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Paugvik: A Nineteenth-Century Native Village on Bristol Bay, Alaska

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Paugvik village is well represented in Russian records from southwestern Alaska, suggesting that it was an important settlement in the 19th century. Excavations in 1985 cleared all or parts of nine houses, where faunal and other evidence indicates participation in the commercial fur trade. Although glass trade beads were present throughout, there were relatively few other industrial trade items and a profusion of objects of traditional native manufacture. Collections, site layout, and historical documents suggest the village was occupied from after A.D. *1800 to about 1870.*

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History of the Region

Herein we report the results of archaeological excavations at the 19th-century native settlement of Paugvik on the Alaska Peninsula in southwestern Alaska. The major fieldwork was in 1985, when a crew of six devoted two months to excavations at the settlement. In describing the Paugvik collections, however, we have added to materials of 1985 those recovered in abbreviated tests at the site in 1961 and 1973. Although our aim is primarily to describe these archaeological results, we also attempt in a preliminary way to place the people of Paugvik within their social and economic surroundings.

The Region and Its People

The Alaska Peninsula juts southwestward from the Alaska mainland and, with its partly submerged extension in the long chain of Aleutian Islands, forms the boundary between the Bering Sea on the north and the Pacific Ocean on the south (Fig. 1). Toward its wider, northeastern end the peninsula is 160 km or more in width. Throughout its length its backbone is the Aleutian Range of volcanic mountains, peaks of which rise to elevations above 1800 m and form a divide that in the northeast is 15–25 km from the abrupt, fjorded coast of Shelikof Strait on the Pacific but as much as 145 km from the coast on Bristol Bay of the Bering Sea. Toward that coast the ground slopes as a soggy plain built by outwash of the Pleistocene glaciers that carved the basins of the lakes that now stretch in series along the northwestern foot of the mountains, which is the source of meandering streams and the spectacular runs of red or sockeye salmon for which Bristol Bay is famous.

The village of Paugvik was located on the right bank of the Naknek River 1 km above its mouth on Bristol Bay and 2 km below the modern village of Naknek. Bristol Bay forms the southeast corner of the Bering Sea, and the flat peninsula coastal plain and shallow seas partake of the arctic climate of the north. The plain is treeless and tundra covered, save for a few protected spots in stream valleys where pioneer stands of stunted spruce appear. On the bay there is a substantial ice cover for much of normal winters. Summers are punctuated by periodic storms that rage inland from the unpredictable Bering Sea.

Faunal food resources are plentiful in the region. Although the shallow seas of the upper bay discourage the approach of larger whales and other sea mammals—walrus, for instance, are found no closer than 200 km to the west, where they haul out in summer on islands fronting Togiak Bay—harbor seals are abundant, and beluga (white whales) inhabit Bristol Bay the year around, coursing up the Naknek River in spring and summer in pursuit of runs of smelt and salmon. Some clam species are available in the upper bay, with mussel colonies on intertidal rocks such as those visible at the mouth of the Naknek at low tide. Seabirds and migratory waterfowl are also plentiful in season.

The major Alaska Peninsula caribou herd calves in spring in the lowlands of the Bering Sea plain near Port Heiden. In early fall the herd drifts northeastward to winter, usually between the Ugashik and Naknek rivers, although in the mid-19th-century caribou were so numerous that they would move seasonally across the Naknek and even the Kvichak River (Hemming, 1971, pp. 39–44). But the most dependable and major resource is provided by the five species of Pacific salmon, which

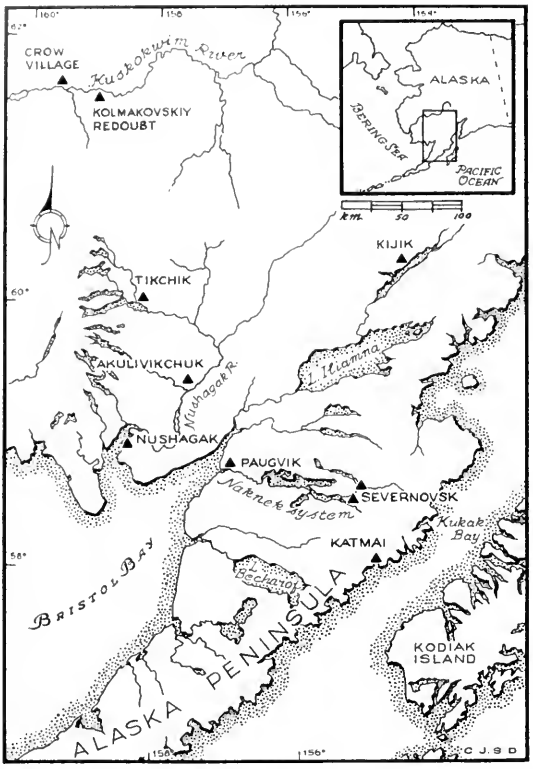

FIG. 1. Map of the Alaska Peninsula.

are present in great numbers in streams during their migrations and also available offshore in Bristol Bay. Runs begin in early June with king or chinook salmon, continue through July with sockeye (red) and chum (dog) salmon, and last through August with pink and silver (coho) salmon (UA, 1974, pp. 422–440). Although all of these species occur in the Naknek River, red salmon are especially plentiful, with annual upstream escapements even under modern fishery pressure running well over 1 million fish (ADFG, 1991); in aboriginal times the runs into the river must have been substantially larger. Smelt also run into the Naknek in spring or early summer, and freshwater fish are abundant, including salmonids, such as rainbow trout and char, grayling, pike, and whitefish (UA, 1974, p. 444).

The upper peninsula lies within the region of aboriginal Western Eskimo or Yupik speech. Nineteenth-century Paugvik itself was occupied by people referred to in the most modern literature as Aglurmiut, known to the Russians as Aglegmiut. Their nearest ethnic and dialectic neighbors were the Aglurmiut of settlements located at the mouth of the Egegik River on the peninsula coast to the southwest, and near the mouth of the Nushagak River across Bristol Bay. These Aglurmiut were the southernmost speakers of the language designated Central Yupik (Krauss, 1982). They were reported by the early Russians to have been driven from the lower Kuskokwim River vicinity in a series of bloody battles of the late 18th century, known more recently in Kuskokwim native tradition as the "bow and arrow wars" (see, for instance, Ackerman & Ackerman, 1973; Fienup-Riordan, 1990). Although some early U.S. sources credited the Aglurmiut or Aglegmiut with control of all of the Bering Sea slope of the northern Alaska Peninsula (e.g., Petroff, 1881, 1884; Porter, 1893), the Russians knew them to have been restricted to the Bristol Bay littoral, from which they had displaced people called by the Russians "Severnovtsy (Northerners) and Ugashentzy" (Wrangell, 1980, p. 64). Although the second of these were people of the Ugashik River located well to the southwest of the region of immediate interest here (Fig. 2), the former were people of the upper portion of the Naknek River drainage and hence of relevance to the condition of Paugvik and its neighborhood.

About 100 km above Paugvik within the Naknek River drainage system, immediately above Iliuk Arm of Naknek Lake and in the geographic center of the peninsula, was the multivillage community called by the Americans Savonoski, known to the earlier Russians as the Severnovsk (i.e., northerner) settlements, with their inhabitants the *Severnovskie Aleuty,* or Severnovsk Aleuts. A sense of contrast in the identities of people of these settlements is made plain by records of births entered by the Alaska Russian Church (ARC, 1816–1936, Nushagak mission) between the 1840s and 1895. At Paugvik, births were recorded as 74% "Aglegmiut," 21% Kusquqvagmiut (i.e., people of the Kuskokwim River region), 2% Kiatagmiut (of the upper drainage of the Nushagak River system or the vicinity of Iliamna Lake), and 3% "Aleut." In the Severnovsk settlements, 92% were recorded as "Aleut," 5% as "Aglegmiut," and 2% as Kiatagmiut (see also Dumond, 1986, p. 5).

There may have been some tradition of hostility between villages at the two extremes of the Naknek Lake and River system, as indicated by the Russian accounts of Aglurmiut history. In 1953 a Severnovsk native alleged that in very old days the two peoples had fought each other with bow and arrow. In those same olden days, he said, the people of the lower Naknek River never went upstream, and the Severnovsk people never went

downriver but repaired to the Pacific coast rather than to Bristol Bay to hunt sea mammals (Davis, 1954). A similar course for trading was reported for the Severnovsk people in the 1880s by the first U.S. census official in the region, Ivan Petroff, who remarked that

> the people of two villages ... in the vicinity of lake Walker [his designation for Naknek Lake] came down to Katmai [on Shelikof Strait] to do their shopping and to dispose of their furs, undertaking a very fatiguing tramp over mountains and glaciers and across deep and dangerous streams in preference to the canoe journey to the Bristol Bay stations. (Petroff, 1884, p. 25)

And he reported a local tradition in which hostilities probably involving the two Naknek River peoples are alluded to, when at a feeder stream of Naknek Lake there was

> a night attack made by the "bloodthirsty" Aleuts long years ago, when every soul in the place was dispatched without mercy, with the exception of one man, who hid himself under a waterfall close by, and thus survived to tell the tale. (Petroff, 1884, p. 24)

In 1912 the violent volcanic eruption in the vicinity of Mt. Katmai, which deposited 30 cm or more of pumice and ash on upper Naknek Lake, caused the permanent abandonment of the two Severnovsk settlements then occupied. Despite any residual hostile feeling for the 20th-century descendants of the Aglurmiut, most of the survivors relocated on the left bank of the Naknek River 10 km above Naknek village. Not only had the Severnovsk people fled there as the eruption began, but canneries on the lower Naknek promised occasional employment, and the Pacific coastal settlements they had been inclined to visit in earlier times were totally destroyed by the eruption.

Unlike the people of Paugvik and their descendants, the social and linguistic affinity of the Severnovsk people is not clear in generally available sources. However, the matter is important to some considerations stemming from the work reported here and will be pursued briefly.

When the Russian fur hunters followed the path of Vitus Bering to the New World after his unlucky voyage of 1741–1742, they applied their appellation "Aleut" to native peoples of what we now know as the Aleutian Islands—peoples who spoke one or more languages that are now called (after the Russian innovation) Aleut (Fig. 2). But as the Russians moved eastward around the northern edge of the Pacific, they applied the same term, Aleut, to people they met on Kodiak Island. These were a people who spoke a language entirely unintelligible to natives of the Aleutian Islands. It is now recognized as the southernmost of the Yupik languages and designated Alutiiq or Sugpiaq, and the people are called Koniag. The Russian fur hunters also applied the designator "Aleut" to the Eskimo-speaking peoples they began to meet on the Alaska Peninsula (shown as Peninsula Eskimo in Fig. 2). This practice continued until they had crossed the peninsula to the Bering Sea, where they gave separate ethnic designations to the larger ethnolinguistic groups, such as Kusquqvagmiut of the Kuskokwim, Kiatagmiut of the upper reaches of the Nushagak, Wood, and Kvichak rivers, and "Aglegmiut" of the Bristol Bay coast.

Is there, then, any affinity implied among those Eskimo-speaking peoples they had designated as Aleuts—a designation applied from Kodiak in the south to people of the Ugashik River and of the Severnovsk settlements of the Naknek drainage in the north?

Certainly the native people of the Pacific coast of the Alaska Peninsula were related to those of Kodiak. As one traveler in the first decade of the 19th century reported of people of the peninsula's Kukak Bay (as near to the Severnovsk settlements as was Katmai), "the customs, the manners, and in a great degree the clothing and language ... are the same as those of the people of Kodiak" (Langsdorff, 1814, II, p. 236). And in census and vital statistics documents of the Russian Orthodox church (ARC, 1733–1938, 1816–1936), the people of that coast were as often as not referred to as "Kodiak Aleuts." With regard to people farther north on the peninsula, at least one 19th-century traveler reported a dialectal difference between Severnovsk people and those of Katmai (Spurr, 1900, pp. 92–93), although in recent decades native informants in Naknek village have reported that natives of the Severnovsk villages spoke a language essentially identical to that of both Kodiak and Ugashik but differing in significant respects from speech current around Naknek in the earlier years of this century (Dumond, fieldnotes of 1974, 1985). In 1961, an account of the 1912 Katmai eruption was recorded in the native speech of one of the few surviving members of the original Severnovsk migrants to the lower Naknek River, a woman who was born in a Severnovsk settlement in 1879 according to church records (ARC, 1816–1936, Nushagak mission). This account has been recognized to be in Alutiiq, although with some Central Yupik elements (Michael Krauss, personal communication to Dumond, 1979). Thus it seems

reasonable to conclude that the people of both the Severnovsk villages and Ugashik (i.e., the Peninsula Eskimo of Fig. 2), like those of Kodiak (the Koniag), were native speakers of some form of Alutiiq. It also seems reasonable to conclude that the Russian ethnic designator "Aleut," when applied to Eskimo-speaking peoples, was reserved for speakers of that same language.

Seen in this way, the designation of the upper Naknek community by the Russian fur hunters and priests as "northerner settlements" makes considerable sense. The Severnovsk people were the northernmost of the "Aleuts" or Alutiiq speakers, their villages located directly north of and accessible by trail from the Russian-controlled hunting station of Katmai on the Pacific coast. As Alutiiq-speaking southerners, however, they contrasted with the Central Yupik Aglurmiut of Paugvik, who may now be seen to have occupied a beachhead in enemy territory until peace was imposed by the Russians.

Russian Explorations

As early as the mid-18th century, Russian fur traders began to expand into areas north of the Gulf of Alaska. The tip and the southern shore of the Alaska Peninsula were to some extent within the Russian sphere of influence by 1761, possibly even earlier. In 1799 the Bristol Bay–Iliamna Lake area was controlled by the Lebedev-Lastochkin Company, and some areas of Bristol Bay probably were explored during the last two decades of the 18th century (Black, 1984, p. 27).

Early in the 19th century, as the number of fur-bearing animals declined in traditionally exploited regions, the Russian-American Company focused its attention on the vast area of southwestern Alaska north of the Alaska Peninsula. There, they believed, new profits could be achieved through trade with the Eskimo and Indian inhabitants for beaver pelts and other furs. The company dispatched an expedition in April 1818 under the command of Petr Korsakovskiy to explore part of the Alaska Peninsula and the coast from uppermost Bristol Bay to the mouth of the Kuskokwim River. The party crossed the peninsula at what is now known as Becharof Lake and moved down its outlet stream to Bristol Bay. In August, leaving some of his party at the mouth of the Nushagak River, Korsakovskiy led a detachment eastward to lakes Iliamna and Clark. On Iliamna Lake he met Eremy Rodionov, a local trader, who offered to lead a small party north into the interior, a difficult journey during which they may have reached the Kuskokwim River. In the fall Korsakovskiy and his men returned to Kodiak Island by way of Iliamna Lake (VanStone, ed., 1988).

In the summer of 1819 Korsakovskiy led another exploring party to Bristol Bay. The party planned to explore the Kuskokwim River, but for a variety of reasons was not successful. The 1819 expedition did, however, establish a trading post, Aleksandrovskiy Redoubt, at the mouth of the Nushagak River at what would become the site of the mission and settlement of Nushagak (Fig. 1). Fedor Kolmakov, a company employee who had accompanied Korsakovskiy on both his expeditions, was placed in charge (Fedorova, 1973a, p. 8; 1973b, pp. 68–69). The two expeditions of Korsakovskiy and the coastal explorations undertaken by V. S. Khromchenko and A. K. Etolin between 1819 and 1822 (VanStone, ed., 1973) provided the Russian-American Company with its first reliable information concerning relations among native groups in the Bristol Bay region and the extent to which they would be influenced by the establishment of Aleksandrovskiy Redoubt (Berkh, 1823a, pt. 2, pp. 1–20, 1823b; RAC/CS, vol. 3, no. 164, 4 May 1823).

The Aglurmiut

The native people whom Korsakovskiy and other explorers encountered on the upper Alaska Peninsula and in Bristol Bay were the Central Yupik-speaking Aglurmiut or "Aglegmiut." Korsakovskiy briefly described the Aglurmiut in his 1818 journal (VanStone, ed., 1988, pp. 29–31), and the first published account of subcultural groups in the Bristol Bay region was derived from the explorer's 1819 journal as reported by Berkh (1823b). In this account the coastal inhabitants are referred to as "Glakmiut" and are said to have been constantly at war with the Kusquqvagmiut of the Kuskokwim River. V. S. Khromchenko, during his coastal explorations of southwestern Alaska, in 1822, noted that the Aglurmiut were the most warlike people along the coast between Bristol Bay and Norton Sound. His account included a brief description of their culture and a rather extensive vocabulary (VanStone, ed., 1973, pp. 52–53). Wrangell (1970, p. 17), Khlebnikov (Lyapunova & Fedorova, eds., 1979, p. 77), and early reports of the general man-

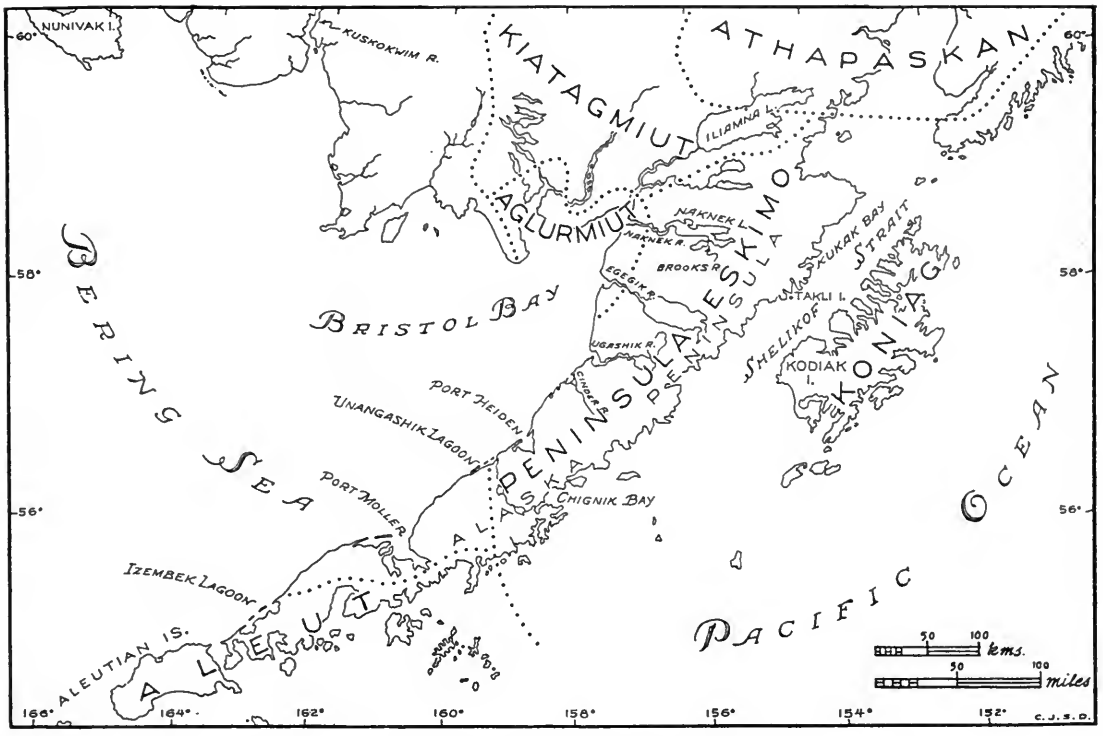

FIG. 2. Map of southwest Alaska showing ethnic group distribution.

agers of the Russian-American Company (RAC/CS, vol. 3, no. 164, 8 May 1823; vol. 9, no. 460, 31 October 1832) described how the Aglurmiut were displaced by warfare from the Kuskokwim River, some moving to Nunivak Island and others settling in Bristol Bay.

Kromchenko was apparently the first explorer to make a distinction between the coastal dwelling Aglurmiut and the Kiatagmiut, who at the time of contact inhabited the banks of the Nushagak and Wood rivers (VanStone, ed., 1973, p. 31). The Kiatagmiut, having recently moved from the upper Kuskokwim (VanStone, ed., 1988, pp. 94, 105), were, like their lower Kuskokwim River relatives and presumably like the "Aleuts" of the Alaska Peninsula, at war with the Aglurmiut. The existence of Aleksandrovskiy Redoubt and the efforts of Fedor Kolmakov were instrumental in stabilizing relations between the Aglurmiut and their new neighbors, thus permitting the former to hunt inland for caribou without fear of attack. Although the Aglurmiut were experienced warriors, constant battles with these neighbors had greatly reduced their numbers, and they found a refuge with Kolmakov at the trading post (Berkh, 1823b, p. 47; VanStone, ed., 1973, p. 52). Under these circumstances, by 1832 the Aglurmiut were already becoming accustomed to the Russians, were learning the Russian language, and were believed to be as useful to the company as the Kodiak "Aleuts" (RAC/CS, vol. 9, no. 460, folios 345–351, 31 October 1832; RAC/CR, vol. 9, no. 284, folios 11, 12, 30 March 1834).

The Aglurmiut population around Aleksandrovskiy Redoubt in 1818 was about 60, a number that grew to approximately 500 by 1832, including those living at the mouth of the Naknek River. In 1838 and 1839 a smallpox epidemic decimated the population of southwestern Alaska and, in spite of vaccinations administered in February 1838, killed a reported 522 people in Aglurmiut settlements near the redoubt, leaving only 351 survivors (Sarafian, 1970, p. 226; Wrangell, 1970, p. 14). Some of the earlier population numbers may have been grossly underestimated, however, as suggested by company reports of 1847 giving the number of Aglurmiut as variously from 850 to 1,000 (Fedorova, 1973a, pp. 164–165).

FIG. 3. Takhuty natives of the Naknek River region. Watercolor by Pavel Mikhailov, 1828, State Historical Museum of Estonia (Tallinn); photo by L. A. Shur. Reproduced through the courtesy of Richard A. Pierce, with permission of Alaska Northwest Publishing Co.

Russian Explorers at Paugvik

The primary Aglurmiut village on the Alaska Peninsula was Paugvik on the right (north) bank of the Naknek River just above its mouth. It was visited by Korsakovskiy in 1818 and appears on I. Ya. Vasilev's map of his explorations in southwest Alaska of 1829 (VanStone, ed., 1988, p. 76). The earliest known depictions of Naknek River people date from 1828 (Fig. 3).

Korsakovskiy was almost certainly not the first Russian to visit Paugvik, however. In 1791 Dmitry Bocharov crossed the Alaska Peninsula in the vicinity of the lake that now (in slightly modified form) bears his name, and he may have visited the settlement (Efimov, 1964, map 180). Furthermore, it is apparent from Korsakovskiy's 1818 journal that at the time of his visit, natives of the Naknek River region had been in contact with Russian traders for some time. Severnovsk *toyons* (i.e., men recognized by the Russians as community leaders) were mentioned as present on Kodiak at the time of his departure, and on his arrival at the Shelikof Strait hunting station of Katmai an "Aglegmiut" girl was referred to (VanStone, ed., 1988, p. 18). In describing his departure from Katmai on 19 May (OS), the explorer mentioned that his party was accompanied by "an Indian [Severnovsk?] toyon who acted as Kolmakov's guide to the Aglegmiut Indian settlement [probably Paugvik] and was used to taking fur goods to Katmai." This native was said to have worked for the company for many years (VanStone, ed., 1988, p. 22). Korsakovskiy's comment may be taken to suggest that at that time, Paugvik maintained relations with the Russian-American Company through the fur hunting and fishing artel at Katmai on the southern shore of the Alaska Peninsula, but possibly not with Severnovsk people as intermediaries, for Korsakovskiy's party was led not over

Katmai Pass and the route along the Naknek River, but rather across the more southerly Becharov Lake and down its outlet stream to Bristol Bay.

On 2 June 1818, Korsakovskiy's party entered the mouth of the Naknek River:

> At the mouth, on the left bank there was an Aglegmiut settlement. At once our toyon with an interpreter went ashore, then all our baydarkas and, on command, we saluted by firing blank cartridges from our pistols. The local Indians greeted us joyfully and thanked us for paying them a visit. (VanStone, ed., 1988, p. 28)

Paugvik is on the right bank of the river, and although there was a village directly opposite on the left bank, designated "Kougumik" on Vasilev's map (VanStone, ed., 1988, p. 76), it seems clear that Korsakovskiy was referring to the bank that was on his left hand as he entered the river mouth.

The following day Paugvik natives brought Korsakovskiy's party food and received in return "Chinese pearls, seed beads, and large beads." Three local men promised to accompany the expedition and were given clothing and beads. A dance was held on 5 June, with at least 400 natives present (VanStone, ed., 1988, p. 28), a number that may have included visitors from other villages. In any event, the earliest population figures for Paugvik are Russian Church confessional registers that list 159 inhabitants in 1850 (ARC, 1733–1938, Nushagak confessional registers, 1850), but comparison with registers of later years makes it clear that this is less than the total population, which one projection would estimate at twice that number or more, for the early 19th century (Dumond, 1986, Tables 5, 26).

Paugvik and the Fur Trade

Despite the establishment of Aleksandrovskiy Redoubt in 1819, the Paugvik natives may have continued to trade their furs at Katmai and may have done so as late as 1832 (RAC/CS, vol. 9, no. 460, folios 345–351, 31 October 1832). Not until 1851 was there a documented relationship between the settlement and Aleksandrovskiy Redoubt. In that year the general manager of the company, M. D. Tebenkov, in a communication to the Kodiak office noted with apparent disgust that the Aglurmiut were complaining about the prices paid for furs. He also commented on their failure to provide men for service to the company *baydarshchik* at Aleksandrovskiy Redoubt, which had by then been reduced to an *odinochka,* a post under a single Russian or Creole official. Tebenkov threatened to "drive away all the Aglegmiuts from Naknek [River] and from the mouth of this river, namely from Pagvyk, to their old places of habitation in the neighborhood of the Kuskokvims" (RAC/CS, vol. 32, no. 278, folios 132, 133, 20 April 1851).

Although specific information on the fur trade at Paugvik is lacking, the records of the Russian-American Company contain some information concerning the methods by which the manager at Aleksandrovskiy Redoubt dealt with natives of the surrounding areas for furs. When new contacts were made with villages like Paugvik, the manager attempted to determine the toyons. These individuals were given silver medals called "United Russia," with the Tsar's picture on one side, a certificate designating the leader as a person of authority recognized by the company, and occasional incentive gifts. The post manager was warned against handing out medals indiscriminately, was charged with keeping a careful account of those medals he did distribute, and was encouraged to retrieve them from the families of toyons who died, so that they might be awarded to others. The toyons were supposed to be individuals who were respected by their fellow villagers and whose friendly relations with the Russians would benefit the company. A toyon encouraged his fellow villagers to hunt and bring their furs to the redoubt. Probably the toyons never had as much authority in their communities as the company's officials believed, but in one way or another a faithful toyon could often encourage hunters in his village to expend more energy in the company's behalf than they might otherwise have been inclined to do (RAC/CS, vol. 8, no. 322, folio 247, 23 May 1831; vol. 9, no. 460, folio 350, 3 October 1832; vol. 16, no. 467, folios 178, 179, 31 October 1838; vol. 17, nos. 387, 388, folios 370–372, 4 June 1839).

Although this was the traditional manner of dealing for furs with inhabitants of Bristol Bay and adjacent regions, the Russians also sent out hunting parties. In the summer of 1839, for example, a party of Eskimos was sent from Aleksandrovskiy Redoubt to hunt for beavers. The hunters were paid a specific wage, and all furs taken belonged to the company. This particular hunt was highly successful, and the natives seemed to approve of the arrangement (RAC/CS, vol. 18, no. 335, folios 314–317, 25 May 1840).

The most popular trade goods of the period were tobacco, various kinds of dry goods, and beads of various sizes and colors. Other goods bartered by

the Russians in western Alaska and likely to have been included in the trading inventories at Aleksandrovskiy Redoubt at one time or another were knives, iron spears, steel for striking a fire, needles, combs, pipes, cooking pots, large cups, mirrors, copper rings, earrings, bracelets of copper and iron, leather pouches, pestles and mortars, small bells, navy buttons, flannel blankets, objects referred to as "Aleutian axes," and items of European clothing (Zagoskin, 1967, pp. 161–162).

Although not explicitly stated in the sources, it is likely that the Aglurmiut of Paugvik, like natives elsewhere in Alaska, were encouraged to become indebted to the company to ensure that they would have to trade with or work for the local post. The more closely natives were bound to the company and the more heavily they relied on the trader for supplies and items of European manufacture, the less likely they were to pursue traditional subsistence activities to the exclusion of trapping. Certainly many traditional hunting techniques began to be forgotten at this time. The company assumed a paternal role, controlling goods that the natives could obtain and carefully regulating how much they were to receive. Aside from these generalities, however, no details are known of the mechanics of the fur trade at Aleksandrovskiy Redoubt, such as relations between traders and natives, formalities of trading procedures, inventories of trade goods, or relative values of furs and trade goods.

In 1840, A. K. Etolin, the general manager of the Russian-American Company, proposed to reduce the company's expenditures by consolidating a number of the most remote posts. Aleksandrovskiy Redoubt would be reduced to an *odinochka,* under a single *baydarshchik* and two or three "Aleut" assistants. These men would be subordinated to Nikolaevskiy Redoubt on Cook Inlet from where they would be supplied with food and trade goods by way of a small post on Iliamna Lake (RAC/CS, vol. 23, no. 703, folio 554, 23 December 1844; DRHA, 1936–1938, vol. 1, pp. 365–366). Although this new arrangement must have affected the trade at Paugvik, the precise nature of these effects unfortunately cannot be determined.

After an initial short period of importance as the only company post north of the Alaska Peninsula, Aleksandrovskiy Redoubt lapsed into relative obscurity with the emergence of other posts and the establishment of better lines of communication throughout southwest Alaska. The strategic location of Aleksandrovskiy Redoubt and the efforts of Fedor Kolmakov brought about, within a period of little more than 20 years, extensive exposure of the natives of southwestern Alaska to the fur trade. Acculturation was most rapid among the Aglurmiut who lived closest to the post, including the inhabitants of Paugvik.

The Russian Orthodox Church

During the 10 years following the establishment of Aleksandrovskiy Redoubt, there is evidence that Fedor Kolmakov baptized a small number of natives, probably Aglurmiut, who were employees of the Russian-American Company (Barsukov, 1886–1888, vol. 2, p. 36). In the spring of 1829 Bishop Ivan Veniaminov arrived at the redoubt to visit the few Christians living there. When he made a second visit three years later he learned that Kolmakov had baptized 70 Eskimos from several villages. A small chapel was constructed at the post in the same year (Barsukov, 1886–1888, vol. 2, pp. 37–48).

The first reference to the Naknek region in surviving church records appears to be in 1841, when the Kodiak mission recorded in their vital statistics notations a visit to the peninsula in which 57 people were baptized at Katmai and an additional 46 (24 males and 21 females, ages 1–67) were baptized in the Severnovsk settlements (ARC, 1816–1936, Kodiak, 1841); there is no indication that the trip extended to Paugvik, however. In 1842 the first missionary was assigned to the Nushagak mission (RAC/CS, vol. 21, nos. 28–30, folios 24–27, 11 February 1842; no. 249, folios 183, 184, 9 May 1842; DRHA, 1936–1938, vol. 1, pp. 385–386). At that time, Christians at the redoubt numbered about 200, and during the next three years as many as 400 additional natives were baptized. The priest began making trips into the interior and perhaps to Paugvik. Apparently the Nushagak mission district included Paugvik from the mission's founding, but it was three years later, in 1844, that the Severnovsk settlements and those of Ugashik were transferred to that mission from Kodiak (ARC, 1733–1938, Nushagak, Bishop of Kamchatka to Missionary of Nushagak Church, 14 July 1844). Thereafter vital statistics and registers of communicants began to be maintained at Nushagak for both Paugvik and the Severnovsk settlements, although whether these were uniformly the results of annual visits of the priest or whether they involved visits of the Naknek people to Nushagak is not known.

In the 1840s, when Aleksandrovskiy Redoubt was reduced to an *odinochka* and subordinated to Nikolaevskiy Redoubt on Cook Inlet, manager Etolin wanted the priest at Nikolaevskiy to take charge of the church at Nushagak. When Bishop Veniaminov received this information he immediately instructed the missionary at Nikolaevskiy to make a trip to the mouth of the Naknek River "to learn in detail all local conditions regarding communications with Nushagak" (DRHA, 1936–1938, vol. 1, pp. 364–366). This instruction suggests that the Bishop was concerned particularly about the Christians at Paugvik and whether they could be served adequately when the missionary was withdrawn from Nushagak. The church authorities, however, in spite of suggestions of Etolin for consolidating mission activity in the region, decided after a brief interval to maintain a priest at the Nushagak mission.

By 1848 there were 1,080 parishioners in the Nushagak region and the Aglurmiut were considered to be the most faithful, sometimes traveling great distances to attend services (RAC/CS, vol. 34, no. 382, folio 130, 6 June 1853; Barsukov, 1897–1901, vol. 1, p. 407). By 1864 all the natives in the villages that the Nushagak missionary was able to visit were said to have been baptized (DRHA, 1936–1938, vol. 1, p. 149). On 1 July 1865, the priest visited Paugvik (DRHA, 1936–1938, vol. 1, p. 149), the first clearly documented visit of a churchman to the settlement, but from the regularity with which confessional registers for that settlement were maintained after 1850, it seems evident that such visits had taken place in the past, even though a chapel was not constructed until the 1870s (ARC, 1733–1938, Nushagak, Church/Clergy Registers, Sts. Peter and Paul Church, and Confessional Lists).

Paugvik in the American Period

In 1867, following purchase of Alaska by the United States, the San Francisco firm of Hutchison, Kohl and Company purchased the assets of the Russian-American Company. This firm, which operated the Nushagak post under its original name for one or possibly two years, was soon reorganized to form the Alaska Commercial Company. Like other American firms, it was not as generous with credit as its predecessor. On Kodiak Island, for example, the Alaska Commercial Company and other traders, after following a credit policy similar to that of the Russian-American Company, suddenly shifted to an exchange business and attempted to collect outstanding debts (DRHA, 1936–1938, vol. 2, pp. 186–187). Their native customers thus found themselves billed for accounts that they could not possibly pay for years. Because the Alaska Commercial Company never had any serious competition in the Nushagak River region, they probably also abandoned the paternalistic policies of the Russian-American Company in that region and refused to allow their patrons to run up large debts. Whatever the effect of this on the people at Paugvik and other Nushagak-region villages, the Alaska Commercial Company post at Nushagak maintained a moderately flourishing trade at least through the remainder of the 19th century. At various times between 1880 and 1890, the post maintained outposts at Ugashik and Togiak, and there could well have been one at Paugvik.

Charles Bryant, who visited Nushagak in 1868, noted that beaver was the principal fur and that more than 2,000 skins were taken in by the post annually (Bryant & McIntyre, 1869, p. 36). During the 1870s beaver, muskrat, land otter, and red fox seem to have been the most important fur-bearing animals in the Nushagak region. There was also a small trade in swansdown, and caribou skins were dried and traded (Elliott, 1875, p. 40). Muskrats seem to have been taken in increasing numbers even though their value was low, and the traders were compelled to accept these pelts in order to be able to buy more valuable furs (Elliott, 1886, p. 399).

A commercial development in Bristol Bay that had a greater and more lasting effect on the natives of the region than the fur trade was the salmon fishing industry. All five species of Pacific salmon make spawning runs into the rivers of Bristol Bay, and of them red or sockeye salmon, which spawn only in systems with freshwater lakes, are the most important species commercially. Most of the rivers flowing into Bristol Bay have numerous lakes at their headwaters.

The earliest commercial fishing in the Bay was carried out by the Alaska Commercial Company, and the first cannery was established at Nushagak in 1883 by the Arctic Packing Company. By 1903 there were 10 canneries in Nushagak Bay alone (VanStone, 1967, pp. 67–72). In the Naknek River region commercial fishing began in 1890, when salteries were established a short distance above the river's mouth, on the left bank by the Arctic Packing Company and on the right, about 2 km

FIG. 4. Native houses near Naknek, 1900. U.S. Fish and Wildlife Service photo no. 22-FFA-2546, U.S. National Archives.

above Paugvik, by L. A. Pederson. In 1893 the Arctic Packing Company saltery was sold to the Alaska Packers Association, and the following year a cannery was constructed at the same location. In 1893 the Naknek Packing Company absorbed the Pederson saltery and erected a cannery near it (Moser, 1902, pp. 209–211).

