NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION MONOGRAPH 17:
Douglas Sutton (ed.), ***Saying So Doesn't Make It So: Essays in Honour of B. Foss Leach***

SAYING SO DOESN'T MAKE IT SO

PAPERS IN HONOUR OF B. FOSS LEACH

Edited by
Douglas G. Sutton

New Zealand Archaeological Association
Monograph 17

Whaling, Subsistence and Settlement among the Westcoast People of Vancouver Island

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INTRODUCTION

This paper discusses the archaeological evidence for, and the possible implications of, whale exploitation among the Nuu-chah-nulth people of Vancouver Island (see Figure 1). Until recently these people have been known as the Nootka, a misnomer which originated with Captain James Cook in 1778. The westcoast people today prefer to be known as Nuu-chah-nulth and this usage will be followed here.

The spectacular and dangerous nature of aboriginal whaling off the west coast of Vancouver Island has ensured it received early and sustained academic attention. Several detailed ethnographies have been collected (Curtis 1916; Drucker 1951; Swan 1868; Waterman 1920). Interest has primarily focused on two time honoured ethnological questions: how old is it and where did it originate? In keeping with the archaeological methods and theories current at the time, Lantis (1938, 1940) proposed a diffusionist model based on comparisons of cultural traits. She argued that Nuu-chah-nulth whaling originated with northern Eskimo-Aleut people. As archaeological data became available it was articulated with Lantis' evidence (Borden 1951, 1962; Duff 1965; Swanson 1956) into a more comprehensive explanation of age and origin.

In short, that argument runs as follows. Initial settlement of the northwest coast proceeded via the coast and was accomplished by a maritime adapted people, whose economy included whaling. These people were subsequently displaced or absorbed by inland salmon fishing people who pushed out to the coast. Because of geographical isolation and the small size of salmon streams on the west coast of Vancouver Island, a strongly maritime orientated economy was retained. Contemporary Nuu-chah-nulth people therefore demonstrate cultural continuity with the oldest settlers of the Northwest coast.

Dewhirst (1977: 1–2) argues instead for a recent, independent origin for westcoast whaling, on the basis of new archaeological evidence from Yuquot (see Appendix), where whaling harpoons appear about A.D. 800, in association with equivocal evidence for increasing sea mammal exploitation. Increasing pressure on inshore and riverine resources is argued to have promoted greater emphasis on 'outside' or maritime resources, leading eventually to the development of whale hunting. Dewhirst's proposed sequence begins with settlement by a people with a shoreline-forest adapted economy. As the salmon 'stabilized'

around 3000 B.C. (Fladmark 1975: 195–208) the economy shifted to exploit riverine resources more exclusively. The present whaling/maritime adaptation did not occur until the salmon was pressed to its exploitable limits, thus necessitating the development of new technologies which would provide access to new food sources.

Dewhirst's evidence for a recent change to a more maritime economy is, however, debatable and, even if valid, it is not necessarily inconsistent with an older Eskimo-Aleut origin as proposed by Lantis. The evidence is equally consistent with a model which argues that the economy of the first settlers was maritime. It could be argued that as the salmon stabilized around 3000 B.C., the maritime orientation declined in favour of salmon exploitation. These two resource bases, maritime and riverine, were subsequently balanced to provide a viable economy with safeguards against the fluctuations and failures of any single resource. The fact is, there is not yet sufficient archaeological evidence to support either scenario with any confidence.

Apart from the move away from diffusionist explanation towards independent invention, Dewhirst's paper is also indicative of a more general change in the orientation of archaeological explanation. Following the trend of the 1970s, research interests in Northwest Coast whaling moved away from questions of origin and age, and focused on cultural ecology. To what extent did whaling contribute to the economy? In particular, archaeologists began to question Drucker's (1951: 49) assertion that "the prestige value of whaling outweighed its economic importance." The counter-position is presented by Inglis and Haggarty (1983) and Huelsbeck (1983, 1988a, 1988b). Closely related to this issue was the question of the relative importance of maritime, riverine (especially salmon) and land resources. This issue is addressed by Cavanagh (1983), Dewhirst (1977) and Huelsbeck (1988b). As with questions concerning age or origin, the available archaeological evidence is still not sufficient to resolve the question of the importance of whaling in the northwest coast economy, but it does open up a whole spectrum of questions concerning westcoast subsistence. This paper collates the archaeological evidence at present available for whaling and discusses some of its possible implications for our understanding of the organization of Nuu-chah-nulth society.

THE ARCHAEOLOGICAL EVIDENCE

Faunal remains have been recovered and analyzed from four westcoast site locations: two sites at Ozette, Cape Flattery, in Makah territory; one in Alberni Inlet, Tseshaht and Opetchesaht territory; three in Hesquiat Harbour and two in Nootka Sound, in Mowachaht territory (see Figure 1). A summary of the evidence for whale exploitation is presented in the Appendix at the end of this paper. An outline of each site's chronology, whale faunal remains, artefacts of whalebone and articles of whaling technology is given.

All sites yielded some evidence of whale exploitation. At one extreme were the four 'inside' harbour locations. DiSo 16 and DiSo 9, two cave habitation sites at the sheltered head of Hesquiat Harbour, contained a small number of whale bones and whalebone artefacts and several articles related to whale hunting technology. At Kupti (DkSp1), a large village site in Nootka Sound, test excavations produced a large concentration of fragmented whalebone and eight worked whalebone fragments. The Shoemaker site (DhSe 2) at the head of Alberni Inlet is a habitation/house site. It yielded even sparser evidence of whaling: only small fragments of whalebone, a few whalebone artefacts and no whaling technology. These four sites are all 'inside' sites as defined by Dewhirst (1977), Folan (1972) and Folan

