ARCTIC
VOL. 40, NO. 1 (MARCH 1987) P. 16-32

The Bowhead vs. the Gray Whale in Chukotkan Aboriginal Whaling

IGOR I. KRUPNIK[1]

(Received 5 September 1984; accepted in revised form 22 July 1986)

ABSTRACT. Active whaling for large baleen whales — mostly for bowhead (*Balaena mysticetus*) and gray whales (*Eschrichtius robustus*) — has been practiced by aborigines on the Chukotka Peninsula since at least the early centuries of the Christian era. The history of native whaling off Chukotka may be divided into four periods according to the hunting methods used and the primary species pursued: *ancient* or *aboriginal* (from earliest times up to the second half of the 19th century); *traditional* (second half of the 19th century to the 1930s); *transitional* (late 1930s to early 1960s); and *modern* (from the early 1960s).

The data on bowhead/gray whale bone distribution in the ruins of aboriginal coastal sites, available catch data from native settlements from the late 19th century and local oral tradition prove to be valuable sources for identifying specific areas of aboriginal whaling off Chukotka. Until the 1930s, bowhead whales generally predominated in the native catch; gray whales were hunted periodically or locally along restricted parts of the coast. Some 8-10 bowheads and 3-5 gray whales were killed on the average in a "good year" by Chukotka natives during the early 20th century. Around the mid-20th century, however, bowheads were completely replaced by gray whales. On the basis of this experience, the author believes that the substitution of gray whales for bowheads, proposed recently by conservationists for modern Alaska Eskimos, would be unsuccessful.

Key words: bowhead, gray whale, aboriginal whaling, Chukotka, Asiatic Eskimos, Chukchis

RÉSUMÉ. Depuis au moins les premiers siècles de l'ère chrétienne, les aborigènes de la péninsule Chukotka ont fait une chasse active aux grandes baleines à fanons, en particulier la baleine boréale (*Balaena mysticetus*) et la baleine grise de Californie (*Eschrichtius robustus*). L'histoire de cette chasse autochtone à la baleine au large de la péninsule Chukotka peut être divisée en quatre périodes selon les méthodes de chasse utilisées et les espèces primaires poursuivies: la période *ancienne* ou *autochtone* (des premiers temps jusqu'à la deuxième moitié du 19e siècle); la période *traditionnelle* (deuxième moitié du 19e siècle jusqu'aux années 1930); la période *transitionnelle* (fin des années 1930 jusqu'au début des années 1960); et la période *moderne* (à partir du début des années 1960).

Les données sur la distribution d'ossements de baleines boréales et grises dans les ruines de sites autochtones côtiers, les données de prises disponibles de colonies autochtones de la fin du 19e siècle et la tradition orale locale comportent des sources importantes permettant d'identifier les régions spécifiques de chasse à la baleine au large de la péninsule Chukotka. Jusqu'aux années 1930, les baleines boréales figuraient en première importance dans les prises autochtones; les baleines grises étaient chassées périodiquement ou localement le long de certaines parties de la côte. Lors d'une «bonne année», une moyenne de quelque 8 à 10 baleines boréales et de 3 à 5 baleines grises de Californie étaient tuées par les autochtones de Chukotka. Vers le milieu du 20e siècle cependant, les baleines boréales furent complètement remplacées par les baleines grises. Selon cette expérience, l'auteur croit que la substitution des baleines grises par des baleines boréales, proposée pour les Inuit modernes de l'Alaska par des partisans de la défense de l'environnement, ne connaîtrait aucun succès.

Mots clés: baleine boréale, baleine grises de Californie, chasse autochtone à la baleine, Chukotka, Inuit asiatiques, Chukchis

Traduit pour le journal par Maurice Guibord.

РЕЗЮМЕ. Интенсивная охота на крупных промысловых китов -- преимущественно на гренландских (полярных) (*Balaena mysticetus*) и серых китов (*Eschrichtius robustus*) -- велась коренными жителями Чукотского полуострова по крайней мере с начала нашей эры.

История охоты на китов обитателями Чукотки может быть подразделена на четыре периода в зависимости от метода охоты и основных промысловых особей: древний или коренной (с древнейших времен до второй половины 19 века); традиционный (со второй половины 19 века до 1930х годов); переходный (со второй половины 1930х годов до начала 1960х); и современный (с начала 1960х годов).

Данные о находках костей гренландских и серых китов в местных прибрежных районах, имеющиеся сведения о китовых уловах в коренных поселениях с конца 19 века и местная устная информация оказались ценными источниками для выделения определенных районов охоты на китов коренным населением Чукотки.

До 1930х годов гренландских киты обычно представляли большую часть местного улова; на серых китов охотились время от времени или в определенных ограниченных частях побережья. Примерно 8-10 гренландских китов и 3-5 серых китов представляли добычу туземцев Чукотки в "удачный год" в начале 20 века. Около середины 20 века, однако, гренландские киты были полностью вытеснены серыми китами.

Учитывая эти обстоятельства, автор считает что замена гренландских китов серыми, недавно предложенная сторонниками охраны окружающей среды для современных эскимосов Аляски, окажется безуспешной.

Ключевые слова: гренландский (полярный) кит, серый кит, коренной китовый промысел, Чукотка, Азиатские Эскимосы, Чукчи

Перевел для журнала Илья Солитерман.

[1]Institute of Ethnography, Academy of Sciences, 19, Dm. Ulyanova St., 117036, Moscow, U.S.S.R.

INTRODUCTION

Modern archaeology traces the existence of active whaling by Chukotka aborigines back to the first centuries of the Christian era (Rudenko, 1947; Arutyunov and Sergeev, 1969, 1975; Dikov, 1971, 1977; Anderson, 1981). During recent decades, thousands of whale bones have been identified and inventoried in the ruins of numerous ancient sites along the coastline of the Chukotka Peninsula, from Kresta Gulf to the shores of the East Siberian Sea. These bones formerly were used as the main building material in the construction of underground dwellings, meat cellars, skin-boat holders, storage racks and graveyards. The importance of whaling in the aboriginal lifestyle is substantiated by numerous discoveries of implements for killing and flensing whales and by ancient rock paintings depicting whaling scenes. For recent centuries, it is evident also in European narratives, native folklore and oral tradition and local records.

Until recently the species orientation of aboriginal whaling in Chukotka was not questioned. The predominant opinion was that the ancient whalers hunted for the bowhead whale (*Balaena mysticetus*) exclusively. Demarcation of distinct areas of aboriginal whaling, particularly of the whale species *most hunted*, was raised only recently, following coastal surveys and archaeological investigations on the eastern shore of the Chukotka Peninsula. These brought to light a number of ancient settlements and ritual areas built of bowhead and/or gray whale bones (Arutyunov *et al.*, 1979, 1982; Chlenov, 1982; Chlenov and Krupnik, 1984; Bogoslovskaya *et al.*, 1979; Krupnik *et al.*, 1983; Krupnik, 1983, 1984).

The new data — complete through 1984 — show that the role of whaling varied in the economies of different aboriginal groups in Chukotka. They also indicate that the ranges of bowhead, gray and some other large baleen whales off the Chukotka Peninsula largely or entirely overlapped until the very recent past (Nikulin, 1947; Tomilin, 1957; Berzin and Rovnin, 1966; Alaska Geographic, 1978; Haley, 1978; Zemski, 1980). Therefore, a preference for a particular species in the aboriginal catch was obviously determined by very local ecological conditions or by specific cultural traditions. To explain these new facts, it is necessary to summarize the available archaeological, ethnohistorical and biological data on local aboriginal whaling (Krupnik, 1979, 1980, 1982, 1984; Bogoslovskaya *et al.*, 1982, 1984; Krupnik *et al.*, 1983).

HISTORICAL REVIEW

The history of whale hunting by Chukotka aborigines — Asiatic (Siberian) Eskimos and Maritime Chukchis — may be divided into four periods: (1) ancient or aboriginal (from ancient times to the second half of the 19th century), (2) traditional (last half of the 19th century to the 1930s), (3) transitional (late 1930s to early 1960s) and (4) modern (since the early 1960s) (*cf.* Marquette and Bockstoce, 1980; Krupnik, 1982, 1984; Krupnik *et al.*, 1983). These periods differed in the types of whaling gear and hunting methods used, in the ratio of cetacean species harvested and in the general importance of whaling in the native economy. A remarkable evolution of the social, ritual and ideological place of whaling in local customs is also apparent.

Ancient Period

Due to our scarce knowledge of the early prehistory of the Chukotka Peninsula and to the paucity of radiocarbon dates, the precise time of the appearance of aboriginal whaling in Chukotka is a matter of conjecture. However, specialized whaling existed there at least by the first or second century A.D., since vast accumulations of whale bones and baleen, with remnants of well-developed hunting and flensing implements (e.g., large toggle-head harpoons, lances, stone flensing knives) are widely known from Okvik and Old Bering Sea (OBS) sites on different parts of the coast (*cf.* Rudenko, 1947; Arutyunov and Sergeev, 1969, 1975; Dikov, 1967, 1974, 1977; Teyn, 1980). The location of the major sites representing this period are shown in Figure 1 and are listed, with references, in Table 1.

Old Bering Sea and Okvik were the earliest neo-Eskimo whaling cultures found in Chukotka. They were also the first in the chronological sequence of the so-called Arctic Maritime Tradition, characterized by active open-water hunting for large sea mammals from multi-seat skin boats with bone toggle-head harpoons fastened to drag sealskin floats (Larsen and Rainey, 1948; Rainey, 1958; Giddings, 1960; Arutyunov, 1979; Anderson, 1981).

Ancient methods of Chukotka whaling must be reconstructed according to later narratives and the highly realistic paintings of the Pegtymel petroglyphs on the arctic coast (Dikov, 1971). The earliest references to whale meat consumption by Chukotka aborigines comes from Russian cossacks of the early 18th century (1710; see Institut Narodov Severa, 1935). The first accounts of aboriginal whaling methods were presented, according to these narratives, by G. Steller in 1744 (Steller, 1938) and S. Krasheninnikov in 1756 (Krasheninnikov, 1949). The first documented landing of a whale by Chukotkan natives was observed in September 1778 (Cook, 1971); the first description of hunting practices was in the autumn of 1791 (Titova, 1978); and the first account of actually observed native whaling was in August 1856 (Heine, 1859).

According to these sources, the hunting process included the pursuit or close approach of a whale in boats moved by paddles on the open water, striking the animal with one or more harpoons with skin drag floats attached and the use of a large killing lance for the *coup de grace*. These methods seem to have changed little during the entire ancient period. Only toward the end of that period did the rectangular skin sail appear (Bogoras, 1904), and only in the late 18th century were bone and flint harpoon points replaced by iron blades obtained by natives from Russians.

Unfortunately, except for one recent publication (Teyn, 1980), all the archaeological data on very early whale bone or baleen have been published without the biological identification of the whale species involved. Thus, we can use these data only by analogy with much later stages of Chukotka aboriginal whaling or with synchronous Eskimo sites on St. Lawrence Island. On this basis, one would suspect that the majority of bones and baleen of large whales unidentified as to species (see Fig. 1) were from bowhead whales (*Balaena mysticetus*). But if we take the Pegtymel rock paintings as being realistic sketches of the animals hunted, at least three species pursued by natives in boats can be recognized: the bowhead, the gray and the humpback whale (Dikov, 1971: Figs. 12, 14, 28, 29, 99 — identification by L.S. Bogoslovskaya; *cf.* Jordan, 1980).

