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VOLUME 67

THE BRUCE COLLECTION OF ESKIMO MATERIAL CULTURE FROM PORT CLARENCE, ALASKA

JAMES W. VANSTONE

November 26, 1976

FIELDIANA: ANTHROPOLOGY

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FIELD MUSEUM OF NATURAL HISTORY

VOLUME 67



FIELD MUSEUM OF NATURAL HISTORY
CHICAGO, U. S. A.

The Bruce Collection of Eskimo Material
Culture from Port Clarence, Alaska



FRONTISPIECE: Port Clarence Eskimos making souvenirs. Photograph by Eric A. Hegg in 1900. Northwest Collection, University of Washington Library.

369.

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THE BRUCE COLLECTION OF ESKIMO MATERIAL CULTURE FROM PORT CLARENCE, ALASKA

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PREFACE

In 1896 and 1897 Field Museum of Natural History purchased two sizeable collections of contemporary Eskimo ethnographic specimens from Mr. Miner W. Bruce, a United States government employee and trader who lived in western Alaska for a number of years beginning in 1892. One of these collections was made in the vicinity of Kotzebue Sound and the other in and around Port Clarence while Bruce was serving as superintendent of the government-operated Teller Reindeer Station. It is the latter that is described and illustrated in this study.

The Bruce Port Clarence collection must be included among the significant assemblages of nineteenth-century Alaskan Eskimo material culture in American and European museums. It has never been described or illustrated and, in fact, has seldom been examined or referred to by students of Eskimo material culture. Although some of the material in the collection is duplicated in other better known and better documented assemblages of Alaskan Eskimo ethnographic specimens, it also includes many unique items or items poorly represented in other collections. The primary purpose of this study is to make the Bruce Port Clarence collection better known to students of Alaskan Eskimo ethnography. It is hoped that in the future a similar report can be prepared for Bruce's Kotzebue Sound collection.

This study was supported, in part, by a grant (R50-20-92) from the National Endowment for the Arts in Washington, D.C., a federal agency. I am grateful to several of my colleagues at Field Museum of Natural History for assistance during my study of the Bruce collection. Dr. Glen Cole guided me toward a more accurate description of the lithic materials and Dr. Luis de la Torre identified a number of mammal bones. Maps were drawn by Mr. Richard Roesener and the excellent photographs are the work of Mr. John Bayalis and Mr. Ronald A. Testa. The manuscript was typed by Ms. Kathleen Fine.

For helpful suggestions during the preparation of this study, I wish to express my appreciation to Dr. Wendell H. Oswald and Ms. Dorothy Jean Ray.

I

HISTORICAL BACKGROUND

Port Clarence and Grantley Harbor were observed and named in September, 1827 by Captain Frederick W. Beechey during his second season of arctic exploration in co-operation with Captain (later Sir) John Franklin's second expedition. It is apparent, however, that earlier Russian charts showed an inlet in this area (Bockstoce, 1976). Recognizing the importance of these two indentations of the Alaska coast, free from ocean swell, as the best harbors on the American side of Bering Strait north of the Aleutian Islands, Beechey noted that "these two ports, situated so near Beering's Strait, may at some future time be of great importance to navigation, as they will be found particularly useful by vessels which may not wish to pass the strait in bad weather" (Beechey, 1831, vol. 2, p. 267). Grantley Harbor was further described as "well adapted to purposes of repair" and "sufficiently deep to receive a frigate, provided she lands her guns" (Beechey, 1831, vol. 2, p. 268).

Beechey remained for only four days in the newly observed harbors before heading south, but his prediction concerning their utility and future use proved remarkably accurate. Between 1849 and 1854 at least six of the ships searching for Franklin's third expedition came to Port Clarence (Collinson, 1875, pp. 114-120) and for five consecutive years a search ship wintered in Grantley Harbor. Seamen from these vessels made frequent visits to Eskimo villages in the area and, in turn, many Eskimos visited the ships out of curiosity as well as to trade. Although Port Clarence may have been, for many generations, an important international trading center for Eskimos from villages on the Alaskan and Siberian coasts (Ray, 1964, p. 75), these contacts with the Franklin search vessels almost certainly represented the first sustained interaction with Europeans to have taken place in the area.

In September, 1866 39 members of the Western Union Telegraph Expedition landed at Port Clarence to construct sections of a tele-

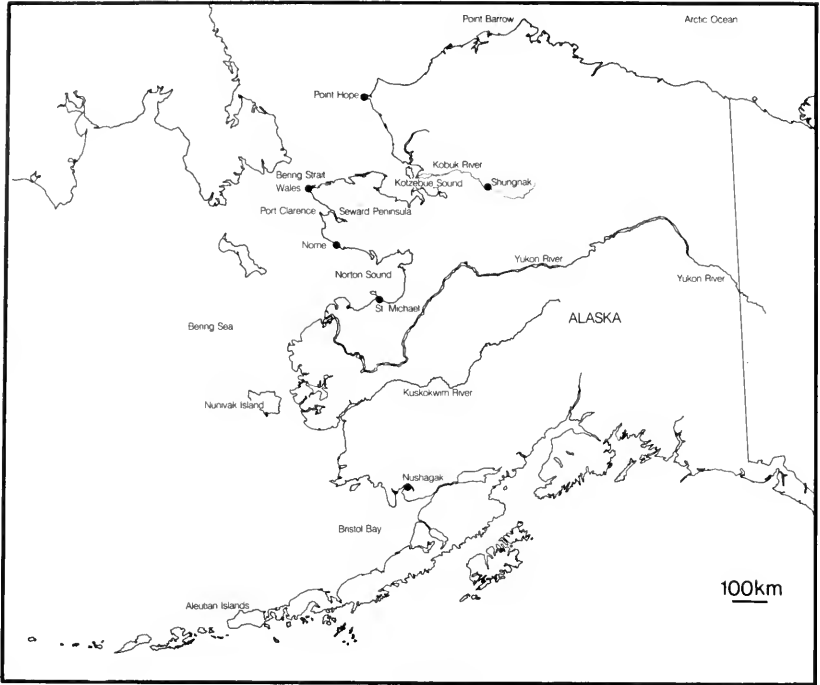


FIG. 1. Map of Alaska.

graph line intended to cross Bering Strait and connect the capitals of America and Europe. This contingent of the expedition remained nearly a year during which information was received that the Atlantic cable had been laid, thus rendering the project unnecessary, and that the United States had purchased Russian America. Eskimos at Port Clarence experienced considerable contact with members of the expedition and made for them miniature sleds, snowshoes, and engraved pieces of ivory. Although Eskimos had previously traded enthusiastically with early explorers, this was apparently the first time that souvenirs were manufactured specifically for sale or trade to white men (Ray, 1975, pp. 164-167, 175).

In 1848 the first commercial whaling ships passed through Bering Strait into the Arctic Ocean. Port Clarence was not a port of call for the whalers during the heyday of sailing ships in the 1850s and 1860s although a few called there to obtain fresh drinking water and driftwood for fuel (Ray, 1975, p. 198). After the steam whaling vessel was introduced into the arctic fleet in 1880, however, the ships were able to winter in the arctic and Port Clar-

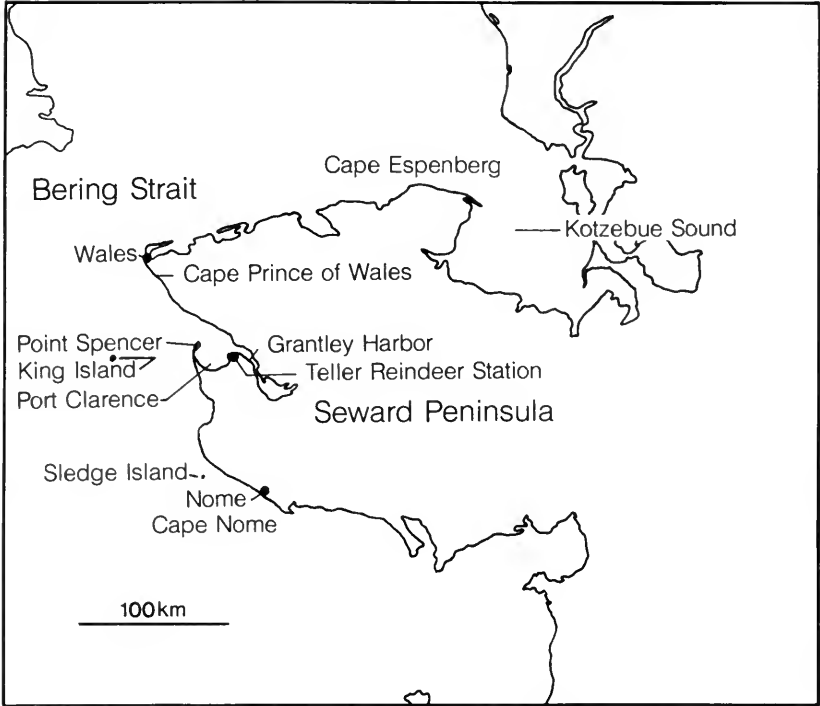


FIG. 2. Map of Seward Peninsula and vicinity.

ence became an important mid-summer rendezvous for the fleet. The ships gathered about July 1 to await the arrival of a vessel from San Francisco with fresh provisions, mail, and coal, and to which they could transfer their spring catch of baleen and oil before entering arctic waters once again. In the early 1880s the U.S. Revenue Marine Service established a coal stockpile on Point Spencer from which the whalers could obtain an emergency supply (Jackson, 1894, p. 15; Swineford, 1898, p. 182; Alaska. Coast Pilot notes . . . , 1899, p. 194; VanStone, 1958, p. 5; Ray, 1964, p. 75; 1975, pp. 200-201).

By 1890 virtually the entire whaling fleet paid a visit each summer to Port Clarence. In July of that year, when the Rev. Sheldon Jackson, first General Agent of Education in Alaska and a Presbyterian missionary, paid his initial visit to the port, there were 25 whalers at anchor off Point Spencer waiting for the arrival of the supply ship (Jackson, 1894, p. 15). The fleet usually remained until the 10th or 15th of July and its presence attracted many Eskimos to the area not only from the settlements in the

immediate vicinity, but also from villages on Seward Peninsula, King Island, Norton Sound, and more distant points. The crews of the ships wished to obtain fur clothing to wear when whaling in the high arctic. As for the Eskimos, they brought dried fish and furs to trade as well as items of native manufacture which quickly became popular trade items in great demand among the sailors of the fleet. H. L. Aldrich who sailed with the fleet in 1887 noted that Eskimos in their skin boats came out to the anchored vessels almost every day with items to trade that included "fancy carved ivory pipes" and "bags decorated with fancy needle work" (Aldrich, 1889, pp. 75, 163). Over the years, of course, the Eskimos learned which items of native manufacture were most in demand and, based on their experience with members of the Western Union Telegraph Expedition, they developed an early form of what might be called tourist art. Some of the new materials which they received in trade from the whalers, such as cloth, yarn, glass beads, and metal, were incorporated into their traditional crafts which thereafter were a "blending of non-Eskimo materials and ideas with traditional subjects and forms" (Ray, nd).

In 1892 domestic reindeer were brought from Siberia to the Port Clarence area through the joint efforts of Sheldon Jackson and Captain Michael A. Healy of the U.S. Revenue Marine Service. This program, supported by the U.S. Bureau of Education, was intended to provide Alaskan Eskimos with a new source of food that would offset the decline in sea mammals caused by the unrestricted killing of whales, walrus, and seals by commercial interests during the second half of the nineteenth century. There was also a small market for the meat and skins of the reindeer and it was hoped that the Eskimos could derive a cash income from their sale.

The first deer were landed by the U.S. Revenue Cutter *Bear* in July, 1892 on the north shore of Port Clarence at a place which Jackson had named the Teller Reindeer Station after John M. Teller, a U.S. senator who had helped steer appropriations for the project through Congress. Chukchi herders were brought from Siberia to teach the Eskimos the techniques of herding and the proper methods of caring for the animals.

At the opening of the station, Miner W. Bruce, a former journalist from Nebraska, was appointed superintendent. He and his one assistant had charge of four Chukchi herders, an equal number of Eskimo apprentices, and approximately 175 deer. They were

also expected to double as school teachers. Bruce's job was a formidable one since he had no training for either position and his inability to speak either Eskimo or Chukchi made communication with those he was supposed to teach and with whom he worked extremely difficult and uncertain (Jackson, 1894, pp. 14, 16; Ray, 1965, pp. 71-72, 80; 1975, p. 222). Bruce's first annual report to Jackson (Jackson, 1894, pp. 25-116) seems to indicate that the initial year went smoothly enough and all concerned learned a great deal about the care and maintenance of reindeer. Apparently, however, the superintendent, who had been recommended to Jackson for the job by Healy, did not get along well with the latter. Therefore, Healy made the accusation that Bruce, through the captain of a chartered ship sent to the coast of Siberia to obtain deer, had traded five gallons of whiskey for some animals in July, 1893 at the beginning of the second season. Although these charges were denied, Healy was successful in persuading Jackson to fire both Bruce and his assistant (Ray, 1965, pp. 82-83; 1975, p. 223).

Bruce had made matters worse for himself by taking 11 Port Clarence Eskimos and a collection of sleds, dogs, kayaks, and other artifacts to Chicago for exhibition at the World's Columbian Exposition. Healy wrote to Sheldon Jackson on July 30, 1893: "Had I been in Port Clarence when [Bruce] left there I never would have allowed him to take those natives away, and I hope someone will be thoughtful enough to make him file a bond for their keep while away and to return them to their homes. To have the reindeer project become the father of a Dime Museum is to me a cause of mortification" (*quoted in* Ray, 1975, p. 223).

Thus Miner Bruce served as reindeer superintendent for only one year. After that time he became a trader to widely scattered points in Alaska, and a sizeable portion of his business is said to have been the collecting of Eskimo manufactures for resale (Ray, nd). It was during this period that he negotiated with Field Columbian Museum (later Field Museum of Natural History) to sell the collections of Eskimo material culture now in that institution.

II

THE COLLECTION

INTRODUCTION

The Bruce collection of ethnographic materials from Port Clarence, Alaska was officially received by Field Columbian Museum on October 31, 1897 and catalogued as accession 65. It is apparent from the accession records that approximately half the material was purchased from Mr. Bruce in February, 1894 and thus collected by him during the year that he served as reindeer superintendent. The remainder of the collection was purchased at a later date, probably in 1896 but certainly before the entire collection was accessioned the following year. In the catalog of the Department of Anthropology at Field Museum of Natural History the Bruce collection is assigned 735 numbers. In some cases, more than one specimen has the same catalog number. At the time this study was begun, 526 catalog numbers representing 589 specimens, including 11 objects from accession 546 acquired from Bruce in 1898, were located in storage and on exhibition (see Appendix), leaving specimens represented by 209 numbers unaccounted for. Of this number, 164 specimens are no longer in the collection, having been sold, exchanged, or consigned to waste many years ago. The remainder have apparently been lost.

The present condition of much of the Bruce collection is poor. Seventy-eight years of inadequate storage and damaging exhibition installation have taken their toll. Ivory, antler, bone, and wood specimens are cracked and broken; occasionally pieces of particular specimens are missing. Sinew has disintegrated and skins have dried and split. The few remaining items of clothing that were not sold out of the collection have been badly damaged by insects and lack of humidity control in the storerooms. Most of the masks in the collection have been cleaned and repaired recently in the Department of Anthropology's conservation and restoration laboratory.

Unfortunately, the scanty records accompanying the Port Clarence collection tell us little concerning Bruce's relations with the museum and nothing about his collecting methods. There is no way of determining which objects were obtained at Port Clarence and which were collected by Bruce during his subsequent extensive travels throughout northwest Alaska. Even while holding the position of reindeer superintendent, Bruce made at least one trip to Cape Prince of Wales and also visited a number of other villages on Seward Peninsula (Jackson, 1894, p. 43). However, even if it could be determined with certainty that all the artifacts which are the subject of this study were collected at Port Clarence, the collection could still not be said to have an accurate provenience. According to Bruce (Jackson, 1894, p. 74), there were seven settlements within a radius of 20 km. of the reindeer station and although this may be something of an exaggeration, it is clear that the general area had a total permanent population of at least 350 in the nineteenth century (Ray, 1964, p. 75). In addition, as we have noted, Port Clarence was a traditional trading center and the added presence of the whaling ships each year attracted large numbers of Eskimos from distant settlements during the summer months. Although these Eskimos were attracted by an opportunity to trade with the whaling vessels, they would have been equally satisfied to trade with Bruce. As a result, of course, the provenience "Port Clarence" means little as far as determining accurately the place where a particular artifact was made and used.

The Bruce collection is sufficiently varied so that items of material culture can be described and discussed within the following use categories: sea and land hunting, fishing, tools and manufactures, household equipment, clothing, transportation, ceremonial equipment, personal adornment, smoking complex, toys and models, and raw materials. The descriptions which follow, although hopefully sufficient to make clear the special characteristics of each artifact type, are brief and the reader is urged to examine carefully the many photographs. In addition to the basic artifact descriptions, each use category contains relevant comparisons with similar specimens in published collections and, where possible, an attempt is made to determine a more exact provenience for each artifact type. For the comparisons, I have relied heavily on Nelson (1899), but other ethnographic accounts and published catalogs of museum specimens have been utilized.

SEA AND LAND HUNTING

The collection contains six *ice-hunting harpoons* which vary in length from 179-202 cm., measurements made from the distal end of the socketpiece to the distal end of the ice pick. Five of these harpoons are similar in construction, consisting of a wooden shaft, socketpiece of walrus penis bone with round or wedge-shaped tang, ivory finger rest, and bone ice pick (pl. 1b). The lashings are of sealskin or baleen. Two of the finger rests are in the form of seals' heads with inset eyes of baleen. Three have attached foreshafts, two of ivory, and the other of bone. A sixth harpoon is quite different from the other five. Although of comparable length, its wooden shaft is considerably smaller in diameter and the entire harpoon is of much lighter construction. The socketpiece, of walrus penis bone, is shorter than the others and has a round tang grooved for lashing to the shaft. A bone finger rest is set much further back than on the other five harpoons. A short ice pick, fitted in a slot in the shaft and lashed with sealskin line, appears to have been made from a metal spike. This harpoon has a small antler foreshaft which fits into a rectangular slot in the socketpiece. A closed socketed harpoon head of antler with spurred tang fits over the distal end of the foreshaft (pl. 1a).

In addition to the ice-hunting harpoons, there are 14 *sealing harpoon heads*, four *foreshafts*, and one *harpoon ice pick* in the collection. Although they vary in length from 7-15 cm., the harpoon heads, with one exception, are essentially similar. They have closed sockets, central round or oblong line holes, and metal blades (pl. 2c,d,l). Twelve heads are made of antler and two of ivory. Four have bifurcated spurs and three have deep, decorative grooves; one of the ivory specimens is decorated with spurred lines (pl. 2c). An antler head has lashing holes (pl. 2l), and another has a cover of sewn sealskin; the blades of all specimens are held in place with antler or metal rivets. The unique harpoon head is round with a deep closed socket and single spur. The metal blade, which is at right angles to the line hole, is lashed in place with sinew (pl. 2k).

Three of the four harpoon foreshafts are for ice-hunting harpoons. The longest is 22 cm. and the other two are 20 cm. in length. All have round tangs and central, oblong line holes (pl. 2e). Two are of ivory and one of antler. The antler specimen has been repaired with two metal rivets. The fourth foreshaft, much smaller, also has a round tang; the thin, central line hole is rectangular (pl. 2j). This antler foreshaft was probably used with a sealing harpoon.

A single bone harpoon ice pick has a wedge-shaped tang. A hole is drilled through the pick at the distal end of the tang to aid in hafting (pl. 2g).

There are five light *sealing harpoons* of the type used in a kayak and thrown with the aid of a throwing board. The two complete specimens measure 140 cm. and 146 cm. in length, respectively. Both have slender wooden shafts and the longer specimen has a bone socketpiece lashed to the shaft with sinew (pl. 3c). A small hole just above the tang permits the socketpiece to be further secured to the shaft by means of a feather quill which runs through the hole and is wedged into a slit in the wood. This harpoon has no foreshaft, the small, barbed harpoon head fitting directly into a slot in the socketpiece. A small plug of wood in the slot helps to hold the harpoon head in place. The shorter harpoon does not have a socketpiece, but instead a fixed antler foreshaft lashed to the shaft with root lashing. Fitted to this foreshaft is a closed socketed antler harpoon head, bladeless and with a bifurcated spur (pl. 1c). The other three sealing harpoons are in varying stages of disrepair and all have broken shafts. Two have heavy bone socketpieces lashed to the shafts with sinew. On one of these a seal's head is represented by crude engraving. These harpoons resemble specimens from the Norton Sound area illustrated by Nelson (1899, pl. LVa, 1-5).

The only *throwing board* in the collection has a single finger hole and an ivory peg extending from the handle. The specimen is painted with brown and dark blue paint (pl. 2a).