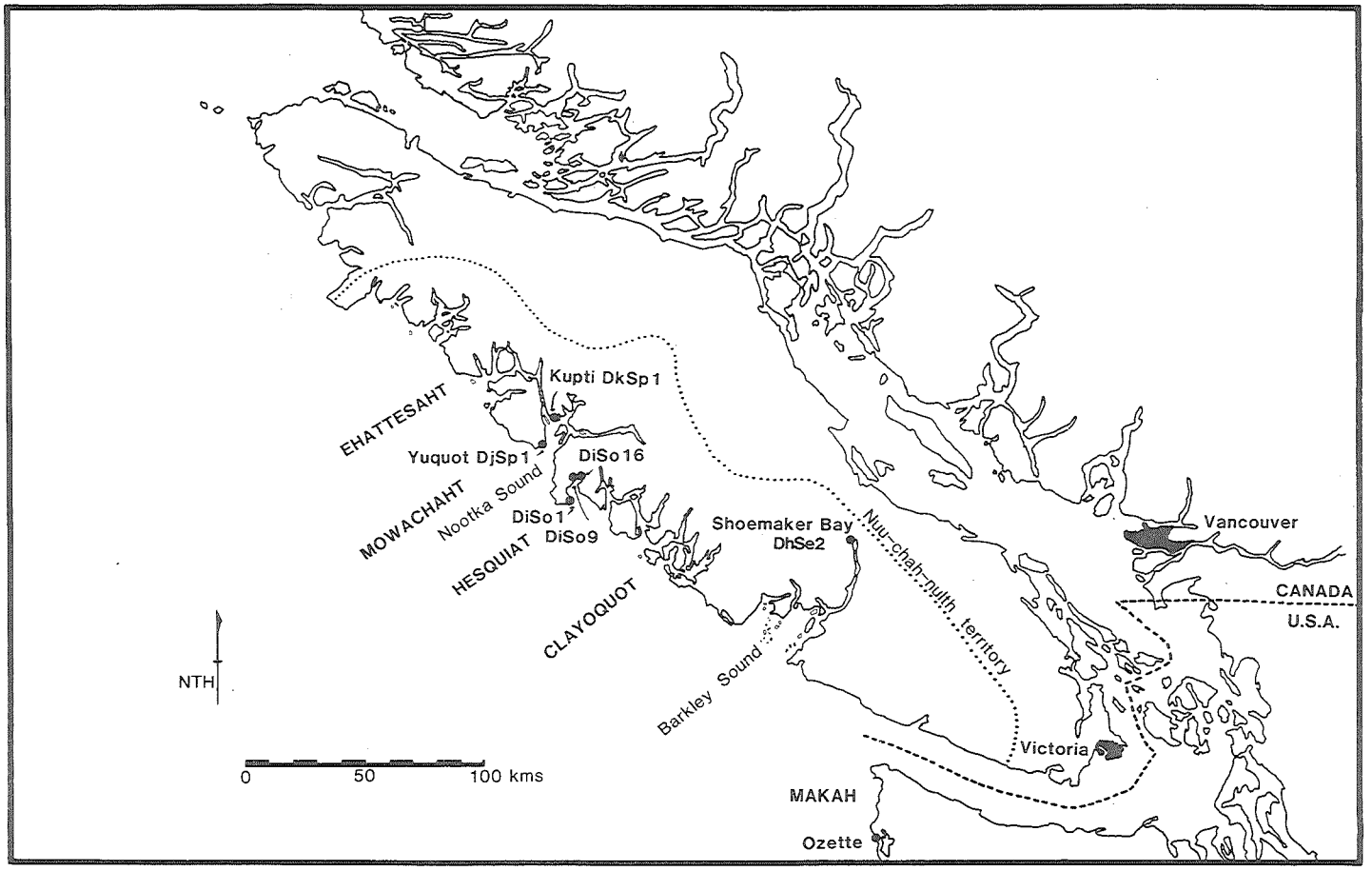

Figure 1: Map of Vancouver Island showing the nineteenth century boundary of Nuu-chah-nulth territory and the Nuu-chah-nulth sites and groups discussed in the text.

and Dewhirst (1980a). 'Inside' sites are found in sheltered locations such as the head of an inlet or further upstream. Folan and Dewhirst associate 'inside' sites with winter occupation and with the exploitation of salmon and terrestrial resources. 'Inside' sites would not therefore be expected to yield evidence of whaling except in the form of whalebone artefacts, as they are physically well removed from open sea and were probably occupied outside the whaling season. Whaling is fairly well established as a spring/summer occupation based on the migration routes and seasonal cycles of the main whale species exploited (Huelsbeck 1988a; Kool 1982; Swanson 1956).

Yuquot, DiSo 1 at Hesquiat, and Ozette are all by contrast 'outside' sites. This means they are in exposed coastal locations close to or facing open sea. Such sites are believed to be associated with spring to fall occupation and with the exploitation of marine resources, which may include salmon. Extensive evidence for whaling might reasonably be expected at these locations. Yuquot disappointed these expectations; DiSo 1 and Ozette fulfilled them.

At Yuquot very little whalebone midden was recovered. However, an extensive and varied assemblage of whalebone artefacts, and debitage from whalebone artefact manufacture attest to the ready availability of whalebone. Whaling size harpoon valves appear sometime after A.D. 800.

At Hesquiat, DiSo 1, whalebone is a major component of the faunal remains from all levels and an important raw material for artefacts. Whale hunting harpoon parts are also present from the lowest levels up; from about A.D. 800 to the historic period.

Two locations were excavated at Ozette. Dense whalebone midden was recovered in both areas. The midden trench (Area A) establishes intensive whale exploitation at approximately 2000 B.P. and the mudslide house site (Area B70) brings it up into the historic period. At the mudslide site, whalebone dominates the midden, surrounds the houses and provides the raw material for an extensive whalebone artefact manufacturing industry. The full technological assemblage for whaling was recovered from the late prehistoric house floors. Huelsbeck (1983: 55) argues that this "pattern of [whale] procurement was essentially unchanged throughout the last 2,000 years." While the Ozette midden evidence certainly suggests this is true, the absence of any definitive evidence that the technology is older than A.D. 800 at Ozette is a problem. Clearly, however, by late prehistory whale products dominated all aspects of Ozette technology and economy to the point that Huelsbeck (1983, 1988a, 1988b) argues that whale products account for as much as 83% of the consumable food represented in the midden.

