekseavik and the Yukon Island II period of Cook Inlet culture (Giddings, 1952, p. 93; deLaguna, 1934, p. 104).

Eskimos in the Kotzebue Sound region have been disposing of their dead by exposure on the surface of the ground at least since 1826 (Beechey, 1831, p. 457) and this fact probably accounts for the failure to find burials in the vicinity of the Kotzebue site.

Evidence of trade can also be considered as a communal aspect of the life of Kotzebue peoples. Jade from the upper Kobuk, which was to become widely diffused by historic times (Weyer, 1932, p. 106), is present at Kotzebue as early as 1400 A. D. and almost always in the form of finished artifacts. This absence of evidence for the manufacture of jade implements suggests that they were mostly imported from the upper river as finished objects.

POTTERY

Two **pottery paddles** of whale rib have one concave surface and narrow at the proximal end to form a hand grip. One is plain (Pl. 14, 2), while the other has seven parallel straight line impressions (Pl. 14, 1). Both illustrate the type of implement used in preparing the outer surface of pottery vessels.

Since no complete pots were found and large sherds are not common, the

shapes of vessels from the Kotzebue site are not readily definable. However, some general remarks can be made concerning the larger rim sherds and the few basal fragments that occur in the collection.

Judging from the larger rim sherds, there are three vessel shapes represented. The most common has a convex outer surface with a rim that is either square, rounded, inward sloping or outward sloping (Fig. 13, 2, 4-6, 9-11, 13, 18). Next in importance is a straight or nearly straight sided vessel with a flat rim (Fig.

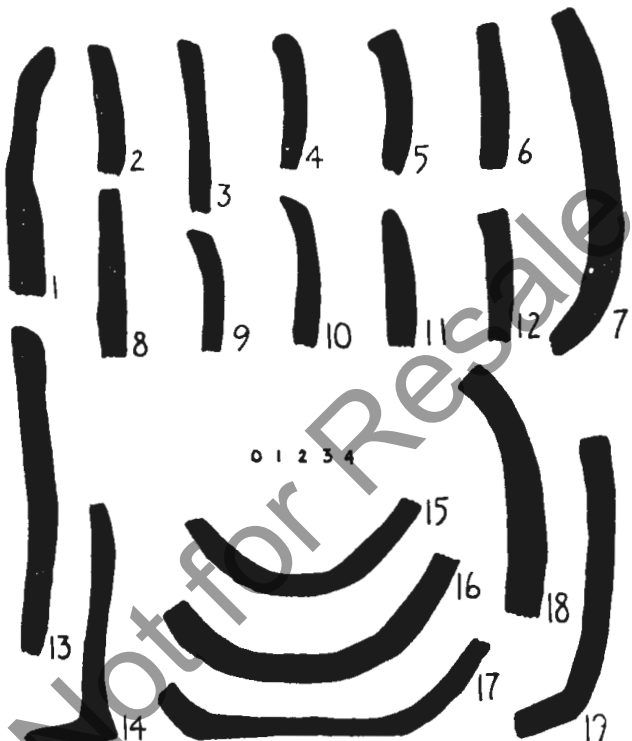

FIGURE 13. POTTERY PROFILES

13, 3, 8, 12). A third type is represented by one fragment and is quite different from the other rim sherds in the collection. This sherd is constricted near an everted, A shaped rim and shows indications of flaring out below the constricted area (Fig. 13, 1). It is decorated with two sets of short horizontal striations running parallel to the rim.

Of the seven basal fragments in the collection, four appear to be conical with a small flattened area on the bottom that enables the pot to sit upright without being supported (Fig. 13, 15, 16, 19); another sherd is from a vessel that has a completely rounded base (Fig. 13, 19). The two remaining basal sherds are from flat bottomed vessels (Fig. 13, 14, 17). One of these flares out at the base and the bottom of the vessel is slightly convex (Fig. 13, 14). All of the basal fragments appear to be from undecorated pots.

Although it is impossible to associate any of the large rim sherds with a specific type of base, it can be said that conical or rounded bases with a small flattened area on the bottom appear to be the most common type while the most

common vessel wall is one in which the outer surface has a greater or lesser degree of convexity.

There are seventy-three rim sherds in the pottery collection, most of which are small. The most prevalent type is the flat-topped or square rim (Fig. 13, 2, 8, 12) of which there are thirty-nine specimens or over half the total number of rim sherds. Next in importance are sherds with rounded rims (Fig. 13, 4, 11, 13) of which there are seventeen. Twelve specimens have an outward sloping rim (Fig. 13, 3, 9-10) while four are inward sloping (Fig. 13, 5-6, 18). A single specimen has a Λ shaped lip that is everted (Fig. 13, 1). Nine lip fragments have a suspension hole near the rim and fourteen other sherds also have holes but whether these are for suspension or mending cannot be determined.

Of the 430 potsherds in the Kotzebue collection, only twenty-one show some form of surface treatment. The types of decoration in order of frequency are corrugations (14), concentric circles (4), knotted grass matting impression (1), check stamped (1), striations (1).

The corrugated ware (St. Lawrence Corrugated Type)[2] consists of a number of short lines, varying in width, placed indiscriminately on the pot (Pl. 13, 2, 4, 7, 8, 11). This design usually runs in only one direction on a single sherd, either parallel or at right angles to the rim. One exfoliated sherd has a series of these corrugations on the interior (Pl. 13, 8), all other corrugated sherds being treated on the exterior only.

The four concentric circle stamped sherds (Barrow Curvilinear Paddled Type) are uniform in appearance and probably were impressed with a concentric circle pottery paddle similar to one found by Giddings (1952, Pl. XIII, 9) at Kotzebue. All of the sherds with this type of surface treatment are very faintly impressed and in some cases cannot be seen at all unless light hits the sherd from the right direction (Pl. 13, 3).

The single check stamped sherd (Nunivak Check Stamped Type) is covered with large checks approximately 5 mm. square which were probably also impressed with a pottery paddle upon which a check stamped design was engraved (Pl. 13, 1). A single sherd bears the impression of knotted grass matting, with the knots and twisted strands of grass plainly visible (Pl. 13, 10). A type of striation decoration (Seward Striated Type) is represented by one sherd which contains two series of short striations running parallel to each other and to the rim of the vessel (Pl. 13, 9). These striations are extremely wide and were probably made with a stick pressed on the wet clay.

All of the 430 sherds were examined to determine the type of temper used in their manufacture. The temper proved to be almost exclusively a combination of organic and inorganic material, the exceptions being seven gravel tempered and three sand tempered sherds. The inorganic temper consists of sand, gravel or pebbles, with the coarser material being the most common. These are combined in nearly all the sherds with either feathers or grass, the latter being the most common. The texture of the Kotzebue pottery is not particularly fine nor is the tempering material distributed uniformly throughout the ware; grass and feathers as well as inorganic tempering often protrudes through the surface.

To determine the thickness of the ware, all of the unexfoliated sherds were measured. The thickest was 26 mm., the thinnest 3 mm. and the average was about 11 mm.

Nearly all of the sherds are black in color but some are buff colored and there are a few that range in color from black to buff on the same sherds. This is due, undoubtedly, to unevenness of firing.

The four lamp sherds are fragments of shallow, undecorated saucer-shaped containers (Pl. 13, 6). All are tempered with sand and grass. A shallow, thick bowl-shaped fragment may have been used as a lamp, as it is heavily incrusted on the inside (Pl. 13, 5).

[2]The type names for Alaskan pottery have been worked out by Mr. Wendell Oswalt of the University of Arizona and will be discussed in detail by him in a paper to be published soon in **American Antiquity.**

ANALYSIS AND COMPARISON

As mentioned previously, the shapes of pottery vessels from the Kotzebue site are not readily definable due to the absence of complete pots and large fragments which include both base and rim. However, some comparative remarks can be made on the basis of the most common types of rim and basal sherds.

Vessels with rounded bottoms are generally associated with straight sides or sides of varying degrees of convexity. Both straight and convex rim sherds are present in the Kotzebue collection. Rounded bottoms, in addition to occurring at Kotzebue, are reported from the Old Bering Sea and Punuk phases on St. Lawrence Island but none of the pots are complete enough for accurate reconstruction (Collins, 1937, p. 342). Round bottomed pots are also found in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, pp. 94-95) but again no complete vessel reconstruction is possible. The peculiar type of conical base with a flattened area on the bottom that constitutes the most common basal form in the author's Kotzebue collection, is generally characteristic of the Kobuk River region being present at Ekseavik, Ahteut and at Kotzebue in houses dating between 1400 and 1500 A.D. (Giddings, 1952, pp. 94-95). At these sites it is associated with straight and convex sides. A round bottomed vessel with a convex outer surface and decorated with concentric circles is described from Pouten Bay near East Cape Siberia (deLaguna, 1947, pp. 234-35).

Flat basal sherds, of which there are two in the author's Kotzebue collection, may be associated with a convex outer surface to form the so-called barrel shaped vessel type. This is a widely distributed vessel form, being reported from Point Hope, the lower Yukon River (deLaguna, 1947, pp. 228, 230) and Nunivak Island where it is covered with check stamped decoration (Collins, 1928, p. 254).

Flat bottoms may also have been associated with the straight rim sherds in the collection to form the flower pot shape. Vessels of this type are found in relatively recent sites from Bristol Bay to Norton Sound, along the Kobuk River and at Point Hope (Oswalt, 1952b, p. 20; deLaguna, 1947, Pl. 23, 2, Pl. 22, 6; Larsen, 1950, p. 178; Mathiassen, 1930, p. 64; Giddings, 1952, p. 94; VanStone, 1954, p. 190); However, the shape is also present in an Ipiutak site at Chagvan Bay (Larsen, 1950, pp. 180-183) and in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, p. 94).

