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THE ANTIQUITY OF TLINGIT SETTLEMENT ON ADMIRALTY ISLAND, SOUTHEAST ALASKA

Madonna L. Moss, Jon M. Erlandson, and Robert Stuckenrath

A series of 29 radiocarbon dates from 11 sites on Admiralty Island span the last 3,200 calendar years. Although our research corroborates many of the results of de Laguna's (1960) earlier work in the area, we find the Tlingit settlement pattern to be at least 1,600 years old, significantly older than previously believed. Dating of a wooden fish weir demonstrates that mass harvesting of salmon has an antiquity of at least 3,000 years.

Una serie de 29 fechas de radiocarbono procedentes de 11 sitios arqueológicos sobre Admiralty Island *abarca los ultimos 3,200 años calendarios. Aunque nuestra investigación corrobora la mayoría de los resultados hallados por de Laguna (1960) en el area, encontramos que el patrón de asentamiento Tlingit debe tener, por lo menos, una antigüedad de 1,600 años, significativamente más viejo de lo que previamente se había pensado. Una fecha de radiocarbono hecha con una muestra de una trampa para peces indica que la cosecha de salmón en gran escala tiene una antigüedad de, al menos, 3,000 años.*

Almost 40 years have elapsed since Frederica de Laguna's field research on the archaeology, ethnology, and history of southeast Alaska's Angoon Tlingit (de Laguna 1960). The Angoon Tlingit are one of 13 Tlingit groups or *kwaans* whose territory encompassed over 800 km of the northern Northwest Coast at the time of European contact (Figure 1). Over the years, several important studies have increased our knowledge of southeast Alaska's archaeology (i.e., Ackerman 1968; Ackerman et al. 1979, 1985; Davis 1984; de Laguna 1972; de Laguna et al. 1964), but the question of the antiquity of Tlingit occupation remains unanswered. Through artifactual evidence and oral history, de Laguna (1960:203) identified a series of sites she attributed to relatively recent occupation by the Angoon Tlingit.

Although the development of cultural resource management programs by government agencies has accelerated the pace of archaeological research, major gaps remain in our understanding of cultural evolution in southeast Alaska (Arndt et al. 1987). Regional surveys such as those conducted by Goldschmidt and Haas (1946) and Herem (1975) identified hundreds of ethnohistoric sites, few of which subsequently have been investigated. Little research has been conducted among the Angoon Tlingit, a particularly lamentable situation because of the rich legacy of de Laguna's work. Prior to our study, only two archaeological sites had been radiocarbon dated on Admiralty Island (Swanson 1982; Swanson and Davis 1982), neither located in traditional Angoon Tlingit territory.

Between 1980 and 1987, Moss and Erlandson recorded 67 archaeological sites on the 445,000-ha Admiralty Island (Erlandson and Moss 1983; Moss 1985; Moss and Erlandson 1985). During the summer of 1985, we conducted limited excavations at nine sites in the Angoon vicinity, including five sites investigated by de Laguna (Figure 2). Research goals include establishing the antiquity of the ethnohistoric economic pattern and detecting differences between prehistoric and historical-period patterns through intensive faunal analyses.

In this paper, radiocarbon dates are presented that complement de Laguna's research in the Angoon vicinity and illustrate the archaeological implications of correcting marine shell dates following Stuiver et al. (1986). Our investigations also lead us to examine the stability of late prehistoric shorelines in this isostatically and tectonically active region. To place our discussion in an environmental and archaeological context, brief site descriptions are presented. A comprehensive study