From the beginning, operators of salmon canneries in Bristol Bay made little effort to utilize the local labor supply. Most of the actual fishing was by Euro-Americans who came to Alaska for the fishing season and returned home when the runs were over and the canneries had completed their packs. The actual canning was done by imported Chinese laborers, with supervisory positions held by Euro-Americans. As late as 1891 only an occasional native was employed by the canneries, the Chinese being considered more reliable and methodical (VanStone, 1967, p. 73).

In 1900 the cannery of the Alaska Packers Association on the Naknek River employed 58 Euro-American fishermen and 54 Euro-American cannery workers, trap and beach men, and salters; 20 employees were local natives and 140 were Chinese. In the same year the Naknek Packing Company across the river employed 60 Euro-American fishermen and beach hands, while 12 Euro-Americans, 11 natives, and 131 Chinese worked in the cannery (Moser, 1902, pp. 210–211). Although relatively few native people were actually employed, the canneries attracted large numbers of them during the fishing season. Board was supplied to all natives employed, and this they certainly shared with their unemployed relatives. Some of them also found it easier to harvest the waste of the canneries than to make their own fish traps. Missionaries and some government employees deplored the influence of the canneries on

FIG. 5. Native houses and fish-drying racks near South Naknek, 1900. U.S. Fish and Wildlife Service photo no. 22-FFA-2542, U.S. National Archives.

the natives, particularly the drinking and gambling that were characteristic of the Chinese laborers (VanStone, 1967, pp. 73–77).

Since the cannery of the Naknek Packing Company was only a short distance upstream from Paugvik, it is certain to have had some effect on the choice of locations for villagers' houses. Native houses were certainly present on the hill west of the cannery in 1900 when photographs were taken by U.S. Fish Commission employees (Fig. 4). Here, as across the river near the Alaska Packers Association cannery, native settlements previously located downstream would have begun to coalesce around the new industrial establishments (Figs. 5, 6), creating a permanent change in local patterns of settlement. As indicated in Part 5, however, there is evidence that the shift upstream in fact predated the establishment of any commercial fish processing station.

Following the sale of Alaska, the Russian Orthodox Church had acted immediately to reduce the number of its clergymen in the new American territory, a move prompted by fear that the missions could not be effectively supplied after the local demise of the Russian-American Company. In 1868 the priest at Nushagak was withdrawn, and the mission was left in the care of a lay reader (DRHA, 1936–1938, vol. 1, pp. 153–251). But within 10 years a priest had been reassigned (RAC/CS, vol. 42, no. 445, folio 166, 19 September 1860), and during the priestless interval church membership in the Bristol Bay region continued to increase. By 1878–1879 communicants appear to have numbered nearly 2,400, making Nushagak the second largest of the nine missions in the Alaska diocese (DRHA, 1936–1938, vol. 1, p. 116). But in 1884 the Moravian Church entered the mission field in southwestern Alaska and three years later established a school and mission, called Carmel, a few miles above the Nushagak Orthodox

FIG. 6. Native house and cache near South Naknek, 1900. U.S. Fish and Wildlife Service photo no. 22-FFA-2543, U.S. National Archives.

mission. The era when the Russian Orthodox Church had a clear field in Alaska had come to an end (VanStone, 1967, pp. 37–48).

During the last decades of the 19th century, the Russian Orthodox priest at Nushagak continued to visit the settlements under his jurisdiction, including those of the Naknek region. In 1876 the first chapel was under construction at Paugvik (ARC, 1733–1938, Nushagak, Church/Clergy Registers, Sts. Peter and Paul Church, 1876). In January 1883, there is a record of a five-day visit to Paugvik for "preaching and officiating" (DRHA, 1936–1938, vol. 2, pp. 144–145).

It appears impossible to determine with absolute certainty the date of abandonment of Paugvik. Withdrawal of the population probably was the result of a gradual shift upstream, toward the location of present Naknek and the first canneries, although this shift must have predated the establishment of salteries or canneries. H. W. Elliott (1886, p. 400), writing on the basis of a visit in the early 1870s, noted that

> [a]n old deserted settlement—ruins of Paugwik—marked by the outlines of its cemetery, still is visible at the debouchure of the Nakneck. With a strange disrespect for the departed, those natives who live at an adjoining village come over here to excavate salmon-holes in the ancient graveyard, so that a process of moist rotting shall take place prior to eating them.

Elliott may well have been describing two parts of Paugvik, one of which was no longer occupied even in the early 1870s. Although evidence for two separate parts of the village known as Paugvik is not as direct as might be wished, such a situation seems to accord well with known facts.

On the one hand, a village of Paugvik (or of some recognizable variation of that name) was recorded in the 10th U.S. census of 1880 (said to include two settlements but possibly meaning on

different sides of the river) with a total population of 192 (Petroff, 1884, p. 17); in the 11th census of 1890 as a single village entry, population 93, including one white male (Porter, 1893, p. 5); in the 12th census of 1900 as population 94, including two Norwegian males (U.S. Census, 1900); and in the 13th census of 1910 as population 74, including one Norwegian male (U.S. Census, 1910). On this basis, Paugvik would seem to have existed at least until 1910.

On the other hand, when the archaeologist Helge Larsen was conducting a reconnaissance in southwestern Alaska in the summer of 1948 and stopped in Naknek, he reportedly was told by the local postmaster, who said he had lived in the village since 1895, that the site Larsen—and later we—excavated had been abandoned 20 years before his own arrival in Naknek (Larsen, 1950, pp. 177–178). Furthermore, the very postmaster from whom that statement is reported is listed in the 1910 census enumeration sheets as living in Paugvik (U.S. Census, 1910, "Bugorwik" sheets, family entry 79).

Considering all these circumstances, it seems not only possible but likely that the Paugvik of the U.S. census enumerators, at least of the later ones, was not the 19th-century Paugvik in which our excavations were focused. This interpretation is entirely in accord with some of the results of those excavations.

2

History of Archaeological Research

Work Before 1985

The Paugvik site was first examined from an anthropological viewpoint in 1931, when Ales Hrdlicka of the Smithsonian Institution exhumed a number of skeletons in the vicinity. His photographs of the site show it to be without any identifiable structures, covered with grass like that to be seen today, but flanked by a single large pond where there are now two smaller ones (Hrdlicka, 1943, Fig. 224; see present Figs. 7, 8). He reported that the bluff on which the site was situated was subject to active tidal erosion. He also noted the presence of burials on two small ridges behind the site (Hrdlicka, 1943, p. 351). Hrdlicka recovered undecorated pottery and large quantities of clam and mussel shells but noted that worked stone was rare. He excavated a number of graves and observed that the site covered at least two acres, having been once much larger. Indeed, he indicated belief that "on the whole the Russian influence appears to have been late and superficial, [for] the settlement has plainly existed from long before" (Hrdlicka, 1943, pp. 386–388). Although he apparently left no record of the exact location of his excavations, his catalog of crania in the U.S. National Museum lists seven males and eight females from Paugvik, or *Pawik,* in his rendering (Hrdlicka, 1944, pp. 30–33).

In 1948 the site was visited for a few days by the Danish archaeologist Helge Larsen, who reported briefly on his limited excavations in the site he referred to as Pavik (Larsen, 1950). In 1961 Paugvik was tested by a party from the University of Oregon that mapped the major habitation portion of the site (the map was reproduced with modifications by Dumond, 1981, Fig. 4.2). The excavations of that year were limited to a 1 × 10-m trench no more than 1 m in depth, where it encountered sterile clay and silt of the glacial outwash that underlies the entire low-lying region along Bristol Bay. Results were reported at the time in abbreviated narratives (Dumond, 1962a, pp. 70–71; 1962b, p. 17) but were incorporated in later more complete descriptions (Dumond, 1981). Using the terminology employed by Larsen (1950) the historic-period archaeological component was in 1961 formally designated the Pavik phase of local culture, and this designation will continue to be used for the defined archaeological phase, although the name of the site itself is given as Paugvik, the spelling shown on the earliest maps of the upper Alaska Peninsula.

Although Hrdlicka (1943) had indicated his belief that the site was largely prehistoric, the Russian Church records and the results of both 1948 and 1961 excavations indicated the former settlement to have been largely if not entirely of the 19th century. In 1961, however, three (of 356) potsherds recovered from deposits containing postcontact trade materials and Pavik phase artifacts were of a thick, gravel-tempered ceramic type (now termed Naknek thick plain) that was characteristic of the prehistoric Brooks River Camp phase of culture of the Naknek region, which is known to date between about A.D. 1100 and 1450 (Dumond, 1981). This finding suggested that there were at least some prehistoric occupation remains to be found in the Paugvik vicinity, and in 1973, when the University of Oregon was conducting an archaeological survey and limited excavations along the lower Naknek River, it seemed appropriate to test the site once again in search of more definitive evidence of earlier occupation.

In 1973 a trench 1 × 18 m in extent was laid out on the western side of the major rise of ground

FIG. 7. Aerial view of the Paugvik site and environs. Cannery buildings are in left foreground; lower Naknek River is on the left, with Bristol Bay visible in right background. The site is on the high portion of the river bluff seen in middle background above the pond to the left. Photo by James Thompson, 1985.

in the main part of the Paugvik site, in an area that examination of the eroding river bluff indicated contained thick deposits of midden but in which there were no recognizable house depressions. Two detached 1 × 2-m pits extended the excavation line an additional 8 m to the east (Dumond, 1981, Fig. 4.2; present Fig. 9). In the trench and its extensions, characteristic postcontact Pavik phase artifacts were found in heavily streaked brown midden soil in which layers of peaty sod marked former ground surfaces. Beneath the heaviest of these old sod layers in the continuous trench, in places undisturbed by intrusions from overlying Pavik levels, there was a layer of white volcanic ash about 1 cm thick. This was thought to be an ash that had been fairly securely dated to about A.D. 1450 in the upper Naknek River drainage, where it immediately overlies cultural deposits of the Brooks River Camp phase.

In the lower, southwestern end of the trench the excavation of 1973 was carried less than 1 m, at which point sterile glacial outwash was encountered. There the upper surface of the glacial clays was capped by a stratum of peat some 50 cm thick that tapered upslope to the northeastward and vanished entirely about 12 m along the trench (Dumond, 1981, Fig. 4.3). This peat was interpreted as the remains of vegetation at the edge of the kettle lake that once covered what is now the dissected basin west of the hill, a counterpart of the ponds that still remain east of it (Dumond, 1981, Fig. 4.2; present Fig. 9). In the higher, northeastern end and in the detached pits, sterile outwash was not reached by the end of the field season, with excavations carried to about 1.5 m below the surface. The nature of the artifact-rich deposits in the northeastern section of the continuous trench strongly suggested the presence of a habitation not visible from the surface. A deeper test in a limited area of the section revealed a trace of the white volcanic ash only a few centimeters lower than the trench floor.

Again, scattered potsherds of Brooks River Camp phase type—now 15 in number (in a total of 356)—were recovered, half of them from otherwise Pavik phase deposits and half from the underlying peaty layer at the western end of the trench. No datable charcoal was recovered with the sherds, most of

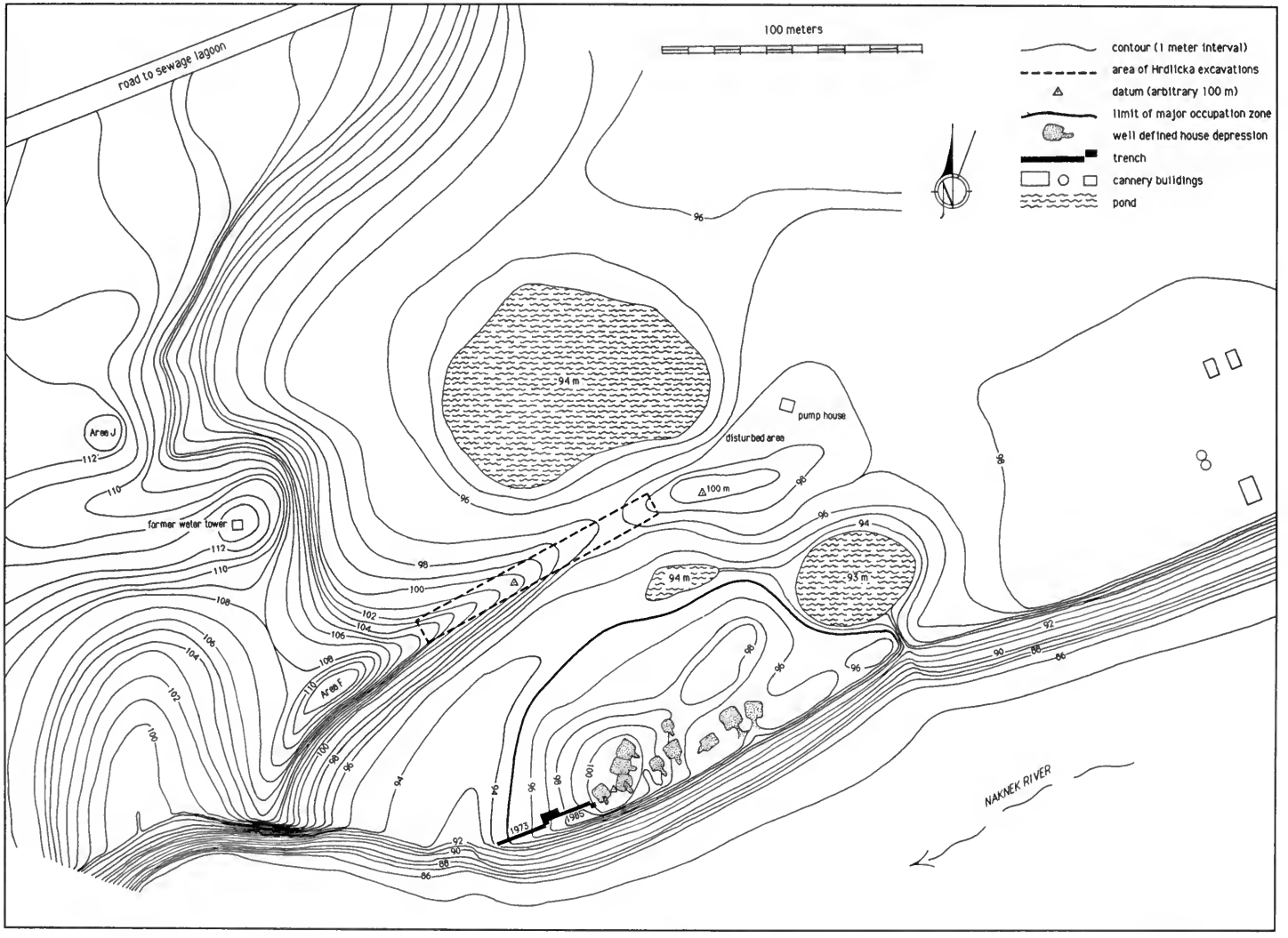

FIG. 8. Contour map of the Paugvik site.

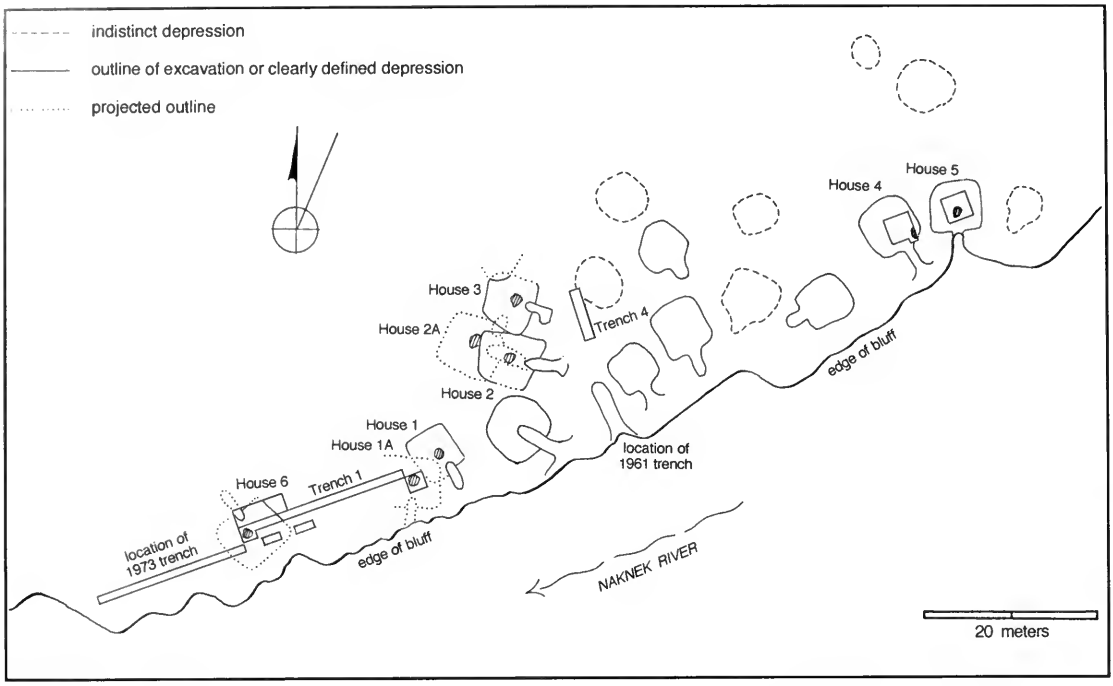

FIG. 9. Plot of the major occupation area at Paugvik.

which could represent items lost or discarded near the edge of the former pond at a time well before the establishment of the known historic Paugvik settlement. Surveillance of the eroding river bluff at the Paugvik site was maintained during the ensuing 1974 field season, and a thin band of white volcanic ash was discovered above scattered artifacts in the bluff immediately opposite the 1973 trench. A small excavation carried below the volcanic ash at that point yielded 14 Brooks River Camp phase potsherds next to charcoal that produced a radiocarbon date of about A.D 1255 (695 ± 65, SI-2070), finally providing some confirmation of prehistoric occupation at the site and contributing to the identification of the white volcanic ash (Dumond, 1981, pp. 65–67). Nevertheless, it seemed clear that very few remains of any such earlier occupation remained, presumably having been erased by the heavy tidal erosion that as late as the 1970s was taking its toll on the bluff in the area of heaviest 19th-century occupation.

In none of this work, however, had any attempt been made systematically to sample the habitation area of the site to determine its extent, nor had any attempt been made to examine the surrounding area carefully to determine the probable location of Hrdlicka's excavations. The need for some such attempt became evident in 1983, when a road was constructed immediately north of the site to connect the modern village of Naknek with a new municipal sewage facility. Thus, in 1985, with financial support from the Alaska Historic Preservation Office, it was possible to expand the excavation program sufficiently to permit such additional mapping and testing to be accomplished.

Summary of the 1985 Field Season

Mapping

Although major effort in 1985 was directed to the excavation of houses and middens, a new contour map of the Paugvik site also was plotted by alidade and planetable, supplemented by the use of three datum points at the same elevation—assigned an arbitrary value of 100 m—from which triangulations were made and elevations were measured (Fig. 8). For outlying areas some elevations were estimated by handlevel. In the actual area of the 10 well-defined house depressions, horizontal positions were pinpointed by extension of a single metric grid system over the entire site, laid out

with reference to the line that had been established for the trench of 1973 (Fig. 9).

To determine the area of actual major occupation, a soil sampling device with a 1-inch barrel was used where soil conditions permitted. Because the underlying sterile layer in the entire area is a greenish, clay-laden till that is unmistakable even in modest amounts, this small sampler was entirely adequate where frost did not impede penetration. Shovel tests were used where a larger exposure was necessary. In the habitation area in particular, the peaty soil was consistently frozen beneath the thick layer of overlying sod (of *Calamagrostis canadensis* [Canadian bluejoint]). Here it was necessary to first cut away the sod to give the underlying soil a chance to thaw enough that either the shovel or the soil sampler could be used.

The southern edge of the site is on the bluff of the Naknek River, which was actively eroding until only recently, and on the face of that bluff the signs of occupation could be traced in profile until they disappeared both to the east and to the west. North of the bluff and outside of the area marked by surface depressions (in which the presence of occupation was obvious), tests were made at approximately 10-m intervals as far north as the westernmost of the two small ponds shown in Figure 8. Tests were made at about double this interval in the area through the swale just west of the obvious habitation area and also on the relatively high ground east of the easternmost pond. Both of these last areas were essentially devoid of any trace of occupation debris, with glacial material appearing within about 40 cm of the surface.

In the higher ground surrounding the habitation area, a search was made for traces of earlier excavations. A total of 10 fairly clearly defined holes, obviously dug a number of years ago, each about 30 × 120 cm in extent and 30 cm in depth, were located in the area marked with the bold dashed rectangle in Figure 8. In one of these a fragment of tooth enamel gave evidence of the almost certain presence at one time of a buried human, suggesting strongly that this was the place of Hrdlicka's burial excavations. In the same area, seven other depressions, smaller and less clearly delineated, were also counted, but higher up the rising ground to the west no additional depressions were noted, and the soil testing revealed no burials that could be identified.

Within the habitation area, the limit of significant occupation debris is bounded by the 95-m contour that appears as a thick line in Figure 8. Within that area the location of debris was somewhat irregular, with occupation fill anywhere from 20 cm to 2 m in depth above the irregular surface of the underlying glacial till. As a general rule, the midden deposits appeared to be deepest between the 97- and 99-m contours, although there were exceptions: for instance, the knoll that lies between the concentration of visible houses and the eastern pond was almost devoid of midden on its summit. The area of heaviest occupation trash was not solely confined to the immediate vicinity of visible house depressions.

Excavations

Although no formal grid had been established in 1973, when the trench of that year was backfilled the key stakes were driven completely into the ground to permit relocation of the trench if desired. In 1985 these were used to orient the excavation grid, which was labeled according to cardinal directions, although in fact the nominal grid north was oriented 41 degrees west of magnetic north, or about 20 degrees west of true. Unless specifically indicated otherwise, the nominal orientation will be used in the site descriptions hereinafter.

Three houses were excavated completely, two more were tested, and likely midden areas were trenched. Traces were found of at least five and possibly six additional houses that were not recognized on the surface. Because frost hampered excavations throughout the season, the major excavation units were attacked for short periods at a time, rotating from one to another as thawing permitted.

Trench 1 of 1985 was 20 m in length, its (nominal) south edge lying along the coordinate designated N10, which was just 2 m north of the south edge of the 1973 trench, and its west end (coordinate E20) coinciding with the east end of the continuous portion of that 1973 trench (Fig. 9). Frozen ground was encountered a short way under the sod.

House 1 was located at the highest point of the knob on which the remains of the village were discerned. Definition of the relatively shallow house was clear except for the south corner, where an earlier disturbance was encountered, the cause of which was only later understood. Concurrent with this excavation, sod was removed from House 2 and House 3, which were selected because they were apparently completely undisturbed by loot-

ers' pits and because initial shovel tests showed each of them to have well-defined floors in the vicinity of substantial rock-lined central fireplaces. The amount of frost remaining in all but the central areas of their floors, however, dictated some delay before excavations could begin in earnest.

As frost permitted, work in Trench 1 was continued until Pleistocene-age glacial till was encountered throughout, at depths varying from 1.0 to more than 9 m. At its western end, the trench penetrated the floor of a house, including a rock-lined fireplace, that apparently had been permanently frozen in its position beneath 1 m or more of peaty overburden. In the course of the summer a small area to the south of Trench 1 was opened up to expose the hearth, and a larger expansion of 2 × 6 m was opened to the north, which was field-designated Trench 2. At its opposite or eastern end, Trench 1 penetrated a heavy deposit of wood ash that suggested the presence of a house floor underlying a portion of House 1 and might have been responsible for the difficulty encountered in defining one corner of that house. A 2 × 2-m area was opened up in this vicinity to test this supposition; this small unit was then designated Trench 3.

Meanwhile, thawing had proceeded rapidly enough in Houses 2 and 3 to permit a shift of the crew to those units, while the newly opened trenches were allowed to thaw. The initial promise of rapid clearance of the new houses, with their particularly well-marked floors, was not realized, however.

House 2, in particular, had been excavated over an earlier habitation (designated House 2A), which had its subterranean entrance lying squarely beneath the stone-lined fireplace and its floor beneath the rear bench of House 2. House 2 itself was both deeper and larger than expected, and the complexity introduced by the underlying structure caused considerable delay.

The excavation of House 3 also began deceptively, with the structure promising to be rather small and shallow, although with some well-preserved structural members and a fairly clear floor deposit. Complexity arose particularly with the discovery that the edges of Houses 2 and 3 had either coincided or overlapped slightly. Furthermore, in the vicinity of their conjunction there was also the buried entranceway to an earlier house, the floor of which was never discovered. In addition, the northernmost corner of House 3 had been cut away by a still later house or other structure, which was so faintly indicated on the surface as to have been imperceptible during our earlier examinations.

Because of these complications, progress was sufficiently delayed that full-scale excavations of additional houses could not be undertaken. Trench 2 was cleared to underlying glacial till, exposing about one third of the frozen floor of the buried house, which is now designated House 6. The yield of artifacts of organic material—wood, bone, fur, baleen, etc.—was especially good from this house floor and the adjacent area. Trench 3 was shallow, but the excavation cleared the stone-lined fireplace that had clearly pertained to the earlier house (now House 1A) that underlay portions of House 1. Trench 4 was de-sodded to provide some sample of the midden near the entries of Houses 2 and 3.

By this time the season was nearly over, and additional sampling of the northeastern portion of the site, in which we had intended to completely excavate at least one relatively undisturbed house, was perforce confined to the testing of two house depressions (Houses 4 and 5). Both had only weakly defined floors, although both also revealed the large rock-lined fireplaces that were now recognized as characteristic of the site. In Trench 4 an area of 1 × 6 m, less than that originally opened, was carried to a depth of about 1 m, at which time sterile till had not been encountered, and the season was brought to an official close. All excavations were completely backfilled.

3

Excavation Detail

Trench 1

In 1973 the main trench, which was 1 m wide, had been laid out parallel to the bluff with its nominal western end beginning at the base of the western side of the hill on which the main house remains of Paugvik could be discerned. The westernmost 18-m section was opened as a continuous trench, the 2-m segments of which were simply designated sections 1 through 9, beginning at the low western end. East of this, the trench was continued as two detached 2-m sections, which were designated sections 11 and 13 (Fig. 9), but neither was carried to the sterile layer because of hampering frost. When the trench was backfilled at the close of the season, some key stakes were pounded into the ground to make relocation of the trench possible if desired.

In 1985 Trench 1 was laid out with its nominal southern edge (on the coordinate designated N10 in the arbitrary grid of that year) exactly 2 m north of the southern edge of the 1973 trench, its western end (at coordinate E20) coinciding with the eastern end of section 9 of the 1973 trench (Fig. 9). Twenty meters to the east (at E40) the trench ended almost exactly 1 m short of the edge of the depression at the top of the hill that was designated House 1. Through intermittent excavation as permitted by thawing, excavation of the trench was carried to sterile glacial silt and till throughout its length; a total of 27 m^3 of material was removed.

As with all of the units excavated in 1985, the trench was everywhere overlain by the pinkish streak of volcanic ash marking the 1912 eruption from the vicinity of Mount Katmai. The eastern end of the trench was shallow, with glacial till, clays, and loess encountered within 50 cm of the surface in most of the area east of E36, although in the southern wall of the easternmost meter of the trench there was clear evidence of charcoal and wood ash less than 20 cm below sod that marked the northern edge of a hearth that pertained to the house designated House 1A.

At the opposite or nominal western end of the trench, where midden overlay the glacial material 1 m or more in depth, a stone-lined hearth was encountered that was considered probably a feature of the house that had been suspected to lie beneath the eastern end of the 1973 trench, and evidence of a vertical aboriginal cut 4 m to the east of that hearth in Trench 1 was considered the edge of the same house. This area of Trench 1 was solidly frozen but slowly yielded plentiful scraps of wood and twigs at the presumed house-floor level. This excavation led to the opening of a 2 × 6-m section north of the east end of Trench 1, which was designated Trench 2 in the field. This new area was cleared to reveal additional portions of what is here designated House 6.

In the 4.5-m section east of the eastern edge of House 6, two more aboriginal cuts were found (Fig. 10). The easternmost of these almost certainly represented a cut for the tunnel of a house entrance, for at that point frozen remains of structural members were found slumped into a trench of aboriginal date that crossed Trench 1 at about right angles; to the west and stratigraphically later was evidence of a second deep cut suspected of having been a part of yet another house that had in turn been partly obliterated when House 6 was constructed (Fig. 10; some of the area designated House 6A almost certainly pertained to this house, although the jumbled logs and sticks of House 6A did not reveal any clearly decipherable pattern). Thus there appeared to be three generations of

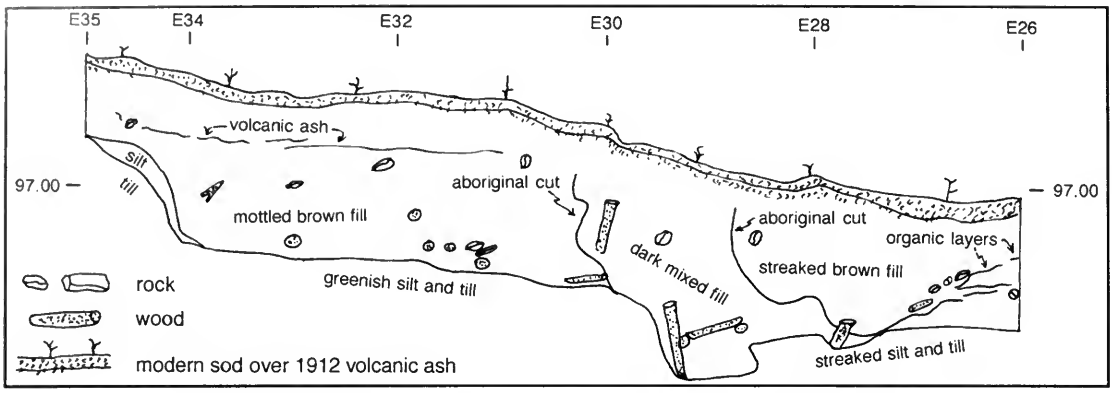

FIG. 10. Profile of a portion of the south face of Trench 1 (grid in meters).

structures, all of Pavik phase age, represented in the western portion of Trench 1.

We had hoped that the lengthy expanse of the trench would lead to discovery of an undisturbed deposit of the gray volcanic ash that in the 1970s had been determined to separate materials of the historic Pavik phase from those of the earlier Brooks River Camp phase and thus to mark the location of some significant quantity of the earlier material. However, in most of the trench the ash was nonexistent, evidently (as with all the houses excavated) eradicated entirely by Pavik phase occupants of the site. But in the 4 m of Trench 1 east of E30, and coinciding with the easternmost portion of the deepest part of the trench, discontinuous traces of the ash were noted at the trench's southern edge. The overall deposit in that area appeared simply as midden, rather than as a house cut or other aboriginal excavation, and because it was relatively undisturbed beneath the remnant ash, it was thought to promise the recovery of some Camp phase materials (Fig. 10). Unfortunately, the yield from that section was the lightest from anywhere in the trench.

Potentially diagnostic artifacts from the trench section E30 to E34 are listed in Table 1. Unfortunately, the edge of the cut for the apparent house entrance (Fig. 10) was not clearly identified in the generally mixed fill until excavation of that 2-m section of the trench (E30–E32) was nearly complete. With few exceptions artifacts were recorded only by level and 2-m section; it is therefore not surprising if the sample from the section is mixed. In the 2-m section to the east (E32–E34), however, there was no such disturbance. The distribution of artifacts there might at first be construed to suggest the presence of at least a trace of a lower component in that area. That is, the lower portions of the section yielded no glass beads and a single thick sherd of a type characteristic of the earlier Brooks River Camp phase (Table 1). However, the presence of four sawed slate pieces (generally rare in materials of the Camp phase, a time when slate was almost universally chipped to shape) seems to indicate with equal strength that the entire deposit was predominantly Pavik in age. In any event, given the paltry scale of this uncertain evidence and the small overall proportion of thick-paste sherds from the entire excavation (46 of 930)—where many of the thick fragments may well be from Pavik phase lamps rather than Brooks River Camp phase pots—there seems no reason to suppose that the Pavik collection overall is seriously contaminated by earlier materials.

House 1

The surface depression marking the location of this house was visible enough that the collapsed structure was confidently desodded in its entirety, only to encounter frost a short distance below sod. As thawing permitted work to resume, the aboriginal floor, with a fireplace in a shallow pit unlined by stones, was revealed 10 cm below modern ground surface at the center of the depression.

Altogether, an area of about 35 m^2 was opened, from which some 12 m^3 of fill was removed by season's end. The house had evidently been constructed with horizontal logs outlining the base of the walls, and on the northeastern side and along the eastern side of the front and the eastern portion of the rear the limits were defined with some ease

TABLE 1. Potentially time-sensitive artifacts from two sections of Trench 1, Paugvik.

Artifact[a]		E32-E34		E30-E32		
No.	Label	Upper	Lower	Upper	Lower	Total
Trade objects						
21.	bullet mold half	1				1
62.	metal ulu	1			1	2
107.	glass bead	12		4	5	21
133.	nail	1				1
Stone artifacts						
15.	slate end blade, type 1	1			1	2
55.	whetstone, type 1				1	1
56.	whetstone, type 2		1			1
60.	stone saw				1	1
63.	stone ulu blade	1				1
64.	untyped ulu fragment	1				1
77.	misc. sawed slate pieces	2	4			6
78.	misc. polished stone	2	1	1	1	5
140.	slate chips and chunks		2	2	2	6
Naknek ware potsherds						
100.	thin plain, variety unknown	1		2	4	7
101.	thin plain, Pavik variety				1	1
105.	thick plain, variety unknown		1			1

[a] Number and label refer to descriptions in Table 2.

by the telltale channel and adjacent cut in the greenish glacial till. In much of this area where the edges were so clearly defined it was also possible to estimate the height of aboriginal ground surface (Fig. 11). In sections of the western side and toward the northwestern rear corner of the house, however, the till surface dipped below the floor of the house and the definition of floor limits was less certain. A similar cut in the till was located in parts of the right (southwestern) front corner, but in other parts of the same corner the till had been dug out by an earlier disturbance. As the tunnel entrance of the house was cleared, it became clear that the disturbed area extended to the tunnel side. At first suspected to mark a side chamber, excavation showed that the disturbance had predated the construction of House 1, for the buried rock pile that was a major part of the disturbed area, which penetrated about as deeply as the floor of the entrance, had been cut cleanly by the House 1 tunnel edge. The disturbance was explored only to the limits indicated in Figure 11.

House 1 was the smallest and shallowest of the four houses in which substantial excavations were made, and it departed from all of the others in the discernible outline of its base logs and in the absence of a barricade of stones around the centrally located fire. The tunnel, too, was unusually stubby and extended an uncharacteristically short distance into the house floor. Although deteriorated posts and horizontal wood fragments were plentiful, and although some of these and some shallow depressions without traces of wood (Fig. 11) could be imagined to be at strategic locations on the floor, it was not possible to identify the locations of major roof support posts with confidence. The total area of the actual house floor was about 25 m^2.

House 1A

Excavations in the eastern end of Trench 1 had revealed a heavy deposit of ash on the south wall, and toward the end of the season the trench was expanded south by a 2 × 2-m cut designated in the field as Trench 3. In a rather hasty excavation, the expansion uncovered a large stone-lined hearth that was almost certainly—to judge from the other houses excavated—the central feature of a dwelling, designated House 1A (Fig. 11). The excavation was carried somewhat below the level of the supposed house floor, and its relation to the floor of House 1 is shown in Figure 11, section C-C.