The corrugations on fourteen Kotzebue sherds were probably applied with a paddle bearing grooves similar to the illustrated specimen already described (Pl. 14, 1). Sherds of this type are comparable with scattered finds from all culture phases on St. Lawrence Island (Rainey, 1941, p. 536; Collins, 1937, p. 168; Geist and Rainey, 1936, pp. 223, 238; Oswalt, 1953b, p. 7) although they are most common in Old Bering Sea and early Punuk.

Concentric circle surface treatment, found on four sherds in the Kotzebue collection, is an important design element from Cape Prince of Wales northward. Near Cape Prince of Wales decorated ware of this

type is reported for a late Birnirk site (deLaguna, 1947, p. 234) and, as already mentioned, it is found on a pot described by deLaguna from near East Cape, Siberia (1947, p. 234). At Kotzebue the type occurs rarely in houses dating approximately 1400 A.D. but is the most important form of decoration at Ekseavik and Ahteut (Giddings, 1952, p. 95). At Point Hope concentric circle decorated ware occurs in the western Thule and Tigara phases, a fact, together with the occurrence of the type in early Kobuk sites, that leads Larsen and Rainey to point out that decorated pottery of this type should not be considered as exclusively Birnirk unless it is found in association with other Birnirk types (Larsen and Rainey, 1948, pp. 173-177).

Knotted grass matting impressions, which occur on the outside of one sherd in the Kotzebue collection, are reported on the outside of a pot from Point Hope (deLaguna, 1947, p. 230) and some form of closely woven textile impression occurs on the inside of Ahteut vessels (Giddings, 1952, p. 95). As a decorative element on vessel bottoms, grass matting appears to be restricted to southern Alaska, occurring in the Togiak and Kuskokwim river regions (deLaguna, 1947, p. 228) and at Hooper Bay Village (Oswalt, 1952b, p. 20).

Check stamped pottery in Alaska appears to consist of two general types. The first is characterized by large square to rectangular checks (6 mm. wide) usually impressed on a thick, poorly fired ware. Sherds of this type are widely distributed in both time and space being present in late sites on Nunivak Island and at Cape Nome (Collins, 1928, p. 254; VanStone, 1954, p. 182) and in the Old Bering Sea phase on St. Lawrence Island (Collins, 1937, p. 169; Rainey, 1941, p. 536) as well as at Kotzebue. A single check stamped sherd from the Tigara phase at Point Hope appears to belong to this type (Larsen and Rainey, 1948, Pl. 91, 11).

The second variety of check stamped ware is thin, well fired and characterized by small square to rectangular checks (2 to 4 mm. wide). Sherd decoration of this type, referred to as Norton Check Stamp by Griffin (1953), is the dominant decorative motif on pottery from the upper clay levels at Iyatayet on Cape Denbigh (Giddings, 1949, Fig. 4; Griffin, 1953, p. 41). It is also reported at an Ipiutak related site in Bristol Bay (Larsen, 1950, pp. 181-186), but the only recent occurrence is in late sites on Nunivak Island (VanStone, 1954, p. 182).

The single Kotzebue sherd bearing short horizontal striations in vertical series may be intrusive into a house dating approximately 1440 A.D., as this is a decorative motif that has hitherto been reported, for the most part, only from late sites in northern Alaska. The type occurs at Ambler Island and rarely in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, p. 94) as well as at Point Hope (Mathiassen, 1930, pp. 63-64) and on Seward Peninsula (Oswalt, 1953b, p. 9). Nelson illustrates a pot from Hotham Inlet with scalloped rim and bearing this type of decoration (1899, p. 202).

The scarcity of lamp sherds in the Kotzebue collection may be at least partly attributed to the fact that all of the Kotzebue houses have

central fireplaces. Lamp sherds are rare in Giddings' Kotzebue houses, most of which have a central fireplace, (Giddings, 1952, pp. 20, 84-85, 94-95) and at the Ipiutak site, where all the houses have a central fireplace, lamps are completely absent (Larsen and Rainey, 1948, p. 111). All four sherds from the author's Kotzebue houses are from saucer shaped lamps, a type limited in distribution along the coast of Alaska and shown by deLaguna (1947, p. 233) and Oswalt (1953a, pp. 19-22) to have been derived from the conical bottomed, wide mouthed clay lamps common during the early phases on St. Lawrence Island and at the Ahteut site along the Kobuk river.

The oldest saucer shaped clay lamps are from the Ekseavik and Onion Portage (approximately 1400 A.D.) sites (Giddings, 1952, pp. 95, 121-22) and the type also occurs in Kotzebue houses dating approximately 1550 A.D. (Giddings, 1952, pp. 94-95). In the Bristol Bay and Norton Sound regions saucer shaped lamps appear to be late (Larsen, 1950, p. 180; Nelson, 1899, p. 65; deLaguna, 1947, Pl. XXLI, 1-4; Hough, 1898, Pls. 13, 18, 19), the oldest known specimens being from Hooper Bay Village where they were found at the bottom of an excavated layer dating approximately 1600 A.D. (Oswalt, 1953a, p. 29). The Kotzebue saucer shaped lamps under discussion, being from houses dating approximately 1440 A.D., are among the earliest examples of this form in the Kobuk-Kotzebue region.

Very little can be said concerning the method of manufacture of Kotzebue pottery except that since the sherds have a tendency to exfoliate in layers, the vessels were probably made by the patch-modeling method. Although most Alaska pottery appears to have been made by patch-modeling, the coiling method is also reported, being described for recent pottery at St. Michael (Nelson, 1899, p. 201) and for one sherd from the Old Bering Sea phase on St. Lawrence Island (Collins, 1937, p. 168).

A combination of organic and inorganic material, usually pebbles and grass, is the dominant type of tempering in the Kotzebue pottery. Temper is not generally a valid criterion for cross-comparing Alaska pottery and sherds containing both organic and inorganic material are reported from many places along the Alaskan coast (Larsen, 1950, pp. 180-181; deLaguna, 1947, p. 227; Nelson, 1899, p. 201; Oswalt, 1952b, p. 28; Giddings, 1952, pp. 102-103; VanStone, 1954, p. 184). Although sherds containing only inorganic temper are definitely in the minority at Kotzebue, they belong to a tradition that is widespread in the Eskimo area (deLaguna, 1934, p. 68; Weyer, 1930, p. 263; Collins, 1928, p. 254, Fig. 1-4; Collins, 1937, p. 167; Mathiassen, 1927, I, p. 66; Oswalt, 1952b, p. 26; VanStone, 1954, p. 184).

The vessel shapes and most of the decorative features of Kotzebue pottery suggest that this ware fits into the northern Alaska and north eastern Siberia pottery category which is characterized by "...rounded or conical-bottomed pots, with straight or barrel shaped sides, and rough surface decorated with textile and paddle impressions." (deLaguna, 1947, p. 247). However, the presence of flat bottoms

associated with straight or convex sides suggests a more widely distributed ware that is best known in the Bristol Bay-Norton Sound region.

MISCELLANEOUS AND UNIDENTIFIED

Thirteen thin antler sections found together in one house and containing numerous drilled holes and rectangular slots may have been concerned in some way with plate armor or may be simply **reinforcement pieces** (Pl. 14, 3, 4, 5).

A number of complete, small ivory specimens defy identification. One is an oblong object that is notched along all its edges and has a drilled hole in the center (Pl. 14, 8). A similar specimen, also unidentified, is illustrated by Mathiassen from Naujan (Mathiassen, 1927, I, Pl. 35). A rectangular object with rounded edges is hollowed out to a depth of .7 cm. and has two evenly spaced drilled holes (Pl. 14, 6). A curved piece of ivory is notched at either end and has drilled holes at each corner (Pl. 14, 7).

Although there is no evidence that the Kotzebue people hunted the great baleen whale, fragments of whale bone were found in a number of the houses suggesting that dead whales occasionally floated up on the beach and were utilized by the villagers. Also fragments of cut birch bark occur in the site showing that this material was utilized, probably for making baskets. This bark could have been obtained from drift logs, or, as is more likely, was traded to the Kotzebue people by groups living up the Kobuk, Noatak or Selawik rivers.

TREE RING DATING

The cross dating quality in trees about the Arctic Circle was first pointed out by Douglass (1919) and the methods of dendrochronology have been applied in the Alaskan arctic by Giddings who, over a period of years, refined the correlation of tree growth at certain timberline points with the temperature of the growing season (Giddings, 1941).

Since it seemed likely that all the trees growing along the Kobuk River would be subject to one temperature stress, Giddings chose this area as one in which archaeological sites could be dated in the living tree record and a long chronology extended backward in time as it came to include wood from older sites. This proved to be possible and a tree ring chronology covering nearly one thousand years furnished a means of dating the Kobuk River sites, the first in the north to be accurately placed in time by an application of the dating methods of dendrochronology (Giddings, 1942, 1944, 1948, 1952, pp. 105-110).

The problem of dating Eskimo sites along the treeless coast is complicated by the fact that the source of any drift logs used for building may be different from the sources of all other logs used in a particular house. Therefore, as Giddings has pointed out (1952, p. 106), the Kotzebue site would have received drift from the Selawik, Kobuk and Noatak rivers or the open ocean.

The use of driftwood for house construction creates problems in estimating the time of building and abandonment. If, for example, only one dated construction log exists for a particular house, all that can be assumed is that building took place after the bark date of this specimen. However, logs may be taken from older houses to construct new ones or they may be added some time after building as repair beams. Therefore, it is desirable to have a large number of dated logs in order to arrive at a closer estimate of occupation and abandonment. The fact is

well illustrated by House 11 at Ekseavik where forty-three dates were obtained. A range of 100 years occurs in these dates but fifteen fall within a single decade indicating construction at this time (Giddings, 1948, p. 28; 1952, pp. 106-107).

