

SMALLPOX IN THE PACIFIC NORTHWEST

The First Epidemics

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NINETEEN NINETY-TWO MARKED THE five hundredth anniversary of Columbus's discovery of the Americas. A major topic in the scholarly reassessment of the Columbian voyages has been their effects on the Native inhabitants of the Americas. We now know that, within a few generations of Columbus, several virulent diseases native to the Eastern Hemisphere were introduced to "virgin soil" American Indian populations. Most caused heavy mortalities, which cumulatively resulted in a hemispheric population decline of unprecedented magnitude.¹

The most deadly of these "new diseases" was smallpox. The first great American smallpox epidemic appeared in 1519 in Hispaniola, was carried with Cortez to Mexico, and from there spread throughout most of the continuously settled portion of the New World.² Although there are no historical or traditional records which indicate that this epidemic spread to the relative isolation of the Pacific Northwest, the presence of a contemporary archaeological discontinuity in a sampled segment of the middle Columbia Basin suggests that it might have.³

There is *currently* no other evidence of any kind which can be used to support the introduction of high-mortality exotic diseases to the Northwest prior to 1774, the beginning of direct contact between the region's Indians and Euroamericans. After that date the sequence of disease introduction is fairly well known, although few of these early epidemics have been described in the published literature.⁴

¹ See appendix, section I, for a review of recent research.

² Alfred Crosby, "Conquistadore y Pestilencia," chapter 2 of *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, 1972).

³ Sarah Campbell, *Postcolumbian Culture History in the Northern Columbia Plateau, A.D. 1500-1900*. (Ph.D. dissertation, University of Washington, 1989).

⁴ See appendix, section II, for a review of recent research in the Northwest.

Of the several major smallpox epidemics which occurred among the Indians of the Pacific Northwest in the century after 1774, the epidemic of the late 1770s was certainly the most widespread, and is likely to have caused the greatest total mortality. The following exposition is based upon two studies of my own: an overview talk presented at the 34th annual Northwest Anthropological Conference in 1981, and the more detailed treatment which formed chapter 2 of my 1985 dissertation.⁵

BACKGROUND: CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS

Before examining the historical evidence for the epidemic, it is important to review the relevant medical characteristics of smallpox. Smallpox is an acute infectious disease, spread by contact with infected individuals. The usual mode of transmission is by "droplet infection" (that is, through sneezing), though touching an infected individual or fresh corpse is also effective. There is a remote possibility of acquiring the disease through contact with virus-laden items of clothing, personal possessions, etc. The duration of smallpox in an individual is short, lasting only a month from infection to death or recovery. The first two weeks constitute an asymptomatic incubation period, followed by a second two weeks when lesions are present and the carrier is infectious. Individuals who survive an attack of smallpox are usually left with visible scars (pockmarks), and acquire a life-long immunity to later attacks of the disease.

For non-immune populations in close interpersonal contact, the infection rate is normally high. Smallpox mortality varies from one epidemic to another, dependent upon several variables besides the immunity factor, including the genetic diversity of the population, the strain of the virus, and the ability of the indigenous health care system to cope with the disease. Recent research suggests that genetically homogeneous populations offer less resistance to viral infection; American Indian and Oceanian populations show markedly less internal genetic diversity than do those of Europe, Africa, or East Asia. A widely quoted study of mortality from *Variola major* ("classic smallpox") in twenty non-immune populations arrived at an average mortality of 30 per cent of those infected. (*Variola minor*, which is not reported historically before the late 1800s, had a case mortality of less

⁵ The oral presentation was entitled "Smallpox on the Northwest Coast: a summary of ethnohistorical data from 1774 to 1836," and covered the first three epidemics; the chapter title is "Smallpox in the Pacific Northwest; a summary of ethnohistorical data from the first fifty years of Euroamerican contact (1774 to 1824)."

than 1 per cent.) Vaccination with the related, benign cowpox virus provides immunity to smallpox, but the technique was not discovered until 1798, and had no effect on mortality rates in Northwest Native American populations until the epidemic of 1836-38.

Given the high infectivity of smallpox, its short duration in each individual, and the phenomenon of immunity among those who recover, it should be apparent that the disease will move rapidly through a given population and that it requires a continually replenished supply of non-immunes to sustain it in a single population over an extended period of time. Studies of an epidemiologically similar viral disease, measles, among isolated island populations have demonstrated that the disease will die out (for lack of susceptibles) when the total population drops beneath approximately one-third of a million. Above that mark, the disease is always present, maintained by a regularly renewed pool of susceptibles among the newborn and young children without acquired immunity.⁶

The aboriginal fishing and gathering populations of the Pacific Northwest were apparently neither dense nor continuous enough to support the continual presence of smallpox. The disease therefore occurred only periodically, dependent upon, first of all, introduction from outside the region and, secondly, the presence of a pool of non-immune susceptibles in the resident population. These epidemiological requirements explain the very distinctive patterning of smallpox epidemics in the Pacific Northwest during the early contact period. Epidemics appeared every generation: in the late 1770s, 1801-02, 1836-38, and finally (in two separate areas) in 1853 and 1862-63.

BACKGROUND: DATA

Documentation for the first epidemic of the historic period comes from two classes of data: contemporary statements by Euroamerican explorers and traders and remembered accounts of Indian informants collected at a much later time. References to smallpox in the early

⁶ This summary of the epidemiological characteristics of smallpox has been prepared from Cyril Dixon, *Smallpox* (London, 1962), J. Donald Millar, "Smallpox," pp. 736-42 in Paul Hoeprich, *Infectious Diseases* (San Francisco, 1977), Abram Benenson, *Control of Communicable Diseases in Man* (Washington, 1990), and Frank Fenner et al., *Smallpox and its Eradication* (Geneva, 1988). On genetic variability and viral resistance see Francis Black, "Why Did They Die?" (*Science* 258: 1739-40, 1992). On measles epidemics and population size see Black, "Measles Endemicity in Insular Populations: Critical Community Size and its Evolutionary Implication" (*Journal of Theoretical Biology* 11: 207-11, 1966). On periodicity of measles and smallpox epidemics see Ann Jannetta's *Epidemics and Mortality in Early Modern Japan* (Princeton, 1987).

journals are, with few exceptions, limited to mentions of pock-marked individuals; no eye-witness accounts by Whites of actual epidemic visitations are known to exist.⁷ Indian reminiscences are particularly important on the Columbia Plateau, where sustained White contact followed, by a full thirty years, that on the coast.

Map 1 shows the distribution of smallpox references, by ethnolinguistic unit, assignable to the decade of the 1770s. Map 2 shows known European landfalls (a possible source of smallpox) for the period from 1774 to 1779. The references cluster and may be discussed in three geographic regions: North Coast, Columbia Plateau, and Central Coast.

AREAL ACCOUNTS

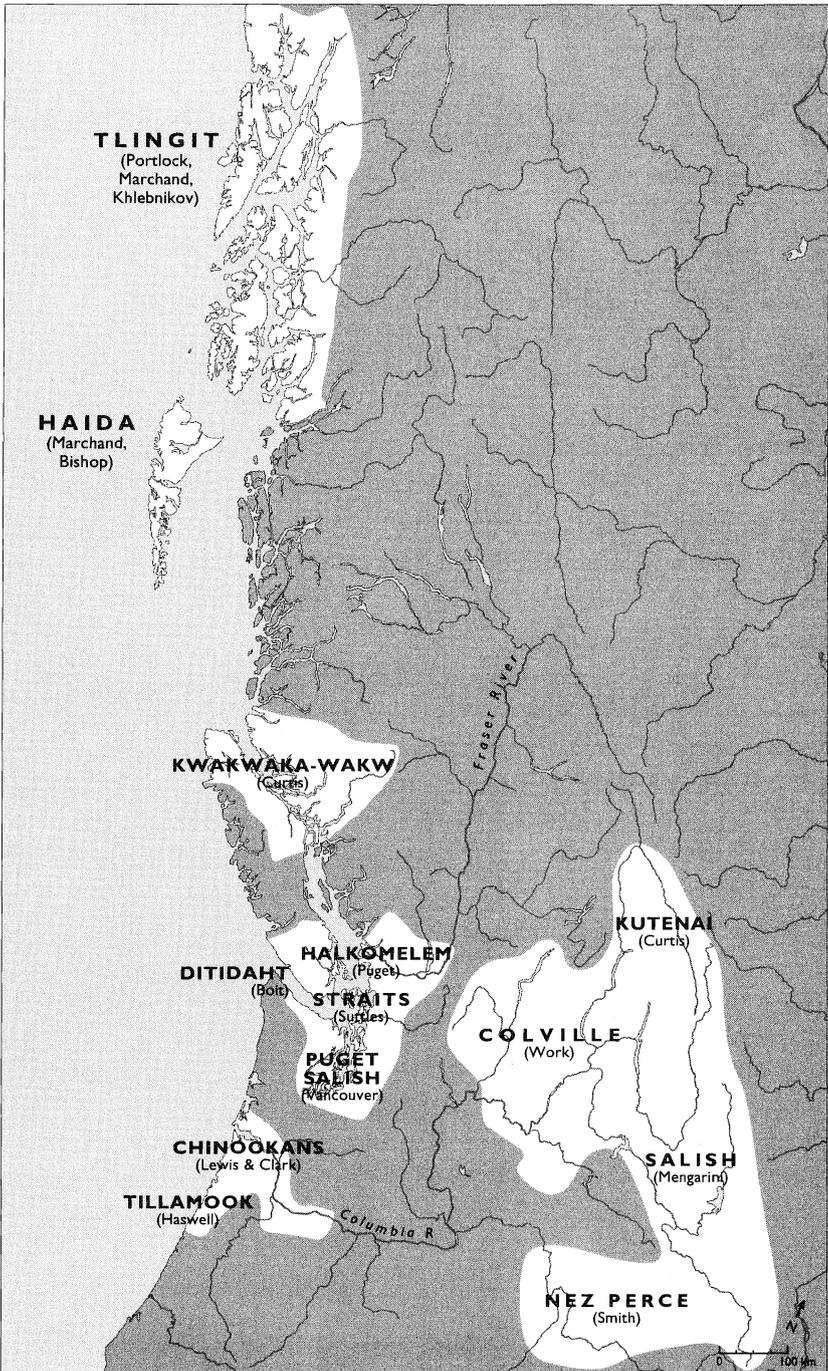
North Coast

The first appearance of smallpox among the Tlingit is, relative to other groups, well recorded, with at least three citations in the historical literature. All were recorded from the Sitka area. The first comes from the journal of the British explorer Nathaniel Portlock, in 1787.