Summary: Taken at face value the archaeological evidence indicates the following:

1) Whale products and whale technology have a very low rate of representation at 'inside' habitation sites and much higher representation at 'outside' sites. This is consistent with Folan and Dewhirst's association of 'inside' sites with winter occupation, and exploitation of riverine/terrestrial resources, and of 'outside' sites with summer occupation and the exploitation of maritime resources. It is also consistent with their proposed seasonal movement of groups between the two site types.

2) At Yuquot, Hesquiat and Ozette whale products are present from the earliest levels to the historic period. Utilization of whale products therefore begins by at least 2,000 B.P. throughout the westcoast.

3) The technology for whale hunting is present at both Yuquot and Hesquiat by about A.D. 800. Before this date, whale products could have come solely from drift whales, although this seems unlikely at Ozette in view of the quantity of whale midden recovered.

4) Aside from the differences between 'inside' and 'outside' locations, there appears to be a gradient in the intensity of whale exploitation from southwest to northeast; i.e., from Ozette through Hesquiat to Yuquot, the archaeological evidence for whaling declines.

5) An abundance of evidence points to the occupation of the Ozette site by people who specialized in the procurement and production of whale products. Huelsbeck (1988b) argues that production must have exceeded consumption.

DISTORTIONS IN THE ARCHAEOLOGICAL EVIDENCE

There are bound to be problems with the interpretation of evidence from such a small sample of sites. Ozette is the only site in the excavated sample which is located both on the 'outside' and facing open ocean. It is, therefore, the most likely site to yield evidence of whale exploitation. Yuquot and DiSo1 at Hesquiat are also on the outside coast, but both are located in semi-protected bays on headlands such that the site itself faces into a sound and not open ocean. They are not, therefore, optimum whale hunting locations.

Aside from sampling error three other possible sources of consistent bias are identified here: a) the location of excavation areas within the site, b) curation of whaling equipment, and c) the archaeological invisibility of whale oil.

a) The Ozette excavations are the most extensive, and offer the most comprehensive coverage of activity areas within a site. Furthermore, the site faces directly on to open ocean and the houses are located right at the beach itself. It is also the site with the most whalebone. At Ozette, evidence for whale exploitation concentrated close to the beach where primary butchering would have taken place, and around but *outside* the houses. Density of whalebone recovered from the trench (Area A) decreased moving inland away from the beach front midden area (Kirk and Daugherty 1974). Although whalebone was in places literally stacked against the house walls, it was not usually found on the house floors. Blubber, however, was brought into the houses, as evidenced by whale barnacles.

   The DiSo 1 site at Hesquiat was located at the top of a steep bluff overlooking the beach, not on the beach itself like Ozette. It is therefore well removed from where the primary butchering of whales would have taken place. Whalebone would probably not be carried up to the site except for a specific purpose. Even the rendering of blubber into oil could have taken place on the beach below the site. Furthermore, the random test square sampling procedure followed at DiSo 1 resulted in a midden sample which could not be attributed to either the inside or outside of dwellings.

   Much the same is true of Yuquot. The excavations were located on a midden crest, set back from the beach. Dewhirst recognizes that this placement of excavations may have contributed to the low level of whalebone midden recovered (Dewhirst 1979: 6). Most of the whalebone was artefact debitage as might be expected around houses set back from the beach. The large number of hearths encountered strongly suggests

the excavation was inside a dwelling. Whale barnacles indicating the presence of blubber were also recovered.

The relative abundance of whalebone recovered at Ozette compared with either Hesquiat or Yuquot could be a function of excavation strategy. The large areal excavations at Ozette included butchering areas, house floors and outside houses. These three areas were physically very close but clearly distinguished. At Hesquiat and Yuquot, excavations were set back from the beach front and the type of activity area excavated is not firmly established.

b) Whaling equipment is poorly represented at all sites. Even at Ozette, whaling harpoons are far from numerous despite the huge whale middens and optimum conditions for preservation. Disarticulated components of whale harpoons were not found scattered over the house floors in large numbers like the sealing and fishing harpoons and points. The most common whaling artefact was not harpoon components but the small valve parts of the seal skin floats.

   Several factors contribute to the low frequency of whaling harpoons. First, quality more than quantity counted. It required only a few harpoons to bring in one whale. Hundreds would be required to capture an equivalent quantity of seals or fish. Furthermore, whale harpoons which failed were gone completely. Very few broken harpoons would come back to a site to be discarded on the midden or house floor. The ethnographic literature stresses the importance of correct ritual for successful whaling (Curtis 1916; Gunther 1942; Sapir 1924). This can also be seen in the archaeological evidence. Intact whale harpoons were curated as is demonstrated by the recovery at Ozette of complete examples, which had been carefully stored in cedar bark pouches. Furthermore, damaged whale scapulae recovered at Ozette indicate that used harpoons were assiduously removed from the skeleton after butchering (Mauger 1979) perhaps as much for ritual reasons as pragmatic ones.

   Whaling equipment and in particular the whaling harpoon were not objects to be produced in quantity or dealt with lightly. They were manufactured and curated with considerable care and were probably never casually discarded. Consequently few remain for the archaeologist to recover.

c) Finally, there is the problem of 'invisible' whale products: blubber, meat and especially oil. Primary butchering of whales took place on the beach. This is documented ethnographically (Curtis 1916; Waterman 1920) and in the archaeology at Ozette. Usually only bone for artefacts, blubber, meat and oil ever made it past the high tide line. Most whale midden would not then survive. Whale barnacles provide one clue to the presence of blubber in or around houses but once rendered into whale oil it becomes completely invisible. Large quantities of whale oil could therefore have been consumed at any of the excavated sites discussed here, but would leave no evidence.