A quantity of well preserved wood was collected from most of the author's Kotzebue houses and it proved to be datable in terms of Giddings' Kobuk River chronology. Figure 14 shows the measured ring widths of four logs from Kotzebue houses compared with Giddings' chronology. Two of the curves illustrated (KZ-1 and KZ-4) represent logs from the same house. The other two are from different houses. All measurements are in hundredths of a millimeter, but KZ-4 is presented in a scale four fifths that of the other three because of a greater variation in the ring widths.

Giddings has pointed out (1948, p. 32) that sensitivity in his material is higher than the average over short periods of time and that these intervals of increased sensitivity occur about seventy years apart in the Kobuk chronology. Such periods center around the following signatures: 1912-1922, 1742-1751, 1534-1543, 1358-1365 and 1205-1219. It will be noticed that the curves illustrated show marked sensitivity between 1350 and 1370 with 1358, 1361 and 1365 being the narrowest rings in each curve. In addition, three of the author's Kotzebue curves show a less well defined area of sensitivity between the years 1265 and 1295.

A total of 29 dated logs were obtained from nine houses at the Kotzebue site. Taken together they represent a chronology from the year 1177 to 1571. The bark and near bark dates are listed below by the individual house:

H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8	H-5a*
1476	1315	1437	1569	1409		1500	1408	1351nb
1508	1372	1438	1571nb	1427nb		1515nb	1409	1354
	1395	1486		1443			1370	
	1442	1489		1453nb			1384	
				1462			1423	
							1430	
							1435	
H-12*								
1396								

The curves which are illustrated represent that logs with the longest and most sensitive records. They show the clearest correlation with Giddings' Kobuk-Kotzebue chronology.[3]

SUMMARY AND CONCLUSIONS

The people who live along the Kobuk River today speak Eskimo, but since they inhabit a heavily forested area, their material culture more closely resembles that of the Athabascans than the culture of the coastal Eskimo. As Giddings has pointed out, these Kobuk people cannot be considered as merely intermediate between two well defined cultures,

*These houses were not excavated.

[3]Most of this material has appeared in the **Tree Ring Bulletin** (VanStone, 1953) including Figure 14.

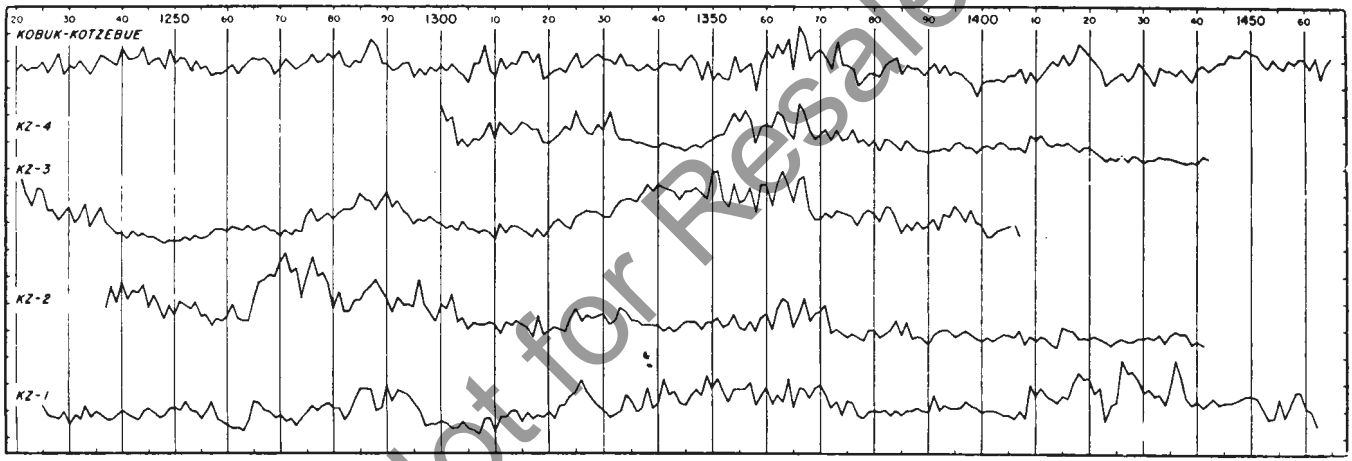

Fig. 14. Crossdating between four house logs from Kotzebue and the Kobuk-Kotzebue master chronology.

the Athabascan and the Eskimo, because there has been a marked degree of cultural continuity in the area over a period of at least 700 years. This combination of cultural elements which belongs to neither the coastal Eskimo nor the Athabascan pattern, Giddings has called the "Arctic Woodland Culture" (Giddings, 1952, p. 1).

This new form of culture can be best defined as "a remarkable adaptation to an environment which includes clear streams, rugged mountains, forests and a bay of the sea" (Giddings, 1952, p. 115). Thus, as one would expect, river fishing and caribou hunting are the most important means of subsistence with harbor sealing also important at those sites nearest the coast. "Exchanges of the resources of these endeavors as well as materials such as furs, tree barks and root fibers, and mineral substances, helps to minimize the special effects of local environment and makes possible the enrichment of the life of the individual without his having to move continually from one environment to another" (Giddings, 1952, p. 115).

YEARLY CYCLE

One of the questions raised in the introduction to this report was whether the material from Kotzebue could be considered as transitional between coastal and inland types of culture or merely as a coastal extension of a woodland culture. With this question in mind, we can turn to a reconstruction of the yearly cycle at Kotzebue as determined largely from the archaeological record.

In the spring, soon after the ice went out, salmon were caught in gill nets. The Sound is quite shallow in front of the Kotzebue site and today the fish usually run close to shore. The nets are tended from a kayak and while there are no kayak parts in the author's archaeological collection, there is no reason to believe that the kayak was not as important at Kotzebue as it was at other coastal sites. Salmon, as well as whitefish and trout, continued to run through a good part of the summer and, in addiion to being netted, were speared with the three prong fish spear.

Summer seems to have been the time of greatest activity for the Kotzebue people. In addition to fishing there was caribou hunting with bow and arrow or lance and birds were taken with spears and blunt arrows. Seals and beluga were harpooned, presumably from kayaks and umiaks during all the time that the Sound was open, the former also being killed as they basked on the ice in early spring.

The winter season, far from being a time of inactivity, was, as it is today, a period characterized by specialized fishing techniques. Pickerel were taken with hook or a gorge and line from the numerous fresh water lakes in back of the site while sheefish, whitefish and tomcod were caught with the same implements through the ice of the Sound directly in front of the village. Sheefish may also have been caught in nets under the ice as they are today.

In addition to the subsistence activities mentioned above, it is virtually certain that the Kotzebue Eskimos also depended heavily on the gathering of greens, berries and bird's eggs in season. These are aspects of the economy that would leave no trace in the archaeological record.

It can thus be seen that the material culture at the Kotzebue site draws freely on all the resources of its favorable environment. The food supply was such as to insure the people against extreme seasonal scarcity. When caribou and other land animals were scarce, greater emphasis was placed on fishing and sealing. Although the abundance of fish and seals cannot be predicted from year to year, yet it is certain that some of each will be present annually and this fact favors permanent residence and lends stability to the economy. This remarkable adaptation to such a varied environment is typical of all culture phases belonging to the Arctic Woodland Culture (Giddings, 1952, p. 115-116).

On the basis of the yearly cycle just given, Kotzebue culture cannot be considered as transitional. Rather, it is essentially a coastal manifestation of the Arctic Woodland Culture with the addition of some specialized fishing techniques. A careful study of the trait list shows that artifacts associated with land hunting outnumber those associated with sea hunting by almost two to one, a fact that is, for the most part, true of the individual houses as well. This is of particular interest with regard to a coastal site and serves to emphasize the inland slant of Kotzebue culture. A similar ratio of land to sea hunting equipment exists in Giddings' Kotzebue houses (Giddings, 1952, pp. 127-128).

Giddings has stated that in his opinion the Intermediate and Old Kotzebue sites were wintering places for a group of relatively settled people who spent part of their time hunting in the interior but who also lived on the coast during at least part of the spring and fall and netted salmon there during the summer (Giddings, 1952, p. 111). This suggests a semi-nomadic way of life but, though probably most villages in northern Alaska were completely or nearly deserted for at least a small portion of the year, the present author believes that the emphasis at Kozebue was on permanent coastal living. This is all the more important because of the definite inland characteristics of Kotzebue culture.

The hunting of migratory animals as an important part of the economy does not necessarily mean that the people who hunted them were nomadic, or even semi-nomadic. This is especially true of a population which has an alternate means of subsistence such as was available to those who lived at Kotzebue. They did not have to follow migratory animals but could afford to wait until the animals came to them.

The abundance of caribou bones and antlers in the Kotzebue site attests to the importance of this animal in the native economy. Caribou are plentiful in the Kotzebue region today and were probably more plentiful before the introduction of firearms. Many undoubtedly came down to the coast in the summer time to get away from the mosquitos and could be hunted by the Kotzebue people without leaving the village for more than a few days at a time. The Tikerarmiut, permanent coastal

dwellers to the north, range extensively over the interior in the summer while at the same time maintaining their permanent village at Point Hope (Rainey, 1947, pp. 266-67) and the people at Hooper Bay Village have in recent times, also hunted caribou without giving up permanent coastal residence (Oswalt, 1952a, p. 73). It can thus be seen that the favorable environment at Kotzebue gave an even greater stability to Kotzebue culture than was possible for peoples living along the Kobuk River.