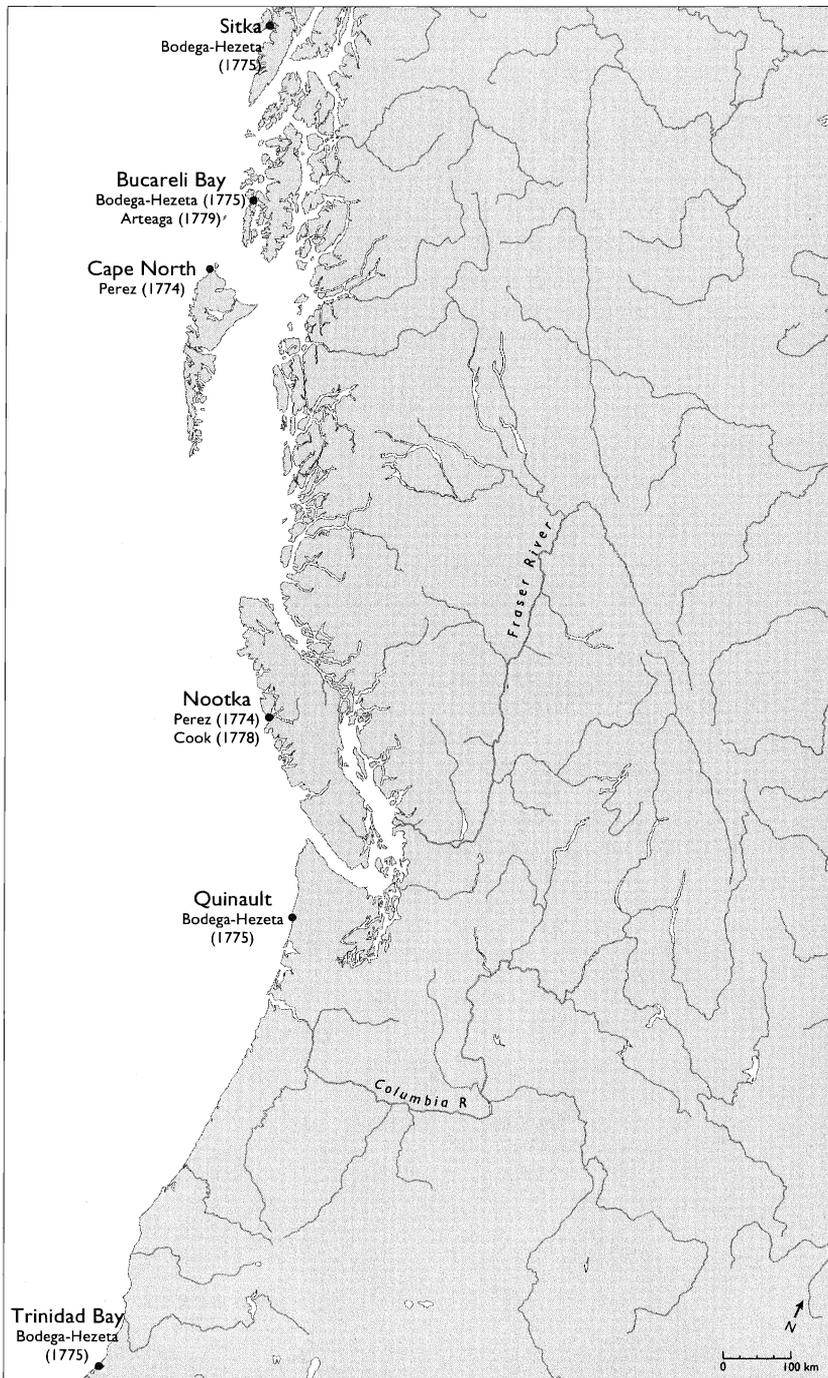
12/8/87, Portlock's Harbor, 57°44'N.

I expected to have seen a numerous tribe, and was quite surprised when I found that it consisted only of three men, three women, the same number of girls, two boys about twelve years old, and two infants. . . . I observed the oldest of the men to be very much marked with the small-pox, as was a girl who appeared to be about fourteen years old. The old man endeavored to describe the excessive torments he endured whilst he was afflicted with the disorder that had marked his face and gave me to understand that happened some years ago. This convinced me that they had had the small-pox among them at some distant period. He told me that the distemper carried off great numbers of the inhabitants, and that he himself had lost ten children by it; he had ten strokes tatoood on one of his arms, which I understood were marks for the number of children he had lost. I did not observe any of the children under ten

⁷ In fact, considering the nature of European contact in the 1770s, it would be surprising if we *did* have eyewitness accounts. The Spanish ships were never (at this time) in contact with the Indians for more than a month, usually much less, at one time. Captain Cook was at Nootka exactly one month. Assuming the disease came on shipboard, and given the two-week latency period, sailors would have to stay in one place for a considerable period of time to observe the epidemiological consequences of their visit. And throughout the decade of the seventies, Whites and Northwest Indians were in face-to-face contact for a total of less than four months. There was plenty of time in the interim for an epidemic to spread and die out.



MAP I Smallpox, 1769-1780 known distribution (by ethnolinguistic unit)



MAP 2 European/Native American contacts on the Northwest Coast, 1774-1779

or twelve years of age that were marked; therefore I have great reason to suppose that the disorder raged little more than that number of year ago; and as the Spaniards were on this part of the coast in 1775, it is very probably that from them these poor wretches caught this fatal affliction. A number of the Indians who visited us from the Eastward were marked with the small-pox, and one man who had lost an eye gave me to understand that he had lost it by that disorder; but none of the natives from the Westward had the least traces of it. I cannot account for this circumstance any other way than by supposing that the vessel from which these unfortunate people caught the infection, was in a harbor somewhere about Cape Edgecombe, and perhaps none of the natives further to the westward than the Sound [Sitka Sound] had an opportunity of having any intercourse with her, and by that means happily escaped the disorder.⁸

Exactly four years after Portlock's observations, French explorer Étienne Marchand visited Sitka, and similarly commented on the presence of pock-marked individuals:

It cannot be doubted that the smallpox has been introduced into the countries which border on Tchinkitanay Bay [Sitka Sound]; for several individuals of both sexes bear unequivocal marks of it; and they explained very clearly to Surgeon Roblet, who questioned them concerning the cause of these marks, that they proceeded from a disorder which made the face swell, and covered the body with virulent pustules that occasioned violent itchings; they even remarked that the French must be well acquainted with it, since some of them also bore the marks of it. In 1787, Captain Portlock was witness of the ravages which it had made, in the harbor to which he has given his name, and which is situated at no great distance to the Northwest of Tchinkitanay towards the latitude of 57°50'.⁹

The third account from the Tlingit exists in three versions. That given below, from Kyrill Khlebnikov's 1820 Report, is the oldest and assumed original. The two later versions¹⁰ were apparently copied from Khlebnikov with only minor variations.

⁸ Nathaniel Portlock, *Voyage Around the World* (London, 1789), 271-72.

⁹ Claret Fleurieu, *Voyage Round the World performed during the years 1790, 1791 and 1792 by Étienne Marchand* (London, 1801), 328.

¹⁰ Vladimir Romanov, O Kolyuzhakh ili Koloshakh vooobshche (*Severnyy arkhiv* 17: 3-28, 1825), and Frederic Lütke, *Voyage Autour du Monde* (Paris, 1835), 15.

According to Saigakakh there was an epidemic of small pox there some 50 years ago, that is about 1770. He was a small child and barely remembers it, but he knows for a fact that there were only one or two persons left in each family. According to him it spread from Stakhin [Stikine] to Sitka, but did not go further north. The Kolosh [Tlingit] supposed that this illness was visited on them by the crow [*sic*: should probably read raven, the local culture hero] as a punishment for the endless wars they waged among themselves.¹¹

References for the Haida of the Queen Charlotte Islands are sketchier, but sufficient to establish the presence of smallpox among them as well. Marchand, at Cloak Bay on "Coxes' Strait" (Parry Passage), noted "Several among them have the face deeply marked with the small-pox; but it is not known whether this disorder be peculiar to these islands, or whether, as may be supposed they owe it to their communication with the Europeans."¹² In 1795 Charles Bishop recorded from a Haida chief, "They are very numerous, and were much more so before the small Pox which raged here a few years since, and by Kowes' account, swept off two thirds of the people scarcely any that were affected survived."¹³ An oral tradition collected by the early ethnographer of the Haida John Swanton, which apparently recalls a 1787 visit by explorer George Dixon, is also relevant here:

When . . . the first ship . . . came in sight they [the people of Chaatl] thought it was the spirit of the Pestilence, and dancing on the shore, they waved their palms toward the newcomers to turn back. When the white people landed, they sent down to them their old men, who had only a few years to live anyhow, expecting them to fall dead; but when the new arrivals began buying their furs, the younger ones went down too, trading for axes and iron, the marten and land otter skins they wore.¹⁴

A very late account, which may refer to Haida, Tlingit, or both, comes from the 1829 journal of Anglican missionary Jonathan Green:

¹¹ Kyrill Khlebnikov, *Colonial Russian America: Kyrill T. Khlebnikov's Reports, 1817-1832* (Portland, 1976), 29.