When the House 1A fireplace was first exposed to confirm the existence of the house itself, it was thought likely that the House 1A entry tunnel was the cause of the disturbed fill at the front of House 1. Although this possibility cannot be ruled out

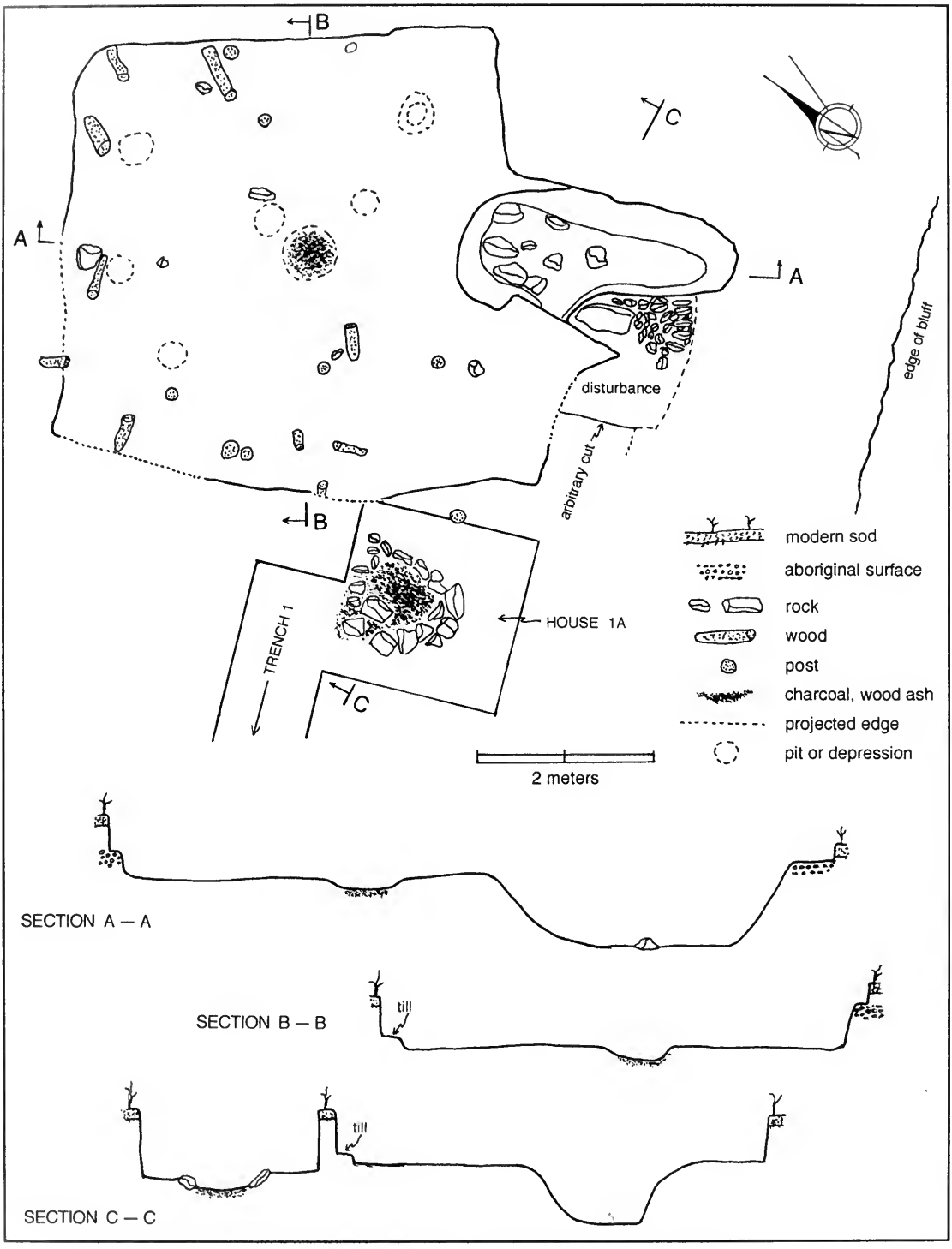

FIG. 11. Plan and sections of House 1 and excavated portion of House 1A.

entirely, a careful examination of the modern surface south of the House 1A excavation revealed a slight but abrupt depression, and the adjacent bluff showed what seemed to be a section of truncated entrance tunnel, suggesting rather that the entrance had opened more directly toward what is now the river bluff (as projected in Fig. 9). This orientation is more likely, as indicated by a surface of uncut glacial till that rose some 10 cm above the floor of House 1 at its western edge (Fig. 11, sect. B-B, C-C). Because the till remnant rose even higher above the level of the floor of House 1A and yet was within 75 cm of the House 1A hearth, its presence seems explicable only by the existence of a low earthen bench in House 1A immediately behind (i.e., north or northeast of) its central fire, a bench high enough to lie completely above the till at that point.

Whatever its precise orientation, House 1A must have predated House 1. First, the position of House 1A was almost impossible to discern by any surface indication, whereas House 1 was clearly visible. Second, nothing in the fill of House 1 indicated any overlying disturbance such as would be caused by a later structure. Finally, if the disturbance at the front of House 1 was in any way related to House 1A, the excavation evidence was clear that the House 1 entrance postdated it. In any event, there were clearly two generations of houses located at what we called House 1.

House 2

The central, rock-lined hearth of House 2 was encountered in the initial test pit at a depth of about 30 cm. As thawing permitted the hearth area to be exposed, the surrounding floor was found to be fairly distinct but not cleanly overlying sterile till as hoped. A transverse trench 40 cm wide was then laid out along the north–south excavation grid and excavated slowly into and through the floor. What it revealed was that the hearth and the center of the house covered earlier excavations of considerable size. Comparable complexity was found over much of the floor, little of which overlay the recognizable greenish glacial clay; indeed, only a portion of the south wall and the southwest corner were clearly defined where the position of the major corner post was circled by a shallow cut in a small bed of remnant till. The southeastern corner had been entirely eradicated by the deep house lying immediately to the south of House 2. That house had been passed over in choosing the excavation sample both because of its depth and because of all the 10 house depressions visible on the site it had suffered the most serious damage through pot hunting.

The positions of the other walls of House 2 were defined only with some difficulty; there was no evidence remaining of any horizontal base logs, but the two northern corners were marked by fairly substantial post remnants. Efforts to positively locate the front wall included a fairly expansive but shallow cut—the limits of which are shown in Figure 12—that produced a few timbers and rocks that seemed at first to mark the existence of some kind of storm shed at the outer end of the sunken entrance, but when the cut was completed there was no clear evidence of any such structure. Like the other two houses with completely excavated entries, the entrance tunnel of this one seemed to open directly to the outside.

Whereas the transverse trench, which crossed the house diagonally, provided evidence that the southeastern corner had been eradicated by a later structure, it also yielded evidence of some underlying structural remnants at the north, above which the floor of House 2 was traced. The biggest surprise came upon clearing the deep disturbance beneath the hearth, which the trench had also revealed. This disturbance was the entrance of an earlier house, the front part of the floor of which was hopelessly confused with what had been taken to be a slightly raised bench at the back of House 2. As the final result, it was not entirely clear whether the piles of firecracked rock and the area of charcoal and ash found on what was first thought to be the back bench (Fig. 12) were, in fact, features of House 2 or of the house underlying it.

House 2A

With clearance of the earlier entrance to a point slightly west of the back wall of House 2, charcoal and ash appeared that invited an extension westward by an arbitrary cut to reveal the rock-filled hearth of what is now designated House 2A, clearly the major structure underlying House 2. No attempt was made to carry the clearance beyond that area shown in Figure 12. On the south, the original cut for the House 2A floor had not eradicated the till now remaining at the corner of House 2. Although the actual northern and southern edges of the House 2A floor were not identified, its width

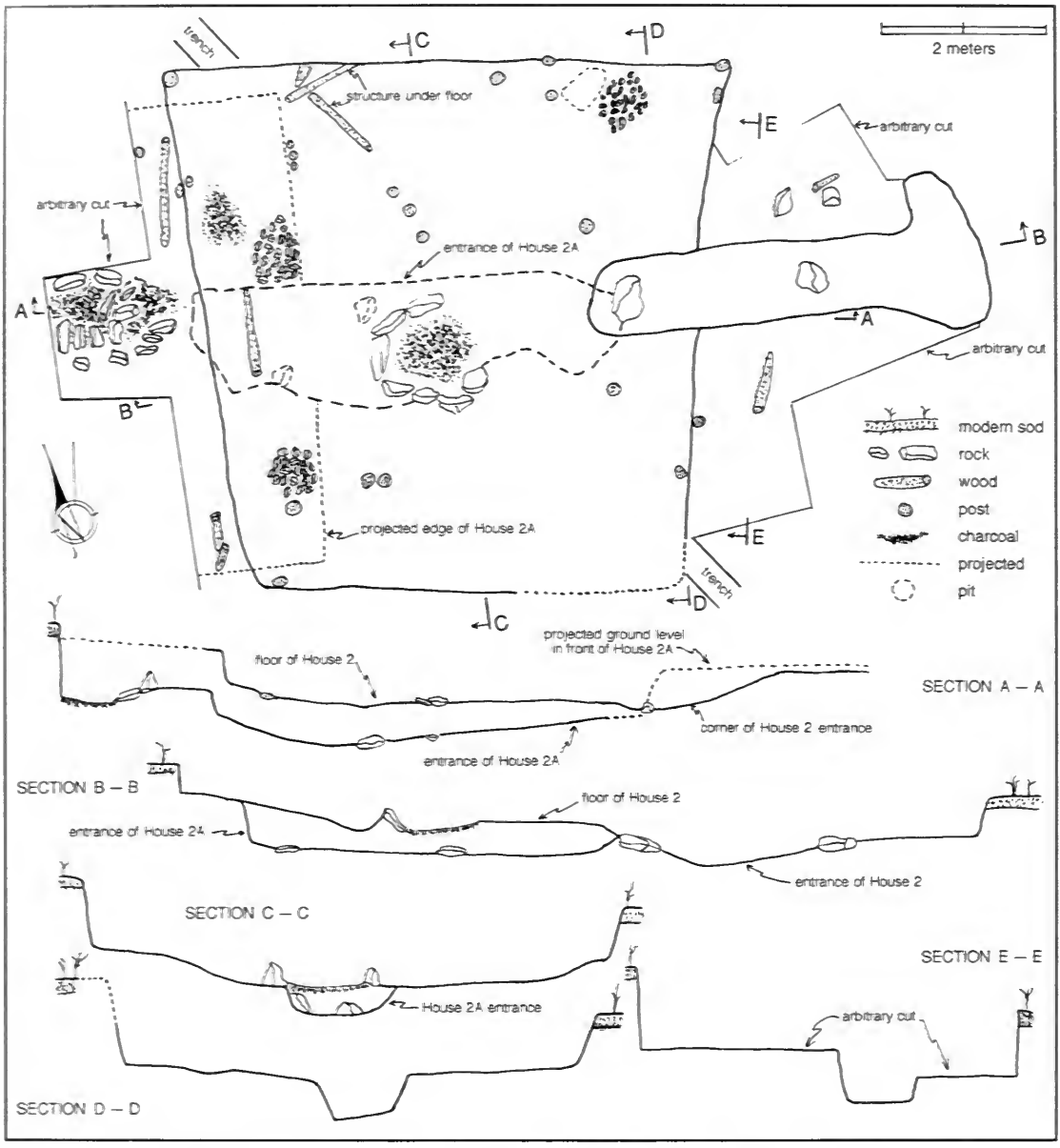

FIG. 12. Plan and sections of House 2 and excavated portions of House 2A.

appears to have been somewhat less than that of the later House 2. The separation of artifacts pertaining to Houses 2 and 2A is provisional only.

Altogether, some 55 m² was opened to uncover the total House 2 complex, in which the large House 2 itself was well over 30 m² in floor area. In this complex, three generations of houses are indicated: House 2A, overlain by House 2, which then had one front corner obliterated by construction of the (unnumbered) house immediately south of it. In addition, the structure thought to lie beneath the floor within a cut in the till on the north side (Fig. 12), which for lack of time was not cleared when it was concluded to be unassociated with the floor of House 2, could have been contemporary with House 2A. When it became clear that the base of the joint feature of Houses 2 and 2A was reached and glacial till appeared in patchwork fashion around the floor, work was ended without attempting to clear all underlying pockets of mid-

den and other disturbed material below the house and without carrying the excavation everywhere to sterile ground.

House 3

Although more deeply buried than House 1, House 3 was not so deeply covered as House 2 and upon testing promised a substantial floor under only some 20 cm of fill at the stone-lined fireplace. Unfortunately, as in House 2 there were no recognizable base logs. About 40 m^2 was finally opened, from which at least 15 m^3 of material was removed, although this amount was insufficient to expose the entire floor.

Complexity arose with the discovery that the edge of House 2 had either coincided with or very slightly overlapped that of House 3 (of which the limit shown in Fig. 13 is the best approximation). From the relatively greater clarity of the side of House 2, which we actually excavated concurrently with House 3, it was evident that House 2 was built later.

Furthermore, near the conjunction of houses, the underlying log structure that had been found within the northern edge of House 2 (Fig. 12) extended beneath the floor of House 3. There, at the northern end of the set of short parallel logs (Fig. 13), the pile of fire-cracked rocks continued down below those logs; both logs and rocks were located within a cut in the till. This structural arrangement was thought immediately to be remains of a sunken house entrance, but because the floors of both Houses 2 and 3 completely overlay it and because of the persistence of frost in the hole and the rapid passage of the excavation season, this structural arrangement was never explored to its base. Whatever it was, it probably was not a passageway connecting Houses 2 and 3.

In addition, the northernmost corner of House 3 had been eradicated by a still later house or other structure lying north of it but so faintly indicated on the modern surface as to have been missed completely upon earlier examination. This area is now labeled simply "disturbance" (Fig. 13). The northern edge of House 3 was perforce left unexcavated as the season drew to a close, and the floor was found to extend farther in that direction than anticipated and into frozen ground under a very large pile of backdirt.

Although, with the exceptions noted, the floor was clearly defined, there was nothing to convincingly mark the location of aboriginal ground surface, although it is presumed to have lain no more than 10 cm below the top of modern sod and only a few centimeters below the telltale streak of Katmai volcanic ash. Apparently the house was in most places excavated between 40 and 70 cm into the contemporary surface of the ground. As is often the case, the entranceway, thoroughly frozen before it began to be uncovered, yielded a substantial portion of the organic artifacts recovered from the house.

Added to evidence from House 2, the excavation of House 3 suggested that not three but four generations of structures could be traced at Paugvik: (1) the entry or other structure underlying both Houses 2 and 3, (2) House 3, (3) House 2, and (4) the unnumbered house south of House 2. House 2A was a feature of either the first or second of these stages, whereas the northern corner "disturbance" of House 3 was a feature of either the third or fourth stage.

House 4

As the end of the excavation season approached it was clear that time remaining was not sufficient to allow complete clearance of any of the houses that showed clearly on the surface of the remaining eastern end of the site. Two were selected for limited tests.

The surface depression designated House 4 was about 5 × 5 m, with an evident entrance channel pointing toward the bluff above the river (Fig. 9). A 2-m-square cut was made in the center of the visible depression, but although the floor was evident within 20 cm of surface, no hearth appeared; rather, as the floor stain was traced through expansion of the pit southeastward, a substantial hearth appeared in what would have been the extreme southeastern corner of the house if the surface depression were taken as an accurate indication of the actual house location (which it was concluded not to be). The apparently elliptical rock-ringed hearth, only one side of which was exposed, was 90 cm north–south, thus apparently virtually identical in size and shape to those of all the other houses except House 1. In all, 9.5 m^2 was cleared to the relatively shallow floor of the house, below which appeared no indication of earlier occupation fill. The conclusion, therefore, was that later disturbances had modified the visible surface depression of a house originally constructed over

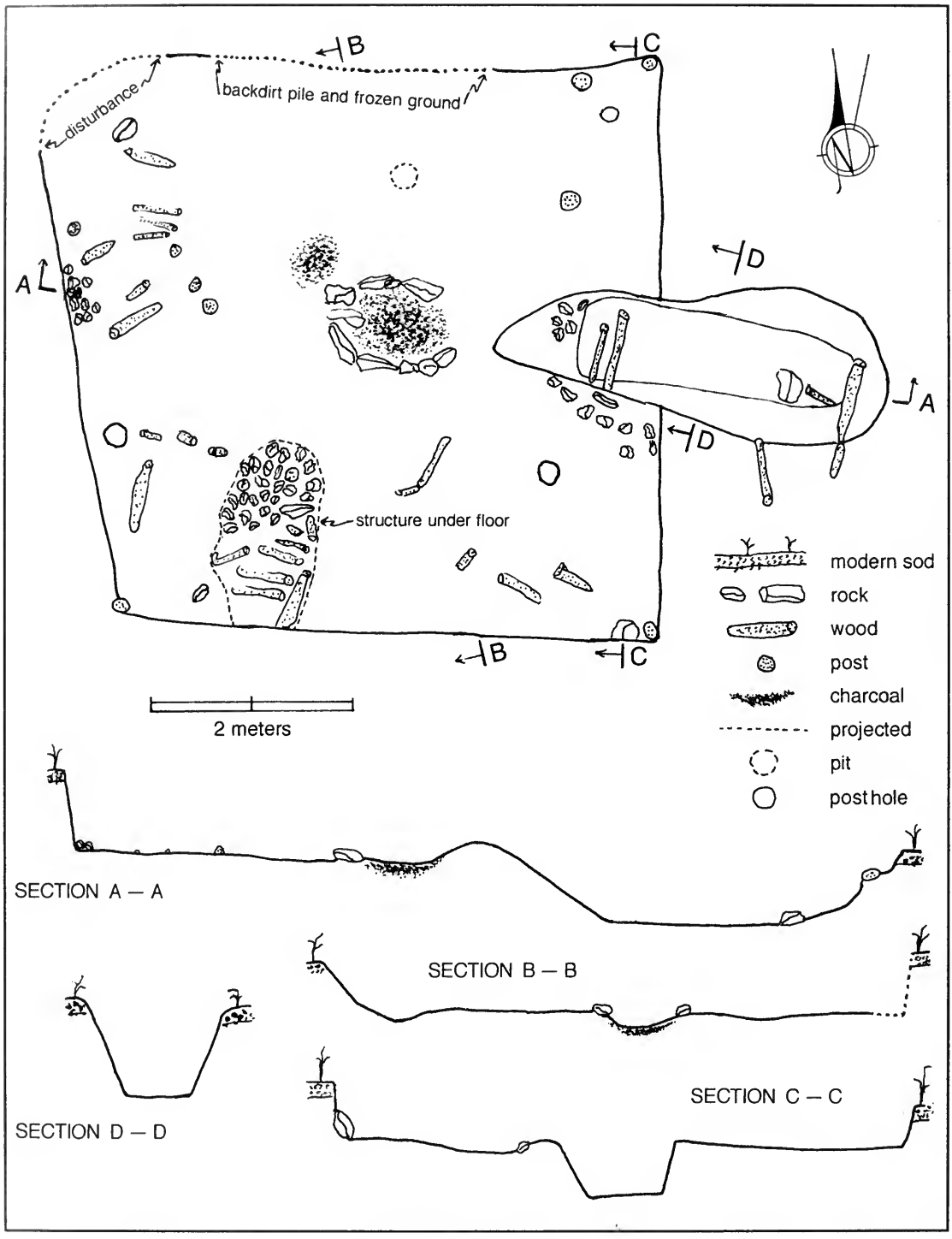

FIG. 13. Plan and sections of House 3.

undisturbed ground, to give an erroneous picture of the house's true orientation: what seemed to be backdirt from the excavation of the next house to the east, designated House 5, overlay much of the House 4 hearth.

House 5

Unlike House 4, here a 3 × 3-m excavation revealed the substantial rock-lined hearth, about 1.0 × 0.7 m in plan size, with its long depression north–south, to be in the center of the visible surface depression. Like House 4, the relatively shallow overburden, the modest overall size (about 5 × 5 m), and the lack of evidence of any structure beneath the hearth and center of the floor indicated that we would have done well to begin the season by excavating these outliers, which might have provided a simpler introduction to the archaeology of the Paugvik houses than did the habitations we actually chose to begin with. The most unusual find from House 5 was the single gun part recovered from the Paugvik site.

Together, Houses 4 and 5 appeared to represent two generations of structures in the eastern edge of the remnant Paugvik site.

House 6, Area 6A

The eastern end of the continuous portion of the 1973 trench was suspected of having penetrated a habitation of some kind, although there was no sign of a house on the existing surface. It was partly the hope of exploring this possibility further that dictated the placement of Trench 1 of 1985 next to the eastern end of the 1973 cut. The lower portions of Trench 1 were uniformly frozen, but when the base of occupation material was finally reached at its western end, the suspicion of 1973 was confirmed by the presence of the substantial rock-lined hearth that, on the basis of evidence from other houses being uncovered, was supposed to mark the approximate center of a semisubterranean structure (Fig. 14). Accordingly, a 3 × 6-m cut was laid out north of Trench 1 to open more of the presumed house, although the degree of frost encountered at the base of Trench 1 made it clear that excavation of the new section would not be speedy. This northern cut was designated Trench 2 in the field, but for present purposes the house revealed by Trench 2 and the western 5 m of Trench 1 is designated House 6, which is described here as a unit.

The eastern edge of the house was discernible in the wall profiles of both northern and southern edges of the cut (Fig. 14, profiles N10, N13), and the limit of the floor within the trenches was thought to be located accurately, although a jumble of preserved logs and sticks, probably collapsed from a wall or roof, tended to obscure portions of the actual floor edge. For present purposes the section judged to be outside of the house within Trench 2 and the western 5 m of Trench 1 is designated Area 6A, probably but not certainly a habitation; the lower 20 cm in the appropriate areas is taken to be floor deposit of House 6 and Area 6A. As suggested by the number of organic items, preservation of the House 6 and Area 6A floors and of the excavated portion of the House 6 entrance tunnel was excellent, yielding grass cordage, much of the hair collected from the site, and wooden artifacts, including mask parts and five clear examples of flat wooden pelt stretchers.

In Area 6A, evidently predating House 6, there were three fairly well-defined pits, on an apparent (house?) floor at the approximate level of the floor of House 6, the easternmost of which (Fig. 14) yielded a number of flat sections of worked wood that at first were thought to be remnants of skin stretchers such as were found on the floor of House 6 itself, although examination in the laboratory cast doubt on this initial interpretation. The second pit yielded major fragments of twined netting, thought to be a fishbag, and the third produced an evident cache of leafstalks of the spreading wood fern (*Dryopteris expansa* (Presl) Fraser-Jenkins & Jermy), a native foodstuff of the region. It is likely, although not clearly demonstrable from the 1985 evidence, that this section of floor represented the still earlier house betrayed by the westernmost aboriginal cut indicated in Figure 10, which was partly destroyed in the construction of House 6. Thus, despite the nicely frozen condition of House 6, its invisibility from the modern surface, and the absence of occupation debris immediately beneath it, that house was almost certainly not the earliest habitation in its part of the site but was rather at least a second- and probably a third-generation structure in that vicinity, to judge by profiles of Trench 1 (Figs. 10, 14).

Unfortunately, the slowness of thaw in the deep overburden, which totaled about 1 m, ruled out further extensive expansions of excavations in House 6 in the time available. But in the last days

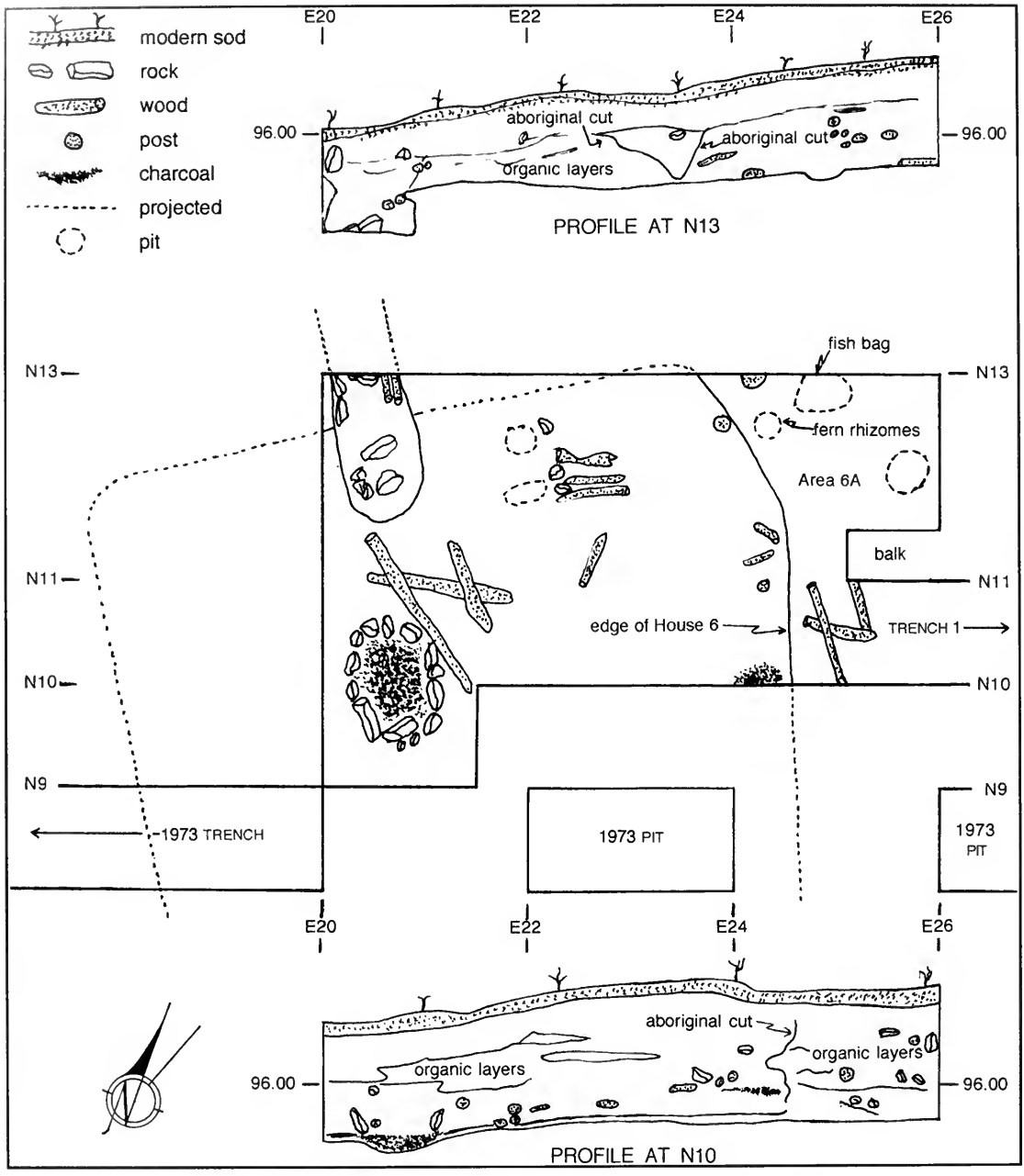

FIG. 14. Plan and profiles of excavated portion of House 6 (grid in meters).

of the season a 1 × 1.5-m southward extension at the west end of Trench 1 permitted the complete exposure of the House 6 hearth. For purposes of artifact provenience both the eastern 2 m of the continuous section of the 1973 trench (sect. 9) and the first detached segment of the trench to the east (sect. 11) were counted as portions of House 6.

Trench 4

As excavations of Houses 2 and 3 progressed, it was speculated that the relatively flat area near their entrances might produce an informative sample of midden material associated with one or both houses. Accordingly, a 2 × 6-m trench was

laid out at that place, oriented north–south on the site grid, and was desodded to permit thawing. As the season wore on, however, it became clear that not all excavations projected could be completed, and so the area finally excavated was reduced to 1 × 6 m (Fig. 9). Work came to a hurried close as at least some glacial till showed throughout the length of the trench at depths of 1.0–1.4 m below the modern surface. Materials recovered did appear to represent the midden expected; the matrix was jumbled and without definable strata. The section of the trench almost immediately in front of the entrance to House 3, in particular, yielded plentiful bone remains that appeared to represent largely animals of fur-bearing species that were mostly articulated at the time of deposition, presumably skinned carcasses thrown out in front of the house.

With cessation of excavation of Trench 4, the summer's work was brought to an end. All units were backfilled.

Stratification of Cultural Features

All major units of excavation revealed evidence of a sequence of construction at the Paugvik site and within the relatively brief temporal limits of the historic Pavik phase. There are indications of two generations of house structures both at House 1 and at combined Houses 4 and 5, of apparently three generations of construction in combined Trench 1 and House 6, and of at least three and probably four generations of structures represented at combined Houses 3 and 4.

4

Collections

In the following discussion, artifacts from the Paugvik site excavated in 1961, 1973, and 1985 are described under three headings: procurement network, maintenance network, and protective network. Within these three broad categories, further subdivision was made on the basis of the activity for which the artifacts were intended. Although no exhaustive comparative treatment is attempted, some comparative data derived from Nelson (1983) and from published and unpublished reports dealing with sites closest to Paugvik, both spatially and temporally, are included with the descriptions when relevant. Numbers in parentheses refer to numbered items in Table 2.

Procurement Network

Hunting

Recovered objects associated with sea and land hunting reflect the diversity but not the complexity of early historic Eskimo weaponry. The *toggle harpoon head* (1) is represented by a single antler specimen, an antler spur fragment, and an ivory fragment. The complete head has a blade slit parallel to the round line hole, a closed socket (which is broken) and a single spur. Incised lines on the spur below the line hole depict a human face when the head is held upside down. A single incised line extends along one side to the tip of the blade slit (Figs. 15, 44h; Dumond, 1981, Pl. XVII, Ab). Small harpoon heads like this one were probably used with a light sealing harpoon thrown with the aid of a throwing board. A similar head was recovered from the Old Togiak site on Togiak Bay (Kowta, 1963, pp. 68, 71, Pl. 5c). The spur fragment includes the lower half of a grooved line hole from which a straight incised line extends to near the end of the basal spur. The ivory fragment includes one side of the blade slit.

There are eight *harpoon dart heads* of antler in the collection, seven of which are complete or nearly so. Six of the complete heads and the incomplete specimen, here designated *type 1* (2), are identified as having been used with a light sealing harpoon (Nelson, 1983, Pls. XIV, LV 1–5). They are symmetrically or asymmetrically barbed bilaterally, with a centrally located, triangular line hole. The complete heads have sharp or sloping shoulders and plain conical tangs (Figs. 16h, 44i–k; Dumond, 1981, Pl. XVII, Ah–k). Similar harpoon dart heads have been recovered from a number of late prehistoric and historic sites in southwestern Alaska, including Hooper Bay village in the Yukon delta (Oswalt, 1952a, p. 49, Pl. 1, 2–5), Old Togiak (Kowta, 1963, pp. 78–79, Pl. 7), and House 15 at Chagvan Bay (Staley, 1990, p. 239, Fig. 50e,f), and from earlier excavations at the Paugvik site (Larsen, 1950, Fig. 55A, 2). The eighth dart head, designated *type 2* (3), is heavier and may have been used for taking salmon; barbs are on one side only, and the round line hole is off-center; the shoulders slope to a wedge-shaped tang (Fig. 16f). This style of harpoon dart head has been previously reported from Old Togiak (Kowta, 1963, pp. 132–136, Pl. 19), Platinum South Spit on Goodnews Bay (Larsen, 1950, Fig. 55B, 3), the Tikchik site on the Nushagak River (VanStone, 1968, p. 58, Pl. 8, 5–9, 12), and late prehistoric sites of the upper Naknek River drainage (Dumond, 1981, Pl. XVII, Ad–j).

The collection contains two *harpoon foreshafts* (4), one of antler and the other of ivory. The antler specimen is broken at the proximal end but probably had a wedge-shaped base. There is a centrally

TABLE 2. Distribution of artifacts and detritus from Paugvik.[a]

Description	H1		H1A	H2		H2A	
	A	B		A	B	A	B
Procurement network							
Hunting							
1. toggle harpoon head							
2. harpoon dart head, type 1						2	
3. harpoon head, type 2							
4. harpoon foreshaft	1						
5. harpoon socketpiece				1	2		
6. float mouthpiece							
7. bladder float plug							
8. harpoon ice pick							
9. wound plug							
10. lance blade sheath							
11. bow fragment							
12. arrowhead							1
13. blunt arrowhead							
14. metal end blade							
15. slate end blade, type 1	4	1		7	3	5	1
16. slate end blade, type 2	1			3			1
17. slate end blade, unclassified	2	1		3	2	1	
18. chipped proj. point	1						
19. arrow shaft							
20. gun side plate							
21. bullet mold half							
22. boat or meat hook							
Fishing							
23. lurehook						1	
24. lurehook shank						2	
25. barbless antler point						1	1
26. leister prong	3			2	1		
27. fish spear point							
28. net weight				2	1		
29. net float				1			
30. net mesh gauge							
31. fish scaler							
Trapping							
32. pelt stretcher							
Transportation							
33. kayak deck beam							
34. kayak keel protector							
35. umiak rib or riser							
36. sled stanchion							
37. sled upright							
38. sled runner							
39. sled shoe		1		8	2		2
40. snowshoe crosspiece							
Maintenance network							
Tools and manufacturing							
41. antler splitting wedge	2			6			1
42. steel wedge	1			4	2		
43. wooden maul							
44. metal axe head						1	
45. stone adze blade						1	
46. stone skin scraper blade		1					
47. skin scraper blade blank				1			
48. crooked knife handle						1	
49. crooked knife blade							

TABLE 2. *Extended.*

H3				H6		H6A						
A	B	H4	H5	A	B	A	B	T1	T4	73T	61T	Total
								1	1	1	1	3
									3	1		7
	1											1
									1			2
3	2			1	1			2	1	4		17
1	1											2
										1		1
	1									2		3
					1							1
					1			1				2
				1							1	2
1					2	1			1	4		10
					1	1						2
2			1								4	7
9	2	1		9	7			6	6	14	18	93
1				3	1				1	3	3	17
1	2	3	1					1	2			19
												1
					1		2					3
			1							1		
								1				1
1												1
												1
				2	1							5
				3		2				1		8
				2				1	1	3		13
	1											1
2	3	1		1					1	6	2	20
								1			1	3
1												1
									1			1
					5							5
						1						1
										1		1
					1							1
				1								1
				1								1
				1								1
4	1		1		1	2		2	6			30
						1						1
3	2		1	1	2		2	4	1	2	3	30
								1				8
					1							1
			1									2
					1							2
												1
												1
												1
1				1		2					1	3

TABLE 2. *Continued.*

Description	H1 A	H1 B	H1A	H2 A	H2 B	H2A A	H2A B
50. composite knife handle							
51. end-bladed knife blade							
52. rodent incisor knife							
53. engraving tool							
54. metal knife or engraver				1			
55. whetstone, type 1				1			
56. whetstone, type 2				3			
57. whetstone, type 3					1		
58. whetstone, type 4	1						
59. whetstone, type 5				1			
60. stone saw				1			
61. metal bladed ulu							
62. metal ulu blade							
63. stone ulu blade							
64. untyped ulu fragment	2		1	4			
65. ulu handle							
66. metal scissors							1
67. awl							
68. stone scraper or knife				1			
69. bottle glass scraper				2			
70. pick or mattock blade							
71. shovel blade							
72. rake prong							
73. ice pick or chisel		1					
74. snow beater							
75. unidentified metal object	2						
76. sawed slate blanks				2			
77. misc. sawed slate pieces	5	1		9	4	7	1
78. misc. polished stone				2			
79. chipped bifaces	2				1		
80. ochre anvil							
81. hammerstone							
Household equipment							
82. compound vessel							
83. vessel side fragment							
84. vessel bottom fragment (2 types)				2	1		
85. spoon	1						
86. ladle				2			
87. dipper							
88. water bag nozzle							
89. nozzle or float part				1			
90. large bag fragment							
91. mat or bag fragment							
92. grass cordage							
93. birch bark basket							
94. metal kettle parts							
95. brass box							
96. pottery lamp	2	1		4			
97. stone lamp				2			
98. bottle glass				3			
99. chinaware fragments	1			8	2	5	1
Naknek ware potsherds							
100. thin plain, variety unknown	13		3	146	26	20	1
101. thin plain, Pavik var.				7	9	6	
102. thin plain, Camp var.							
103. thin plain, Brooks R. var.				5	1	3	2
104. thin plain, exterior ridged						3	1
105. thick plain, variety unknown	4			3	1	4	1
106. thick plain, Camp var.							