COMPARATIVE SUMMARY

From the text comparisons it is obvious that the archaeological material from the author's excavations most closely approximates Giddings' collection from the same site. The following is a list of comparable traits from Giddings' "Old" Kotzebue site and the author's collection:

house with rectangular floor plan, four post center construction and central fireplace
step up from tunnel in front of place where tunnel joins main body of house
split antler ice pick for fishing
fish arrow prong
pickerel and sheefish lure-hook shank in realistic fish form
ice scoop rim
stone net sinker
bone net sinker
arrowhead, sharp shoulder, conical tang with two knobs
blunt arrowhead with wedge-shaped tang
blunt arrowhead with bifurcated tang
bow brace
sinew twister
ownership marks on arrowheads
harpoon head, closed socket, blade slit parallel to line hole
socket piece with wedge-shaped tang
peg for throwing board
harpoon dart head assymetrically barbed with offset line hole and conical tang
antler wedge
bone wedge
adze head, closed socket, flattened face for handle attachment
ulu blade with lashing slot made with stone saw
side scraper of chert with convex working edge
flint scraper to be hafted into a groove at the tip of a handle
beaver tooth tool
root pick
two-handed scraper of caribou leg bone
tci-tho scraper, worked on both faces
hair comb, handle with triangular tip
lancet
pot with conical base with flattened area, straight or convex sides
pottery with concentric circle decoration

Comparable traits from Giddings' "Intermediate" Kotzebue site:

house with four post center construction
bone net sinker

antler net sinker
fish arrow prong
leister prong
center prong with multiple opposite barbs
gorge
plummet shaped fish line sinker
arrowhead, sharp shoulder, plain conical tang
arrowhead, sharp shoulder, conical tang with bulge
end notched arrowhead of the socketed type
blunt arrowhead with wedge-shaped tang
blunt arrowhead with drilled socket
stemless flint arrow point
bow brace
sinew twister
ownership marks on arrowheads
harpoon foreshaft, tang in shape of blunted cone
harpoon socket piece, hollowed out socket at proximal end
harpoon dart head with one or more pairs of opposite barbs and a central line hole
salmon arrowhead or small harpoon dart head
straight sided, end grooved lance blade receiver
sled shoe with drilled holes for pegging to runner
antler wedge
bone wedge
adze head, closed socket, flattened face for handle attachment
one piece, end bladed knife handle
side bladed crooked knife
flat, wooden composite knife handle
composite knife handle of bone or ivory slotted to hold small end blade
flint flaker to be hafted into a groove at the tip of a handle
beaver tooth tool
sawed mammoth tooth
stone saw
root pick
two-handed scraper of caribou leg bone
scapula shovel
tci-tho scraper, worked on both faces
spoon with oblong bowl, either squared or rounded at the end
paired, lateral labrets
drop pendant
plate armor
round bottomed pot
pot with conical base with flattened area, straight or convex sides
flat bottomed vessel associated with straight rim (flower-pot shape)
sherd decoration of horizontal striations in vertical series (rare)
saucer shaped lamp

The following traits are present in the author's collection but are absent from both Giddings' Kotzebue sites:

arrowhead, sharp shoulder, conical tang with four knobs
arrowhead, sharp shoulder, conical tang with lashing collar
arrowhead, sloping shoulder, plain conical tang
arrowhead, sloping shoulder, conical tang with bulge
shoulderless arrowhead, wedge-shaped tang

shoulderless arrowhead, conical tang
open notched arrowhead
harpoon head, open socket, lashing slot, no blade slit (Thule Type 1)
harpoon head, open socket, drilled lashing hole, multiple opposite barbs (Thule Type II)
harpoon head, open socket, lashing slot, blade slit parallel to line hole (Thule Type III)
harpoon foreshaft, wedge-shaped tang
harpoon socket piece, bifurcated tang
harpoon socket piece with incised bands near the socket end
harpoon dart head, barbs on one side only, offset line hole
trace buckle
composite knife with base not completely split to form two halves
single edged man's knife blade
beaming tool
scraper handle
chert hand drill
bark peeler
ladle of mountain sheep horn
bowl made of a single piece of wood
hair comb with bifurcated handle
drum handle
dice (?)
corrugated pottery decoration
knotted grass matting impressions on pots
check stamped pottery
sherds containing only inorganic temper

All the traits in the above list, though absent from the Old and Intermediate Kotzebue sites, are present in other Kobuk River sites with the exception of the following:

shoulderless arrowhead with conical tang
Thule Type I and II harpoon heads
composite knife with base not completely split to form two halves
single edged, man's knife blade
beaming tool
scraper handle
ladle of mountain sheep horn
drum handle
corrugated pottery decoration
check stamped pottery decoration
sherds containing only inorganic temper

As has already been mentioned, Giddings' Old Kotzebue houses date approximately 1400 A.D. while those designated Intermediate Kotzebue have been assigned an approximate date of 1550 A.D. The dates of the author's houses, with the exception of House 4, fall between these. The material from House 4 is included in the above comparisons because, with the exception of a single-edged man's knife blade, it contained no artifacts not present in the other houses. It is therefore significant that a few important traits such as sled shoes, labrets, plate armor and the saucer shaped lamp are older in the Kotzebue Sound region than was previously supposed.

The above comparisons make it difficult for the author to see how the occupation at Kotzebue can be divided into old and intermediate phases. Rather, continuity of culture over a period of approximately 200 years appears obvious and suggests a continuous occupation of the area by a groop of people practicing a culture which remained basically the same throughout this period.

It is apparent from the text comparisons that the Kotzebue sites have much in common with the various Kobuk River sites. In addition to this basic affinity with the Arctic Woodland Culture there is also a definite resemblance to eastern Thule material culture as shown by the following list of traits that the two manifestations have in common:

split antler ice pick for fishing
three prong fish spear (barbs found at Naujan; center prongs only at Kotzebue)
gorge (gull hook in Thule sites)
arrowhead, sharp shoulder, conical tang with two or four knobs
shoulderless arrowhead with wedge-shaped tang (?)
arrowhead, sloping shoulder, conical tang with a bulge
harpoon head, open socket, lashing slot, no blade slit (Thule Type I)
harpoon head, open socket, multiple opposite barbs (Thule Type II)
harpoon head, open socket, lashing slot, blade slit parallel to line hole (Thule Type III)
harpoon socket piece, bifurcated tang
harpoon socket piece, wedge-shaped tang
harpoon socket piece, hollowed out socket at proximal end
harpoon dart head, one or more pairs of opposite barbs, central line hole
sled shoe with drilled holes for pegging to a runner
trace buckle (ivory block)
adze head, closed socket, flattened face for handle attachment
one piece and bladed knife handle
side bladed knife handle
single edged man's knife blade
flint flaker to be hafted into a groove at the tip of a handle
scapula shovel
oval bowl made from a single piece of wood
composite bowl
spoon with oblong handle, either squared or rounded at the end
drop pendant
drum handle
oblong object, notched along all its edges with a drilled hole in the center

Thus, in conclusion it may be said that at the Kotzebue site, which was occupied during the 15th and 16th centuries, the artifact types are, with certain important additions, closely related to those excavated by Giddings in the same area and reflected a form of culture greatly influenced by a river and forest environment. This artifact assemblage, particularly with regard to sea hunting, also resembles that of the Thule culture suggesting contact between Kotzebue and other coastal groups with western Thule affinities.

TRAIT LIST

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8
FISHING								
net sinker, hole at each end drilled through laterally (Pl. 1, 2, 3, 6)	7	4	—	—	2	—	—	6
net sinker, holes drilled parallel to long axis (Pl. 1, 1)	5	6	1	—	5	—	2	4
net sinker, combination of above (Pl. 1, 4)	—	3	—	—	—	—	—	1
stone net sinker, notched (Pl. 1, 5)								
fishing ice pick (Pl. 1, 7)	3	12	1	—	6	—	2	8
fish arrow prong (Pl. 2, 3, 11, 12)	2	3	—	1	2	1	1	3
center prong, barbless (Pl. 2, 13)	—	7	1	2	1	—	—	9
center prong, multiple opposite barbs (Pl. 2, 7, 8)	—	—	1	—	—	—	1	—
gorge (Pl. 2, 16)	1	2	—	1	1	—	—	—
pickerel lure-hook shank (Pl. 2, 9, 10)	1	1	—	—	—	—	1	—
shee lure-hook shank (Pl. 2, 4, 5)	—	—	1	1	—	—	1	—
grayling lure-hook shank (?) (Pl. 9, 19)	—	—	—	—	—	1	—	—
blank for pickerel or shee lure-hook shanks (Pl. 2, 6)	—	—	2	—	—	—	—	2
barb for pickerel or shee lure-hook shank, straight (Pl. 2, 17)	2	1	—	1	1	—	—	—
barb for pickerel or shee lure-hook shank, crooked (Pl. 2, 18)	—	—	2	—	—	—	—	—
line sinker (Pl. 2, 14, 15)	—	1	—	—	1	—	—	2
ice scoop rim (Pl. 2, 20)	—	—	—	—	—	—	—	1
LAND HUNTING								
arrowhead, Type 1 (Pl. 3, 1-6, 18, 19)	2	3	—	—	2	—	—	9
arrowhead, Type 2 (Pl. 3, 14, 16, 20)	2	—	—	—	—	—	—	3
arrowhead, Type 3 (Pl. 3, 17; Pl. 4, 1-4)	1	3	1	—	—	—	6	—
arrowhead, Type 4 (Pl. 3, 7-9, 11)	—	3	—	2	—	—	—	—
arrowhead, Type 5 (Pl. 4, 12)	—	1	—	—	1	—	—	1
arrowhead, Type 6 (Pl. 4, 11, 13)	—	—	—	—	1	—	1	1
arrowhead, Type 7 (Pl. 3, 10; Pl. 4, 6, 10)	—	—	—	—	1	1	—	1
arrowhead, Type 8 (Pl. 3, 15; Pl. 4, 5)	—	—	—	—	1	—	—	1
arrowhead, thin elongated tang (Pl. 3, 12)	—	1	—	—	—	—	—	—
arrowhead, shoulderless, conical tang (Pl. 3, 13)	—	—	—	—	—	—	1	—
blunt arrowhead, wedge-shaped tang (Pl. 5, 2)	—	—	—	1	2	—	—	1
blunt arrowhead, bifurcated tang Pl. 5, 3)	—	1	—	—	—	—	2	—
blunt arrowhead, drilled for capping a shaft (Pl. 5, 1)	—	—	—	—	2	—	1	—