To summarize: Like most negative evidence in the archaeological record, the absence of evidence for whaling is extremely difficult to interpret. Lack of evidence for whale exploitation in the form of whalebone or whaling harpoons is not necessarily indicative of the absence of either whale hunting or of large quantities of whale products. The high quality, comprehensive data now available from Ozette do, however, provide some excellent guidelines to interpretation.

YUQUOT 1803–1805

One further unique source of data exists for the westcoast, namely the journal kept by John R. Jewitt (1976) while he was held as a slave by Chief Maquinna of Nootka Sound from March 1803 to July 1805. Jewitt, unlike anthropologists, had little interest in native politics or religion and his status as a slave probably gave him little access to such matters. His journal reflects as much. Jewitt's primary concerns were how to keep his workload down and his belly full. Not surprisingly his journal contains almost daily entries recording current economic activities and what food was available to him. This is precisely the kind of information which is so valuable to archaeologists trying to interpret midden remains. The riches of Jewitt's journal as a source of economic data have recently been explored by Cavanagh (1983). Her thesis collates the entries recording food production and consumption over a two year period giving particular attention to whaling and whale products. The unique value of the journal is that it provides a picture of both production *and* consumption. Of special interest here is the difference between them, because this is exactly what is so difficult to estimate from archaeology alone—i.e., problem c) above.

Figure 2 presents Cavanagh's collation of Jewitt's record of food consumption among the Mowachaht from June 1803 to July 1805. It indicates that over the two year period whale products were consumed on at least 28.7% and possibly up to 36.2% of the occasions recorded. It was a significant contribution to the diet, even allowing for possible biases. This record of whale consumption is likely to be fairly accurate as Jewitt hated whale products and the Mowachaht loved them. This led to some conflict over what constituted an acceptable diet and tended to ensure that whale products sustained a high level of recording (Cavanagh 1983: 122–124).

Cavanagh's Table 12 reports the whale hunting experience of Chief Maquinna and other Mowachaht whalers over the same two year period. Only five whales were captured. Although they represent a very large amount of food (see Inglis and Haggarty 1983: 13–14 for a breakdown), it is difficult to see how five whales contributed to anything like 36.2% of the meals partaken of from 1803 to 1805. It is also difficult to see how whale products provided the consistent, year-round availability evident in Cavanagh's Figure 14 (see Figure 3a here) when the whaling season was less than two months long (see Figure 3c).

If rendered down to oil, then carefully conserved over long periods it may be possible, but virtually every time Jewitt mentions whale blubber or oil it is coincident with feasting and the halting of other economic pursuits—a point he mentions often because of his dislike of whale blubber and 'train oil' and the absence of all other choice on the menu, when blubber or oil was available.

At least part of the answer to the discrepancy between the Mowachaht's whaling successes and the pattern of whale consumption is trade. Figure 3b collates the occasions on which Jewitt recorded whale products being brought to the Mowachaht from other groups. This occurred on 15 *recorded* occasions, and is therefore a minimum number. The quantities involved were substantial. Table 1 details the dates of the visits, and the groups bringing whale products to the Mowachaht. On only one occasion were whale products brought to the Mowachaht while the whaling season was still in progress in Nootka Sound. In at least 12 of the 15 recorded examples whale products were brought, sometimes long distances, from groups to the south where whales may have been available in greater numbers and for longer periods. None of the 15 visits were recorded as being part of formal ceremonies such as a potlach, but instead appear to be spontaneous gestures on the part of the visitors.

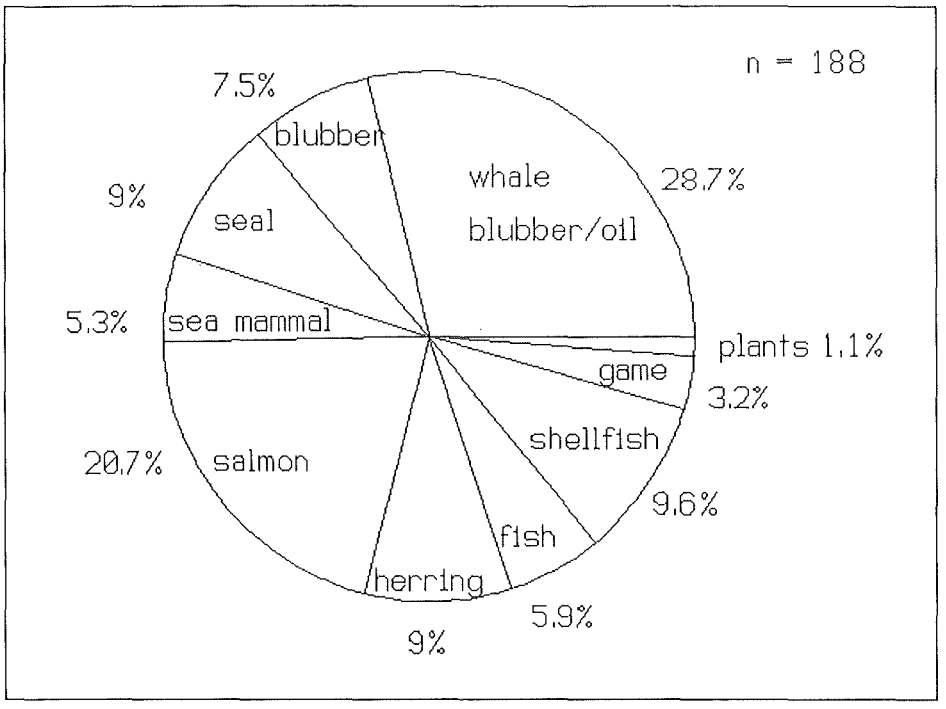

Figure 2: Percentage of occasions on which the consumption of particular foods was recorded by Jewitt (1976) between June 1803 and July 1805. After Cavanagh 1983: 123.