¹² *Ibid.*, 438.

¹³ Charles Bishop, *The Journal and Letters of Captain Charles Bishop on the Northwest Coast of America* (Cambridge, 1967), 83.

¹⁴ Quoted in Erna Gunther, *Indian Life on the Northwest Coast of North America as Seen by the Early Explorers and Fur Traders during the Last Decades of the Eighteenth Century* (Chicago, 1972), 121.

Some thirty or forty years since, the small-pox made great ravages among them [coast natives between 53° and 58°N latitude]. This disease they call Tom Dyer, as some suppose from a sailor of this name, who introduced it, though it is probable that it came across the continent. Many of their old men recollect and they say, that it almost desolated their country.¹⁵

Columbia Plateau

The Columbia Plateau region was opened to continuing White contact with the exploratory parties of Lewis and Clark, Simon Fraser, and David Thompson in the years 1805-1808. The earliest record of the epidemic of the 1770s is found in an 1829 report from the Hudson's Bay Company's Fort Colvile.

1/4/29

Immense numbers of them were swept off by a dreadful visitation of the smallpox, that from the appearance of some individuals that bear marks of the disease, may have happened fifty or sixty years ago [1769-79]. The same disease committed a second ravage, but less destruction than the first about ten years afterwards.¹⁶

More details are supplied in a letter of Congregational missionary Asa Smith dated February 6, 1840, from Kamiah Mission among the Nez Perce.

It appears from the accounts of the people that epidemics have formerly prevailed among them, carrying off many people in a short time. No epidemic has however prevailed among them very recently. Twice during the remembrance of the most aged among this people has the small pox been among them. The first time it visited them must have been 60 or perhaps 70 years ago [1770-80]. Some very old people, I should think 70 or 80 years old + perhaps more, relate that when they were children a large number of people both of the Nez Perce + Flatheads wintered in the buffalo country. In the spring as usual the people from this region went to buffalo. Instead of finding their people as they expected, they found their lodges standing in order, + the people almost to an individual dead. Only here + there one survived the disease. It seems to have been the most virulent form of the small pox. From thence it followed the people to this

¹⁵ Jonathan Green, *Journal of a Tour on the NorthWest Coast of America in the Year 1829* (New York, 1915), 39.

¹⁶ John Work, cited in David Chance, *Influences of the Hudson's Bay Company on the Cultures of the Colvile District* (*Northwest Anthropological Research Notes* 7(1), Memoir 2, 1973), 120.

region + swept through the whole country, very few surviving the attack of the disease. Some fled + thus avoided the contagion.¹⁷

Jesuit missionary Gregory Mengarini's 1847 "Recollections" from St. Mary's Mission (Flathead) validates Smith's account.

About seventy years ago [1777], according to the calculations of the elders, the Flatheads included at least eight hundred families or about four thousand people. Now it occurred that while a small number had left for a buffalo hunt, all those remaining in a camp were attacked by a devastating plague which in a very few days killed everyone with the exception of fifteen children who were not infected by the disease. Among this number were . . . [some] who still live. The disease caused the growth of large red and black pustules over the entire body, particularly on the chest. Those developing red pustules died within a few days, but those who were plagued by the black pustules died almost instantly. During this same period the epidemic destroyed another entire nation of savages who spoke a different tongue and dwelt about five days' journey from the Flatheads. Of them remained not even the name.¹⁸

Finally, in the early 1900s Edward Curtis collected a tradition from the third and northernmost Plateau group which migrated annually to the Plains for the bison hunt, the Kutenai.

About this time a small tribe called Tunaha, camping east of the Rocky Mountains, was nearly exterminated by smallpox. Fleeing from the strange evil, the remnant hurried eastward, but before they had gone far, eight young men left the party and turned their faces to the south. The larger party was never heard from, but the smaller found refuge among the Flathead in a valley near the site of Butte, Montana.¹⁹

The Tunaha, according to ethnographer of the Kutenai Turney-High²⁰, were the easternmost band of Kutenai, who were exterminated by the first epidemic of smallpox. Franz Boas' Kutenai tale "The

¹⁷ In Clifford Drury, *The Diaries and Letters of Henry H. Spalding and Asa Bowen Smith Relating to the Nez Perce Mission, 1838-1842* (Glendale, 1958), 136-37. A very similar and certainly related account was written three months after Smith's, by William Gray, at Lapwai Mission (quoted in Olof Larsell, *The Doctor in Oregon, 1947*, 114).

¹⁸ Gregory Mengarini, *Recollections of the Flathead Mission* (Glendale, 1977), 193-94.

¹⁹ Edward Curtis, "The Kutenai" (pp. 116-155 in volume 7, *The North American Indian*, 1911), 119.

²⁰ Harry Turney-High, *Ethnography of the Kutenai* (*American Anthropological Association Memoir* 56, 1941), 132.

Great Epidemic," collected in 1914 from an informant born in 1856, may also refer to the initial outbreak of smallpox among this northern Plateau people.²¹

Central Coast

Most of the Indian peoples of western Washington and Oregon and southwestern British Columbia who were contacted in the early years of exploration are reported to have suffered from an early outbreak of smallpox. In Western Oregon Lewis and Clark noted signs of the disease among both Upper Chinookans and Chinook proper.

3/4/06, probably near the Sandy River

an old man who appeared of Some note among them and father to my guide brought forward a woman who was badly marked with the Small Pox and made Signs that they all died with the disorder which marked her face, and which She was verry near dieing with when a Girl. from the age of this woman this Distructive disorder I judge must have been about 28 or 30 years past [1776-78], and about the time the Clatsops inform us that this disorder raged in their towns and destroyed their nation.²²

On the Oregon coast, one of the few ships to stop during the late 1700s, the American vessel *Columbia*, noted "two or three of our visitors were much pitted with the small pox" near modern Lincoln City (Tillamook Salish area), on August 10, 1788.²³

The journals of George Vancouver's 1792 exploration of Puget Sound and the Strait of Georgia contain a number of references to pock-marked Indians.

12/5/92, Rendsland Creek, Hoods Canal (Twana territory)

at the extremity of the inlet . . . about sixty, including the women and children . . . one or two had visited us on the preceding Thursday morning [at Port Discovery]; particularly one man who had suffered very much from the small pox. This deplorable disease is not only common, but it is greatly to be apprehended is very fatal

²¹ Franz Boas, *Kutenai Tales* (*Bureau of American Ethnology Bulletin* 59, 1918), 268-71. Claude Schaeffer, in "Plains Kutenai: An Ethnological Evaluation" (*Alberta History* 30(4): 1-9, 1982) believes that there were two smallpox epidemics in the eighteenth century which affected the Kutenai. The first, which exterminated the Tunaha, occurred around 1736, before the Kutenai had horses; the second in 1781-82. Most of the accounts, he believes, refer to the earlier outbreak.

²² William Clark in Gary Moulton, *The Journals of the Lewis + Clark Expedition*, 7: March 23-June 9, 1806 (Lincoln, 1991), 65.

²³ Robert Haswell in Frederic Howay, *Voyages of the Columbia to the Northwest Coast, 1787-1790 and 1790 to 1793* (*Collections of the Massachusetts Historical Society* 79, 1941), 34.

amongst them, as its indelible marks were seen on many; and several had lost the sight of one eye . . . owing most likely to the virulent effects of this baneful disorder.²⁴

21/5/92, Carr inlet

in the SW Corner of the Cove was a small Village. . . . Two of the three in the canoe had lost the Right Eye + were much pitted with the Small Pox, which Disorder in all probability is the Cause of that defect.²⁵

Anthropologist Wayne Suttles' Straits informants associated the abandonment of many traditional village sites with the initial appearance of smallpox in their territory.

Native traditions corroborate the pre-contact date [for the smallpox epidemic] and indicate that several villages were completely wiped out, while all suffered losses . . . when the smallpox wiped out a tribe on Boundary Bay, the Semiahmoo took over their territory. . . . In the San Juan Islands two or three Lummi villages and one or two Samish villages were nearly wiped out by smallpox, and the survivors moved to Mainland villages.²⁶

The Vancouver logs are silent on signs of smallpox among Salishan peoples of the Strait of Georgia area. Nevertheless, there are hints in the contemporary Spanish journal of Galiano and Valdez, which describes "pimply" (in translation) individuals "blind in one eye" (a common complication of smallpox) near Nanaimo (Halkomelem territory).²⁷ In a summary statement on the Indians of Puget Sound and the Strait of Georgia, Peter Puget stated: "the Small pox most have had, and most terribly pitted they are; indeed many have lost their eyes, + no Doubt it has raged with uncommon Inacteracy [*sic?*] among them." (18/8/92)²⁸

²⁴ George Vancouver, *A Voyage of Discovery to the North Pacific and Round the World* . . . (London, 1798), I: 241. See also Archibald Menzies, "Menzies' Journal of Vancouver's Voyage, April to October 1792" (*Archives of British Columbia, Memoir* 5, 1923), 29.

²⁵ Peter Puget, "Log of the Discovery, May 7-June 11, 1792" (*Pacific Northwest Quarterly* 30(2): 177-217), 198. See also Vancouver (*ibid.*), 217 and Menzies (*ibid.*), 35.

²⁶ Wayne Suttles, "Post-contact Culture Change Among the Lummi Indians" (*British Columbia Historical Quarterly* 18 (1 + 2): 29-102, 1954), 42.