Of the three *harpoon dart socketpieces*, two are of walrus penis bone and the third of antler. The two bone specimens have sharp shoulders and round tangs. One is grooved above the tang for lashing (pl. 2h). The other has a wooden plug inserted in the distal end with a slot to receive a small harpoon dart head with round tang. The antler specimen is drilled to fit over the end of a wooden shaft (pl. 2i). It also has a wooden plug in the distal end to receive a dart head with a wedge-shaped tang.

There are seven *whaling harpoon heads* in the collection. Three are of ivory and four of bone. All are closed socketed with central line hole and blade slit at right angles to the line hole. In size, all are similar to the illustrated specimens (pls. 2b,f; 4d). One harpoon head has a metal blade held in place with a metal rivet, while another has a fragmentary slate blade with a pronounced center groove. Two ivory heads have a series of notches at frequent inter-

vals along one edge (pl. 2b). Whaling equipment in the Bruce collection may have come from the village of Wales on Seward Peninsula or other whaling communities in northwest Alaska.

Two rolls of *walrus hide line* have crude cord attachers at one end. The collection also contains a roll of *sealskin line*.

There is a single *float* of sealskin with the fur removed. It has a crude wooden T-shaped stopper at one end.

Float plugs are among the relatively small number of decorated objects in the collection. All five have deep grooves for lashing to the float and human or quasi-human facial representations on their outer surfaces. The largest, presumably for a float used in whaling, has ivory eyes inset with small pieces of amber and seal incisors set into a narrow mouth for teeth. The features are human except for the nose which is in the shape of a whale's tail (pl. 4a). A much smaller, unfinished plug, 9.5 by 6.5 cm., has a similar nose. The faces on these plugs resemble features on nineteenth-century masks from the village of Point Hope in northwest Alaska (VanStone, 1968-1969, p. 837, pl. 6,a-b). The remaining plugs have wholly human features. One of these has ivory eyes with wooden insets (pl. 4b) and on another the eyes are of blue glass beads and the hair is painted black (pl. 4h). The fifth, 10 by 8 cm., is crudely carved, the eyes and nose being indicated by narrow slits. A small wooden float with human features was collected by Nordenskiöld (1881, vol. 2, p. 241) at Port Clarence in 1879.

The collection contains a single ivory *float mouthpiece* with a wooden stopper (pl. 4e), and an ivory *float toggle*. The latter has a stylized seal's head at one end with round wooden insets for eyes and nose (pl. 4o).

There are nine *detachable lance heads* in the collection, all of which are approximately the size of the illustrated specimens (pl. 4f-g, m-n). Four have thin metal blades, three have blades of chipped blue chert, and two have ground slate blades. The metal blades are triangular in shape while the chert and slate blades have broad, rectangular tangs. The blades of four specimens are lashed to their shafts with narrow strips of baleen; sinew is the lashing material for the remaining five. Nelson (1899, pp. 145-146, pl. LVb, 5-6) describes and illustrates similar heads used on Nunivak Island and in the Yukon-Kuskokwim delta. He was of the opinion that stone heads persisted because the Eskimo belief system prohibited the use of metal in cutting up sea mammals.

Ten specimens are identified as *lance blades*, five of which are made of chert and five of ground schist or serpentine. All are much larger than the blades attached to the previously described lance heads and some may be knife blades. The chert specimens are all very similar and of approximately the same size. They are broad and have wide tangs that are either flat or rounded (pl. 4i-k). Of the five slate blades, only one is complete. It is flat on both sides with beveled edges and has a short, square tang (pl. 4c). Another specimen is long, thin, and six-sided in cross-section with a slightly tapered tang broken at the end (pl. 4l). The remaining three slate blades are tip fragments, all of which are flat with beveled edges.

Skillful wood carving is a notable characteristic of three *boxes for lance or harpoon blades*, all of which are illustrated. Two boxes are in the shape of whales and have close-fitting triangular covers on their undersides. Both have holes drilled through the top, perhaps for attachment with a line to the gunwale of an umiak. The larger of these boxes (pl. 5a) is the most skillfully carved and originally had inset eyes, probably blue beads. The smaller box (pl. 5b) had a series of larger insets on the upper surface, all of which are now missing. The third box is in the shape of a seal (pl. 5d). It has eyes of inset blue beads, baleen insets for nostrils, and a rectangular cover on the underside. A fourth specimen has been formed in the shape of a whale's head from a hollowed-out section of whale bone. The mouth is indicated by an engraved line and the eyes by small inset pieces of baleen. This box has a flat wooden lid held in place with sealskin thongs (pl. 5c).

Three *seal scratchers* (Nelson, 1899, p. 129) of wood are essentially similar in construction (pl. 6a). The distal end is divided into three parts, to each of which is fastened a seal's claw, held firmly in place by sinew lashing. One specimen is apparently unfinished and has not been fitted with claws. The proximal end of another is carved in the shape of a seal's head with inset eyes of blue beads. This scratcher is somewhat smaller than the illustrated specimen.

A *club* used for killing seals has a rounded wooden handle. A knob of bone, carved in the shape of a polar bear's head and flattened to fit against the side of the handle, is attached by sinew lashing passing through three holes in the knob and handle (pl. 7b). A somewhat similar club from Cape Espenberg is described and illustrated by Nelson (1899, p. 127, pl. LII, 2).

Seal drags, of which there are three in the collection, consist of a loop of sealskin line with a small ivory toggle handle at one end.

The loop end of the drag is hooked through a hole cut in a dead seal's lower jaw, enabling the hunter to pull the animal from the place where it was killed to his camp or village. All three drags have ivory handles in the shape of seals. The most skillfully carved has inset baleen eyes and nostrils, engraved flippers, and engraved lines covering the back (pl. 6b).

Two sets of four wedge-shaped wooden *plugs*, flattened-oval in cross-section, were used to keep seals inflated after they were killed (Nelson, 1899, p. 131, pl. LII, 19). In spring, when seals are thin and likely to sink after being harpooned, the hunter blew air into holes made in the skin to inflate the animals in several places. Wooden plugs were then inserted in these holes to keep the air from escaping and the seals could then be towed easily behind a kayak. Each set of four plugs is fastened to a larger wedge-shaped section of wood carved at one end to represent the head of a seal. Both heads have glass beads inset as eyes and on one the seal's whiskers are represented by fragments of seal hair (pl. 6g). In addition to the sets of plugs just described, there are two much larger single plugs. One of these is also carved to form a seal's head with inset eyes of blue beads and seal hair whiskers (pl. 6e).

A probe to loosen seal blubber from the skin, thus making it possible to inflate the dead animal as noted above, consists of a long (25 cm.), curved section of antler, round in cross-section and pointed at the tip. It is set into a wooden handle and held in place with sealskin lashing. An almost identical specimen from Sledge Island is described and illustrated by Nelson (1899, p. 131, pl. LII, 13).

Alaskan Eskimos made excellent sinew-backed *bows* and there are three in the Bruce collection. Two, of approximately the same length, are of the single-curve type and have two flattened cables of braided sinew along the back. On one specimen, which lacks a string, the backing is held in position by a continuous cross-lashing of sinew which extends along the entire length to within about 12 cm. of the ends. The backing on the second specimen is held in place by numerous cross-lashings at short intervals along the length of the shaft. The string is a single length of sinew (pl. 8a). The third bow has a sinew string and double cables of braided sinew along the back. There is a double-curve about 28 cm. from each end of the shaft, into which are fitted triangular blocks of

wood as reinforcement. These blocks are lashed to the shaft with sinew, some strands of which also serve as cross-lashing to hold the backing in place (pl. 8b).

Associated with the bows is a single *bow case and quiver* of seal-skin which consists of two compartments. The larger for the bow has a slit opening at one end. The smaller, which is also open at one end, is for arrows. There are two sealskin carrying straps. With the advent of firearms, the bow quickly became obsolete. Whymper (1869, p. 169) reported that in 1867 at Port Clarence many Eskimos had flintlock and percussion weapons and that bows were not widely used.

Four *arrows* with spruce shafts were presumably used for hunting large game or possibly for war. Three have thin antler heads which fit into round holes at the distal end of a wooden shaft and are held in place with sinew lashing. Two heads have thin notches along one edge (pl. 9d), and the third a series of pronounced barbs in the same position. The fourth arrow has a slate blade which fits into a slit in the shaft and is lashed with sinew (pl. 9g). At the proximal end of all four of these arrows are three feathers with one side of the plume removed and the butt pointing toward the tip. These feathers, which are in poor condition, are lashed to the shaft at either end with sinew.

Bird arrows with blunt heads of various design are four in number. The heads of two specimens are of bone and two are of antler. One is knob-like and fits over the end of the shaft (pl. 9a); two are notched around the edges and have split tangs (pl. 9b). The head of the fourth specimen is slightly curved and terminates in three pronounced notches (pl. 9c). It fits over the end of the shaft and is held in place with small wooden pegs on opposite sides. All four arrows have two feathers. Their butts, which point toward the distal ends of the arrows, are inserted in little slits in the shafts. The tips are lashed in place with sinew. Sections of the shafts of two arrows are painted black.

In addition to the complete bird and large game arrows just described, there are six spruce *arrow shafts* with heads missing and a single antler *arrowhead*. The latter has a sharp shoulder, plain conical tang, and three barbs along one side near the tip. The shafts are all feathered in a manner similar to that described above.

Bird spears in the Bruce collection are of two basic types. The first consists of a wooden shaft approximately 150 cm. long with a

single, long point of bone or antler barbed on one or both sides. Set in the shaft at about one-third to one-half the distance from the butt are three prongs which are lashed in position with their barbed points extending outward to form a triangle (pl. 3e). These spears, of which there are four in the collection, were thrown with the aid of a throwing board.

The second type of bird spear is of approximately the same length and has three long, rounded, tapering points, barbed along the inner side and set in the form of a triangle around the distal end of the shaft. Sinew lashing secures them to each other and to a central knob on the end of the shaft (pl. 3b). There are three spears of this type, all with antler points. In addition to the complete spears of both types, there are three *bird spear points* that were associated with specimens of type 1; two of ivory and one of bone (pl. 7g-h). Also two prongs, one of bone and one of ivory, of the kind associated with type 2 spears, and two ivory side prongs for spears of the first type.

The collection contains two sets of *bird snares* which consist of a strip of baleen approximately 1 m. in length and with a sealskin cord fastened to each end by means of which the snares could be attached to stakes. They resemble specimens described and illustrated by Nelson (1899, p. 134, pl. LI, 1) as having been used for catching ducks and other wildfowl near the grassy borders of lakes. Small nooses are spliced at intervals along the baleen strip and the snares were set just above the surface of the water so that the nooses floated on the surface among the grass and weeds.

There are 42 *marmot snares* of the noose type described and illustrated by Nelson (1899, p. 124, pl. LI, 4). The noose, made of baleen, passes through a small wooden or bird bone cylinder. At one end of the cylinder a small block of wood is tied crosswise. This type of snare was fastened to the end of a bent willow or alder stick and hung over a marmot's runway. The cross stick serves as trigger and the animal is caught when the bent stick springs upright.

Three sinew *nets* were used for catching ptarmigan in spring when the male birds attack others suspected of invading their territory. These nets, which were used with a stuffed bird decoy, consist of sinew netting with wooden spreaders at either end so that the net can be set upright. Larger nets are supported by a number of slender sticks placed at intervals. One specimen has a net of extremely fine mesh and a spreader at each end (pl. 6d), while the

other two have larger meshes and five and eight spreaders, respectively. Similar nets are described and illustrated by Nelson (1899, p. 132, pl. LI, 9).

Two *bolas*, one with eight bone balls and the other with six, were used for killing birds. The balls are attached to braided sinew cords approximately 60 cm. in length. On one specimen, these cords are bound together at the proximal end with a tassel of grass (pl. 6c). A bunch of feather quills serves a similar purpose on the other.

Sea gulls were taken with *gull hooks*, pieces of bone sharpened at each end with a groove in the center to which is attached a length of sinew (pl. 6f). There are five of these hooks in the collection. Such a hook was inserted into the throat of a dead fish which would then be swallowed by a gull, the sinew line being held by the hunter or fastened to an anchor. When the gull attempted to fly away with the fish, the hook turned in its throat, effectively holding the bird.

One of the most ingenious *spring traps* devised by Eskimos involves the tension of twisted sinew cords to throw a lever, thus driving a sharp point into the head of the animal that sprang it. There are two of these traps, a type described and illustrated by Nelson (1899, pp. 122-123, fig. 34), in the Bruce collection. The smaller, made entirely of wood except for an ivory catch to hold the crosspiece and a spike of the same material, is probably a model (pl. 7a). The larger, about half again the size of the illustrated specimen, has an ivory crosspiece and catch but the cylinder containing the sinew is of wood. This spring trap is probably not a model and was used, as were those described by Nelson, to kill foxes and wolves.

Two *ice staffs* have long wooden shafts with points of ivory at the distal ends into which short nails have been inserted. The ivory points are lashed to the shafts with sealskin thongs. Around these points are fastened hoops made of baleen on one specimen and antler on the other. They are suspended horizontally by means of a netting of sinew (pl. 3d). These staffs were used by hunters to test the ice and to distribute their weight when walking over places that would not otherwise support them. A similar specimen from Cape Nome is described and illustrated by Nelson (1899, p. 215, fig. 67).

Two pairs of wooden *snow goggles* to protect the eyes of the wearer from the glare of sun on the snow have short visors ex-

tending across their entire length with a narrow slit directly beneath. On the reverse there is a central notch to fit over the nose. A narrow strip of sealskin fitted around the head of the wearer (pl. 7f).

Four *bullet molds*, three of schist and one of a more coarse-grained, dark stone, consist of two halves, each of which has been hollowed out on one surface in the form of half of a small musket ball. The three schist molds are rectangular and may originally have been fitted into wooden blocks. Their halves were held together with wooden or metal pegs (pl. 7d). The fourth specimen is more irregularly shaped but the two halves were also held together with pegs. On each specimen there is a conical hole at the top through which lead could be poured into the mold.

There are six *powder flasks* in the collection, five made primarily of wood and a sixth of antler. Of the wood specimens, one has a wooden plug stopper (pl. 10g), one a wood stopper fitted with a measure made from a rifle cartridge (pl. 10a), one a similar stopper together with a small ivory funnel attached to it by a string (pl. 10c), one a stopper and measure made entirely from a single 44 cal. center-fire cartridge (pl. 10e), and the fifth a combination stopper and measure of ivory (pl. 10b). Three flasks are decorated with incised lines and one with rows of incised figures in the old engraving style (Ray, 1969, pp. 14-15) similar to those which are frequently found on ivory drill bows (pl. 10g). The antler flask is fitted with a bottom piece of the same material and has a sealskin neck and spout; the stopper is missing (pl. 7c). To indicate skill of workmanship and variety of sizes and shapes, all specimens are illustrated.

A crudely made *reloading tool* consists of two pieces of ivory held together with a strand of heavy wire. One section has a round hole to receive the cartridge case. Opposite this hole in the other section is a tamper made from a thick nail (pl. 7e).

FISHING

Large mesh *gill nets for salmon* are represented in the collection by four specimens, only one of which is complete. All are made of strips of walrus hide and the complete specimen, strung with wooden floats and unworked stone sinkers, is approximately 7 m. long. Nets of this type were generally set out perpendicularly from shore and could be checked from a boat or hauled in hand-over-hand and then reset.

Three nets of smaller mesh are made of sinew cord and, although incomplete, apparently were considerably longer than the salmon nets. They may be *herring seines* or were perhaps used to catch whitefish. None have floats or sinkers. Two net fragments no more than 1 m. in length have the same size mesh as those just described, but are made of strips of walrus hide.

The collection contains four *net shuttles*, two of wood and two of antler. The two wooden specimens have wedge-shaped notches at each end and are grooved their entire length on each side (pl. 11f; 12g). The larger of the antler shuttles is similar in design. Cracks at the inner end of each notch have been repaired with sinew lashing (pl. 12f). These three shuttles were presumably used in the manufacture of large gauge nets. The fourth shuttle is much smaller and contains some fine, twisted cord, possibly made of willow or spruce bark (pl. 12e).

Used together with shuttles in the manufacture of nets are *mesh gauges*, of which there are six in the collection. A long-bladed gauge of ivory has spurred line, engraved decoration along the back, and a notched handle (pl. 10h). The remaining five gauges, four of antler and one of ivory, are much smaller and were used in the construction of small mesh nets; all are illustrated (pl. 10d; 12c; 11b,d,e). One of these has the handle wrapped with spruce root and lashed with sinew to make it large enough to afford a convenient grip for the hand. The blade of this specimen is wrapped with a strip of sealskin line (pl. 11e).

Two virtually identical *fish spears* have long wooden shafts and are three-pronged at the distal end. The two ivory side prongs are barbed along the upper half of the inner side and their distal ends fit into notches in the shaft to which they are lashed with a strip of baleen. The center prong, notched on both sides and also made of ivory, fits into a narrow slot at the end of the shaft and is fastened with a strip of sinew. Sinew lashing also connects the three prongs about 6 cm. from their tips (pl. 3a). Such spears were generally used in the fall through holes in the ice of lakes for whitefish and pickerel.

Three arrows are identified as *fish arrows* on the basis of their resemblance to similar specimens described and illustrated by Nelson (1899, pp. 160-161, fig. 44). One arrow has two barbs of unequal length, notched along their outer edges, set into opposite grooves in the shaft and lashed with sinew (pl. 9e). A second spec-

imen is similar except that the barbs are of approximately the same length, have greater flare at their distal ends, and are notched on the inner edges (pl. 9f). The third arrow is also similar but has three barbs rather than two. All three arrows have, or had, three feathers, the ends of which are secured to the shaft with sinew lashing.

Objects in the collection associated with hook-and-line fishing are not numerous. There are three *tomcod rods*, two of which are complete. One has a round wooden shaft approximately 50 cm. in length terminating in an antler tip or guide with a square hole through which passes a length of baleen line. This tip is similar to one from Sledge Island illustrated by Nelson (1899, pl. LXVII, 12). The second rod, made entirely of wood, has a round hole and narrow slot at one end and a slot at the other so that the line can be wound around the rod when not in use (pl. 9h). The third rod is longer than the two just described but is so fragmentary that nothing additional can be noted concerning its form. Three antler specimens are identified as *tips for tomcod rods*. One has a rectangular hole in the center (pl. 11c) and the other two are notched at one end and have narrow, thin tangs (pl. 10f).

Fishing with hook and line is also represented by a coil of heavy walrus hide *line* to which is attached a large sinker of schist (pl. 11a). The sinker has been broken and repaired with baleen lashing. On two sides, a little below the middle, are holes through which passed baleen leaders now missing. Small hooks were attached to the leaders. A large oval *sinker* of serpentine has holes at either end for line attachment (pl. 12b). Another, of fossil ivory, is fish-shaped with similar holes and inset ivory eyes with pupils of baleen. A bone *lure-hook shank*, possibly used for large whitefish or pickerel, has two line holes at the narrow tip of the shank and holes for a pair of hooks at the distal end (pl. 12d).

A model wicker *salmon trap* (pl. 12a) is incomplete, lacking the funnel-shaped inset at the mouth. In construction it is similar to one from the lower Yukon illustrated by Nelson (1899, pl. LXX, 14). Associated with this trap are six badly broken sections of willow fencing. It is probable that when in position they indicated how such a fence led from the mouth of the trap to the banks of the stream or slough.

In the collection there are two *ice scoops* for removing freshly formed ice from holes cut for fishing. The rims of the scoops consist of bands of antler bent into a circle with their overlapping ends

pierced and bound together with sealskin lashing. The upper edges of both rims have long, rounded points in front. Along the lower edges are pairs of holes through which pass the sinew that forms the netting across the bottom. Both scoops are lashed to oval wooden handles (pl. 1d). The illustrated specimen is the shorter of the two by about 15 cm.

TOOLS AND MANUFACTURES

Adzes in the Port Clarence collection consist of two types; those which have the blade attached directly to the handle, and those with the blade inserted into a head which is fastened to the handle. There are seven specimens in the former category. Four have stone blades (two made of jade and two of serpentine) of varying sizes with sealskin lashing to wooden handles (pls. 13a,c; 14b,d). The blade of one of these (pl. 14b) is extremely narrow with the working edge parallel to the handle. Nevertheless, it was probably used as an adze rather than an axe, possibly with a sideways movement of the wrist while working the vertical surfaces of wooden objects. In addition to the complete specimens of type 1, there is a single wooden handle for this type of adze. Jade comes from only one place in western Alaska, near the village of Shungnak on the Kobuk River, but it was traded extensively. It is a difficult material to work.

Two type 1 adzes with stone blades of chert have handles which make use of a natural bend in the wood. The blades are lashed with sealskin thongs to prepared surfaces of the handles (pl. 13c). A single specimen has an iron blade fastened with sealskin thongs to a carefully worked wooden handle. The handle is reinforced on the underside with a triangular shaped piece of ivory secured to the wood with ivory pegs (pl. 13d). The initials "PR" are stamped on the inner surface of the blade.