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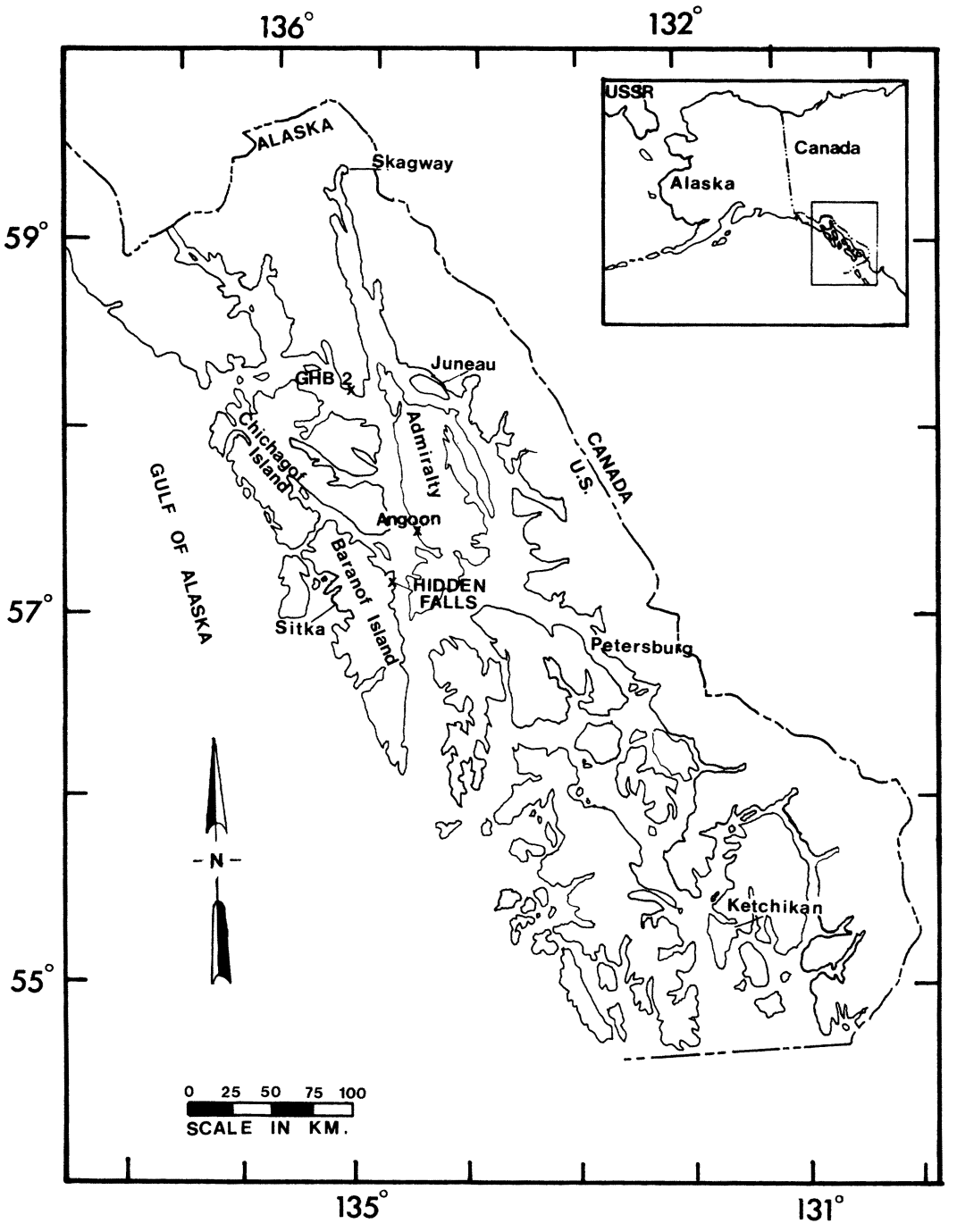

Figure 1. Map of southeast Alaska.