The earliest evidence suggesting the possibility of active hunting for gray whales (in addition to the undoubted catch of bowheads) was obtained from the ancient Ekven cemetery, on the northeastern edge of the Chukotka Peninsula. In the report on the excavated burials (Arutyunov and Sergeev, 1975), the

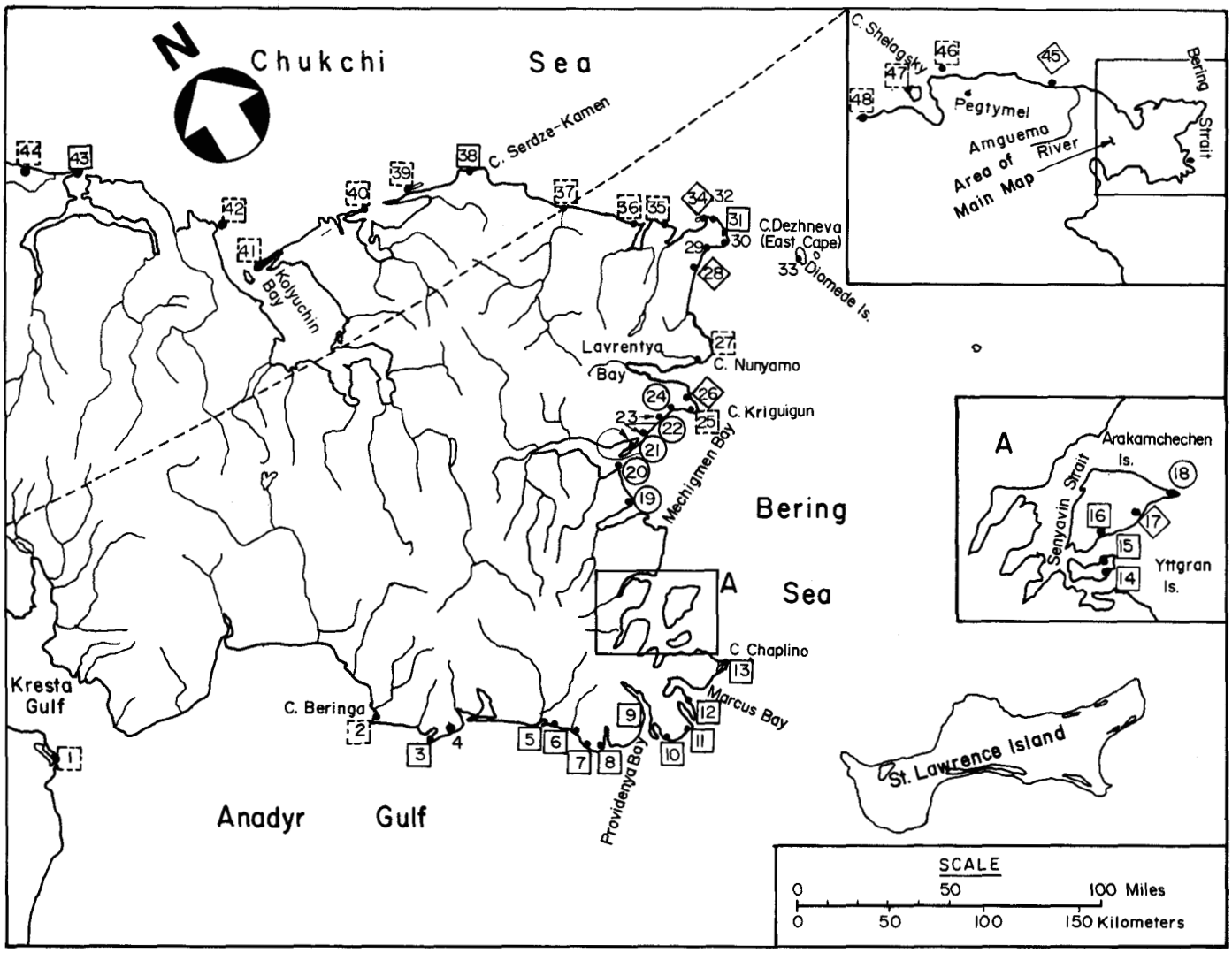

FIG. 1. Location of major ancient whaling sites and/or ruins of communal dwellings with whale bones and carcasses in Chukotka. *Solid square*: bones of bowhead whales predominate; *broken square*: bones of large, unidentified *Mysticetus* sp., but seemingly bowhead; *diamond*: bones of bowhead whales predominate, but bones of gray and/or other whales evidently present; *circle*: bones of gray whale predominate, but bones of bowhead and/or other whales evidently present; *unenclosed number*: whaling (apparently for bowheads) present according to early narratives, folklore and/or oral tradition. These sites are identified in Table 1.

bones of small whales are easily recognized in a number of sketches. They include scapulae 35-45 cm long, mandibles to 1.5 m long and small vertebrae and invertebral discs. Although no osteological analysis was conducted at the time, the archaeologists easily separated these bones from those of large (bowhead?) whales. They now strongly support the present author's idea that these bones formerly belonged to gray whale calves or juveniles (S.A. Arutyunov, pers. comm. 1982).

In the OBS burials of Ekven cemetery (1st-5th centuries A.D.) bones of small whales were rather scarce and could be considered as being the products of irregular hunts or even accidental beach discoveries (S.A. Arutyunov, pers. comm. 1982). The same could be said of the occasional discoveries of gray whale baleen specimens in the ruins of OBS underground dwellings on Cape Shmidta (Ryrkaipyi) on the arctic coast, where, as in Ekven cemetery, the bones and baleen of bowhead whales predominated (Teyn, 1980). But in the burials of the Birnirk culture, which followed OBS chronologically (5th-7th centuries A.D.), the ratio changed drastically: the number of bones of "small whales" increased, while bones of large (bowhead?) whales disappeared altogether. Some highly specialized toggle-head harpoons were also found in Birnirk burials; they were larger than those used in walrus hunting but smaller than the classic harpoon heads used for large bowheads (Arutyunov and Sergeev, 1975). Nine small whale scapulae of 40-45 cm found in only a single Birnirk grave in Ekven cemetery indicate the intensity of Birnirk gray whaling.

The Punuk culture, which followed Birnirk in Chukotka (9th-15th centuries A.D. — analogous to the Thule Culture of the American Arctic), was evidently the high point of aboriginal whaling off the Chukotka Peninsula (*cf.* Rudenko, 1947; Arutyunov and Sergeev, 1975; Dikov, 1977, 1974 [ed.]; Anderson, 1981). The majority of ancient whaling artifacts (large toggle-head harpoons, killing lances, flint flensing knives) and the vast accumulation of huge whale bones and baleen in the ruins of dwellings and burials and even lying on the beaches have been traced by archaeologists to the Punuk period. These bones have been identified by cetologists and local natives as

TABLE 1. Major Ancient Whaling Sites and/or Ruins of Communal Dwellings Containing Whale Bones

Map key (Fig. 1)	Name	Sources
1	Uelkal	M.A. Chlenov and Yu.M. Rodnyi, pers. comm. 1976
2	Enmelyn	Rudenko, 1947
3	Nunligran	Rudenko, 1947; L.M. Votrogov, pers. comm.
4	Sanlik	
5	Kurgoo	field identifications by author and L.S. Bogoslovskaya, 1979
6	Sinrak	field identifications by author, 1975
7	Sirhenik/Sireniki	field identifications by author, 1975
8	Imtuk	field identifications by author, 1975
9	Yryrak (Plover Bay)	Rudenko, 1947; M.A. Chlenov, pers. comm. 1981
10	Avan	field identifications by author, 1975
11	Kiwak	field identifications by author, 1975
12	Tasik (Chechen, Marcus Bay)	field identifications by M.A. Chlenov, 1976
13	Ungazik (Indian Point)	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
14	Napakutak	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
15	Siklook (Whalebone Allee)	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
16	Yarga (Yergyn)	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
17	SE Coast of Arakamchechen Isl.	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
18	Kygynin	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1977, 1981
19	Nykhsirak/Nykhchigen	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
20	Masik/Mechigmen	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
21	Raupelyan	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
22	Lorino	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
23	Ilyan	Destroyed
24	Kukoon	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
25	Akkani	field identifications by author and M.A. Chlenov, 1981
26	Yandogai	field identifications by author, L.S. Bogoslovskaya and M.A. Chlenov, 1981
27	Nunyamo	Dikov, 1977
28	Ekven (and cemetery)	Arutyunov and Sergeev, 1975
29	Dezhnev/Tunitlyn	M.A. Chlenov, pers. comm. 1981
30	Nunak	
31	Naukan (East Cape)	Rudenko, 1947; M.A. Chlenov, pers. comm. 1981
32	Mamrokhpak	
33	Imaklik (Big Diomede Island)	
34	Uelen (and cemetery)	Arutyunov and Sergeev, 1969; Dikov, 1967
35	Inchoun	Dikov, 1977
36	Uten	Dikov, 1977
37	Chegitoon	Dikov, 1977
38	Enurmin (Szerde-Kamen)	Dikov, 1977; V.V. Lebedev, pers. comm. 1982
39	Idlidlya Isl.	Dikov, 1977
40	Neshkan	Dikov, 1977
41	Belyak's Spit	Dikov, 1977
42	Kolyuchin Isl.	Kiber, 1824; Nordenskøld, 1880; Dikov, 1977
43	Vankarem	Nelson, 1899; Dikov, 1977
44	Noot Spit	Dikov, 1977
45	Rirkaipyi (North Cape)	Nordenskøld, 1880; Dikov, 1977; Teyn, 1980
46	Shalaurov Isl.	Wrangell, 1948; Beregovaya, 1960
47	Ayon Isl.	Sverdrup, 1930; Dikov, 1977
48	Cape Baranov	Beregovaya, 1953; Okladnikov and Beregovaya, 1971

belonging to the bowhead whale (Tomilin, 1957; Bogoslovskaya *et al.*, 1982). Punuk whaling must have been intense, as dozens of bowhead skulls and mandibles have been found in the ruins of underground dwellings at many points along the coast (see Krupnik, 1983). Remains of some 60 bowheads are still preserved at "Whalebone Allee," the Punuk Eskimo memorial site discovered recently on Ittygran Island, on the southeastern edge of the Chukotka Peninsula (Arutyunov *et al.*, 1982).

During the Punuk and the subsequent "precontact" time (15th-17th centuries A.D.), the area of aboriginal whaling for bowheads reached its maximum geographic extent in the history of native whaling off Chukotka. Judging by the distribution of underground dwellings constructed with whale bone, it extended from Kresta Gulf to Cape Ryrkaipyi (Shmidta) and to Shalaurov Island on the arctic coast (see Fig. 1). The extension of active whaling practices westward along the arctic coast from Cape Shelagski to Ayon Island and Cape Baranov (*cf.* Beregovaya, 1953) is doubtful, though some bones of large whales(?) are found there in the ruins of ancient underground dwellings. From the 18th to the early 20th centuries, bowhead whales were periodically observed in the East-Siberian Sea even farther west, up to the Kolyma mouth (Tomilin, 1957).

The catch was evidently oriented to bowhead juveniles and calves. This view is strongly supported by the folklore and the

oral traditions of native hunters, which stress that their ancestors hunted mainly for "small bowheads." (Asiatic Eskimos usually referred to these small whales as "ingutuk" [author's field data] but, in contrast to Alaskan Eskimos [Braham *et al.*, 1980], considered them bowhead yearlings and not a distinct whale species.) This view is further substantiated by the dimensions of the whale bones preserved at Punuk sites. The most common are bowhead skulls, with widths of 2.2-2.4 m, while adult skulls 2.6-3.0 m in width are very rare (field materials of 1977-81; see also author's measurements in Arutyunov *et al.*, 1982:165-167).

The Punuk, precontact and early contact areas of bowhead whaling embraced all the main native settlements of the Chukotka Peninsula, both Eskimo and Chukchi (Fig. 1). However, there was a gap in the central part of the east coast, centered around Mechigmen Bay, from Cape Kriguigun up to Arakamchechen Island. This part of the coastline was surveyed in 1977, 1979 and especially 1981 (Arutyunov *et al.*, 1982; Chlenov, 1982; Bogoslovskaya and Votrogov, 1982; Chlenov and Krupnik, 1984; Krupnik *et al.*, 1983; Krupnik, 1984). A number of abandoned aboriginal settlements were examined and discussed with their former inhabitants, who, unlike other Chukotka aborigines, used to hunt primarily for gray whales, particularly the nursing young and yearlings (Chlenov and Krupnik, 1984).

At the Masik site, located at the entry of Mechigmen Inlet, some 1000 small gray whale skulls, more than 20 bowhead skulls and a dozen unidentified baleen whale skulls were found and described (Arutyunov *et al.*, 1982; Chlenov, 1982; Krupnik *et al.*, 1983; Chlenov and Krupnik, 1984). A considerable number of small gray whale skulls were preserved at other sites in this region: at Nikhsirak more than 120; at Kukoon *ca.* 130; at Raupelyan *ca.* 70; at Lorino and Ilyan now destroyed; and at Cape Kygynin and the southeast coast of Arakamchechen Island *ca.* 60. The overwhelming majority of skulls observed are 60-80 cm in width, indicating 5- to 6-month-old calves. Considering the likelihood that the bulk of bone remnants is still buried under the surface, we can assume that a total of some 2000-3000 gray whale calf skulls might be deposited there (Chlenov and Krupnik, field materials). It should be stressed that bones of adult gray whales are absent at all the sites observed (with the exception of Cape Kygynin), although skulls, mandibles and other bones of bowheads are present everywhere in varying numbers.

Such a noticeable homogeneity of bone remnants suggests the former existence of a specialized sea mammal hunting area or even a highly specialized maritime culture based on the harvest of gray whale calves, with seal and walrus hunting being of minor significance (see Chlenov and Krupnik, 1984). The northern limit of this cultural area was apparently the Kukoon site, to the west of Cape Kriguigun, and the southern limit was at small camps on the southeastern shore of Arakamchechen Island. All of the sites in the area were populated from at least the 16th century A.D. to the 18th-19th centuries. They were inhabited by Eskimos, who were later assimilated or displaced by Maritime Chukchis (Chlenov and Krupnik, 1984).

Most of the settlements were placed at points where modern gray whale calves regularly approach close to shore. Close approaches of gray whale calves to the shore have been noted recently in Mechigmen Bay, at Capes Kygynin, Leimin, Khalyustkina and Pouten, at the mouth of the Kurupka River and at the entrance of Achchon Lagoon (Bogoslovskaya and Votrogov, 1982; L.S. Bogoslovskaya, pers. comm. 1982). The ruins of large sites of ancient hunters for gray whale calves have been observed at five locations; two more recent stations have not yet been investigated.

We have little direct information, and no data on catch statistics, on native whaling up to the mid-19th century — i.e., for the whole ancient period. The sporadic observations of successful aboriginal whale hunts near the anchorages of Russian or European vessels in the late 18th-early 19th century are too scarce to permit reliable estimates. The only examples come from Lavrentya Bay in 1778 and 1816 (Cook, 1971; Kotzebue, 1821) and Kolyuchin Island in the early 1820s (Kiber, 1824). The same is true of native folklore traditions, which sometimes stress the harvest of "several" whales in successive years, and sometimes several in one successful year, at a number of aboriginal sites, including Naukan, Ungazik, Cape Kygynin and the Senyavin Strait islands (Rubtzova, 1940, 1954; Menovshchikov, 1975).