Three type 2 adzes have wooden heads and one has a head made of antler. Those with wooden heads are all similar, the head being lashed to the handle through a hole and the blade to the head on a flattened surface. All blades are made of jade (pl. 13b). The specimen with an antler head has a small jade blade fitted into a slot at the distal end. The proximal end of the head is flattened for lashing to the wooden handle (pl. 14e).

The single *maul* consists of a large, naturally rounded volcanic pebble fastened with sealskin thongs to a short wooden handle (pl. 14c).

Two implements consisting of sections of large iron spikes hafted with sealskin thongs to wooden handles are identified as *hammers*. Both show signs of considerable use (pl. 16e-f).

A small *root pick* with a wooden handle has a thin pick of jade, round in cross-section and pointed at the distal end (pl. 14a). The pick is lashed to the handle with sealskin thongs. According to Nelson (1899, p. 75), such picks were used by women to dig edible roots of a species of grass which grows on the tundra from the Kuskokwim River north to Bering Strait.

There are three complete *end-bladed knives*. One has a wooden handle and chipped blade of chert which fits into a slot at the distal end of the handle and is lashed with caribou skin thongs (pl. 15j). A second knife, apparently made in imitation of a piece of European cutlery, is made entirely of fine-grained slate (pl. 15k). The third is constructed from a single piece of ivory (pl. 15i). It has simple incised line decoration and may have been intended as a letter opener for the souvenir trade.

With one exception, the six *end-bladed knife blades* in the Bruce collection are made of fine-grained schist. The exception is a jade blade sharpened along one side only and narrowed at the proximal end for hafting (pl. 15c). The remaining five blades, only three of which are complete or nearly so, are diamond shaped in cross-section with square tangs (pl. 15h,l). Some of these could have functioned as spear or lance blades.

The collection contains two *crooked knives*, one with a wood and the other an antler handle. The blade of the former is riveted to the handle and also lashed with a piece of cloth (pl. 15a). Root lashing has been used to fasten the blade of the second knife to its handle (pl. 15b).

Another type of *side-bladed knife* has a carefully worked wooden handle into which a jade blade has been inserted (pl. 15g). This blade has been worked on one side only and the implement may have been used as a scraping as well as a cutting tool.

Eight *ulus*, or women's knives, are all essentially the same; a broad wooden handle fits directly over the proximal end of a semi-lunar shale blade. The illustrated specimens indicate the range in size (pl. 15m-n; 16h,k). There are also three *ulu blades*, only one of which is complete. Two are of shale including the complete specimen which has a pronounced rectangular tang (pl. 16j). The third specimen is of copper and is flat across the top (pl. 16g). The identi-

fication of this object is doubtful; it may have been used unhafted as a skin scraper.

The five *whetstones* are made from a relatively hard material, probably a very fine-grained schist. Two rectangular specimens are well shaped (pl. 15f), while the remaining three are little more than natural stones with two flat surfaces showing varying degrees of use (pl. 15d-e). There are traces of red ochre on one of these (pl. 15d).

Two bone implements with spatulate-shaped working ends have been identified as *chisels* on the basis of descriptions and illustrations in Nelson (1899, pp. 86-87, pl. XXXVIII, 12-15). One is made from the ulna of a canid (pl. 16c), most likely a dog, and the other from a moose metapodial (pl. 16d). According to Nelson, such implements were used for making incised grooves in wood preparatory to splitting.

Another wood-working implement is an *engraving tool* which consists of a beaver tooth set in the end of a short wooden handle and fastened with sinew (pl. 16a). According to Nelson (1899, p. 89), such implements were also used for sharpening steel and iron knives.

A metal-pointed *awl or bodkin* has a handle of polished, black material that may be horn. Such implements were used to make holes for stitches (pl. 16b). Nelson (1899, p. 106) notes that at the time his collections were made, many, although not all, bodkins were pointed with metal.

A small *saw* for working ivory appears to resemble European cross-cut implements of the same type. The toothless blade is fastened to a wooden frame, across the middle of which is a wooden crosspiece dove-tailed into the frame. A double strand of wire is stretched across the frame at the top, with a piece of wood inserted between the strands so that the wire can be twisted, thus tightening the blade of the saw in the frame (pl. 16i). Nelson (1899, p. 80, pl. XXXVI, 10) describes and illustrates a similar saw from Cape Prince of Wales.

Implements associated with the typical Eskimo bow drill are well represented in the Port Clarence collection. There are six wooden *drill mouthpieces*, all of which have stone insets (schist or a fine grained porphyritic material) with holes to receive the proximal ends of the shanks (pl. 17b,c). Two specimens, one apparently unfinished, are carved at both ends to represent animal heads (pl. 17b).

There are ten *drill shanks* which vary in length from 12-43 cm. Most specimens, however, are similar in size to those illustrated (pl. 17f-i). All have metal drills made from nails flattened at the point inserted into holes drilled in the distal ends of the shafts. One shank has an antler reinforcement piece fitted over the distal end and fastened with pegs of the same material (pl. 17h).

The five *drill bows* are all quite distinctive. Two are of wood, one with notches at either end for the bow string, and the other with holes for the attachment of the string (pl. 17k). There are also two bone bows, one made from a caribou rib (pl. 17e) and an ivory specimen with engraved line decoration (pl. 17d). The latter two have strings made from strips of sealskin.

A *fire drill* of the pump type has two crosspieces fastened at right angles to a round wooden shank, the bottom crosspiece being fixed in place and the top one moveable (pl. 18e). A piece of twisted sinew is attached at either end of the top crosspiece and to the proximal end of the shank. The latter is held in the hand and rotated by moving the top crosspiece in a rapid up-and-down motion. This type of fire drill apparently does not occur in previously published collections of Alaskan Eskimo material culture. Also associated with fire making is a wooden *drill bearing*. It has four holes along the sides where a drill has been used (pl. 17j).

Skin scrapers, of which there are eight in the Port Clarence collection, can be divided into four types. The two specimens belonging to type 1 have carefully shaped handles with deep grooves for the thumb and finger. One is made of ivory and has a chert blade wedged into a slot in the handle. A small piece of cloth has been used to hold the blade in place (pl. 18h). The second specimen is of wood and the blade, probably a circular piece of metal fitted over a rounded section of the handle, is missing. The single type 2 scraper consists of a chisel-shaped slate blade lashed with sealskin to the prepared surface of a wooden handle with a natural curve to facilitate grasping (pl. 17a).

The four scrapers belonging to type 3 are circular in shape. Two consist of rectangular strips of antler sharply bent with their opposite ends lashed with sealskin; one side has been sharpened to form a working edge (pl. 18i). A similar specimen from Sledge Island has been described and illustrated by Nelson (1899, p. 115, pl. L, 7). The other two specimens are circular sections of ivory similarly sharpened along one side (pl. 18f-g). On one of these, which shows

considerable wear, there are simple parallel engraved lines and spurs (pl. 18f). These scrapers were used for the preliminary removal of fat from animal skins.

The identification of two antler specimens as type 4 scrapers is based on their superficial resemblance to specimens illustrated by Nelson (1899, pl. L, 5-6, 13). Two sections of antler have short, deep, v-shaped grooves at the distal ends (pl. 32l); one specimen has a suspension hole. If these are scrapers, they may have been used on bird or small mammal skins. The remaining scraper belongs to type 5 and is quite different from the others. It is a flat, spatulate section of bone rounded at the proximal end and tapering to a blunt, pointed working edge (pl. 18c).

HOUSEHOLD EQUIPMENT

There are a pair of two-piece *buckets* in the Port Clarence collection made from broad, flat pieces of spruce; one specimen is round and the other oval in shape. Their sides have overlapping ends fastened together by sewing thin strips of spruce root through small, slit-like holes made for the purpose. The bottom of each bucket has a chamfered edge to fit into a groove around the inner edge of the side. The round specimen is 24.5 cm. in diameter and 17 cm. deep, while the oval bucket is 36 cm. by 28.5 cm. and 12.5 cm. deep. According to Nelson (1899, p. 72), buckets or tubs of this type were used for carrying water, seal oil, berries, and other food supplies. Buckets used for carrying water, however, usually have handles and these do not. Oval buckets similar to the specimen just described but smaller are identified by Nelson as urine tubs.

An ivory *bucket handle*, probably for a water bucket, has two whales carved in high relief on the upper side, while on the lower surface figures of five whales are engraved (pl. 18a). The bucket for which this handle was intended may have been used to give a ceremonial drink to whaling captains during the annual spring whale hunt in northern coastal villages like Point Hope (Rainey, 1947, p. 260). The closest whale hunting community to Port Clarence is the village of Wales at the tip of Cape Prince of Wales.

The collection contains 10 *bags* of varying sizes, shapes, and materials. Six specimens are made of a combination of fishskin and sealskin. The largest of these, two clothing bags, are approximately 50 cm. in diameter at the bottom and narrow toward the top. The sides are made of salmon trout skins alternating with strips of tanned sealskin. The bottoms are pieces of untanned seal-

skin with the hair side in. There is a strip of caribou fawn skin around the top of one and tanned sealskin in a similar position on the other (pl. 19Aa). Such bags, being waterproof, were ideal for transporting clothes and other possessions in umiaks. A fragmentary, much smaller bag is also constructed of alternating strips of fishskin and sealskin. The remaining two bags of this type are smaller but essentially the same in construction (pl. 20a-b). Small fishskin bags were collected by H.M.W. Edmonds in the St. Michael area about 1891 (Ray, 1966, p. 122).

Two small bags are constructed of alternate strips of light and dark caribou skin (pl. 20c-d). Both have bottoms of sealskin and strips of the same material around the tops. On the larger of the two, small tufts of muskrat skin have been attached at intervals for decoration. The smaller specimen may be a tobacco bag.

The sides of a well-constructed, large bag, possibly for clothing, are made entirely of rectangular strips of tanned sealskin, while the bottom and strip around the top are of untanned sealskin (pl. 19B).

A small, rectangular grass bag, approximately 22 cm. wide and 15 cm. deep, is made of long, rectangular sections of plaited material sewn to each other at frequent intervals; the bottom is of sealskin. The final bag is pouch-shaped, the front made of strips of tanned sealskin and the rear of dried seal intestine. Designs on the front are cut out of fishskin and stitched on with sinew (pl. 20e).

A type of household item infrequently described in studies of Alaskan Eskimo material culture but relatively common in the Port Clarence collection are skin *pouches* of which there are nine specimens. Such pouches were probably not household equipment in the same sense as most of the objects described in this section, since some were part of the wearing apparel of individuals and intended to contain small personal belongings.

The three largest pouches terminate in sealskin bags with cords and have large decorative flaps of alternate strips of fishskin and tanned sealskin; a strip of sealskin circles the outer rim of these flaps (pl. 19Ab). Pouches similar to these are referred to by Nelson (1899, p. 104) as "housewives" and were intended to contain sewing materials and other articles of women's work. When not in use, a "housewife" is rolled up and fastened with a cord which, on the specimens illustrated by Nelson (1899, pl. XLIV, 14, 15) have slender crosspieces of antler, bone, or ivory affixed to them.

Six small rectangular pouches are constructed of several different kinds of skins. One specimen has alternate strips of hare and ground squirrel skin on both sides (pl. 21a). An elaborate pouch with a sealskin strap has a rectangular design consisting of blue-black birdskin patches, strips of caribou skin with red yarn decoration on the obverse, and sealskin with the fur outside on the reverse; there is a trim of fox skin (pl. 21e). A narrow rectangular pouch has designs consisting entirely of different colors of caribou skin on both sides. There is a beadwork fringe of light blue, dark blue, red, and white beads along the bottom (pl. 21f). A combination of small strips of ground squirrel skin and caribou skin with yarn decoration is characteristic of two small, rectangular pouches. Both have fringes of an undetermined fur (pl. 21b,d). The front of the last pouch is decorated primarily with caribou skin, utilizing the different colors; the reverse is a single piece of the same material (pl. 21c).

There are seven coiled *grass baskets* in the Port Clarence collection. Nelson's (1899, p. 204) description of this method of basket manufacture exactly fits five specimens, one of which is extremely large, being 40 cm. in diameter at the bottom. Its sides round gradually upward to an oval opening. Two similar baskets, much smaller, have straight sides which constrict sharply to form an oval opening (pl. 22c). The sides of a shallow basket are 9 cm. high and constrict only slightly (pl. 22e). The smallest basket in the collection resembles the larger ones except that it has a flat top with a small opening in the center (pl. 22f).

The single oval basket is extremely well made and has a carefully fitted lid with a sealskin loop handle in the center. The bottom coil of this specimen was commenced around an oval open space 7.5 cm. in length into which a piece of tanned sealskin has been sewn (pl. 22a). Baskets like this one may have held sewing equipment. A damaged basket is roughly rectangular in outline with rounded corners, a flat lid, and narrow rectangular pieces of sealskin sewn in both the lid and bottom (pl. 22b).

In addition to the baskets just described, there is a single *grass tray* with outward sloping sides 4 cm. in height (pl. 22d).

The four *birch bark baskets* are similar in size and construction. All are made of a single piece of bark folded at the ends and stitched with spruce root to a split rim of the same material fastened to the inner and outer edges of the bark. About 3 cm. below

the rim, a reinforcing strip of root encircles the baskets; additional small pieces of bark reinforce the outer surfaces on all four sides (pl. 23f). The fourth basket is very similar in construction, but much smaller.

There are two wooden *dippers* which have been made by cutting a strip of spruce and carving one end in the shape of a handle. The other end is thinned to a long, wedge-shaped point. According to Nelson (1899, pp. 65-66), construction of this type of vessel proceeded as follows: the wood is steamed and bent so that the thin edge rests against the strip just inside the base of the handle. After the bending is completed, the piece of spruce is held in position by means of two pairs of sticks which are clamped on opposite sides and tied with spruce rootlets. When the frame is dry, the clamps are removed and holes punched through the overlapping wood. A wooden bottom with chamfered edge is fitted into a groove around the bottom of the sides and the overlapping sides are then stitched with spruce root. Both Port Clarence specimens have rims painted red and one has more elaborate red and black painted lines, inside and out (pl. 23a-b).

A round *dish* is made from two pieces of spruce wood. The bottom is flat with outward sloping sides chamfered to fit in a groove on the inside of the rim. The rim is made from a thick strip of wood, softened by steam, and then bent until the beveled ends overlap (Nelson, 1899, p. 71); these are stitched with spruce root (pl. 23c).

An antler *spoon* has a long, thin handle and spatulate blade. The handle is decorated with incised notches (pl. 18d). The collection also contains a wooden ladle with a deep oval bowl (pl. 18b).

There are two lamps in the Port Clarence collection. A clay specimen is circular in shape and heavily encrusted with oil (pl. 23e). A stone lamp is semi-lunar shaped and also shows extensive indications of use (pl. 23d).

Woven *grass mats* were used on sleeping platforms, to wrap around bedding, and sometimes to partition off a corner of a room (Nelson, 1899, p. 202). There are five mats in the collection and two methods of construction can be noted. The first is described by Nelson (1899, p. 203) as follows:

A set of three or four straws were twisted and the ends turned in, forming a strand, a number of which were arranged side by side with their ends fastened along a stick, forming one end of the mat and hanging down for the warp. Another strand was then used as a woof . . . carried from one side to the other, passing above and below the strands of the warp; then the woof strand

was passed around the outer strand of the warp and turned to repeat the operation. The strands were made continuous by adding straws as necessary, and with each motion the strands were twisted a little so as to keep them firmly together.

Two mats, both in very poor condition, were constructed according to this method. The largest measures approximately 233 by 140 cm. and the other is almost as large. Both closely resemble a mat illustrated by Nelson (1899, pl. LXXIV, 15).

The other mats in the collection are made of braided strands of grass. One rectangular specimen 156 by 86 cm. consists of long, braided strips of varying widths sewed together at intervals. Varying shades of brown grass create geometric designs on this specimen (pl. 24A). A large, nearly square mat approximately 172 by 123 cm. consists of a series of long, two-strand braided pieces of sinew in an under-over weave (pl. 24B). The most unusual specimen appears, both in shape and method of construction, to have been made in imitation of a hooked rug. Such a mat, actually a rug, may have been made at the suggestion of, or for sale to, a Euro-American visitor.

Seven objects are identified as *work or trinket boxes*, most of them probably associated with women's work and personal adornment. Two circular boxes 20 and 27 cm. in length, respectively, have sides of one piece construction and bottoms which fit into grooves on the sides in the same manner as the buckets and dippers previously described. Both have lids which taper toward the top. The larger, which is illustrated, has an ivory handle with an animal head carved at each end (pl. 25b). The smaller box has a large blue bead set in the center of the lid. A small, six-sided box with a flat bottom pegged to the sides and a round hole in the center possibly contained small objects associated with sewing (pl. 25f).

A rectangular box with a tight-fitting lid which can be removed by pulling a piece of attached string has small insets of ivory on all sides. The bottom is fastened with wooden pegs (pl. 25c). The sides of another rectangular box are mortised in place and the bottom fastened with pegs; this box has a flat lid (pl. 25d). A round box has a marten or fox carved on the upper surface and three round ivory insets. The fox is painted in dark red and the rest of the box is black except for red stripes on the tight-fitting cover of the central hole (pl. 25h). The last box of this general type, perhaps a container for sewing equipment, is ovoid in shape and constricted

toward the center. The sides and bottom are one piece and the lid is flat across the top with a small red bead in the center (pl. 25a).

Seven specimens are described as *match boxes*, but it is equally likely that they were made to contain percussion caps for muzzle-loading firearms (Nelson, 1899, p. 164, pl. LXIII, 28-30). All are made of wood, are flattened and rectangular in shape, and have sliding covers. Three are plain (pl. 25i,k), one has engraved designs (pl. 25m), and one has a human face carved on the cover (pl. 25j). In addition to the complete boxes, there is a single cover with a carved human face. Two additional oval boxes have hinged covers, but they may have served the same purpose as those just described (pl. 25e,l).

Two *meat trays* are hollowed-out sections of spruce logs, both approximately 67 by 14 cm. and 5.5 cm. deep. According to a note fastened to one of these trays, they were excavated from an archaeological site about 13 km. from Port Clarence. In this area archaeological sites were frequently looted for objects to sell or trade to the whaling ships.

Needle cases in the collection, three in number, are plain antler tubes with wood bottoms and stoppers. All are approximately the same size and the decorated specimen is illustrated (pl. 25g).

Three objects are identified as *snow beaters* used for beating snow from boots, clothing, and other items made of fur. Two are quite similar in shape but vastly different in size. They are made of curved sections of antler, flattened on one surface and with protruding knobs at the proximal ends with holes to receive wrist straps. The larger specimen, which is illustrated (pl. 26A,b), has a knob in the form of a human head and is similar to a beater from the lower Yukon described and illustrated by Nelson (1899, p. 77, fig. 21, 2); the smaller specimen is 18 cm. in length. A wooden beater has a notched handle and a central ridge on the inner surface (pl. 26A,a).

Two identical wooden *drying frames* consist of parallel sections separated at either end by short, flat connecting pieces (pl. 26A,c). Wet clothing and other household items were hung from these frames suspended above a lamp or open fire.

A *back scratcher* consists of a wooden rod 48 cm. in length with a circular ivory disk 3.5 cm. in diameter fitted on one end. The outer surface of the disk is decorated with a circle of short engraved lines with spurs. Nelson (1899, p. 310, fig. 98) illustrates a similar im-

plement from Sledge Island. He observed "men using long handled scratchers to relieve irritation caused by eruptions on the skin or by parasites."

CLOTHING

It is regrettable that the clothing originally in the Port Clarence collection has been seriously depleted through the years so that it now includes virtually no examples of men's or women's outer garments. Much of this material was sold to private individuals about 1900, not long after the collection was acquired by Field Museum. As a result of this depletion, the bulk of the clothing items available for study consists of mittens and boots with only a few additional garments represented. As Nelson (1899, p. 31) has noted, however, garments worn by both men and women from Point Barrow to the mouth of the Yukon were practically identical in pattern. Thus his extensive collection of clothing from western Alaska can be consulted with reference to the wide range of garments missing from the Port Clarence collection.

Nelson (1899, p. 31) indicated that the skins of domesticated reindeer were used extensively in the manufacture of winter garments throughout coastal western and northwestern Alaska. Most of these skins were obtained from the Chukchi of northeastern Siberia through an elaborate trade network that was flourishing at the time the Russians established a trading post at the present town of St. Michael in 1833 (Zagoskin, 1967, pp. 100-101). It is doubtful whether many items of clothing in this collection were made from the skins of reindeer introduced into western Alaska in 1892 at Port Clarence. At the time Miner Bruce made the collection, hides of Alaskan deer were not generally available to Eskimos of the region.

The Eskimos of Norton Sound and Seward Peninsula also hunted caribou which were plentiful inland from the coast in the late nineteenth century, but were depleted shortly thereafter, a result, in part, of the introduction of breech-loading firearms. Some of the garments in the Port Clarence collection, therefore, may be made of caribou skin rather than the hides of domestic reindeer.

The collection contains two *hats*, one made from the skin of a wolf's head. The nose of the animal rests directly over the brow and there is a strip of sealskin sewn to the lower border to which thongs are attached at the corners for tying under the wearer's chin (pl. 27A,b). In addition to these two hats, there is a skinned

head of a wolf presumably for use in making a finished hat similar to the one described above.