²⁷ Dionisio Galiano and Cayento Valdez, *A Spanish Voyage to Vancouver Island and the North-West Coast of America* (London, 1930), 48 + 50.

²⁸ Peter Puget, Log of the Discovery, June 12-August 19, 1792 (London, Public Record Office, Admiralty 55/27). Robert McKechnie, in *Strong Medicine: History of Healing on the Northwest Coast* (Vancouver, 1972), 75, incorrectly identifies these Indians as Haida, because Puget penned the passage while in Queen Charlotte Strait (the Haida inhabit the Queen Charlotte Islands).

The disease penetrated to the southwest corner of Vancouver Island, among the Nootkan Ditidaht. On the 28th of June 1791, John Boit and John Hoskins of the ship *Columbia* noted its presence at Nitinaht village.

abrest the village of Nittenatt. . . . Twas evident that these Natives had been visited by that scourge of mankind the Smallpox. The Spaniards as the natives say brought it among them.

Cassacan [a high ranking noble] had also [besides venereal disease] had the small pox; of which his face bears evident marks. Infamous Europeans, a scandal to the Christian name; is it you who bring and leave in a country with people you deem savages the most loathsome diseases?²⁹

And finally, Edward Curtis' Kwakwaka-wakw informant recalled a late eighteenth-century epidemic:

The Koskimo, who formerly lived at Kósüü (on Cape Commerell) and later at Kwáněë (Deep Bay) came to their present location in the time of the great-great-grandfather of the informant Tsulniti, who was five years old when Fort Rupert was established in 1849. . . . Quatsino Sound had been occupied by the populous Hoyalas. . . . An epidemic almost exterminated the Hoyalas, and the remnant scattered among the tribes to the south and on the eastern coast of Vancouver Island, wherever they had relatives by marriage. So great was the mortality in this epidemic that it was impossible for the survivors to bury the dead. They simply pulled the houses down over the bodies and left them. It was soon after the epidemic that the Koskimo moved into this region.³⁰

CORRELATION OF ACCOUNTS

There are a number of patterns apparent in the ethnohistorical evidence presented so far. The first concerns the geographical extent of the epidemic. It is obvious from the map that smallpox was widespread in the Pacific Northwest in the decade of the 1770s. It is also certain that smallpox occurred among more Indian groups than those for which documentary information has survived. The blank spaces on Map 1 correspond, in large part, to peoples who were contacted late by Euroamericans, and for whom written documenta-

²⁹ John Boit in Howay (ibid.), 377; John Hoskins in Howay (ibid.), 196.

³⁰ Edward Curtis, "The Kwakiutl" (volume 10 of *The North American Indian*, 1915), 306fn.

tion from the early period is consequently sparse. Moreover, conditions were favourable in the Northwest at this time for a maximal spread of the disease. The epidemiological characteristics of smallpox, the flight reaction typical of "virgin soil" populations, the denser and more continuous pre-contact populations, and the extensive social and economic networks characteristic of the native Pacific Northwest all suggest that smallpox, at this time, must have spread to the limits of settlement.

The evidence presented here, therefore, *can* be taken to support the concept of a "pandemic" affecting all of the peoples of the Pacific Northwest. As Henry Dobyns has suggested, the epidemic of the 1770s may simply be an extension of the widespread epidemic that is recorded for other parts of western North America between 1779 and 1781. A quotation from his 1966 paper is useful here.

The 1780 epidemic certainly was important . . . [it] affected Indians over much of western North America. . . . I suspect that this epidemic was the same one that killed over 40,000 individuals in Mexico City in 1779 and perhaps 50,000 in Puebla (Rosenblat 1954: 73). Epidemic smallpox was disastrous in the Dominican missions of Lower California in 1780-82 (Aschmann 1959: 248). Colonists from the Peninsula carried the disease into Upper California in 1781 (Cook 1939:P 155). In northern Sonora, epidemic smallpox fatalities occurred at San Ignacio Mission from August 21 to October 1, with 84% of the mortality among children (Pinart n.d.: 20-20v). . . . Aberle, Watkins, and Pitney (1940: 167) considered this 1781 epidemic "the greatest in the modern history of the Southwest" with a mission mortality exceeding 50% of the Pueblo population enumerated in 1760, over 5,000 persons. If the disease did spread north from Mexico City, it traveled at different rates over different trade routes, for it reached northern New Mexico earlier than northern Sonora. The episode began at San Juan Pueblo late in January, peaked during the week of February 15-19, and receded in mid-March (Aberle, Watkins, and Pitney 1940: 168). Jemez was so reduced that a mission was no longer maintained there, it became a visitation station (Hodge, Hammond, and Rey 1945: 279 n.90). . . . The Dakota winter counts indicated that many people died of smallpox in two successive winters, 1780-81 or 1781-82 (Mallery 1886: 131). Thompson (1916: 322-23) reported smallpox among the Chippewa and Sioux in 1780 and suggested that they had contracted it by wearing clothing taken from white victims who

had been ill with the disease. From these two groups, the contagion spread to the other Plains tribes and across the Rocky Mountains. Mortality reached an estimated $\frac{3}{4}$ of the population and eyewitnesses reported that in many tents all the inhabitants died (p. 321). The Blackfoot reported that they contracted the disease by attacking a Snake encampment decimated by it (p. 336).³¹

A "pandemic" over the entire Northwest is possible, but there are more conservative interpretations that may be made from the evidence. One major problem with the "pandemic" interpretation is that the dates do not match. Six of the Euroamerican chroniclers³² estimated, by the ages of pockmarked individuals or the age of their informants, the year of the first smallpox outbreak. The range is from 1769 to 1780; the mean year is 1775. The coastal dates tend toward the earlier years of the decade; those of the interior favour the latter half of the range. There is also a possibility, of course, that the method of calculating is to blame — perhaps the chroniclers tended to overestimate the ages of their informants.

ORIGINS

It is also possible that we are dealing with two or more regional outbreaks, each with its own history. The North Coast and Plateau clusters, for instance, do not appear to share much more than rough contemporaneity. And the Central Coast cluster may also have a history of its own. The ethnohistorical sources mention two possible areas of origin for the initial outbreak of smallpox in the Northwest: from the Plains (for the Plateau cases), and from Spanish ships (for the coast). I would like to present evidence for a third route as well — from the Russian colony in Kamchatka to the Tlingit.

Kamchatka-Tlingit route

In 1768, the Kamchatka Peninsula in eastern Siberia experienced a major smallpox epidemic. According to one observer, "5,368 persons were carried off."³³ When Cook's expedition stopped at Kamchatka in

³¹ Dobyns 1966, 441. Although Dobyns is a provocative thinker, it is incumbent on me to point out that he has been criticized for playing hob with figures. See David Henige, "Their Numbers Become Thick: Native American Historical Demography as Expiation," in James Clifton, *The Invented Indian* (New Brunswick, 1990), 169-91.

³² Excluding Jonathan Green, whose estimate (1789-1799) is clearly wrong.

³³ William Coxe, *Account of the Russian Discoveries between Asia and America* (London, 1780), 5.

1779, they "met everywhere the Ruins of large Villages with no traces left of them but the Foundations of the Houses."³⁴ The route of the disease is particularly interesting:

The small pox . . . made its appearance in 1767 and 1768. It was brought into the country by a Russian vessel bound to the Eastern islands, for the purpose of hunting otters, foxes, and other animals. The person who had in his blood the fatal germ was a sailor from Okotsk, where he had taken remedies for the disorder previous to his departure; but the recent marks of it were visible. Scarcely landed, he communicated this cruel malady to the poor Kamchadales, which carried off three-fourths of them.³⁵

The "Eastern islands" were the Kuriles, and probably the Aleutians as well, which were being visited by this time for furs. The name of the ship is nowhere recorded in the available literature on the Kamchatka epidemic, but the timing suggests that it may have belonged to the "secret" surveying expedition of Petr Krenitsyn and Mikhail Levashov. Krenitsyn and Levashov left Okhotsk in October 1766, and after an eight-day voyage arrived at Kamchatka, where they remained for a year and a half, coincident with the Kamchatka epidemic. On 14 August, 1768, after three weeks at sea, they arrived in the Aleutians. From a base on Unimak Island, exploring parties were sent as far west as 100 miles along the Alaska Peninsula. The expedition remained in the Aleutians for an entire year, during which time over fifty men were lost to "sickness" (mainly scurvy), and returned to Kamchatka in August 1769. Of the voluminous records of this expedition, only a few short summaries have been published; the rest remain, in manuscript, untranslated, in the Russian Central State Archive of the Fleet.³⁶

The link between the Kamchatka and Tlingit smallpox epidemics is, given the present state of knowledge, weak. Aboriginal trade networks, however, existed between the Aleut, Chugach Eskimo, and northernmost Tlingit. The possible very early date of 1769 for Tlingit smallpox makes sense in terms of transmission from Kamchatka and Portlock's observation that Tlingit from the islands east of Sitka were pock-marked, while those from the west were not, but it does not

³⁴ David Samwell in J. C. Beaglehole, *The Voyage of the Resolution and Discovery, 1776-1780* (Cambridge, 1967) III: 1252.

³⁵ M. deLesseps, *Travels in Kamchatka during the years 1787 and 1788* (London, 1790), 128.

³⁶ I. V. Glushankov, "The Aleutian Expedition of Krenitsyn and Levashov" (*Alaska Journal* 3(4): 204-210, 1973).

agree with Khlebnikov's assertion that the disease spread north from the Stikine River to Sitka.