John Bockstoce (1977) believes that, before the start of the commercial Yankee whaling industry in the North Pacific in the mid-19th century, Alaskan Eskimos annually killed four times as many bowhead whales as they did at the dawn of the 20th century. Such a ratio yields a figure of some 40-50 whales taken annually by the 3500-4000 coastal Eskimos of northwestern Alaska. This figure is supported by the available harvest data of 10-15 bowheads killed in a "good year" at a single large settlement, such as Point Hope or Point Barrow, in the mid-19th century (Durham, 1979; Marquette and Bockstoce, 1980).

The same ratio (4:1) was not true of aboriginal whaling in Chukotka. Ice conditions and the prevalence of open-water hunting off Chukotka made native whaling on the Siberian side far less productive than on the American side, even in periods of abundant whale stocks. The highly specialized ancient mode of whaling for bowheads from shore ice by hunters armed with killing lances was reported only at Uelen village (Leontyev, 1973; V.V. Leontyev, pers. comm. 1982, 1983).

The size of ancient whaling villages and the amount of preserved bone indicates the regular catch of some bowheads(?) at only a few sites: Sireniki, Sinrak, Avan, Ungazik and Naukan, and probably also at Uelen, Big Diomede and Kolyuchin Island (the latter three not having been visited by the author). At other sites whales certainly were harvested occasionally, but bones for dwellings and storage racks were obtained mostly from beached animals or from ancient house ruins.

There is no need to exaggerate the efficiency of precontact and early contact gray whaling in the Mechigmen Bay area as well. With an annual harvest of 5-10 gray whales for all the sites (but mainly at Masik), the 1000-3000 whale skulls still preserved could have been deposited during the rather short time span of two or three centuries. As yet we have no evidence on which to base identification of the "small summer whales" reportedly harvested by natives at some other locations during the 18th and early 19th centuries in the Senyavin Strait area, Kolyuchin Island, and westward from the Amguema mouth (Rubtzova, 1940; Kiber, 1824; Titova, 1978). No data on loss ratios in aboriginal whaling before the late 19th century are available.

The high social and ideological position of whaling in the native culture throughout the aboriginal period can be deduced from ethnographic data acquired in the 19th and 20th centuries, from folklore and oral tradition and from numerous findings of whale amulets, sculptures and rock paintings (Zhurov and

Sergeev, 1962; Ivanov, 1954; Glinskii *et al.*, 1982; Chlenov, 1981). Some brief accounts of native whaling festivals and rituals from the late 18th and early 19th century are also available (Titova, 1978; Lazarev, 1950; Hooper, 1976). Judging from these data, the symbolic role of the bowhead whale seems to have been extremely important in both Eskimo and Maritime Chukchi cultures. During specific periods, it reached a particularly high level of elaboration, as judged by complex ceremonial centers and special sacrificial structures. Visual remnants of this epoch can be seen in the ancient bowhead whale memorial on Ittygran Island ("Whalebone Allee") and in the numerous bowhead skulls and mandibles erected at different places along the Siberian coast (Arutyunov *et al.*, 1982).

The ideological role of whales other than bowheads is hardly known. Still, a number of ritual structures built from gray whale calves' skulls was discovered recently in the Mechigmen Bay area (Chlenov and Krupnik, 1984). Hooper (1976) also reported a whale festival at Providenya Bay in winter 1849 as being dedicated to the successful hunt of a humpback whale. In a ritual song, the whale killed was named "kapookah" (*quipuqaq* = "the humpback whale" in Siberian Yupik).

Traditional Period

This was the time of the sharp depletion of all whale stocks off the Chukotka Peninsula by Yankee commercial whalers and the extermination of wintering gray whales in the lagoons of southern California (Scammon, 1968; Tomilin, 1957). It was immediately followed by a rapid decrease in the productivity and extent of native whaling in Chukotka (see evidence and local references in Gondatty, 1898; Bogoras, 1904; Kalinnikov, 1912; Karaev, 1926; Vdovin, 1965), accompanied by mass starvation and other disasters, mostly between the 1870s and 1890s. The native yearly cycle, methods of whaling and modes of distribution changed as well.

Bogoslovskaya (in Bogoslovskaya *et al.*, 1982) concluded that by the late 19th century Yankee whalers had exterminated a distinct stock of bowhead whales that formerly had fed in the summer months in the coastal waters of Bering Strait, Bering Sea and the southern Chukchi Sea. It was apparently the very stock exploited previously by Chukotka aboriginal hunters. If this conclusion is correct, the timing and productivity of the native bowhead whaling, which has been reconstructed in detail for the late 19th-early 20th centuries (Krupnik, 1979, 1980; Bogoslovskaya *et al.*, 1982), had to have been recent developments.

By the late 19th century, local whalers in Chukotka, both Eskimo and maritime Chukchi, had mastered the method of capturing bowheads with Yankee whaling equipment: darting and shoulder guns, wooden whale boats with triangular canvas sails and iron weapons. This hunting complex has been repeatedly described in Russian sources (Kalinnikov, 1912; Razumovski, 1931; Shnakenburg, 1933; Knopfmiller, 1940; Tomilin, 1957) and seems very similar to the recent spring bowhead whaling methods of the St. Lawrence Island Eskimos. According to local informants, there was little change in native whaling techniques between 1890 and 1940.

The introduction of Yankee gear did not bring drastic changes to aboriginal whaling procedures in the early 20th century. They retained the main traits of ancient hunting tactics (*cf.* Durham, 1974), as whales continued to be approached in skin or wooden boats on open water, using sails and/or paddles, and then harpooned. The size and number of boat crews engaged in hunting remained stable, as did traditional norms of inter-crew cooperation and intra-crew role differentiation. Some ancient gear remained in active use as well: large skin boats, wooden paddles, sealskin drag floats, walrus lines and killing lances.

According to informants, killing lances continued to be used in all whaling communities up to the mid-20th century. In the village of Sireniki some large bowheads were killed by killing lances as recently as the early 1930s, without the use of European firearms. Sleeping whales were approached silently in umiaks, and the two most skilled harpooners struck them simultaneously from both sides with lance thrusts to the heart. The dead whale was transported to shore by all the crews working together, and it was butchered by the whole community in a common effort.

Based on the oldest informants' testimonies, bowheads were the main or, in any case, the most prestigious whale prey in all of the largest native sites along the north and southeastern coasts of Chukotka Peninsula (Fig. 2), for both Eskimos and Chukchis. Active gray whaling was practiced during the traditional period in two areas only: in Mechigmen Bay and its vicinity, and at Uelen village, to the west of East Cape. For the small Chukchi sites in Mechigmen Bay (Mechigmen = Masik, Lorino, Ilyan, Raupelyan), with a combined population of 170-200 people, this gray whaling was evidently part of their cultural heritage dating from aboriginal times. The development of gray whaling by Uelen Chukchis is, however, a matter of controversy. According to Gondatty (1898:IV), ". . . whales were plentiful in Uelen some 20-40 years ago. Those with baleen [bowheads] were successfully pursued, as were those without baleen [gray?]; the latter even more commonly." That active whaling for gray whales occurred at Uelen in the 19th century is strongly supported by local oral tradition (V.V. Leontyev, pers. comm. 1982, 1983).

From about 1910(?) to the 1920s, the Eskimos at Naukan, Avan and Ungazik also conducted some gray whaling. Their hunt was irregular, however, and seems to have been started to compensate for the scarcity of bowheads.

The method of gray whaling during the traditional period, with the use of iron toggle-head harpoons, has been described in general by Scammon (1968), Kalinnikov (1912) and, especially for the Mechigmen Bay area, by Shnakenburg (1933). Additional information was obtained recently by the author from local elders (Krupnik *et al.*, 1983; Krupnik, 1984).

Mechigmen Bay hunting for gray whales usually began in June-July, when the water became ice free, and lasted all summer, whenever whales came close to shore. Yearlings and suckling calves were the only game pursued. As a rule, three to four hunting crews with five to eight hunters from neighboring coastal communities participated in whaling; but in several cases, even one or two crews were known to take a whale. Hunters in skin boats paddled right up to a small whale from its left side and struck it with a large toggle-head iron harpoon with a sealskin drag float attached to a walrus-hide line some 25-30 m long. The strike was made in any part of the trunk, just to fasten the harpoon head with the float attached. The whale plunged immediately, but soon reappeared on the surface, where it was killed with a long iron-headed lance. The best case was to hit the whale's heart on the first strike. The whale then turned on its back after thrashing around; the boats tried to move away from the convulsing animal.

If the mother of the dead calf was near, she usually tried to put

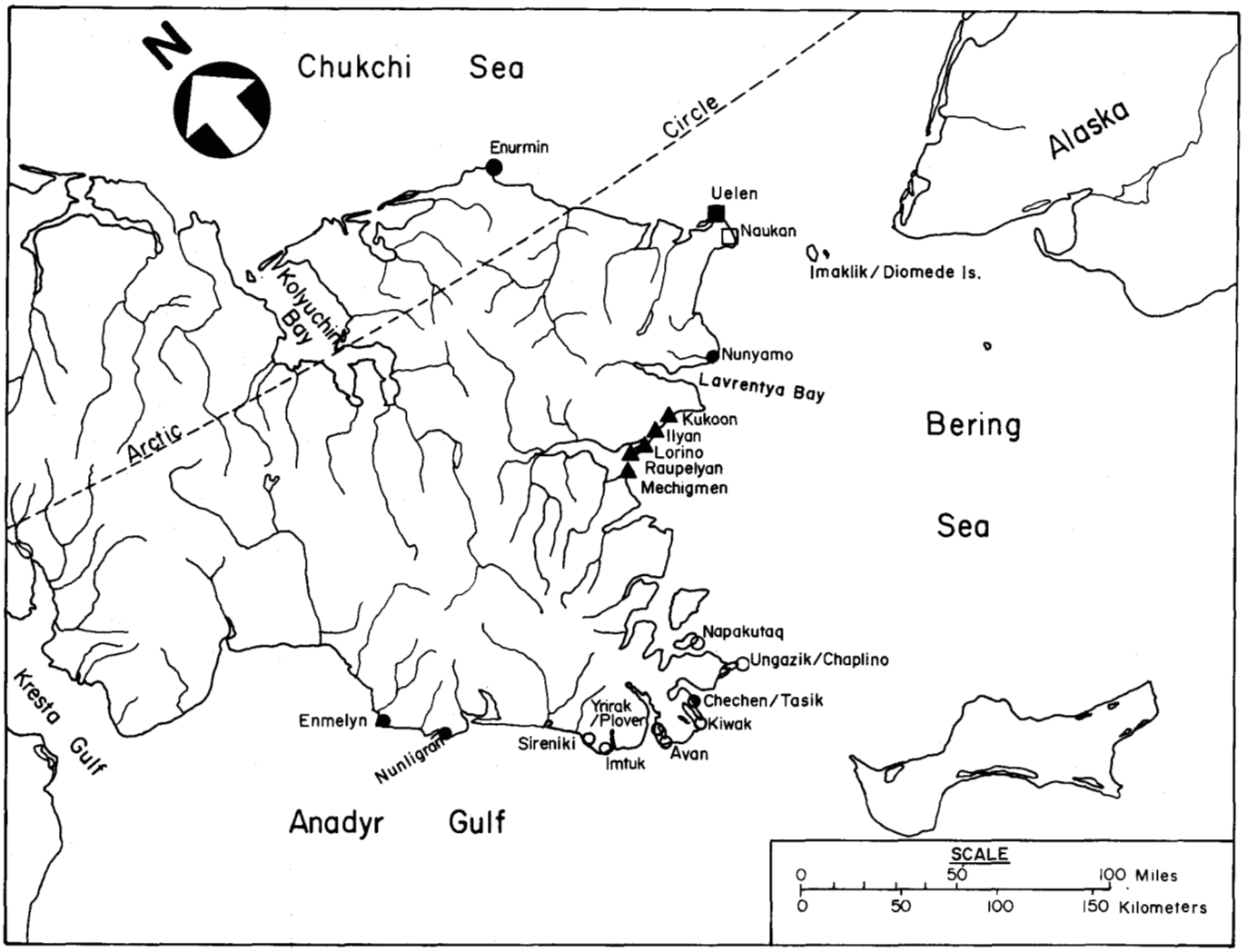

FIG. 2. Active Traditional Period aboriginal whaling sites in Chukotka (late 19th century to early 1930s). *Circle*: bowhead whales predominated, but other whales were sporadically hunted; *square*: the bowhead whale was emphasized in the culture, but gray whales were also regularly hunted; *triangle*: active gray whaling, with no bowheads registered. Open symbols are Eskimo sites; closed symbols, Chukchi sites.

it on her back or else attacked the hunters. To scare her off or to weaken her by loss of blood, the hunters used their firearms. As far as the oldest informants remembered, hunters never pursued adult gray whales, who were considered too dangerous to hunt and too heavy to transport and process. When outboard motors were introduced in the early 1930s, hunters started driving the whales at full speed, trying to separate the calf from its mother and get it closer to shore. If there was only a single calf, it was not difficult to take, the old hunters said, because, when harpooned, it quickly became weakened due to loss of blood.