The only man's *coat* remaining in the collection is made entirely of undecorated reindeer hide and is not a typical Eskimo garment of this type. The coat is of simple four-piece construction, the front and back being two separate pieces, as is each sleeve. There is no hood and no cuffs or borders. A card attached to the garment indicates that it is from Siberia, and it may have belonged to Bruce or one of his co-workers.

Three waterproof *raincoats* are made from the intestines of seals sewn in horizontal strips. All have drawstrings around the borders of the hoods, but not at the wrists. Two specimens are plain, but the seams of the third have been decorated by sewing in small strips of red and blue yarn. As Nelson (1899, p. 37) points out, these garments were worn during wet weather on shore and also by hunters at sea in kayaks where the lower border of the garment was frequently tied around the manhole of the vessel to prevent the shipping of water in rough weather.

A type of garment not mentioned by Nelson is a single pair of short reindeer skin *trousers*, the legs of which reach only to the knees; the waist is low in front and higher behind. These pants were presumably held in place by a thong looped around the waist. The pattern consists of two pieces in each leg, a separate crotch piece, and a horizontal strip around the back. The front is decorated with parallel strips of trimmed light and dark reindeer skin with tiny cuttings of red yarn sewn into the seams (pl. 28A,c). Knee breeches from Point Barrow are described and illustrated by Murdoch (1892, p. 125, fig. 69).

There are four women's *belts* in the collection, three of which are decorated with the incisors of reindeer or caribou. They are obtained by cutting off the tip of the lower jaw leaving sufficient bone to retain the teeth in their natural position. On two specimens, the teeth are sewn in single rows along strips of sealskin (pl. 28B,b). The third has three narrow rows of teeth sewn on a strip of commercially prepared leather (pl. 28B,a). These belts were held in place by ivory toggles which are present on two specimens. Nelson (1899, p. 59, pl. CVI, 3) describes and illustrates belts of this type as being worn from the lower Kuskokwim to the arctic coast. A fourth specimen, also identified as a belt, is apparently unfinished and made from alternate squares of light and dark trimmed reindeer hide. There are thongs for fastening but no backing (pl.

28B,c). Rather than a belt, it may be a decorated border that was intended for sewing to the lower edge of a man's or woman's coat.

Sealskin *mittens*, of which there are 15½ pairs, are constructed in three ways: with the hair on the inside, on the outside, and of tanned sealskin with the hair removed. There are 3½ pairs of mittens with the hair in. These are of simple two-piece construction and are turned up at the wrist so that a strip of hair is showing (pl. 29d). There is only one mitten with the hair outside (pl. 29c).

The largest number of sealskin mittens, 11½ pairs, are made of hairless tanned sealskin, usually with a piece of bleached skin around the wrist (pl. 29b). Two pairs are of the gauntlet type which flare at the proximal end and reach to the elbows. Mittens of tanned sealskin are waterproof and all specimens are made in simple, two-piece pattern.

There are also 3½ pairs of sealskin *gloves* made of tanned skin with the hair inside. All are of similar pattern, each finger and the thumb being a separate piece sewed on the hand. Two pairs and a single glove have strips of trimmed reindeer skin with red yarn decoration around the wrist (pl. 29f). A third pair resembles gloves from King Island described and illustrated by Nelson (1899, pp. 38-39, pl. XX, 7). The fingers and the hand are of one piece with three triangular pieces of skin of a lighter color extending down the back between the fingers (pl. 29a).

Five pairs of mittens are made of reindeer hide, two with the hair inside and three with it outside (pl. 29e). These are fashioned according to the same pattern as those described above as are two fragmentary pairs with reindeer skin linings covered with ground squirrel skin.

A single pair of tanned sealskin *dance mittens* reach to the armpit and have holes cut for the fingers and thumb. Each mitten is hung with numerous puffin beaks which rattle as the dancer moves his arms. A loop of reindeer skin held the mitten against the arm and strips of the same material were tied over the shoulder (pl. 28A,b). Neither Nelson (1899) nor Murdoch (1892) illustrate mittens of this type, but a pair, now in the U.S. National Museum, was collected at Nushagak on Bristol Bay in the 1880's (VanStone, 1972, p. 40), and I have seen them in use at Point Hope and other locations along the arctic coast.

There is a single pair of reindeer skin *socks* with the hair outside to be worn inside boots in winter (pl. 30A,b).

Sealskin *winter boots* in the collection have soles made of tanned bearded sealskin crimped about the heel and toe. Their upper sections reach to just below the knee. Five pairs have the hair outside and three of these, including one child's pair, are plain with a band of tanned sealskin around the top. The other two pairs are ornamented; one has geometrical designs in light and dark tanned sealskin (pl. 30B,b) and the other is decorated with a band of red cloth around the top and attached strips of muskrat fur (pl. 28A,a). The two pairs of boots with the hair inside, one pair for an infant, are plain with no borders. All these boots are of three-piece construction; the leg or upper, the sole, and a triangular piece covering the front of the foot and the instep.

More numerous in the collection are winter boots of reindeer skin of which there are 11 pairs plus two unmatched boots—8½ adult and 3½ child's; all have the hair on the outside. The feet and ankles are made of short summer hair, while the legs are either plain or made in some pattern formed by combining pieces of white hair from the animal's belly with brown hair from the legs of winter deer (Nelson, 1899, p. 40). Yarn and cloth were also utilized as decoration. Representative samples of these boots are illustrated (pls. 26B,a-b; 30B,a). In addition to the complete specimens, the collection contains a single pair of reindeer skin *boot uppers*.

Summer boots are made entirely of tanned sealskin with the hair removed, often decorated by the use of strips of pieces of dark and light shades of brown. There are 3½ pairs in the collection, one pair of which is for an infant and labeled as being from Point Hope (pl. 30A,c). The adult summer boots are low, reaching just above the ankle (pl. 30A,d).

Rain boots are knee length and made entirely of dark tanned sealskin with the hair removed. The straps and border around the top are of light tanned sealskin. There are five pairs of these rain boots, two of which are for young children (pl. 30A,a). In addition, there are three pairs of *waist-high rain boots* of tanned sealskin which are simply waterproof pants with the boot attached.

A single pair of *slippers* are made of tanned sealskin. There are small loops at the heels and a piece across the top of the foot has the hair outside.

In addition to the garments just described, the collection contains three ivory *buttons* carved in the shape of sea mammal heads. The eyes and ears are inset pieces of baleen (pl. 32e).

TRANSPORTATION

The number of specimens associated with transportation, never numerous, has been depleted through the years, particularly large items such as kayaks and sledges. Models of kayaks and umiaks are also missing, having deteriorated and been discarded years ago. The remaining objects in this category give a very poor idea of the extensive number of artifacts associated with Eskimo transportation in western Alaska. The reader is referred to Nelson's more extensive discussion of this subject (1899, pp. 205-228).

A single *harpoon line holder*, oval with a flat surface, fitted directly in front of the manhole on the decking of a kayak. The harpoon line was coiled in this holder in such a manner that it could pay out smoothly when the weapon was thrown. Nelson (1899, pl. LVIII) illustrates a hunter seated in a kayak equipped with a line holder and about to throw a bird spear with the aid of a throwing board.

Also fastened to the decking of kayaks were *harpoon or spear rests*, one example of which, made of ivory, is in the collection. Such rests were designed to prevent spears, or possibly paddles, from falling off the sloping deck of a kayak and were fastened upright to the gunwale on each side. This specimen is curved over at the upper end and is pierced with a narrow, oblong hole through the tip. The lower surface is heavily scored with grooves to give it a firmer hold against the surface of the skin covering (pl. 32,g).

In the Bering Strait area where whaling is practiced, *spear guards* in the form of ivory or bone forks were lashed to the bows of umiaks to receive the ends of spears or lances; the harpoon line passed through the guard when an animal was struck. The single specimen in the Port Clarence collection is constructed of three pieces of ivory mortised together and fastened with ivory pegs. The projecting ends are carved in the form of animal heads, possibly polar bear heads (pl. 31,b). Two very similar spear guards are described and illustrated by Nelson (1899, p. 226, pl. LXXVIII, 33, 37).

There are two double-bladed *kayak paddles* in the collection, both approximately 225 cm. in length and ornamented in red and black paint. The blades, which are narrow and short, are flat on one side and have a steep ridge running down the other. They resemble a paddle from King Island described and illustrated by Nelson (1899, p. 224, fig. 71b).

A single *boat hook* of antler has incised line decoration and is grooved for lashing to a wooden pole (pl. 33c). Such hooks were useful to hunters in kayaks during landings on the ice or rocky shores.

There are 16 individual *dog harnesses* in the collection, eight of which are made of tanned sealskin with the hair removed, and the remaining eight of untanned sealskin. Those fashioned of untanned skin are folded double with the hair outside. All these harnesses are similar in construction to those described by Nelson (1899, p. 209). Although some originally in the collection are missing and others lack numbers, they appear to have been collected in sets of three. Most of these harnesses lack swivels or hooks, but there are wood or ivory toggles on four specimens. In addition, there is a single ivory *block or fastener* with holes passing through it in two directions (pl. 32f). It was used to connect two sections of a harness.

Also associated with dog traction, in addition to the harnesses and fastener, is a single *dog muzzle* made of tanned sealskin (pl. 31c) and a *whip* which has a wooden handle wrapped with strips of sealskin. At the upper end of the handle is a round ivory ferule. The thick lash is made from a piece of walrus hide that apparently had been part of an old dog harness (pl. 31a).

Three sets of *snowshoes* are constructed of two pieces of wood spliced in front where they curve upward and are held together by two crossbars toward the center, before and behind the foot rest. The netting in front of the first crossbar and behind the second is finely woven, while the foot rest is on a strong netting made of widely spaced crosscords of sealskin. The longest of these snowshoes is 136 cm., while the other two pairs are approximately 95 cm. in length and slightly wider. All three pairs closely resemble snowshoes from Norton Bay described and illustrated by Nelson (1899, p. 212, fig. 63), who considers them typical of shoes worn from that area southward to the Kuskokwim and up the lower Yukon and Kuskokwim rivers.

CEREMONIAL EQUIPMENT

The Port Clarence collection contains one example of the typical Eskimo tambourine *drum*. A section of sea mammal intestine has been stretched over an oval wooden frame 41 cm. in diameter and lashed with sealskin thongs. At the lower end of this frame is a plain handle made from a section of caribou antler. There is also a

single undecorated *drum handle* made from a section of walrus tusk (pl. 46f).

Four large gull feathers bound together with sinew and with small stones tied at the proximal end of each is tentatively identified as a *dance wand* (pl. 46i). Nelson (1899, pp. 415-416) describes similar wands from the Bering Sea region which were held by female dancers and moved in time to their movements and the beating of a drum.

A fine-grained stone *amulet* in the shape of a baleen whale has a hole drilled through the head. Such an amulet might have been used in whaling ceremonies or kept with whaling gear in an umiak to bring good fortune when these great animals were being hunted (pl. 33a). Similar amulets from Sledge Island and Point Barrow are described and illustrated by Nelson (1899, p. 439, fig. 151) and Murdoch (1892, pp. 403-404, 435, figs. 407, 421).

By far the most abundant ceremonial objects are wooden *dance masks*—there are 25 in the collection. As Ray (1967, pp. 6-7) has pointed out, masks were never carved solely as art objects but as an integral aspect of religious and secular activities. Most mask art was religious and since the Eskimos recognized many categories of spirits, the potential subject matter for the carver was considerable. Religious masks were worn during dance festivals and by shamans during performances not related to curing. The festivals honored spirits of game animals important to the economy, while shamans most commonly wore masks to consult their guardian spirits at times of crises threatening an individual or the community. The carving of a mask was usually a shaman's responsibility and its shape could be determined either by his own vision or by traditional forms. If a shaman was not a good carver, he could commission someone else to execute his design. Laymen carved masks representing their own guardian spirits (Ray, 1967, pp. 11, 18).

The Port Clarence masks, considered as a group, are more elaborate than those from northwest Alaska (see VanStone, 1968-69), but less so than masks from the Yukon-Kuskokwim region (see Nelson, 1899, pp. 393-415, pls. XCVIII-CIII). With few exceptions, however, they more closely resemble the northern masks than they do those from the south. It is likely, therefore, that most if not all of them were collected in the Seward Peninsula-St. Michael area where northern influence was strong, but the presence of southern

influence is indicated by the extensive use of color and some appendages.

Because of their diversity, each mask in the Port Clarence collection is described separately. Whenever possible, each description contains information concerning place of origin and comparative data relating to similar masks that have been published or seen in other museum collections.

12932, 21 cm. high (pl. 34, left)

This smooth, rounded mask from King Island has slit eyes and a pronounced, triangular nose with nostrils carefully delineated. The features are painted with a white wash and encircled with a broad, red band. Slight traces of blue paint indicate that the outer rim beyond the red band was also painted.

12933, 15.5 cm. high (pl. 34, right)

The entire face of this small mask, possibly from King Island, appears to be drawn toward the chin. Slanting eyes and eyebrows blend with the long nose characterized by prominent vertical nostrils. Even the grain of the wood matches this downward emphasis of the features. There are two faint, vertical scratches running from the lower lip toward the chin, possibly to indicate tattooing in which case the representation of a female is intended. The entire mask is painted a brownish red. According to Ray (1967, p. 22), face masks were placed on graves all along the coast north of St. Michael.

12934, 16 cm. high (pl. 35, left)

This simple mask, also possibly from King Island, is noteworthy for its extremely sharp, angular nose. Eyebrows are indicated more clearly than on most masks by means of shallow carving and black paint. Hair is also portrayed with black paint, all the paintings being extremely faint. The mask has patches of dried organic material adhering to it in several places.

12935, 23.5 cm. high (pl. 35, right)

An unusual specimen, roughly shaped but apparently never finished, that was secondarily used as a drill bearing for making fires. Holes made by the fire drill can be seen between the eyes, and the outer surface is scorched.

12936, 17.5 cm. high (pl. 36, left)

The face of this mask is painted white, hair and eyebrows black, and the eyes, tip of nose, and mouth red. The nose is a separate piece of wood carefully fitted to the face and lashed with spruce

root lashing. Masks similar to this specimen are illustrated by Ray (1961, fig. 83, right; 1967, pl. 47) from King Island. The form of painted designs is said to be particularly characteristic of the island. As noted previously, King Islanders were in frequent contact with Eskimos of the Port Clarence region and also travelled to the Yukon River to trade before the establishment of Mikhailovskiy Redoubt in 1833 (Ray, 1967, p. 208).

12937, 22 cm. high (not including fur fringe; pl. 36, right)

This mask is box-shaped at the upper end and has the head of an animal below. The box section has a white wash and dark blue dots, while the animal head is dark blue with red eyes, mouth, and nostrils. A strip of white fox fur has been fastened to the upper edge by means of sinew and wooden pegs.

Ray (1967, p. 195, pl. 21) describes and illustrates an almost identical mask from St. Michael that was collected by H. M. W. Edmonds between 1890 and 1899. Even the colors are virtually the same. The Port Clarence specimen, however, is made from a single piece of wood while the one illustrated by Ray is of two pieces and has quills attached to the top rather than a fur fringe. There is also a similar mask from St. Michael in the Sheldon Jackson Museum, Sitka, Alaska. The animal's spirit is said to be the box at the top of the mask (Ray, 1967, p. 195).

12938, 17 cm. high (not including feathers; pl. 37, left)

A nearly round mask with projecting features. The mouth, outlined in red, is widely stretched and set with small wooden teeth painted white. The upper face and chin are also white, and a wide blue line runs parallel to the mouth just under the nose. The area above the eyes and below the chin is a greenish blue color. A narrow strip of fur, originally pegged to the mask with wooden pegs, is fitted across the top, presumably to represent hair. A pair of stripped feather quills tipped with tufts of feathers extend from either side of the head.

According to the catalog card, there originally was a wooden arm and hand, painted red, attached by a quill to one side of the mask. This has disappeared, but a section of the quill remains. A small hole below the chin suggests that an appendage may also have extended downward in that area. Ray (personal communication) does not consider this mask to be characteristic of the Bering Strait region.

13420, 16.5 cm. high (pl. 37,right)

The forehead of this mask is painted blue-green, the eyes circled in red, and a triangular area stretching from below the nose to the chin is also red. The remainder of the face is white. In its general design, this King Island mask somewhat resembles no. 12936. An interesting feature of the specimen is a wide burned strip on the reverse which encompasses the area of the eyes and nose.

13421, 20.5 cm. high (pl. 38,left)

Painted decoration on this mask includes black hair, eyebrows, and chin, and a red spot on each cheek. There are minute traces of white paint around the eyes.

13422, 21 cm. high (pl. 38,right)

The head, eyebrows, and chin of this mask are painted black and there is red paint around the mouth. A spot of red paint also occurs on each cheek. The hole directly in the center of the mouth was for the insertion of a pipe. Both this specimen and the previous one are probably from villages in the Port Clarence area.

13423, 30 cm. high (pl. 39,left)

This unpainted mask represents the head of a caribou or reindeer. A very similar specimen was collected at Port Clarence by Nordenskiöld (1881, vol. II, p. 241) in 1879. Between the ears are holes for the insertion of antlers.

13424, 27 cm. high (pl. 39,right)

Another mask virtually identical to the one just described. Animal masks are common in both the northern and southwestern Eskimo areas. It is likely that wooden antlers rather than real antler tines were inserted in the holes between the ears.

13426, 30.5 cm. high (pl. 40,left)

This specimen, the largest in the collection, is characterized by carefully delineated, high cheeks, a sharp nose, naturalistic eyes, and detailed carving of the teeth in relief. Between the lips on the right side is a small hole into which a pipe was probably inserted. The mask also has ears in high relief, a rarity in Eskimo masks. The only painting clearly visible is the black eyebrows and white eyes. However, there is also a trace of white paint on the teeth. The mask has a flattened rim, approximately 2 cm. wide, running around the face. There were carvings in high relief on this rim, originally 10 in number, but all have been extensively damaged and three are missing completely. It is probable that all the carvings were of animals. This mask is extremely well carved, a note-

worthy feature being the use of the natural grain of the wood to accentuate the high cheeks.

13428, 26 cm. high (pl. 40, right)

Another mask representing a reindeer or caribou head. It is very similar to the two previously described except that there are no holes between the ears for inserted antlers.

13429, 12 cm. high (not including feathers; pl. 41, left)

Finger masks like this one were held by female dancers during ceremonies in the *kashgee* (ceremonial house). On this specimen a serpent-like figure, painted gray and white with a red head, circles the central hole. Background for the figure is white, as is the reverse, but with grey spots and a circle of gray paint around the central hole. Extending from the wooden section of this finger mask are four white feathers interspersed with three long feather quills with tufts of feathers fastened at the top. All are held in place with wooden pegs.

Although finger masks of this type are fairly common in collections from southwestern Alaska, they are not known to have been used in the Port Clarence area (Ray, personal communication). The serpent-like figure is unusual. A small wooden carving in a collection made by Edmonds at St. Michael in 1890-1891 is identified as a "snake" (Ray, 1966, p. 131) and it closely resembles the figure on this figure mask. Possibly both are worms, accounts of which occur frequently in Eskimo mythology.

13430, 23 cm. high (not including feathers; pl. 41, right)

This mask, representing a fox or wolf, has a hinged lower jaw and wooden pegs inserted as teeth. A bladder tongue hangs from the side of the jaw. The whiskers are stripped feather quills and the ears separate pieces of wood. Face and ears are painted gray-green, while the jaws and a strip running around the entire mask are red. There is also red paint around the eyes on the reverse side. Extending from the top of the head are five gull feathers held in place with round wooden pegs. It is probably from St. Michael.

13431, 22 cm. high (pl. 42, left)

A rather crudely carved mask, the face of which was originally white, although only traces of paint remain. Above the projecting brows is a row of recessed circles painted red. The teeth consist of interlocking wooden pegs. There are two similar masks with meshing teeth from King Island in the Sheldon Jackson Museum.

13433, 24.5 cm. high (not including feathers; pl. 42, right)

The face of this wolf mask is painted white, while the forehead and nose are black with white spots. Teeth and nostrils are clearly indicated and painted red as is the tongue of birch bark. There are also spots of red paint in the vicinity of the feather quill whiskers and on the inside of the eyes. Across the top of the mask are seven large gull feathers, the quills of which are inserted through holes in the mask and then held in place with a strip of sinew.

A mask almost identical to this one, although smaller, is illustrated by Ray (1966, p. 133; 1967, p. 189, pl. 14). It was collected by Edmonds at St. Michael in the 1890's. Another similar mask is illustrated by Dockstader (1960, pl. 73) who identifies it as representing a seal. This one is said to have been collected on the Kuskokwim by J. H. Turner in 1885. Ray (1967, p. 189) believes it to be a wolf mask and she also describes another specimen similar to the one she illustrates that was collected at St. Michael in 1890 and is now in the Sheldon Jackson Museum. Wolf masks are common throughout Alaska and were used particularly in the Messenger Feast (Ray, 1967, p. 190).