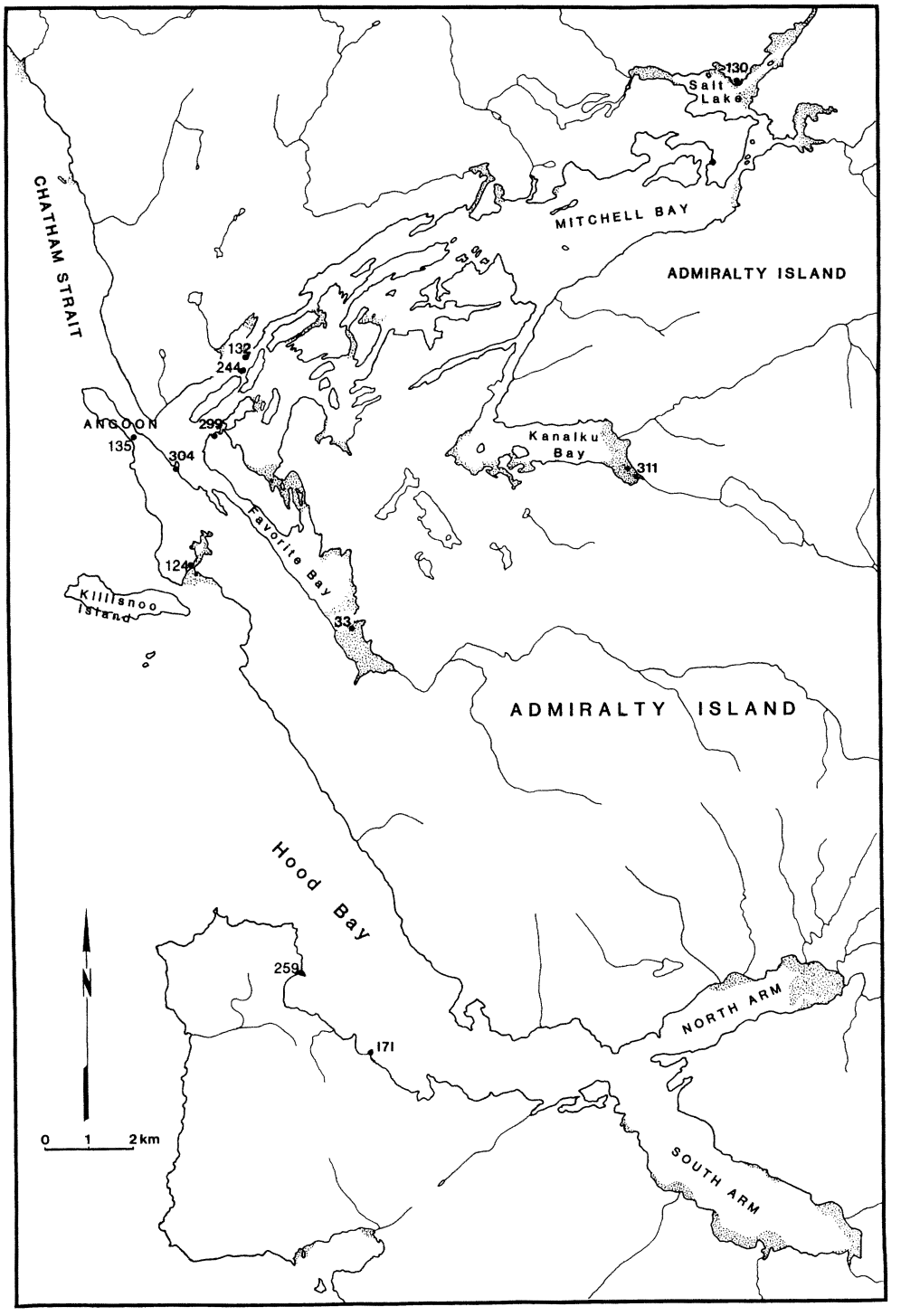

Figure 2. Map of Angoon Project area, southwest Admiralty Island.

Table 1. Radiocarbon Dates from Southwest Admiralty Island.