It may be safely assumed that on all five occasions when the Mowachaht captured whales considerable quantities of whale blubber and oil went out in similar but opposite directions.

In summary, the evidence from Jewitt's journal indicates:

1) That whale products were consumed regularly and in large quantities throughout the year. At all times whale products made a significant contribution to the diet.
2) This was possible despite the highly irregular and somewhat limited success of the local whalers.
3) A reasonably consistent supply of whale products was achieved by distributing whale blubber and oil to other groups whenever it was plentiful. Jewitt's account suggests that this redistribution occurred as part of a general pattern of trade and exchange and did not necessarily take place as part of a ceremonial 'potlatch'.

DISCUSSION

What then does this evidence for whaling on the westcoast contribute to a broader understanding of how Nuu-chah-nulth society was organized? What does it say about subsistence in general and how does this affect settlement? Two dimensions of resource availability need to be taken into account in considering how a viable economy could be maintained on the westcoast.

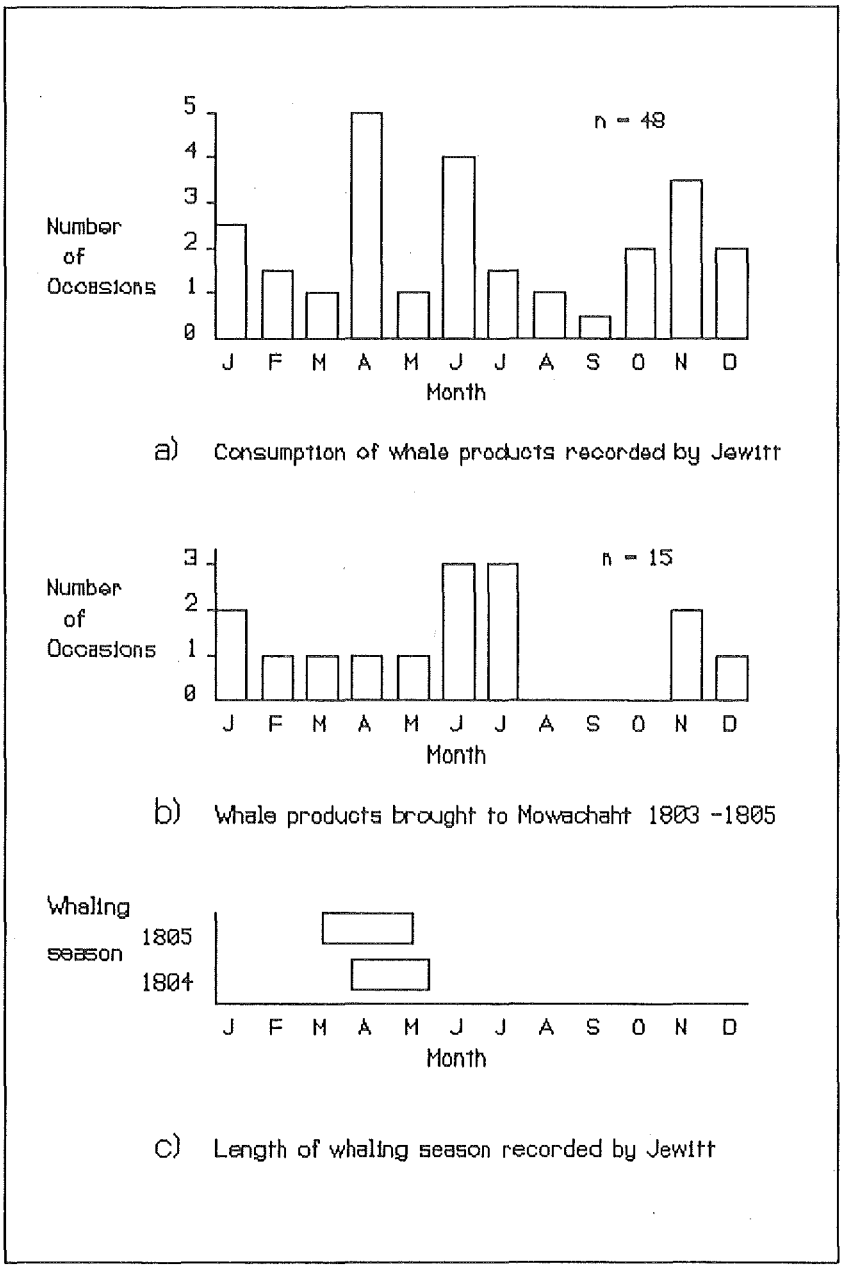

Figure 3: a. Number of occasions per month in which Jewitt (1976) recorded consumption of whale products. Figures are averaged over the two years 1803–1805. After Cavanagh 1983: 123. b. Total number of occasions per month in which Jewitt (1976) recorded whale products being brought to the Mowachaht from other groups. c. Length of the whaling season in Nootka Sound in 1804 and 1805, as recorded by Jewitt (1976).

TABLE 1
Visiting groups bringing whale products to the Mowachaht, and the dates on which these visits occurred (as recorded by Jewitt)

VISITING GROUP*		TOTAL	DATES	PRODUCT BROUGHT
Jewitts spelling	Contemporary name			
Wickenninish	Clayoquot	7	Jun 1804	train oil
Cleuquate			Jul 1804	100 gallons train oil
			Nov 1804	train oil
			Jan 1805	whales blubber
			April 1805**	train oil
			May 1805	train oil
			Jun 1805	train oil
Esquates	Hesquiat	4	Nov 1804	800 weight blubber
			Feb 1805	whales blubber
			Jun 1805	600 weight blubber
			Jul 1805	train oil
Altizarts	Ehattesaht	2	Dec 1804	train oil
			Jan 1805	600 weight blubber
Clazarts	Makah	1	Jul 1805	200 gallons train oil
various		1	Mar 1803	train oil/blubber
TOTAL OCCASIONS = 15				

* see Figure 1 for the location of these groups
** occurred during the Mowachaht whaling season

1) Seasonal or temporal abundance and scarcity. When food is available it is often over abundant, such as when the salmon run or a whale is captured. At other times the same resource may be completely inaccessible. This unevenness in supply needs to be managed.