At Uelen in the 1930s, gray whales coming close to the shore were simply shot with rifles from the cliffs. The hunters fired in volleys at the breathing hole. When the whale was weakened by blood loss, skin and wooden boats were launched in pursuit. The whale was struck with harpoons with drag floats attached and was dispatched with lances or rifles if necessary. Both calves and full-grown animals were hunted in this way (V. Leontyev, pers. comm. 1982). As Uelen elders recall, prior to the early 20th century, gray whales were also hunted in the same way as bowheads: with harpoons and lances only. When a whale was seen moving along the shore, skin boats with paddles were immediately launched in pursuit, aiming to meet it in a line. When the whale appeared at one boat, it was hit with a harpoon with drag floats attached; then it was struck with harpoons two or three more times, if necessary, and finished with a killing lance (V.V. Leontyev, pers. comm. 1982).

At Naukan village, young gray whales and calves have been hunted actively since the mid-1930s during the summer months (July-August). As Naukan elders recall, they were pursued from wooden whale boats and killed with rifles; no darting or shoulder guns were used. Hunters approached the whale, fired in volleys at the breathing hole or at its lips and nose (to destroy the breathing cycle), then struck the animal with an iron harpoon with drag floats attached. At the southern Eskimo communities of Ungazik and Avan, a few full-grown gray whales were also killed between 1910 and 1940, but with darting and shoulder guns (according to informant recall).

The dead gray whale was taken ashore in the same manner as a bowhead, with additional drag floats attached. The processing was done in the surf near the village (in Mechigmen Bay) or on the beach (in Uelen); in the latter case the carcass was pulled ashore by all the members of the community working together. At Mechigmen, Lorino and Raupelyan, according to informants, small gray whales were cut into large pieces, with head

and flippers being removed separately. Meat was stocked in open caches made of gray whale skulls located near the houses. Slices of dried or jerked meat, flippers and whale tongue were also put in the same caches.

Terletzkii (1967:129-130) presents a detailed account of the transportation and processing of a large gray whale(?) killed at Uelen on 24 August 1938. The whale, some 16-17 tons, was taken by a single crew and transported to the beach by four crews in whale and skin boats. It was pulled ashore by the (45-55) men of the village, using walrus and manila lines. Skin with blubber attached was cut in 11 strips and was removed first; later it was divided into 114 pieces of 50-60 kg each. Meat and usable viscera (heart, liver, etc.) were cut into 142 equal portions; the head, including the tongue and gum tissue, was divided into 8 large sections.

The work was done by several(?) hunters, assisted by the men and youths of the community. The successful captain, a rather young person, supervised the butchering and meat distribution. The meat and blubber of the whale were divided among the eight boat crews existing at the community and then distributed among the several families. All of the elders were also presented by the captain with pieces of muktuk, weighing some 15-20 kg, right at the butchering place. Each family thus received *ca.* 200 kg of food. Special parts were allotted to widows, orphans, persons who did not engage in hunting and members of neighboring communities.

Figures on Chukotka native whaling activities were kept during the early traditional period by Yankee whalers. They were extracted from their logbooks by Marquette and Bockstoce (1980) and are summarized here in Table 2, with some additions by the present author.

The period 1910-30 is better documented by local sources,

TABLE 2. Chukotkan Aboriginal Whale Harvest by Site and Year, 1849-1909

	Site Name									
Year	Avan and/or Plover Bay	Chechen and Kiwak	Enurmin	Imtuk and Sireniki	Lavrentya Bay	Naukan and/or Uelen (East Cape)	Nunligran (Preobrazhenya Bay)	Senyavin Strait	Ungazik (Indian Point)	Source
1849						1[b]				1
1851						1				1
1852						1				1
1856								1[b],1[d]		4
1859	4									1
1865						1[b]				1
1866	5			3		1[b]				1
1869					2[b]					1
1870	5[a]					1[b]				1
1871				2					1	1
1877						5				1
1880		1								1
1884									5	1
1886	5[a]					5[a]				1
1887						1				1
1889						1[d]				1
1891	0					1				1
1894	1	1							1	1,2
1895						3[b]			3[b]	2,3
1898	4[c]			5[a]						1
1899	1				2[b]	1[b]			1[b]	3
1900	1			1						1
1901							1[b]		1[b]	5
1902				2						1
1903		1								1
1906				3[b]						1
1907	2			1						1
1908		1	2[b]	3		7				1
1909	3[b]									1

[a]Estimated value for "several," "few" or "some" whales reported.
[b]Incomplete data.
[c]Estimated from baleen obtained in trade from natives.
[d]Definitely a gray whale; other figures appear to be bowheads.

1. Marquette and Bockstoce, 1980.
2. Gondatty, 1898.
3. Doty, 1900.
4. Heine, 1859.
5. Bogoras, 1901.

oral tradition and informants' memories. A brief summary of the available data is presented in Tables 3 and 4. Whales landed at native sites during the 1910-30 period were seldom recorded by species. Thus their biological identification (see Table 3) was possible in only a few cases according to the oldest informants' memories and/or other evidence (e.g., season of catch, amount of meat and blubber used).

Active whaling in the early 20th century was practiced at twelve communities in Chukotka (see Fig. 2); 12-15 whales were harvested in a "good" year, of which 8-10 would be bowheads and 3-5 gray whales (Table 3). This harvest is a full-year estimate for the 1910-19 period. More than 13 whales were landed by Chukotkan aborigines in 1908, 14 in 1910 and 6 in 1911 (see Tables 1 and 2). According to Russian government agents' estimates, some 6-8 "large" (bowhead) whales were taken annually in the late 1890s and early 1900s (Suvorov, 1914).

In the 1920s the harvest was a little lower due to unfavorable weather and a scarcity of ammunition; in the 1930s it increased again due to better weather and a better supply of ammunition. According to Shnakenburg's (1933) estimates, the total aboriginal harvest in the 1923-32 period was 66 whales, or 8 whales per year on average. Twenty-eight of them (*ca.* 40%) were young gray whales taken in Mechigmen Bay at four gray whaling stations: Lorino, Ilyan, Raupelyan and Mechigmen.

TABLE 3. Total Number of Whales Landed by Chukotka Natives, 1910-38

Year	No. of Whales	Remarks	Source
1910	14	bowheads only	1
1911	6	bowheads only	1
1915	6		2
1916	1	incomplete data	3
1920	5	incomplete data, three sites only[a]	4
1920s, early	3-10	estimate	5
1922	3		2
1923	1	incomplete data, one site only	6
1924	5	three sites	6
1925	9:3*	*one site only	2,6[b]
1920s, mid	10	estimate	7
1926	5	incomplete data, three sites only	6
1927	8	five sites	6
1928	6	three sites	6
1929	2	incomplete data	6
1930	14	incomplete data, five sites only	6
1931	12:7*	*four sites[c]	8,6[b]
1932	17:15*	*at six sites	2,9,6[b]
1933	20:6	(see d)	2,6[b]
1934	13:7	incomplete data	10,6[b]
1935	5	incomplete data	10
1936	4	incomplete data, five sites only	10
1937	4	incomplete data, six sites only	10
1938	3	incomplete data, three sites only, spring season	10

[a]Ten more whales were partly butchered at Uelen of 27 totally struck.[4]
[b]When two or more different records are available, they are separated by a colon.
[c]Nine to 16 whales (according to different sources) were killed at Uelen, but only 2 were completely butchered. Two others were later used as stinkers at other sites.
[d]Four bowheads and 2 humpbacks; 10 more bowheads were struck at Enurmino, but only one was successfully butchered.[6]

1. Suvorov, 1914.
2. Sergeev, 1936.
3. Otchyot Kamchatskogo RIK'a, 1928.
4. Sverdrup, 1930.
5. State Archive of the Far East, 1923.
6. Magadan State Archive, 1934 (data collected by N. Shnakenburg).
7. Karaev, 1926.
8. Liprandi, 1933.
9. Shnakenburg, 1933.
10. Knopfmiller, 1940.

Based on data from Yankee logbooks (Marquette and Bockstoce, 1980), fragments of other written sources and local tradition, one can estimate the productivity of aboriginal whaling in the 1880-90 period, although much more tentatively. There are some grounds for believing that whaling was then more intensive at Ungazik (Indian Point), Napakutak and Avan (Plover Bay) (see Table 1). No records are available for Napakutak, although oral tradition and remnants of whale bones indicate the importance of whaling there up to the late 19th and early 20th centuries (Bogoslovskaya *et al.*, 1982).

An annual harvest of several (some?) whales was normal for a number of native communities. Thus 16-24 whales in a "good year" seems a suitable estimate of native whaling productivity in the latter half of the 19th century (*cf.* Bodfish, 1936; Marquette and Bockstoce, 1980). Of that number, 10-15 would have been bowheads and 5-8 gray whales. Possible harvest by major stations would be 2-3 bowheads at Naukan and Ungazik; 1-2 bowheads each at Sireniki (with Imtuk), Avan (with Plover Bay), Uelen and Enurmin (Serdze-Kamen); and 1 whale per year each at Nunligran, Chechen, Lavrentya Bay and the Senyavin Strait Islands. In addition, 4-6 gray whales might have been harvested in Mechigmen Bay and 1 whale, occasionally, at Uelen. We must keep in mind, however, that the last quarter of the 19th century was a time of intense aboriginal whaling activity in both Chukotka and Alaska due to the increased demand for baleen by American whalers and traders.

Our information on loss ratios for the traditional period is poor. According to data obtained from local elders, unproductive losses were minimal at Sireniki and Imtuk, where bowheads were usually hunted right in front of the village and very close to shore. Losses were higher at Avan and Ungazik, where one-third of the whales killed was reported lost in transportation or after only partial butchering because of unfavorable weather conditions.

The highest losses were recorded for the arctic coast at Uelen and Enurmin. Sverdrup (1930:247) reported 27 (bowhead?) whales killed (struck?) at Uelen during the 1920 autumn hunting season, of which 17 were lost in transport, and the 10 remaining were only partially butchered due to heavy storms and ice movement. One day of this autumn hunt is described by Leontyev (1982:30-37), who gives a detailed account of native hunting and butchering practices based on his personal experience and on informant testimony. Five bowheads were killed on that day with darting guns by skilled individual hunters pursuing the whales on foot (!) along the narrow lead between pack and young shore ice. One whale was completely processed, but the 4 others were lost because of drifting ice when only partly butchered. Of 16 whales killed at Uelen in 1929, only 2 were completely utilized. Of 10 bowhead whales killed in 1933 at Enurmin, only 1 was fully utilized, the others being lost in storms (Shnakenburg, 1933). Though some Uelen whales were later stranded at Seshan and Enurmin and used there in 1920 and in 1929, 3-4 were lost for every 1 utilized.

Data on the former utilization of strandings (mostly bowheads) are available for a number of native communities, both Eskimo and Chukchi. Meat was widely used for dog food, while

TABLE 4. Available Data on Aboriginal Whale Harvest by Site in Chukotka, 1920-38

Site	Type	Population	No. of crews	Months with hunt	Dominant Species	Native estimate of usual catch	No. of whales landed by year
Avan	Eskimo	60-90	4-6[c]	May, Oct.-Nov.	bowhead	1 sporadically	*ca.* 1922:1; *ca.* 1924:1;[d] 1930:1; 1933:1; 1934-38:0
Chaplino (Ungazik)	Eskimo	250-350	9-15	May-June, Oct.-Nov.	bowhead; humpback periodically	1 every year	*ca.* 1920-22:4;[b] 1923-31:5;[b] 1932:1; 1933:1; 1934-36:0; 1937:1
Chechen and Kiwak	Mix	80-100	5-6	May, Oct.-Nov.	bowhead	1 sporadically	*ca.* 1920:1; 1921-30:1; 1932:1; 1934:1; 1936:1
Chegitoon	Chukchi	50	2	—	—	—	1930:1[f]
Enmelyn	Chukchi	120-130	4-5	April-May	bowhead(?)	?	1928:1; 1930:1
Enurmin	Chukchi	150-180	5-7	Sept.-Oct.	bowhead	?	1902-32:23; 1933:1; 1938:1
Ilyan and Lorino	Chukchi	100-130	4-5	July-Sept.	gray	2-3 every year	1923-32:16[d]
Imtuk and Sireniki	Eskimo	160-200	8-10	April-May, Nov.-Dec.	bowhead	2-3 every year	1920:4; 1923-27:4; 1928:2; 1929:1; 1930:1; 1931:0; 1932:5; 1933:5 + 1;[f] 1934:3; 1935:2; 1937:2; 1938:1[g]
Mechigmen and Raupelyan	Chukchi	50-60	3	July-Sept.	gray	2-3 every year	?
Naukan	Eskimo	330-350	11-14	May-Oct.	bowhead	1 bowhead every year 1 gray periodically	1920:1; 1923-26:4; 1927:1; 1928:0; 1929:1;[f] 1930-31:0; 1932:2; 1933:2;[a] 1933:3;[a] 1934:2; 1935:0; 1936:3; 1937:0; 1938:1[g]
Nunligran	Chukchi	130-140	6	April-May, Oct.-Nov.	bowhead	?	1933:1; 1934:1
Seshan	Chukchi	60	2-3	—	—	—	1930:1[f]
Uelen	Chukchi	250-280	8-10	July-Oct.	bowhead/gray	?	1920:10;[e] 1923-24:4; 1930:2;[e] 1937:1; 1938:1[d]
Uelkal	Eskimo	120-130	4-5	—	—	—	1935:1[f]

[a]Including one gray whale.
[b]Including some(?) gray whales and humpbacks.
[c]With assistance by boat crews from adjacent village of Ureliki.
[d]Gray whale.
[e]Whales partially or completely butchered.
[f]Stinker.
[g]Incomplete year catch or one hunting season only.

skin with blubber (especially with flippers) was used for human consumption. Cases of severe poisoning due to rotten meat consumption are reported by local elders from Ungazik, Sireniki, Avan and other communities. The consumption of stranded whales may be considered a dietary custom, as it occurred even in successful years when there was an abundance of fresh whale or walrus meat available in the caches (e.g., at Imtuk in 1933).