13436, 35.5 cm. high (not including appendages; pl. 43, left)

The only mask in the collection with the attached wooden appendages that are particularly characteristic of the Yukon-Kuskokwim region of southwestern Alaska and Nunivak Island. The pointed projection extending from the head and the thin, vertical section of wood below the lower jaw are separate pieces. This mask is painted blue with a strip of red on either side toward the back. The inside of the mouth, which has inserted peg teeth, is also painted red. On each side are two red wooden flipper appendages fastened with sinew to feather quills which are inserted into holes in the mask. There are two feathers projecting from each side and one (consisting of a dark and light feather fastened together) projecting from the forehead. A mask somewhat similar to this one in shape is illustrated by Nelson (1899, pl. XCVIII, 3) and was collected on the lower Yukon River.

53482, 25.5 cm. high (pl. 43, right)

A crudely carved mask, possibly from King Island, decorated with red and black paint. There are red stripes on the forehead and under the eyes; the nostrils and eyes are also painted red. A black stripe runs the length of the long nose extending across the forehead, and there are four vertical black stripes on the chin. Small

holes at either end of the down-turned mouth may have been for the insertion of labrets.

53483, 24 cm. high (pl. 44, left)

Another poorly carved mask, definitely the crudest in the collection. The face is painted red, the forehead and area below the mouth black, and the nose and eyebrows are unpainted. As in the previous mask, small holes on either side of the mouth were probably for the insertion of labrets.

53484, 24.5 cm. high (pl. 44, right)

Although badly weathered, it is nevertheless possible to note how the grain of the wood of this mask conforms to the contour of the raised cheeks. The specimen appears to have been unpainted except for a wide strip of black running horizontally below the eyes, and black hair.

53485, 15 cm. high (pl. 45, left)

This small mask, probably from King Island, has a sharp, prominent nose and narrow, slit eyes and mouth. Tattooing is represented on the lower lip by vertical stripes of red paint. The eyebrows are outlined in red and there are small stripes of the same color at either end of each eye. The hair is painted black and edged with a red stripe.

53486, 15 cm. high (pl. 45, right)

Another very small King Island mask, this one painted entirely red except for the eyebrows which are outlined in black. There are seven small holes on the chin that do not extend through the mask and apparently were intended to contain appendages of some sort, perhaps whiskers. However, five of these holes have been filled with wooden pegs which are level with the surface of the mask.

PERSONAL ADORNMENT

The Port Clarence collection contains only three objects that have been identified as items of personal adornment. There is a *necklace* of dark red and black beads with a small ivory pendant suspended in the center. The pendant, roughly fish-shaped, has drilled round holes and incised lines that have been filled with a light red paint (pl. 46m).

A *brow band* consists of a rectangular strip of tanned sealskin to which have been fastened many small fragments of shell. There are thin strands of sealskin at each end for tying the band at the back of the head (pl. 33f).

A narrow, oval lateral *labret* of ivory is wider and concave on the inner surface and flat on the outer (pl. 33g). The ivory is dark as though having been buried in the ground, and the specimen was doubtless obtained from an archaeological site.

SMOKING COMPLEX

The seven *tobacco pipes* in the Port Clarence collection have ivory stems decorated with etched designs in the modified engraving style (Ray, 1969, p. 16), figures carved in high relief, or both. The bowls are either small and cylindrical with a flaring top or of one piece with the stem. They are either held in place by sinew cords or inserted into a hole on the upper surface at the distal end of the stem. Mouthpieces, of ivory or bone, are missing from five of the seven specimens. Because of the diversity of decorative designs, each pipe will be described separately.

No. 13686—The stem of this specimen has bands of deeply engraved cross-hatched lines and half-circles painted red and black. There are also two bands of etched hunting scenes depicting caribou or reindeer, walrus, umiaks filled with hunters, and a standing hunter with a spear (pl. 47d).

No. 13687—The two-piece bowl of this pipe consisted of a small ivory cylinder inserted through the stem and a flaring rim which is now missing. Decoration along the stem on the illustrated side shows carved sea mammals in high relief and a kneeling hunter pushing a blind in front of him. On the reverse the carved figures are a kayak, crawling man, seal, and polar bear. The illustrated etchings include Eskimo houses, a caribou hunt, and a two-masted schooner. On the reverse side are whales, an umiak elevated on a rack, and a group of men transporting an umiak on a sled. Randomly placed on both sides are a number of shallow, round holes less than a millimeter in diameter (pl. 47c).

No. 13690—This specimen is decorated on three sides with etched designs. Illustrated are a series of large sealskin floats, men with spears, a small animal, large bird, Eskimo house with boat rack, a whaling bark, and a smaller sailing vessel. On the reverse are floats and animals as well as two wrestlers and three men dancing with feathered wands. This pipe also has etched designs on the narrow upper surface of the stem. Here are depicted tents and fish-drying racks in a fish camp, a house with a boat rack, and a group of men paddling an umiak (pl. 47g).

No. 13692—A small pipe with a series of crudely carved sea mammals and a standing bear on the upper surface. There are no etched designs. The stem is in two pieces fastened together with sinew, the bowl being part of the smaller section (pl. 47e).

No. 13697—A similar pipe with carved animals in relief along the top and on one side only. The bowl has a crudely carved human face on two sides (pl. 47f).

No. 13703—This unusual specimen, with a one-piece bowl and stem and a separate ivory mouthpiece, was intended to be held vertically when being smoked. There is an etched band of V-shaped lines at the base of the bowl and three animals carved in relief, two walruses and a bear, on the outer surface. On the illustrated side is a series of nine walruses and on the reverse three umiaks filled with men (pl. 47a).

No. 13706—A long pipe with a triangular stem and two-piece bowl. On both sides are rows of nine sculptured seal heads. The etched design on the illustrated side depicts a caribou hunt. On the reverse polar bear, walrus, and whale hunting are shown in addition to a large sailing vessel (pl. 47,b).

According to Nelson (1899, p. 281), these handsomely ornamented pipes were made at widely separated localities along the coast from the mouth of the Yukon to Kotzebue Sound. The specimens described here were doubtless made for sale or trade to sailors on the whaling vessels that frequented Port Clarence every summer.

An ivory *cigar holder* has a series of carved horizontal ridges and three bands of deeply engraved geometric designs (pl. 33d). Objects such as this one were part of the flourishing curio trade carried on with the whaling vessels.

Three small skin containers are tentatively identified as *snuff or tobacco bags*. One specimen has a bottom and neck of tanned seal-skin between which are sewn vertical strips of dried fishskin. A second bag is entirely of caribou skin and is tied at the neck with a cloth band (pl. 33b). The third, made of seal intestine, has a small bone snuff tube attached (pl. 46k).

Three oval, flat containers may have been *fungus ash or tobacco pouches*; because of their diversity, all are illustrated. The simplest of these is flat across the top with no decoration around the neck. On the front the covering is of birdskin with a border of caribou skin. Small fragments of red yarn decorate the border (pl. 46c). The

second has a design in caribou skin, a rabbit fur trim, and a plain back of caribou skin. The neck is of sealskin with sewn parallel lines of sinew (pl. 46a). The third pouch also has a design in caribou skin with yarn decoration on the front, while the reverse is of ground squirrel skin. The neck consists of parallel strips of caribou and sealskin (pl. 46b). In the 1890's somewhat similar bags were collected by Edmonds in the St. Michael area (Ray, 1966, p. 123, top).

A wooden *mortar* for mixing fungus ash and tobacco has been made by hollowing out a small burl (pl. 33h). Fungus ash was mixed with tobacco to improve the taste and make the tobacco last longer. The collection also contains a single piece of *birch fungus*. These fungi, cut from trees in the interior, were traded to the coast by Athapaskan Indians (Nelson, 1899, p. 291).

Nine small boxes in the Port Clarence collection are identified as *containers for fungus ash or tobacco*. Four are of wood, but only one has a lid (pl. 46d). On two specimens there are engraved geometric designs (pl. 46e, l). Four boxes are hollowed-out sections of antler tines with tight-fitting wooden bottoms pegged in place. Two of these specimens have engraved designs (pl. 46g-h). A single box is made from a section of a small walrus tusk and has engraved geometric designs (pl. 46j). Neither the antler boxes nor the ivory specimen have lids.

TOYS AND MODELS

Many of the objects in this category were probably made for sale or trade to Bruce or Euro-American visitors, particularly the sailors on whaling vessels. This would certainly have been true of three model *ice-hunting harpoons*, all of which are similar in size and design to the illustrated specimen (pl. 32j). Models similar to these have been popular souvenirs in Alaska for more than 80 years.

A miniature *cross-bow* is likely to have been made for a child who might have used it to hunt shore birds along the banks of tundra ponds just as Eskimo children do today. Presumably it was made either by a visiting Euro-American for an Eskimo child or by an Eskimo to whom this European weapon had been described. The specimen, which is entirely of wood except for a trigger of baleen, is not in working order (pl. 32i).

There are two ivory *animal carvings*—a stylized fox or other long-tailed animal (pl. 32c), and a crude, unfinished carving of a

bear with two human figures (pl. 32b). There are also two animal carvings of wood; a rabbit (pl. 32a), and a fox (pl. 32n). The latter is painted red and black and has holes on the underside into which legs were once inserted. A third wooden figure has the body of a human and the head of an animal with long snout and ears (pl. 32h). The arms, which were separate pieces, are missing and the specimen is also painted red and black.

A wood carving of a sealskin *float* may have been part of a model harpoon assemblage or an item of equipment for a model kayak (pl. 32m).

A single crudely made *miniature knife* of ivory resembles a European rather than an Eskimo implement (pl. 32k). European cutlery was often copied by Eskimo craftsmen either as replicas or miniatures.

A small musical instrument resembling a *guitar* is probably neither a model nor a toy, but is included here because it does not fit readily into any of the other categories. The neck and body of the instrument are a single piece of light wood, a sound chamber being created by pegging a flat rectangular cover to the hollowed-out body. There were apparently two strings, although only one remains. It appears doubtful if a resonant tone could be achieved with this instrument (pl. 33e). There is also a model tambourine *drum* to which a beater is attached with a fragment of sinew (pl. 32d).

The collection contains two exceptionally fine *dolls*, a male and a female, both of which are illustrated (pl. 27B). The bodies are of wood and the clothing of sheared reindeer skin with trims of wolverine and rabbit fur. These two figures (male on the left, female on the right) illustrate the type of winter clothing worn by the Eskimos of western Alaska far better than do the limited number of full-sized garments in the collection.

RAW MATERIALS

Raw materials in the Port Clarence collection include seven rolls of sealskin line, one roll of walrus skin line, two small fragments of polar bear skin, one dried salmon skin, two sheets of seal intestines consisting of several pieces sewn together, and a roll of woven two-strand caribou or reindeer sinew. Three narrow strips of caribou or reindeer skin are from the legs of animals and were probably cut for the manufacture of knee-length winter boots. There are also two complete tanned sealskins with the hair removed for making

into waterproof boots. Holes at intervals around the edges indicate that they were staked to the ground as part of the drying process.

CONCLUSIONS

As an assemblage of nineteenth-century Eskimo material culture, the Bruce Port Clarence collection invites comparison with other important collections made at about the same time, particularly those of Edmonds (Ray, 1966) in the Lowie Museum of the University of California, and of Murdoch (1893) and Nelson (1899) in the U.S. National Museum. On the basis of size, variety of artifact types, and age, the Bruce collection must be considered among the dozen or so largest and most important assemblages of its kind.

We have already noted, however, that Bruce's proveniences are open to question and that supporting ethnographic information is minimal. It is obvious that, as a collector, he cannot be ranked with Nelson or Murdoch, or even Edmonds in terms of scientific accuracy and attention to relevant supporting data. Bruce was, essentially, a dealer in Eskimo curios without scientific affiliation and with no intention of writing up his collection for publication. Also, Port Clarence, with its whaling ships and reindeer herd, attracted Eskimos from all over western Alaska, making the problem of accurate data collection extremely difficult and time-consuming even for someone more inclined in that direction than Bruce.

With these qualifications in mind, it can still be said that Bruce has provided us with an important collection of Eskimo materials from which information can be abstracted to supplement and reinforce data derived from the better-documented collections of his contemporaries. Although the Eskimos who traded with Bruce came from far and wide, it seems clear that much of the material he obtained is from locations on Seward Peninsula and thus in some respects duplicates the area covered in such excellent detail by Nelson and, to a much lesser extent, by Edmonds. Some of the most serious gaps in the collection are the result not of indifferent collecting methods, but of the inadequacy of museum storage facilities resulting in the deterioration of specimens and the whims of curators who, from time to time, disposed of significant numbers of items through sale or trade. Nevertheless, the assemblage is reasonably complete in many categories and Bruce was particularly

successful in obtaining one of the largest and most varied collections of ceremonial masks brought together by any nineteenth-century collector.

MATERIAL CULTURE CLUSTERS

The Bruce collection provides an interesting opportunity to focus on changing Eskimo technology at a time when Euro-Americans were beginning to arrive in western Alaska in significant numbers. In a recent paper concerned with the contemporary material culture of Yupik-speaking Eskimos who live along the Bering Sea coast from Bristol Bay to Norton Sound and in adjacent inland areas, Wendell Oswalt (1972) has defined four categories, or clusters, of material objects which reflect the presence or absence of historical introductions and thus serve as a rough measure of technological change. They are as follows:

Eskimo continuities—objects which were made locally at the time of historic contact and are still being made; i.e., traditional Eskimo material culture.

Western imports—objects from western European culture which have been imported directly and accepted into the inventory of Eskimo material culture.

Eskimo-derived forms—those objects which are manufactured locally by Eskimos and modeled after aboriginal types, but use an imported material foreign to the Eskimo environment in their manufacture. Most of these objects are designed for local use, but a few are made to sell to outsiders.

Western-derived forms—the model for objects in this category is foreign, but the material may be local, imported, or a combination of the two. However, the item is manufactured locally and may be used locally or made for sale.

Oswalt is dealing with contemporary Eskimos of southwestern Alaska and is principally concerned with showing the extent to which, among a people exhibiting considerable continuity, traditional manufactures have declined in both numbers and importance since the time of first European contact. He demonstrates convincingly the extent to which Eskimos in selected communities have embraced western technology. Rather than deal specifically with examples of technological change in nineteenth-century collections, he simply notes the kinds of goods that were traded in the area by Russian and American traders and indicates that such forms are to be found in the collections of Nelson and others. Also

present in these early collections are Eskimo innovations in the use of trade items.

It is instructive to apply Oswalt's four material culture clusters to the Bruce collection if only to show more precisely the extent to which it, and by extension other nineteenth-century collections, was subject to external influences that foreshadowed the extensive technological changes documented for the contemporary peoples of southwestern Alaska.

Eskimo continuities—obviously the majority of artifact types in the collection belong to this category since we are, after all, dealing with a collection of traditional Eskimo material culture.

Western imports—a selective factor is, of course, involved here since the collector could be expected to ignore western imports in favor of traditional Eskimo artifacts; Bruce certainly did not expect to sell trade goods to Field Museum. Nevertheless, the following imported items are present:

- muzzle-loading firearms (inferred from the presence of bullet molds and powder horns)
- glass beads
- yarn and cloth used for decoration and in the manufacture of clothing

Eskimo-derived forms

- harpoon ice pick made from an iron spike
- metal harpoon blade
- metal harpoon blade rivet
- metal lance blade
- glass beads for eyes in animal carvings
- metal adze blade
- hammer head made from iron spike
- metal awl point
- drill made from a nail
- circular metal scraper blade (assumed)

Western-derived forms

- bullet mold of stone
- powder flask of wood and antler
- reloading tool of antler
- ivory letter opener
- miniature ivory knife in imitation of European cutlery
- cross-cut saw with metal blade
- grass tray (?)

grass mat in imitation of a hooked rug
match or percussion cap box of wood
reindeer skin coat
belt of imported, commercially tanned leather
ivory buttons
sealskin slippers
gloves of sealskin
ivory pipe
ivory cigar holder
toy crossbow of wood
toy guitar of wood

Of the western-derived forms, those that were clearly manufactured for sale are the ivory letter opener, miniature ivory knife in imitation of European cutlery, reindeer skin coat, sealskin slippers, ivory pipe, and ivory cigar holder. Others, such as the tentatively identified grass tray, the grass mat made in imitation of a hooked rug, and the ivory buttons were probably also intended for sale. Most of the remaining items in this category, as well as all those in the previous one, were presumably made for local use.

There is a possible fifth category that, although not well represented in the Bruce collection, is almost certain to be found in all large collections of nineteenth-century Eskimo material culture. This category consists of miniatures made locally in exact duplication of Eskimo continuities and intended exclusively for sale. Although many visitors to western Alaska in the late nineteenth century desired to obtain souvenirs, it was not often possible for them to return home burdened with bulky items of Eskimo material culture. Thus models in miniature rapidly became popular trade objects. The model ice-hunting harpoon, miniature float for a model kayak, and the dolls are the only representatives of this category in the Bruce collection.

Considering the nature of European contact in the Port Clarence area, it is reasonable to wonder why the Bruce collection does not contain more examples of what might be called market crafts. We know that Port Clarence and adjacent areas were visited frequently by Euro-Americans in the second half of the nineteenth century from the ships of the Franklin search expeditions in the 1850's through the period of intensive commercial whaling to the gold rush at Nome in 1902. Traders and even casual visitors are certain to have encouraged the manufacture of market crafts and

the Eskimos themselves, always alert to the possibilities of trade, would have been quick to appreciate the saleability of such objects.

Part of the answer to the above question, of course, is to be found in the goals of the collector. Bruce knew that his acquisitions would eventually be purchased by a museum and he may have consciously avoided less traditional objects. Furthermore, Eskimos may have withheld certain types of artifacts in the hope of more favorable trading terms with the whaling ships. In any event, the collection does contain a number of objects which have been identified as market crafts and there may be others that have not been so identified, particularly among those specimens that have been considered Eskimo continuities. The highly decorated skin pouches and bags, for example, were likely to have been just as specifically manufactured for trade to the whalers or reindeer station personnel as were the ivory pipes and cigar holder.

Oswalt (1972, p. 89) believes that the vitality of Eskimo material culture is most clearly revealed in the category of Eskimo-derived forms since by integrating new materials into aboriginal forms, the continuity of such forms is insured. The Bruce collection contains relatively few Eskimo-derived forms, again probably a factor of collector selection. As might be expected, however, those that do occur are associated almost exclusively with weapons and tools. In particular, the early recognition of the advantages of metal as a blade material almost certainly accounts for the longevity, as noted by Oswalt, of harpoons, adzes, knives, and scrapers based on aboriginal models.

The sizeable number of western-derived forms in the Bruce collection indicates that the process of material culture change was already clearly defined in the late nineteenth century, less than 50 years after the first sustained European contact in the area. It seems safe to assume that this process of material adaptation, so far advanced at the time of Oswalt's field studies in 1970-1971, is characteristic of all museum collections of nineteenth century Alaskan Eskimo material culture.

TECHNOLOGICAL COMPLEXITY

In a recent book and an unpublished paper, Oswalt has considered the problem of measuring technological complexity among hunting and gathering peoples. Concentrating on artifacts used to procure food, he coined the term "subsistant" to isolate the technology of food procurement and defines it as "any extrasomatic

form which is used directly by man in his procurement of food" (Oswalt, 1973, p. 24). Once identified, the subsistants used by Eskimos and other hunters and gatherers are assigned to one of four categories: instruments, weapons, and tended or untended facilities. Instruments are employed "to perform tasks in which the living mass impinged on is incapable of motion," while a weapon is designed to kill creatures capable of motion. In the Port Clarence artifact inventory, for example, a seal club, used to dispatch a wounded but still living seal, is an instrument, while a sealing harpoon is a weapon. A tended facility, such as a fish hook and line, requires the presence of one or more persons to function, and an untended facility, like a salmon gill net, operates without direct human involvement (Oswalt, 1973, p. 27).

As a measure of the complexity of a subsistant, Oswalt has coined another term: "technounit." This is defined as "an integrated, physically distinct, and unique structural configuration which contributes to the form of a finished artifact" (Oswalt, nd). The total number of technounits in a subsistant assemblage divided by the number of subsistants is, Oswalt believes, a satisfactory measure of technological complexity.

In applying this methodology to the study of Eskimo material culture, Oswalt analyzed the subsistence technologies of selected peoples (Polar Eskimos, Iglulik, Angmagsalik, Taremiut, Copper Eskimo, and Caribou Eskimo) for whom there is reasonably complete information available concerning their aboriginal manufactures. Technounits were totaled and then, as indicated above, divided by the number of subsistants. For example, the Caribou Eskimos, with 31 identified subsistants and 118 technounits, have an index of complexity of 3.80, the lowest for the groups analyzed, and thus can be said to have had the simplest food-getting technology. The Polar Eskimo, with an index of 7.33, had the most complex. Oswalt's data makes it clear, however, that the most complex technologies did not necessarily support the largest populations because of "intervening ecological variables" (Oswalt, nd).