Site Number 49-SIT-	Lab Number	Sample Provenience	Uncorrected ^{14}C Date	Corrected Date Calendar Years Before Present
33	SI-6993	fish weir, southern area	3015 ± 65	3230 ± 80
33	PITT-07	fish weir, central area	2685 ± 40	2790 ± 45
33	SI-6994	fish weir, northern area	2190 ± 45	2170 ± 50
124	Beta-10919	near midden base	1910 ± 90	1590 ± 103
124	Beta-13236	N148/W18, 45–48 cm (base)	1570 ± 80	1255 ± 94
124	PITT-05	column 1, 0–10 cm	1775 ± 45	1435 ± 67
124	PITT-06	column 1, 50–59 cm	1260 ± 40	920 ± 64
130	Beta-13237	column 3, 10–20 cm	1320 ± 90	960 ± 103
130	Beta-22073[a]	column 4, 20–28 cm	1110 ± 60	750 ± 78
132	PITT-02	column 1, 0–10 cm	1220 ± 45	900 ± 67
132	PITT-01	column 1, 40–50 cm	1120 ± 50	770 ± 71
132	Beta-13238	column 1, 110 cm (base)	1130 ± 90	785 ± 103
135	Beta-13513	erosional profile, ca. −50 cm	1000 ± 70	668 ± 86
171	Beta-13239	lower terrace, midden base	1280 ± 90	930 ± 103
171	PITT-03	game trail slough	1285 ± 55	940 ± 74
244	PIT-04	column 2, 0–10 cm	710 ± 45	468 ± 67
244	Beta-13240	column 3, 30–38 cm	520 ± 70	278 ± 86
244	Beta-22074[b]	column 1:10–20 cm (Unit H1W)	1230 ± 90	905 ± 103
259	UCR-2167	column 1, 10–20 cm	1130 ± 60	785 ± 78
259	UCR-2166	column 2, 10–20 cm	1890 ± 60	1565 ± 78
259	Beta-13241	column 2, 60–70 cm	1600 ± 90	1272 ± 103
299	UCR-2168	column 2, 0–5 cm	1425 ± 60	1090 ± 78
299	Beta-13242	column 2, 50 cm (base)	1610 ± 60	1280 ± 78
299	Beta-27677	column 3, 0–10 cm	1000 ± 100	670 ± 112
299	Beta-13514	column 3, 60–70 cm	1770 ± 80	1425 ± 94
304	Beta-13243	base of midden	1530 ± 60	1220 ± 78
311	PITT-131	fish weir, SE south locus	955 ± 35	920 ± 40
311	PITT-132	fish weir, NW south locus	125 ± 35	250 ± 40
311	PITT-133	fish weir, north locus	1700 ± 30	1610 ± 35

[a] Multiple shell fragments; $C^{13}/C^{12} = -.5$ 0/00 per mil C^{13} (400 years).
[b] Multiple shell fragments; $C^{13}/C^{12} = +.1$ 0/00 per mil C^{13} (410 years).

of the sites and an interpretation of the cultural ecology of the early Angoon Tlingit is presented elsewhere (Moss 1989).

RADIOCARBON DATING AND CALIBRATION METHODS

Our chronometric data include 29 ^{14}C dates from 11 sites. Most samples consisted of single clam shells, though two samples incorporated fragments from more than one shell. Six wooden fish-weir stakes also were analyzed. Four laboratories, including Beta Analytic, the Smithsonian Institution, the University of Pittsburgh, and the University of California, Riverside, analyzed the radiocarbon samples. Table 1 presents the dates in radiocarbon years (based on a half-life of 5,568 years), uncorrected for the reservoir or DeVries effects. All ^{14}C dates referenced in the text are corrected calendrically.

For the wooden stakes, we used calibration curves (Pearson and Stuiver 1986; Stuiver and Pearson 1986) on the dates reported by the laboratory. Before calibrating marine-shell dates (Stuiver et al. 1986:Figure 11), isotopic fractionation and the reservoir effect must be corrected for. The isotopic-fractionation adjustment for the sample from a brackish environment (Beta-22073) was 400 years, and one from a marine environment (Beta-22074) was 410 years (see Table 1 notes for C^{13}/C^{12} values). Since most site environments were marine, 410 years were added to correct for isotopic fractionation in samples for which C^{13}/C^{12} ratios were not measured. Next we subtracted a ΔR value, the difference in reservoir age of the regional part of the ocean (derived from data in Robinson and Thompson [1981]) and the ocean as modeled by Stuiver et al. (1986). Since ^{14}C ages for historic

samples of known age were not available for the study area, Minze Stuiver (personal communication 1987) recommended using an average of three sets of values reported for the west coast of North America, or 278 ± 50 years. Finally, the resulting figures were calibrated to calendar years and standard errors were calculated (Stuiver et al. 1986).