Spanish vessels

The most popular theory current among the (non-Spanish) Euroamerican explorers of the Northwest Coast in the late 1700s was that smallpox had been introduced by Spanish explorers. Two of the accounts (Portlock among the Tlingit; Boit at Nitinaht) name the Spanish; another two (Swanton and Green) suggest transmission from European ships, nationality not specified. Placing the blame on other nationalities for the introduction of baleful diseases and customs (such as venereal disease, alcohol, and firearms) among the Indians was common practice at this time, however, so all such statements should be approached with caution. The timing of the first epidemic, nevertheless, implicates the Spanish. The six estimates for the date of the first Northwest outbreak fall between 1769 and 1780. European exploration of the coast began in 1774, with the Spanish Perez Expedition. Two other Spanish voyages were undertaken in 1775 and 1779. The only other vessels on the coast in this time period belonged to the Cook Expedition of 1778. Cook, however, stopped only at Resolution Cove in Nuu-chah-nulth territory, an area from which there is no record of smallpox at this time.

But there are several problems with the Spanish origins theory. The first is the absence of any reference to smallpox in the Spanish records. Copies of nearly all the relevant logs are available at the Bancroft Library of the University of California. I have reviewed the most detailed of these, and have failed to locate a single reference to any contagious disease which might be unambiguously interpreted as smallpox. Typical was the 1774 expedition, which suffered greatly from scurvy.³⁷ But no other disease is mentioned in that year's journals.

Secondly, although smallpox appeared in several epidemics in eighteenth century Mexico, the source area for the Spanish ships, there were no outbreaks that coincided with the exact time of the Northwest Coast expeditions. There is no record of smallpox in Mexico in 1774 or 1775, and although there was an epidemic in 1779, it occurred in the autumn, while Arteaga's ships left the mainland in February.³⁸ There

³⁷ See Herbert Beals (trans.), *Juan Pérez on the Northwest Coast: Six Documents of His Expedition in 1774* (Portland, 1989), 95 + 114, and Tomás de la Peña in Donald Cutter, *The California Coast: A Bilingual Edition of Documents from the Sutro Collection* (Norman, 1969), 193.

³⁸ See Donald Cooper, *Epidemic Disease in Mexico City, 1761-1813* (Austin, 1965).

was a smallpox outbreak in Baja California in 1781, but the disease did not take hold in Upper California before 1838.³⁹

Finally, the duration of the sea voyage from Mexico to the Northwest was a potential barrier to transmission. The 1774 expedition left San Blas (in Nayarit state) on 24 January, Monterey on 11 June, and arrived in the Queen Charlottes 18 July (*ibid.*). The 1775 and 1779 sea voyages from San Blas (to Trinidad and Bucareli Bays, respectively) both lasted eleven weeks. Assuming one infected person at the beginning of the voyage, and given the normal progression of smallpox, after one month he would be either dead or recovered and no longer infectious. Sequential on-board infection might extend the danger period, but a minimum of eleven weeks remains a long time for even this eventuality.⁴⁰

Robert Fortune, in *Chills and Fever: Health and Disease in the Early History of Alaska*, suggests a 1774 introduction date for smallpox. But his source, Irving Rosse's 1883 "Medical and Anthropological Notes on Alaska," is suspect. Rosse states that Don Francisco Mourelle "noticed the marks of small pox among the natives of Sitka Bay and Port Bucareli . . . in 1775," thus leading to Fortune's suggestion of "an introduction of the disease prior to that date." But Rosse is a tertiary source, citing an 1802 English translation of Mourelle as his authority. A reading of Mourelle's original Spanish "Navegación" by Herbert Beals, translator of the Perez voyage manuscripts, has uncovered no mention of "marks of smallpox."⁴¹

Warren Cook believes that smallpox originated with the 1779 Arteaga Expedition and cites a passage from Juan Bodega's manuscript journal at Bucareli Bay which refers to "an epidemic of unspecified nature" in support of his hypothesis.⁴² The relevant passage, from the 1912 translation of G.R. Barwick, is as follows:

20/5/79, Bucareli Bay

the Commander found the greater part of his men seriously ill with an attack, which showed that just when we thought them most

³⁹ Rosemary Valle, "Prevention of Smallpox in Alta California During the Franciscan Mission Period (1769-1833)" (*California Medicine* 119: 73-77, 1973). Valle reviewed all the California mission records for this time period, and failed to find any evidence of smallpox penetration, contra Cook 1939 (see the quote from Dobyens, pp. 16-17).

⁴⁰ On sea voyage barriers to disease transmission see Dean Snow and Kim Lanphear, "European Contact and Indian Depopulation in the Northeast: The Timing of the First Epidemics" (*Ethnohistory* 35: 15-33, 1988).

⁴¹ Robert Fortune, *Chills and Fever: Health and Disease in the Early History of Alaska* (Fairbanks, 1992); Irving Rosse, "Medical and Anthropological Notes on Alaska" (Washington, 1883), and Herbert Beals (p.c., 1993).

⁴² Warren Cook, *Flood Tide of Empire* (New Haven, 1973), 81 + 93.

free they were in the greatest danger; and seeing that several died suddenly in this way, he determined, on the advice of my surgeon Don Mariano Nunez de Esquivel to put ashore and make a shed for them on the beach; this D. Fernando Quiros caused to be erected very quickly, constructing it with the utmost convenience the place afforded, and, in the absence of D. Juan Garcia, entrusting the superintendence to the said surgeon; and such was the care and watchfulness with which he looked after them, that although most of them were in the last stage, and the days at that season had proved very harsh, only two of them died, and he succeeded in a short time in rendering the rest of them sound and robust and in stopping that epidemic, which was already feared as a plague on the Princesa.⁴³

Confusion arises from the journal references to "contagion" and "epidemic," which would, of course, apply to smallpox, but not to the most common sailors' ailment of the time, scurvy, which is a deficiency disease and not contagious. A later passage in Bodega's journal, however, states: "the Commander thought it desirable to set sail . . . to Monterey, having regard also to the wretched condition his crew were in through scurvy, by which contagious disease he had lost eight men" (7/8/79). Cook's "unspecified epidemic" therefore was probably scurvy, which was believed by the Spanish at that time to be contagious and spread by human contact.

This leaves the 1775 expedition of the *Santiago* (under Bruno Hezeta) and *Sonora* (commanded by Juan Francisco de la Bodega y Quadra). Nathaniel Portlock believed that it was this voyage that brought smallpox to the coast; Warren Cook denies it,⁴⁴ however, as there is no mention of smallpox in any of the 1775 journals. The 1775 journals, like those of the 1774 and 1779 Spanish voyages, are replete with references to scurvy. It is possible, as a few passages from the journals of Frays Miguel Campa and Benito Sierra suggest, however, that there was a second disease on board the *Santiago*. On 22 July off the Oregon coast Campa stated, "Those sick with scurvy and other illnesses continue to increase daily"; on 31 August, at Monterey, a special hospital was constructed for the sick, who included "thirty-six suffering from scurvy alone. There are others with various ailments, bringing the number up to fifty."⁴⁵ On 2 November, off the southern

⁴³ Juan de la Bodega y Quadra, Expeditions in the Years 1775 + 1779 towards the West Coast of North America (typescript translation in the Royal British Columbia Archives, Victoria).

⁴⁴ Portlock (above, pp. 8-9) and W. Cook (ibid.), 80.

⁴⁵ Miguel de la Campa cos, *A Journal of Explorations Northward Along the Coast from Monterey in the Year 1775* (San Francisco, 1964), 46 + 59.

California coast, "Don Juan Perez, the second captain, died of typhus, after an illness of nine days."⁴⁶

Of all the Spanish expeditions, the 1775 voyage is the most likely candidate for the introduction of smallpox to the coast. The date is correct (the mean year for the six estimates of the first outbreak), and the voyagers encountered Indians at four separate locations along the coast (Trinidad Bay, Quinault River, Bucareli Bay, and Sea Lion Cove). Two of the locations were in the territory of the Tlingit, who suffered from the epidemic; the Quinault location is close to the Columbia and Puget sound, both foci of the initial outbreak; and Trinidad Bay (in the territory of the Yurok), though lacking in historical documentation, is fifty miles south of a village (the Point Saint George site, north of Crescent City) known, from archaeological evidence, to have been abandoned about this time (according to oral tradition) because of an "epidemic."⁴⁷

Plains origins

A third theory on the origins of the epidemic of the 1770s, popular with the trappers and traders of the Northwest and Hudson's Bay Companies in the early nineteenth century, was that smallpox spread to the Plateau region, and thence to the Coast itself, from the Great Plains. The oral traditions collected from Nez Perce, Flathead, and Kutenai in the later 1800s all suggest this route, as we have seen. Northwest Company employee Ross Cox gives the most complete description of the Plains-Plateau diffusion route, following.

About thirty years before this period⁴⁸ the small-pox had committed dreadful ravages among these Indians, the vestiges of which were still visible on the countenances of the elderly men and women. It is believed in the north-west that this disease was wilfully introduced by the American traders among the Indians of the Missouri, as a short and easy method of reducing their numbers, and thereby destroying in a great measure their hostility to the whites. The Americans throw the blame on the French; while they in turn deny the foul imputation, and broadly charge the Spaniards as the original delinquents. Be this as it may, the disease first proceeded from the banks of the Missouri . . . traveled with destructive rapidity as far

⁴⁶ Benito de la Sierra, "Fray Benito de la Sierra's account of the Hezeta expedition to the Northwest Coast in 1775" (*California Historical Society Quarterly* 9(3): 209-42, 1930), 238.

⁴⁷ Richard Gould, "Tolowa," pp. 128-36 in Robert Heizer (volume editor), *Handbook of North American Indians* volume 8: California (Washington, 1978), 135.