TABLE 2. *Extended. Continued.*

H3				H6		H6A						
A	B	H4	H5	A	B	A	B	T1	T4	73T	61T	Total
				1								3
											2	2
	1											1
				1							1	2
						1						2
	2							4		1		8
					1			3		1		8
					1				1			3
												1
												1
					1						1	3
	1				1							2
								3				3
								1				1
								3				10
											1	1
												1
				2				1		2		5
1										1	1	4
												2
								1				1
						1						1
			1				1					2
												1
				3								3
				1								3
2	1			1				3				9
9	2			11	2			15	2			68
1	1							8		9	12	33
2				1				1		10	1	18
											1	1
				1	1					2	4	8
					1			2				3
					4	2	1					7
				3	3	2	1	1		3	1	17
1	1			2	2					3	1	11
	1			1	1							5
								1	1			2
1												1
1												2
								2				2
				3			1	2		1		7
				1	3		2	1			1	8
										1		1
1		1									1	4
										1		1
1			1								2	11
											2	4
								3				6
6	3		4	2				2	5	2	6	48
135	147	5	9	63	41	30	4	60	28	127	305	1163
29	28	1		49	69	2			5	14	40	250
				6							8	14
												11
												4
1	6			10		2	1	6	2	14	2	57
2				1				2		1	1	7

TABLE 2. *Continued.*

Description	H1 A	H1 B	H1A	H2 A	H2 B	H2A A	H2A B
Personal adornment							
107. glass bead	35	2	2	55	12	11	9
108. native bead							
109. ring				1			
110. bracelet							
111. necklace segment							
112. hair comb				1			
Smoking equipment							
113. snuff box (?)				1			
114. birch fungus							
Toy							
115. bow							
Ceremonial objects							
116. mask, unfinished							
117. mask appendage							
118. figurine							
Miscellaneous							
119. sweatbath respirator							
Protective network							
Clothing							
120. mukluk sole fragment							
121. skin garment fragment							
122. skin patch				2			
123. gut raincoat (?) fragment							
124. button							
125. shoe fragment							
126. sewn skin fragment	1			5		1	1
127. cut skin fragment			1	7	1	1	3
128. uncut skin fragment			3	7	2	2	
129. knotted sealskin line							
130. knotted baleen							
131. wool cloth fragment							
Imported building material							
132. window glass fragment	2			1		2	
133. nail					1		
134. screw	1						
135. mica fragment							
136. brick fragment							
Unidentified objects							
Wood							
137. stake							
138. unidentified							
Antler, ivory, bone							
139. unidentified			1	1			
Debris							
140. slate chips and chunks	16	2		21	8	5	3
141. chert, quartzite chips	1	1	1	9	3	1	1
142. pumice pieces				1			1
143. bone fragments	3			2	1	3	
144. ivory fragments	2			5	1	3	
145. antler fragments	4	2		12	3	2	1
146. iron fragments	1	1		8	3	4	1

TABLE 2. *Extended. Continued.*

H3				H6		H6A						
A	B	H4	H5	A	B	A	B	T1	T4	73T	61T	Total
85	30	5	6	49	20	32	2	193	44	281	36	909
											1	1
1												2
					1							1
					1							1
												1
												1
								1				1
				1				1				2
							1					1
					1		1			1		3
					1			1				2
				1								1
	1				2	1		2				6
										3		3
												2
	1											1
1					4							5
				1					1			2
12	5			13	1			2	4	3		48
5	5	1		14	5			18		3		64
4	5		2	8	4				1	7		45
				1	1							2
										1		1
	2			4	2	1		3		1		13
				1	3	1			1			11
								1				2
									1			2
1												1
				1								1
				4	4							8
1	3				2			1		2		9
1								1	1			5
7	3	1		21	4			11	5			107
5	1		3	5						30		
	1		3		1							7
3	1		1	3	1			1	1	4	3	27
1	1								2	2	1	18
3	3		2	11	7			4	3	29	11	101
11	2	2	4	4				6	5	8	10	70

TABLE 2. *Continued.*

Description	H1 A	H1 B	H1A	H2 A	H2 B	H2A A	H2A B
147. brass, copper fragments				7		1	
148. cut baleen							
149. mammoth tusk, tooth	1			2	1		
Hair (no. samples)							
150. *Canis* (dog, wolf, fox)					2		
151. *Castor* (beaver)				1	1		
152. *Homo sapiens*							
153. *Ondatra* (muskrat)							
154. *Phoca* (harbor seal)							
155. *Rangifer* (caribou)							
156. *Ursus* (bear)							

[a] H = house; T = trench. 73 = trench dug in 1973; 61 = trench dug in 1961.
Level A includes everything above the basal floor; level B is the lowest floor deposit.

located, elongated line slot with incised lines extending from each end; the specimen is round in cross section at the distal end (Fig. 16i). The ivory foreshaft, much larger and heavier, has an asymmetrical tang and an oval line hole from which extends a pronounced line groove on each side (Fig. 44m; Dumond, 1981, Pl. XVII, Al).

Seventeen objects are identified as *harpoon socketpieces* (5), only six of which are complete or nearly so. Four are similar in form, being drilled at the distal end to receive the dart head and having sharp shoulders and plain conical tangs (Fig. 16a, c, d); on one specimen the tang is asymmetrical (Fig. 16c). Three are made of ivory, and one, which is not drilled at the distal end, is made of walrus penis bone. One of the ivory socketpieces has a projecting piece in the center of the drilled hole that presumably served to wedge the tang of the dart head in place (Fig. 16d). An ivory socketpiece is blunt and heavy with sharp shoulders and a rectangular tang (Fig. 44a; Dumond, 1981, Pl. XVII, Bj); a badly weathered specimen of walrus penis bone has sloping shoulders and a plain, conical tang (Fig. 44d; Dumond, 1981, Pl. XVII, Bi). These socketpieces would appear to have been used with a thrusting harpoon having a float of seal intestine similar to a "sea otter harpoon" collected in Bristol Bay in 1881–1883 by C. L. McKay (described and illustrated by Mason, 1902, p. 293, Pl. 12). A similar socketpiece from House 15 at Chagvan Bay was described and illustrated by Staley (1990, pp. 245–246, Fig. 52b).

A single unfinished harpoon socketpiece is made of ivory and has a long bifurcated tang. It is roughly worked and not drilled at the distal end (Fig. 16e). Another incomplete specimen of antler apparently had a wedge-shaped tang (Fig. 16b). Four ivory socketpieces are so badly weathered that their form when complete cannot be determined with certainty. One of these contains, in the drilled end, a wooden plug that permitted a more secure seating of the dart head. Two socketpiece tang fragments, one of bone and the other of ivory, have sharp shoulders and are asymmetrical with pronounced knobs near the tip (Fig. 44e; Dumond, 1981, Pl. XVII, Dc).

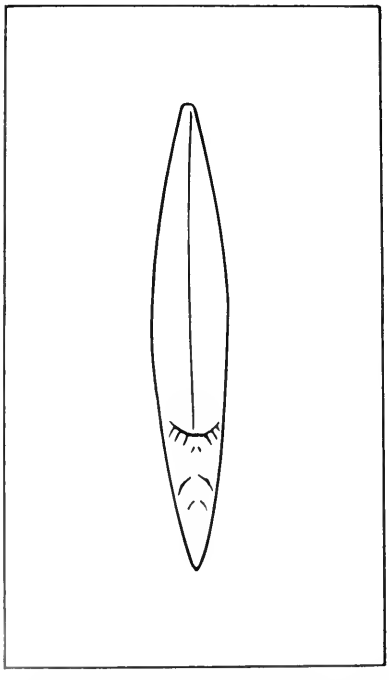

FIG. 15. Toggle harpoon head (point is downward).

TABLE 2. *Extended. Continued.*

H3				H6		H6A						
A	B	H4	H5	A	B	A	B	T1	T4	73T	61T	Total
3	3							4	1	1	1	21
				1		1		1		6	4	17
				5	4			3	2			12
										2		4
				4	1			1				6
								2				2
				2								2
								1				1
	1			8	1							10

The remaining three socketpiece fragments, one of ivory and two of bone, were apparently used with much lighter implements, possibly feathered harpoons thrown from a kayak with the aid of a throwing board (Nelson, 1983, Pl. LIV). These are basal fragments with wedge-shaped tangs; one has a slight projection near the tip (Fig. 16k,l). Socketpieces similar to all the forms from Paugvik were recovered from the Old Togiak site and were described and illustrated by Kowta (1963, pp. 73–78, Pl. 6).

The collection contains two ivory *float mouthpieces* (6), one of which is incomplete. The complete specimen has an enlarged lip and a projecting spur with a drilled hole at the proximal end (Fig. 16g). The incomplete mouthpiece is for a smaller float of the type that is attached to the shaft of a harpoon (Fig. 16j). There is a projection at the proximal end that is pierced for the attachment of a line to bind the mouthpiece to the harpoon shaft (Nelson, 1983, p. 142, Pl. XVI top, 17, 21, 25). A similar mouthpiece was recovered at Paugvik by Larsen (1950, Fig. 55A, 9).

A very small, round ivory object 0.8 cm in diameter and deeply grooved for lashing may be a *bladder float plug* (7).

A probable *harpoon ice pick* (8) of antler tapers to a point at the distal end and has a drilled line hole approximately in the center (Fig. 16m). This implement may have been simply hafted to a shaft and used as a fishing ice pick. Two additional objects are pointed at one end and may also be ice picks. One of ivory has a deep groove along one side (Fig. 44g; Dumond, 1981, Pl. XVII, Cd), while the other of antler is thinned at the proximal end (Fig. 44f; Dumond, 1981, Pl. XVII, An).

A wooden object, rounded at one end and notched on either side, tapers toward the opposite end (Fig. 16s). It may be a *wound plug* (9) used to stop the flow of blood from a carcass.

The collection contains two wooden *lance blade sheaths* (10), convex on the outer surface and hollowed out on the inside, for the protection of stone or metal blades. There are lashing notches at the point of maximum width (Fig. 16n). A similar sheath was described and illustrated by Nelson (1983, p. 146, Pl. LVIIa, 27). Three comparable two-piece sheaths are included in an undated cache of hunting weapons (never published) that was accidentally encountered by a USGS geologist near the shore of Lake Grosvenor in the upper Naknek River drainage system in 1964. (As of 1985, the sheaths, four associated shaft fragments, and eight polished lance heads were held by the National Park Service in Anchorage.)

Two spruce *bow fragments* (11) are ovoid in cross section with nocks that are simple rounded projections with sloping shoulders. The smaller fragment may represent a toy (Figs. 16r, 44c; Dumond, 1981, Pl. XVII, Cc).

Arrowheads (12) for large game or war are represented in the collection by 10 specimens, only two of which are complete; all are made of antler. One complete arrowhead has a pair of barbs on one side, a sharp shoulder, and a conical tang; there is no blade slit. An incised line along one side may be an ownership mark (Fig. 16p). The other complete arrowhead is short with paired barbs at the slightly broken tip, sharp shoulders, and a plain conical tang (Fig. 44l; Dumond, 1981, Pl. XVII, Bc). Two specimens, apparently unfinished, have sharp shoulders and plain conical tangs but no

barbs (Fig. 16o,q). On one there is a series of parallel incised lines, possibly ownership marks (Fig. 16o). Of the remaining six fragments, three are tips (two with blade slots and one with a pair of barbs along one side), two are center sections showing a single barb, and one is a basal fragment, rectangular in cross section, with a conical tang (Fig. 16t).

Two *blunt arrowheads* (13) of wood for use as bird arrows are roughly the shape of an elongated diamond. From a sharp tang, broken on both specimens, they swell to a point approximately one third of the distance from the tip and then taper to a point at the distal end (Fig. 16u,v).

The collection contains seven metal *end blades* (14), two of brass and five of steel. The brass end blades are very thin and flat across the base (Fig. 17d; Dumond, 1981, Pl. XVII, Db). Three steel blades are similar in shape but heavier (Fig. 17c; Dumond, 1981, Pl. XVII, Dh), and the other two are long and narrow with short tangs (Fig. 17b; Dumond, 1981, Pl. XVII, Dg). Because toggle harpoon heads are nearly absent from the Paugvik collection, it is assumed that these blades were used primarily with arrowheads.

There are 129 whole and fragmentary *slate end blades* (15–17), presumably for the same purpose as the somewhat rarer metal end blades. These Paugvik insert blades are divided into two types, of which the first is by far the more common. Type 1 (15) has a faceted butt, always more than 20 mm in length, that extends a variable distance over each face of the blade and was almost invariably formed by rubbing a narrow whetstone lengthwise to the blade, often grooving it deeply. Relatively whole examples among the 81 blades identified vary from 40 to nearly 90 mm in length and are 17–30 mm in maximum width (Fig. 46g–l). Type 2 (16) is similar in overall form and size, but the butt facet has been carved out with abrupt edges (Fig. 46m,n). Those remaining unclassified (17) are too fragmentary for recognition or are variant, most of the latter being very thin and lacking facets but of shapes variable enough that they form no coherent type; a few are thick and may have been in process of manufacture. Those that retain signs of their mode of manufacture were formed largely by abrasive sawing, snapping, and subsequent grinding, although some chipping before grinding is also in evidence (Fig. 46e,f).

Butt-faceted slate insert tips similar to type 1 blades are found in many sites in northern Alaska (e.g., Ford, 1959) and are especially common in late prehistoric and historic sites around the southern Bering Sea. They appear in the upper Naknek drainage sequence after A.D. 1000 and become the dominant projectile arming device after A.D. 1400 in the Brooks River Bluffs phase (Dumond, 1981), at about which time they also appear on Kodiak Island (Jordan & Knecht, 1988; Dumond, 1991). Inserts of type 2 appeared in the Naknek region only with the beginning of the historic period (i.e., after about A.D. 1800), with a geographical distribution much more limited than that of type 1, although they have been reported from some of the latest sites on Kodiak Island (e.g., Clark, 1974, Pl. 16P). Larsen (1950) suggested that such implements with deeply carved facets that he recovered from Paugvik in 1948 were derived from cast brass prototypes, but there is no evidence for this.

The single *chipped projectile point* (18) is reminiscent of artifacts from the Naknek region of the early first millennium A.D. (i.e., of the Smelt Creek phase [Dumond, 1981]), although with a length of 56 mm and a width of 24 mm it is somewhat more elongated than is common in that phase. Although it might be compared with the form of some chipped points of later periods from northern Alaska (e.g., Ford, 1959, Fig. 64), the presence of only the one example—from House 1, from which a few other finds are reminiscent of Naknek River drainage implements of the first millennium—suggests rather that it is somehow derived from some earlier deposit (Fig. 46a).

Arrow shafts (19) are represented by three fragmentary specimens. The first is incomplete at both ends and has a diameter of 9 mm. The second includes the nock and, as is usual with the proximal ends of arrows, is flattened and oval in cross section (Fig. 17e). The third arrow shaft fragment is complete at the distal end, where there is a deep notch 3.5 cm long and pointed at the lower end to receive the tang of the arrowhead (Fig. 17k).

A cast bronze *gun side plate* (20), slightly curved at one end, has holes at both ends to receive the screws that hold the lock to the gun stock. Initials stamped on the back are either "HD" or "HU" (Fig. 17g). This side plate probably was part of the lock mechanism of a shotgun.

The collection contains one *bullet mold half* (21) made from medium-grain sandstone, rectangular in shape with a prepared flat surface into which has been ground a circular depression 0.8 cm in diameter. At one end of the depression is a groove that, when the identical other half of the mold was tied or otherwise affixed to this one, would permit the lead to be poured in (Fig. 17j). This stone mold may have fitted into a wood or antler handle re-

sembling those in ethnographic collections (e.g., Fitzhugh & Kaplan, 1982, p. 167; Nelson, 1983, Pl. LXIII, 8). In southwestern Alaska similar molds have been recovered from archaeological sites at Crow Village on the Kuskokwim River (Oswalt & VanStone, 1967, p. 31, Pl. 2, n), Akulivikchuk on the Nushagak River (VanStone, 1970, p. 62, Pl. 11, 2), and the Nunakakhnak site on Kodiak Island (Knecht & Jordan, 1985, p. 29, Fig. 11).

The point for a *boat or meat hook* (22) is made of ivory and has two oval lashing slots parallel to the flat surface that would lie along the shaft (Fig. 17a). This hook is smaller than most of the boat hooks illustrated by Nelson (1983, pl. LXVIII, 22–25, LXXX, 1–5) and may have been used for dragging large pieces of meat.

Fishing

Fishing was presumably as important to the Paugvik natives as it was to most coastal peoples south of Bering Strait, where there are great salmon runs. There is evidence in the collection to indicate the use of the three-pronged fish spear and leister pronged spear and probable use of the salmon harpoon, nets, and hook and line.

The collection contains a single fish-shaped *lurehook* (23) and five *lurehook shanks* (24). The complete specimen is small and was presumably used for taking small fish such as tomcod or sculpin. The fish-shaped shank of ivory flattens at the proximal end, where there is an oval line hole cut at right angles to the small nail at the distal end that serves as a barb (Fig. 17i).

Five objects, four of ivory and one of antler, are identified as lurehook shanks; all are unfinished, are considerably larger than the complete lurehook, and hence were probably intended for taking larger fish such as grayling or trout. One ivory specimen is drilled at the distal end for a barb (Fig. 17h) and another is drilled near the proximal end for the leader or line (Fig. 17f). Two ivory shanks are flattened at the proximal end, and the single antler shank is narrower and flatter than the others. Similar lurehooks collected throughout southwestern Alaska were described and illustrated by Nelson (1983, pp. 175, Pls. LXVIII, LXIX, Fig. 48). Surprisingly, fish-shaped lurehooks are absent from the archaeological collection from the Old Togiak site (Kowta, 1963, p. 104).

The collection contains eight slender, *barbless pointed objects* of antler (25), which are round in cross section. Three are identified as probable center prongs for the three-pronged fish spear. Although no matching side prongs were recovered, this type of implement was widespread throughout southwestern Alaska in the late prehistoric and historic periods. All but two of the pointed objects are complete and shoulderless, sloping to a pointed proximal end (Fig. 17m–o). Similar barbless points have been recovered at Hooper Bay village (Oswalt, 1952a, pp. 54–55, Pl. 2, items 9, 10) and Old Togiak (Kowta, 1963, pp. 114–121, Pls. 12–14).

The 13 items identified here as *leister prongs* (26), five of which are complete, are made of antler; some may in fact have been bird spear side prongs (see Nelson, 1983, Figs. 42, 44, Pl. LIX). Two of the complete prongs and one nearly complete example were found together and thus may represent pieces of a single leister; each has nine barbs (Fig. 17l). The other complete prongs have eight, six, and four barbs, respectively. Similar weapon points were illustrated by Nelson (1983, Pls. LX, 1, LXVII, 2, LXVIII, 1, Fig. 44), and unilaterally multibarbed prongs were recovered at Hooper Bay village (Oswalt, 1952a, pp. 54–55, Pl. 2, 11–13) and the Old Togiak site (Kowta, 1963, pp. 123–126, Pl. 15) and from House 15 at Chagvan Bay (Staley, 1990, pp. 249–250, Fig. 50a–c).

A piece of low-grade steel, perhaps a spike originally, was flattened and pounded out at one end to form a barb. It is identified as a *fish spear point* (27). Because the distal end is bent slightly, it may have been intended for use with a three-pronged fish spear (Fig. 17p). Similar steel points were recovered from the Nushagak site (VanStone, 1972, p. 55, Pl. 11, items 2, 6).

The use of nets at Paugvik is indicated by 20 recovered *net weights* (28), 12 of bone, seven of antler, and one of mammoth ivory. Six of the bone weights are made from the curved, unsplit ribs of large mammals, probably beluga, cut to length and drilled at each end for suspension. The holes were placed vertically, or what would be edge-to-edge of the unmodified rib, and the surface is essentially unmodified except for flattening at the ends (Fig. 18i). Two of the weights are smaller, possibly formed of caribou ribs, and are worked on all surfaces. In one case the suspension holes were drilled laterally, or flat-side to flat-side (Fig. 17t), and on the other vertically. Three bone weights are made from split sections of the material worked to a rectangular shape and with laterally drilled suspension holes (Fig. 18h). The 12th bone specimen is different, having been worked to a flattened surface at one end where there is a single suspension

hole (Fig. 17q). This last weight may have been used with hook and line.

Of the seven antler net weights, six of which are complete, all except one are made of split segments. The exception is an unmodified section of antler tine drilled vertically at each end. The other three are roughly rectangular in cross section with laterally drilled suspension holes (Fig. 18b). The net weight of mammoth ivory is a piece of the exfoliated outer surface of a tusk, roughly rectangular in shape with suspension holes drilled laterally (Fig. 18d). Net weights similar to those from Paugvik have been reported from all coastal and riverine sites in southwestern Alaska.

Two incomplete *net floats* (29) are made of cottonwood bark, roughly rectangular in outline, with a rectangular gouged line hole for attachment to the net. In cross section these fragments have a rounded triangular form, thinner at the top and thick at the bottom (Fig. 17u). A piece of wood that may be another incomplete net float is approximately 17 cm long and 6 cm wide and roughly rectangular in shape; there are no suspension holes. Bark net floats have been recovered from Hooper Bay village (Oswalt, 1952a, p. 55), Tikchik (VanStone, 1968, pp. 283–284, Pl. 6, 14), and Akulivichuk (VanStone, 1970, p. 68, Pl. 11, 11).

A single *net mesh gauge* (30) is a made-over fragment of a bone sled shoe. The gauging distance of 6 cm may have been designed for nets for blackfish or herring (Fig. 17r). Wooden mesh gauges were recovered at Hooper Bay village (Oswalt, 1952a, p. 55) and Crow Village (Oswalt & VanStone, 1967, p. 32, Pl. 3, k, o, p), and antler examples were found at Akulivikchuk (VanStone, 1970, p. 61, Pl. 9, items 19, 20).

The broad, flattened area of a caribou antler tine has been modified so as to be concave along its working edge and taper at the proximal end to form a handle (Fig. 17s). This is tentatively identified as a *fish scaler* (31). Similar implements from Old Togiak are made of caribou scapulae (Kowta, 1963, p. 147, Pl. 20).

Trapping

Aside from the presence of the hair and bones of fur-bearing animals, the only direct evidence for trapping is the presence of five wood *pelt stretchers* (32). Presumably they were made locally at Paugvik rather than obtained as trade items. Hides of freshly skinned furbearers were turned and stretched on these frames and traded when dry.

Of the five stretchers, four are complete enough so that their overall shape can be determined. One is long and narrow, the upper (nose) end being extremely thin and pointed and the lower end rounded and considerably wider. Approximately 40 cm from the lower end there is a triangular perforation (Fig. 19a). According to present-day Naknek trappers, this was a stretcher for fox pelts. The three complete shorter stretchers range in length from 49 to 63 cm, are broad at the lower end, and taper slightly to a rounded point at the upper end (Fig. 19b). One specimen has a series of vertical cuts on one surface and was evidently used secondarily as a cutting board. Naknek trappers identified these stretchers as intended for muskrat pelts. The single incomplete specimen was apparently once about the same size and shape as the muskrat stretchers but has been cut off at the upper or nose end.

Transportation

Artifacts related to travel are poorly represented. There is a *kayak deck beam* (33) made from a single piece of spruce driftwood, presumably a curved tree stump (Fig. 18a). Data concerning the construction of a modern kayak at Hooper Bay suggest that a beam of this length and curvature would be positioned directly in front or in back of the cockpit (Zimmerly, 1979, Fig. 74, p. 95). A complete antler *kayak keel protector or shoe* (34) has a pair of holes with antler pegs for attaching the shoe to the kayak (Fig. 45l). Keel protectors were used at each end of the vessel to protect the skin cover when the boat was drawn up on the beach.

Evidence for the use of the large skin boat is restricted to a single *umiak rib or riser* (35). The lower end is notched where the rib would be fitted to the chine, and the upper end is slightly concave to receive the gunwale. On the inner side is a notch where a stringer would be attached. Approximately 7 cm from the top is a drilled hole and the remains of a sealskin lashing for the attachment of the gunwale. There is a similar hole at the lower end for lashing the rib to a chine (Fig. 20b).

A poorly preserved, wedge-shaped piece of wood with a rectangular groove at the upper end that does not completely penetrate the object (Fig. 21f) is tentatively identified as a *sled stanchion* (36). Stanchions were mortised into the top of a runner and extended to the crosspieces that made up the bed of the sled.

Even more tentative is the identification of a *sled upright* (37) for the type of sled with a railing. This piece is wedge shaped at one end, above which is a large, oval perforation, and narrows at the other end, which is broken (Fig. 20a). This upright, if the identification is correct, may have been placed toward the rear of the sled, with the perforation intended to receive the handlebar.

More certainly identified is a fragment of a *sled runner* (38) from the front of a sled. The piece has a slight upward curve and a flat area at the front to receive a crosspiece. On the side and in the flat surface are holes for lashing to hold the crosspiece in place. Along the lower surface of the runner fragment are holes for the pegs that hold the sled shoes to the runner. A number of wooden pegs are still in place (Fig. 21a). This fragment would have been sufficiently close to the front of the sled to need no slots in the upper surface to receive stanchions.

The 15 antler and 15 whalebone *sled shoe* (39) fragments range in width from 1.5 cm to 4 cm and are as much as 1.2 cm thick, although most are much thinner. There are irregularly spaced holes in the shoe fragments for pegging to the sled runners; in no case are there grooves between the holes that would suggest lashing rather than pegging (Fig. 18c,f,g). Although it might be supposed that antler would be the most satisfactory material for pegs, the only pegs in place in a shoe fragment are of wood. The sled runner described above also has wooden pegs.

A single wooden *snowshoe crosspiece* (40) is thinned at each end for mortising into the outer frame. Along one edge are three notches to receive the webbing (Fig. 18e). The absence of holes through which webbing could be strung suggests the relatively crude type of snowshoe with coarse sealskin webbing intended for use on frozen snow or on the rough surface of the sea ice (Nelson, 1983, pp. 213–214, Fig. 64). Similar crosspieces were recovered from the Hooper Bay Village site (Oswalt, 1952a, p. 67, Pl. 5, 14) and Old Togiak (Kowta, 1963, pp. 177–178, Pl. 25, k,l).

Maintenance Network

Tools

A large percentage of the tools received from the Paugvik site are traditional Eskimo forms, although some incorporate materials of European origin, such as metal for blades. As a group, tools include heavy woodworking implements as well as finer woodworking and antler-carving implements and skin-working tools. In addition, there are several implements associated with general maintenance such as rakes, picks, and a shovel.

The most abundant tool in the collection is the *antler-splitting wedge* (41). A total of 30 were recovered from the houses and virtually all levels of the trenches. The typical wedge is made of a section of caribou antler cut off square at one end and worked to a wedge-shaped bevel at the other. On most of the wedges the bevel is unifaced to take advantage of the hard outer part of the antler for the working edge. Some shaping of the opposite face is evident on most, however. The wedges vary in length from 9 cm to 24 cm and average 14 cm (Fig. 20f,g, 21b–e). Only a few show signs of extensive use. One is somewhat different, having been made from the heavy base of an antler and worked to a bevel at the distal end (Fig. 45k).

In addition to antler wedges, eight *steel wedges* (42) were recovered. Four are rectangular sections of low-grade steel, cold hammered at one end to a bifacial bevel (Fig. 20e). Two are made from iron spikes flattened at the distal end (Fig. 20d). A single specimen is a heavy, oval steel fragment cut off squarely at the top and slightly tapered and rounded at the other end; it may be unfinished (Fig. 20c). The eighth specimen was apparently fashioned from a section of thin steel, round in cross section, possibly a machine part. It is flattened at the proximal end, where there is a rectangular notch, and flattened to a working edge at the distal end (Fig. 22d). All these wedges are heavily rusted.

For driving wedges to split logs, a *maul* (43) of wood was used. The single example is round in cross section with a sharp shoulder and rounded handle. It shows signs of heavy use and may, in fact, have been discarded for that reason (Fig. 22a). Similar mauls of cottonwood were recovered at the Crow Village site (Oswalt & VanStone, 1967, Pl. 4b).

There are two iron *axe heads* (44). The first is roughly rectangular, with a slightly flaring edge and a thickened poll. The eye is teardrop shaped and contains a fragment of the helve (Fig. 22b). Nineteenth-century axes were usually made in two steps. One end of an elongated, flat plate of iron was hammered out while hot and wrapped around a pattern to form the eye (Russell, 1967, p. 257). Then a piece of steel was inserted to serve as the edge and the joints were welded by heating and hammering (Peterson, 1965, pp. 18–19).

The second axe head is broken, so that a whole section is missing on one side from the poll to a point near the edge. This specimen has a flat poll, a widely flaring edge, and a pointed lower lip that grips the handle (Fig. 22c). It closely resembles axe heads found on Umnak Island in the Aleutians, described and illustrated by Russell (1967, p. 296, Fig. 79b), at the Nunakakhnak site on Kodiak Island (Knecht & Jordan, 1985, pp. 26–27, Fig. 8), and at a site on the southeast coast of the Kenai Peninsula (Schaaf, 1988, p. 20, Pl. XIV). Similar axe heads have also been recovered from Russian-American Company sites in Kodiak (Shinkwin & Andrews, 1979) and Sitka (Barnett & Schumacher, 1967).

Of two *stone adze blades* (45), the one from House 2 is made from a slightly metamorphosed sedimentary rock that has a pronounced metallic sheen. It is roughly worked except for a finely ground working edge, which is V-shaped in cross section. The blade tapers toward the proximal end for insertion into a socketed head (Fig. 23f). The form is that classed as Adze IV in prehistoric collections of the Naknek region (Dumond, 1981), where it is characteristic of the first millennium A.D. The second, from the portion of the 1973 trench that is now recognized as part of House 6, is slate, more smoothly polished and celtlike even though the thin blade is also polished only at the bit (Fig. 46s); classed as Adze II in the earlier analysis (Dumond, 1981), the form is more characteristic of the latest prehistoric period.

The one *stone skin scraper blade* (46) is flaked with a finely polished bit on one end, appearing adze-like except for its overall narrow shape (Fig. 46u). This form in the earlier analysis (Dumond, 1981) was called End-Shaver II and is characteristic of the early first millennium A.D.

A possible *skin scraper blade blank* (47) of volcanic stone is roughly chipped on all surfaces, probably preparatory to the final grinding of a working edge (Fig. 23b).

A *crooked knife handle* (48) is made from a slightly curved piece of antler. At one end is an open notch 5 cm long to hold the blade, which was presumably lashed in place (Fig. 23a). There are three metal *crooked knife blades* (49), curved at the distal end (Fig. 23c,d; Dumond, 1981, Pl. XV, Fb).

The collection contains three *composite knife handle* (50) halves, two of antler and one of wood, flat on the inner side and rounded on the outer surface. Both of the antler specimens have short, thin blade slots, possibly for metal blades, with raised lashing lips at the distal end. One has a raised lashing knob and narrow lashing grooves at the proximal end, and the other has only a single lashing groove in this position. There are three engraved circle-dot designs on one handle half (Fig. 23h). The wooden knife half has a longer, wider blade slit and a lashing lip at the distal end (Fig. 23g).

Two *end-bladed knife blades* (51) of low-grade steel have long, thin tangs that narrow toward the proximal end (Figs. 44b, 45d; Dumond, 1981, Pl. XV, Fa).

A *rodent incisor knife* (52) has the bit still in place, hafted in a line with the long axis of a wooden handle; there is a pronounced lashing lip. The handle is constricted toward the proximal end and on one side is a circular depression, which may have contained a glass bead or some other decoration (Fig. 23e).

A complete *engraving tool* (53) has a badly corroded metal blade set into a slit in a crude wooden handle that has a pronounced lashing lip; the lashing is of narrow strips of baleen (Fig. 23n). Another example consists of only the distal end of the handle with a lashing knob and an asymmetrical metal blade (Fig. 45f).

There are two *metal knife or engraver* fragments (54) that cannot be further identified with certainty. One is simply the proximal end of a metal blade embedded in part of an antler handle (Fig. 23o). The other is half of a composite antler handle, at the distal end of which is a broad slot and lashing knob. It may be part of an engraving tool (Fig. 23i).

The 21 *whetstones* have for description been divided into five types based on the nature of the material from which they are made. The eight specimens of *type 1* (55) are of granitic rock, with a variety of sizes and shapes represented. All are fragmentary and are worked on two or more surfaces (Fig. 23p–r). The eight of *type 2* (56) are of shale; all are fragmentary and have been worked on one or more surfaces (Fig. 23l,m). The three *type 3* whetstones (57) are fragments of pumice; two are small and have been worked on one surface (Fig. 22e), whereas the larger piece has a series of parallel, deep, narrow grooves on one surface and appears to have been used as a sharpener for items such as ulu blades and steel needles (Fig. 24). The single *type 4* specimen (58) is of medium-grain sandstone, worked on all four surfaces (Fig. 23j). The single example of *type 5* (59), of schist, is worked on the two narrow surfaces (Fig. 23k).

The category *stone saw* (60), of which there are

three in the collection, is separated from other abrasive stones on the basis of form rather than material. Generally a relatively thin sandstone slab, one edge shows heavy wear on two intersecting planes (Fig. 46o). The function of the artifact is made clear by the numerous slate slabs with saw kerfs, illustrating the technique of abrasive sawing and snapping by which the plentiful slate projectile inserts, and presumably some slate ulu blades, were manufactured.

The *ulu* or woman's knife is represented in the Paugvik collection by two complete metal implements, three metal blades, one whole slate ulu blade, various fragments, and an incomplete wooden handle. The most impressive *complete metal ulu* (61) has a blade of low-grade steel with a semilunar edge and a large, thick wooden handle with a centrally located oval slot near the proximal surface. Narrow striations on both sides of the handle suggest that it was used occasionally as a cutting board (Fig. 25b). The other complete ulu is in very fragile condition. It also has a steel blade and a narrow wooden handle that turns upward at one end (Fig. 25a).

Two of the *metal ulu blades* (62) are of a form that appears to be unique for the Paugvik site. Both have a semilunar edge, and extending from one end is a narrow metal strip that curves upward and over the top of the blade and ends in a tight circle or spiral (Fig. 25c,d). These blades are presumed not to have been of local manufacture and could be used without the addition of a wooden handle. Although the shape of the handle of one of the complete ulus (Fig. 25b) seems to suggest that it covers such a curved appendage, at the time it was excavated the wood of the handle was wet and soft enough to permit examination of the haft edge of the blade, which was disappointingly square. The third metal blade is made from tinned steel plate of the type normally associated with the manufacture of tin cans. Flat across the top, it has a semilunar edge (Fig. 25e).

The single whole *slate ulu blade* (63) is tabular in form and 4 mm thick, with a cutting edge nearly 60 mm in length (Fig. 46t). The type was earlier classed (Dumond, 1981) as Ulu III. Six additional *ulu fragments* (64) may relate to the same type, although at least one of the fragments suggests the presence of a tang set off from the body of the blade.

The unattached *ulu handle* (65) has a broad blade slit possibly intended to receive a stone blade without a tang (Fig. 45a).

The collection contains a single pair of badly corroded metal scissors (66), apparently of fully modern form. The temptation is to consider these a much more recent intrusion into the site, but the provenience, essentially on the small piece of the floor excavated around the hearth of House 2A, seemed undisturbed and genuine enough at the time of excavation.

Five objects of bone and antler have been identified as *awls* (67). A seal scapula is sharpened to a point at one end (Fig. 25g) as is a caribou metacarpus or metatarsus. The other three specimens are simply antler fragments worked to a tapering point at one end (Fig. 25h).

Four retouched stone flakes apparently served as *scrapers or knives* (68). Three of these, retouched along one edge (Fig. 25f), presumably were used unhafted, but a fourth, from the 1961 excavations, is partially wrapped with a strip of lead (Dumond, 1981, Pl. XV, Cj), suggesting that it must have been wedged into a haft. Although the other three objects could belong to an earlier, prehistoric archaeological horizon of the region, the fourth clearly does not. In addition, there are two scrapers made from retouched fragments of green *bottle glass* (69), both about 7 cm in thickness (Fig. 25i). Chipped glass scrapers have been reported from several historic sites in Alaska, and the form is also common elsewhere in North America.

The collection contains two ivory *pick or mattock blades* (70), one of which is complete. The complete specimen is flattened along one surface, presumably for lashing to a wooden handle, although there are no lashing grooves. The working edge is beveled and slightly convex (Fig. 26a). The second blade is fragmentary; only the upper part is present. One surface is flattened, and there is a broad groove along one side. Approximately 11 cm from the distal end is a broad lashing groove (Fig. 25j).

A *shovel blade* (71) is made from the shoulder blade of a large sea lion or walrus. The acromion process has been cut away, and a rectangular slot to receive the handle extends downward from the glenoid fossa for a distance of 9.5 cm (Fig. 26c). A similar shovel blade was recovered at the Old Togiak site (Kowta, 1963, p. 284, Pl. 56a).

Two *rake prongs* (72) are made of antlers. Oval holes for attachment of the handles have been drilled near the proximal ends, but the antlers are otherwise unaltered (Fig. 27b). Nelson (1983, pp. 74–75, Pl. XXXV, 2) described and illustrated a somewhat similar rake from Sabotnisky on the lower Yukon, where rakes were used to remove refuse from the fireplace in the *qasqig* or men's

house, for clearing away refuse material while building a house, and for clearing drift material from places where nets or fish traps were set in rivers and streams.

Tentatively identified as an *ice pick or chisel* (73) is a length of antler rounded and worked to a wedge shape at the distal end. The upper half of this implement is deeply recessed, presumably to receive a long wooden handle. In the center of this recessed area is a round lashing hole, and there is a lashing knob at the proximal end (Fig. 27e).