THE SITES

Daax Haat Kanadaa (49-SIT-244)

De Laguna (1960:79–94) conducted major excavations at *Daax Haat Kanadaa,* reportedly a fort site placed under siege by the Wrangell Tlingit in the early 1800s. Excavations focused on midden deposits located on a narrow terrace halfway up a steep side of the rocky islet. Few of the artifacts de Laguna recovered were diagnostic temporally, and she noted no changes in vertical distribution of artifact types within the stratified deposits. When she discovered four objects of European origin, however, she concluded that the assemblage derived from "a period when the Tlingit had some access to trade material . . . but before the aboriginal culture had been appreciably changed by contact with the whites" (de Laguna 1960:99).

The calibrated ^{14}C ages from 49-SIT-244 indicate deposits of both prehistoric and protohistoric age. The most recent is from the deepest level of the terrace excavated in 1985 (Beta-13240) corrected to 278 years B.P. (A.D. 1670). Initial contact in southeast Alaska occurred in 1741, with the first Europeans known to have visited Angoon territory in 1794 (Vancouver 1798). The few historical-period artifacts found at the site probably resulted from aboriginal trade that became highly developed along the Northwest Coast by the beginning of the eighteenth century (MacDonald 1984: 74). A second sample, taken from the uppermost level of an adjacent column, produced a calendar age of 468 years B.P. (A.D. 1480) (PITT-04). The apparent stratigraphic reversal of these two dates may result from mixing due to downslope movement along the steep slope. The oldest date, 905 ± 103 years B.P. (Beta-22074), came from a column removed from the wall of one of de Laguna's 1950 excavation units. This date demonstrates that de Laguna excavated in an area that contained both prehistoric and protohistoric materials. The dates do not rule out the historical-period occupation of the site as recorded in oral traditions.

Yaay Shanoow or Pillsbury Point (49-SIT-132)

Yaay Shanoow is also a fort site, located on a steep rocky headland overlooking a strategic saltwater passage. De Laguna dug a trench through deep midden deposits at the base of the headland where she found artifacts similar to those from *Daax Haat Kanadaa* and "nothing to indicate that the cultures of the two sites were different, although Pillsbury Point may have been slightly older, since no objects of white manufacture were found" (de Laguna 1960:97).

Three shells from a column placed in the wall of de Laguna's main trench were ^{14}C dated. The oldest date, 900 years B.P. (PITT-02), is from the uppermost level of the column, while dates from the middle and the base of the midden are similar: 770 (PITT-01) and 785 (Beta-13238) years B.P. The reversed dates may not be meaningful, since all three overlap at only one standard deviation. The tightly clustered dates and the depth of the deposit (110 cm) suggest that the midden was formed in a relatively short period. The earliest date from *Yaay Shanoow* and that from *Daax Haat Kanadaa* roughly are contemporary.

Hood Bay Fort or Marten's Fort (49-SIT-171)

Marten's Fort is a shell midden located on the top and slopes of a steep-sided rocky headland and on a flat, forested terrace just above the beach. The headland was an islet at one time, and the lower terrace was a beach spit connecting the islet to the shore of Hood Bay. De Laguna dug a few test pits at the site, recovering several prehistoric artifacts (de Laguna 1960:53). Shells from the lower terrace (Beta-13239) and the slope of the rocky headland (PITT-03) were analyzed. The two dates are nearly identical, 930 and 940 years B.P., respectively, indicating that some of the midden on both landforms was deposited contemporaneously. The dates demonstrate that the headland has

been connected to the shore since at least A.D. 1000, and the conformation of the local coastline has not changed dramatically since that time.