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8
blunt arrowhead, end triangular in shape (Pl. 5, 7)	—	2	—	—	2	—	—	—
bow fragment (Pl. 4, 7)	1	—	—	—	—	—	—	—
bow brace (Pl. 5, 5-6, 13)	1	1	—	—	1	—	—	2
sinew twister (Pl. 4, 18)	1	—	—	1	—	—	1	—
shaft straightener (Pl. 4, 8-9)	1	—	—	—	—	—	—	1
bird spear side prong (Pl. 4, 20)	1	1	—	—	—	—	—	—
bird spear center prong (Pl. 4, 20; Pl. 5, 16)	1	—	—	—	1	—	—	2
arrow point, stemless (Pl. 4, 16, 17)	1	—	—	—	—	—	—	2
arrow point, stemmed (Pl. 4, 14, 15)	—	—	1	—	—	—	—	1
SEA HUNTING								
harpoon head, closed socket. blade slit parallel to line hole Pl. 5, 9, 12)	—	—	—	—	—	—	—	2
harpoon head, closed socket, blade slit at right angles to line hole	—	1	—	—	—	—	—	—
harpoon head, open socket, lashing slots, blade slit parallel to line hole (Pl. 5, 10)	—	1	—	—	—	1	—	—
harpoon head, open socket, drilled lashing holes, multiple opposite barbs (Pl. 5, 8)	—	—	1	—	—	—	—	—
harpoon head, open socket, lashing grooves, no blade slit (Pl. 5, 11)	1	—	—	—	—	—	—	—
harpoon head fragments (Pl. 5, 20, 22)	—	1	—	1	—	—	—	—
toy harpoon head, blank for open socketed type (Pl. 5, 19)	—	1	—	—	—	—	—	—
toy harpoon head, closed socket, opposite barbs (Pl. 5, 18)	1	—	—	—	—	—	—	—
toy harpoon head, closed socket, barbless (Pl. 5, 17)	—	1	—	—	—	—	—	—
harpoon foreshaft, blunted cone-shaped tang (Pl. 5, 14)	—	—	—	—	1	—	—	1
harpoon foreshaft, wedge-shaped tang (Pl. 5, 15)	—	—	—	—	1	—	—	—
harpoon socket piece, hollowed at proximal end (Pl. 6, 3, 6)	—	1	—	—	3	—	—	2
harpoon socket piece, wedge-shaped tang (Pl. 6, 1, 9)	1	1	—	—	—	—	—	—
harpoon socket piece, bifurcated tang (Pl. 6, 13)	—	1	—	—	—	—	—	—
harpoon socket piece fragments (Pl. 6, 2, 4, 5)	—	2	1	—	—	—	—	3
dart socket piece (Pl. 6, 18)	—	—	1	—	—	—	—	—
finger rest (Pl. 5, 21)	—	—	—	—	—	—	1	—
bladder mouthpiece (Pl. 5, 24)	—	—	—	—	—	—	—	1
throwing board peg (Pl. 5, 23)	1	—	—	—	—	—	—	—

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8
harpoon dart head, assymetrically barbed, wedge-shaped tang, drilled line hole (Pl. 6, 8)	—	1	—	1	—	—	—	—
harpoon dart head, assymetrically barbed, wedge-shaped tang, gouged line hole (Pl. 6, 11)	—	1	—	—	—	—	—	—
harpoon dart head, shoulderless wedge-shaped tang, unilaterally barbed, drilled line hole (Pl. 6, 12)	—	1	—	—	—	—	—	—
harpoon dart head, symetrically barbed, wedge-shaped tang, gouged line hole (Pl. 6, 10)	—	1	—	—	—	—	—	—
harpoon dart head, sloping shoulder, conical tang (Pl. 6, 16)	—	2	—	—	—	—	—	—
salmon arrowhead (?) (Pl. 6, 17)	—	—	—	—	—	—	—	1
snow goggles (Pl. 6, 19)	1	1	—	—	—	—	—	—
lance blade receiver (Pl. 6, 14, 15)	—	—	—	—	—	—	—	2
lance blade (Pl. 6, 7)	—	1	—	—	—	—	—	—
TRAVEL AND TRANSPORTATION								
sled shoe fragments (Pl. 7, 12)	1	—	1	—	1	1	7	—
trace buckle (Pl. 7, 6)	—	—	—	1	—	—	—	—
TOOLS AND MANUFACTURES								
wedge (Pl. 7, 3, 4)	1	13	—	2	1	—	1	8
adze head, antler, closed-socketed (Pl. 7, 5, 7-8)	—	3	1	—	3	—	—	1
adze handle (Pl. 7, 11-12)	—	—	2	—	1	—	—	—
adze blade, jade (Pl. 7, 13)	1	1	—	—	—	—	—	—
adze head, jade (Pl. 7, 9-10)	—	2	—	—	—	—	—	—
end bladed knife handle (Pl. 8, 1, 5, 7)	2	1	—	—	3	—	2	—
side bladed knife handle (Pl. 8, 6)	1	3	1	—	3	1	1	—
composite knife handle (Pl. 8, 2-4, 11)	—	2	—	—	1	—	—	1
man's knife blade, double edged (Pl. 8, 12)	1	—	2	—	1	—	—	1
man's knife blade, single edged (Pl. 8, 8)	—	—	—	1	—	—	—	—
man's knife blade, fragments	—	1	—	—	3	—	—	4
ulu blade, (Pl. 8, 16-18; Pl. 9, 2, 4-5, 9)	1	5	1	1	1	1	4	11
ulu blade fragments	2	7	1	—	2	1	2	8
ulu handle (Pl. 8, 14-15; Pl. 9, 3)	—	1	—	—	—	—	—	2
end scraper (Pl. 9, 1, 6, 8)	—	—	—	1	2	—	—	—
side scraper (Pl. 8, 9-10, 13)	—	2	—	—	2	—	3	6
scraper handle (Pl. 9, 10)	—	1	—	—	2	—	—	2
hand drill, chert (Pl. 9, 7)	—	—	—	—	—	—	—	1
flaker point (Pl. 9, 12, 13)	1	1	—	1	1	—	—	—
willow bark tool (Pl. 9, 18)	—	—	—	—	—	—	1	—

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8
beaver and porcupine (?) teeth (Pl. 9, 11)	—	2	—	1	2	—	—	—
beaver tooth tool handle (Pl. 9, 16-17)	—	—	2	—	1	—	—	1
whetstone (Pl. 9, 15)	—	2	—	—	1	—	—	1
pounding stone (Pl. 10, 5)	—	—	—	—	—	—	1	—
stone saw (Pl. 9, 14)	—	—	—	—	—	—	—	1
maul (Pl. 10, 4)	—	—	—	—	—	—	—	3
pick (Pl. 10, 2, 3)	1	6	—	1	2	—	—	—
two-handed scraper (Pl. 10, 7)	1	1	—	—	—	—	—	1
bag handle (Pl. 10, 6; Pl. 11, 3-6; Pl. 12, 20)	1	3	—	—	2	—	—	—
stake pounder	—	—	1	—	—	—	—	—
red ochre	—	—	—	1	—	—	—	—
shovel, walrus scapula (Pl. 11, 8)	—	1	1	—	—	—	—	—
shovel, antler	—	—	—	1	—	—	—	—
shovel, composite (Pl. 11, 7)	—	1	—	—	—	—	—	—
worked mammoth tooth (Pl. 11, 2)	—	—	—	1	—	—	—	3
worked mammoth tusk (Pl. 11, 1)	—	—	—	1	—	—	—	—
SKIN WORKING AND TAILORING								
tci-tho (Pl. 12, 15)	2	1	—	1	3	—	—	1
awl or bodkin (Pl. 12, 6-8)	2	11	1	3	4	1	—	4
FOOD PREPARATION								
ladle of mountain sheep horn (Pl. 10, 1)	—	1	—	—	—	—	—	—
wooden bowl, one piece	—	—	—	—	—	—	1	—
wooden bowl, composite	—	—	—	—	—	—	1	—
wooden bowl, rim (?)	—	1	—	—	—	—	—	—
spoon, oval bowl (Pl. 12, 1, 3)	—	1	—	—	2	—	—	1
spoon, oval bowl, flat across end (Pl. 12, 2)	—	—	—	—	—	—	1	—
drinking tube (Pl. 12, 4)	1	—	—	—	—	—	—	—
PERSONAL ADORNMENT								
labret (Pl. 12, 13-17)	1	2	—	—	—	—	2	—
comb (Pl. 12, 21-22)	—	—	—	—	1	—	1	2
pendant, drop shaped (Pl. 12, 10, 11)	—	—	—	2	—	—	—	1
pendant, effigy (?) (Pl. 12, 28)	—	—	1	—	—	—	—	—
brow band (Pl. 12, 27; Fig. 12)	1	—	—	—	—	—	—	1
COMMUNAL ACTIVITY								
plate armor (Pl. 12, 18, 19)	—	20	—	—	—	—	—	3
lancet (Pl. 12, 12)	—	1	—	—	—	—	—	—
drum handle (Pl. 12, 23)	—	1	—	—	—	—	—	—
toy drum handle (Pl. 12, 24)	1	—	—	—	—	—	—	—
gaming piece (Pl. 12, 25, 26)	2	1	—	1	—	—	1	—