Three flattened pieces of wood, oval in cross section, are tentatively identified as *snow beaters* (74) for beating snow from clothing and other objects. The two complete specimens taper slightly at the proximal end to form a handle (Fig. 27a,d). Somewhat similar implements from various locations in Alaska were described and illustrated by Nelson (1983, pp. 77–78, Fig. 21).

Unidentified metal objects (75) that are presumed to have been intended as some form of tool include a section of gun barrel partially flattened at one end, possibly for use as a hide flesher (Fig. 28f), and a heavy iron ferule that has an attachment hole at the proximal end and tapers to the distal end, which is broken (Fig. 27c). A piece of steel with what appears to be a concave working edge may be the blade for an ulu.

Numerous items of stone are apparently artifacts in the process of manufacture. Six of these are rather clearly *sawed slate blanks* (76) for insert blades, completely cut to basic form, but not yet sharpened and faceted (Fig. 46p–r). The majority of the rest are 51 *sawed slate pieces* (77) characterized by the presence of saw kerfs but of no apparent final shape. There are also 25 *miscellaneous polished stone* scraps (78), largely slate, that may be unidentifiable fragments of ulus or insert blades or, in a few cases, chips from the resharpening of stone adze blades.

The 17 crudely *chipped bifaces* (79) of slate or shale are also presumably artifacts in process of manufacture (Fig. 46b–d). These are scattered through the site, but more than half were recovered from the 1973 trench. Of those recovered in 1985, six are lanceolate in form, 55–90 mm in length, and are presumably blanks awaiting polishing into lance heads. Although chipping before grinding is indicated for some Pavik phase artifacts, these bifaces are also reminiscent of artifacts termed lanceolate biface classes I and II (i.e., those above and below 70 mm in length), which are especially characteristic of the Brooks River Camp phase of the early second millennium A.D. in the Naknek region (Dumond, 1981), when the basic shape of slate implements was formed before polishing by chipping rather than sawing. One of these from Paugvik is a slate ellipsoid 50 mm long, again reminiscent of the Camp phase.

One slab of a fractured cobble is heavily stained with red hematite in its fortuitous basin, evidently from use as an *ochre anvil* (80) in crushing paint. There are eight heavily scarred pebbles that have been used as *hammerstones* or pounders (81).

Household Equipment

All domestic equipment not considered in previous sections is described here, including wooden serving and storage vessels and utensils, pottery and stone lamps, other ceramics, and woven materials.

There are three wooden *compound vessels* (82) that are sufficiently complete so that their size and form can be determined with certainty. These vessels are of two-piece construction, consisting of a flat, oval bottom and a thin strip bent around to form the sides. The overlapping ends of the side pieces are fastened together by sewing strips of root through holes drilled for the purpose. Base pieces have chamfered edges to fit into a groove around the inner edge of the side pieces.

The first of these vessels is complete except for a section of one side. The two ends of the side, which is 4.5 cm high, are lap-spliced with root through two parallel rows of slits. On the bottom of this vessel are two shallow incisions in the form of a cross (Fig. 26b). The second vessel is very shallow and complete but badly warped; a portion of the bottom is split. The two ends of the side, which is 3 cm high, are fastened together with root through a single row of slits (Fig. 28b). Much of the rim of the third vessel is missing, but it is clear that the two ends of the side piece were lashed together through two parallel rows of slits. In addition to the groove on the inner edge of the side, four wooden pegs, one on each side and end, held the bottom in place.

Seven fragments of *compound vessel sides* (83) were recovered, only one of which is complete enough to indicate the height of the vessel. This fragment is from a much larger container than the complete vessels just described and lacks a groove running around the lower edge to receive the vessel bottom (Fig. 28c). A much smaller fragment does show this groove (Fig. 28d). The rims on three

fragments are rounded. All fragments show lashing that held the two ends of the side together. On the two more complete fragments the ends of the side were fastened with root lashing through a single row of slits.

The collection contains 17 fragmentary *compound vessel bottoms* (84), and on the basis of size and shape two types can be differentiated. The first type includes six fragments of oval vessel bottoms, none of which are chamfered to fit into grooves in the sides. Most are from relatively large vessels, the longest being approximately 29 cm in length, the smallest 8 cm (Fig. 28a,e). Three apparently consisted of two pieces of wood, probably equal halves, pegged together with wooden pegs. Both lashing and pegs were used to fasten two of these bottoms to the sides. Two bottoms were apparently used as cutting boards, perhaps after being discarded as vessels, and two are badly charred.

The second type of vessel bottom, of which there are six in the collection, is very small. All were apparently round or nearly so and may be the bases of trinket or snuff boxes similar to those illustrated by Nelson (1983, Pl. LXXXVI) rather than of household containers (Fig. 29i). It is also possible that one or more of these round, flat pieces of wood are poke stoppers associated with the storage of food or seal oil. However, they lack the deep lashing grooves usually found on plugs and stoppers.

Nine relatively whole *spoons* (85), eight of antler and one of wood, and two additional fragments were excavated from the Paugvik site. Three of the antler specimens have elongated oval bowls and straight handles of various lengths (Fig. 29a,c,g). Two have deeper, more carefully shaped bowls; the handle of one widens at the proximal end (Fig. 29d), and the handle of the other has a pronounced curve (Fig. 45i; Dumond, 1981, Pl. XVII, Dg). One specimen has paired parallel incised lines running around the edges (Fig. 29c), and another has a ribbed handle with a single straight incised line in the center of the bowl (Fig. 29a). The single wooden spoon is much more crudely made; it is a narrow strip of wood hollowed out at the wider distal end to form the bowl (Fig. 29e).

Of the fragmentary spoons, one is the handle of a much larger wooden specimen broken off at the point where it widens to form the bowl (Fig. 30b). The other, of antler, consists of the bowl only. Running down the center is a single incised line that terminates in a Y pattern ornamented with spurred lines (Fig. 29f). Spoons similar to those from Paugvik were described and illustrated by Nelson (1983, p. 69, Pl. XXX, 207) and were recovered from the Old Togiak site (Kowta, 1963, p. 281, Pl. 55, a–g).

Five large spoonlike objects are identified as *ladles* (86). Two antler specimens have spatulate bowls that are flat at the distal end (Fig. 30e,g). The wooden ladle consists of a bowl only, which is shaped like the bowls of the complete spoons but is larger (Fig. 30f). Two ladles, one of antler and the other of bone, are simply large, irregularly shaped bowls that would have had separate, attached handles (Fig. 30c,d). The antler specimen has a pair of drilled holes at the proximal end for this purpose (Fig. 30c). These two objects may be small shovels.

The Paugvik collection contains one complete *dipper* (87) and two fragments. The complete dipper of wood is carefully made, with a bowl that has a flat bottom and sides that slope out toward the rim. The handle flares at the proximal end, which is rounded (Fig. 30a). A similar dipper, identified as a ladle, was recovered at Crow Village (Oswalt & VanStone, 1967, p. 35, Pl. 5, f). A single small fragment from the point where the handle joins the bowl appears to be from a similar dipper.

A large dipper fragment is made from a single piece of wood carefully fashioned into a thin handle at one end and thinned down to a wedge-shaped point at the other. The wood was then steamed and bent to form the sides of a circular bowl and lashed just inside the base of the handle (Fig. 30h). The bottom would have been a separate piece. This type of dipper, common throughout southwestern Alaska, was described and illustrated by Nelson (1983, pp. 65–66, Pl. XXIX, 6–8).

A spoon-shaped *water bag nozzle* (88) of antler somewhat resembles similar objects from southwestern Alaska illustrated by Nelson (1983, p. 74, Pl. XXXIIIa, 5). These bags, made from the stomachs or bladders of animals, were used to carry water or oil while on hunting trips at sea; they had wooden stoppers (Fig. 29j). The collection also contains two other antler nozzles that obviously are for containers of some sort (Fig. 29h,l). One of these has a projecting lip (Fig. 29h) and may have been a *bladder float nozzle* (89).

Two large fragments of conical, loosely woven, twined *grass bags* (90) appear to be from those that according to Nelson (1983, p. 203) were used to hold fish. The tops consist of two parallel rows of two-strand braided grass. Bags with similar tops, although more closely woven, were illustrated by Fitzhugh and Kaplan (1982, p. 125) and Kaplan

and Barsness (1986, p. 122). Fish bags of this type were also used on Nunivak Island (Lantis, 1946, Fig. 17 opp. p. 177).

Twined work is also represented by seven *mat or bag fragments* (91) varying in fineness of weave. The coarser examples may be parts of sleeping maps similar to one described and illustrated by Nelson (1983, p. 203, Pl. LXXIV, 15), but all four could be bag fragments. All fragments may have been more tightly woven than they appear at present (Figs. 31–33). In addition to the twined fragments, the collection contains eight fragments of *braided grass cordage* (92) (Figs. 34, 35).

The single fragment of a *birch bark basket* (93) indicates that the vessel was made from one piece of bark folded at the four corners and then stitched, probably with spruce root as indicated by the large and widely spaced stitching holes. Three small birch bark fragments may also be from baskets. Containers of birch bark are commonly associated with interior Eskimo settlements in southwestern Alaska and have been recovered from the Crow Village, Tikchik, and Akulivikchuk sites (Oswalt & VanStone, 1967, pp. 47–48, Pl. 11b; VanStone, 1968, p. 283; 1970, p. 67, Pl. 11, 13).

The collection includes several *metal kettle parts* (94). A cast iron kettle rim fragment includes a circular lug welded to the rim and is from an extremely large vessel (Fig. 30i). There are also two lugs for kettle handles of the type that was riveted to the kettle rim on opposite sides just below the lip. One lug is brass (Fig. 29k) and the other is cast iron (Fig. 45b). A brass kettle lid (94) has raised edges and a ring handle. Attached to the handle is a short strip of two-strand braided grass (Fig. 45j). A round *brass box* (95) has a convex top with recessed lower edges and a flat bottom (Fig. 45g).

The saucer-shaped *pottery lamp* (96), widespread through southwestern Alaska, is represented by four virtually complete examples and sherds that represent seven additional lamps. The complete specimens are all undecorated and are fired poorly, if at all. The temper of these is predominantly grass, although some gravel can be noted in at least one. The walls are thick, and the pronounced rims are rounded. Three lamps are extremely shallow (Fig. 36a, b), while the fourth is deeper (Fig. 37a).

Grass is also the predominant temper in the fragments, with one exception that appears to be tempered primarily with hair. All are poorly fired, and at least two are from lamps even shallower than any of the complete examples; on one of these fragments the lip barely projects above the surface. Oswalt (1952b, pp. 21–22) suggested that saucer-shaped clay lamps were derived from the conical-bottomed, wide-mouth clay lamp common in northern Alaska during the early phases of Eskimo prehistory. Early examples of the saucer-shaped clay lamp have been excavated from sites in the Kobuk River–Kotzebue Sound region, from which they evidently spread to the Bristol Bay–Norton Sound area.

Four *stone lamps* (97) were also recovered at Paugvik. One of these is crudely worked from a roughly circular piece of granitic rock flattened on one side and hollowed out on the other. It is encrusted with carbon (Fig. 29b). Two others are heavy stone spalls with fortuitous basins that appear from carbon deposits to have been pressed into service as lamps. A fourth, also of granitic rock, has been carefully worked to an elongated oval shape. This lamp is shallow with a rounded lip and shows signs of use (Fig. 37b). Because it resembles lamps from phases of the first millennium A.D. (e.g., Dumond, 1981, Pl. VI, Fc, Pl. XI, De), it may have been salvaged by Paugvik residents from earlier sites in the Naknek River region.

In addition to the bottle glass scrapers, the collection contains six small *bottle glass* fragments (98). Two of these, one green and the other brown, are approximately 0.8 cm thick; a third is a bottom fragment from a small bottle of clear glass. The remaining fragments are extremely small and thin, ranging in thickness from 1 to 2 mm. One is a fragment of a faceted bottle.

Excavations at the Paugvik site in 1961 and 1973 yielded only eight nondescript *chinaware fragments* (99). In 1985, 40 fragments were recovered. Most of those collected, like those from other historic sites in southwestern Alaska, are sherds of factory-made ironstone (earthenware), a utilitarian stoneware variant that was extremely popular during the 19th century, particularly in frontier areas, because of its strength and durability.

Chinaware sherds from the 1985 excavations were each assigned a serial number and then a potential vessel number, as nearly as such an assignment could be made from appearance alone, for none of the sherds could be fitted to one another (Table 3). Looked at in this way the 40 sherds could come from no more than 31 vessels, but in two cases where sherds were indicated as possibly from the same vessel (nos. 3 and 24, and nos. 15, 34, and 37) the proveniences of the separate sherds were so widely separated that their origins in a

single vessel seems unlikely. Thus the 40 sherds probably represent at least 35 different vessels.

Factory-made ceramics are commonly the most voluminous trade goods excavated from historic sites in southwestern Alaska. Nearly 6,000 chinaware fragments have been excavated from six published sites along the Kuskokwim and Nushagak rivers and on Lake Clark (Oswalt & VanStone, 1967, pp. 52–55; VanStone, 1968, pp. 288–292, 1970, pp. 74–81, 1972, pp. 55–60; VanStone & Townsend, 1970, pp. 75–86; Oswalt, 1980, pp. 70–73). Decorative types recovered from these sites consist primarily of plain, under-glazed lined, cut sponge-stamped, hand-painted, and transfer-printed wares. Although there is some late 19th- and early 20th-century American ironstone in the assemblages, the majority is the standard British export ware described by Jewett (1878) that sustained the North American market in the 19th century.

British ceramics reached Alaska through the Russian-American Company, which found it cheaper and more convenient to obtain manufactured goods that reached the Northwest Coast on British and American ships rather than to rely on the long overland or ocean supply lines to Russia. In 1839 the Hudson's Bay Company contracted to supply Russian America with provisions and manufactured goods, and the agreement became effective in 1840. After 10 years, the agreement was not renewed (Davidson, 1941; Gibson, 1976, pp. 83, 139, 200–208). Nevertheless, the ceramic supply network, which came to include an increasing number of Staffordshire and other British potteries, continued after the sale of Alaska to the United States in 1867.

The number of exotic contact-period ceramic fragments recovered from the Paugvik site is thus unusually small. There are no identifiable maker's marks, and only five patterns can be identified: "Willow," "Watteau," "Cherry Picking," "Camilla," and possibly "Davenport" (Fig. 38). Only the ubiquitous "Willow" pattern has been reported from all the other excavated sites in southwestern Alaska, and the "Cherry Picking" pattern occurs at Crow Village (Table 3). The "Camilla" and "Watteau" patterns were recovered at the Nunakakhnak site on Kodiak Island (Knecht & Jordan, 1985, Table 1, p. 25).

The number of decorated chinaware sherds from the Paugvik site is also too small to permit meaningful comparison with other sites and thus at first glance seems not to provide new information relating to the chronological or distributional questions associated with this particular trade item. It is certainly significant, however, that the residents of Paugvik apparently had restricted access to ceramics, as compared with the residents of other excavated village and trading post sites in the region.

Aside from the clay lamps, ceramics of aboriginal type are of what has been classed as *Naknek ware* (100–106), one of two ware types known for the region prehistorically (Dumond, 1981). Naknek ware vessels are patch modeled and paddled against the hand, tan to black in color, baked in an open fire, and when found commonly have caked food residues in the interior. The range of shapes in any one period is limited. Techniques of clay treatment are poor, resulting in considerable variation in frequency and distribution of temper, which is predominantly water-worn gravel in such quantity as to result in a pronouncedly crumbly fracture, and varying directly in size with the vessel wall thickness. Grass may also be present, and temper fraction may vary significantly over different parts of the vessel.

Naknek ware is then divided into two subclasses, depending simply on thickness, in a division that has been shown to be temporally significant (Dumond, 1981). Naknek thin ware has walls less than 10 mm in thickness and is often relatively hard. Naknek thick ware has walls of 10 mm or more, sometimes more than double that dimension (Fig. 39). In the Paugvik collection there is no overall surface decoration, so that the only two types represented are Naknek thin plain, by far the more common, and Naknek thick plain, much of which in fact probably pertains to an earlier occupation in the vicinity. In keeping with the less than consistent manufacturing techniques, some otherwise thin vessels may have a few reinforced sections that in small sherds may be classed as thick; a few other thick sherds may actually be derived from lamps (Fig. 39L) rather than from the ordinary Naknek ware cooking vessels.

Within each type, varieties are distinguished by vessel shape, chiefly indicated by rim sherds. There are four of these varieties represented at Paugvik.

The *Camp variety* (102, 106) appears in both types but is far more common in thick plain. The variety is characterized by a globular shape with in-sloping lips that restrict a neckless opening (Fig. 39K,L). The base tends to be small, although not pointed but tapering to a flat area (Dumond, 1981, Fig. A.1). There are examples of this rim in the Paugvik collection but no examples of the base.

The *Pavik variety* (101) is confined to the Nak-

TABLE 3. Chinaware sherds from the 1985 Paugvik excavations.

Sherd no.	Unit[a]	Vessel no.	Description
1	H1	1	Base and foot of a transfer-printed cup (Fig. 38b). The letters ORT on the base are probably final letters of the word DAVENPORT, a factory at Longport in the Staffordshire Potteries. This firm, which exported widely to North America, was in existence from c. 1793 to 1887, and after 1850 their wares were normally marked with the name Davenport (Godden, 1964, p. 189).
2	H1	2	Plain (?) fragment of ironstone from a plate or saucer.
3	H2	3	Blue transfer-printed cup rim with handle junction (Fig. 38g), manufactured by the Copeland Spode factory. The pattern is "Watteau" (Sussman, 1979, p. 231) and has been recovered from Hudson's Bay Company sites in western Canada.
4	H2	4	Fragment of transfer-printed plate rim (Fig. 38c) manufactured by Copeland and Garrett, Spode Works, Stoke, Staffordshire Potteries, between 1833 and 1847. The design is called "Cherry Picking" and dates from 1838. It was not recorded by Sussman (1979) and is not generally known to have been exported to North America (Louise M. Jackson, personal communication). However, it was recovered from the Crow Village site.
5	H2	5	Plain plate (ironstone) foot.
6	H2	6	Transfer-printed blue willow pattern border.
7	H2	7	Plain fragment (plate?).
8	H2	6	Transfer-printed blue willow plate soup rim with moulded ridge.
9	H2	6	Transfer-printed blue willow border of rim fragment.
10	H2	6	Transfer-printed blue willow pattern. Possibly the ball of a soup plate shoulder or rim.
11	H2	8	Plain or cream fragment, possibly from a soup plate or saucer.
12	H2	9	Blue transfer-printed cup body; staining on the inside.
13	H2	8	Plain fragment from shoulder of a soup plate.
14	H2	10	Brownware fragment of the lid of a storage vessel.
15	H2	11	Fragment of green transfer-printed cup (see comment to sherd no. 34).
16	H2	12	Plain plate body fragment with illegible impressed mark.
17	H2	13	Flake with no glaze, unidentifiable.
18	H2	14	Fragment from brownware storage vessel.
19	H3	15	Plain fragment of moulding around plate rim; ironstone.
20	H3	16	Rim fragment of porcelain bowl with plain pink band on the outside.
21	H3	17	Body fragment of brownware serving bowl.
22	H3	18	Blue floral transfer-printed cup fragment, possibly a Copeland and Garrett or W. T. Copeland piece (Louise M. Jackson, personal communication).
23	H3	19	Fragment of plate body without glaze on either side.
24	H3	3	Transfer-printed blue cup fragment (Fig. 38d) with the "Watteau" pattern (see Sussman, 1979, p. 231). Possibly same as sherd no. 3, although proveniences differ.
25	H3	20	Body fragment of utilitarian brownstone serving vessel.
26	H3	21	Basal fragment of utilitarian brownstone vessel with part of an impressed mark, enclosed in a circle; includes the final letters of two words, REENS in a curve at the top of the circle, and SIDE horizontally across the middle. It has not been possible to identify this mark.
27	H3	22	Chip from a utilitarian brownstone vessel.
28	H5	23	Fragment of plate with blue feather edge. A hole has been drilled through the shoulder.
29	H5	24	Body fragment of blue transfer-printed plate.
30	H5	24	Fragment of blue transfer-printed plate.
31	H5	24	Plain plate or soup plate fragment.
32	T1	25	Plain cup fragment.
33	T1	26	Body fragment of blue transfer-printed cup (Fig. 38a) with the "Camilla" pattern manufactured by Copeland and Garrett and W. T. Copeland of Stoke, Staffordshire Potteries, from 1833 and still manufactured by Spode Limited (Sussman, 1979, p. 83).
34	T2	11	Fragment of green transfer-printed plate rim. It could belong to the same vessel as no. 15, and no. 37, although proveniences differ. The pattern design may be "Davenport IV," illustrated by Williams and Weber (1986, p. 168), made by the Davenport factory (see sherd no. 1).

TABLE 3. *Continued.*

Sherd no.	Unit[a]	Vessel no.	Description
35	T2	27	Bowl fragment with hand-painted brown band on the outside.
36	T4	28	Plain plate body fragment with fragmentary unidentified impression.
37	T4	11	Green transfer-printed body fragment (see sherd nos. 15 and 34).
38	T4	29	Unidentified flake without glaze.
39	T4	30	Blue transfer-printed flake.
40	T4	31	Blue transfer-printed flake.

[a] H = house; T = trench.

nek thin plain type and has an unrestricted opening and sides tapering outward in flower-pot form, often with an additional slight flare at the lip (Fig. 39B–G). In some cases, this flare occurs above a very slight constriction after the manner of the so-called situla shape that has been described for historic-period ceramics in western Alaska to the north (e.g., Oswalt, 1955). The base of this variety is flat and relatively wide (Fig. 39M).

The *Brooks River variety* (103) of the Naknek thin plain type has a form approaching that of a cylinder or barrel (Fig. 39A). Although not generally found in vessels of Naknek ware paste anywhere in the region (where the shape commonly pertains to the earlier Brooks River ware with distinctive fiber-tempered paste), some rims at Paugvik cannot reasonably be assigned to any other shape. Unfortunately, the restriction at the lip of such vessels may be pronounced enough that rim sherds too small to reveal the conformation of the lower vessel walls can be mistaken for the lips of globular pots and so classed as Camp variety. This may be the case with some sherds in the present collection (Table 2). The base of vessels of this variety are indistinguishable from those of the Pavik variety (Fig. 39M).

The *exterior ridged variety* (104) is represented by even fewer sherds. The total vessel shape is evidently that of the Pavik variety, of which this may be considered a variant, in which the wet clay was pinched into a pronounced horizontal ridge somewhat below the lip (Fig. 39H), as though to emphasize the thickened region that often occurs in that portion of the vessel walls (e.g., Fig. 39B,D,E). This is the only approach to decorative treatment in the Pavik ceramic collection.

In the Naknek region, the Naknek thick plain type, Camp variety, is characteristic of the period from about A.D. 1000 to 1450, the time of the Brooks River Camp phase (Dumond, 1981). The Naknek thin plain type in the same variety, including some vessels with exterior ridges, appears thereafter in the Brooks River Bluffs phase. The Pavik variety of the Naknek thin plain type is then present in quantity only in the Pavik phase of historic times. In the present case, as has been indicated, the majority of the Naknek thick plain potsherds of the Paugvik site are thought to represent earlier deposits located in the vicinity or in some cases to possibly result from misclassification of small fragments of clay lamps.

Personal Adornment

A total of 538 complete glass *trade beads* (107) were recovered from the Paugvik site in 1985, with 317 recorded for the trenches of 1961 and 1973 (Table 4). Although most were probably used as items of personal adornment, it is probable that a few may have served to decorate other items of material culture. For present purposes, the 1985 sample is deemed of ample size for analysis, inasmuch as an examination of the earlier material revealed no apparent difference in the range of types.

The bead typology developed by Kenneth and Martha Kidd (1970) is here applied to the Paugvik bead sample of 1985, although some problems were encountered in its use. Colors were sometimes difficult to define or assign, and it was also difficult at times to separate precisely the "round" bead varieties from the "circular" varieties. As a result, there may be some mixture of such Kidd varieties as IVa6 and IVa7. A total of 116 beads, or 20% of the 1985 collection, could not be assigned within the original Kidd classification, which for present purposes was expanded to accommodate the Paugvik sample. Table 4 gives a complete list of the number and varieties of beads excavated at Paugvik in 1985.

The 54 bead varieties from the site represent eight separate Kidd types. The most frequently occurring variety is IIa14, circular in shape, opaque,

TABLE 4. Glass beads from the 1985 Paugvik excavations, by original excavation unit.

Kidd no.	Shape[a]	Color[b]	Size[c]	Unit[d]									Total
				H1	H2	H3	H4	H5	T1	T2	T3	T4	
Ia2	T	opaque black	S, M			2			1				3
Ia3	T	clear light gray	S						5				5
Ia5	T	opaque white	VS, S, M	2	23	8		1	29	2		1	66
Ia9	T	opaque mint green	S, M		3								3
Ia10	T	opaque surf green	M			2							2
Ia13	T	translucent aqua blue	S, M	1					34	6		3	44
Ia14	T	opaque robin's egg blue	S, M	2		3		1	3				9
Ia15	T	translucent bright blue	VS, S, M	3	12	15							30
Ia16	T	opaque shadow blue	S					1					1
Ia22	T	translucent dark rose brown	M		1								1
Ia[e]	T	translucent purple	L						1				1
Ic[e]	T	translucent bright blue	M									1	1
IIa2	C	opaque redwood	S	1					2				3
IIa7	C	opaque black	S, M		1	1			5				7
IIa12	C	translucent oyster white	S, M		1				1				2
IIa13	R	opaque white	L			2							2
IIa14	C	opaque white	S, M. L		13	2			47	5		1	68
IIa17	R	opaque light gold	L		3	1							4
IIa21	R	translucent citron	VL						4				4
IIa24	R	opaque apple green	S		1								1
IIa25	R	opaque surf green	L			1							1
IIa34	C	translucent light aqua blue	VS, S, L			1			44	3		2	50
IIa35	R	opaque light aqua blue	L		1								1
IIa36	R	opaque aqua blue	ML		2	1							3
IIa37	C	opaque aqua blue	S, L						1	1		1	3
IIa38	O	opaque aqua blue	M									1	1
IIa39	R	translucent aqua blue	L						2			1	3
IIa40	R	opaque robin's egg blue	S, L	5	3	3	1		4			3	19
IIa41	C	opaque robin's egg blue	S, L	1		1			4			1	7
IIa43	R	translucent bright blue	S, M, L		5								5
IIa59	C	clear rose wine	M			1							1

TABLE 4. *Continued.*

Kidd no.	Shape[a]	Color[b]	Size[c]	Unit[d]									Total
				H1	H2	H3	H4	H5	T1	T2	T3	T4	
IIa61	R	clear rose brown	L	1									1
IIa[e]	C	opaque yellow	L						7	2			9
IIa[e]	C	opaque green	L						1				1
IIa[e]	C	opaque blue-green	L						1				1
IIa[e]	C	translucent aqua blue	S						2				2
IIa[e]	C	translucent aqua blue	S						1				1
IIIa1	T	opaque redwood/opaque black	S									1	1
IIIa2	T	opaque redwood/clear light gray	S						5	1		1	7
IIIa3	T	opaque redwood/clear apple green	S, M		5	16	1		11	3		1	37
IIIf2	T	clear ultramarine/translucent light aqua blue	L		1	1							2
IIIa[e]	T	opaque oyster white/opaque white	VS, S, M	4	5	26	1	1		3		5	45
IVa1	R	opaque redwood/opaque black	S	1					2				3
IVa3	C	opaque redwood/clear light gray	S						7	1		1	9
IVa5	R	opaque redwood/clear apple green	S, M	13									13
IVa6	C	opaque redwood/clear apple green	S, M		2	4			10	9		7	32
IVa[e]	C	opaque oyster white/opaque white	S, M, L	2	2	22	2	2	5	5	2	11	53
W1b2	R	opaque white	L	1	3								4
W1b10	R	opaque light aqua blue	L									1	1
W1b11	R	opaque robin's egg blue	M, L			2						1	3
W1b12	R	opaque bright blue	L						1	2			3
W1b13	R	opaque bright copan blue	L						1				1
W1c1	O	opaque white	L						1				1
W1b[e]	R	translucent white	M, L						2				2
Total				37	87	115	5	6	244	43	2	44	583

[a] T = tubular; R = round; C = circular; O = oval.
[b] Colors after Kidd and Kidd (1970).
[c] VS = very small; S = small; M = medium; L = large; VL = very large.
[d] H = house; T = trench.
[e] Variety not recorded by Kidd and Kidd (1970).

TABLE 5. Types and varieties of beads in the 1985 Paugvik sample.

Kidd no.	No. of beads	No. of present varieties[a]
Ia	165	11
Ic	1	2
IIa	200	25
IIIa	90	3
IIIf	2	1
IVa	110	5
W1b	14	7
W1c	1	1
Total	583	54

[a] Kidd types have been expanded for present uses. See Table 4.

and white. The second most common is Ia5, a tubular opaque white bead. The nine most commonly occurring varieties account for 61% of the total bead sample. Rounded beads (represented by Kidd classes I and III) make up 53% of the sample. The greatest number of beads of any one type is 184 beads of type IIa, representing 20 different varieties. Type Ia, with 165 beads, is represented by 11 varieties at Paugvik. Of the 116 beads that could not be placed within the Kidd classification, 98 belong to types IIIa and IVa, tubular and circular beads of opaque oyster white with a white interior. The assemblage includes only 15 wire-wound beads, or 2.5% of the sample. The total Kidd types and varieties, as expanded for the present analysis, are listed in Table 5.

For a comparison of the Paugvik beads with those from other historic sites in southwestern Alaska, perhaps the most significant varieties are circular or round beads with opaque red exteriors and clear green or brown interiors (IIIa3, IVa5–6), of which there are 82 examples, comprising 14% of the sample. These are varieties for a form known as Cornaline d'Aleppo, which derives its name from association with the Italian export business with the city of Aleppo in Syria. This sort of bead was widely distributed among Indians of North America in the first half of the 19th century (Orchard, 1929, p. 87; Woodward, 1965, pp. 19–20). Of the two primary varieties of Cornaline d'Aleppo bead, the green- and brown-lined red forms occur chronologically earlier in the eastern United States and Canada than do those with white cores, a variety absent from the Paugvik sample but present in bead assemblages from other sites in southwestern Alaska. Previous students of beads from archaeological sites in this region have believed that both forms were introduced into Alaska after extensive use elsewhere in North America but that the exact time of introduction cannot be determined (Oswalt & VanStone, 1967, p. 60; VanStone, 1968, p. 295; VanStone & Townsend, 1970, p. 97).

TABLE 6. Cornaline d'Aleppo red beads from southwestern Alaskan sites.[a]

Site	No. of beads	"White lined"	"Green lined"	"Brown lined"	"Black centers"[b]
Paugvik	583		82		
Crow Village	416	8	7		
Akulivikchuk	537	2		4	
Tikchik	407	2		18	
Kijik	1,229	111		12	
Kolmakovskiy R.	(2,431)				
Russian levels					75
U.S. levels					80

[a] Based on information from Oswalt and VanStone (1967), VanStone (1968, 1970), VanStone and Townsend (1970), and Oswalt (1980).
[b] Possibly a misidentification of green-lined red.

Distribution of Cornaline d'Aleppo beads at excavated historic sites in southwestern Alaska is shown in Table 6.

A large number of white-lined red beads were found at the Kijik site, which may have been occupied somewhat later than the others. Also, at Kolmakovskiy Redoubt beads that are "red with black centers" occur in approximately equal numbers in both Russian- and U.S.-period levels. Because the clear centers of the green-lined red beads appear black unless held up to the light, the Kolmakovskiy beads may be the green-lined red variety. In any event, they cannot be said to be an exclusively Russian import. The white-lined red form also occurs in both the Russian- and U.S.-period levels but in much smaller numbers.

South of Bristol Bay the picture is somewhat clearer. Bead assemblages from Chirikof Island south of Kodiak (Workman, 1969), the Korovinskii site on Atka Island in the Aleutians (Veltre, 1979), Reese Bay on Unalaska Island (Francis, 1988), and Nunakakhnak on Kodiak Island (Shapiro, 1988) indicate that the green-lined red variety was imported into Alaska relatively early in the 19th century. The Chirikof Island site was abandoned by the time of the Alaska purchase of 1867, and thus all trade goods recovered there belong to the Russian period. The Chirikof collection includes 45 green-lined red beads and a single white-lined red example, which Workman (1969, pp. 200–212) believed had been imported

from the interior. The Korovinski collection contains 11 green-lined red beads but no white-lined red examples, and because the site was largely abandoned by 1872 the beads there can also be considered of Russian importation. Longhouses at the Reese Bay site were abandoned about 1806, and approximately 10% of the beads recovered from them were the green-lined form. At the Nunakakhnak site, apparently abandoned in the 1880s (Knecht & Jordan, 1985, p. 21), 37% of the recovered beads were the Cornaline d'Aleppo form; those with a light green center were by far the most common. Thus, Workman (1969, p. 204) was apparently correct when he noted that the green-lined red form of the Cornaline d'Aleppo is "a marker of Russian contact in this area."

The absence of the white-lined red variety at Paugvik seems significant. Nevertheless, given the conflicting evidence at Chirikof Island, Korovinski, and Kolmakovskiy Redoubt, as well as the presence of both varieties at Kijik, Crow Village, and the Nushagak River sites, the precise chronological significance of the Cornaline d'Aleppo beads in southwestern Alaska still wants clarification.

Also of interest in the bead assemblage at Paugvik are the large number of white beads that cannot be accommodated within the Kidds' classification system (Table 4). These beads are oyster white on the exterior with an opaque white core. Although a wide range of beads of various sizes and colors were recovered from the historic sites in southwestern Alaska, the aboriginal people were apparently partial to white beads, as this was the predominant color present in the assemblages from all the Nushagak River sites except Nushagak itself, as well as those from Kijik, Crow Village, and Kolmakovskiy. Most of the beads are described simply as "white" without reference to exterior/interior differences, but at Akulivikchuk (VanStone, 1970, p. 84) and Kijik (VanStone & Townsend, 1970, p. 94), a large number exhibited a variation between exterior and interior color. If the white beads from all these sites were reexamined, a considerable number probably would be found to have cores that differ slightly in color from the exteriors.

A single flat *native bead* of lignite (108) appears to represent an item manufactured in aboriginal style.

With the exception of beads, few items of personal adornment were recovered from the Paugvik site. There are two brass *finger rings* (109; Fig. 38h) and a circular band of soft binding iron that may have been worn as a *bracelet* (110). A bear's tooth has been drilled along one side at the edge and may have been worn by itself or as part of a *necklace* (111; Fig. 38f). An antler *hair comb* (112; Fig. 38j) is roughly rectangular in shape, with a series of short, closely spaced teeth at one end. The teeth appear to be too closely spaced for the implement to have been used for shredding grass or sinew.

Smoking Complex

A rectangular section of antler may be one side of an oval *snuff box* (113). The edges of the fragment are ornamented with parallel incised lines and in the center are a pair of incised circle designs with radiating spurs (Fig. 38i). For smoking, fungus ash was frequently mixed with tobacco to improve the taste and to make the tobacco last longer. The collection contains a single piece of *birch fungus* (114). These fungi, cut from trees in the interior, were traded to the coast by Athapaskan Indians (Nelson, 1983, p. 271).

Toys

There are two fragments of *toy bows* (115), one with a simple rounded nock and the other with a nock that is roughly diamond shaped. Both are ovoid in cross section, but the smaller is relatively wide and flat (Fig. 38k,l).

Ceremonial Objects

A single *unfinished mask* of wood (116) was recovered from the Paugvik site. The shaping appears to be virtually complete, but the nose, eyes, and mouth are barely indicated. On the reverse side the surface is nearly flat except for the area that would fit over the nose of the wearer (Fig. 40a). There are also three *mask appendages* (117) for the type of composite mask characteristic of southwestern Alaska. The first is fragmentary and roughly paddle shaped (Fig. 38e). The second is in the shape of a human hand with a hole through the palm (Fig. 38m). Pierced hand appendages are believed to have been associated with masks representing powerful *tuunrat* spirits that controlled the availability of animals on earth. The holes symbolize the willingness of the spirits to allow some animals to slip through their fingers, thus

assuring their continued abundance on earth (Fitzhugh & Kaplan, 1982, p. 202). Most Yupik carved hands have four fingers and no thumb, whereas this one has three fingers and a short thumb. The more problematic mask appendage is a piece of wood carved in the shape of a human leg (Fig. 45e).