Ganax Noowoo (49-SIT-135)

De Laguna (1960:47) briefly described this shell midden located in the modern community of Angoon. Although the presence of a cemetery prohibited excavation, she recorded approximately 97 cm of midden and recovered a few artifacts. In 1985, a shell sample from 50 cm below the surface in an erosional profile yielded a calibrated ^{14}C age of 668 years B.P. (Beta-13513), suggesting a prehistoric age for this midden.

Alderwood Cove (49-SIT-259)

49-SIT-259 is a 350-m-long midden located on a raised beach and a fort-like rocky headland. The site name, *Keishish Aani,* ("white alder village") is known to a few Angoon residents and is mentioned in one of Olson's (1967:76) stories. De Laguna did not learn of the site from her informants, nor did she investigate this location. Unlike the better-known villages described by de Laguna, 49-SIT-259 does not contain gardens or other historical-period features. A shell from the base of the shallow midden on the fort landform dated to 785 years B.P. (UCR-2167). A column sample excavated on the front of the "village" terrace extended through 80 cm of midden without reaching the base of the deposit. Two dates from the village are considerably older than the fort, a lower sample dated to 1,272 years B.P. (Beta-13241) with an upper sample at 1,565 years B.P. (UCR-2166). The reversed dates may result from downslope movement and disturbance from a large tree growing out of the midden.

Killisnoo Picnicground Village (49-SIT-124)

This large shell midden extends for approximately 220 m along the front of a raised marine terrace that partially was under cultivation at the time of de Laguna's work. Since then, grading has exposed much of the site, though relatively undisturbed portions were identified in forested areas. A shell from the base of the midden exposed in a road cut dated to 1,590 years B.P. (Beta-10919). Historical-period disturbance may account for the reversal of two dates from the top and bottom of a nearby column sample: 1,435 (PITT-05) and 920 (PITT-06) years B.P., respectively. A shell from the base of undisturbed midden at the north end of the site produced a date of 1,255 years B.P. (Beta-13236). The dates indicate that 49-SIT-124 was occupied primarily between 900 and 1,600 years B.P.

Anteyuq (49-SIT-299)

De Laguna (1960:45–46) reported collapsing smokehouses, cache pits, garden plots, and scattered shell midden deposits from *Anteyuq.* She excavated a few test pits, but no artifacts were found. We removed a column sample from a 50-cm-deep shell midden exposed in the wall of a cache pit on a rocky knoll at the northeast end of the site. Two ^{14}C samples produced dates of 1,090 years B.P. (UCR-2168) and 1,280 years B.P. (Beta-13242). We excavated a second column through 80 cm of midden on a terrace at the foot of the knoll. The base of this column dates to 1,425 years B.P. (Beta-13514), and the top dates to 670 years B.P. (Beta-27677).

Windy Smokehouse Village (49-SIT-130)

49-SIT-130 is a fish camp located at the mouth of a major salmon stream in Salt Lake, approximately 16 km northeast of Angoon. Tlingit elders from Angoon report use of the site until 1924 for fishing, hunting, trapping, and gardening. The site contains a circular pond, probably built or modified by the site occupants, that held fish prior to processing. Samples from an older shell midden dating to 960 years B.P. (Beta-13237) and 750 years B.P. (Beta-22073) indicate that the site also contains a prehistoric component, and may have been used intermittently since at least A.D. 1000.

Garnes Point Midden (49-SIT-304)

De Laguna (1960:46) was told that a lineage house stood at Garnes Point (49-SIT-304), where she encountered "scanty traces of midden" apparently of recent origin. A shell from the base of a 20-cm-thick midden exposed in a sea cliff produced a ^{14}C date of 1,220 years B.P. (Beta-13243). This date suggests initial site occupation as early as A.D. 730, though the recovery of two glass beads indicates that a historical-period component also is present. Recent construction at the site unearthed the remains of two human burials of unknown age, suggesting more than a seasonal occupation. The site may be part of a prehistoric winter village, an early portion of historic Angoon, or both.