Oswalt's stimulating approach to the study of technological complexity is based primarily on function rather than form. At the analytical level, however, it depends entirely on structure for the identification of technounits. Therefore the methodology has, potentially at least, interesting implications for the study of ethnographic collections in museums. To be truly meaningful, however, collections to which the technounit concept is applied should con-

sist of a reasonably complete subsistant inventory, be well documented as to function, and of known and restricted provenience. Unfortunately, these criteria are unlikely to be met in most museum collections from the Eskimo or any other area. Facilities in particular are seldom fully represented in museum collections.

All of the above-mentioned criteria are relevant in applying the technounit concept to the Port Clarence collection. Port Clarence was a summer gathering place for Eskimos from western Alaska and, although many items may originate from southern Seward Peninsula, the previous descriptions indicate that areas as remote as Point Hope to the north and the Yukon Delta to the south are represented in the collection. Even on Seward Peninsula alone there were, with adjacent islands included, eight Eskimo societies with a total estimated population in 1850 of 3,400 (Burch, 1975, pp. 11-12). Although the traditional culture of all of these people was similar, there unquestionably were significant regional differences in material culture that would perhaps not be reflected in a museum collection much larger and more precisely documented than the one made by Bruce.

In addition to matters of provenience, there is a problem concerning the subsistants themselves. It is clear that the collection does not contain all the subsistants used by the inhabitants of even a restricted area of western Alaska. Furthermore, some of the subsistants represented are not complete enough for an accurate determination of their technounit number. This is the result, in part, of inclinations on the part of the collector, but also due to the vicissitudes to which the collection has been subjected since it was accessioned nearly 80 years ago. These are, of course, some of the same problems that made it difficult to determine accurately the impact of Euro-American influence on the artifact assemblage.

Unfortunate as these problems are with reference to this particular assemblage, they are problems shared by many, if not most, ethnographic collections in all museums and thus would seem to limit the feasibility of the technounit concept as a tool for studying museum collections. With these limitations in mind, a list of subsistants in the Port Clarence collection broken down into technounits is given below.

Instrument

1 tu

plug to keep dead seal inflated (pl. 6e)

- 3 tus
seal club (pl. 7b): wood handle + bone head + sinew head-handle binder
- 5 tus
ice scoop (pl. 1d): wood handle + antler rim + sinew rim binder + sinew netting + sinew rim-handle binder

Weapons

- 3 tus
throwing board used with sealing harpoon (pl. 2a): wood body + ivory finger peg + ivory peg to hold end of spear
- 4 tus
bird bolas (pl. 6c): bone weights + sinew weight suspension cords + feather or grass grip + sinew weight-cord-feather binder
- 5 tus
arrow for large game or war (pl. 9d,g): antler or slate head + sinew head-shaft binder + wood shaft + feathers + sinew feathers-shaft binder
- 5 tus
bird arrow (pl. 9a-c): bone or antler head + sinew head-shaft binder + wood shaft + feathers + sinew feather-shaft binder
- 5 tus
fish arrow (pl. 9e-f): antler barbs + sinew barb-shaft binder + wood shaft + feathers + sinew feather-shaft binder
- 5 tus
sealing harpoon used from kayak (pl. 1c): antler head + sinew line attached to head + antler foreshaft + root foreshaft-shaft binder + wood shaft
- 6 tus
fish spear (pl. 3a): center prong + side prongs + sinew center prong-shaft binder + baleen side prong-shaft binder + sinew center-side prong binder + wood shaft
- 7 tus
sealing harpoon dart used from kayak (pl. 3c): antler dart head + bone socketpiece + wood socketpiece plug + sinew line attached to dart head + sinew socketpiece-shaft binder + feather quill socketpiece-shaft binder + wood shaft
- 9 tus total for bird spears
bird spear with side prongs (pl. 3e): bone or antler point + sinew point-shaft binder + wood shaft + bone or antler side prongs + sinew side prong-shaft binder
bird spear with end prongs (pl. 3b): bone or antler end prongs + sinew prong binder + sinew prong-shaft binder + wood shaft
- 10 tus total for bows
single curve bow (pl. 8a): wood shaft + sinew bow backing + sinew bow-backing binder + sinew bowstring
double curve bow (pl. 8b): wood shaft + wood shaft reinforcement pieces + sinew reinforcement piece-shaft binder + sinew bow backing + sinew bow-backing binder + sinew bowstring

- 13 tus
ice hunting harpoon (composite description, pl. 1a,b): metal blade + antler or metal rivet + blade-head binder + antler head + bone or antler foreshaft + bone socketpiece + baleen or sinew foreshaft-shaft binder + sinew foreshaft-socketpiece binder + wood shaft + ivory or bone finger rest + sinew finger rest-shaft binder + bone or metal ice pick + sinew pick-shaft binder

Tended Facility

- 4 tus
lure hook (pl. 12d): bone shank + line (assumed) + antler barbs + sinker (assumed)
- 3 tus
tomcod rod: wood rod + antler or ivory tip + sinew line
- 3 tus
seal scratcher (pl. 6a): wood body + seal claws + sinew seal claw-body binder

Untended Facility

- 2 tus
gull hook (pl. 6f): bone hook + sinew line
- 2 tus
bird snare: baleen noose + sinew noose-anchor binder
- 3 tus
ptarmigan net (pl. 6d): sinew netting + wood spreaders + netting-spreader binder
- 3 tus
marmot snare: baleen noose + wood or bone sleeve + wood trigger
- 6 tus
salmon net: walrus hide netting + wood floats + sinew net-float binder + stone sinkers + sinew sinker-net binder + anchor line
- 8 tus
spring trap (pl. 7a): wood body + twisted sinew cords + wood cord holders + wood lever + ivory spike + sinew spike-lever binder + ivory catch to hold lever + sinew catch-lever binder.

The above listing indicates a total of 25 subsistants consisting of 115 technounits for an index of complexity of 4.6. Although somewhat higher than the index for the Caribou Eskimo, this one is lower than those of the other five groups in Oswalt's sample. Since the Bruce collection inventory is far from complete, however, the significance of this index is questionable. To arrive at a more meaningful comparison with the indices of complexity for the groups in Oswalt's sample it is necessary to restrict consideration to the weapons category alone. The inventory of weapons in the Bruce collection appears to be reasonably complete and thus comparable to similar inventories in the collections analyzed by Os-

walt. It is also possible to expand slightly the inventory of weapons described in this report by including the following additional subsistants from relevant areas mentioned by Nelson (1899):

- 3 tus
lance (Cape Nome, Nelson, 1899, p. 145, pl. LVb, 3): stone blade + sinew blade-shaft binder + wood shaft
- 10 tus
lance with detachable head (composite description, pl. 4, f-g, m-n, Nelson, 1899, p. 146, pl. LVb, 1-2): metal or chert blade + baleen or sinew blade-head binder + wood head shaft + bone socketpiece + sinew or cord socketpiece-shaft binder + antler finger rest + sinew finger rest-shaft binder + wood shaft + sinew or cord shaft-butt binder + ivory butt.

With the addition of these weapons, the subsistant total for this category becomes 15 consisting of 85 technounits for an index of complexity of 5.6. Similar indices of complexity *for weapons only* for the Eskimo sample used by Oswalt are as follows:

Polar Eskimo	11.3
Iglulik	9.1
Angmagsalik	8.3
Taremiut	7.4
Copper Eskimo	6.6
Caribou Eskimo	4.3

It is difficult to assess the significance of these figures with specific reference to the Bruce collection, but the data for all groups except the Caribou Eskimo, seem to reflect an expectable heavy concentration on direct confrontations with complex weapons for hunting sea mammals. The low index for the latter group reflects primarily a distinctive and highly specialized inland hunting technology.

It is clear that simply by considering weapons in this manner, it is possible to obtain a certain insight into their comparative development. The index for the weapons in the Bruce collection, lower than but comparable to indices for the other groups (excluding the Caribou Eskimo), may reflect only the inadequacies of the collection or a greater dependence on non-weapons for the taking of fish and game, or, more likely, a combination of the two.

More significant, perhaps, are comparisons in terms of the most complex weapon used for sea-mammal hunting. For the Bruce collection, this is the ice-hunting harpoon (13 tus). Oswalt (personal communication) believes that among Eskimos a single artifact form is developed to "perfection" for land or water use; the more complicated the form, the greater the dependence on it. For

example, tu totals for ice-hunting harpoons and related forms for the groups in Oswalt's sample are as follows (Oswalt, nd):

	tus
Polar Eskimo—ice-hunting harpoon	14
Iglulik—ice-hunting harpoon, seals	17
Iglulik—ice-hunting harpoon, walrus	13
Angmagsalik—peep-sealing harpoon	16
Tareumiut—ice-hunting harpoon for seals at breathing holes	12
Tareumiut—ice-hunting harpoon for seals at edge of ice	16
Copper Eskimo—generalized sealing harpoon	15

It would appear that 12 to 17 tus for ice-hunting harpoons was the "leading edge of perfection" for this implement in Eskimo cultures at the time of historic contact (Oswalt, personal communication). The harpoons of the Iglulik and Angmagsalik are the most complex because these people depend more heavily on seals than do the other groups in the sample and those Eskimos represented by the Bruce collection. The ice-hunting harpoon is a critical substantant for any analysis that attempts to relate technological complexity to culture and environment as does the system devised by Oswalt. It was an essential implement used to harvest an important natural resource at the low point in the seasonal cycle when food stresses were greatest.

Suggestive comparisons such as this one, geared to the specific strengths of a museum collection, would appear to be of greater significance than broader comparisons utilizing an index of complexity for the entire collection. Such specific comparisons indicate the potential value of the Bruce collection and similar museum assemblages for providing useful insights into technological complexity and its relationship to culture and environment.

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APPENDIX

The Bruce Port Clarence Eskimo Collection (Accession 65)

Following is a list of the Bruce Port Clarence Eskimo specimens described in this study. It is not a complete list of the collection as it appears in the catalog of the Department of Anthropology, Field Museum of Natural History. Specimens that could not be located or have been sold, traded, or otherwise disposed of are not included. Museum catalog numbers preceded by an asterisk (*) are illustrated. Identifications given here do not invariably correspond to those in the catalog.

Sea and Land Hunting

12793-95	ice-hunting harpoon
13035	" " "
*13036	" " "
*13041	" " "
12716	sealing harpoon head
*12717	" " "
*12719	" " "
12720	" " "
*12721	" " "
12727-28	" " "
12732-34	" " "
*12740	" " "
12742	" " "
12746	" " "
12771	" " " (with sealskin cover)
12703	harpoon foreshaft
*12704	" "
*12706	" "
no number	" "
*12982	harpoon ice pick
*12789	sealing harpoon
12790-92	" " (incomplete)
*13383	" "
*12984	throwing board
*12078	harpoon dart socketpiece
13176	" " "

*13178	"	"	"		
12678-79	whaling harpoon head				
*12680	"	"	"		
12681	"	"	"		
*12682	"	"	"		
12683	"	"	"		
*12684	"	"	"		
13404	roll of walrus hide harpoon line				
13409	"	"	"	"	"
13006	roll of sealskin harpoon line				
13185	sealskin float				
*53487-89	float plug (acc. 546)				
53490-91	"	"	"		
*13494	float mouthpiece				
*13544 (?)	float toggle				
*12445-46	detachable lance head				
12465	"	"	"		
12496-98	"	"	"		
*12499-500	"	"	"		
12537	"	"	"		
12066	lance or knife blade (fragment)				
*12067	"	"	"	"	"
12073-74	"	"	"	"	"
*12075	"	"	"	"	"
12666	"	"	"	"	"
*12668-69	"	"	"	"	"
12670	"	"	"	"	"
*12671	"	"	"	"	"
*12286	box for lance or harpoon blades				
*12295-97	"	"	"	"	"
12656	seal scratcher				
12658	"	"			
*12659	"	"			
*12032	club for killing seals				
12618	seal drag				
*12619	"	"			
12620	"	"			
12315	plug to keep seals inflated				
*12316	"	"	"	"	"
12317	"	"	"	"	"
*12318	"	"	"	"	"
12341	probe to loosen seal blubber				
12451	bow				
*12452	"				
*13387	"				
13388	bow case and quiver				
12531	arrow for big game or war				
*12532	"	"	"	"	"
12533	"	"	"	"	"
*13396	"	"	"	"	"

13389	bird arrow
*13394-95	" "
*13397	" "
12462	arrow (incomplete)
13392	" "
13393 (1-3)	" "
13398	" "
12750	arrowhead
*12785	bird spear (type 1)
12786-88	" " "
*12782	" " (type 2)
12784	" " "
12797	" " "
*12712	bird spear point (type 1)
12713	" " " "
*12714	" " " "
12709-10	" " " (type 2)
12707-08	bird spear side prong
12578-79	bird snare
12621	marmot snares (17)
12622	" " (25)
12585-86	ptarmigan net
*12590	" "
*12612	bolas
12613	"
*12624 (1-5)	gull hooks
12608	spring trap
*12609	" " (model)
12665	ice staff
*13282	" "
*13821	snow goggles
13824	" "
12322	bullet mold
*12501 (1-2)	" "
12505 (1-2)	" "
12506 (1-2)	" "
*12246-51	powder flask
*12507	reloading tool

Fishing

13220	salmon net, complete
13168	" " incomplete
13208-09	" " "
12417	herring seine (?), incomplete
12996	" " " "
13004	" " " "
12419-20	" " " fragments
*12389-91	net shuttle
*53343	" " (acc. 546)
*12394	mesh gauge

*12397	" "
*12400-02	" "
*12406	" "
12779	fish spear
*12780	" "
12529	fish arrow
*12530	" "
*12534	" "
12698	tomcod rod and line
*12798	tomcod rod
12799	" "
*12140	tip for tomcod rod
12142	" " " "
*12143	" " " "
*12995	line and sinker
12091	sinker
*13630	"
*12388	lure-hook shank
*12803-05	model salmon trap and sections of fencing (incomplete)
13267	ice scoop
*13365	" "

Tools and Manufactures

12015-16	adze (type 1)
*12024	" "
*12027	" "
*12047	" "
*12049-50	" "
12014	adze (type 2)
*12017	" "
12018	" "
*12028	" "
*12021	maul
*12037	hammer
*12107	"
*12026	root pick
*12059	end-bladed knife
*12061	" " "
*12081	" " " (?)
*12060	end-bladed knife blade
12064	" " " "
*12070	" " " "
12071	" " " "
12079	" " " "
*12080	" " " "
*12086	crooked knife
*12145	" "
*12136	side-bladed knife
*12051	ulu
*12056	"

12124-26	"
*12129-30	"
12132	"
*12111	ulu blade
12112	" " (fragment)
*12113	" " " (?)
*12058	whetstone
12063	"
*12065	"
12092	"
*12100	"
*12347	chisel (ulna)
*12370	" (metapodial)
*12245	engraving tool or knife sharpener
*12042	saw
*12045	awl
12545	drill mouthpiece
*12546	" "
12547-48	" "
*12549	" "
12597	" "
*12554	drill shank
12555	" "
*12557	" "
12559	" "
12561-62	" "
12564	" "
*12565	" "
*12569	" "
12571	" "
*12572	drill bow
12574	" "
*12583	" "
*12603	" "
12606	" "
*12573	fire drill
*12504	fire drill bearing
*12001	skin scraper (type 1)
12030	" " "
*12029	" " (type 2)
12038	" " (type 3)
*12039-41	" " "
12360	" " (type 4)
*12361	" " "
*12137	" " (type 5)

Household Equipment

12256	round bucket
12284	oval bucket
*13601	bucket handle

*12160	bag
*12175	"
*12197	"
12215	"
*12240	"
*13083	"
*13109-10	"
13118	"
13085	pouch with flap ("housewife")
*13117	" " " "
13216	" " " " (fragmentary)
*12161	rectangular pouch
*12163	" "
*12167-68	" "
*12170	" "
*12224	" "
*12411	round basket
12413	" "
*12429	" "
*12433	" "
13174	" "
*12432	oval basket
*12430	rectangular basket
*12431	tray (?)
12287	birch bark basket
*12292	" " "
12293-94	" " "
*12253-54	dipper
*12283	dish
*13842	spoon
*13848	ladle
*12288	lamp
*12290	"
*12334	mat
12414	"
*12415	"
12449	"
13008	"
*12267	work or trinket box
*12274	" " " "
*12281-82	" " " "
*12285	" " " "
*13647	" " " "
13811	" " " "
*12265	match box
*12302	" "
12303	" "
*12304-05	" "
*12307-08	" "
12300	" " cover

12298-99	meat tray
*13631	needle case
13632.	" "
13634	" "
12325	snow beater
*12343	" "
*12346	" "
*12312	drying frame
12313	" "
12326	back scratcher

Clothing

*12962	hat
*12993	wolf's head hat and skin of wolf's head
12963	coat
13080	raincoat
13210	"
13755	"
*13075	trousers
12967	belt
*12978	"
*13074	"
*13076	"
12830	pair of mittens
12877	" " "
*12902	single mitten
no number	pair of mittens
*13186	single mitten
*12843	pair of mittens
12848	" " "
12854-56	" " "
12864, 1-2	" " "
12864 (?)	" " "
12876	" " "
12878	" " "
12889	" " "
12899	" " "
12903	single mitten
*12861	pair of gloves
12865	" " "
*12898	" " "
12901	single glove
12834	pair of mittens
12886-87	" " "
12896-97	" " "
*12913-14	" " "
12921-22	" " "
12871	" " "
12873-74	" " "
*12869	dance mittens

*13224-25	pair of socks
12847	winter boots
*12852	" "
*12870	" "
12875	" "
12891	child's winter boots
12882	" " "
12892	winter boots
12833	child's winter boot
12842	winter boots
12845	child's winter boots
12863	winter boots
*12867	" "
12879	child's winter boots
*12880	winter boots
12888	" "
12890	child's winter boots
12895	winter boots
12904	winter boot
12918	winter boots
*12920	" "
12839	winter boot uppers
12832	summer boot
*12846	infant's summer boots
*12862	summer boots
12866	" "
12836	rain boots
12851	child's rain boots
12881	rain boots
*12895	child's rain boots
12900	rain boots
13194	waist-high rain boots
13201-02	" " " "
12909	slippers
*13522	buttons (3)

Transportation

12987	harpoon line holder
*13537	harpoon or spear rest
*12770	harpoon or spear guard
13155	kayak paddle
13158	" "
*12319	boat hook
13143-44	five dog harnesses
13149	three " "
13173	two " "
no number	six " "
*13543	harness block or fastener
*13144	dog muzzle
*13147	whip

13132	snowshoes
13134	"
13138	"

Ceremonial Equipment

12309	drum
* 12355	drum handle
* 13177	dance wand (?)
* 13626	whale-shaped amulet
* 12932-38	mask
* 13420-24	"
* 13426	"
* 13428-31	"
* 13433	"
* 13436	"
* 53482-86	" (acc. 546)

Personal Adornment

* 13588	necklace
* 13219	brow band
* 13579	lateral labret

Smoking Complex

* 13686-87	pipe
* 13690	"
* 13692	"
* 13697	"
* 13703	"
* 13706	"
* 13629	cigar holder
12239	snuff or tobacco bag
* 12258	" " " "
* 12183	" " " "
* 12195	fungus ash or tobacco pouch
* 12203	" " " " "
* 12208	" " " " "
* 12257	mortar
12259	birch fungus
* 12260-62	fungus ash or tobacco box
12263	" " " " "
12264	" " " " "
12266	" " " " "
* 12276-78	" " " " "

Toys and Models

12818	model ice-hunting harpoon
* 12819	" " " "
12820	" " " "
* 12374	toy cross-bow
* 13596	animal carving

* 13612	" "
* 13615	" "
* 13619	" "
* 13590	human-animal carving
* 12127	model float
* 12324	miniature knife
* 12144	guitar
* 12813	model drum
* 12177	doll
* 12178	"

Raw Materials

12273	roll of sealskin line
12994	" " " "
12997-13000	" " " "
13007	" " " "
13181	roll of walrus skin line
13170	fragment of polar bear skin
13187	" " " " "
13169	dried salmon skin
13121	sheet of sewn seal intestines
13179	" " " " "
12424	roll of two-strand woven caribou or reindeer sinew
12853	narrow strip of caribou or reindeer skin
12859	" " " " " " "
12893	" " " " " " "
13190	tanned sealskin
13191	" "

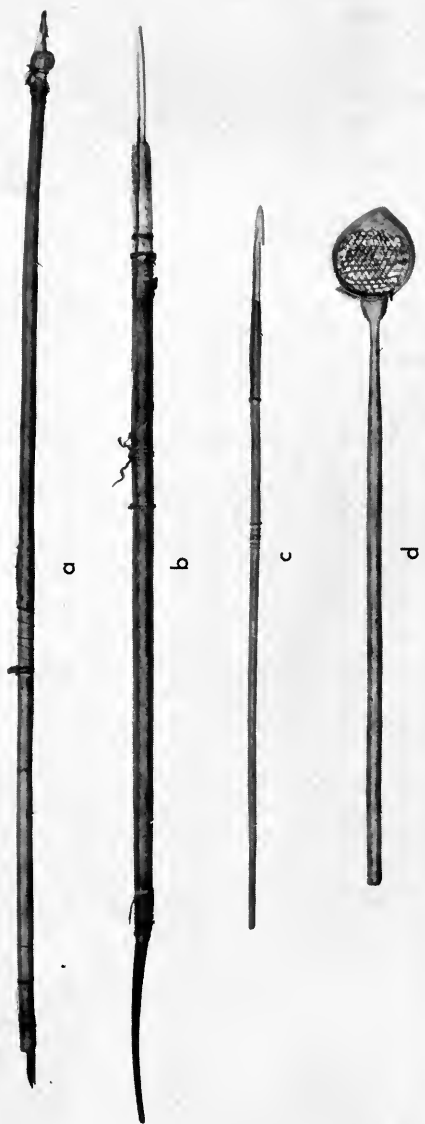


PLATE 1. **a**, ice-hunting harpoon (13036); **b**, ice-hunting harpoon (13041); **c**, sealing harpoon (13383); **d**, ice scoop (13365).