The social and ideological position of bowhead whaling is well documented by written sources for both the 19th and early 20th centuries, and it still is easily inferred from native elders' accounts. At most native communities a number of attitudes and ritual practices connected with whaling survived until the late 1930s. From Lantis's (1938) list we can cite for the Asiatic side the following: the high prestige of boat captains and of the whole crew who first harpooned a whale; fixed norms of whale meat and baleen distribution among eight crews (symbolic number) based on the role of each in the hunt; potlach-like festivals organized by a captain or by his crew in the case of a successful hunt; communal whale festivals at the beginning and conclusion of the whaling season; and ritual treatment of some parts of the whale (see Bogoras, 1909; Voblov, 1952; Ivanov, 1954; Rubtzova, 1954; Zhurov and Sergeev, 1962; Teyn, 1975; Menovshchikov, 1979; Arutyunov *et al.*, 1982; Glinskii *et al.*, 1982).

The ideological role of gray whaling in the native culture during the traditional period is poorly documented. It seemed to have been relatively high in the small Chukchi communities in Mechigmen Bay, where no bowhead whaling was practiced after the mid-19th century. In the winter of 1932 I.S. Vdovin (pers. comm. 1983) participated in a whaling festival at Lorino village after a successful year's kill of two gray whales. In the same year he visited Mechigmen village (at the ancient Masik site) and saw there some ancient wooden ritual figurines of gray whales still being used in whaling festivals. According to V.V. Leontyev (pers. comm. 1983), the successful harvest of a gray whale at Uelen in the 1930s was usually followed by a whaling festival.

At larger, mostly Eskimo, sites where bowhead whaling predominated (e.g., Naukan, Ungazik, Avan, Napakutak), the catch of gray whales was usually considered less prestigious and was accompanied by shortened or simplified rituals. The native attitude toward gray whale meat and maktak (skin with blubber) was much less enthusiastic, and at some communities (Sireniki and Imtuk) even negative. Based on native treatment, we can judge that in those communities where gray whale hunting was incorporated into the native culture during the late 19th-early 20th century only because of the decline of bowhead whaling, it was seen as a less valuable substitute for a bowhead whale in both the nutritional and the social domains.

Transitional Period

The transitional period was characterized by a gradual increase in the area and productivity of the gray whale catch on the Chukotka Peninsula. This development was parallel to the sharp decrease of native bowhead whaling due to the scarcity or aging

of outdated Yankee whaling gear. Oral tradition at all the coastal communities preserves the date when the last bowhead whale was harvested, even if some 40-50 years ago — for example, at Avan in 1933, Kiwak 1936, Enurmin *ca.* 1938, Uelen 1937 (the last, unsuccessful hunt occurred there in 1953 — V. Leontyev, pers. comm. 1982), Ungazik 1941. From that time on, local hunters have harvested gray whales exclusively. Bowhead whaling was preserved at two communities only: at Sireniki, up to 1960, and at Naukan, up to 1946 (with one more bowhead killed in 1952; see Table 5).

Local gray whaling in the 1930s and '40s was done mostly from skin and wooden whale boats with outboard motors, and with rifles and iron-tipped harpoons with skin floats attached. During the late 1940s and '50s the hunt expanded to a much larger scale, with small schooners and cutters and large-caliber guns being used. Both modes of hunting are well documented in narratives and other sources (e.g., Smolyak, 1957; Bezumov, 1960; Leontyev, 1973; Sergeev, 1959; Sooshkina, 1961; Ivashin and Mineev, 1978, 1981; also see photos in Leontyev, 1973; Ivashin and Mineev, 1981) and are still preserved in older hunters' memories. Bowheads and some other large baleen whales apparently were also killed periodically from cutters and brought to native villages, but no specific records are available.

Local gray whaling from wooden boats even during the 1950s included some elements of traditional hunting. Whales were mostly pursued with boats using outboard motors and killed with rifles (by shooting simultaneously from several whale boats). The pursuit of a gray whale in whale boats lasted up to 3-4 hours; the animal was struck with 300-600, sometimes up to 2000, shots (see Sergeev, 1959; Sooshkina, 1961; Ivashin and Mineev, 1981). However, iron toggle-head harpoons with seal-skin floats and iron killing lances were still widely used. Calves and immature animals still predominated in local harvests, as the mean weight of gray whales taken in the 1940s did not exceed 5-8 tons. It increased to 8-12 tons in the late 1950s, although the catch of a full-grown whale from open boats was extremely rare. The hunters who were interviewed unanimously confirmed that these animals were considered to be too fast and too dangerous to pursue in a whale boat.

Gray whale carcasses were transported to the village by boats with additional sealskin floats attached (see photo in Ivashin and Mineev, 1981). They were either processed in the surf or else pulled up on the beach by all the members of the community, just as in the traditional period. Processing sometimes took up to 4-6 hours, with the whole local population engaged, including children (Sergeev, 1959; Sooshkina, 1961; photos and drawings

TABLE 5. Chukotkan Whale Harvest by Local Community, 1940-60[1]

Year	Community Name																				
	Akkani	Alkavtaam	Chaplino	Chegitoon	Enmelyn	Enurmin	Inchoun	Kiwak	Lorino	Meinypylgino	Naukan	Nunligran	Nunyamo	Penkignei	Rapuelyan	Seshan	Sireniki	Uelen	Vankarem	Yandogai	Yanrakynnot
1940																	1*				
1941			1*		0		0	0			0	0		0			1*				0
1942			0		0		0	0			1	0		0			2*				0
1943			0		0		0	0			1	1*		0			1*				0
1944			0		0		0	0	2[2]		0	0		0			0		1		0
1945	1		0	1	0		0	0	6[2]		1	0		1	2	1	2*			1	0
1946								1	3[2]		1*										
1947	4		0				1	0	8		0	1	1				3*	0	0	0	0
1948	5		0				0	0			3	0	5				0		0	0	0
1949	4		0				0	0			0	0	3				1*		0	4	0
1950	5		0				0	0			2	0	4			1	1*		1	2	0
1951								0													
1952	2[2]		1					0[4]			1*									1	
1953	4[2]		2		2				12		7		5				2[3]				3
1954	2[2]		3		0		1[2]						2[2]								0
1955	7		4		0	3	1		22		5						0	3		2	7
1956	14		1		4		1		52		8		10				5	2		9[4]	4
1957	21		1		0		6		43		5[4]	0	6				1*	4			6
1958			3		4		11		68				5				2	10			14
1959	29	1	6	1	2		7		60			0	32				4	19			26
1960	22		8		1	1	7		48	1		2	16				3[3]	14	3		25

[1]Earlier versions of this table were presented in Krupnik, 1984, and Krupnik *et al.*, 1983. Only years with reliable data are listed. Catch data were obtained from informants' communications and/or local periodicals. Bowheads are marked by (*); other figures are for gray whales.
[2]Incomplete data.
[3]Including one bowhead whale.
[4]Village abandoned.

in Ivashin and Mineev, 1981; Davydov, 1971:48, 56, 113). Free sharing of meat, skin and blubber was still widely practiced during the butchering process; local elders, widows and persons absent for some reason still received their shares, as in earlier times. Meat was stored in large communal meat cellars built even in the 1940s and '50s of whale bones (ribs, mandibles, skulls, scapulae, etc.), though in a manner distinct from the earlier individual cellars. Ruins of such communal meat caches still remain at Sireniki, Ungazik, Lorino, Akkani and other sites. Some whale meat was further shared by local inhabitants with their relatives in neighboring communities.

Active gray whaling from boats was practiced in the 1940-50s in 15-17 native villages, extending from Kresta Gulf up to Kolyuchin Bay (Fig. 3), supplemented by a few special schooners with native crews anchored at two state repair/processing stations at Providenya and Lavrentya bays. Young gray whales periodically were found in fish nets to the south of the Anadyr River mouth, at Alkatvaam, Meinypylgino and Khatyrka villages (just south of Fig. 1). Thus, the 1950s evidently marked the peak of the geographical spread of gray whaling for the entire history of native aboriginal whaling in Chukotka.

General records of the gray whale catch off Chukotka since 1948 have been presented by Ivashin and Mineev (1978) and by Zimushko and Ivashin (1980). Data for specific settlements for the 1941-60 period also have been published (Krupnik *et al.*, 1982, 1983; Krupnik, 1984); figures for the post-1960 take of gray whales will be presented in a later publication. Three to 5 bowheads and 5-8 gray whales were taken by local hunters in the late 1930s in a "normal year." In 1945 the local harvest was 2 bowheads and 14 gray whales. By the mid-1950s it had increased to 40-60 gray whales, but only a single bowhead was taken in Sireniki in a "good year" (see Table 4). Villages in Mechigmen Bay (Lorino and Akkani) and in the East Cape area (Uelen and Naukan) remained the major centers of local gray whaling, as before.

The rate of unproductive losses in the 1940s and '50s was rather high: some estimates suggest that up to 30% of the whales killed sank, with the same percentage being struck and lost (Ivashin and Mineev, 1978; Zimushko and Ivashin, 1980). The loss rate was offered by the local state government as the main reason for ending aboriginal whaling from boats and cutters in the late 1950s and early 1960s.

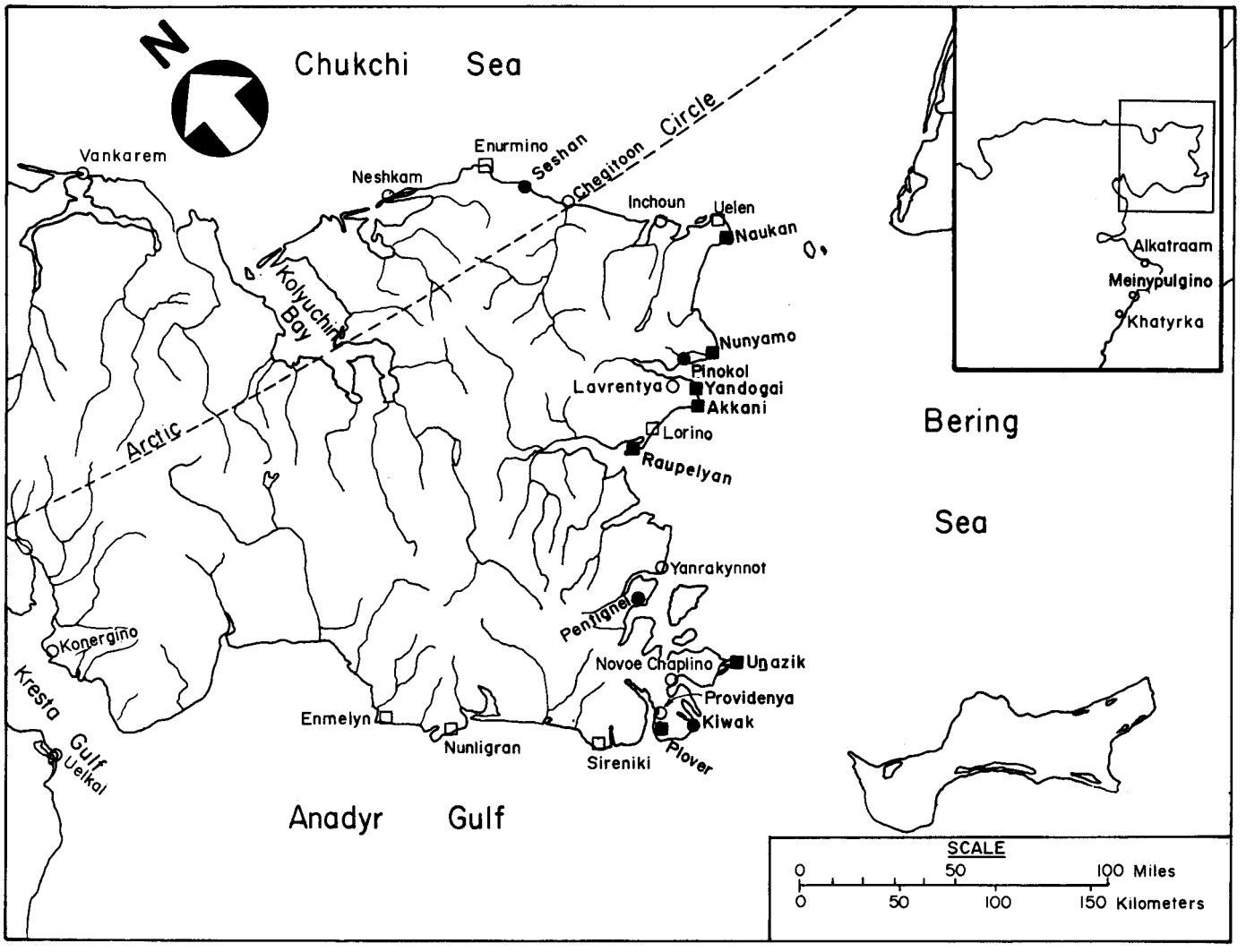

FIG. 3. Transitional and Modern periods: centers of late gray whaling and/or recent butchering in Chukotka. *Open square*: modern community with ancient whaling traditions; *open circle*: modern community with recent, sporadic or no whaling traditions; *closed square*: abandoned or relocated community with active whaling in the 1940s and 1950s; *closed circle*: abandoned or relocated community with minor, sporadic or no gray whaling in the 1940s and 1950s.