Two wooden human *figurines* (118) are worked to a point at one end. On the larger, which is very poorly preserved, the head and shoulders are depicted but the features have been obliterated (Fig. 40c). A similar figurine was recovered at Paugvik by Larsen (1950, Fig. 55a, 7). The smaller depicts only the head, but the incised features are clearly indicated. The marks of a rodent tooth tool are clearly visible on this figurine (Fig. 40b).

Miscellaneous

A bundle of grass wrapped with a sealskin thong may have served as a *respirator* (119) for a person taking a sweat bath, although Nelson (1983, p. 288) indicates that these respirators were usually made of wood shavings (Fig. 40d).

Protective Network

Clothing

Fragments of skin and commercial cloth are relatively scarce in the inventory of materials from the Paugvik site, and most of those recovered are too small or too poorly preserved for identification as to the type of apparel they represent. One explanation, of course, is that preservation in many parts of the site was poor, with frozen sections discontinuous except for those in Trench 1 and House 6, and it was only from frozen matrix that cloth and leather fragments were recovered. Cloth garments along with those of skin were probably of importance at the site; when the Korsakovskiy expedition visited Paugvik in 1818, European clothing was already among the trade objects most desired by the natives (VanStone, ed., 1988, pp. 28–29).

There are six fragments of sealskin *mukluk soles* (120), all of which are quite small but include an area of crimping around the toe (Fig. 41c); no upper sections were identified.

Three fragments of cut sealskin, each found with numerous small, deteriorated pieces, may be *garment fragments* (121).

Two circular pieces of sealskin with a row of sewing holes around the edges are identified as *patches* (122), probably for parkas or boots but perhaps for boat covers (Fig. 41a). Large pieces of sea mammal intestine suggest parts of *raincoats* (123).

Five *buttons* (124) were recovered. Three are four-hole buttons of wood that are obviously homemade (Fig. 41f). The fourth is covered with brown wool fabric and the material of the button itself cannot be determined (Fig. 41g). Half of a plain brass button is a coin-shaped disc that once had an eye of the same material soldered to the back. Around the edges on the reverse is stamped "F Barnes & Co." (Fig. 41e). A similar complete button from the Nushagak site is stamped with the words "F. BARNES & CO./LONDON" (VanStone, 1972, p. 64, Pl. 13, 10). It has not been possible to locate this firm in lists of known button companies, but buttons of this type, with soldered eyes, were manufactured between 1812 and 1820 (Olsen, 1963, pp. 31–33). Evidently an attempt had been made to cut the Paugvik button into strips.

The two fragments of factory-made *shoes* (125) are too fragmentary to provide much information about the method of manufacture or to be of chronological significance. A single sole fragment appears to have been sewn to the upper, the insole attached to it by a row of wooden pegs that run longitudinally along the center of the foot; one peg is still in place (Fig. 41b). In the United States, machine-made pegs were introduced about 1811, and a hand-operated pegging machine was patented in 1829 (Anderson, 1968, pp. 58–59). The other shoe fragment is the outer section of a heel made of leather, which had been fastened to the lifts around the edges and in the center with heavy iron nails as much as 0.4 cm in diameter. The nail heads protrude on the outer surface (Fig. 41d).

In addition to the skin clothing fragments, there are 48 sea mammal or caribou *skin fragments with stitching holes* (126) along one or more edges, 64 *cut skin fragments* (127) presumably associated with clothing, and 45 *uncut skin fragments* (128). Because of the fragility of the deteriorated material, these counts are approximate. There are also two fragments of *knotted sealskin line* (129; Fig. 41h) and one fragment of *knotted baleen* (130).

Unfortunately, little can be inferred concerning the European clothing in use because of the small number and poor condition of those fabrics re-

covered. The fibers of the 13 *cloth fragments* (131), now brown or black in apparent color, are extremely degraded but appear to be wool of plain (tabby) weave or twilled weave. Two fragments may have been originally fulled, and one has a seam with stitch holes along one edge. On another, stitch marks and circular impressions indicate that three buttons had once been sewn along one edge. On one fragment two paired sets of wefts are evident, one now black and the other brown. One fragment is unusual in having two such sets of wefts, one of wool and the other spun with coarse animal hair of unknown origin.

Imported Building Materials

The Paugvik natives had very little access to imported building materials. Some of the few pieces that were recovered may have been salvaged from driftwood, and others may be unrelated to occupation of the site.

The 11 fragments of *window glass* (132) are clear and small (maximum dimension of the largest is 42 mm) and range in thickness from 1.0 to 2.2 mm, with a mean thickness of 1.51 mm; five of the 11 are between 1.1 and 1.65 mm. Although window glass was highly prized by the natives of southwestern Alaska at least as early as 1842 (Zagoskin, 1967, p. 255), such glass was apparently available at Paugvik only in small quantities. The Hudson's Bay Company imported English window glass into the Pacific Northwest from the time of its establishment there and after 1840 can be expected to have been the source for flat glass found in Alaska at least until 1867. Before the mid-19th century the major English production was of spun-blown crown glass, much of which was very thin (Roenke, 1978, pp. 5–6). Although large sheets of this glass show circular patterns of bubbles or imperfections, these are almost never discernible in fragments as small as those reported here. According to Roenke (1978, p. 116), the modal thickness of sheet glass fragments found in archaeological sites in the Pacific Northwest that were occupied before 1845 does not exceed 1.4 mm, becomes thicker than the mean of the Paugvik shards only sometime after that date, and exceeds the thickness of the single thickest Paugvik fragment only after about 1870. Although variations in the thickness of such glass products are great enough to rule out the definitive dating of very small samples by this measurement alone, the thickness of the Paugvik shards is very much in keeping with a date sometime before the sale of Alaska in 1867.

Two square-cut *nails* (133) were recovered, on one of which the head is missing. The complete nail is within the range of the 40d length. There are also two badly corroded *screws* (134) with rounded heads.

A small fragment of muscovite *mica* (135) approximately 2 cm × 1.5 cm may have been part of the covering for a window. Zagoskin (1967, p. 186) mentioned that mica was brought from Sitka to be used for window panes in the Russian-American Company buildings at Nulato on the Yukon. The collection also contains one very small fragment of *brick* (136).

Unidentified Objects

There are a large number of unidentified objects, most of them fragmentary. The more interesting of these are described according to the material of which they are made.

Wood

The following objects, complete or nearly so, were found. Eight are *stakes* (137) pointed at one end, ranging in length from 3 cm to 10 cm, two of them complete (Fig. 42a,c), and the rest are *unidentified* (138): a short, handlelike object recessed at one end, with a sharp shoulder (Fig. 42d); a flat, oval piece with a series of incised lines on one side (Fig. 42i); an oval shaft with a narrow blade slit at one end, grooves left by sinew lashing, and narrow, fringelike slits at the other end (Fig. 42b); an object wedge shaped at one end and rounded with an incised groove at the other (Fig. 42j); a piece of birch bark cut to an oval shape (Fig. 42e); and a small peg enlarged at one end (Fig. 42g).

Antler, Ivory, Bone

Those *unidentified objects* (139) illustrated include a partially exfoliated strip of antler, with incised eyes at one end as well as a number of other incised lines, possibly representing an animal or fish (Fig. 43c); a thin antler fragment with parallel incised lines on one side and a vertical series of drilled holes, probably part of the rim of something (Fig. 42f); a paddle-shaped object of antler with a pro-

jection enlarged at the end and a line hole (Fig. 43a); a partially exfoliated antler fragment, possibly a handle, with a knob at one end on which a mouth and eyes are incised (Fig. 42k); a forked handle-like object of antler (Fig. 45c; Dumond, 1981, Pl. XVII, Cg); a possible spoon handle of antler, along the rear of which is a vertical row of circular depressions that once contained beads, with one bead still in place (Fig. 45h); two oval ivory tubes, on one of which are incised lines (Fig. 43d,e); two sea mammal ribs with elliptical perforations in one end (Fig. 43f); and a caribou scapula with two round perforations in the blade (Fig. 43b).

Miscellaneous Debris

This section lists manufacturing detritus, items that appear to have been picked up and purposely brought to the site, and subsistence byproducts. Some of these items are confined to those collected in 1985 (see Table 2).

Scraps of cut or broken material discarded in manufacture, not yet completely formed for use, or at times possibly only fortuitously present include 107 fragments of *slate* (140), 31 chips of *chert or quartzite* (141), several pieces of *pumice* (142), and cut *bone, ivory,* and *antler fragments* (143, 144, 145).

Metal scraps include 70 *fragments of iron* or steel (146) many of which appear to be cut from barrel hoops. There are also 21 *fragments of copper-based alloys of brass* or bronze (147). Five of these have been analyzed for content, confirming the industrial origin of four of them but suggesting that one, from Trench 1 (see Part 3) is possibly native copper (Harritt & Dumond, in preparation).

Although there were numerous scraps of baleen, these were not systematically collected, except for a piece cut into a leaf shape (148; Fig. 42h).

Fragments of remains of Pleistocene woolly mammoth of Alaska (*Mammuthus primigenius*) attest to the proclivity of the Paugvik people for bringing home segments of tusk and tooth from mammoth remains that erode regularly from Pleistocene deposits around the mouth of the Naknek River and upper Bristol Bay. The latest radiocarbon designation associated with Alaskan mammoth remains is on the order of 13,500 years ago (see, for example, Guthrie, 1990, p. 244), and no Alaskan mammoth remains have yet been found associated with contemporary human traces. But *mammoth tusk or tooth* fragments (149) were recorded in eight excavation units at Paugvik, tusk laminae in five of them (in House 2, level A, the tusk fragment found was apparently used as a net weight), and cheek teeth or their sections in four of them.

Remains of more contemporary fauna include a number of samples of *hair* (150–156), including that of canids (dog, wolf, or fox), beaver, muskrat, seal, caribou, bear, and humans. The extensive bone waste is set out separately in Appendix 1, by the original excavation units.

Samples of ash and soil were taken from six of the hearths excavated in 1985, in the hope that these samples would provide information regarding use of vegetal materials other than those represented by scattered remains of fern rhizomes. The samples were dried and then floated in water, with preservation and subsequent drying of both heavy and light fractions. A summary of the rather disappointing results is given in Table 7.

TABLE 7. Flotation analysis of six Paugvik hearths.

Hearth location	Fraction	Content
H1	light	charcoal, roots
	heavy	pulverized mammal bone, bird bone, shell
H1A	light	charcoal, rootlets, mica flecks; 1 probable fish vertebra fragment; grass; calcined bone fragments
	heavy	same as light, without vertebra; 1 white seed bead
H2	light	charcoal; twigs; bird bone, probably duck (Alcidae)
	heavy	small bone, pulverized large mammal bone; 1 piece green glass; salmonid vertebra; bird toes
H3	light	twigs; charcoal; salmonid vertebra; bird toe
	heavy	salmonid vertebrae; bird toe; calcined bird bone, mammal bone
H6 (secondary hearth)[a]	light	charcoal
	heavy	pulverized bird bone, mammal bone
H6 (main hearth)	light	charcoal; unburned wood; grass
	heavy	pulverized bird or rabbit bone; pulverized shell; mica flecks; 1 white seed bead

[a] The small section of fire at the east edge of the house; see Figure 14.

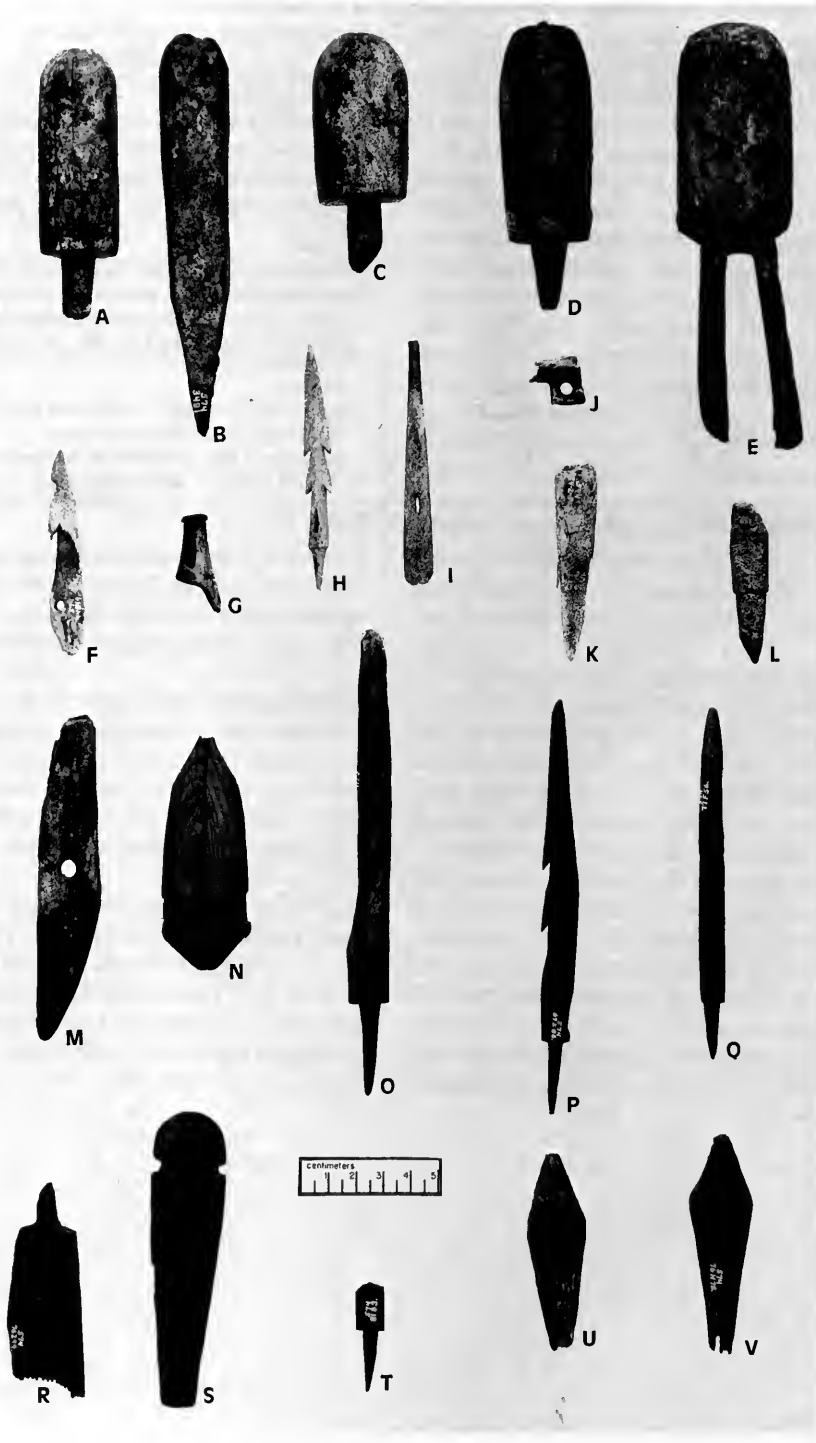

FIG. 16. *a*, harpoon socketpiece; *b*, harpoon socketpiece; *c*, harpoon socketpiece; *d*, harpoon socketpiece; *e*, harpoon socketpiece; *f*, harpoon dart head; *g*, float mouthpiece; *h*, harpoon dart head; *i*, harpoon foreshaft; *j*, float mouthpiece; *k*, harpoon socketpiece fragment; *l*, harpoon socketpiece fragment; *m*, harpoon ice pick; *n*, lance blade sheath; *o*, unfinished arrowhead; *p*, arrowhead; *q*, unfinished arrowhead; *r*, bow fragment; *s*, wound plug; *t*, basal fragment of arrowhead; *u*, blunt arrowhead; *v*, blunt arrowhead (FMNH neg. no. A-110990).

FIG. 17. *a,* boat or meat hook; *b,* end blade; *c,* end blade; *d,* end blade; *e,* arrow shaft fragment; *f,* lurehook shank; *g,* gun side plate; *h,* lurehook shank; *i,* lurehook; *j,* bullet mold half; *k,* arrow shaft fragment; *l,* leister prong; *m,* pointed object; *n,* pointed object; *o,* pointed object; *p,* fish spear point; *q,* net weight; *r,* mesh gauge; *s,* fish scaler (?); *t,* net weight; *u,* net float fragment (FMNH neg. no. A-110994).

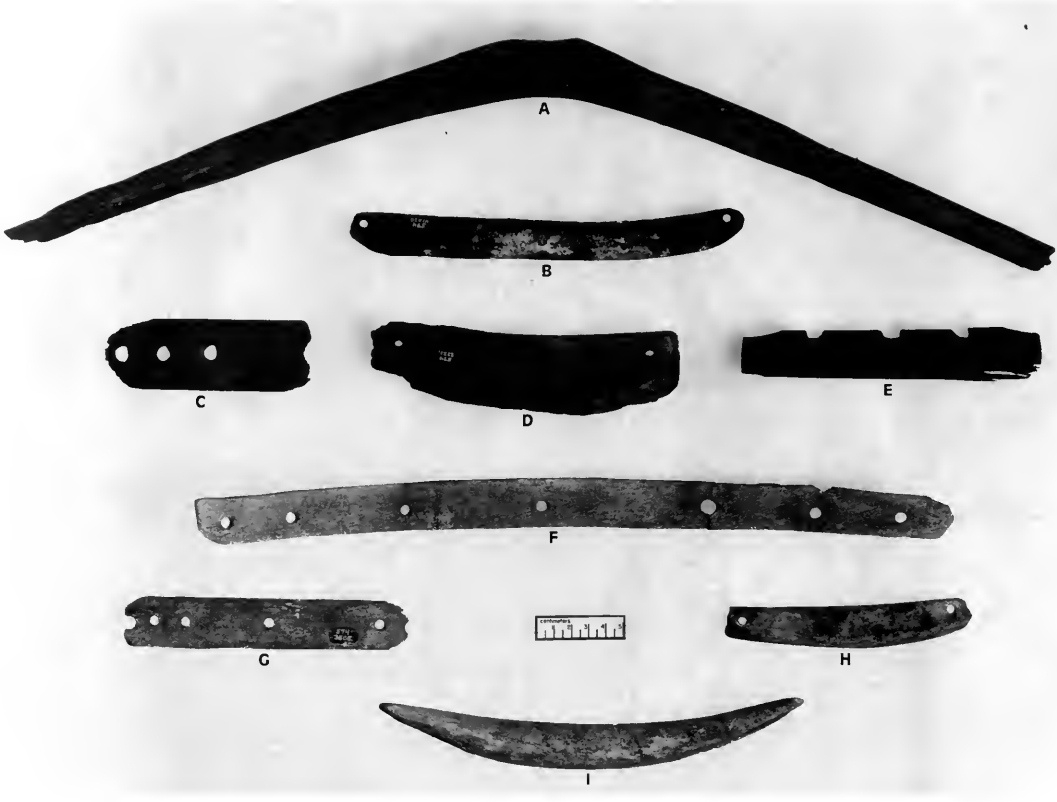

FIG. 18. *a,* kayak deck beam; *b,* net weight; *c,* sled shoe fragment; *d,* net weight; *e,* snowshoe crosspiece; *f,* sled shoe; *g,* sled shoe fragment; *h,* net weight; *i,* net weight (FMNH neg. no. A-110991).

FIG. 19. *a,* pelt stretcher; *b,* pelt stretcher (FMNH neg. no. A-110989).

FIG. 20. *a,* sled upright; *b,* umiak rib or riser; *c,* wedge; *d,* wedge; *e,* wedge; *f,* wedge; *g,* wedge (FMNH neg. no. A-110986).

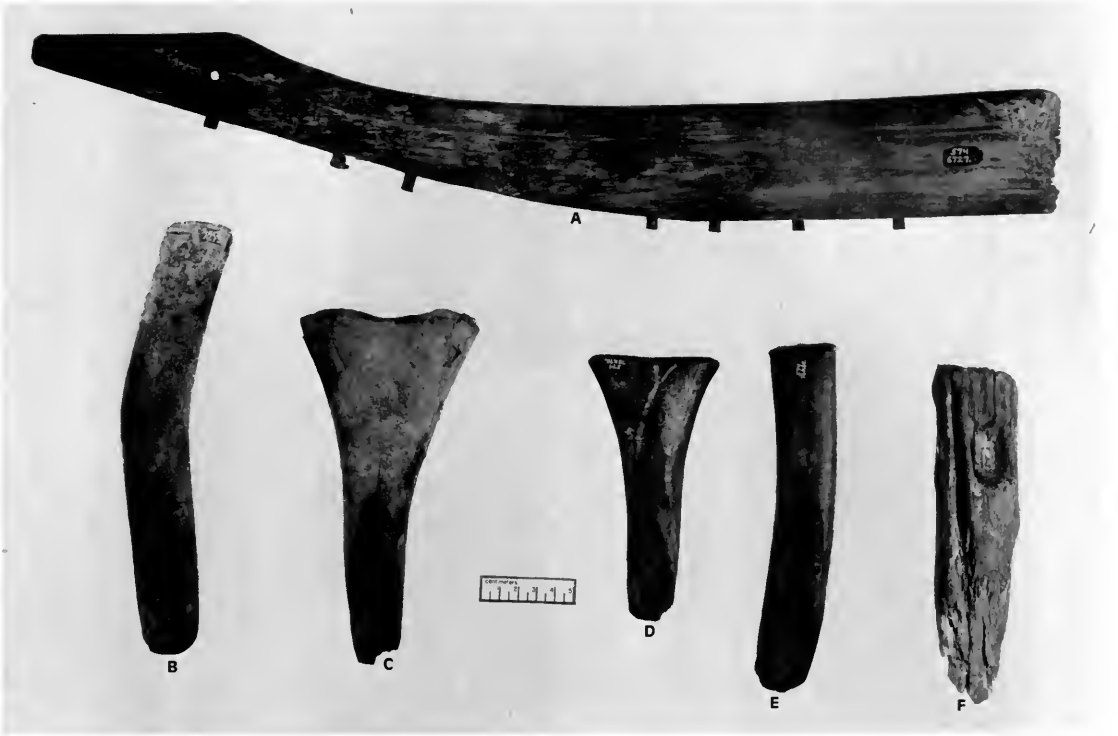

FIG. 21. *a,* sled runner; *b,* wedge; *c,* wedge; *d,* wedge; *e,* wedge; *f,* sled stanchion (?) (FMNH neg. no. A-110988).

FIG. 22. *a,* maul; *b,* axe head; *c,* axe head; *d,* wedge; *e,* whetstone (FMNH neg. no. A-110986).

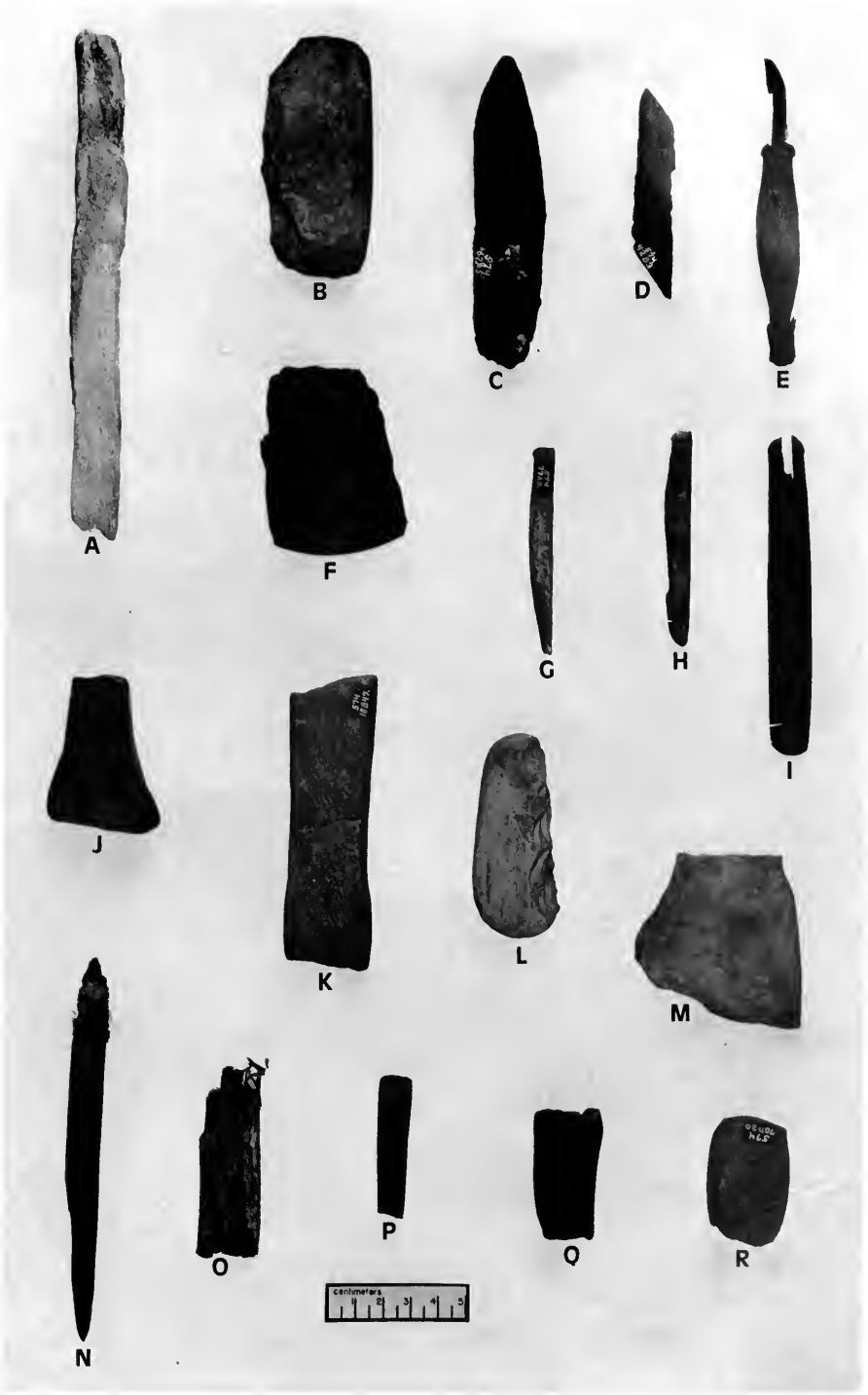

FIG. 23. *a*, crooked knife handle; *b*, skin scraper blade blank; *c*, crooked knife blade; *d*, crooked knife blade; *e*, rodent incisor knife; *f*, adze blade; *g*, composite knife handle; *h*, composite knife handle; *i*, knife or engraver fragment; *j*, whetstone; *k*, whetstone; *l*, whetstone; *m*, whetstone; *n*, engraving tool; *o*, knife or engraver fragment; *p*, whetstone; *q*, whetstone; *r*, whetstone (FMNH neg. no. A-110992).

FIG. 24. Whetstone (FMNH neg. no. A-110987).

FIG. 25. *a,* ulu; *b,* ulu; *c,* ulu; *d,* ulu; *e,* ulu; *f,* scraper or knife; *g,* awl; *h,* awl; *i,* scraper or knife; *j,* pick or mattock blade (FMNH neg. no. A-110984).

FIG. 26. *a*, pick or mattock blade, *b*, compound vessel; *c*, shovel blade (FMNH neg. no. A-110982).

FIG. 27. *a*, snow beater; *b*, rake prong; *c*, unidentified; *d*, snow beater; *e*, ice pick or chisel (?) (FMNH neg. no. A-110993).

FIG. 28. *a,* compound vessel bottom; *b,* compound vessel; *c,* compound vessel side; *d,* compound vessel side; *e,* compound vessel bottom; *f,* unidentified (FMNH neg. no. A-110995).

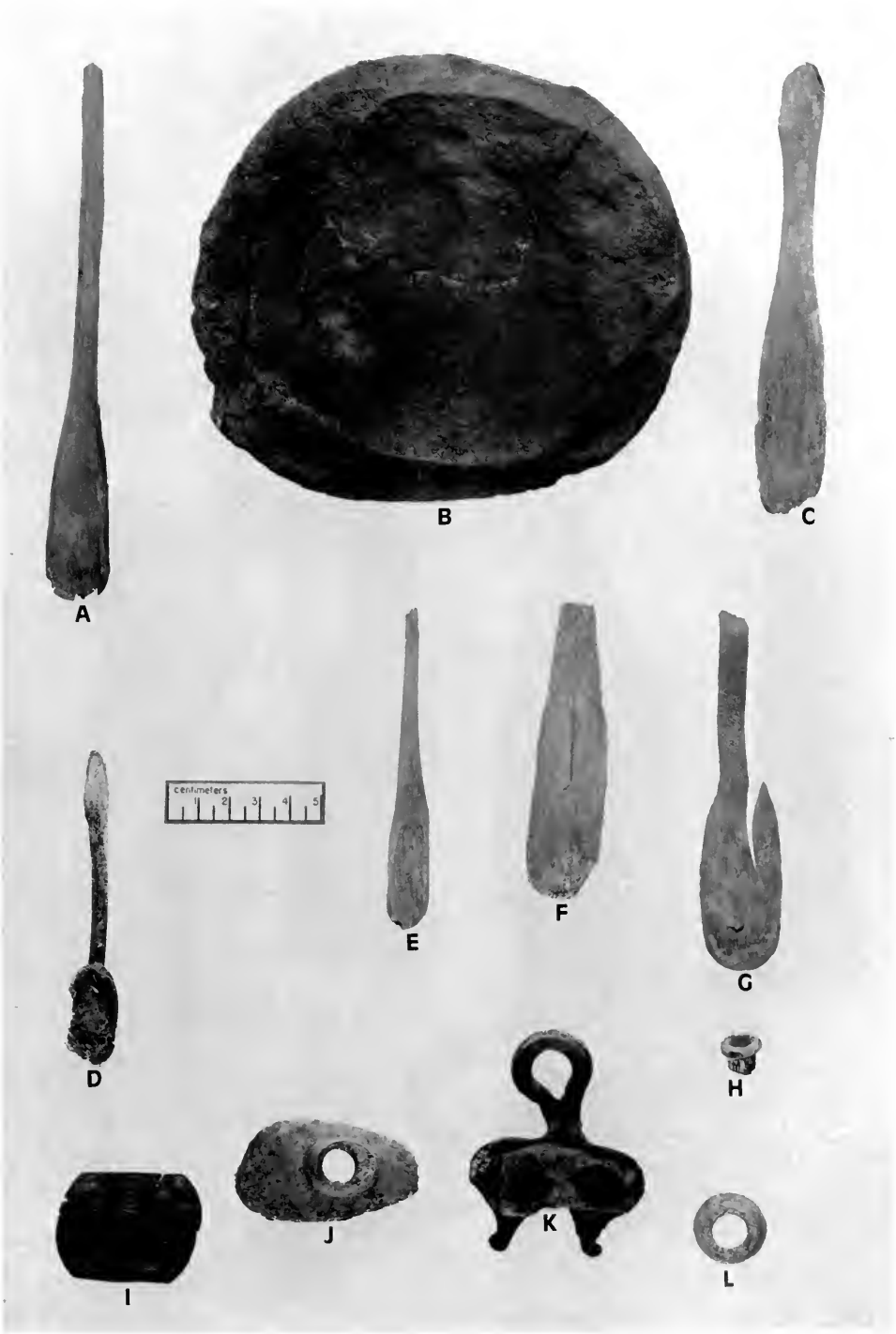

FIG. 29. *a*, spoon; *b*, lamp; *c*, spoon, *d*, spoon; *e*, spoon; *f*, spoon; *g*, spoon; *h*, bladder float nozzle (?); *i*, compound vessel bottom; *j*, water bag nozzle (?); *k*, lug for kettle handle; *l*, nozzle (FMNH neg. no. A-110985).

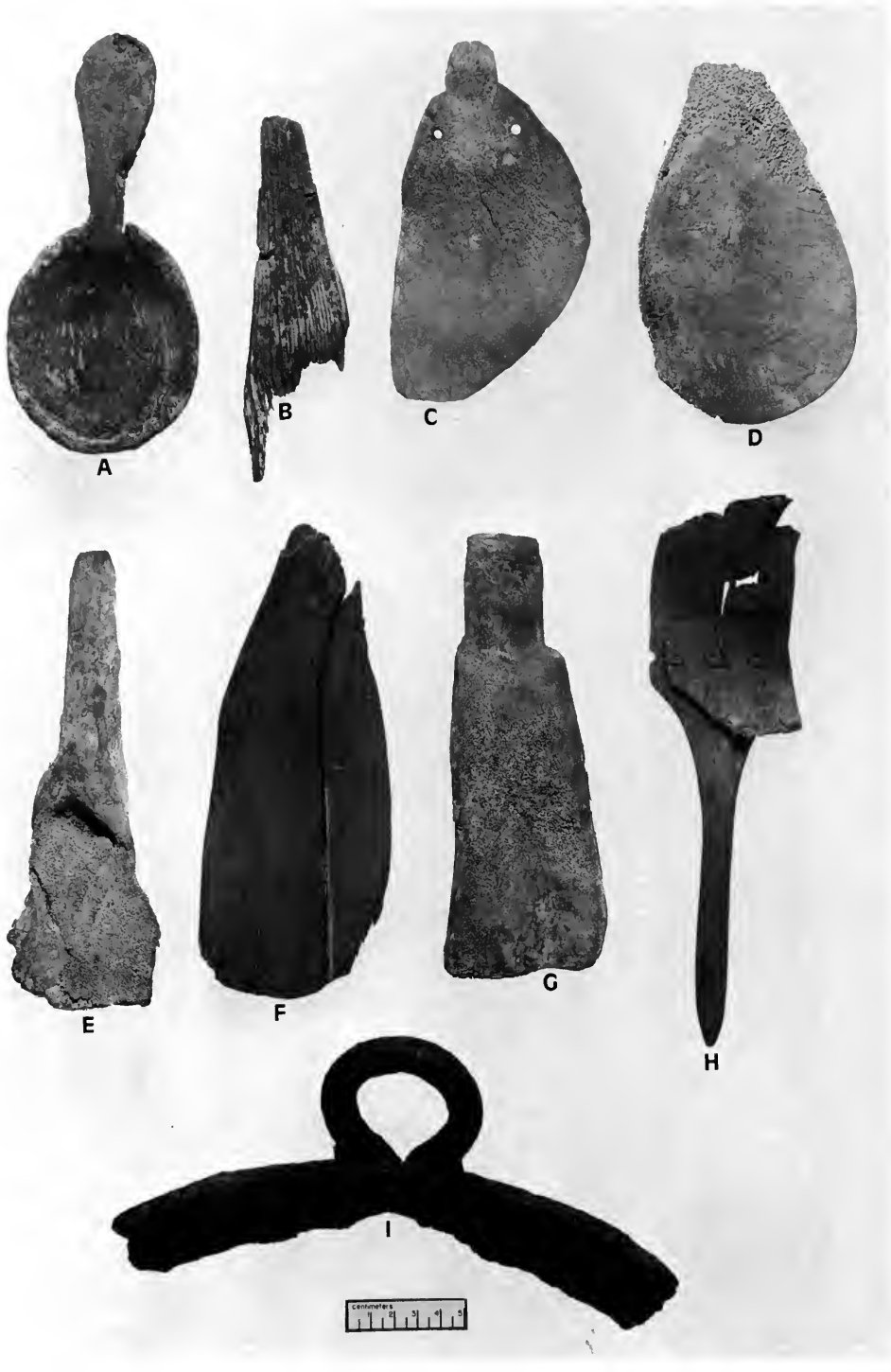

FIG. 30. *a*, dipper; *b*, spoon fragment; *c–g*, ladles; *h*, dipper fragment; *i*, kettle rim fragment (FMNH neg. no. A-110980).

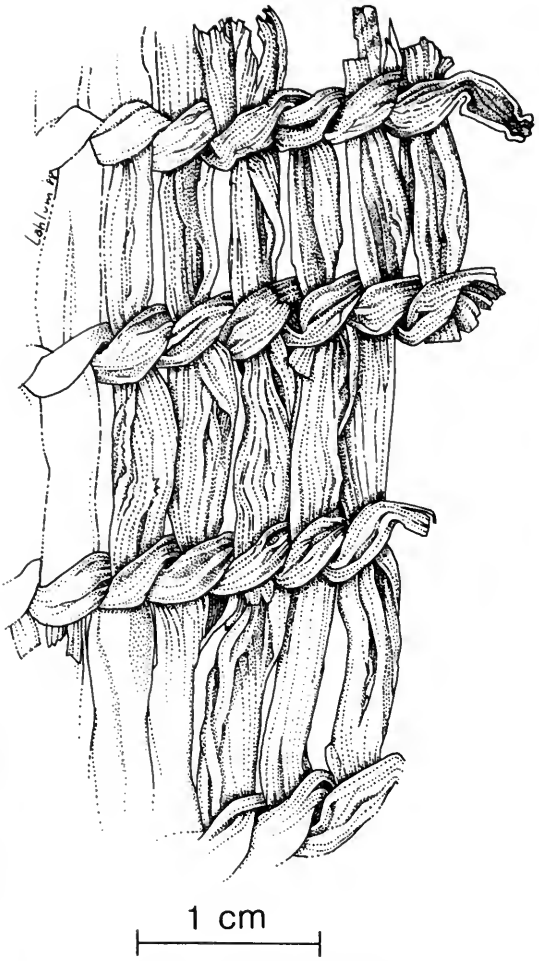

FIG. 31. Mat or bag fragment.