PLATE 2. a, throwing board (12984); b, whaling harpoon head (12682); c, harpoon head (12721); d, (12721); d, harpoon head (12740); e, harpoon foreshaft (12704); f, whaling harpoon head (12684); g, harpoon ice pick (12982); h, harpoon dart socket-piece (13178); i, harpoon dart socketpiece (12078); j, harpoon foreshaft (12706); k, harpoon head (12717); l, harpoon head (12719).

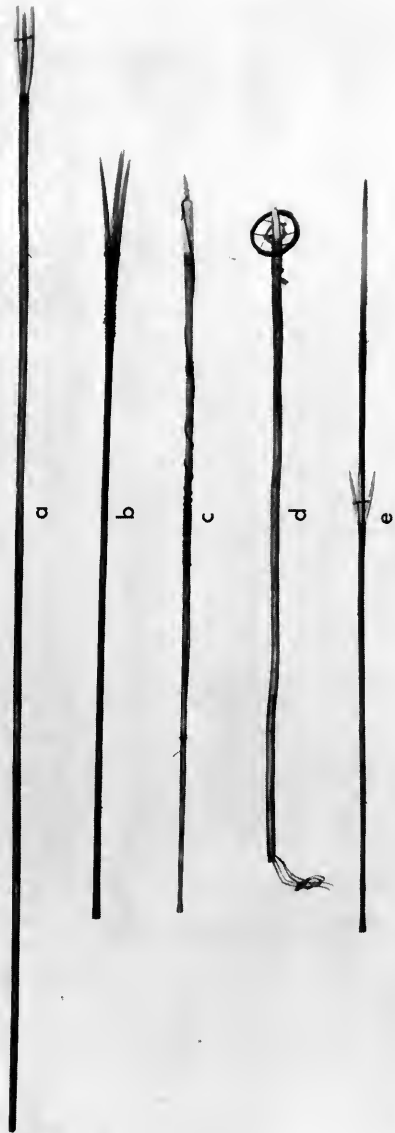


PLATE 3. a, fish spear (12780); b, bird spear, type 2 (12782); c, sealing harpoon (12789); d, ice staff (13282); e, bird spear, type 1 (12785).

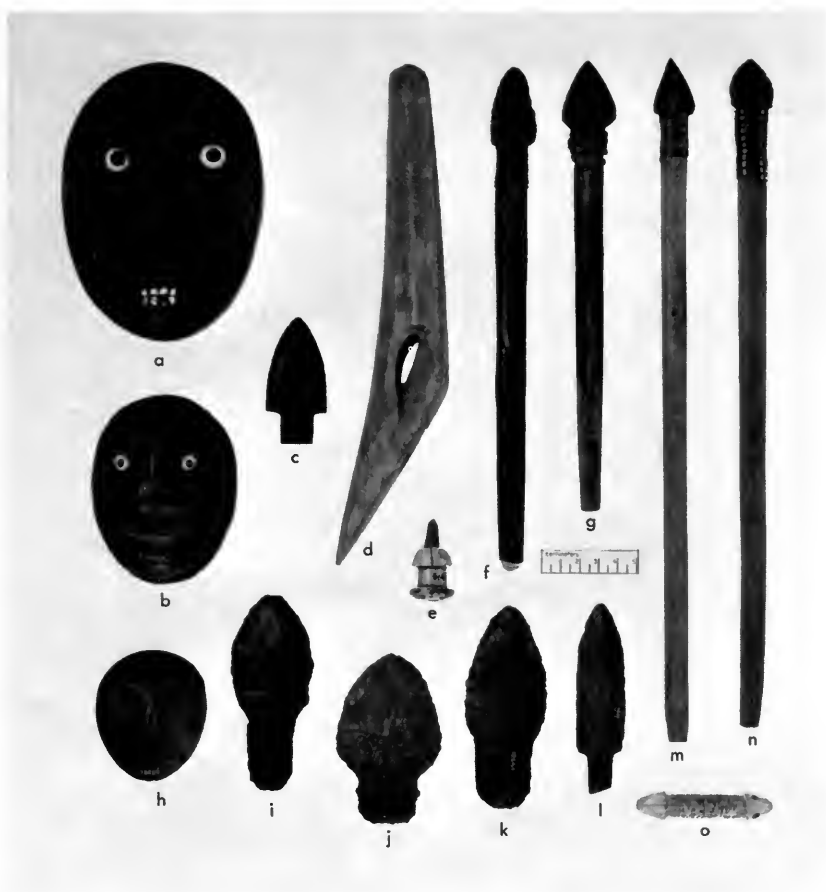
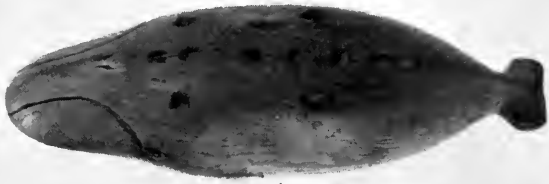


PLATE 4. a, float plug (53487); b, float plug (53488); c, lance blade (12067); d, whaling harpoon head (12680); e, float mouthpiece (13494); f, detachable lance head (12446); g, detachable lance head (12445); h, float plug (53489); i, lance blade (12669); j, lance blade (12671); k, lance blade (12668); l, lance blade (12075); m, detachable lance head (12499); n, detachable lance head (12500); o, float toggle (13544?).



a



b



c



d



PLATE 5. a, box for lance or harpoon blades (12295); b, box for lance or harpoon blades (12296); c, box for lance or harpoon blades (12297); d, box for lance or harpoon blades (12286).



PLATE 6. a, seal scratcher (12659); b, seal drag (12619); c, bolas (12612); d, ptarmigan snare (12590); e, plug to keep seals inflated (12316); f, gull hook (12624); g, plugs to keep seals inflated (12318).



PLATE 7. a, model spring trap (12609); b, club for killing seals (12032); c, powder flask (12247); d, bullet mold (12501); e, reloading tool (12507); f, snow goggles (13821); g, bird spear point, type 1 (12714); h, bird spear point, type 1, (12712).

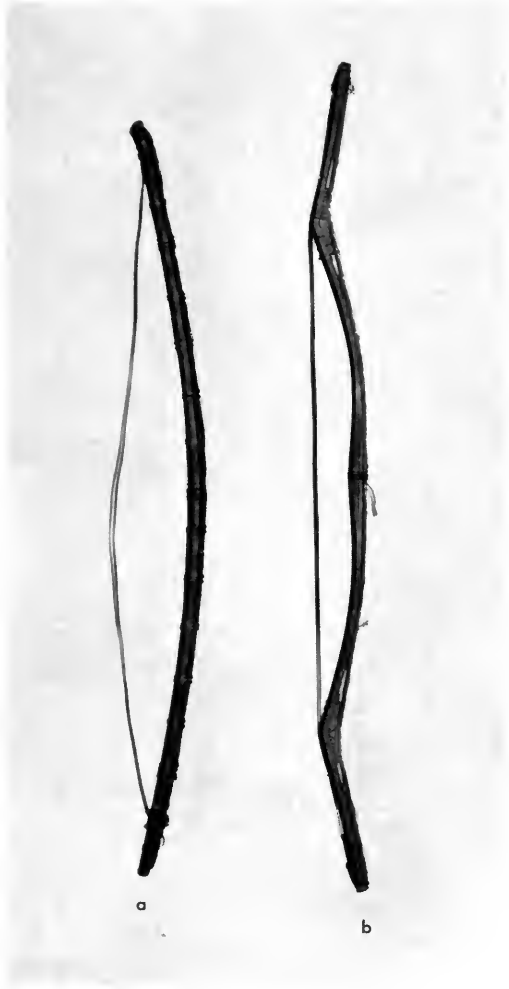


PLATE 8. a, bow (12452);
b, bow (13387).

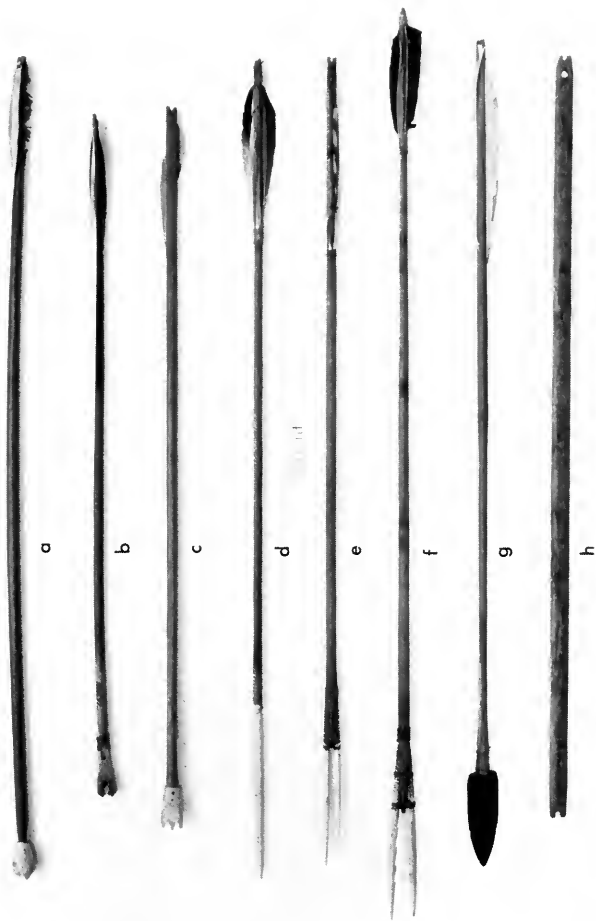


PLATE 9. a, bird arrow (13394); b, bird arrow (13397); c, bird arrow (13395); d, arrow (12532); e, fish arrow (12534); f, fish arrow (12530); g, arrow (13396); h, tomcod rod (12798).



PLATE 10. a, powder flask (12250); b, powder flask (12251); c, powder flask (12248); d, mesh gauge (12397); e, powder flask (12246); f, tip for tomcod rod (12143); g, powder flask (12249); h, mesh gauge (12394).



PLATE 11. a, line and sinker (12995); b, mesh gauge (12402); c, tip for tomcod rod (12140); d, mesh gauge (12400); e, mesh gauge (12401); f, net shuttle (12391).



PLATE 12. a, model salmon trap, incomplete (12803-05); b, sinker (13630); c, mesh gauge (12406); d, lure-hook shank (12388); e, net shuttle (53343); f, net shuttle (12389); g, net shuttle (12390).



PLATE 13. a, adze, type 1 (12049); b, adze, type 2 (12017); c, adze, type 1 (12047); d, adze, type 1 (12050).



PLATE 14. a, root pick (12026); b, adze, type 1 (12027); c, maul (12021); d, adze, type 1 (12024); e, adze, type 2 (12028).



PLATE 15. **a**, crooked knife (12086); **b**, crooked knife (12145); **c**, end-bladed knife blade (12060); **d**, whetstone (12100); **e**, whetstone (12058); **f**, whetstone (12065); **g**, side-bladed knife (12136); **h**, end-bladed knife blade (12080); **i**, end-bladed knife (?) (12081); **j**, end-bladed knife (12061); **k**, end-bladed knife (12059); **l**, end-bladed knife blade (12070); **m**, ulu (12129); **n**, ulu (12051).



PLATE 16. a, engraving tool (12245); b, awl or bodkin (12045); c, chisel (12347); d, chisel (12370); e, hammer (12107); f, hammer (12037); g, ulu blade (12113); h, ulu (12130); i, saw (12042); j, ulu blade (12111); k, ulu (12056).

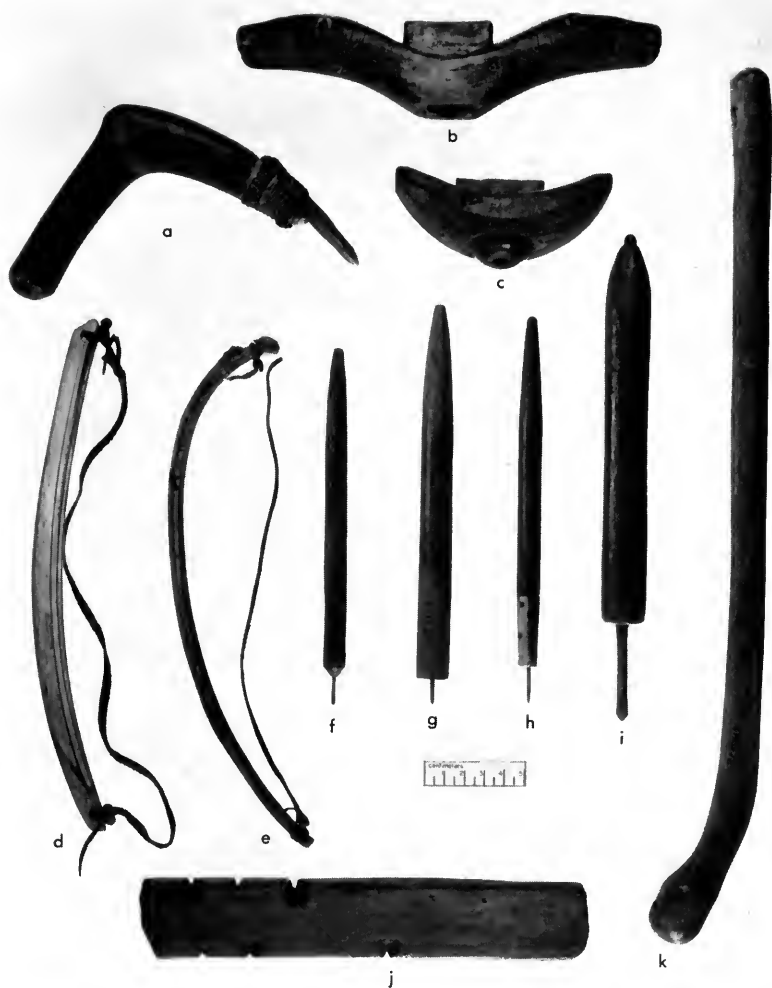


PLATE 17. a, skin scraper, type 2 (12029); b, drill mouthpiece (12549); c, drill mouthpiece (12546); d, drill bow (12583); e, drill bow (12603); f, drill shank (12557); g, drill shank (12565); h, drill shank (12554); i, drill shank (12569); j, fire drill bearing (12504); k, drill bow (12572).



PLATE 18. a, bucket handle (13601); b, ladle (13848); c, skin scraper, type 5 (12137); d, spoon (13842); e, fire drill (12573); f, skin scraper, type 3 (12040); g, skin scraper, type 3 (12041); h, skin scraper, type 1 (12001); i, skin scraper, type 3 (12039).

A



B



PLATE 19. A. a, bag (13083); b, housewife (13117). B. bag (13110).



PLATE 20. a, bag (13109); b, bag (12160); c, bag (12240); d, bag (12197); e, bag (12175).



PLATE 21. a, pouch (12167); b, pouch (12163); c, pouch (12161); d, pouch (12224); e, pouch (12168); f, pouch (12170).



PLATE 22. a, basket (12432); b, basket (12430); c, basket (12411); d, tray (?) (12431); e, basket (12429); f, basket (12433).



a



b



c



d



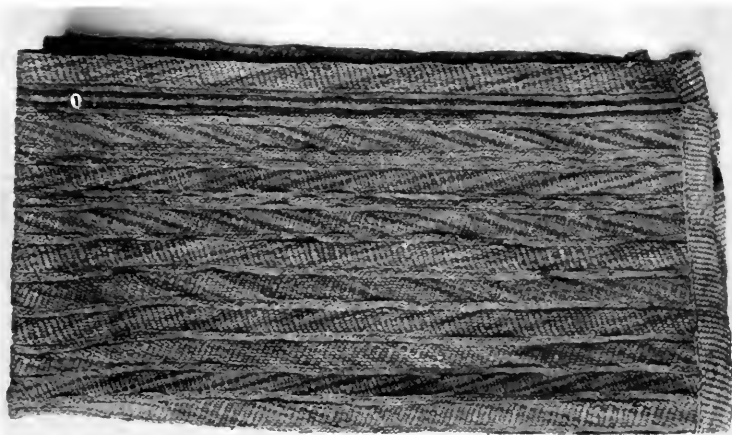
e



f

PLATE 23. a, dipper (12254); b, dipper (12253); c, dish (12283); d, lamp (12288); e, lamp (12290); f, basket (12292).

A



B

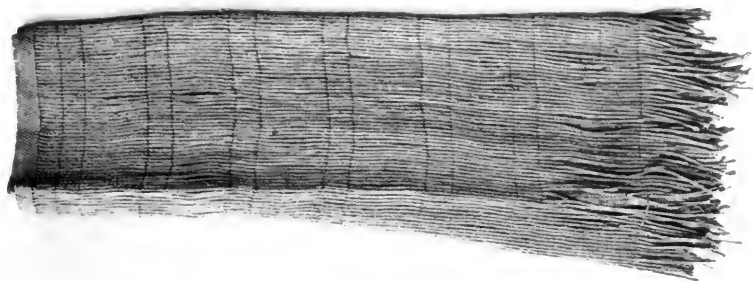


PLATE 24. A, mat (12415). B, mat (12334).



PLATE 25. a, work or trinket box (13647); b, work or trinket box (12274); c, work or trinket box (12281); d, work or trinket box (12267); e, match box (12265); f, work or trinket box (12285); g, needle case (13631); h, work or trinket box (12282); i, match box (12302); j, match box (12304); k, match box (12305); l, match box (12308); m, match box (12307).

A



B



PLATE 26. A. a, snow beater (12346); b, snow beater (12343); c, drying frame (12843); B. a, winter boot (12867); b, winter boot (12880).



PLATE 27. A. a, wolf's head hat (12993); b, hat (12962). B. a, doll (12177); b, doll (12178).



PLATE 28. A. a, winter boot (12870); b, dance mittens (12869); c, trousers (13075).

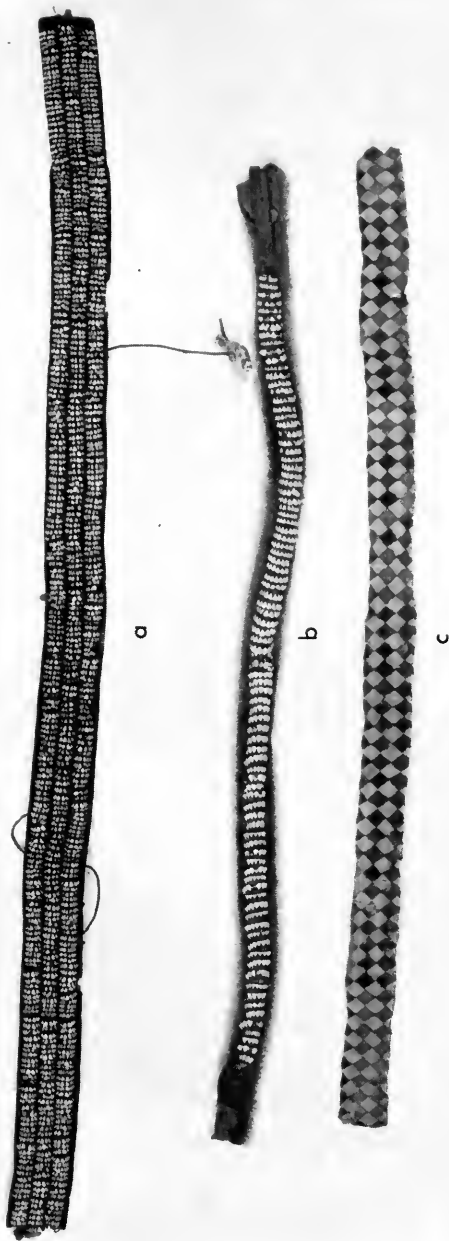


PLATE 28. **B. a**, belt (13074); **b**, belt (12978); **c**, belt or decorated parka border (13076).



PLATE 29. a, glove (12861); b, mitten (12843); c, mitten (13186); d, mitten (12902); e, mitten (12914); f, glove (12898).



PLATE 30. A. a, rain boot (12895); b, sock (13224); c, summer boot (12846); d, summer boot (12920); b, winter boot (12852).



PLATE 31. a, whip (13147); b, spear guard (12770); c, dog muzzle (13144).