	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8
POTTERY								
pottery paddle (Pl. 14, 1-2)	—	—	—	—	—	—	—	2
lamp sherds, saucer shaped, (Pl. 13, 5, 6)	1	2	—	—	1	—	1	—
pot sherds (Fig. 13; Pl. 13)	33	189	16	8	65	—	41	78
MISC. AND UNIDENTIFIED								
reinforcement piece (Pl. 14, 3-5)	—	13	—	—	—	—	—	—
ferule (Pl. 14, 9)	—	—	—	—	1	—	—	—
oblong object, notched edges, drilled hole in center (Pl. 14, 8)	—	1	—	—	—	—	—	—
unidentified objects (Pl. 14, 6-7)	—	—	—	—	—	—	—	2
whale bone fragments	—	2	—	—	1	—	1	2
birch bark fragments	1	1	—	—	—	—	—	—

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PLATE 1

FISHING

	Description	House No.	Ref. Page
1.	Net sinker	KH-5	91
2.	Net sinker	KH-1	91
3.	Net sinker	KH-5	91
4.	Net sinker	KH-2	91
5.	Net sinker	KH-8	91
6.	Net sinker	KH-2	91
7.	Fishing ice pick	KH-2	92

PLATE 2

FISHING

	Description	House No.	Ref. Page
1.	Leister prong	KH-8	92
2.	Leister prong	KH-5	92
3.	Fish arrow prong	KH-4	92
4.	Shee lure-hook shank	KH-7	92
5.	Shee lure-hook shank	KH-3	92
6.	Blank for pickerel or shee lure-hook shank	KH-8	92
7.	Center prong	KH-3	92
8.	Center prong	KH-7	92
9.	Pickerel lure-hook shank	KH-1	92
10.	Pickerel lure-hook shank	KH-7	92
11.	Fish arrow prong	KH-5	92
12.	Fish arrow prong	KH-2	92
13.	Center prong	KH-8	92
14.	Line sinker	KH-5	92
15.	Line sinker	KH-2	92
16.	Gorge	KH-2	92
17.	Barb	KH-1	92
18.	Barb	KH-3	92
19.	Grayling lure-hook shank (?)	KH-6	92
20.	Ice scoop rim	KH-8	92

PLATE 1

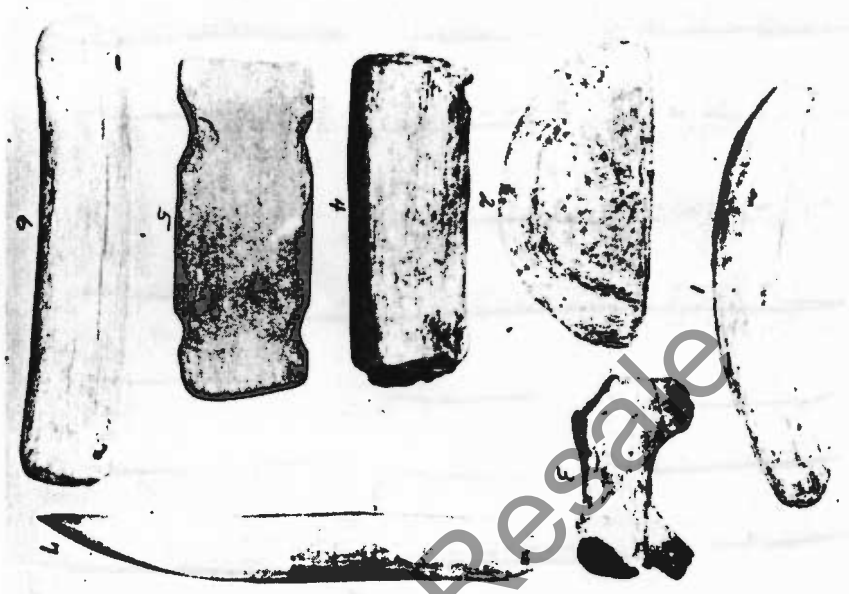


PLATE 2

PLATE 3

LAND HUNTING

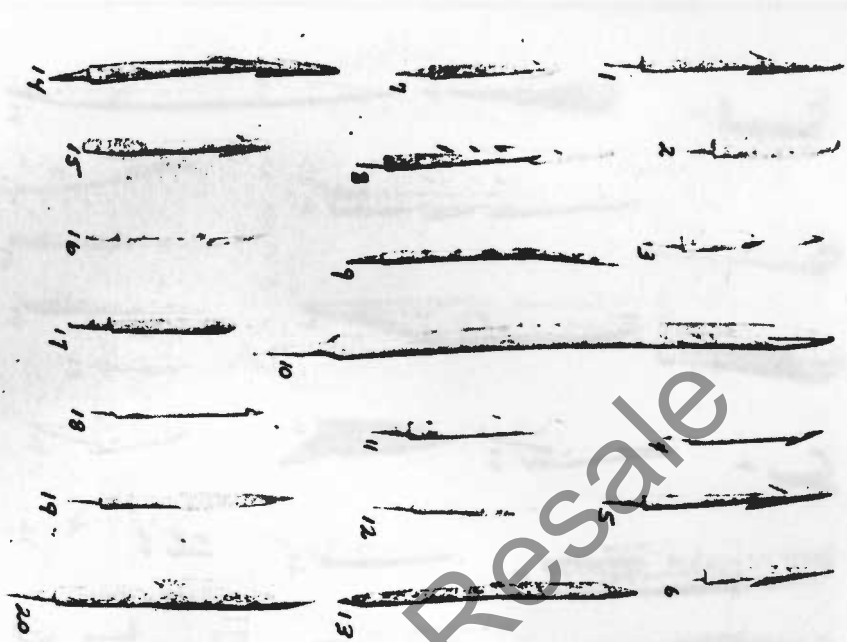
	Description	House No.	Ref. Page
1.	Arrowhead	KH-5	95
2.	Arrowhead	KH-2	95
3.	Arrowhead	KH-8	95
4.	Arrowhead	KH-8	95
5.	Arrowhead	KH-8	95
6.	Arrowhead	KH-2	95
7.	Arrowhead	KH-2	95
8.	Arrowhead	KH-4	95
9.	Arrowhead	KH-8	95
10.	Arrowhead	KH-6	95
11.	Arrowhead	KH-2	95
12.	Arrowhead	KH-2	95
13.	Arrowhead	KH-7	95
14.	Arrowhead	KH-2	95
15.	Arrowhead	KH-5	95
16.	Arrowhead	KH-1	95
17.	Arrowhead	KH-7	95
18.	Arrowhead	KH-1	95
19.	Arrowhead	KH-8	95
20.	Arrowhead	KH-8	95

PLATE 4

LAND HUNTING

	Description	House No.	Ref. Page
1.	Arrowhead	KH-7	95
2.	Arrowhead	KH-5	95
3.	Arrowhead	KH-7	95
4.	Arrowhead	KH-2	95
5.	Arrowhead	KH-8	95
6.	Arrowhead	KH-8	95
7.	Bow fragment	KH-1	97
8.	Shaft straightener	KH-1	97
9.	Shaft straightener	KH-8	97
10.	Arrowhead	KH-5	95
11.	Arrowhead	KH-8	95
12.	Arrowhead	KH-5	95
13.	Arrowhead	KH-5	95
14.	Arrow point	KH-3	97
15.	Arrow point	KH-8	97
16.	Arrow point	KH-8	97
17.	Arrow point	KH-8	97
18.	Sinew twister	KH-4	97
19.	Bird spear center prong	KH-5	97
20.	Bird spear side prong	KH-2	97

PLATE 3



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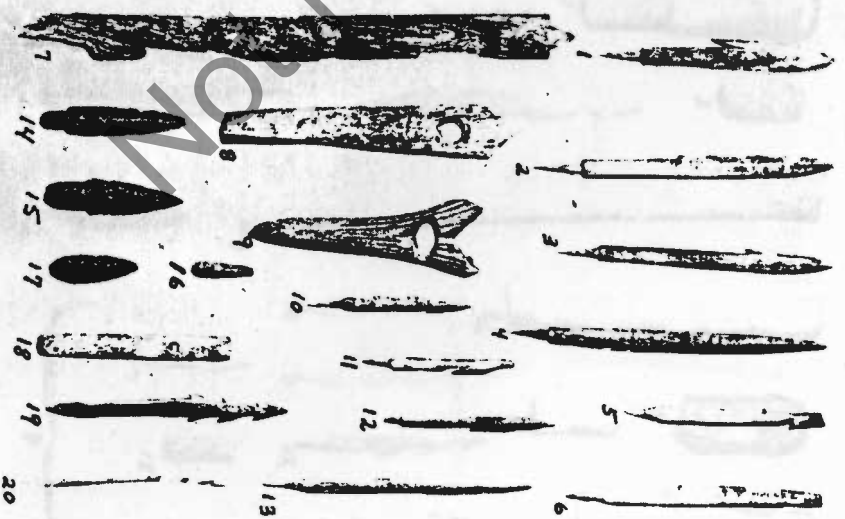

PLATE 5

LAND HUNTING, SEA HUNTING

	Description	House No.	Ref. Page
1.	Blunt arrowhead	KH-7	96
2.	Blunt arrowhead	KH-4	96
3.	Blunt arrowhead	KH-2	96
4.	Blunt arrowhead	KH-8	96
5.	Bow brace	KH-1	97
6.	Bow brace	KH-2	97
7.	Blunt arrowhead (?)	KH-2	97
8.	Harpoon head	KH-3	101
9.	Harpoon head	KH-8	101
10.	Harpoon head	KH-6	101
11.	Harpoon head	KH-1	101
12.	Harpoon head	KH-8	101
13.	Bow brace	KH-5	97
14.	Harpoon foreshaft	KH-8	101
15.	Harpoon foreshaft	KH-7	101
16.	Bird spear center prong	KH-8	97
17.	Toy harpoon head	KH-2	101
18.	Toy harpoon head	KH-1	101
19.	Toy harpoon head	KH-2	101
20.	Harpoon head fragment	KH-2	101
21.	Finger rest	KH-7	102
22.	Harpoon head fragment	KH-4	101
23.	Throwing board peg	KH-1	102
24.	Bladder mouthpiece	KH-8	102