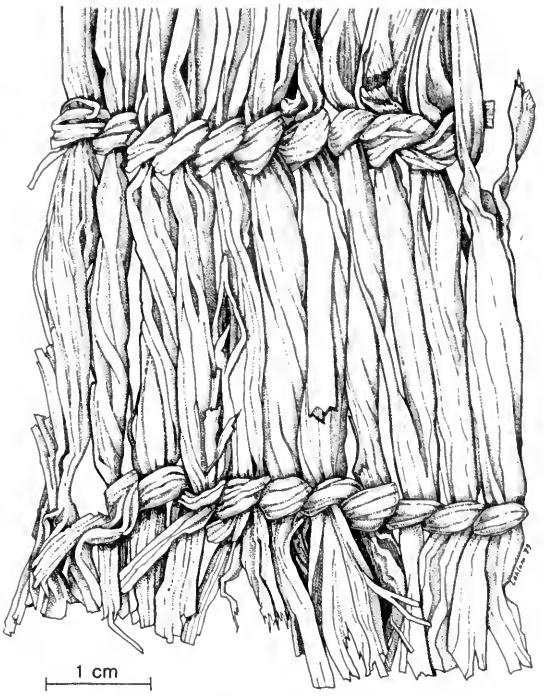

FIG. 32. Mat or bag fragment.

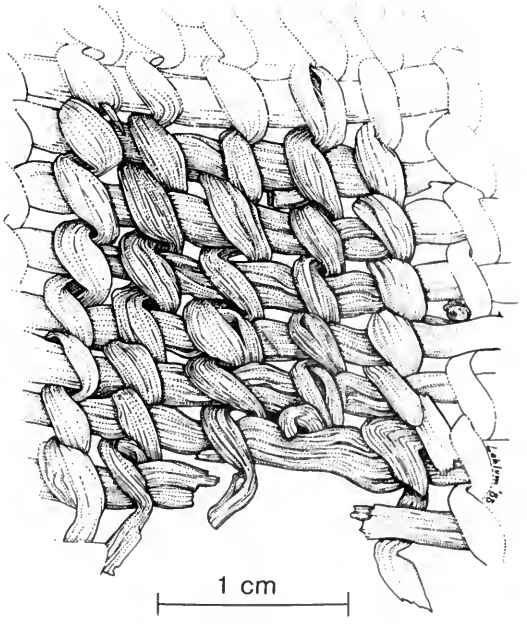

FIG. 33. Mat or bag fragment.

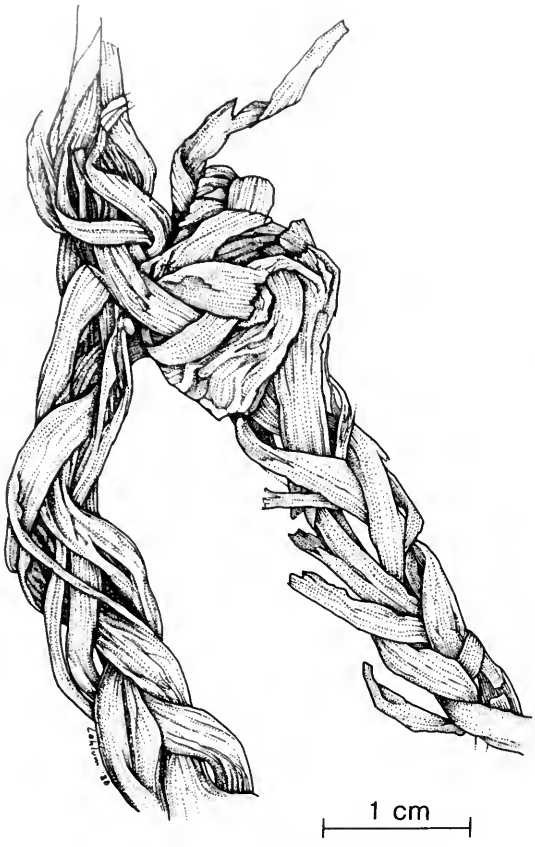

FIG. 34. Braided grass cordage.

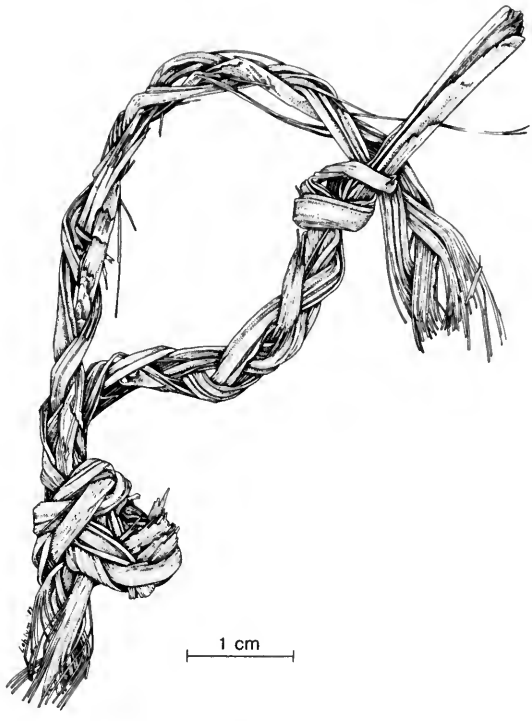

FIG. 35. Braided grass cordage.

FIG. 36. *a*, lamp; *b*, lamp (FMNH neg. no. A-110981).

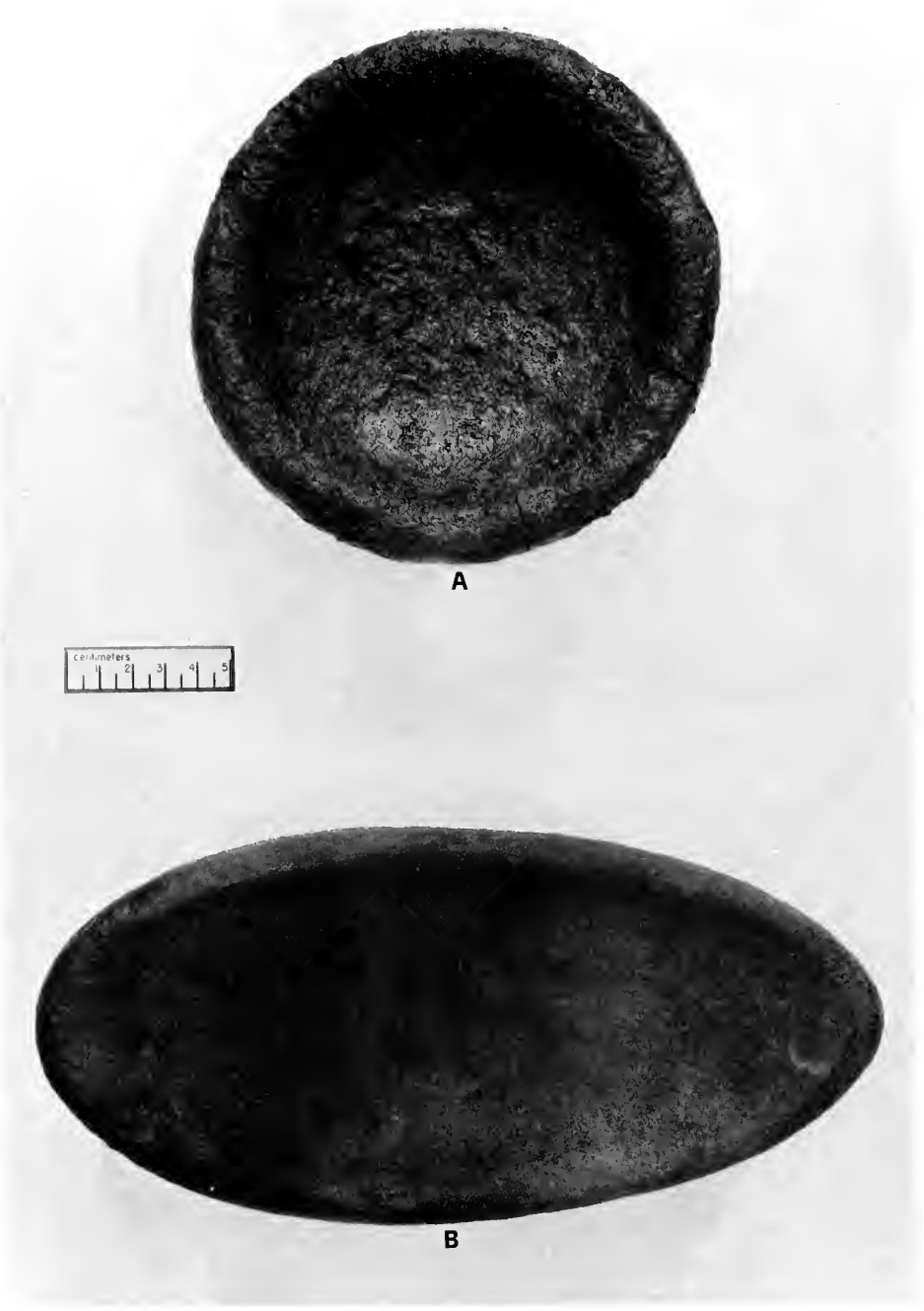

FIG. 37. *a*, lamp; *b*, lamp (FMNH neg. no. A-110983).

FIG. 38. *a,* fragment of blue transfer-printed cup with the "Camilla" pattern; *b,* base and foot of a transfer-printed cup possibly showing part of the "Davenport" mark; *c,* fragment of transfer-printed plate rim with the "cherry picking" pattern; *d,* transfer-printed blue cup fragment with the "Watteau" pattern; *e,* mask appendage; *f,* necklace fragment; *g,* blue transfer-printed cup rim fragment with the "Watteau" pattern; *h,* finger ring; *i,* snuff box fragment; *j,* hair comb; *k,* toy bow fragment; *l,* toy bow fragment; *m,* mask appendage (FMNH neg. no. A-111335).

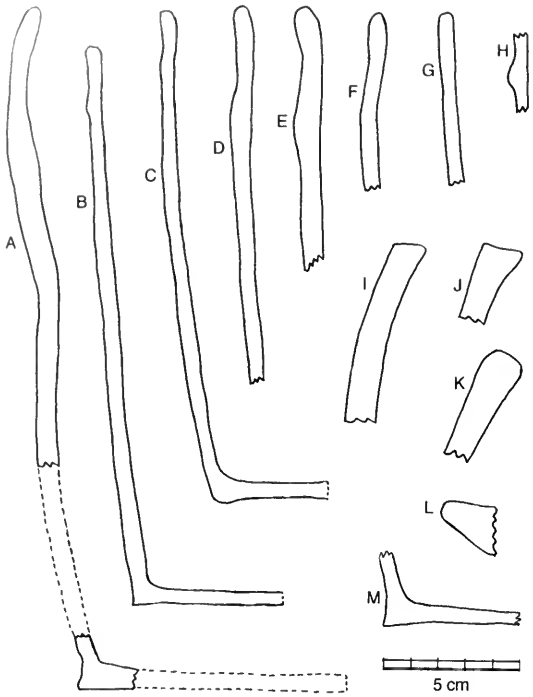

FIG. 39. Pottery profiles.

FIG. 40. *a,* unfinished mask; *b,* human figurine; *c,* human figurine; *d,* respirator (?) (FMNH neg. no. A-111337).

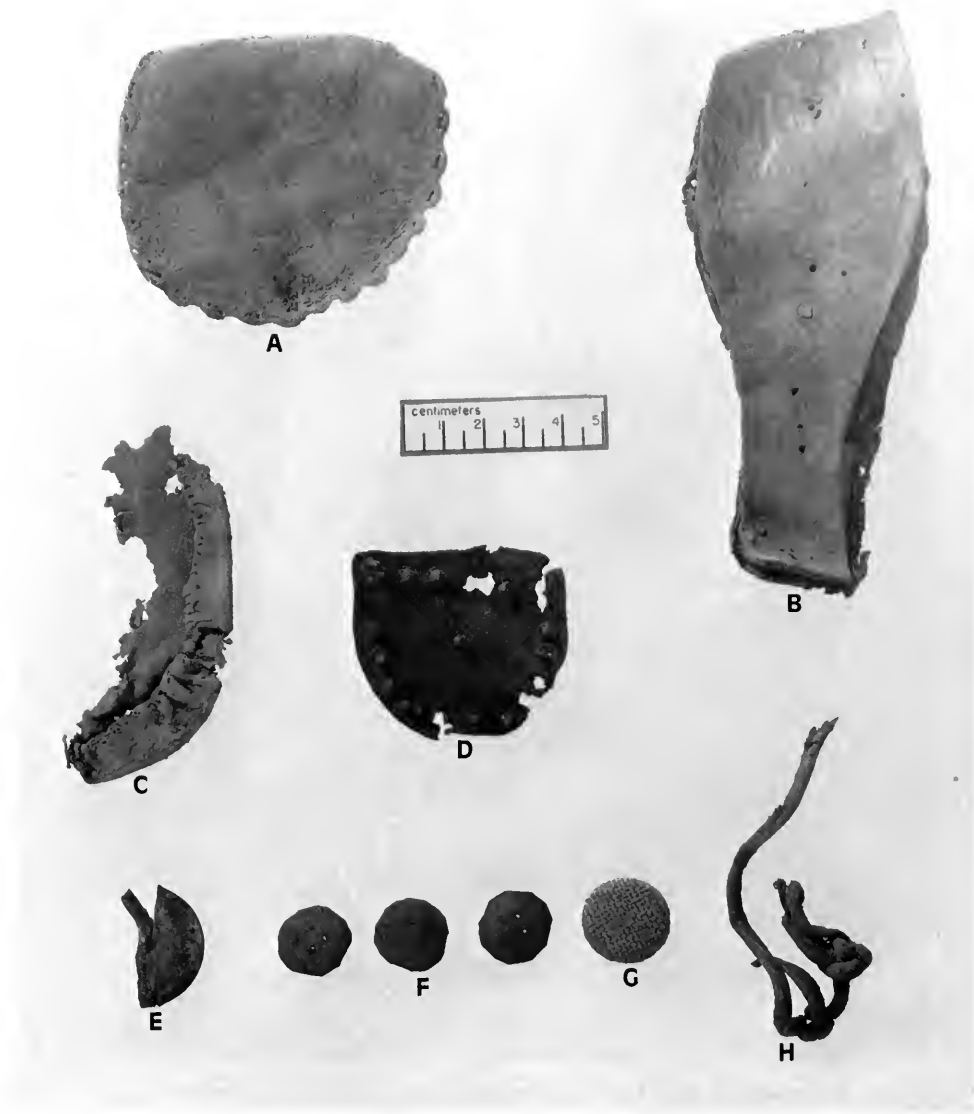

FIG. 41. *a,* sealskin patch; *b,* shoe sole fragment; *c,* mukluk sole fragment; *d,* shoe heel fragment; *e,* brass button; *f,* wood buttons; *g,* cloth covered button; *h,* knotted sealskin line (FMNH neg. no. A-111477).

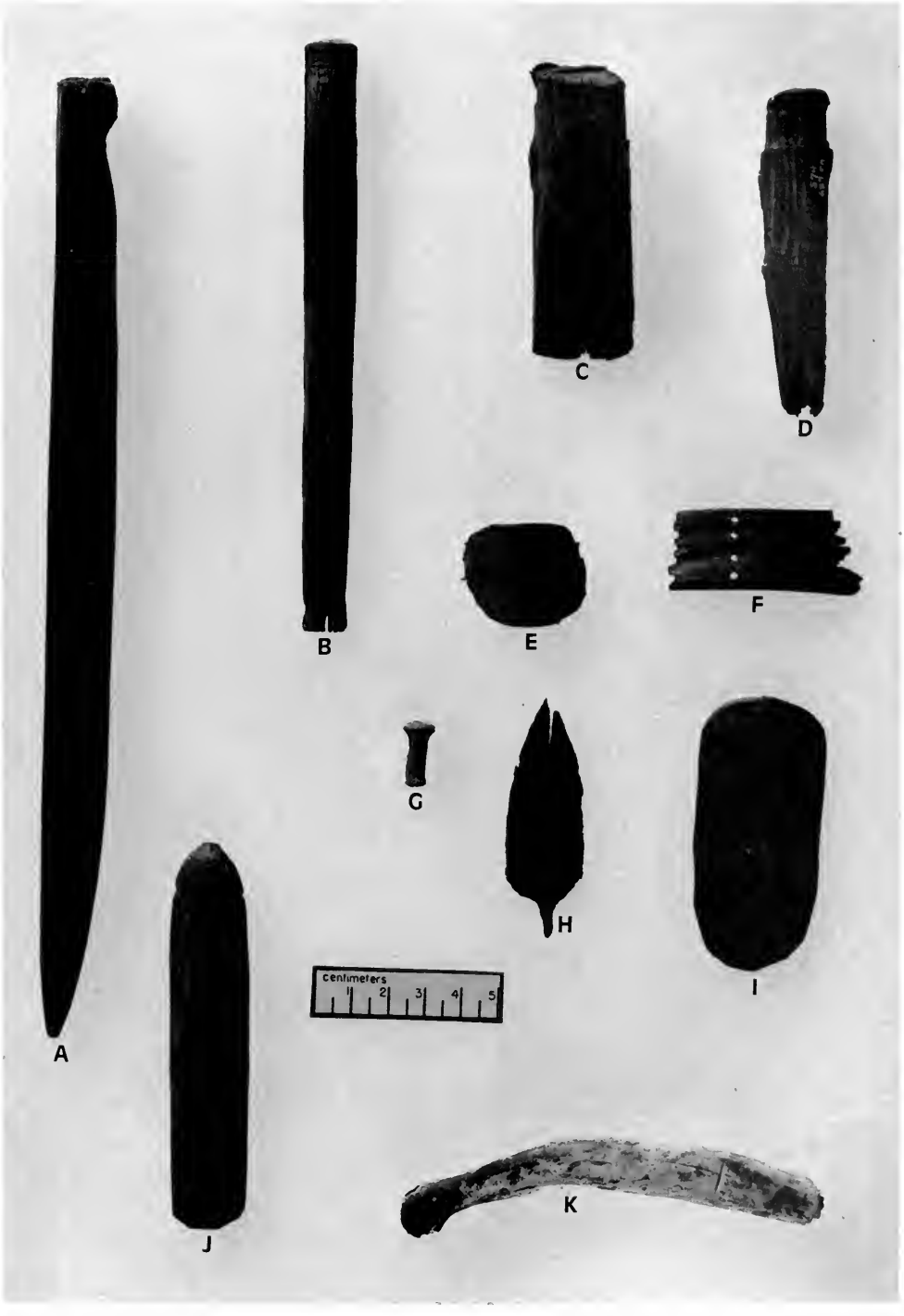

FIG. 42. Unidentified objects (FMNH neg. no. A-111336).

FIG. 43. Unidentified objects (FMNH neg. no. A-111476).

FIG. 44. *a,* harpoon socketpiece; *b,* knife blade; *c,* bow fragment; *d,* harpoon socketpiece; *e,* harpoon socketpiece tang fragment; *f,* harpoon ice pick; *g,* harpoon ice pick (?); *h,* toggle harpoon head; *i,* harpoon dart head; *j,* harpoon dart head; *k,* harpoon dart head; *l,* arrowhead; *m,* harpoon foreshaft (FMNH neg. no. A-111362).

FIG. 45. *a,* ulu handle; *b,* lug for kettle handle; *c,* unidentified; *d,* end-bladed knife blade; *e,* mask appendage (?); *f,* engraving tool; *g,* brass box; *h,* spoon; *i,* spoon, *j,* kettle lid; *k,* wedge; *l,* kayak keel protector or shoe (FMNH neg. no. A-111361).

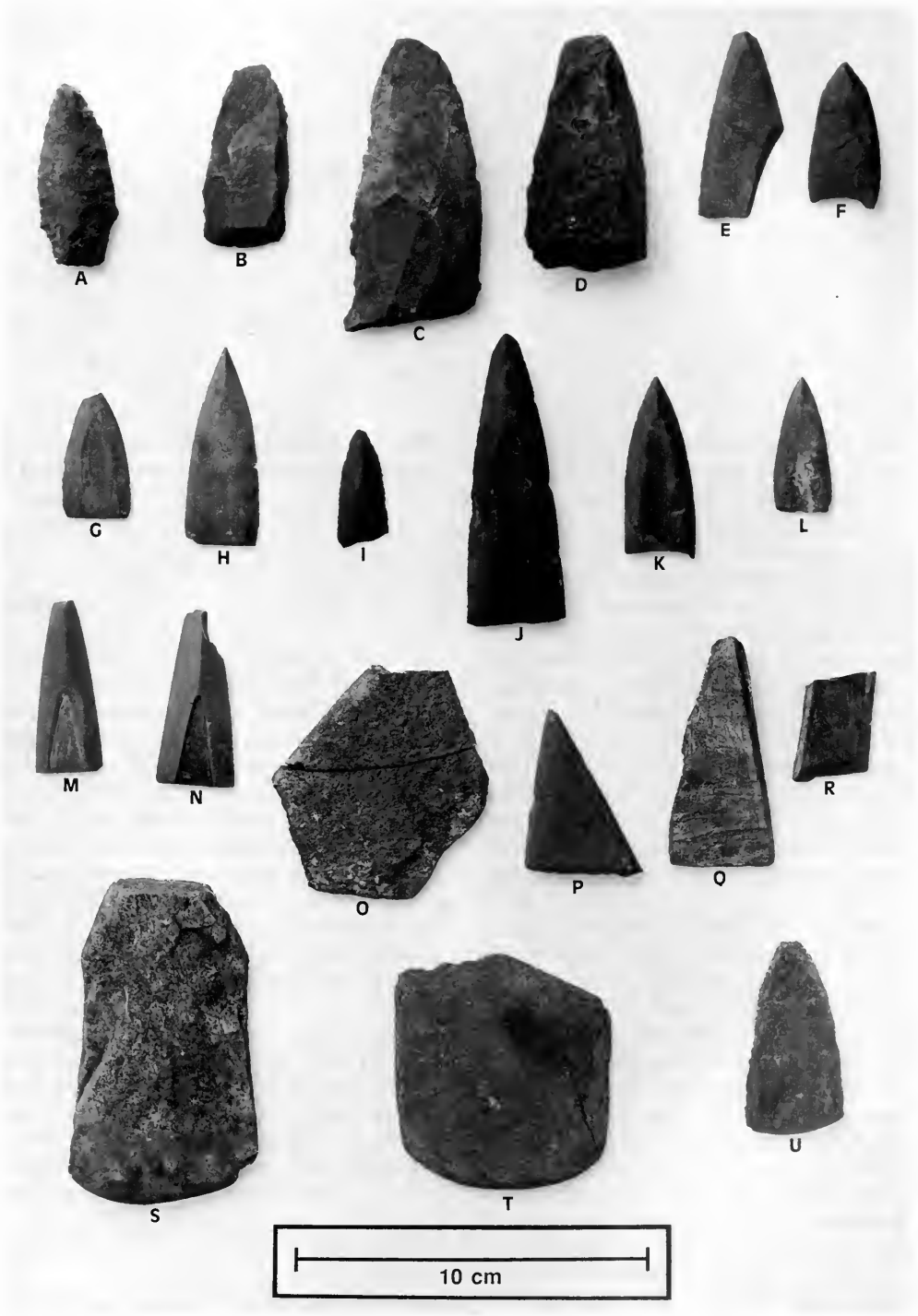

FIG. 46. *a,* projectile point; *b,* chipped biface; *c,* chipped biface; *d,* chipped biface; *e,* end blade; *f,* end blade; *g,* end blade; *h,* end blade; *i,* end blade; *j,* end blade; *k,* end blade; *l,* end blade; *m,* end blade; *n,* end blade; *o,* stone saw; *p,* slate blank; q, slate blank; *r,* slate blank (broken); *s,* adze blade; *t,* tabular ulu blade; *u,* skin scraper blade (FMNH neg. no. A-111935).

5

Paugvik in Historical Context

In this final section we briefly consider the place of Paugvik within southwestern Alaskan prehistory and history.

Subsistence

Identified faunal elements recovered from the Paugvik settlement during the several years of excavations are summarized in Table 8, where emphasis is placed on the relatively numerous mammalian remains. The identifications of moose elements are evidently tentative, based chiefly on the size of two separate bones (see Appendix). Moose reportedly were virtually nonexistent on the Alaska Peninsula before the year 1900 (e.g., DI, 1980, p. III-65), although a rare presence in the Naknek vicinity at the time Paugvik was occupied is of course possible. The animal cannot, however, be considered very significant in terms of routine subsistence.

Both birds and fish were much more fully identified following the work in 1961 and 1973, as summarized in Table 9. Despite the lack of more detailed identifications of bird and fish remains from 1985, the high proportions of both salmon and waterfowl shown in Table 9 can reasonably be extended to work of that later year.

Mammals

From the faunal remains collected at Paugvik (Table 8), those considered to have been probably the most important mammalian food remains are summarized in Table 10. The mean live weights given may not be absolutely accurate indications of the amount of usable meat for each species, but the contrasts presented in total live meat available are so clear and the differences among the species are so robust that there should be little doubt that the order of mass in fact represents the order of availability of meat for subsistence.

The total amount of beluga meat (and blubber) obviously far exceeds that of all others. Whether or not this was all consumed locally, the contrast between the beluga total and that of the next ranking species, caribou, is so great that it must receive attention. Even though oil rendered from blubber of these small toothed whales was evidently an item of native trade in some parts of western Alaska (see Zagoskin, 1967, pp. 101–102) and some allowance for these potential trade uses may be made, the bulk taken still is such as to place the beluga at the top of the list of apparent mammalian food.

The relationship between live weight of caribou and bear and between bear and seal, with the larger in each pair amounting to about 150% of the smaller, is less robustly clear-cut. Nevertheless, the possibility that bears were killed for purposes other than food (i.e., for fur or to remove them as nuisances around the settlement) serves to set the bear potentially apart from the more clearly subsistence species, although the presence of bony elements within the houses seems to indicate that bears were also eaten. In any event, the progression in order of frequency of beluga, caribou, seal, or more generally beluga, large land mammal, seal, is unambiguously supported.

The high importance of the beluga is in accord with the species distribution and with reports of local informants. Bristol Bay is a year-round habitat of belugas (FWS, 1985, pp. 2–14), which enter the major tributary rivers in spring to meet young juvenile salmon on their way to the sea and in

TABLE 8. Faunal remains found in various Paugvik units.[a] E = total skeletal elements, and I = minimum number of individual animals.[b]

Animals	H1		H2		H3		H4	
	E	I	E	I	E	I	E	I
Land mammals								
Caribou (*Rangifer tarandus*)	60+	2	211	6	37	2	23	1
Bear (*Ursus arctos*)			17	1	7	1		
Beaver (*Castor canadensis*)	3+	1	1	1	+	2		
Porcupine (*Erethizon dorsatum*)								
Wolf (*Canis lupus*)								
Dog (*Canis* cf. *familiaris*)								
Dog or wolf (*Canis* sp.)			+	2	+	1		
Fox (*Vulpes* cf. *fulva*)			+	3	+	1	4	2
Unidentified canid (*Canis, Vulpes*)							11	2
Otter (*Lutra canadensis*)					+	1		
Muskrat (*Ondatra* sp.)	1	1						
Moose (?) (*Alces alces*)								
Sea mammals								
Beluga (*Delphinapterus leucas*)								
Unidentified cetacean (cf. *D. leucas*)	9	1	90	1	20	1	5	1
Harbor seal (*Phoca* cf. *vitulina*)	1	1	6	1	+	2		
Walrus (*Odobenus rosmarus*)								
Birds	6	1	50	6	13	4	1	1
Fishes	17		23		57	2		
Mollusks								
Macoma clam (*Macoma balthica*)		5		18		9		1
Mussel (*Mytilus edulis*)		1		1		2		
Whelk (cf. *Neptunea lyrata*)				2		1		
Cockle (*Clinocardium nuttalli*)								

[a] H = house; T = trench.
[b] Abstracted from information in the Appendix and from Dumond (1981).

summer and fall to pursue mature salmon upstream. Local native people have told of driving belugas upstream by kayak, the boatmen slapping the water with their paddles, to arrive at a lagoon located near the upper tidal limit more than 30 km inland. When the tide dropped, the whales were beached and butchered. Other local residents report the presence of beluga skulls in the vicinity (Dumond, 1973–1985, fieldnotes, 1973, 1974).

There is nothing in the artifact assemblage, however, that can be recognized as a specific indicator of the harvest of belugas. Hunting techniques similar to that mentioned above have been described for the 19th century both from western Alaska (Zagoskin, 1967, p. 113) and from the mouth of the Mackenzie River in northwestern Canada. In the latter region, once the animals were driven into shallows they were harpooned and then speared (McGhee, 1974; Krech, 1989, p. 63). The toggling heads of the harpoons used, however, were reportedly heavier and larger (perhaps by 50%) than those of the usual sealing harpoons (McGhee, 1974, pp. 39–40). There are no such implements in the Paugvik collection, in which the delicate (and rare) examples of toggling heads (artifact class 1) must have been used for animals no larger than seals. Although some of the larger slate blades of the collection (end blades of type 1, artifact class 15) could well have armed lances used for whale killing and butchery (cf. Krech, 1989, p. 106, Figs. 5b,d, 16a), there is nothing to show them as any way specialized for that purpose. Others of the same type probably were used to tip both arrowheads for land animals and harpoons for seals, although for seals barbed dart heads of bone or ivory would also have been used.

Birds

The Alaska Peninsula is a staging area for the migration of numerous species of migratory waterfowl (UA, 1974, p. 461ff; FWS, 1985, pp. 2–10). Although the major areas involved are located well southwest of Paugvik, the high proportion among bird remains of ducks and geese of various species

TABLE 8. *Continued.*

H5		H6		T1		T4		73T		61T		Total	
E	I	E	I	E	I	E	I	E	I	E	I	E	I
5	1	627	11	66	2	82	3	182	6	13	2	1306+	36
		2	1			14	1	1	1			41	5
		+	4	2	1			12	2			18+	11
								7	1			7	1
										1	1	1	1
								1	1			1	1
		+	3	4	1			10	2			14+	9
		+	9			+	1	104	4	1	1	109+	21
						+	4					11+	6
		2	1			+	1	1	1			3+	4
												1	1
		?1	1			?1	1					?2	2
								34	2	4	1	38	3
1	1	169	4	19	1	16	1	49	2	6	2	384	15
		39	3			7	1	67	5	5	2	125+	15
										1	1	1	1
		117	11	1	1	32	6	83	27	3	3	306	60
		50	3	23	1	+	4		32		1	211+	43+
	1		8		2		1	443	223			488+	268
							1	41	24			46+	29
			1					1	1			5	5
												1	1

meets expectations. The overall number of bird elements recovered, however (Table 8), is small enough to suggest that birds were not a major staple. The presence of some egg shells accords well with local reports of the gathering of eggs, especially gull eggs, in the summer months (Dumond, 1973–1985, fieldnotes, 1973, 1974).

Fishes

Of all the expected major food resources, salmon and other fish remains are the least well represented. Although a considerable quantity of fishing equipment was recovered, including both spears and net parts (see Table 2), the actual remains of fish are not common, although salmon did provide the major fraction of the modest sample (Table 9). One reason for this shortage must lie in preservation, especially of the relatively soft salmon bones. A second and probably more important reason, however, is the practice of filleting the fish for drying or smoking, with the mass of bony parts left at the processing point rather than taken into the houses. Figure 5 (p. 11) shows racks of drying salmon.

Of the remaining fishes (Table 9), the inconnu (sheefish) is normally not found south of the Kuskokwim River (Morrow, 1980, p. 25), and the identification, evidently made from a single scale, may be in error. Other whitefish, as well as pike and grayling, are present in the Naknek River system and could have been taken there in open water or, possibly, through the ice. None of these species is so well represented as to suggest they were crucial to subsistence.

Shellfish

Shellfish, given the high proportion of relatively long-lasting debris (i.e., shell) versus edible meat and the small number of shells recovered in the excavations, must have been relatively unimportant as a staple food, although no doubt would have been a welcome seasonal protein supple-

TABLE 9. Skeletal elements (E) and minimum number of individual (I) birds and fishes identified from previous Paugvik work.[a]

Animal	1973 Trench		1961 Trench	
	E	I	E	I
Birds[b]				
Loon (*Gavia stellata*)	5	2		
Grebe (*Podiceps* sp.)	1	1		
Cormorant (*Phalacrocorax* sp.)	1	1		
Duck (Anatinae or Aythyinae)	29	8	1	1
Goose (*Anser* or *Branta*)	34	8	1	1
Tundra swan (*Cygnus* cf. *columbianus*)	2	1		
Murre (*Uria* sp.)		1	1	
Gull (*Larus* spp.)	5	2		
Bald eagle (*Haliaeetus leucocephalus*)	1	1	1	1
Ptarmigan (*Lagopus* spp.)	3	1		
Raven (*Corvus corax*)	1	1		
Fishes				
Bone waste				
Silver salmon (*Oncorhynchus kisutch*)				8
Salmon (*Oncorhynchus* spp.)		1+		23
Scales				
Salmon (*Oncorhynchus* spp.)				1
Whitefish (undetermined)				1+
Arctic grayling (*Thymallus arcticus*)				1
Inconnu (*Stenodus leucichthys*)				1
Northern pike (*Esox lucius*)				1+

[a] Adapted from Dumond (1981, Table 6.32).
[b] Also represented by various shells of unidentified species.

ment. Most common is the macoma clam, a chalky-shelled mud clam that is found in the inlets of upper Bristol Bay. Colonies of the second most frequent, the common blue mussel, are present wherever there are rocky outcrops exposed at low tide, as at the mouth of the Naknek River.

Vegetal Foods

The only example here is provided by rhizomes of a fern of the family Aspleniaceae, probably wood fern (*Dryopteris* sp.). These rhizomes were recovered in some quantity in 1961 and in the 1970s (Dumond, 1981, pp. 65, 67, where they were tentatively identified as the related *Polystichum*), and within the pit in Area 6A of 1985. A plant of southeastern Alaska, Cook Inlet, and the Bristol Bay region, the wood fern is known as a food source; the old leaf stalks on the underground stem are dug in early spring for roasting and the young fiddleheads in summer are eaten boiled or steamed (UA, 1981, p. 14). The dietary importance of this plant at Paugvik is unclear. Although found in scattered examples throughout the site in 1985, concentrations were known only from Area 6A by House 6, in the short trench excavated in 1961, and in what had clearly been a pit full of them that was recognized in the face of the bluff below the site where it was exposed by erosion in 1975 (Dumond, 1981, pp. 65, 67).

Conclusion

Based on ethnographic information from southwestern Alaska, salmon, systematically preserved and stored, probably represented the single most important staple of the Paugvik people, although we do not have direct archaeological evidence of such reliance. Second in importance to salmon appears to have been beluga, followed somewhat distantly by caribou or bear, or both, followed even more distantly by seal. The other mammals represented in Table 8 probably were used primarily for purposes other than food, although the situation with bear is unclear. Waterfowl were clearly taken and were probably important but to a much lesser degree. The importance of gathered eggs cannot be assessed on the basis of present

TABLE 10. Proportions of mammal foods probably available at Paugvik.

Species	Min. no. (%) animals represented[a] E		I		Estimated individual live weight (lb)	Total live weight taken (lb)	Total weight (%)
Caribou	1,306+	(68.9)	36	(48.6)	250	9,000	12.4
Bear	41	(2.2)	5	(6.8)	1,200	6,000	8.2
Beluga	422	(22.3)	18	(24.3)	3,000	54,000	74.2
Seal	125+	(6.6)	15	(20.3)	250	3,750	5.2
Total	1,894	(100.0)	74	(100.0)		72,750	100.0

[a] E = skeletal elements; I = individuals.

evidence. Although wood fern was evidently a common foodstuff, its overall importance to the diet is unclear. Lacking from the collection are remains of species of berries such as that locally called blackberry (*Empetrum nigrum*), which is common along the lower Naknek River. It is gathered heavily by local people today and without doubt was important in the past.