The transition to mass gray whaling, and thus to mass gray whale meat consumption, differed between Eskimo and Chukchi communities. As noted above, bowhead meat and skin (with blubber) were everywhere considered the most prestigious and delicious native food, with apparently the sole exception of the Mechigmen Bay area. The substitution of bowheads by gray whales in local consumption was uneventful in most of the Chukchi communities. In Eskimo villages (Naukan, Chaplino and Sireniki), on the other hand, the local inhabitants had to overcome their former disgust of gray whale meat and its treatment as an "inferior" food. This transition was most painful at Sireniki, where active bowhead whaling survived up to 1960. Prior to this date a number of local inhabitants refused to eat gray whale meat and skin, claiming it was distasteful and smelly. The meat of stranded gray whales was never used at Eskimo villages for human consumption, being utilized for dog food only.

The transition to mass gray whaling accelerated the erosion of norms, social values and attitudes formerly connected with whaling. Pursuit of a gray whale usually began with firing in volleys from several boats, thus eliminating the traditional priority of the first crew (and its captain) to strike the whale. A small gray whale easily could be harvested and transported to shore by 2-3 crews or even by a single boat crew, which made useless both traditional norms of cooperation and the fixed hierarchy of meat distribution according to participation in the hunt. Local elders recalled, however, that even a small gray whale was still treated as much more prestigious game than any other sea mammal hunted. But this prestige was no more than a fraction of the former status held by a successful boat captain and his harpooner. Even now, information on famous native whaling captains of the early 20th century is readily recalled by informants, who remember even the smallest details of certain bowheads killed some 40-60 years ago. Data on former gray whale harvests, however, were usually treated as unimportant, and hence are obscure and undeveloped in local oral tradition.

According to local elders, hunting for gray whales was not accompanied by specific rites and festivals. Some communities (e.g., Sireniki and Chaplino) did not even treat it as a part of their traditional cultural heritage. That probably served as one of the main reasons for the quick erosion of the "whaling cultural complex" of the Chukotka aborigines. The last whale festivals took place at Naukan, Chaplino and Sireniki in the late 1930s, following successful bowhead harvests. However, some modest or simplified ceremonies survived at Naukan and Sireniki until the mid-1940s.

Modern Period

This is characterized by the complete cessation of whaling by local hunters and the transition to government-controlled ship whaling exclusively for gray whales using special catcher boats "on behalf of the aboriginal population" (see Ivashin and Mineev, 1978, 1981; Zimushko and Ivashin, 1980; Rezvanov, 1982; photos in Reller and Steinberg, 1981). Modern whaling is conducted along the entire Chukotka coast from Mys Serdze-Kamen to Kresta Gulf (but predominantly from Cape Dezhnev up to Cape Bering (see Votrogov and Bogoslovskaya, 1980; Krupnik *et al.*, 1983) according to quotas set by the International Whaling Commission within the range of 140-200 animals per year (Ivashin and Mineev, 1978). Animals killed are mostly full-grown whales 11.5-12.5 m in length (Zimushko, 1969; Blokhin, 1982). They are taken for ten communities (Fig. 3) having predominantly native populations. Whales are brought close to shore by the ship, then hauled up and processed on the beach by local hunters. The main centers of modern processing and utilization of gray whales are the villages of Lorino, with one-third of the total harvest (Blokhin and Vladimirov, 1983), Uelen, Novoe Chaplino, Sireniki, Yanrakinnot and Uelkal (Krupnik *et al.*, 1983; Krupnik, 1984).

Hunting for gray whales survived longest at the communities of Uelen (up to the early 1970s — V.V. Leontyev, pers. comm.) and Lorino. By the end of the 1960s some 20 animals out of the total quota of 120-140 whales per year were still taken by local hunters. In the last two decades they also harvested some bowheads from boats: at Sireniki in 1964 and 1972, and at Nunligran in 1965 (Ivashin and Mineev, 1978:13; Krupnik *et al.*, 1983; Marquette and Bockstoce, 1980:15).

Altogether, almost 3500 gray whales were taken within the last 20 years by government ships off Chukotka, as were 30 large baleen whales of other species (Ivashin and Mineev, 1978:13). All these whales are transported to native communities and processed there by local hunters. The carcass is brought ashore from the catcher boat by hunters in 1-2 wooden or skin boats and is pulled onto the beach with a tractor. The processing is usually done by 4-8 hunters, assisted by a few other men and youths (see photos in Arutyunov *et al.*, 1982; Dikov, ed., 1974; Menovshchikov, 1972; Reller and Steinberg, 1981). Part of the fresh meat and skin (with blubber) is distributed among the local inhabitants; portions of fresh skin and gum tissue are also consumed directly during the processing. The tradition of the free sharing of small portions of meat and skin with anyone coming to the butchering place (especially when they are elders, widows or guests from other communities) still survives. The meat of stranded gray whales is never consumed but is utilized periodically as fox bait. Utilization of strandings for dog food and even for human consumption occurs only in those villages not visited by the catcher boat. It has been reported particularly for Enurmin (V.V. Lebedev, pers. comm. 1982), Khatyrka or Meinypylgino (A.A. Orekhov, pers. comm. 1983) and some others. In July-October 1982, four dead gray whales were stranded by heavy storms in the vicinity of Enurmino village (Cape Serdze-Kamen). According to local inhabitants, a few gray whales were found as stinkers at Enurmino almost every year (V.V. Lebedev, pers. comm. 1982).

DISCUSSION

During the many years of its existence, Chukotkan aboriginal whaling underwent a considerable evolution. The broad transition to gray whaling (which began at the end of the traditional period) eventually resulted in its being completely substituted for the hunt of all other large cetaceans and in the termination of bowhead whaling, which had been the major focal point of aboriginal culture for centuries.

Time has shown, however, that none of the other sea mammals currently taken in Chukotka (including the gray whale) substitutes adequately for a bowhead whale in either its nutritional or its social status in native culture (Bogoslovskaya *et al.*, 1982, 1984; Krupnik *et al.*, 1983). The meat and skin of the bowhead whale are still regarded as the most delicious native food in the memories of local inhabitants; the attitude toward gray whale meat in some communities is that of indifference.

When local hunters from Sireniki harvested their last bowhead whale from skin boats in 1972, all five crews operating in

the community participated actively in the hunt and in towing and butchering the carcass. The dead whale received a name, as in former times, from the boat captain whose crew was first to attach the harpoon to it. The entire native village population participated in processing the meat and blubber, which were partly distributed among the natives of the neighboring community of Novoe Chaplino and the modern administrative center of Providenya.

Most of the local inhabitants in Chukotka still mourn the loss of bowhead whaling and express a desire to rebuild it as soon as possible. They stress that, irrespective of the size of the catch, bowhead whaling formed the basis of their native culture. It is still considered very important to their national self-consciousness and to the conservation of cultural and linguistic traditions. The pursuit of the gray whale, in contrast, was always considered a less prestigious activity along the entire coast, except, apparently, in the area of Mechigmen Bay and at Uelen village. It is still considered so despite the total cessation of all native whaling off the peninsula over the last 10-20 years.

Therefore, in accord with the International Whaling Convention (IWC) of 1946, and following more recent IWC statements, some of us are arguing in favor of the renewal of a limited bowhead whale harvest in the U.S.S.R. by local hunters in certain communities in Chukotka (Bogoslovskaya *et al.*, 1982, 1984; Krupnik *et al.*, 1982, 1983; Krupnik, 1982, 1984). The resumption of strictly controlled aboriginal whaling within the IWC quota at three sites — Sireniki, Nunligran and Uelen — with a combined catch of some 2-3 whales per year based on the same methods now used by Alaskan Eskimos will not damage the Pacific bowhead stock of 1783-2865 animals (Braham *et al.*, 1979:304) and will not break the trend toward its recovery. The history of Chukotkan aboriginal whaling presented above indicates that this resumption should be effected as quickly as possible. Any further delay decreases the number of experienced hunters able to transmit their knowledge to younger generations, which causes real damage to aboriginal cultural continuity.

Gray vs. Bowhead Whale in Alaskan Eskimo Whaling

In recent years a number of conservationists have fought to considerably reduce current bowhead whaling by Alaskan Eskimos and/or to substitute for it the harvest of gray whales, far more numerous according to current estimates (International Whaling Commission, 1979a; Storro-Patterson, 1980). The "extremist" viewpoint even argues in favor of a complete ban on Alaskan Eskimo bowhead whaling or its reduction to purely symbolic ranges at a few of the "most traditional" communities (Mitchell and Reeves, 1980). Both these ideas already have led to sharp protests by Alaskan Eskimos and by a number of biologists and anthropologists (International Whaling Commission, 1979b; Marquette and Braham, 1980; Adams and Dronenburg, 1980).

Based on the historical experience of the complete substitution of gray whale harvest in Chukotka for that of the bowhead, one can stress a number of negative effects following such a substitution. The abundance of gray whale meat, as it was shown above, does not substitute in the minds of Chukotkan inhabitants for bowhead whale products (meat; and mostly skin with blubber, or maktak), which are still considered the best tasting and most prestigious native foods even some 20-50 years after the end of regular bowhead harvests. Keeping in mind stories told by the oldest hunters in Chukotka, one may predict the rapid erosion of aboriginal norms, rites and values connected with whaling solely through a transition to a far less prestigious form of hunting — that is, to the harvest of gray whales.

From an ethical viewpoint, the international community and intergovernmental agencies (e.g., the International Whaling Commission) do not have the right to force local aboriginal groups to decrease their whaling activity up to some "biologically admissible minimum," which is so difficult to estimate. It is even more questionable to insist on the strict substitution of one species for another, or on the differentiation of those aboriginal communities that are allowed to hunt bowheads (or any other species) due to their "deep historical tradition" from those not allowed to due to the "modernization of their modes of life" (*cf.* Mitchell and Reeves, 1980). Such "regulations" can be considered only as drastic interference in the development of a native culture.

The problem of choosing what is of greater importance, the survival of a biological species or a specific culture of an ethnic minority, cannot be determined beforehand. In any case, in my view, it should not be solved in the manner proposed by the conservationists. It is quite evident that such prejudicial confrontations should be avoided, since everybody aspires to keep both phenomena alive. Keeping in mind the current attitudes of Alaskan Eskimos toward gray whale meat consumption (*cf.* Marquette and Braham, 1980; Adams and Dronenburg, 1980), one cannot consider the gray whale to occupy the position of "main ethnic symbol" that was held for centuries by the bowhead whale. The transition to mass gray whaling would force Alaskan Eskimos to switch from the accustomed times, purposes and modes of hunting. Greater individualization of gray whale harvesting and butchering will inevitably cause the relaxation of inter- and intra-community norms of cooperation and division of labor, thus opening the road to disruption and fragmentation of current northwestern Alaska and St. Lawrence Island Eskimo social systems and to rapid culture change (see Worl, 1979, 1980).

Both the arguments listed above and the proposal for the resumption of limited aboriginal bowhead whaling in Chukotka do not deny, however, the general possibility of gray whale harvesting by Alaskan Eskimos. The perspectives are more realistic for those communities where gray whales are more accessible and where a strong cultural opposition does not already exist. As the history of Chukotkan aboriginal whaling shows, the gray whale enters the aboriginal culture much more easily when regular bowhead whaling continues, even when it is treated by local hunters as a less valuable and less prestigious substitute for a bowhead whale. This situation was shown above for Uelen, Naukan, Ungazik and some other Chukotkan whaling stations in the 1910-30 period. Thus, a balanced form of partial substitution may turn out to be suitable for certain Alaskan communities, perhaps including combined or proportional quotas for the catch of both species, as well as for the further raising of community quotas by the addition of gray whales only. Changes in the total catch quotas necessary for starting both limited aboriginal bowhead whaling in Chukotka and active gray whaling in Alaska apparently could be obtained through mutual reallocations between the states in question.

ACKNOWLEDGEMENTS

This paper is a comprehensive summary of my information on Chukotka aboriginal whaling, some of which has been published

elsewhere (Krupnik, 1979, 1980, 1982, 1984; Bogoslovskaya *et al.*, 1982, 1984; Krupnik *et al.*, 1982, 1983). The data discussed here were obtained through an extensive survey of local hunting statistics in the literature and of data in the regional and state archives of Magadan, Anadyr, Providenya, Petropavlovsk, Tomsk and Leningrad. Valuable information was collected from elder and middle-aged inhabitants of the region during field studies in Chukotka from 1975 to 1981, sponsored by the Institute of Ethnography, Academy of Sciences of the U.S.S.R.