Favorite Bay Fish Weir (49-SIT-33)

A fish weir located near the head of Favorite Bay is made up of more than 670 upright stakes exposed in the bank of a tidal channel at the +1.6 foot tide level (Erlandson and Moss 1988). The weir extends over 100 m from north to south, though no clear pattern in the arrangement of stakes is discernible. The oldest dated stake, 3,230 years B.P. (SI-6993), came from the south end of the weir nearest the head of the bay. A stake from the center of the weir dated to 2,790 years B.P. (PITT-07), and one from the north end to 2,170 years B.P. (SI-6994). Although these ^{14}C dates measure the growth of the wood and not the date the stakes were cut, many of the stakes consist of freshly cut tree limbs that should not be affected seriously by the "old wood" problem (see Schiffer 1986). The great range in the dates suggests that people used this location over a long period, possibly extending the weir northward in response to shoreline shifts associated with progradation, tectonic uplift, or both. No ethnohistoric accounts of this weir have been recorded, although de Laguna (1960:55, 57) was told of similar structures elsewhere in Angoon Tlingit territory.

Kanalku Bay Fish Weir (49-SIT-311)

Remnants of another intertidal fish weir were found near the head of Kanalku Bay. Two discrete loci of wooden stakes are separated by 500 m. Like the Favorite Bay weir, the stakes in the north locus are aligned parallel to the tidal channel cutting through the mudflats. A stake from this north locus dated to 1,610 years B.P. (PITT-133). The south locus is located only 50 m from the forest fringe and may represent the remnants of a weir that originally crossed Kanalku Lake Creek. Stakes from this area dated to 920 years B.P. (PITT-131) and 250 years B.P. (PITT-132). The Kanalku Bay weir appears to have been in use during the time when many of the midden sites investigated in this study were occupied.

DISCUSSION AND CONCLUSIONS

For nearly 30 years archaeologists have used the artifact assemblages from *Daax Haat Kanadaa* and *Yaay Shanoow* as standards of Tlingit material culture. At the end of her book, de Laguna (1960:203) stated: "Since we have not found archaeological material that can with certainty be referred to a period antedating early contacts with Europeans, we have not been able to outline an ancient stage in the development of northern Tlingit culture." The present study has placed de Laguna's research in an absolute chronological context for the first time. We recognize the difficulty of demonstrating direct relations between ethnographic and prehistoric cultures with archaeological evidence. Nevertheless, our data suggest that those sites recognized as Tlingit by de Laguna date to at least A.D. 1000. Furthermore, ^{14}C dates from 49-SIT-124 and 49-SIT-259 suggest continuity of occupation between approximately 900 and 1600 B.P. This is consistent with Fladmark's (1982: 115) assessment of post-1500 B.P. assemblages in British Columbia that "can be more or less confidently associated with the ethnographic inhabitants of the area."

There are over 60 intertidal fishing structures recorded in southeast Alaska (Steve Klingler, personal communication 1988) and a few hundred in coastal British Columbia (James Haggarty, personal communication 1988), but only a handful of these have been radiocarbon dated. Dating of the Favorite Bay Fish Weir demonstrates that mass salmon-harvesting techniques were in use

at least 3,000 years ago, approximately 1,500 years earlier than previously thought (e.g., Fladmark 1986:105). While there is no way to directly link the 3,200-year-old Favorite Bay Weir with Tlingit groups, we believe the hypothesis that Tlingit culture evolved in situ over a period of several thousand years should be considered.