2) Spatial dispersion. Some resources are only available at confined locations and these may be mutually exclusive; e.g., salmon and whales.

This spatial/seasonal resource variability is addressed by a number of authors in similar ways. As outlined above, Dewhirst (1977) following Drucker's (1951) ethnographic description uses an inside/protected/winter/salmon versus outside/exposed/summer/maritime distinction. Haggarty and Inglis (1983) prefer an exposed; semi-exposed; protected classification based on geographically defined macroenvironmental zones while Huelsbeck (1988b) defines his offshore; nearshore; stream/forest on the basis of the resources available rather than the geography. Beneath the battle over nomenclature, all four authors are searching for a way of quantifying the relative importance of the different resources and defining how the exploitation of resources was scheduled. Each appreciates that in order to achieve an optimal economy there has to be some movement of either people, food products or both. There are a number of ways of achieving such movement.

1) A village group has rights to a number of resources and village sites. They move as a group on a seasonal basis to exploit different resources.

2) Households rather than village groups move in the above way.

3) Individuals and small family groups hold rights and move independently to exploit resources. In this case the composition of village and household groups would be constantly changing.

4) Products rather than people move, possibly traded or exchanged along kinship lines.

5) Any combination of the above is also possible.

The evidence collated on whaling examines how this scheduling and movement was managed in relation to one important resource. This provides a building block towards the broader picture.

Dewhirst (1977: 11) working from ethnographic data proposes a model in which

> Nootkan ecological orientation is adaptation to the two major environmental settings ['inside' and 'outside'] on a seasonal basis, but without exclusive adaptation to either setting.

Consequently, the Nootka were "poorly equipped to exploit one setting year round" (ibid.: 17). The two part cycle of movement was accomplished by moving complete households which came together in communally owned village sites for summer and winter—i.e., options 1) and 2). Groups with exclusively 'inside' or 'outside' orientation are argued to be disadvantaged as a result of war. Whaling, an extreme 'outside' adaptation is argued to be late and result from isolated groups being forced to live exclusively on the 'outside'. The somewhat ambiguous archaeological data recovered at Yuquot are cited by Dewhirst in support of Drucker's contention that whaling was more prestigious than economic, and that no single resource was the focus of specialized exploitation.

Inglis and Haggarty (1983, 1986) combine Dewhirst's information with data collected in extensive site surveys in the westcoast region (Haggarty and Inglis 1983, 1985). They argue, contra Dewhirst, that "the pattern that emerges is one of emphasis on the outside with scheduling to exploit the inside on a seasonal basis" (Haggarty and Inglis 1983: 16). Furthermore,

> archaeological evidence from areas that have been surveyed intensively indicates the existence in late prehistoric times of numerous relatively small independent groups exploiting resources within socially constrained territories from year round villages (Inglis and Haggarty 1986: 221).

The "seasonal round of activities was initiated and first described" only after the traditional pattern had been disrupted by European trade (Inglis and Haggarty 1986: 195). A semi-specialist economy focusing on maritime resources and whaling in particular made permanent occupation of 'outside' villages possible. Their re-evaluation of the early historic literature led them to conclude that whaling was a

> major economic activity of at least nine Nootkan groups. Five of these groups were successful enough to provide for their own needs as well as to generate a surplus to trade (Inglis and Haggarty 1983: 15).

The Mowachaht groups at Yuquot were unrepresentative of the early historic situation because it was there that the effects of European trade were earliest and most profound. At Yuquot, Nuu-chah-nulth chiefs faced a 'scheduling dilemma' in the spring/summer months: whether to monopolize trade with the Europeans or go whaling. They chose the former. As a result, the focus changed from specializing in whale products to being 'port managers' specializing in the management of access to Europeans and their trade goods.

In essence, Inglis and Haggarty are arguing for a change from a combination of 3) and 4) towards one combining 1), 2) and 4). In both the prehistoric and historic Nuu-chah-nulth

economy, the emphasis in this model is placed on specialization and trade rather than the wholesale movement of people as the key to managing resources.

Most recently, Huelsbeck has drawn together a complete analysis of whaling and economics at Ozette (1988a) and a comprehensive assessment of westcoast economics as seen in the archaeological evidence (1988b). On the importance of whales at Ozette he concludes that "whales probably were the most important food resource of the Ozettes, both in their diet and as a commodity to be traded" (Huelsbeck 1988a: 21). The Makah economy was specialized rather than generalized. Their excellent location facilitated both marine hunting and trade, which they exploited by generating a surplus of whale products, then trading them for essentials including cedar for house planks and canoes (Huelsbeck 1988b). In both historic and prehistoric times, Ozette therefore favoured option 4): products more than people moved.

Huelsbeck (1988b) argues that on the basis of archaeological evidence alone a similar conclusion can be sustained for Hesquiat, but the situation at Yuquot appears ambiguous, although a clear 'outside' emphasis is still discernible.

CONCLUSION

It was argued at the beginning of the paper that taken at face value the expanding archaeological evidence supports Drucker's and Dewhirst's model for a broad generalized economic base facilitated by seasonal movement of household and village groups. An examination of possible distortions in the archaeological record revealed the probable underrepresentation of whale midden and hunting technology, and a problem with identifying invisible whale products such as oil. Cavanagh's analysis of Jewitt's journal provided some insight into these problems. It indicated that consumption patterns at Yuquot in 1803–5 did not correspond with production because trade was an important mediator.