⁴⁸ "This period" was 1811, the year of the establishment of the Red River Colony in modern Manitoba. "Thirty years before" would be 1781.

north as Athabasca and the shores of the Great Slave Lake, crossed the Rocky Mountains at the sources of the Missouri, and having fastened its deadly venom on the Snake Indians, spread its devastating course to the northward and westward, until its frightful progress was arrested by the Pacific Ocean. Some of the old voyageurs who were stationed at English River and Athabasca, when this scourge made its first appearance, give the most harrowing details of its ravages. The unfortunate Indians, when in the height of the fever, would plunge into a river, which generally caused instant death; and thousands of the miserable wretches by suicide anticipated its fatal termination. Whole villages were depopulated.⁴⁹

The fur company employees were, indeed, eyewitnesses to this outbreak in the northeastern Plains, where they occupied a number of trading posts. For the northwest Plains, the assumed source of diffusion to the Plateau, there is an excellent account of the appearance of smallpox among the Blackfoot, given to Northwest Company explorer and geographer David Thompson by the Piegan informant Saukamappee in the winter of 1787-88. According to Saukamappee, at "the Stag River [probably the Red Deer River between Calgary and Edmonton] death came over us all, and swept more than half of us by the Smallpox, of which we knew nothing until it brought death among us. We caught it from the Snake Indians. . ."⁵⁰ The "Snake" in these accounts are assumed to be mounted Shoshonean Indians, who at this date ranged much further north than their historic location in the upper Snake River drainage of Idaho. The Snake, in turn, would have contracted smallpox from sources to the south, ultimately from the Pueblos, where, as we have seen in the quotation from Dobyns, there was a documented outbreak in 1781. The disease would have been transmitted to Plateau peoples (Nez Perce, Flathead, and Kutenai) from Snake and/or Blackfoot sources, in the Plains themselves, during the annual bison hunt.

It is notable that these extensive tribal contacts — Snake with Blackfoot, Plateau Indians with Plains Indians — were probably themselves the result of a recently adopted trait in the cultures of all the Indian groups involved, the horse. Francis Haines' historical research suggests, and local traditions support, a date of around 1730 for introduction of the horse to the Plateau, also from Shoshoneans to

⁴⁹ Ross Cox, *The Columbia River* (Norman, 1957), 169. See also John Dunn, *The Oregon Territory and the British North American Fur Trade* (Philadelphia, 1845), 84-85.

⁵⁰ David Thompson, *David Thompson's Narrative, 1784-1812* (edited by Richard Glover) (Toronto, 1962), 245-46.

the south.⁵¹ The annual Plains bison hunt probably began after the adoption of horse culture. Anastasio noted the dual factors of depletion of Plateau bison and increased mobility provided by horses as possible motivators for the Plains hunt.⁵²

POPULATION DECLINE FROM THE EPIDEMIC OF THE LATE 1770S

One particularly difficult issue concerning the epidemic of the 1770s is the extent of depopulation it caused among the Native Americans of the Northwest. Several of the above accounts, in particular those collected from Indian informants, indicate sizable mortalities. For instance: "He told me that the distemper carried off great numbers of the inhabitants" (Portlock: Tlingit); "According to Saigakakh . . . there were only one or two persons left in each family." (Khlebnikov: Tlingit); "by Kowes' account, the small Pox swept off two thirds of the people scarcely any that were affected survived." (Bishop: Haida); "the small-pox made great ravages among them . . . it almost destroyed their country." (Green: North Coast); "Immense numbers of them were swept off by a dreadful visitation of the smallpox." (Work: Colville); "Very few surviving the attack of the disease." (Smith: Nez Perce); "a devastating plague in a very few days killed everyone . . . in a camp . . . with the exception of fifteen . . . the epidemic destroyed another entire nation." (Mengarini: Flathead); "a small tribe called Tunaha . . . was nearly exterminated." (Curtis: Kutenai); "they all died . . . the Clatsops inform us that this disorder raged in their towns and destroyed their nation." (Clark: Chinookans); "several villages were completely wiped out, while all suffered losses." (Suttles: Straits); "So great was the mortality . . . it was impossible for the survivors to bury the dead." (Curtis: Kwakwaka-wakw)

The above accounts, collected independently from all parts of the Northwest, agree that the demographic impact of the epidemic was considerable. But they do not provide *specific* information — on exact mortalities, villages abandoned, etc. The lack of specific data has caused some historians to adopt a sceptical viewpoint concerning the demographic effects of the epidemic. Historian Robin Fisher, for

⁵¹ Francis Haines, "The Northward Spread of Horses among the Plains Indians" (*American Anthropologist* 40: 429-37, 1938), and George Suckley, "Report on the Fauna and Medical Topography of Washington Territory" (*Transactions of the American Medical Association* 10: 183-217, 1857), 199.

⁵² Angelo Anastasio, "The Southern Plateau: An Ecological Analysis of Intergroup Relations" (*Northwest Anthropological Research Notes* 6(2), 1972), 109-229.

instance, in his critically acclaimed *Contact and Conflict: Indian-European Relations in British Columbia, 1774-1890* (1977) questions the extent of population decline among the Indians of the northern Northwest Coast in the first century of contact on a number of grounds, as follows:

the absence of accurate figures makes it impossible to determine exactly what happened to the Indian population during this period, but it is possible that estimates of the impact of disease have been exaggerated. . . . The journals do not contain numerous accounts of wholesale depopulation resulting from smallpox. . . . Frequently, the contemporary comments about population decline were based on the observation of deserted villages . . . villages were clearly abandoned for a number of reasons. . . . The demographer Norma McArthur has questioned the assumption that European diseases caused wholesale depopulation. She has argued that for an epidemic to initiate substantial decline in a previously stable population, age-selective mortality is a pre-requisite. . . .⁵³

Fisher makes a number of important points. His discussion isolates three lines of evidence that should be addressed in any discussion of population decline from the epidemic of the late 1770s: population statistics, abandoned villages, and comparative epidemiological and demographic evidence. I will deal with each one of these points in the following pages.

Population statistics

The first point is easily dealt with. Fisher is right: there are no statistics on decline from the epidemic of the 1770s. Nor should we expect to find them. Lacking a reference point in pre-epidemic population sizes, late eighteenth century observers were not in a position to make statistical statements on population decline. There are also no good estimates on total populations. Since the earliest chroniclers were explorers and traders who were not resident in the area for extended periods, they did not undertake head counts of any units larger than villages. Population estimates before Lewis and Clark (1805-06) were crude, based on methods such as house counts, extrapolation from canoe numbers and sizes, and mere "eyeballing."⁵⁴

⁵³ Robin Fisher, *Contact and Conflict: Indian-European Relations in British Columbia, 1774-1890*. (Vancouver, 1977), 21-22.

⁵⁴ Robert Boyd, *The Introduction of Infectious Diseases among the Indians of the Pacific Northwest, 1774-1874*. (unpublished Ph.D. dissertation, University of Washington, 1985), chapter 5.

But this does not mean that statistical evidence is lacking. There are two lines of evidence here, both comparative. First, as noted earlier in the quotation from Henry Dobyns (pp. 16-17), the Northwest outbreak may have been part of a larger epidemic which affected Native American populations throughout western North America. And there are figures from other subregions of the West, which, though varying widely in reliability, give an impression of general magnitude of loss. Dobyns cites some of these figures: a sample includes the following: Baja California $\frac{1}{3}$ loss, 5,025 among the northern Pueblos, over half the Blackfoot, $\frac{3}{5}$ among the Cree, and a similar figure throughout the northern Plains; nearly 90 per cent of the Chipewyan.⁵⁵ Other figures appear in Stearn and Stearn's survey volume *The Effect of Smallpox on the Destiny of the American Indian* (Boston, 1945).

Secondly, there are well-documented statistics on population decline associated with later epidemics among Pacific Northwest Native Americans. For the post-1824 period we have several generally overlooked enumerations made by the Hudson's Bay Company and by early governmental officials. It is now possible to say with a considerable degree of confidence, for instance, that Chinookan and Kalapuyan populations in the "fever and ague" focal area declined by nearly 13,000 (92 per cent) in the decade between 1830 and 1841; that the mortality from the 1836-38 smallpox epidemic in the Alaska Panhandle and northern mainland British Columbia was around 10,000; and that 20,000 Indian lives (62 per cent) were lost in British Columbia as a result of the 1862-63 smallpox epidemic.⁵⁶

Earlier in this paper I cited the data on genetic susceptibility of American Indians to viral diseases and the average figure of 30 per

⁵⁵ Baja: Homer Aschmann, *The Central Desert of Baja California: Demography and Ecology (Ibero-Americana 42, 1957)*, 188; northern Pueblos: Marc Simmons, "History of Pueblo-Spanish Relations to 1821," pp. 178-93 in Alfonso Ortiz (volume editor), *Handbook of North American Indians* volume 9: Southwest (Washington, 1979), 192; Blackfoot: David Thompson (*ibid.*), 245; Cree and Chipewyan: James Smith, "Western Woods Cree" and "Chipewyan," pp. 256-70 and 271-84 in June Helm (volume editor), *Handbook of North American Indians* volume 6: Subarctic (Washington, 1981), Northern Plains: Henry Dobyns, Introduction to "Essays on the Historic Epidemiology of Native American Peoples" (manuscript, 1983); overview: E. Wagner and Allen E. Stearn, *The Effect of Smallpox on the Destiny of the American Indian* (Boston, 1945).