PLATE 6

SEA HUNTING

	Description	House No.	Ref. Page
1.	Harpoon socket piece	KH-1	101
2.	Harpoon socket piece	KH-8	102
3.	Harpoon socket piece	KH-5	101
4.	Harpoon socket piece	KH-2	102
5.	Harpoon socket piece	KH-8	102
6.	Harpoon socket piece	KH-2	101
7.	Lance blade	KH-2	102
8.	Harpoon dart head	KH-2	102
9.	Harpoon socket piece	KH-2	101
10.	Harpoon dart head	KH-2	102
11.	Harpoon dart head	KH-2	102
12.	Harpoon dart head	KH-2	102
13.	Harpoon socket piece	KH-2	102
14.	Lance blade receiver	KH-2	102
15.	Lance blade receiver	KH-8	102
16.	Harpoon dart head	KH-2	102
17.	Harpoon dart head	KH-8	102
18.	Dart socket piece	KH-3	102
19.	Snow goggles	KH-2	102

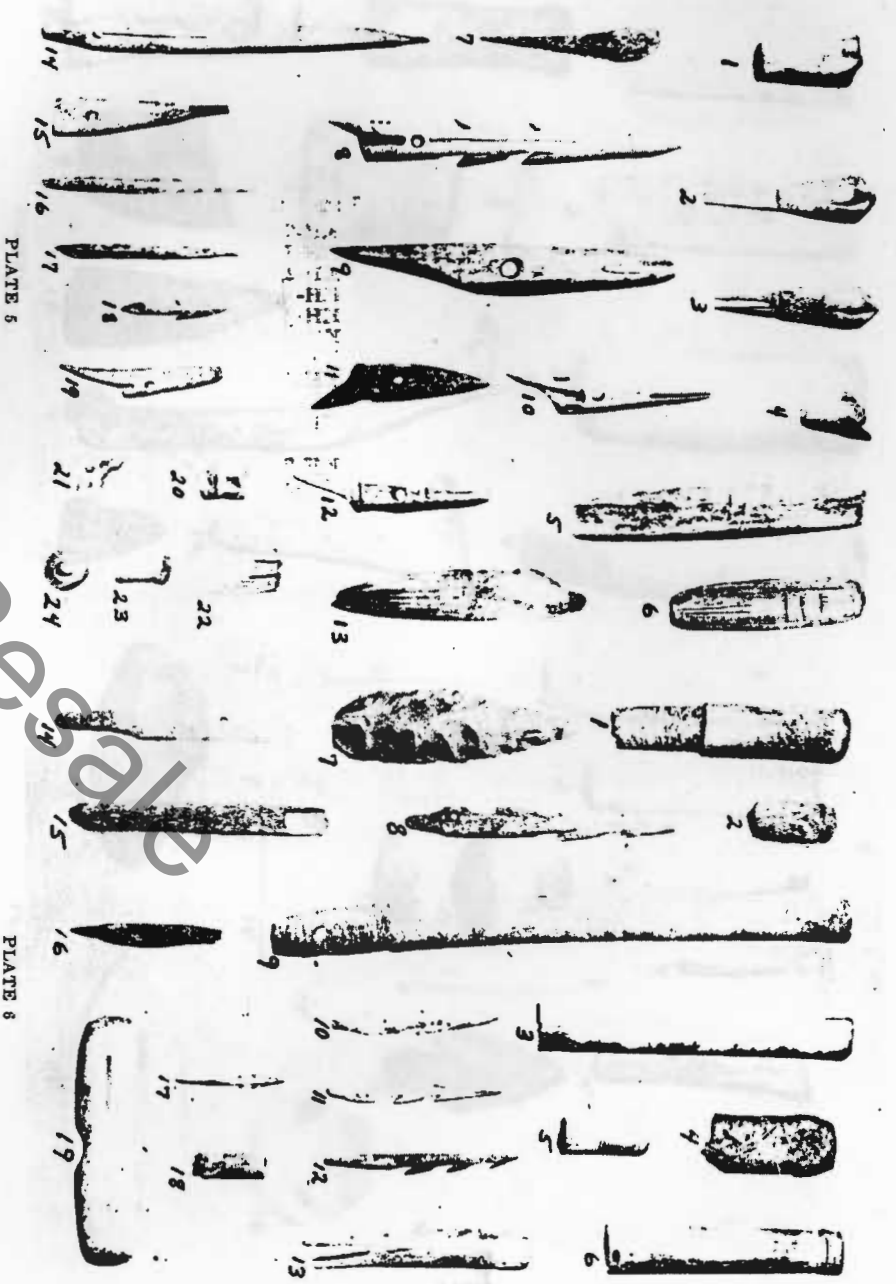

PLATE 7

TRANSPORTATION,
TOOLS AND MANUFACTURES

	Description	House No.	Ref. Page
1.	Sled shoe section	KH-3	113
2.	Sled shoe section	KH-7	113
3.	Wedge	KH-2	106
4.	Wedge	KH-5	106
5.	Adze head	KH-2	106
6.	Trace buckle	KH-3	113
7.	Adze head	KH-8	106
8.	Adze head	KH-5	106
9.	Adze head of Jade	KH-8	106
10.	Adze head of Jade	KH-2	106
11.	Adze handle	KH-3	106
12.	Adze handle	KH-5	106
13.	Adze blade	KH-2	106

PLATE 8

TOOLS AND MANUFACTURES

	Description	House No.	Ref. Page
1.	End bladed knife handle	KH-2	106
2.	Composite knife handle	KH-2	106
3.	Composite knife handle	KH-6	107
4.	Composite knife handle	KH-8	106
5.	End bladed knife handle	KH-1	106
6.	Side bladed knife handle	KH-5	106
7.	End bladed knife handle	KH-7	106
8.	Man's knife blade	KH-4	107
9.	Side scraper	KH-8	107
10.	Side scraper	KH-8	107
11.	Composite knife handle	KH-2	107
12.	Man's knife blade	KH-2	107
13.	Side scraper	KH-8	107
14.	Ulu handle	KH-8	107
15.	Ulu handle	KH-2	107
16.	Ulu blade	KH-2	107
17.	Ulu blade	KH-2	107
18.	Ulu blade	KH-8	107

PLATE 7

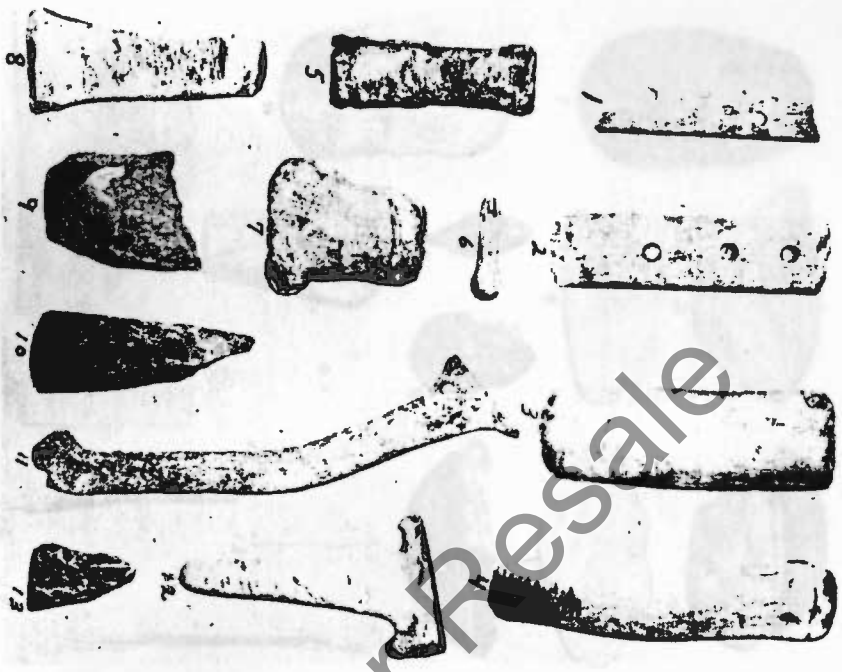

PLATE 8

PLATE 9

TOOLS AND MANUFACTURES

	Description	House No.	Ref. Page
1.	End scraper	KH-5	107
2.	Ulu blade	KH-7	107
3.	Ulu handle	KH-8	107
4.	Ulu blade	KH-8	107
5.	Ulu blade	KH-8	107
6.	End scraper	KH-4	107
7.	Hand drill	KH-8	107
8.	End scraper	KH-5	107
9.	Ulu blade	KH-4	107
10.	Scraper handle (?)	KH-7	107
11.	Beaver tooth	KH-5	108
12.	Flaker point	KH-1	107
13.	Flaker point	KH-2	107
14.	Stone saw	KH-8	108
15.	Whetstone	KH-8	108
16.	Beaver tooth tool handle	KH-5	108
17.	Beaver tooth tool handle	KH-3	108
18.	Willow bark tool	KH-7	107

PLATE 10

TOOLS AND MANUFACTURES

FOOD PREPARATION

	Description	House No.	Ref. Page
1.	Ladle	KH-2	116
2.	Root pick	KH-5	108
3.	Root pick	KH-2	108
4.	Maul	KH-8	108
5.	Pounding stone	KH-7	108
6.	Bag handle	KH-2	108
7.	Two-handed scraper	KH-1	108