Recent re-evaluations of the archaeological and historic evidence for whaling suggest that when the evidence is considered in its broader context a pattern of specialized economics, permanently settled villages, and extensive trade is more likely to have prevailed in prehistory. The pattern described in ethnographic accounts and supported by Dewhirst is probably the result of disruption and change brought about by European trade. Conditions prevailing in the post-European era favoured the formation of group confederacies which controlled corporate rights to a comprehensive suite of sources of production. Through the dual processes of intermarriage and internecine warfare, confederacies consolidated large territories and began to exploit resources in a seasonal round, as a corporate body. This displaced an earlier far more fluid pattern of more specialized subsistence and permanent settlement.

APPENDIX

OZETTE: MIDDEN TRENCH (AREA A)

[References: Gustafson 1968; Kirk and Daugherty 1974; McKenzie 1974]

The Ozette Village site is located on Cape Alava, just south of Cape Flattery. In 1966, Daugherty directed the excavation of a trench 70 m long and 2 m wide through a large midden deposit. Results are only partially published.

Chronology

Radiocarbon dates indicate occupation lasted from at least 2000 B.P. to the historic period. McKenzie's (1974) summary of the stratigraphy near the beach argues for a series of four superimposed house floors separated by 'beam' layers of mixed sterile and redeposited cultural material. All house floors have large hearth areas.

Faunal Remains: No report on the whalebone is available; however, McKenzie's cross-section of the beach portion of the trench indicates that concentrations of whalebone occur from the lowest levels up. Some concentrations are associated with house floors. Photos and comments given by Kirk and Daugherty (1974) also indicate that whalebone was abundant throughout the sequence, at least in the portion closest to the sea. Furthermore, "clusters of whale barnacles showed up repeatedly ... in all parts of the trench, especially the end near the beach" (Kirk and Daugherty 1974: 53). These whale barnacles came from both gray and humpback whales. Aside from the whale remains, a strong maritime economy is indicated: 90% of the faunal remains were sea mammal, of which 80% were northern fur seal.

Artefacts of Whalebone: These were recovered from all levels, and they included spindle whorls, bark shredders, wedges, scrapers, awls, clubs, barbed points and hafts. Of particular interest is a whalebone D-adze haft with an incised whale design (McKenzie 1974: 67). The use of split whale ribs for bark shredders is noted (McKenzie 1974: 58, 61), indicating a 2000 year antiquity for at least some of the manufacturing techniques documented from the later houses in Area B70. Concentrations of whalebone were also recovered in house postholes suggesting a possible structural use as was found at Area B70 (see below).

Hunting Technology: Toggling harpoons were present from the first house floor up (Level 8). The largest two harpoons could possibly have been for hunting whale (McKenzie 1974: 84, 142) but none were comparable in size to the ethnographic examples. No other artefacts specifically associated with whale hunting were recovered.

OZETTE: WET WOOD HOUSE SITE (AREA B70)

[References: Glesson 1980; Huelsbeck 1983, 1988a, 1988b; Kirk and Daugherty 1974; Kool 1982; Mauger 1979, 1980; Samuels 1980, 1983]

Excavations proceeded at the Ozette mudslide site from 1970 to 1981. Five houses were excavated.

Chronology

The earliest platform, House 1, was built no more than 450 years ago. This house and four subsequent houses were occupied for between 50 and 200 years before being buried by a mud slide (Huelsbeck 1988b: 23; Samuels 1983: 9–31).

Faunal Remains: The houses were surrounded by midden deposits which were dominated by whale and sea mammal remains. A total of 3,402 whale bones were identified. They represent at least 67 individuals: 28 gray whales, 31 humpback whales, 6 right whales and 2 finback whales. Sperm whale and killer whale are represented by teeth only. For gray and humpback whales, all parts of the skeleton are present (Huelsbeck 1988a: 36). Modification by gouging of some bones, especially vertebrae, suggests bone may have been rendered to extract oil. Whale barnacles were recovered from the house floors (Huelsbeck 1983: 52) indicating the blubber was brought into the dwellings. Little whale bone was recovered from within the houses.

Artefacts of Whalebone: Over 1000 whalebone tools were identified, representing nearly 25% of the total artefacts recovered (Huelsbeck 1983: 52). Cedar bark processing tools (56 shredders; 8 beaters; 1 creaser) and wood working tools (13 adze handles; 71 wedges) preferentially selected whalebone as a raw material. Five of the 23 spindle whorls were of whalebone.

Other artefacts of whalebone include clubs, "swords", spatulate tools, digging sticks and small items such as harpoon parts. Mandibles and ribs were favoured raw material for the larger items (Mauger 1980: 60–69). Several consistent patterns of utilization have been identified for the techniques employed at the different stages of manufacture. Gray whale mandibles were preferred to humpback because they are straighter. Whalebone was also an important construction material. It was used for water diversion, bank stabilization walls, levelling and retaining walls (Huelsbeck 1983: 53). Scapulae were often associated with house walls and mandibles and vertebrae were preferred for drainage wall construction (Mauger 1979: 44).

Hunting Technology: A complete, articulated whale harpoon curated in a cedar bark pouch was recovered from one house floor (Kirk and Daugherty 1974: 128–129). Mussel shell blades were found embedded in three humpback scapulae and two pieces of maxilla. Both gray and humpback scapulae were frequently broken at this same spot probably in order to retrieve the harpoon blade for reuse—especially valuable metal blades (Mauger 1979: 44–45). Over 5,000 bone points and 200 harpoon parts were recovered (Glesson 1980: 95). No information is available on their size or which could have been used for whaling rather than sea mammal hunting. Apart from harpoons, 17 floats, 156 float plugs and 28 float tubes were also recovered (Glesson 1980: 95–96). These results confirm that the ethnographically recorded whaling technology is indeed pre-European.

ALBERNI INLET (SHOEMAKER BAY I AND II—DhSe 2)

[References: McMillan and St. Claire 1982]

The site is located at the head of Alberni Inlet, Barkley Sound. It is therefore a long way from open sea, and unlikely to contain much evidence of whale exploitation.