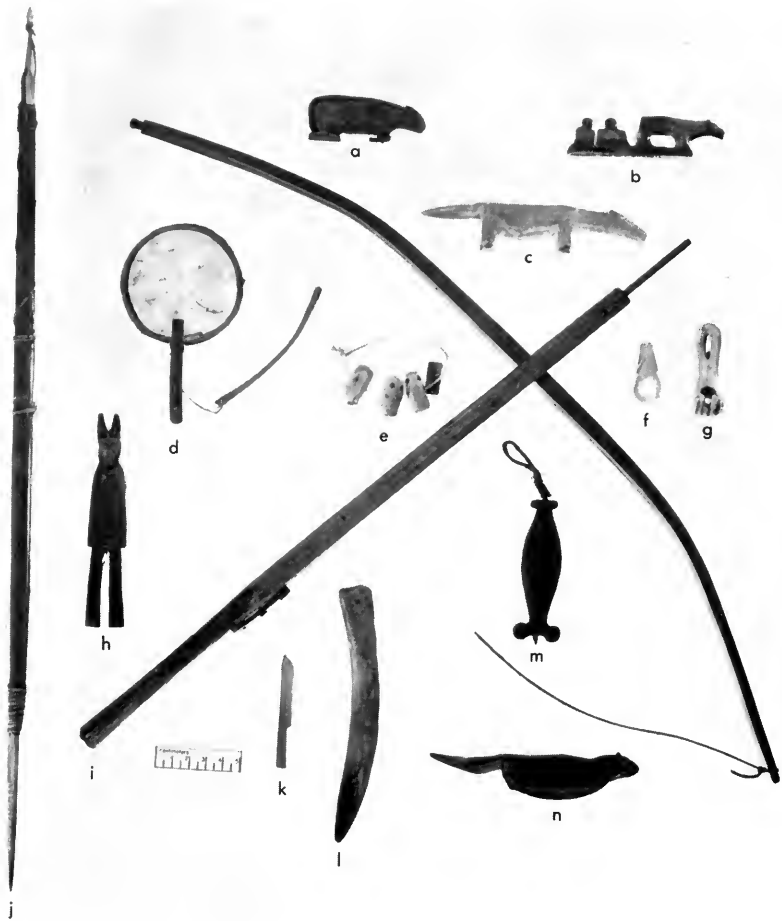


PLATE 32. **a**, animal carving (13615); **b**, animal carving (13596); **c**, animal carving (13612); **d**, model drum (12813); **e**, buttons (13522); **f**, harness block or fastener (13543); **g**, harpoon or spear rest (13537); **h**, human-animal figure (13590); **i**, toy cross-bow (12374); **j**, model ice-hunting harpoon (12819); **k**, miniature knife (12324); **l**, scraper, type 4 (12361); **m**, model float (12127); **n**, animal carving (13619).



PLATE 33. a, whale-shaped amulet (13626); b, snuff or tobacco bag (12183); c, boat hook (12319); d, cigar holder (13629); e, guitar (12144); f, brow band (13219); g, lateral labret (13579); h, mortar (12257).

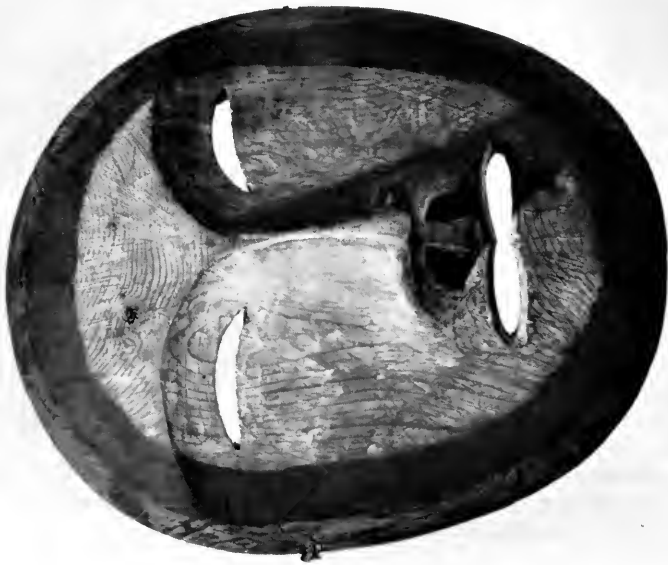


PLATE 34. Masks; left (12932), right (12933).

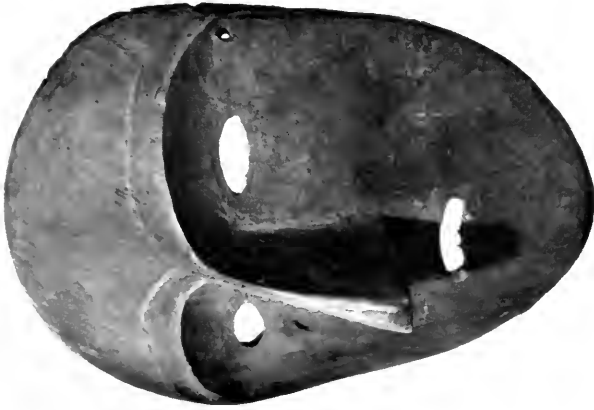
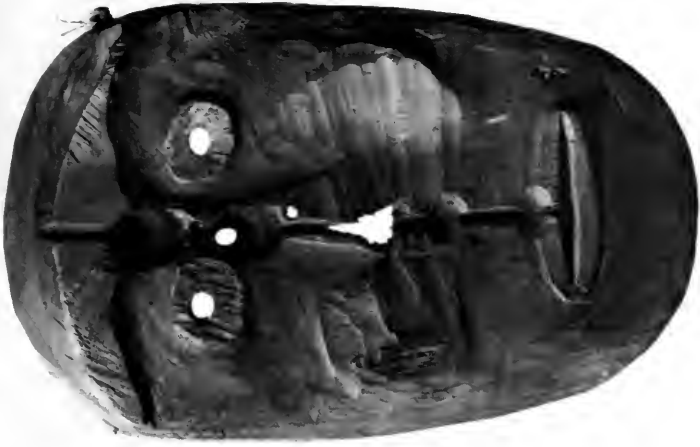


PLATE 35. Masks; left (12934), right (12935).

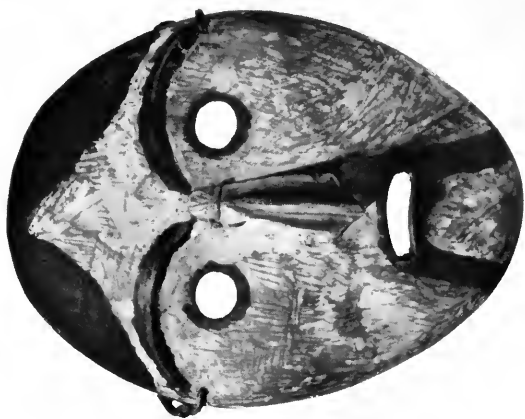
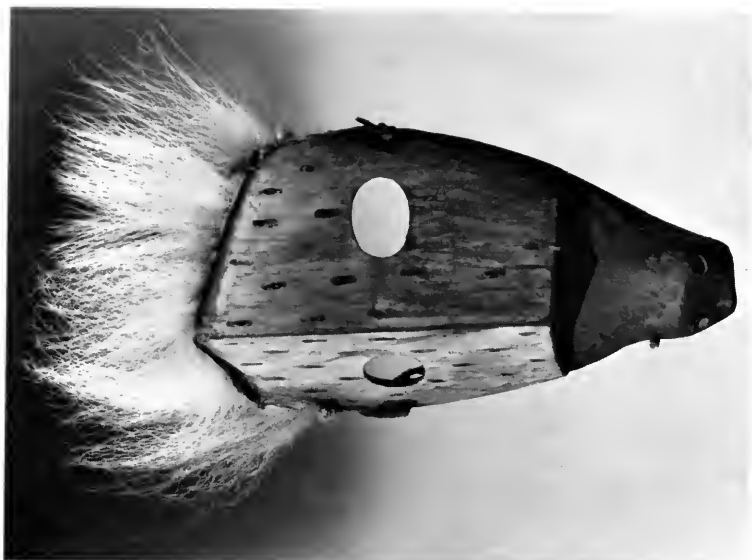


PLATE 36. Masks; left (12936), right (12937).

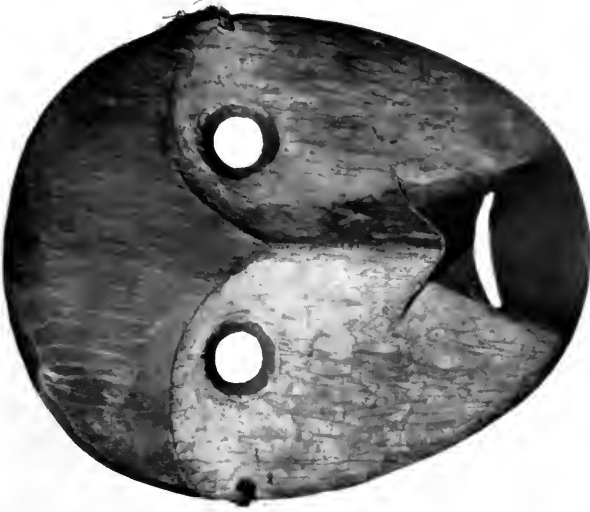


PLATE 37. Masks; left (12938), right (13420).

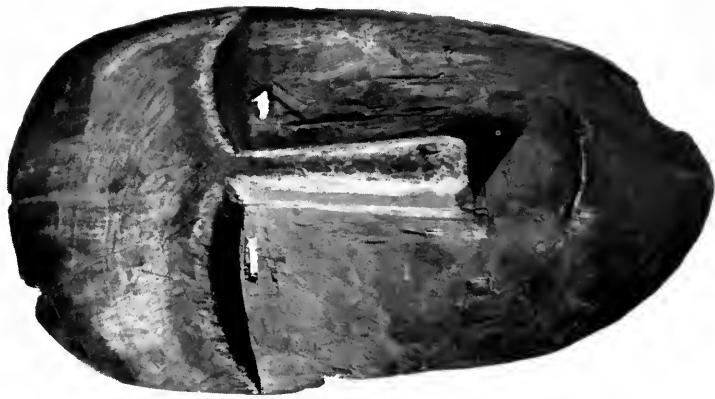


PLATE 38. Masks; left (13421), right (13422).

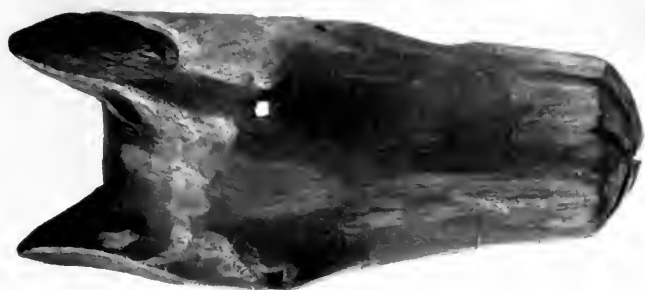
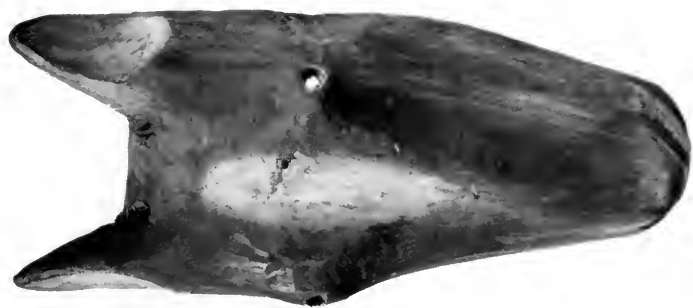


PLATE 39. Masks; left (13423), right (13424).

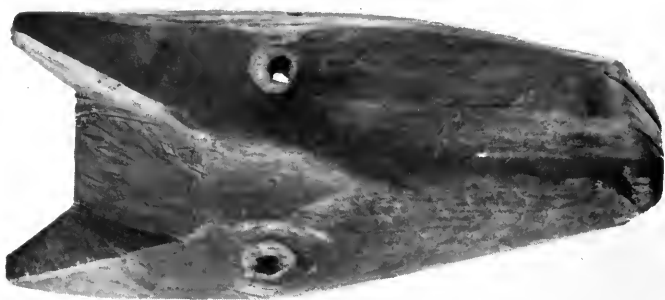


PLATE 40. Masks; left (13426), right (13428).

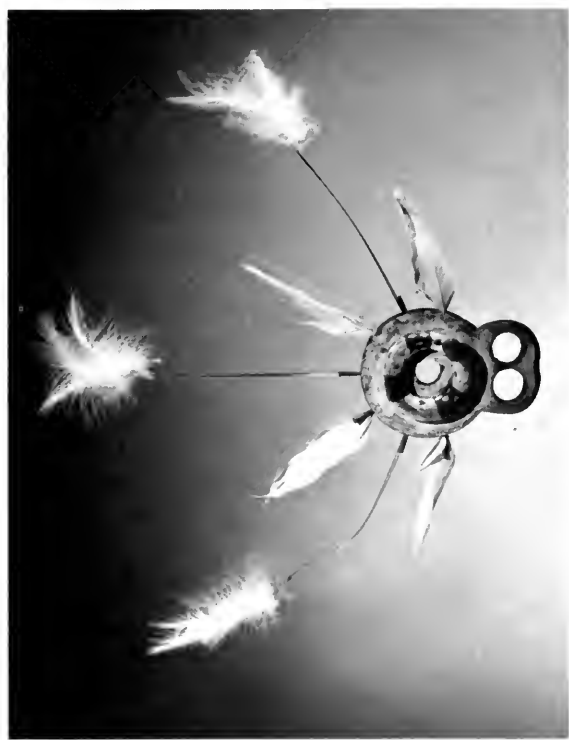


PLATE 41. Masks; left (13429), right (13430).

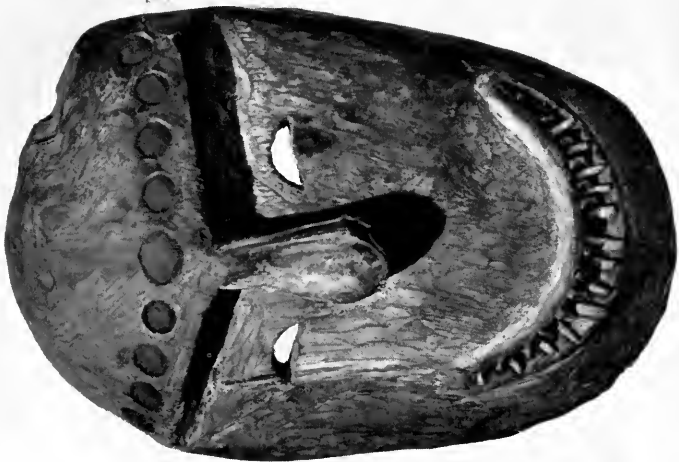
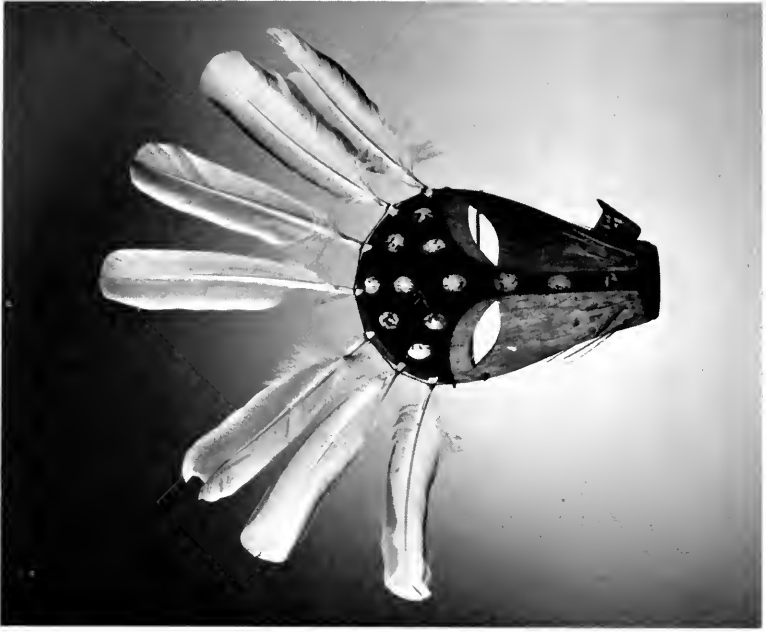


PLATE 42. Masks; left (13431), right (13433).



PLATE 43. Masks; left (13436), right (53482).

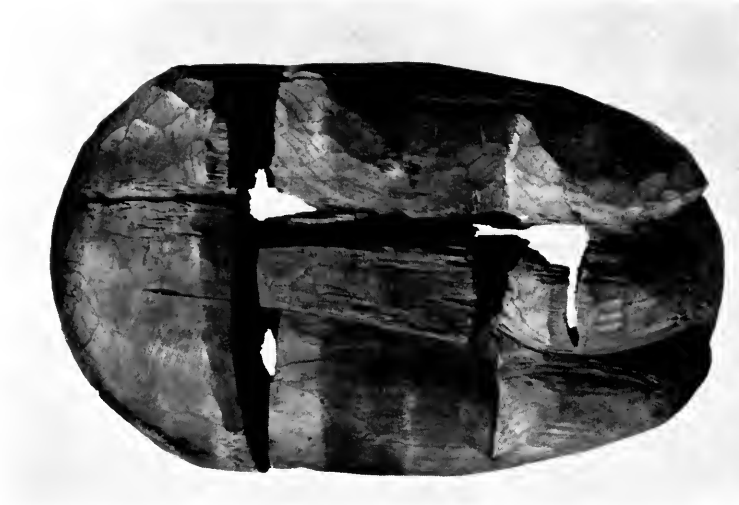


PLATE 44. Masks; left (53483), right (53484).



PLATE 45. Masks; left (53485), right (53486).



PLATE 46. a, fungus ash or tobacco pouch (12203); b, fungus ash or tobacco pouch (12195); c, fungus ash or tobacco pouch (12208); d, container for fungus ash or tobacco (12276); e, container for fungus ash or tobacco (12277); f, drum handle (12355); g, container for fungus ash or tobacco (12260); h, container for fungus ash or tobacco (12261); i, dance wand (?) (13177); j, container for fungus ash or tobacco (12262); k, snuff or tobacco bag (12258); l, container for fungus ash or tobacco (12278); m, necklace (13588).

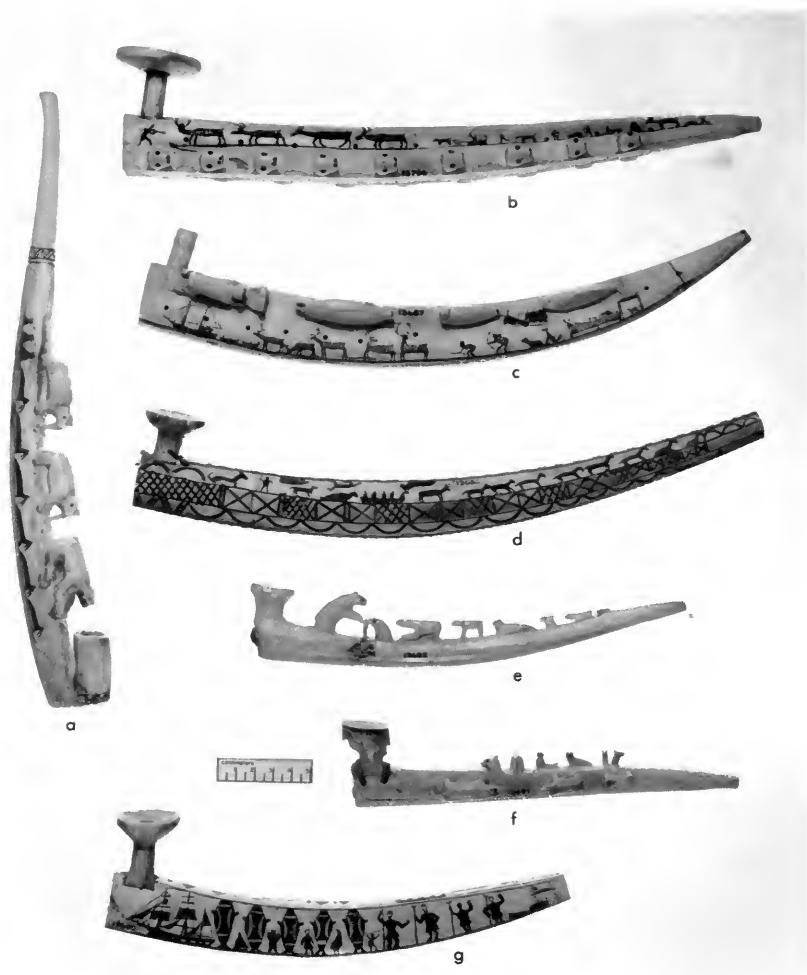


PLATE 47. a, pipe (13703); b, pipe (13706); c, pipe (13687); d, pipe (13686); e, pipe (13692); f, pipe (13697); g, pipe (13690).



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