⁵⁶ All statistics are from Robert Boyd, "Demographic History, 1774-1874," pp. 135-48 in Wayne Suttles (volume editor), *Handbook of North American Indians* volume 7: Northwest Coast (Washington, 1990). They have been computed from several contemporary before and after population estimates and censuses, mostly from the Hudson's Bay Company. See also James Gibson, "Smallpox on the Northwest Coast, 1835-1838" (*BC Studies* 56: 61-81, 1982), 72 and Wilson Duff, *The Indian History of British Columbia* volume 1: *The Impact of the White Man (Anthropology in British Columbia Memoir 5, 1964)*, 43 for independently derived loss estimates.

cent mortality from *Variola major* epidemics in non-immune populations. The comparative loss figures for the epidemic of the 1700s in other parts of the west uniformly exceed the 30 per cent average. Similarly, the quoted losses from later important epidemics in the Pacific Northwest are also greater than this average. There is therefore nothing in the comparative literature to suggest that mortality from virgin soil Northwest smallpox in the late 1770s was less than 30 per cent; indeed, it is more likely that it was greater.

The problem of "abandoned villages"

As Fisher notes, several early chroniclers commented on the presence of abandoned villages, but none gave a definitive reason for their abandonment. There is a cluster of such references in the primary ethnohistorical literature from the late eighteenth century post-epidemic central and north coasts, and it behooves us to examine it closely.

It is important to emphasize that the first chroniclers were not present at the time the villages were being abandoned; they uniformly arrived well after the fact. Not speaking the native languages, they were unable to determine by questioning informants the reasons for abandonment. They therefore offered a number of hypotheses to explain why the settlements had been emptied. The list included disease mortality, seasonal movement, warfare, famine, and even abandonment for hygienic reasons.

The earliest of the passages comes from the manuscript journal of James Colnett, from the Queen Charlotte Islands (Haida):

15/8/88

"Around where we lay were remains of numbers of dwellings + many corps laying in Boxes; the decay of Both habitations + coffins, was nearly equal, + the time of quitting the place must have been when the mortality happened. This desertion might be accounted for several ways, first after a Battle and defeated [*sic*] or a severe winter + perish'd by Famine, by the fish quitting the Ground. . .⁵⁷

Colnett assumed that apparent contemporaneity of abandonment of houses and coffins implied a "mortality;" simple population movement was ruled out. His hypothesized reasons for this "mortality" are, anthropologically speaking, sound. A failure of fish runs and consequent famine is possible in light of what is known about aboriginal Northwest subsistence. Particularly in the interior and north, where

⁵⁷ James Colnett, Journal Prince of Wales [1788] (microfilm A250, Suzzallo Library, University of Washington).

the food base was not as diverse as in the south, failure of a few key resources may indeed have led to famine.⁵⁸ "mortality . . . after a Battle and defeated" is also possible, particularly for the North Coast, where pitched battles with considerable mortalities are well established for the late prehistoric (before 1774) and early contact periods.⁵⁹ But Colnett does not consider disease mortality.

Most of the mentions of abandoned villages come from the various journals of the 1792-94 Vancouver Expedition. Vancouver and several of the members of his party entered Northwest waters with an epidemic depopulation hypothesis of their own already formed — they were aware of the havoc caused by imported diseases among the Indians of Mexico — and they were also familiar with Portlock's statement on smallpox among the Tlingit (pp. 8-9, previous). And their worst suspicions seemed to be confirmed by the number of apparently abandoned villages they encountered in Puget Sound, the Strait of Georgia, and the Inland Passage. Nevertheless, every statement as to the reason for this apparent depopulation was presented with the utmost caution, as the following passage from Archibald Menzies shows:

[Strait of Georgia]

but if they might judge from the deserted villages they met in this excursion, the Country appeared to be formerly much more numerously inhabited than at present, tho' they could form no conjecture or opinion on the cause of this apparent depopulation which had not an equal chance of proving fallacious, from their circumscribed knowledge of the manners and modes of living of the inhabitants.⁶⁰

As the early explorers were uncertain to ascribe reasons to the abandoned villages, so have been contemporary ethnographers. Erna Gunther, for one, apparently changed her mind on this problem over forty-five years' familiarity with the coast. In 1927 she dismissed Vancouver's observations on empty villages in the Strait of Juan de Fuca thusly: "As to the general uninhabited condition of the shore, Vancouver probably passed at a time when the Klallam were away on

⁵⁸ See Wayne Suttles, "Coping With Abundance: Subsistence on the Northwest Coast," pp. 56-68 in Richard Lee and Irven DeVore (editors), *Man the Hunter* (Chicago, 1968), and Robert Boyd, 1990 (*ibid.*), 136.

⁵⁹ The definitive treatment of North Coast warfare is Brian Ferguson's "A Reexamination of the causes of Northwest Coast Warfare," pp. 267-328 in Ferguson (editor), *Warfare, Culture, and Environment* (Orlando, 1984).

⁶⁰ Menzies (*ibid.*), 63.

food-gathering expeditions.”⁶¹ In 1972, however, referring to a site at Port Discovery on the eastern end of the Strait, she stated:

Vancouver found a deserted village site that could have been occupied by about one hundred persons in houses of Nootka style, where human bones were lying in the weeds. There were many epidemics of new diseases like measles and smallpox that were not recorded and a small community could be so reduced in numbers that the survivors fled, leaving the dead unburied.⁶²

Vancouver’s description of the Port Discovery abandoned village is, along with Peter Puget’s account of the empty village on Homfray Channel (Klahoose Salish area), one of the most complete in the literature. Both are reproduced below.

2/5/92, Port Discovery

We landed not far from the large rivulet, where we found a deserted village capable of containing a hundred inhabitants. The houses were built after the Nootka fashion, but did not seem to have been lately the residence of Indians. The habitations had fallen into decay; their insides, as well as a small surrounding space that appeared to have been formerly occupied, were much overrun with weeds amongst which were found several human skulls . . . other bones, promiscuously scattered about.⁶³

28/6/92, Homfray Channel

“this Village was built . . . on the top of a Rock . . . this Rock by its size was once I have no Doubt the Residence of about Three Hundred People. . . . This Village must have been deserted some time for the Houses were in such condition shattered and broken, that it was almost impossible to distinguish the one from the other. . . . The village is composed of three Distinct Buildings, each Row being divided by a Lane of Passage in which was an astonishing Quantity of Filth and dirt, with a very offensive smell. . . . Their Domestic utensils were in the Houses and some Carcasses of Dogs were found among the Ruins — from these circumstances, may we not infer that the Inhabitants were driven from the Village instead of making a voluntary Retreat or else why leave behind their materials for building the formation of which must be attended with infinite Labour to them; but what still more

⁶¹ Erna Gunther, *Klallam Ethnography* (*University of Washington Publications in Anthropology* 1: 171-314, 1927), 177.

⁶² Erna Gunther (op. cit.), 76.

⁶³ Vancouver (ibid.), 229.

Strengthened the above opinion in my mind, were the Carcasses of the Dogs, for I have always perceived these Animals to be highly caressed [*sic*] by the Indians, as the only domesticated Creature in their Possession, and whenever a Remove took Place, the Dogs were always considered as part of the Family.⁶⁴

Both of these villages had been abandoned for a length of time and in such a manner that would seem to rule out seasonal movement as an explanation. Warfare is a strong possibility in each instance. Indeed, the Chemakum, the aboriginal inhabitants of the Port Discovery area, were described by an early ethnographer as being "very pugnacious. [They] have been successively engaged in wars with the Makah, Klallum, Toan huch, Snohomish, and Dwamish in all of which [they] suffered severely."⁶⁵ An early missionary, however, was told in 1887 by survivors "that their diminution was caused by small pox."⁶⁶ Puget favours a warfare hypothesis to explain the deserted Homfray Channel village; Menzies thought the people left because of garbage and vermin; neither entertained the possibility of abandonment due to disease.⁶⁷

The last two passages concerning abandoned villages in the Vancouver Expedition journals date from 1793 and 1794, in the Coast Tsimshian and Stikine Tlingit areas, respectively.

19/9/93

From Restoration Bay [mouth of Burke Channel] to Salmon Bay [mouth of the Nass] in the Inland parts are few inhabitants at least our Boats found that Country nearly deserted . . . if we may judge from the Numerous villages which bound this + many other parts of the Inland Navigation + which now are left to decay, it is to be supposed that it was once the principal Retreat of the NW Americans.⁶⁸

August 1794, Kupreanof Island area

this branch about a mile wide stretched about 5 miles in an eastwardly direction . . . the remains of no less than eight deserted villages were seen; some of them were more decayed than the others. . . . In the vicinity of these ruins were many sepulchres of tombs . . . of different sizes, and some of them contained more

⁶⁴ Puget (*ibid.*).

⁶⁵ George Gibbs, *Tribes of Western Washington and Northwest Oregon (Contributions to North American Ethnology I, 1877)*, 177.

⁶⁶ Myron Eells, "The Twana, Chemakum and Klallam Indians of Washington Territory" (*Smithsonian Institution Annual Report for 1887*, pp. 605-81, 1889), 607.

⁶⁷ Menzies (*ibid.*), 66-68.

⁶⁸ Peter Puget, *Journal [1793]* (microfilm no. 274, Suzzallo Library, University of Washington).

bodies than the others; in the largest there were not more than four or five. . . . Many of these sacred monuments seem to have been erected a great length of time.⁶⁹

Similar passages describing deserted villages may be found in the 1793 journals of Johnstone in Puget (27/7; Skeena Tsimshian) and Menzies and Puget (11/8; Clarence Strait Tlingit).