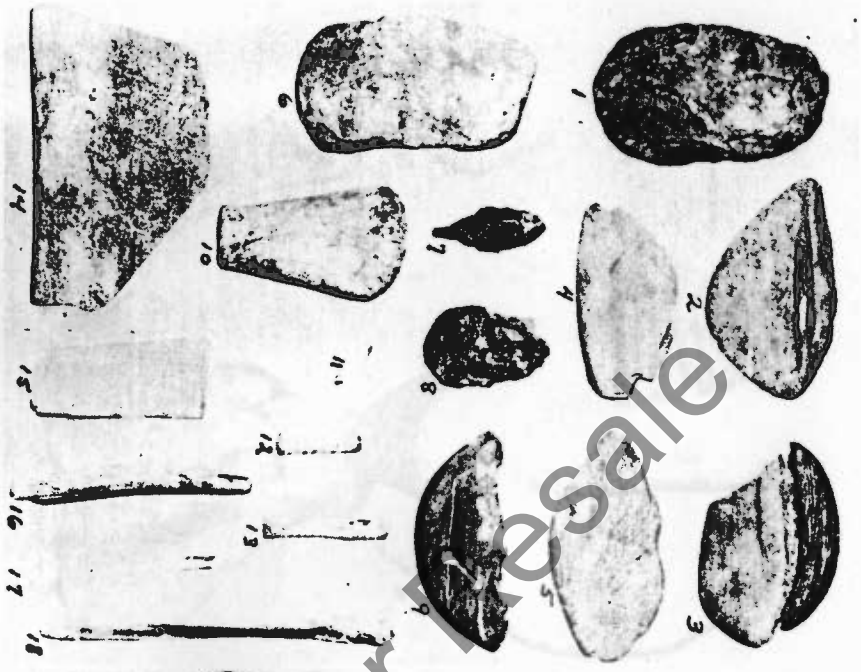

PLATE 9

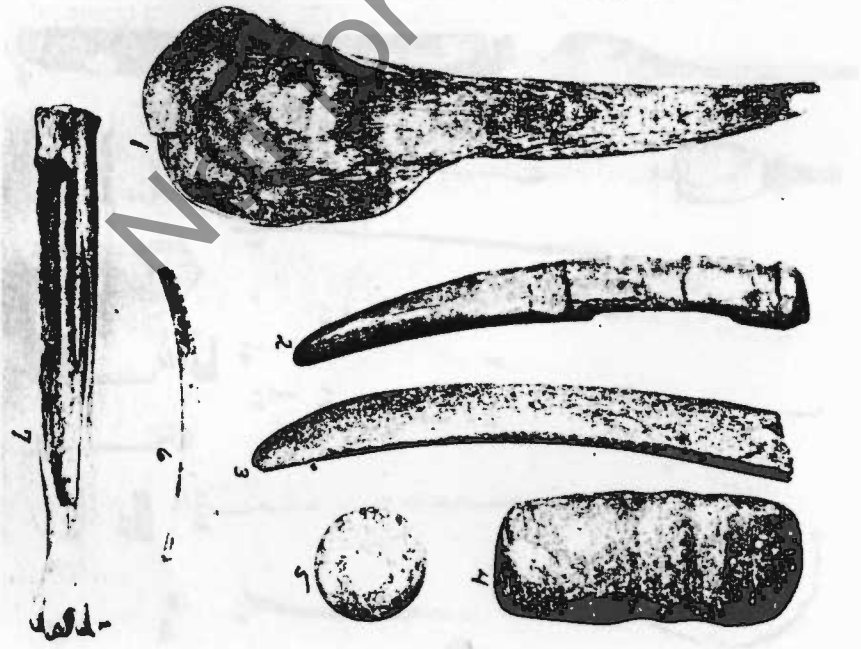

PLATE 10

PLATE 11

TOOLS AND MANUFACTURES

	Description	House No.	Ref. Page
1.	Worked mammoth tusk	KH-3	108
2.	Worked mammoth tooth	KH-8	108
3.	Bag handle	KH-1	108
4.	Bag handle	KH-5	108
5.	Bag handle	KH-5	108
6.	Bag handle	KH-2	108
7.	Shovel blade	KH-2	108
8.	Shovel blade	KH-2	108

PLATE 12

TOOLS AND MANUFACTURES
SKIN WORKING AND TAILORING, FOOD PREPARATION, COMMUNAL ACTIVITY

	Description	House No.	Ref. Page
1.	Spoon	KH-8	116
2.	Spoon	KH-7	116
3.	Spoon	KH-5	116
4.	Drinking tube (?)	KH-1	116
5.	Tci-tho	KH-2	116
6.	Awl or bodkin	KH-2	116
7.	Awl or bodkin	KH-2	116
8.	Awl or bodkin	KH-4	118
9.	Pendant	KH-4	118
10.	Pendant	KH-4	118
11.	Pendant	KH-8	119
12.	Lancet	KH-2	117
13.	Labret	KH-7	118
14.	Labret	KH-7	118
15.	Labret	KH-1	118
16.	Labret	KH-2	118
17.	Labret	KH-2	118
18.	Plate armor	KH-8	119
19.	Plate armor	KH-2	119
20.	Bag handle	KH-2	108
21.	Comb	KH-8	118
22.	Comb	KH-8	118
23.	Drum handle	KH-2	119
24.	Toy drum handle	KH-1	119
25.	Gaming piece	KH-1	119
26.	Gaming piece	KH-2	119
27.	Brow band	KH-1	118
28.	Pendant	KH-3	118

PLATE 11

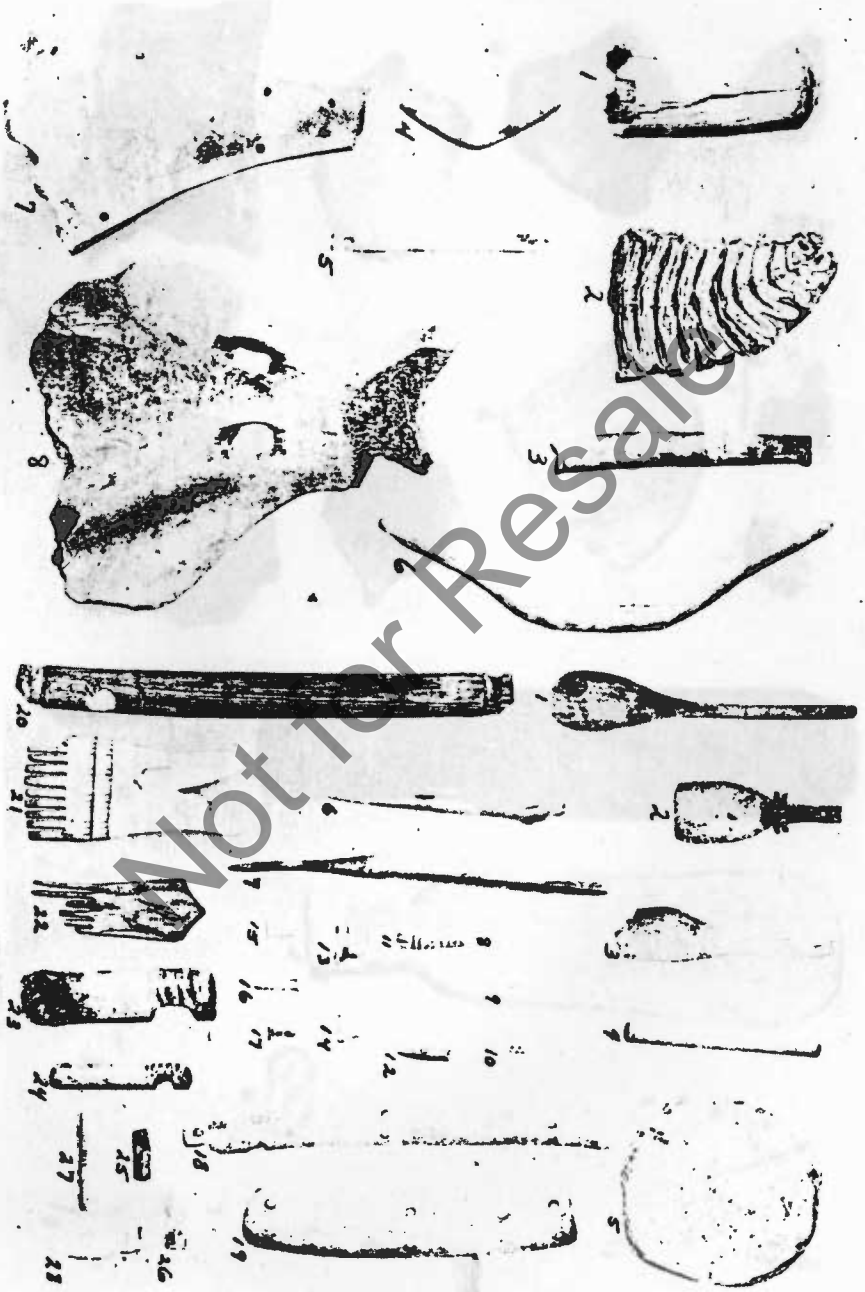

PLATE 12

PLATE 13

POTTERY

	Description	House No.	Ref. Page
1.	Potsherd	KH-5	122
2.	Potsherd	KH-2	122
3.	Potsherd	KH-5	122
4.	Potsherd	KH-2	122
5.	Potsherd	KH-5	122
6.	Potsherd	KH-1	122
7.	Potsherd	KH-2	122
8.	Potsherd	KH-8	122
9.	Potsherd	KH-5	122
10.	Potsherd	KH-7	122
11.	Potsherd	KH-8	122

PLATE 14

POTTERY,
MISCELLANEOUS AND UNIDENTIFIED

	Description	House No.	Ref. Page
1.	Pottery paddle	KH-8	120
2.	Pottery paddle	KH-8	120
3.	Reinforcement piece (?)	KH-2	126
4.	Reinforcement piece (?)	KH-2	126
5.	Reinforcement piece (?)	KH-2	126
6.	Unidentified object	KH-2	126
7.	Unidentified object	KH-1	126
8.	Unidentified object	KH-8	126
9.	Ferule (?)	KH-5	139

PLATE 13

PLATE 14