Sites located along the modern shoreline, often containing collapsing buildings and historical-period features, frequently are believed to be of recent origin. Our analysis demonstrates that the settlement pattern documented for the historical period has considerable antiquity. Sites used as villages and fish camps span at least the past 1,600 years. Prehistoric villages may have been both more numerous and less consolidated than those documented by the late-nineteenth-century ethnographers (i.e., Emmons 1888; Krause 1956; Niblack 1888). The four fort sites (including the headland component at 49-SIT-259) all postdate 950 years B.P., suggesting that after A.D. 1000, raiding and warfare intensified among the northern Tlingit. Robert Ackerman (personal communication 1988) has pointed out that resource competition may have increased during this brief cold period when mainland glaciers were advancing (Denton and Karlen 1973). In addition, this coincides with the onset of Neoglacial conditions at nearby Hidden Falls (Holloway 1984:83).

The distribution of radiocarbon dates within various sites may provide some insight into the nature of site formation processes in southeast Alaskan shell middens. Of the five sites where ^{14}C dates are available from stratified levels of a single column, four produced stratigraphic reversals. Of these four, only one may be significant, however, since the dates at 49-SIT-130 overlap at the 66 percent confidence level (one sigma), and at two others (49-SIT-244, 49-SIT-259) at the 96 percent level (two sigma). Nonetheless, stratigraphic reversals appear to be relatively common in the dated sites, suggesting that downslope movement, bioturbation, and other site-formation processes may affect the structure of such sites, even when stratified deposits are present.

The radiocarbon series also suggests that the shoreline in the Angoon area has remained largely static for the past 3,000 years. This relative stability contrasts with some areas on the southeast Alaskan mainland that continue to experience rapid uplift (Hicks and Shofnos 1965). We suspect that archaeologists eventually will find earlier sites on Admiralty Island, but they will be located on older marine terraces farther inland from the modern shoreline.

Finally, correcting ^{14}C dates from marine shells for isotopic fractionation and the reservoir and DeVries effects reduces the age of late prehistoric southeast Alaskan shell dates by 240 to 360 years. Thus, presenting the ^{14}C age reported by the laboratory as well as adjustments for isotopic fractionation and local reservoir effect is important, particularly when assessing the effects and timing of European contact on Native societies.

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PREHISTORIC DIET IN THE NORTHERN SOUTHWEST: MACROPLANT REMAINS FROM FOUR CORNERS FECES

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A large corpus of data on plant remains from prehistoric feces yields patterns of prehistoric Four Corners Anasazi diet. A general stability of plant-food consumption continues from at least the Basketmaker III through Pueblo III periods, with corn being the one consistently common fecal remain. Other agricultural plants—both crops and weeds—are important throughout the region. There is temporal and spatial variation in the types and abundance of macroplant remains recovered from these feces. Temporally distinct assemblages from the same study area are more similar than contemporary assemblages from different areas. This indicates the importance of the local resource structure (both natural and human maintained) as a major factor influencing dietary composition, even within a relatively small region such as the Four Corners of the northern Southwest.

Un cuerpo grande de datos que tratan de los restos de plantas que se encuentran en las heces dan muestras de la dieta prehistórica de los Anasazi de Four Corners. *Una estabilidad general del consumo de plantas continua desde las etapas* Basketmaker III *hasta* Pueblo III. *El maiz es el resto fecal que las etapas tienen en común. Otras plantas agrícolas tanto cultivas como hierba, tienen importancia por toda la región. Hay una variación temporal y espacial en los tipos y la abundancia de los restos macroplantas que se han recubierto de estas heces. Asemblajes distintas temporalmente de la misma area de estudios son más similares que los asemblajes contemporáneos que vienen de areas distintas. Esto muestra la importancia de la estructura de los recursos locales (o bien naturales o los mantenidos por los seres) como factor principal que influye la composición dietética aunque dentro de una región relativamente pequeña como la de* Four Corners *en la parte norte del sudoeste de los Estados Unidos.*

Anasazi plant-food consumption has been a central issue of discussion among archaeologists of the Four Corners (northeastern Arizona, northwestern New Mexico, southwestern Colorado, and southeastern Utah). Enormous resources are marshaled to investigate prehistoric food-acquisition strategies; analysts study hundreds of flotation and pollen samples each year. Explanations for changes in population aggregation, regional abandonment, formation of exchange networks, and

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