I am deeply indebted to my colleagues and co-authors of some earlier presentations — Dr. Michael A. Chlenov, Dr. Lyudmila S. Bogoslovskaya and the late Leonard M. Votrogov — whose constant participation and support in the work conducted and fruitful criticism on the data obtained must be acknowledged with gratitude. Valuable information was further provided by V.V. Leontyev and S.A. Arutyunov, who critiqued the first draft of this paper, and also by I.S. Vdovin, V.V. Lebedev, Yu.M. Rodnyi and S.A. Bogoslovsky. I am most grateful to many Eskimo and Chukchi informants who shared with me their personal knowledge on former aboriginal whaling activities. Some of them must be mentioned by name: Ran'av (born in 1915) from Lorino village; I. Ashkamakyn (1911), U. Ukhsima (1915) and V. Ankatagyn (1925-79) from Providenya; V. Tagitootkaq (1922) and Ulgoowie (1912-83) from Novoe Chaplino; A. Ratkhoogwie (1905-77), P. Napagoon (1912-83), S. Kovakvyrgyn (1930), A. Kookilgyn (1922) and N. Asykolyan (1927) from Sireniki; Tnangoohan (1911), Piuranga (1916) and O. Einetegyn (1932) from Lavrentya; and V. Goohugwie (1922) from Anadyr.

Special thanks go to A.V. Smolyak and the late D.A. Sergeev, who kindly shared with me data from their field notes collected in Chukotka in 1954 and in 1958-60; to A.I. Peeka, who recently helped me to fill some gaps in my statistical records; and to John Bockstoce (New Bedford Whaling Museum), Wilman Marquette (National Marine Mammal Laboratory, Seattle), George Harry (formerly with the National Marine Mammal Laboratory, Seattle) and Rosita Worl (formerly with the University of Alaska, Anchorage), who provided me with valuable materials on the Alaskan Eskimo whaling situation.

Finally, I thank an unnamed reviewer for extremely helpful comments on the manuscript of this paper and Ernest S. Burch, Jr., for helping put the manuscript into publishable form.

REFERENCES

ADAMS, M., and DRONENBURG, R. 1980. Why not the Gray Whale? The Arctic Coastal Zone Management Newsletter 30:9-11.

ALASKA GEOGRAPHIC. 1978. Alaska whales and whaling. Alaska Geographic 5(4). 145 p.

ANDERSON, D.D. 1981. Ob izmeneniyakh doistoricheskykh modeley zhizneobespechenya Eskimosov; predvaritelnaya razrabotka. [Changing prehistoric Eskimo subsistence patterns; a working paper.] In: Gurvich, I.S., ed. Traditzionnye cultury Severnoi Sibiri i Severnoi Ameriki. Moscow: Nauka. 67-82.

ARUTYUNOV, S.A. 1979. Problems of comparative studies in Arctic Maritime cultures based on archaeological data. Arctic Anthropology 16(1):27-31.

———, KRUPNIK, I.I., and CHLENOV, M.A. 1979. "Kitovaya Alleya" — Drevneeskimosskii kultovyi pamyatnik na ostrove Ittygran. ["The Whalebone Allee" — ancient Eskimo memorial on Ittygran Island.] Sovetskaya Ethnographia 4:12-28.

———. 1982. Kitovaya Alleya. Drevnosti ostrovov proliva Senyavina. [The Whalebone Allee. Antiquities of the Senyavin Strait Islands.] Moscow: Nauka. 175 p.

ARUTYUNOV, S.A., and SERGEEV, D.A. 1969. Drevnie kultury Aziatskikh Eskimosov. Uelenskii Mogilnik. [Ancient cultures of the Asiatic Eskimos. The Uelen cemetery.] Moscow: Nauka. 205 p.

———. 1975. Problemy ethnicheskoi istorii Beringomorya. Ekvenskii mogilnik. [Problems of the ethnic history of Bering Sea region. The Ekven cemetery.] Moscow: Nauka. 240 p.

BEREGOVAYA, N.A. 1953. Nakonechniki garpunov iz drevnikh poselenyi Baranova Mysa. (Raskopki Kolymskoi expeditzii 1946 g). [The harpoon heads from ancient settlements of Cape Baranov (excavations of Kolyma expedition, 1946).] Materialy i issledovanniya po archeologii SSSR 39:421-445.

———. 1960. Archeologicheskie nakhodki na ostrove Shalaurova. [Archaeological findings on Shalaurov Island.] Materialy i issledovanniya po archeologii SSSR 86:183-195.

BERZIN, A.A., and ROVNIN, A.A. 1966. Raspredelenye i migratzii kitov v severo-vostochnoi chasti Tikhogo okeana, Beringovom i Chukotskom moryakh. [The whale distribution and migrational routes in the Northeastern Pacific, Bering and Chukchi Seas.] Izvestya TINRO 58:179-208.

BEZUMOV, R.YA. 1960. Promysel morskogo zverya. [The sea-mammal hunting.] Magadan kn. izd. 56 p.

BLOKHIN, S.A. 1982. Investigations of gray whales taken off Chukotka in 1980. Report of the International Whaling Commission 32:375-380.

——— and VLADIMIROV, V.L. 1983. Investigations of gray whales taken off Chukotka in 1981. Report of the International Whaling Commission 33:553-555.

BOCKSTOCE, J. 1977. Eskimo whaling in Alaska. Alaska Magazine 43(9):4-6.

BODFISH, H.H. 1936. Chasing the bowhead. Cambridge: Harvard University Press. 281 p.

BOGORAS, W.G. 1901. Dnevnik vo vremya puteshestviya i prebyvanya v Unyine. [Diary of the journey and stay at Uniin.] Leningrad: Archive Academy of Sciences. 250 p.

———. 1904. The Chukchee, Material Culture. Memoirs of the American Museum of Natural History 7(1). 276 p.

———. 1909. The Chukchee. Religion. Memoirs of the American Museum of Natural History 7(2). 260 p.

BOGOSLOVSKAYA, L.A., CHLENOV, M.A., and YURTZEV, B.A. 1979. Ostrova proliva Senyavina — Unikalnyi prirodnyi i kulturnyi komplex. [The islands of Senyavin Strait — an unique natural and cultural complex.] Priroda 9:91-97.

BOGOSLOVSKAYA, L.A., and VOTROGOV, L.M. 1982. Gruppirovki serykh kitov na mestakh letne-osennego nagula. [Groupings of the gray whales on summer-autumn feeding grounds.] In: Zemskii, V., ed. Izuchenye, okhrana i ratzionalnoe ispolzovanye morskikh mlekopitayushchikh. Astrakhan. 36-37.

——— and KRUPNIK, I.I. 1982. The bowhead whale off Chukotka: migrations and aboriginal whaling. Report of the International Whaling Commission 32:391-399.

———. 1984. Grenlandskii kit v vodakh Chukotki (Istoriya i sovremennoye sostoyanie populyatzii). [The bowheads off Chukotka (history and present status of the population.] In: Yablokov, A.V., ed. Morskie Mlekopitayuschchie. Moscow: Nauka. 191-212.

BRAHAM, H., DURHAM, F.E., JARRELL, G.H., and LEATHERWOOD, S. 1980. Ingutuk: a morphological variant of the bowhead whale, *Balaena mysticetus*. Marine Fisheries Review 42(9-10):70-73.

BRAHAM, H., KROGMAN, B., LEATHERWOOD, S., MARQUETTE, W., RUGH, D., TILLMAN, M., JOHNSON, J., and CARROL, G. 1979. Preliminary report of the 1978 spring bowhead whale research program results. Report of the International Whaling Commission 29:291-306.

CHLENOV, M.A. 1981. Kit v folklore i mifologii Aziatskikh Eskimosov. [The whale in the folklore and mythology of the Asiatic Eskimos.] In: Gurvich, I.S., ed. Tradizionnye kultury Severnoi Sibiri i Severnoi Ameriki. Moscow: Nauka. 228-244.

———. 1982. Korotko ob expeditziyakh. [In brief on the expeditions.] Sovetskaya ethnographia 1:158-159.

——— and KRUPNIK, I.I. 1984. Whale Allee. A Site on the Chukchi Peninsula, Siberia. Expedition 26(2):6-15.

COOK, J. 1971. Tretye plavanye kapitana Jemsa Kuka. Plavanye v Tikhom okeane v 1776-1780 gg. [The third voyage of Captain James Cook. Voyage in the Pacific in 1776-1780.] Moscow: Mysl. 636 p.

DAVYDOV, V.T. 1971. Na beregakh Mechigmena. [On the coasts of Mechigmen.] Moscow: Sovetskaya Rossiya. 208 p.

DIKOV, N.N. 1967. Uelenskii mogilnik po dannym raskopok v 1956, 1958 i 1963 godakh. [The Uelen cemetery according to data from excavations in the years 1956, 1958 and 1963.] In: Krushanov, A., ed. Istoria i kultura narodov Severa Dalnego Vostoka. Moscow: Nauka. 42-79.

———. 1971. Naskalnye zagadki drevnei Chukotki (Petrogliphy Pegtymelya). [The rock mysteries of ancient Chukotka (Pegtymel petroglyphs).] Moscow: Nauka. 130 p.

———. 1974. Chiniiskii mogilnik. (Istorii morskikh zveroboyev Beringova proliva.) [The Chini cemetery (to the history of ancient sea-mammal hunters of Bering Strait).] Novosibirsk: Nauka. 166 p.

———, ed. 1974. Ocherki istorii Chukotki s drevneishikh vremyon do nashikh dnei. [Essays on the history of Chukotka from the most ancient times up to the present days.] Novosibirsk: Nauka. 456 p.

———. 1977. Archeologicheskye pamyatniki Kamchatki, Chukotki i Verkhnei Kolymy. Azia na styke s Amerikoi v drevnosti. [Archaeological monuments

of Kamchatka, Chukotka and Upper Kolyma. Asia joint to America in antiquity.] Moscow: Nauka. 352 p.

DOTY, W. 1900. Log book, St. Laurence Island. Ninth annual report on introduction of domestic reindeer into Alaska. 224-256.

DURHAM, F.E. 1974. Ancient and current methods of taking the bowhead whale. Alaska Sea Grant Report N 73-9, 1-15. Anchorage: University of Alaska.

———. 1979. The catch of Bowhead Whales (*Balaena mysticetus*) by Eskimos with emphasis on the Western Arctic. Natural History Museum of Los Angeles County, Contributions to Science 314:1-14.

GIDDINGS, J.L. 1960. The Archaeology of Bering Strait. Current Anthropology 1(2):121-138.

GLINSKII, E.A., SERGEEV, D.A., and FRADKIN, E.E. 1982. Kit v predstavlenyakh Beringomorskikh Eskimosov. [Whales in the view of Bering Sea Eskimos.] Sovetskaya Ethnographia 4:112-121.

GONDATTY, N.L. 1898. Poezdka iz sela Markova na reke Anadyre v bukhtu Providenya, Beringov Proliv. [Voyage from Markovo village on Anadyr River to Providenya Bay, Bering Strait.] Zapiski Priamurskogo otdela Russkogo Geographicheskogo obtchestva 4(1):1-42.

HALEY, D., ed. 1978. Marine mammals of eastern North Pacific and Arctic waters. Seattle: Pacific Search Press. 255 p.

HEINE, W.G. 1859. Die Expedition in die Seen von China, Japan und Okhotsk. Bd. 3. Leipzig: Costenoble.

HOOPER, W.H. 1976. Ten months among the tents of the Tuski. 2nd ed. New York: AMS Press. 417 p.

INSTITUT NARODOV SEVERA. 1935. Kolonialnaya politika tzarizma na Kamchatke i Chukotke v XVIII veke. [Tzarist colonial policy in Kamchatka and Chukotka in the 18th century. Compendium of archival documents.] Leningrad: Institute Narodov Severa. 211 p.

INTERNATIONAL WHALING COMMISSION. 1979a. Bowhead whaling: population status and alternative biological resources. Report of the Wildlife Panel of the International Whaling Commission meeting on aboriginal subsistence whaling, Seattle, Washington.

———. 1979b. Report of the panel to consider cultural aspects of aboriginal whaling in North Alaska to the International Whaling Commission Meeting on Aboriginal/Subsistence Whaling, Seattle, Washington.

IVANOV, S. 1954. Materyaly po izobrazitelnomu iskusstvu narodov Sibiri. XIX-nachalo XX v. [Materials on the decorative art of Siberian aboriginals 19-early 20th century.] Moscow/Leningrad: Trudy Instituta Ethnografii. v. 22.

IVASHIN, M.V., and MINEEV, V.N. 1978. O sostoyanii zapasov serykh kitov. [On the state of gray whale stocks.] Rybnoe khozyaistvo 3:15-17.

———. 1981. The history of gray whale harvesting off Chukotka. Report of the International Whaling Commission 31:503-505.

JORDAN, R. 1980. The University of Pennsylvania Museum collection of chipped stone amulets from Point Barrow, Alaska. Anthropological Papers of the University of Alaska 19(2):33-41.

KALINNIKOV, N.F. 1912. Nash krainii Severo-Vostok. [Our extreme Northeast.] Zapiski po gidrographii. Supplement to Vol. 34. Saint-Petersburg. 246 p.

KARAEV, A.I. 1926. Chukotsko-Anadyrskii krai (Ocherki mestnogo zhitelya). [Chukot-Anadyr region. Essays of the local inhabitant.] Ekonomicheskaya Zizn Dalnego Vostoka 4:136-153.

KIBER, D.R. 1824. Izvlechenya iz dnevnykh zapisok . . . [Extracts from a diary containing data and observations collected in swampy deserts of Northeastern Siberia.] Sibirskii vestnik I.

KNOPFMILLER, M.O. 1940. Morskoi zveroboinyi promysel Chukotki. [The sea-mammal hunting in Chukotka.] Unpubl. dissertation materials and field notes. Institute of Ethnography, Leningrad.