The Fur Trade

The most important fur-bearing animals at Nushagak at the end of the Russian period were beaver, river or land otter, muskrat, fox, and lynx (Elliott, 1875, p. 40). Russian traders also accepted bear and wolf pelts, however (e.g., Khlebnikov, 1976, Appendix 4; Oswalt, 1980, p. 86). At Paugvik, bone waste indicates (in order of abundance) individuals of fox, beaver, dog or wolf, bear, otter, and muskrat. Confirmation is found in the presence of fur identified as beaver, bear, muskrat, and canid (Table 2, Appendix).

This evidence supports the statement regarding the fur animals important at Alexandrovskiy, and suggests in the case of fox and otter that some trapping was done close enough to the Paugvik settlement for the animals to have been brought home and skinned there. Trench 4 produced the essentially complete skeletons of one fox and one otter (recorded as feature 14) in positions indicating disposal of the whole articulated animal corpses at a location that would have been only a short distance outside the door of House 3.

However, both bears and wolves killed for fur alone probably would have been skinned outside the village. If so, this implies that the bulk of the possible wolf bones in and around the Paugvik houses were more likely those of dogs, whereas the presence of bear bones seems to say that at least portions of the bear carcasses were brought into Paugvik as meat.

Activities within the fur trade are clearly confirmed by finds of fur stretchers within House 6 of a size for both fox and muskrat (Table 2, item no. 32).

Seasonality

In the sample presented here, the seasons from spring through summer to fall are indicated by a range of forms, including the belugas and salmon, which are available through much of the entire period. Birds' eggs and fern parts are associated with spring. Winter appears to be chiefly marked by the caribou remains, overwhelmingly those of mature individuals carrying antlers.

The major peninsula caribou subherd calves in spring southwest of Port Heiden. In summer the animals scatter, but in early fall all drift northward to winter on the coastal plain northeast of the Ugashik River, returning south in late February or March. A high point in herd numbers seems to have been reached in the mid-19th century, forcing the limit of their winter migration farther northeast. Thus, as of the early 1870s, Elliott reported caribou to

> cross and recross the Kvichak River in large herds during the month of September. . . . At the mouth of this stream is one of the broadest deer-roads in the country. The natives run along the banks of the river when reindeer [sic] are swimming across, easily and rapidly . . . securing in this way any number that fancy or want may dictate. (Elliott, 1886, p. 397)

During that period, then, caribou must have been available in the immediate Naknek vicinity much of the time from September until March. Those animals represented in the bone waste at Paugvik

TABLE 11. Counts of potsherds from sites in southwestern Alaska.[a]

Site	Native pottery	Chinaware
Kijik	0	1,092
Kolmakovskiy Redoubt	1	3,480
Akulivikchuk	2	329
Nushagak	12	317
Crow Village	61	325
Tikchik	310	223
Paugvik	1,506	48

[a] Based on information from Oswalt and VanStone (1967), VanStone (1968, 1970, 1972), VanStone and Townsend (1970), and Oswalt (1980).

were probably taken locally, as suggested by the large numbers of skeletal elements compared with the apparent number of individual animals (Table 8, ratio of E:I), the ratio being the highest of the four large mammal forms in Table 10. Had the meat been hauled long distances, more boning probably would have taken place outside the Paugvik settlement.

In addition to evidence from caribou remains, fur trapping customarily took place principally in fall and winter seasons; thus, the evidence for such activity at Paugvik provides some confirmation of winter occupation. The use of the site in winter is suggested strongly by the nature of the habitations themselves: semisubterranean structures with substantial central fireplaces.

Thus, the immediate area of the Paugvik settlement probably was occupied by at least some people all year round. However, the houses excavated were not necessarily the living sites in all seasons. Accounts of local people in the 1920s and 1930s indicate the custom of moving from the permanent winter house (by that time an above-ground frame structure) into tents for summer. Although the tents might move to several locations during the ice-free season, they were often only a few yards from the winter settlement. We suppose that a comparable pattern existed during the period of occupation at the Paugvik site.

Dating

Trade beads were recovered at essentially every excavation site, the single exception being a short and unproductive section of Trench 1. Evidence of times before contact with Europeans is otherwise confined to the older, thicker pottery variety that was mixed with some later deposits. Given the arrival of Russians along the southern coast of the Alaska Peninsula less than two decades before A.D. 1800 and the establishment of the post at Nushagak only in 1819, the major occupation in the excavated portion of the site probably did not predate 1800 and may not have begun earlier than about 1810.

When we began our research, we expected to find evidence of the same occupation lasting until at least 1900 and perhaps beyond, with some artifacts relating to the period of the development of the commercial fishery and the presence of canneries in those later years. Upon completion of our analysis, however, our conclusion differs significantly from our expectation.

The small number of trade artifacts in the sample makes absolutely specific dating difficult, and the period of occupation is both too late and too short for the radiocarbon method to provide any assistance. But the very shortage of imported trade objects at the site now appears to have temporal significance.

Ceramics

As discussed in Part 4, fragments of imported chinaware are far outnumbered by those of native pottery. In this aspect Paugvik stands in marked contrast to other 19th-century sites excavated in southwestern Alaska (Table 11).

Of the few imported sherds from Paugvik that can be reasonably dated on stylistic grounds or manufacturer's identification (Table 3), some are types that endured to the end of the 19th century or beyond. But none of them so identified were necessarily manufactured after about 1850, and at least one would have been made not later than 1847 (i.e., Table 3, sherd no. 4).

Beads

Although the precise chronology of bead types introduced to Alaska is obscure, it appears that the green-lined red variety of Cornaline d'Aleppo beads did pre-date the other varieties of that type. The fairly substantial sample of Cornaline d'Aleppo beads from the Paugvik sites is entirely of this earlier green-lined variety.

Metal

By far the majority of metal objects from Paugvik are those fashioned into aboriginal-style implements. Metal animal traps are lacking entirely, as is common at 19th-century sites of the region, despite efforts of the Russians to introduce such traps for beaver (Zagoskin, 1967, p. 221; Oswalt, 1980, p. 83). Much more uncommon in the case of Paugvik is the absence of tin cans; tin cans have been reported from all of the comparator sites (such as those listed in Table 11). The unusual shape of two of the ulus (Table 2, item no. 62), with the curving metal strip as handle, may indicate some temporal category of which we are unfamiliar; certainly they are not standard trade objects of the American period. One of the axe heads (Table 2, item no. 44) is of a type known to have been associated with the Russian-American Company.

Glass

Bottle glass (Table 2, item no. 98) is represented by only eight fragments, two of them retouched as scrapers, the total less even than the very small number recovered at Tikchik (VanStone, 1968) and only about 10% of the glass found at Akulivikchuk (VanStone, 1970). This indicates a very limited acquisition of bottled products of any kind. The characteristics of the 11 fragments of window glass (Table 2, item no. 132) are in keeping with a date between about 1840 and 1870.

Summary and Conclusions

We have mentioned specifically the artifact classes that seem to us to carry rather direct temporal implications. In Part 1 and elsewhere, we have made additional remarks leading to a similar end. Here we briefly summarize these and add still other circumstances that contribute to our conclusions.

The Orthodox Church in Alaska holds many recognized chapel sites in both present and former settlements, some with structures standing (and in use) and some with none. For instance, there are three such Church holdings on the mainland coast of Shelikof Strait almost directly across the peninsula from Paugvik, all of them at settlements occupied in the 19th century and substantially contemporary with Paugvik. These are at the former settlements of Katmai and Douglas, both abandoned in 1912, and at a site on Kukak Bay, evidently abandoned sometime before 1900.

Examination of local Naknek-vicinity ownership records both in the office of the Bristol Bay Borough, at Naknek, and in the Bureau of Land Management regional office in Anchorage and queries to officials of the Orthodox Church reveal no comparable holding in or adjacent to the area we recognized and excavated as Paugvik but rather only the single site of the present Orthodox religious structure, which is located on the bluff above the Naknek River somewhat to the west of the center of present Naknek village, 2 km upstream from Paugvik. When the first chapel was constructed in 1876 (ARC, 1733–1938, Nushagak, Church/Clergy Registers, Sts. Peter and Paul Church, 1876) it was at this site—one seemingly much more convenient to modern Naknek than to the site we explored. The church was in active use in 1900 when photographed by a U.S. Fish Commission party (Fig. 47), and its replacement structure still stands.

Although Elliott (1886) described the abandoned village of "Paugwik" as "marked by the outlines of its cemetery" (which seems to imply the existence of an Orthodox burial ground), there is no sign of any such graveyard near the village of our excavations. The only Orthodox cemetery in evidence in the region is that surrounding the modern church building at the Naknek location.

The comments attributed by Larsen (1950) to the postmaster at Naknek at the time of his visit in 1948 indicated that the former village site we know as Paugvik had already been abandoned for some 20 years in 1895. Also, the imported material recovered at Paugvik includes nothing of the plentiful quantity that seems clearly related at other sites to occupation after the development of the commercial fishing industry in the region (as, for instance, at Kijik; see VanStone & Townsend, 1970). Furthermore, although a few trade objects in the Paugvik collection could date from the American period (i.e., after the late 1860s), there is nothing in that collection that must date from the American period, whereas everything reasonably datable could equally well be from several decades earlier.

Given all of the above, we accept the import of Elliott's statement that was based on his visit of the mid-1870s. We conclude that the major occupation of the archaeological Paugvik site began as early as 1800 and that all occupation ended by 1870. Thus, it is a site representative of the Russian period alone.

FIG. 47. Russian Orthodox chapel near Naknek, 1900. U.S. Fish and Wildlife Service photo no. 22-FFA-2547, U.S. National Archives.

Paugvik in the Russian Period

Some of the Russian period settlement of Paugvik certainly has slipped down the bluff with tidal erosion, which has been severe in the past. The portion remaining in 1985 (Figs. 8, 9, pp. 17, 18), however, must provide some indication of the contemporary appearance of the village, with the houses strung out along the bluff above the river. There is no indication of a Russian chapel or cemetery at the site as it remains, and there is no documentary evidence that would indicate any such presence there, rather than closer to modern Naknek.

With regard to another common feature of 19th-century native sites in the region, the *kazhim* or *qasigiq*, however, the situation may be different. According to historical accounts, the Aglurmiut were like their linguistic relatives of the Kuskokwim River vicinity in the use of a community structure that served also as men's residence house (Wrangell, 1970, pp. 17–18, 1980, pp. 65–67). This is described as of construction similar to that of the ordinary semisubterranean winter house, although larger, entered by a tunnel entrance, and with an especially large and deeply sunken fireplace in the center (Elliott, 1986, pp. 385–387; Zagoskin, 1967, p. 115). Examples of these structures, with the well-marked entrance tunnel and large and deep firepits, have been excavated at sites such as Tikchik and Akulivikchuk (VanStone, 1968, figs. 16, 18; 1970, fig. 11). We suspect strongly that one such structure is represented at the Paugvik site by the large depression located between Houses 1 and 2 (Figure 9, p. 18). This suspicion is suggested by its size—from surface appearance the largest house on the site—and by its depth, which indicates the sort of central hole that

would incorporate a deep fireplace. We decided against excavation of this depression, however, both because of its rather daunting dimensions and because it is the most heavily vandalized area at the site. The tentativeness of our conclusion is based on evidence of recent digging in the center of the depression. This haphazard excavation had been so extensive as to make it actually unclear whether the depth was really because of an original fireplace or simply the result of vandals' digging.

Aside from this area, the houses of the site appeared relatively uniform, and this uniformity was confirmed in our excavations: all consisting of a single room with sunken entry tunnel, comparable to houses at sites such as Tikchik and Akulivikchuk (VanStone, 1968, 1970) but without the evidence of storm sheds at the outer end of the entrances. Whether this represents a real absence or simply our failure to recognize traces of such sheds in the excavations is not clear.

One surprise was in the consistent evidence for reconstructions and superimpositions of houses at the site. Although all versions of all houses yielded glass beads bespeaking a period of European or American contact, there is unmistakable evidence for at least three generations of houses during the time the site was occupied. Seventy-five years is considered the longest reasonable span of occupation in the portion of the site we excavated; thus about 25 years appears to be about the maximum length of time that such a semisubterranean structure could be expected to retain its usefulness before reaching a stage of rot that would render continued use dangerous. This situation, together with the number of house remains encountered in our excavations that were not indicated clearly on the surface (at least equaling the number we recognized on the surface and expected to excavate), should serve as reminders for archaeologists who make much of village size and population estimates based on nothing more than the surface appearances of southern Alaska archaeological sites.

Beyond the physical condition of the site, an element that stands out as strongly characteristic is the small number of imported goods recovered. Although the people of the settlement were obviously active in pursuing furs for the Russian trade, the Russians apparently were not lavish in dispensing payment in imported goods.

Although upon first arrival in the New World the Russian fur hunters had instituted the Siberian practice of collecting *yasak* from the natives (the headtax payable in furs by each man), some years before the establishment of the Russian-American Company in 1799 a change was instituted by which natives of the Aleutian Islands and Kodiak were organized into hunting parties under Russian supervision, with the hunters being paid according to their individual success (Gibson, 1976, p. 32n). This procedure was not so commonly employed in the region north of the Alaska Peninsula, although a few hunting parties were organized in somewhat this fashion (e.g., Oswalt, 1980, p. 81). For the most part, natives were simply encouraged to hunt, with prodding from the toyon, and their take was purchased by barter. In this process the Company traded European goods for furs and engaged in trading furs from one region to another, thus trading skins less desirable (to the Russians), such as wolf, wolverine, and caribou, into regions where they were wanted by natives. Thus they gained beaver and otter (Oswalt, 1980, p. 80). In any event, the result appears to have been the introduction of very few exotic objects into the site at Paugvik.

Relations with Neighbors

Historical accounts indicate that the Aglurmiut first entered Bristol Bay no earlier than about A.D. 1800, when their warlike behavior displaced previous inhabitants to the Severnovsk settlements of the upper Naknek River drainage and to the Ugashik River. In seeming contradiction of this bit of history, however, are conclusions from previous archaeological work in the Naknek region. When information from Paugvik was confined to results of the limited excavations of 1961 and 1973 and to the short statement of Larsen (1950), it was concluded that the Paugvik people's "material culture was substantially indistinguishable from that of the people they displaced" (Dumond, 1981, p. 185). Since the time of that report, however, information from the latest precontact (Brooks River Bluffs) phase of the upper Naknek region obtained in three seasons of excavation by the National Park Service (Harritt, 1988) and the analysis of the 1985 Paugvik collection suggest a modification of this view.

As reported elsewhere (Dumond, 1994), between the Pavik archaeological phase of the Paugvik site (beginning ca. A.D. 1800) and the Brooks River Bluffs phase of the Naknek region (A.D. 1450–1800), discrepancies are noteworthy both in the form of the ordinary habitations and in the quan-

tity of ceramics. In the Bluffs phase the late prehistoric houses were dominated by multiroom structures that appear comparable, although not identical, to native houses of Kodiak Island of the same period. In the same phase there was a marked decline in the use of ceramics from the immediately prior (Brooks River Camp) phase (A.D. 1050–1450): during the Camp phase, the number of pottery sherds amounted to 64% of the total of stone implements recovered, whereas the overall proportion of sherds to stone artifacts in all Bluffs phase sites sampled dropped to a mere 7%. This situation is parallel to the contemporary situation on much of the Kodiak Island group, where ceramics were known but scarcely used (e.g., Jordan & Knecht, 1988; Dumond, 1991). This situation changed dramatically after about A.D. 1800 with the Pavik phase of the Paugvik site, when ceramic fragments only slightly differing in form from those of the Bluffs phase exceed in number artifacts of both stone and metal (Table 8, p. 17) and where there is no doubt that the ordinary habitation was a single-room house entered by a sunken tunnel or cold trap.

Although a single-room house was in use at the major Severnovsk site at the time it was abandoned in 1912 (and had been for several decades, according to historical accounts) 19th-century observers contrasted it with the semisubterranean house of Paugvik as being more nearly above ground and more commodious and involving more wood in its construction (Porter, 1893, p. 169; Petroff, 1884, p. 15). The 1912 example illustrated by Davis (1954, Fig. 14) was essentially an aboveground cabin covered with sod. Nevertheless, late prehistoric multiroom houses were reported at the edge of the same Severnovsk site (Davis, 1954, Map 5, Fig. 10). Comparable multiroom structures are also reported from a Bluffs-phase site (designated 49-NAK-015) on the upper tidal portion of the Naknek River, where testing by the Bureau of Indian Affairs has confirmed impressions derived from surface configuration (S. Neal Crozier, personal communication, 1993). Similar depressions suggest the presence of late-prehistoric multiroom houses at a site (49-NAK-008) near the mouth of the Naknek River, where occupation is known to be of the Brooks River Bluffs phase, although testing has suggested that some single-room houses may also have been present (Dumond, 1981, pp. 78–81).

Thus it appears that multiroom structures were especially characteristic of the Naknek area settlements of A.D. 1450–1800, during which time the Naknek River drainage is thought to have been the home of a single, relatively homogeneous society (Dumond, 1986, pp. 4–5; Harritt, 1988, pp. 101–115). It also appears that there was a change in modal house form in the lower drainage that coincided with the arrival of Aglurmiut people described in documentary sources. Whether a roughly parallel shift occurred at the same time in the region of the Severnovsk settlements or whether the change there was instead some result of the enhanced Russian presence in the 1840s and after is unknown. Unfortunately, no sites of the precise age of the Paugvik site have been excavated in the upper portion of the Naknek system, and until this can be accomplished no truly close comparison of Russian-period remains at the two extremes of the Naknek River drainage are possible.

Nevertheless, locations of settlements of this date, between 1800 and 1870, seem now to be confined to those extreme ends of the river system. That is, no sites of the age of archaeological Paugvik have been found anywhere in the area between the mouth of the Naknek River and the tributaries completely above the uppermost portion of Naknek Lake, where the Severnovsk settlements were reported to be during the Russian period, and where the Severnovsk site is located that was tested briefly by a two-man party in the Katmai Project of 1953 (Davis, 1954). Extensive work at Brooks River, a lower tributary of Naknek Lake, resulted in the identification of no significant occupation in the 19th century. Although a site of possibly such age was reported from a cursory examination in 1963 (Dumond, 1981, p. 31), tests in 1984 provided clear evidence that the site in its entirety postdates the 1912 volcanic eruption (Dumond, 1988). However, at Brooks River there is a great deal of evidence for human use in the decades before A.D. 1800 and for use resuming after 1912 (Dumond, 1981, 1988). Thus the suggestion made on the basis of historical and ethnographic accounts, that there was a kind of no-man's land that separated the Aglurmiut of Paugvik and the Alutiiq-speaking people of the Severnovsk settlements, appears to be confirmed by the material evidence as we now understand it.

We conclude that the evidence from the site known as Paugvik and dated in this work to the period of Russian control of Alaska confirms the historical information as it is provided in the documentary sources available (summarized in Part 1).

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Appendix: Fauna from Paugvik, Alaska

David S. Reese[a]

Paugvik village is located at the mouth of the Naknek River in southwestern Alaska. It was occupied in the 19th century until about A.D. 1870. Fauna was recovered by hand collection and dry sieving through a 1-cm mesh.

The appended catalogue provides details on the fauna recovered from Houses 1–6 and Trenches 1 and 2. House 5 and Trench 1 produced very small samples.

Caribou was found in all contexts, with 28 individuals. Most came from House 6 (11 individuals) and House 2 (six individuals).

There are two probable adult moose bones, from House 6 and Trench 4.

Canids were found in all contexts except Houses 1 and 5, with most from House 2 (six individuals). There are a total of 27 individuals (15 fox, seven dog/wolf, and six fox or dog/wolf).

Beaver remains were found in House 1, House 2, House 3 (two individuals), House 6 (four individuals), and Trench 1, representing nine individuals.

Bear remains were found in House 2, House 3, House 6 (two individuals), and Trench 2, representing five individuals.

Otter bones were present in House 3, House 6, and Trench 2, representing three individuals.

Muskrat bones were found in two areas (House 1, Trench 2), representing two individuals. Muskrat hair was found in Trench 1.

Whale bones were found in all deposits, with four individuals from House 6 and one or two from Trench 1, for a total of 10 or 11 individuals.

Seal remains were present in House 1, House 2, House 3 (two individuals), House 6 (three individuals), and Trench 4, representing eight individuals.

There are 210 birds bones present from 30 individuals. Most of these came from House 6 (11 bones, 11 individuals), House 2 (six individuals), and Trench 2 (56 individuals). There were no bird bones in House 5, and only one bone was found in both House 4 and Trench 1.

Fish bones were found in all contexts except Houses 4 and 5. There are probably no more than 12–14 individuals represented. Salmon is the most likely form present.

There are 55 shells: 45 *Macoma,* five *Mytilus,* four whelks, and one *Clinocardium.* Most of the shells came from Houses 2 and 3.

Unmodified mammoth tusk pieces were found in Houses 2 and 6.

All of the fauna might have been eaten, but this is particularly likely for the caribou and rarer moose as well as the whale, seal, birds, shells, and fish. Over 30 of the terrestrial mammal individuals (15 fox, nine beavers, five bears, three otters) may have been killed for their fur rather than for meat.

These same species were represented in the smaller terrestrial vertebrate sample from the earlier work at Paugvik: six caribou individuals, four foxes, two or three other canids, two beavers, one bear, one otter, four whales, five seals, and 27 birds (mainly ducks and geese). The aquatic faunal component was somewhat larger than that of the present sample, with 37+ fish individuals and 248 shell valves (Dumond, 1981, p. 177).

The modern fauna in the Paugvik area has previously been described (Dumond, 1981, pp. 10–11).

Catalogue of the Fauna from Paugvik Village

Abbreviations used: F = fused, JF = just fused; L = left; MNI = minimum number of individuals; mt = metatarsus; R = right; UF = unfused. *Alces* = moose; *Canis familiaris/C. lupus* = dog/wolf;

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Castor canadensis = beaver; cetacean = whale (probably beluga); *Lutra canadensis* = otter; *Ondatra* = muskrat; *Phoca vitulina* = harbor seal (ribbon seal could also be present); *Rangifer tarandus* = caribou; *Ursus arctos* = brown bear; *Vulpus fulva* = fox; *Clinocardium nuttalli* = Nuttall's cockle; *Macoma balthica* = Baltic macoma; *Mytilus edulis* = mussel.

House 1

Rangifer: 7 antler fragments (7 worked), skull fragment, scapula fragment (cut down tuber spinae), 2 proximal femora (2 F, 1 L, 1 R [butchered through trochanter majus]), 3 distal femora (3 F, 2 L, 1 R, 2 MNI), proximal tibia (F, R), distal tibia (F, R), 2 pelvis acetabulum fragments (1 F, L), 2 astragali (1 L, 1 R, 1 badly worn, 2 MNI), calcaneus (F, R), naviculocuboid, 8 carpi/tarsi/sesmoids, proximal metacarpus, proximal metatarsus, proximal metapodial fragment, distal metacarpus (F), 3 phalanges 1 (3 F), 2 phalanges 2 (2 F), 2 phalanges 3, 4 vertebrae, 14 ribs (2 MNI).

Castor: 2 mandibles (1 L, 1 R), incisors, ulna.

Ondatra: ulna.

Cetacean: 4 vertebrae, 3 vertebral centra epiphyses, phalanx, rib.

Phoca: pelvis.

Bird: 6 bones (1 MNI).

Fish: 17 vertebrae, no toothed elements

Shells (MNI): 5 *Macoma,* 1 *Mytilus*

House 2

Rangifer: 21 antler fragments (21 worked), 2 skull fragments (1 temporal, 1 occipital), 2 mandibles (2 adult, 2 R, 2 MNI), 14 isolated premolars/molars, atlas, 8 scapulae (8 F, 6 R, 2 L, 6 MNI), 3 proximal humerus fragments (2 UF, L, R), 8 distal humeri (8 F, 6 R, 2 L [1 butchered]), 4 proximal radii (4 F, 2 L [1 worn], 2 R), 3 distal radii (2 R [1 UF epiphysis, 1 F], 1 L [UF epiphysis]), 2 distal radius shafts, 5 proximal ulnae (3 R ([1 UF, 2 broken], 2 L [1 butchered, proximal]), 3 pelvis fragments (1 acetabulum, 1 MNI), sacrum fragment, 5 proximal femora (1 UF head, 1 UF trochanter majus, 1 L F, 1 R F, 1 F head; 3 MNI), 3 distal femur fragments (1 UF, 1 F, 1 butchered, 2 MNI), 10 proximal tibia fragments (3 L [2 UF, 1 F], 2 R [2 UF], 3 fragments [1 UF]), 6 distal tibiae (3 L [1 UF, 2 F], 3 R [3 F], 4 MNI), 2 patellae (2 MNI), 6 astragali (3 L, 3 R, 2 badly worn, probably 4 MNI), 3 calcaneus fragments (1 L [F], 1 R [broken], 2 MNI), 2 naviculocuboids (L, R), 8 carpals/tarsals, 5 distal metapodials (5 F, no proximal ends), 5 phalanges 1 (5 F), 1 phalanx 3, 5 vertebral fragments, 32 ribs, 35 fragments (6 MNI).

Ursus: scapula (F, L, very large), radius shaft (UF proximal and distal, L), radius shaft fragment, distal radius/ulna (F, R, proximal radius probably UF), sternum, 2 tibia shafts (2 UF, L, R), 4 carpi/tarsi, 4 metapodials (2 UF [1 mt IV]), 2 vertebrae.

Vulpes: various bones (3 MNI by mandible [1 subadult, 2 adult]).

Canis: various bones (2 MNI by femur, tibia).

Canis/Vulpes: hair (1 sample).

Castor: scapula, hair (2 samples).

Cetacean: 4 teeth, scapula (R), humerus, ?pelvis fragment, 24 metapodials/phalanges, 22 vertebral centra, 22 vertebral epiphyses, 15 ribs.

Phoca: 2 distal humeri (?UF), 2 pelvis, femur (UF distal), metapodial.

Bird: 50 bones and 1 feather (6 MNI, 4 of one species, and one each of two other forms).

Fish: 23 vertebrae, no toothed elements.

Shells (MNI): 18 *Macoma,* 1 *Mytilus,* 1 *Clinocardium,* 2 whelks (1 fragment).

Mammoth tusk fragment.

House 3

Rangifer: 8 antler fragments (8 worked), atlas, scapula fragment, 2 ulnae (F, R, butchered down shaft; broken, L; 2 MNI), distal radius/ulna (F, L, worn), ?ulna shaft, proximal femur (?UF, L, worn), distal tibia (F, L), 4 carpi/tarsi, phalanx 1 (F, worn), 5 vertebrae fragments (1 caudal), 12 ribs (2 MNI).

Ursus: palate fragment, 4 metapodials, vertebra, claw sheath, cf. *Ursus* hair (1 sample).

Vulpes: several bones.

Canis: several bones.

Castor: several bones (2 MNI by humerus).

Lutra: several bones.

Cetacean: skull fragment, jaw fragment, atlas, 10 metapodials/phalanges, vertebra centra, 3 vertebral epiphyses, 3 other bones.

Phoca: several bones (2 MNI by pelvis, ulna).

Bird: 12 bones (4 MNI by humerus, 2 species).

Fish: 57 vertebrae, 1 toothed element (2 MNI).

Shells (MNI): 9 *Macoma,* 2 *Mytilus,* 1 whelk (fragment).

House 4 (tested only)

Rangifer: 2 antler fragments (2 worked), atlas (adult), distal radius (F), 2 ulnae (1 L, 1 R, 1 F, 1 broken adult; F has butchered radius shaft), proximal tibia (UF, opened for marrow), distal tibia (F, fresh, opened for marrow), carpus/tarsus, phalanx 1 (F, worn), 4 vertebral fragments (2 UF centra), 11 ribs.

Canis/Vulpes: mandible (adult), scapula (no glenoid, young), humerus (proximal UF, distal F), radius and ulna (articulate, but separate), distal tibia (F), 5 vertebrae (2 MNI).

Vulpes: mandible (adult), humerus (UF proximal), radius and ulna (articulating).

Cetacean: skull fragment, jaw fragment, metapodial/phalanx, vertebra centra, vertebra epiphysis.

Bird: 1 bone.

Shells: 1 *Macoma.*

House 5 (tested only, N17/E110)

Rangifer: 2 antler fragments (2 worked), distal femur (UF), vertebra (UF), rib (butchered).

Cetacean: jaw (no teeth).

Shells (MNI): 1 *Macoma.*

House 6 (excavated as Trench 2 and Trench 1, E20-26)

Rangifer: 20 antler fragments (20 worked), 8 skull fragments, 2 palate fragments (1 L, 1 R, 2 MNI), 4 atlantes (1 butchered, 4 MNI), 3 axes (1 butchered through and behind articular surface, 1 worn), 19 mandible fragments (all adult, 7 MNI L, 6 MNI R), 23 isolated premolars/molars, 18 scapula fragments (7 L [7 F], 7 R [1 smaller and broken, 6 F], 8 MNI), 16 proximal humeri (11 R [4 UF, 4 F], 5 L [3 UF, 2 F], 8 MNI), 22 distal humeri (12 R [1 UF, 10 F], 10 L [1 UF, 9 F]), humerus shaft (young, possibly UF, R), 4 proximal radii (3 L [3 F], 1 R [F]), 6 ulnae (5 L [3 UF, 2 broken], 1 R [UF]), 11 distal radii (7 L [5 UF, 2 F], 2 R [1 UF, 1 F]), distal radius shaft fragment, 39 pelvis fragments with 18 acetabulum fragments (10 L [1 UF, 6 F, 3 broken], 8 R [2 UF, 5 F, 1 broken], 9 MNI), 11 sacrum fragments (3+ MNI), 6 proximal femora (4 R [2 UF, 2 F], 2 L [1 JF, 1 F]), proximal femur epiphysis (head, R), 6 distal femora (3 UF, 2 MNI; 3 F, 2 MNI), 3 distal femoral epiphyses (2 MNI), 1 small femur (all UF), proximal tibia (11 R [5 UF, 4 F], 7 L [3 UF, 1 JF, 2 F, 10 MNI], 13 distal tibia fragments (8 L [1 UF, 7 F], 5 R [3 UF, 2 F], also 1 shaft and 2 epiphyses, 7 MNI), 2 patellae, 9 astragali (6 L, 3 R, 6 MNI), 8 calcani (9 fragments, 5 L [3 UF, 2 F], 3 R [3 UF]), 4 naviculare (3 MNI), 24 carpi/tarsi, 5 proximal metacarpi (3 MNI), 5 proximal metatarsi (2 very large, 4 or 5 MNI), 5 metapodial fragments, 14 distal metapodials (13 F [1 mt], 1 broken mt), 6 phalanges 1 (6 F), 4 phalanges 2 (4 F), 102 vertebral centra and 49 fragments, 165 ribs (11 MNI).

?*Rangifer*: phalanx 1 (UF), burnt black.

?*Alces*: proximal radius (very large, F, R).

Ursus: scapula (F, R), proximal humerus (F), distal humerus epiphysis (R), 2 radii (2 all UF), proximal ulna (F, R), proximal tibia epiphysis (L), tibia (F, R), 2 astragali (1 L, 1 R), calcaneus (UF, L), 3 carpi/tarsi, 6 metapodials (5 F), 1 phalanx 1, 1 phalanx 2, 2 phalanx 3, 3 phalanx 3 sheaths, 19 vertebrae (2 MNI), cf. *Ursus* hair (9 samples).

Canis: various bones, adult (3 MNI tibia; 2 MNI mandible, atlas, axis), 1 upper shaft of a femur has an incised slit (3 MNI).

Vulpes: various bones (9 MNI mandibles [2 subadult, 7 adult], 3 MNI atlas, femur; 2 MNI axis, tibia) (9 MNI).

Canis/Vulpes: hair (8 samples).

Castor: various bones (4 MNI by humerus, 2 MNI by mandible and pelvis). One individual is very large based on a humerus and femur (4 MNI).

Lutra: scapula, femur (UF).

Cetacean: 6 teeth, 6 jaw fragments (1 looks burnt, 4 MNI), 4 scapula fragments (1 glenoid butchered, 3 MNI), femur head, 25 metapodials/phalanges, 44 vertebrae, 7 vertebral spine fragments, 67 vertebral epiphyses, 29 ribs (4 MNI).

Phoca: 8 humeri and 3 epiphyses (5 MNI), 3 ulnae (3 MNI), 2 pelves, 2 femora (2 MNI), 20 metapodials/phalanges, 1 other bone (3 MNI), hair (2 samples).

Bird: 117 bones and 13 feathers (11 MNI by humerus).

Fish: 43 vertebrae, 7 toothed elements (3 or 4 MNI).

Shells (MNI): 8 *Macoma* (1 burnt), 1 whelk (fragment).

Mammoth tusk fragment (from Trench 2 back, N10/E20).

Trench 1 (E27-36); mixed midden

Rangifer: 5 antler fragments (4 worked), 3 molar fragments, 3 proximal humerus (3 F, 2 L, 1 R, 2 MNI), 2 distal humerus (2 F, 1 L, 1 R, 1 MNI), proximal radius (F, R) attaches to proximal ulna (broken), distal radius/ulna (F, R), pelvis fragment, proximal femur (maybe UF, R, worn), femur head epiphysis, proximal tibia (young adult/adult, R, broken proximal), astragalus (R), 2 calcaneus (1 L [F], 1 R [butchered through distal end]), naviculocuboid, 7 carpus/tarsus, 2 proximal metatarsus (1 butchered), distal metapodial (F, very worn), phalanx 3 (very large), 10 vertebrae [1 UF epiphysis], 18 ribs (2 MNI), hair (1 sample).

Canis: palate fragment, 2 mandibles (1 MNI), distal humerus (F).

Canis/Vulpes: hair (2 samples).

Castor: 2 pelvis (1 L, 1 R, 1 MNI).

Ondatra: hair (1 sample).

Cetacean: jaw and 5 jaw fragments (no teeth, 1 or 2 MNI), humerus head, large shaft (UF), metapodial/phalanx, 5 vertebral epiphyses, 3 small vertebrae, 2 ribs (1 or 2 MNI).

Bird: 1 bone.

Fish: 23 vertebrae, no toothed elements (1 or 2 MNI).

Shells (MNI): 2 *Macoma.*

Trench 4 (midden near the entrances of Houses 2 and 3)

Rangifer: 3 antler fragments (3 worked), 2 mandible fragments (2 L, 2 MNI), atlas, scapula (F, L), 2 proximal radii (2 F, 1 R, 1 L [butchered down center of shaft]), 3 distal radii (1 UF, 2 F [1 butchered toward distal], 3 L, 3 MNI), 9 pelvis fragments (2 L, 2 R, 1 butchered fragment, 2 MNI), 4 proximal femora (2 L [1 UF trochanter majus, 1 F], 2 R [F], 3 MNI), 2 distal femora (1 UF epiphysis, 1 F (distal, worn), 2 MNI), 2 distal tibiae (1 R [UF], 1 L [F], 2 MNI), astragalus (R), calcaneus (UF, R), naviculocuboid, phalanx 1 (F), 13 vertebrae, 36 ribs (3 MNI).

?*Alces*: posterior mandible (condyle process).

Ursus: axis, 2 carpi/tarsi.

Canis/Vulpes: various bones, all adult (4 MNI by mandibles, 2 MNI by scapula and pelvis), 1 burnt mandible, hair (1 sample) (4 MNI).

Vulpes (adult): skull, 2 mandibles, atlas, axis, pelvis, sacrum, 1 astragalus, 1 calcaneus, most vertebrae and ribs; missing other limbs (Animal 1, Feature 14, N24/E65).

Lutra: complete skeleton except for 1 astragalus and 1 calcaneus (second skeleton from Feature 14, N24/E65).

Ondatra: mandible.

Cetacean: tooth, jaw lacking teeth, scapula, femur, 3 metapodials/phalanges, limb bone, 5 vertebrae, 3 vertebral centra epiphyses.

Phoca: 2 humerus, 2 humeral epiphyses (UF), ulna (UF, L), pelvis, metapodial.

Bird: 32 bones (6 MNI; 2 each of 2 species).

Fish: largest sample 41 vertebrae (4 MNI by skull bones).

Shells: 1 *Macoma,* 1 *Mytilus.*

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