Chronology

Excavation revealed two occupation phases:

Shoemaker I 2000–3000 B.P.: Probably a house site as features included a large rock filled trench [*cf.* this feature with trenches around houses filled with whalebone at Ozette], postholes and a hearth. Two complete and one partial burial were excavated.

Shoemaker II 1000–1500 B.P.: Features consisted of three concentrations of faunal remains and a concentration of fire-cracked rock.

Faunal Remains: Both Shoemaker I and II included several fragments of at least one unidentified whale species (p. 92, 113).

Artefacts of Whalebone: Shoemaker I contained no firmly identified whalebone artefacts. Shoemaker II contained one whalebone vertebra epiphysis (a possible spindle whorl), one bark shredder, and one polished and grooved fragment of a whale rib.

Hunting Technology: Both barbed and toggle harpoon heads were recovered from both phases. None, however, are large or robust enough to have been used for whale hunting.

HESQUIAT

[References: Calvert 1980; Haggarty 1982; Haggarty and Boehm 1974; Huelsbeck 1988b]

The three Hesquiat sites from which faunal remains have been recovered are located in Hesquiat Harbour. DiSo 9 and DiSo 16 are cave habitation sites located at the back of the harbour. DiSo 1 is a large midden located at the top of a bluff overlooking the beach beside the present Hesquiat village near the harbour mouth. Extensive areas were excavated at all three sites.

Chronology

DiSo 16 A single occupation with a hearth, dating to between A.D.1200 and 1400.

DiSo 9 Two occupations, both containing hearths:
I: A.D. 600–900
II: A.D. 100–400

DiSo 1 The midden appeared to be a fairly continuous deposit without intervening sterile layers. It is broken into five levels:
I: no radiocarbon dates
II: A.D.1350–1450
III: A.D. 1350-1450
IV: A.D. 700–1300
V: one spurious date

Faunal Remains: At DiSo 16 and DiSo 9 approximately 5% of the mammal bone is whale and 50% of the bone is mammal. At DiSo 1 the faunal remains vary: between 30% and 50% of the mammal bone is whale and between 78% and 95% is whale/sea mammal. Between 20% and 30% of the bone recovered is mammal. No whale bone has been identified to species level.

Artefacts of Whalebone: DiSo 1, Level V contained a bone dagger made from a whale rib. Miscellaneous worked sea mammal bone, including whale was recovered from all levels in DiSo 9 and DiSo 1. In most cases, species identifications are not given for bone artefacts (Calvert 1980).

Hunting Technology: Large harpoon valves, 6–13 cm in length, were recovered from all levels in all sites except DiSo 9 Level II. One mussel shell point was recovered in DiSo 9 Level II, plus several mussel shell knives from both levels at the same site. The evidence here confirms the Yuquot data establishing ethnographic style whaling technology as present from at least A.D. 800 and places it possibly 500 years earlier.

NOOTKA SOUND: KUPTI (DkSp1)

[Reference: McMillan 1969]

The Kupti excavations were conducted by McMillan in 1968. They consisted of 15 one metre square test pits distributed over four terraces.

Chronology

No radiocarbon dates are available. However, the deposits were a maximum of only five feet deep and McMillan (1969: 101) suggests A.D. 1000 as the earliest date of occupation.

Faunal Remains: A major concentration of 737 fragments of chopped whalebone was recovered from test pits 10 and 11. McMillan (1969: 101) considers them too small to be the raw material for artefacts. No complete bones were recovered.

Artefacts of Whalebone: Eight fragments of worked whalebone, including one possible finished artefact of unknown function, were also recovered (McMillan 1969: 85).

Hunting Technology: No artefacts attributable to whalehunting technology were identified.

NOOTKA SOUND: YUQUOT (DjSp 1)

[References: Dewhirst 1977, 1979; Folan and Dewhirst 1980a, 1980b; Savage 1973]

The Yuquot excavations, directed by Dewhirst, cut through the midden crest at the front of the contemporary/historic village site of Yuquot. The excavations were set well back from the present beach and Dewhirst (1979: 6) suggests this is why very little whale bone was recovered. An area 2 to 3 m wide by 13 m long was opened.

Chronology

The stratigraphy is divided into four zones:

I: 2300–1000 B.C. very poor preservation.

II: 1000 B.C.–A.D. 800. Extensive faunal remains. Seventeen rock-rimmed firepits, several superimposed and numerous small postholes suggest successive houses.

III: A.D. 800–1790. Probably no houses, only associated activities.

IV: A.D. 1790–1966. Historic period includes part of at least one documented 19th century house (Captain George).

Faunal Remains: No report on the whalebone recovered is available, however, Dewhirst (1979: 6) mentions that "whalebone was present throughout all four stratigraphic zones, but few whale remains were intact, identifiable elements. Most whalebone was either worked into artifacts or detritus from artifact manufacture." The barnacle *Coronula reginae* which embeds in the humpback whale was present in Zone II and IV. No other species of whale barnacle were recovered (Fournier and Dewhirst 1980). Both Dewhirst (1979) and Savage (1973) argued for increased exploitation of sea mammals through time. The sample however is small and the change even smaller so this argument is open to question.

Artefacts of Whalebone: These include bark shredders and beaters from Zone II, III, and IV (Folan and Dewhirst 1980a): a club made from a whale rib (p. 272), four war clubs (p. 328), two possible leisters (p. 208), harpoon foreshafts, wedges, barbed harpoon heads, harpoon valves and rings from vertebral discs (p. 330).

Hunting Technology: Composite toggle valves were recovered from Zone III and IV. Two large examples, which could have served as whaling harpoon heads, were also recovered. One came from Zone III, the other more complete example is unprovenanced (Folan and Dewhirst 1980a: 298). One slotted valve of a whaling sized harpoon recovered was from Zone II (Folan and Dewhirst 1980a: 301). Documented whaling technology is therefore present from A.D. 800.

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