KOTZEBUE, O.E. 1821. Puteshestvie v. Yuznyi Okean i v Beringov proliv . . . [Voyage of discovery into the South Sea and Bering's Strait in search of the Northeast passage in the years 1815, 1816, 1817 and 1818.] Vol. 1. Saint-Petersburg. 168 p.

KRASHENINNIKOV, S.P. 1949. Opisanie zemli Kamchatki. [Description of the land of Kamchatka.] Moscow/Leningrad: Glavsevmorpoot. 841 p.

KRUPNIK, I.I. 1979. Aboriginal Asiatic Eskimo whaling in the 1920-1930's. Proceedings of the XIV Pacific Science Congress. Committee F, Section FIII:145-148. Khabarovsk.

———. 1980. Morskoi promysel Aziatskykh Eskimosov v 1920-1930-kh godakh. [Asiatic Eskimo sea-mammal hunting in the 1920-1930's.] In: Zemski, V.A., ed. Morskye mlekopitayushchie. Moscow: Pishchevaya promyshlennost. 66-79.

———. 1982. Seryi kit v khozyaistve i promysle aborigenov Chukotki. [The gray whale in the economy and the whaling of Chukotka aboriginals.] In: Zemski, V.A., ed. Izuchenye, okhrana i ratzionalnoye ispolzovanye morskikh mlekopitayushchikh. Astrakhan. 179-180.

———. 1983. Drevniye i traditzionnye poselenya Eskimosov na yugo-vostoke Chukotskogo poluostrova. [Ancient and traditional Eskimo settlements on the southeastern edge of Chukotka peninsula.] In: Alexeev, V.P., ed. Na Styke Chukotki i Alyaski. Moscow: Nauka. 65-95.

———. 1984. Gray whale and the aborigenes of the Pacific Northwest. In: Jones, M.L., *et al.*, eds. The Gray Whale. New York: Academic Press. 103-120.

———, BOGOSLOVSKAYA, L.S., and VOTROGOV, L.M. 1982. Gray Whaling off Chukotka Peninsula. Past and present status. Preliminary draft presented to the 34th Annual Meeting of the International Whaling Commission, Cambridge. 22 p.

———. 1983. Gray whaling off Chukotka Peninsula. Past and present Status. Report of the International Whaling Commission 33:557-562.

LANTIS, M. 1938. The Alaskan Whale Cult and its Affinities. American Anthropologist 40(3):438-464.

LARSEN, H., and RAINEY, F. 1948. Ipiutak and the Arctic whale hunting culture. Anthropological Papers of the American Museum of Natural History 42. 276 p.

LAZAREV, A.P. 1950. Zapiski o plavanii voennogo shlyupa "Blagonamerennogo" v Beringov proliv . . . [Memoirs of the voyage of the Naval sloop *Blagonamerennyi* to Bering Strait and around the world in search for discoveries in the years 1819, 1820, 1821 and 1822.] Moscow: Geographgiz. 473 p.

LEONTYEV, V.V. 1973. Khozyaistvo i kultura narodov Chukotki (1958-1970 g.g.). [Economy and culture of Chukotka peoples. 1958-1970.] Novosibirsk: Nauka. 178 p.

———. 1982. Novaya vlast udachu prinesla. [The new power brought good luck.] Na Severe Dalnem 2:28-37.

LIPRANDI, K. 1933. Syr'evye resursy Chukotki. [The game resources of Chukotka.] Sovetskii Sever 6:58-59.

MAGADAN STATE ARCHIVE. 1934. Morzveroboinyi promysel i morzveroboinaya promyshlennost. [Sea-mammal hunting and sea-mammal industry.] Unpubl. ms., Magadan State Archive, Magadan. 43 p.

MARQUETTE, W., and BOCKSTOCE, J. 1980. Historical shore-based catch of bowhead whales in the Bering, Chukchi and Beaufort Seas. Marine Fisheries Review 42(9-10):5-19.

MARQUETTE, W., and BRAHAM, H.W. 1980. Gray whale distribution and catch by Alaskan Eskimos: A replacement for the bowhead whale? Arctic 35(3):386-394.

MENOVSHCHIKOV, G.A. 1972. Mestnye nazvanya na karte Chukotki. [Local place names on the map of Chukotka. Short toponimic dictionary.] Magadan: Magadan Publishing House. 206 p.

———. 1975. Yazyk naukanskikh eskimosov. [The language of Naukan Eskimos.] Leningrad: Nauka. 512 p.

———. 1979. Kitovyi praznik pol'a u Naukanskikh Eskimosov. [The "pol'a" whale festival by Naukan Eskimos.] Strany i narody Vostoka 20:202-208.

MITCHELL, E., and REEVES, R.R. 1980. The Alaska bowhead problem: a commentary. Arctic 33(4):686-723.

NELSON, E. 1899. The Eskimo about Bering Strait. Annual Report of the Bureau of American Ethnology 18:1-518.

NIKULIN, P.G. 1947. O raspredelenii kitoobraznykh v moryakh omyvaushchikh Chukotskii poluostrov. [On the distribution of cetaceans in the seas off Chukotka peninsula.] Izvestya TINRO 22:255-257.

NORDENSKØLD, A.E. 1880. Shvedskaya polyarnaya expeditzia 1878-79. [Swedish polar expedition of 1878-79. The discovery of Northeast Passage.] Saint-Petersburg. 207 p.

OKLADNIKOV, A.P., and BEREGOVAYA, N.A. 1971. Drevnye poselenya Baranova Mysa. [Ancient settlements of Cape Baranov.] Novosibirsk: Nauka. 213 p.

OTCHYOT Kamchatskogo RIK'a I Kamchatskomu S'iezdu Sovetov. 1928. [Report of the Kamchat RIK to the First Kamchatka Congress of Soviets.] Petropavlovsk. 204 p.

RAINEY, F. 1958. Archaeologya Amerikanskoi Arctiki. [Archaeology of the American Arctic.] Sovetskaya Ethnographia 2:55-62.

RAZUMOVSKI, V.I. 1931. Lastonogie Chukotki. [The pinnipeds of Chukotka.] Sotzialisticheskaya Reconstruktzia Rybnogo Khozyaistva Dalnego Vostoka 11-12:100-107.

RELLER, G., and STEINBERG, D. 1981. Der wal bläst . . . Die jagd beginnt. Freie Welt 3:41-49.

REZVANOV, G.M. 1982. O promysle serogo kita v sezon 1981 g. [On the gray whaling season 1981.] In: Zemski, V.A., ed. Izuchenye, okhrana i ratzionalnoe ispolzovanye morskikh mlekopitayushchikh. Astrakhan. 312-313.

RUBTZOVA, E.S. 1940. Materyaly po yazyku i folkloru Eskimosov. [Materials for the study of the language and folklore of the Eskimos.] Part II. Unpubl. ms., Institute of Linguistics, Leningrad.

———. 1954. Materyaly po yazyku i folkloru Eskimosov. Chaplinskii dialect. [Materials relative for the study of language and folklore of the Eskimos. Part I — Chaplinskii dialect.] Moscow/Leningrad: Academy of Science Publishing House. 555 p.

RUDENKO, S.I. 1947. Drevnyaya kultura Beringova morya i Eskimosskaya problema. [Ancient culture of Bering sea and the Eskimo problem.] Moscow/Leningrad: Glavsevmorpoot. 132 p. + 38 pl.

SCAMMON, C.M. 1968. The Marine mammals of the Northwestern Coast of North America: described and illustrated, together with an account of the American whale fishery. 2nd ed. New York: Dover. 319 p.

SERGEEV, D.A. 1959. Pervyi kit. Iz zapisnoi knizhki ethnographa-archeologa. [The first whale. From the notebook of ethnographer-archaeologist.] Kraevedcheskye zapiski. Magadan 2:110-114.

SERGEEV, M.A. 1936. Narodnoe khozyaistvo Kamchatskogo kraya. [The economy of the Kamchatka area.] Moscow/Leningrad: Akademia Nauk-SOPS.

SHNAKENBURG, N.B. 1933. Kitovyi promysel na Chukotke. [Whaling off Chukotka.] Tikhookeanskaya zvezda. Khabarovsk 259:3.

SMOLYAK, A.V. 1957. Materyaly dlya kharakteristiki sozialisticheskoi cultury i obraza zhizni korennogo naselenya Chukotskogo raiona. [Materials relative to the characteristics of socialist culture and lifestyle of the aborgines of Chukot district.] In: Sibirskii ethnographicheskii sbornik II, 35:3-37. Proceedings of the Institute of Ethnography, Moscow-Leningrad.

SOOSHKINA, N.N. 1961. Na puti vulkany, kity, l'dy. [Volcanoes, whales and glaciers on the way.] Moscow: Geographgiz. 159 p.

STATE ARCHIVE OF THE FAR EAST. 1923. Statisticheskye materialy po obzoru Kamchatskoi gubernii na 1.01.1923. [Statistical data relative to the review of Kamchatka region up to 1.01.1923.] Unpubl. ms., State Archive of the Far East, Tomsk. 18 p.

STELLER, G., trans. 1938. Opisanye strany Kamchatki. [Description of the land of Kamchatka.] Translation from the original German edition, Beshreibung von den Lande Kachatka, Frankfurt/Leipzig, 1774. Unpubl. ms., Institute of Ethnography, Leningrad.

STORRO-PATTERSON, R. 1980. The hunt of gray whales by Alaskan Eskimos: a preliminary review. International Whaling Commission 32 Annual Meeting, Cambridge. SC/32/PS 7. 32 p.

SUVOROV, E.K. 1914. O promysle morzha i kita na Chukotskoi zemle. [On the walrus and whale hunting in Chukotka.] Materialy k poznaniyu Russkogo rybolovstva 3(5):189-198.

SVERDRUP, G.U. 1930. Plavanye na sudne "Mod" v vodakh morei Lapteva i Vostochno-Sibirskogo. [Voyage of the vessel "Mod" in Laptev and East Siberian seas.] Leningrad. 440 p.

TERLETZKII, P.E. 1967. Naselenye Krainego Severa SSSR. [The population of the Far North of the U.S.S.R.] Unpubl. ms., Institute of Ethnography, Moscow. 527 p.

TEYN, T.S. 1975. Eskimosskii prazdnik kita "pol'a" (Na primere posyolka Naukan.) [The "pol'a" Eskimo whaling festival — an example from Naukan.] Kraevedcheskye zapinski (Magadan) 10:88-94.

———. 1980. Primenenye kitovogo usa v khozyaistvennoi zhizni drevnikh morskikh zveroboyev Chukotki. [The usage of baleen in the economy of ancient sea-mammal hunters in Chukotka.] In: Dikov, N.N., ed. Noveyshie dannye po archelogii Severa Dalnego Vostoka. Magadan: Magadan Publishing House. 79-88.

TITOVA, Z.D., compiler. 1978. Ethnographicheskye materialy Severo-Vostochnoi geographicheskoi expeditzii 1785-1795. [Ethnographic materials of the Northeast Geographic Expedition 1785-1795.] Magadan: Magadan kn. izd. 178 p.

TOMILIN, A.G. 1957. Kitoobraznye. [Cetaceans.] Zvery SSSR i prilezhashchikh stran. IX. Moscow: Academy of Sciences Publishing House. 756 p.

VDOVIN, I.S. 1965. Ocherki istorii i ethnographii Chukchei. [Essays on the history and ethnography of the Chukchees.] Moscow: Nauka. 403 p.

VOBLOV, I.K. 1952. Eskimosskye prazdniki. [Eskimo festivals.] In: Sibirskii ethnographic sbornik, I, 18:320-334. Moscow/Leningrad: Proceedings of the Institute of Ethnography.

VOTROGOV, L.M., and BOGOSLOVSKAYA, L.S. 1980. Gray whales off the Chukotka peninsula. Report of the International Whaling Commission 30:435-437.

WORL, R. 1979. Sociocultural assessment of the impact of the 1978 International Whaling Commission quota on the Eskimo communities. Special report for the U.S. Department of the Interior, Anchorage. 81 p.

———. 1980. The North Slope Inupiat whaling complex. In: Kotani, Y., and Workman, W.B., eds. Alaska Native culture and history. Senri Ethnological Studies 4. Senri, Osaka: National Museum of Ethnology. 305-320.

WRANGELL, F.P. 1948. Puteshestvie po severnym beregam Sibiri i Ledovitomu okeanu. [Journey along the northern coasts of Siberia and the Arctic Sea.] Moscow/Leningrad: Glavsevmorpoot. 454 p.

ZEMSKI, V.A., ed. 1980. Atlas Morskikh Mlekopitayushchikh SSSR. [Atlas of the sea mammals of the U.S.S.R.] Moscow: Pishchevaya Promyshlennost. 183 p.

ZHUROV, R.YA., and SERGEEV, D.A. 1962. Drevnie skulpturnye izobrazhenya kitov. [Ancient figurines of whales.] Zapiski Chukotskogo Kraevedcheskogo Muzeya. Magadan 3:21-24.

ZIMUSHKO, V.V. 1969. Nekotorye dannye po biologii serogo kita. [Some data on the biology of the gray whale.] In: Arsenyev, V.A., and Chapski, K.K., eds. Morskie mlekopitayushchie. Moscow: Nauka. 93-97.

——— and IVASHIN, M.V. 1980. Some results of Soviet investigations and whaling of gray whales (*Eschrichtius robustus*), Lilljeborg, 1961. Report of the International Whaling Commission 30:237-246.