Taken in isolation, these passages suggest a disease hypothesis, but cases can also be made for warfare, famine, seasonal movement, or various combinations of these factors. The sources, it must be admitted, are equivocal on causes, but the clustering of passages does seem to indicate a pattern. Again, comparative evidence is useful. At what other times and places do similar patterns occur? From the Pacific Northwest itself there are several such "horizons," both archaeological and historical. One has already been mentioned — the archaeological horizon from the early 1500s, which has been hypothesized, like other post-1492 horizons elsewhere in North America — to represent epidemic depopulation.⁷⁰ Historically, for the first two-thirds of the nineteenth century in the Pacific Northwest, there are several such clusters of references to abandoned villages, and, significantly, all date to post-epidemic time frames. Two of the most notable occurred on the lower Columbia River in the 1830s and 1840s, and in northern British Columbia in the 1860s and 1870s. In the "Wappato Valley" (roughly equivalent to the geographers' "Portland Basin") the dozen plus villages noted by Lewis and Clark (1805-06) and Robert Stuart (1811) were reduced to one by the late thirties. Contemporary accounts describe the abandoned villages and cemeteries associated with them and ascribe them to the "fever and ague."⁷¹ For the period following the great British Columbia smallpox epidemic of 1862-63, there are copious records, both historic and ethnographic, of abandonment of traditional village sites and consolidation of survivors into a few remaining settlements. The most dramatic of these records come from the Haida of the Queen Charlotte and southern Prince of Wales Islands, where more than nineteen mid-nineteenth century villages diminished to four (of equivalent size) by the early twentieth cen-

⁶⁹ James Johnstone in Vancouver (ibid.), III: 289.

⁷⁰ Campbell 1989 and Ramenofsky 1982; discussion in appendix.

⁷¹ Two particularly explicit accounts are Norbert Blanchet at Clackamas village, May 6, 1841, in Carl Landerholm, *Notices and Voyages of the Famed Quebec Mission to the Pacific Northwest* (Portland, 1956), 84; and Edward Belcher at Mount Coffin and Coffin Rock, Chinookan cemeteries near the mouth of the Cowlitz in July 1839, Edward Belcher, *Narrative of a Voyage Round the World, performed in Her Majesty's Ship Sulphur, during the years 1836-1842* (London, 1843), 292-93.

tury.⁷² The journals of visitors to the Charlottes in the 1870s and 1880s are replete with references to abandoned or nearly deserted village sites and groups of untended memorial poles.⁷³ This comparative evidence suggests that the cluster of references to abandoned villages in the 1780s and 1790s represents a similar phenomenon. Probable support for this argument is John Draper's archaeological survey of the southern Oregon coast, which demonstrated village abandonment in the 1770s.⁷⁴ Although other explanations cannot be eliminated, it seems likely that the early Central and North Coast explorers were witnessing evidence of mortality from the smallpox epidemic of the late 1770s.

Robin Fisher's scepticism concerning the extent and demographic impact of the earliest historically recorded smallpox epidemics is understandable, given the state of knowledge in 1977, when his critique was written.⁷⁵ Although more evidence is needed, and the hypothesis should be further tested in the future, what we now know about the epidemic of the late 1770s indicates that it was region-wide, and had a considerable demographic impact. Placed in the larger context of the first century of contact in the Pacific Northwest (1774-1874), the first smallpox outbreak initiated an ongoing process of disease introduction, demographic decline, and cultural upset that facilitated the eventual submission of the indigenous populations and cultures to the invading Euroamericans. Only in the present century have Northwest Native American populations begun to recover from the onslaught of exotic infectious diseases which began with the smallpox epidemic of the 1770s.

⁷² Robert Boyd, "Population Decline from Two Epidemics on the Northwest Coast" pp. 249-55 in *Disease and Demography in the Americas* (Washington, 1992).

⁷³ See, for instance, James Swan's diary for 1883 (University of Washington Archives, Seattle), Newton Chittenden's *Hyda Land and People: official report of the Exploration of the Queen Charlotte Islands for the Government of British Columbia* (Victoria, 1884), and George Dawson's "On the Haida Indians of the Queen Charlotte Islands." pp. 103-71 in *Report of Progress for 1878-79, Geological Survey of Canada* (Montreal, 1880).

⁷⁴ See appendix.

⁷⁵ It should also be pointed out that Fisher's citation of Norma McArthur on Polynesian populations, quoted above, is misleading. Population decline (regular, measurable on a year-by-year basis) may indeed be initiated by age-selective mortality. But Northwest Native American population decline during the pre-settlement period was of a different nature. Depopulation as documented for the Northwest was (using the contemporary evolutionary term) "punctuated" (or episodic), associated mostly with major disease events, and was cumulative. In the years following initial contact, Polynesian depopulation was also considerable and, as in the Pacific Northwest, primarily the result of mortality from sequential epidemics. This is apparent from both McArthur (*Island Populations of the Pacific*, Canberra 1967) and recent demographic studies of Hawaii (e.g. Robert Schmitt, *Demographic Statistics of Hawaii: 1778-1965*, Honolulu 1968). Contemporary historical demographic studies of Polynesia tend to support, not question, the depopulation hypothesis for the Pacific Northwest.

EPILOGUE

Epidemic smallpox would reappear among Pacific Northwest Indians at least four more times (circa 1801-02, 1836-38, 1853, and 1862-63) in the next century, dependent upon the dual epidemiological requirements of introduction from the outside and presence of a large enough pool of non-immune susceptibles. It was a generation after the 1770s before these conditions were met again. The 1801-02 smallpox epidemic, on present evidence, was certainly introduced from the Plains, and affected only the peoples of the central coast. Lewis and Clark (for Chinookans) verify the year of the second outbreak (Moulton 1990: 285-86), while John Work, speaking in 1829 for Nez Perces district peoples, noted two early outbreaks, "about ten years" apart (op. cit.), and Asa Smith, for Nez Perce, dated a second epidemic to "two years after" [*sic*; probably "before"] Lewis and Clark (op. cit.: 137). Several ethnographic sources suggest that this outbreak was also present among Salishan peoples. Teit (1900: 176, 1930: 212, 315-36, on interior Salish), Elmendorf (1960: 272 on Olympic Peninsula and Vancouver Island Salish), and Jenness (1955: 34, on Sto:lo, dated by Duff 1952: 28) all describe an epidemic which they date to the first decade of the 1800s.⁷⁶

⁷⁶ The sources are James Teit, The Thompson Indians of British Columbia (*Memoirs of the American Museum of Natural History* 2(4): 163-392) and The Salishan Tribes of the Western Plateaus (45th *Annual Report of the Bureau of American Ethnology*: 23-396); William Elmendorf, The Structure of Twana Culture (Washington State University Research Studies 28(3)); Diamond Jenness, The Faith of a Coast Salish Indian (*Anthropology in British Columbia Memoir* 3); and Wilson Duff, the Upper Sto:lo Indians of the Fraser Valley (*ibid.*, *Memoir* 1).

APPENDIX

Overview of Research on Post-Columbian Disease and Depopulation

I: THE HEMISPHERE

In early November 1989, the Smithsonian Institution sponsored a symposium, "Disease and Demography in the Americas: Changing Patterns Before and After 1492," one of several in a series commemorating the quincentenary of Columbus's discovery of the Americas. A major concern of the symposium was the problem of the post-Columbian introduction of Old World infectious diseases into the Western Hemisphere, and the contribution of these diseases to the depopulation of the American Indian. Participants presented papers summarizing current research in several subregions of the Americas. Despite the fact that the researchers came from several disciplines (archaeology, physical anthropology, ethnohistory, and history were represented), employed several diverse methodologies, and quibbled over details such as disease identification and magnitude of population decline, a consensus was apparent. It is now clear that most highly infectious crowd-type diseases such as smallpox, measles, and influenza, as well as vector-carried ailments including malaria and yellow fever, were introduced to the Americas after Columbus (tuberculosis and syphilis were native), and that the mortality associated with their appearance led to what has been aptly called "the greatest demographic disaster in the history of the world."¹

Research in the "disease and depopulation" problem in the Americas is primarily recent, with most publications post-dating 1966. Prominent names in the field include Henry Dobyns (among anthropologists) and Alfred Crosby and William McNeill (in history). Dobyns' 1966 "Estimating Aboriginal American Population: An Appraisal of Techniques with a New Hemispheric Estimate" (*Current Anthropology* 7: 395-416), with its controversial hypothesis that the Native American population may have declined by as much as 95 per cent after four centuries of contact, largely due to mortality from imported diseases, provoked much of the ensuing research on the

¹ William Denevan, "Introduction" to *The Native Population of the Americas in 1492* (Madison, 1976), 7. For lists of indigenous American versus imported Old World diseases see Marshall Newman, "Aboriginal New World Epidemiology and Medical Care, and the Impact of Old World Disease Imports" (*American Journal of Physical Anthropology* 45: 667-72, 1976). Two recent studies by physical anthropologists which present the paleopathological evidence for pre-Columbian tuberculosis and syphilis are Jane Buikstra (ed.), *Prehistoric Tuberculosis in the Americas* (Evanston, 1981) and Brenda Baker and George Armelagos, "The Origin and Antiquity of Syphilis: Paleopathological Diagnosis and Interpretation" (*Current Anthropology* 29: 703-37, 1988).

problem. "Conquistadore y Pestilencia," chapter 2 of Alfred Crosby's 1972 *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport), a lucid exposition of the process of transoceanic disease transfer and of the first smallpox "pandemic," which spread through the Americas following Cortez' conquest of Mexico, has been widely read by both historians and anthropologists. The "disease and depopulation" hypothesis for the Americas was introduced to mainstream historical thought in chapter 5, "Transoceanic Exchanges, 1500-1700," of William McNeill's award-winning 1976 *Plagues and Peoples* (Garden City). All three authors have written extensively on the "disease and depopulation" topic.

There is now a sizeable literature detailing the post-Columbian disease and demographic history of major segments of the New World, particularly the northern regions of Spanish America, the southeast United States, and the Great Plains. A select list of works published in the last twenty years would include: 1) Spanish America; Sherburne Cook and William Borah's *Essays in Population History, Mexico and the Caribbean* (two volumes, Berkeley, 1971-74), Noble David Cook's *Demographic Collapse: Indian Peru, 1520-1620* (New York, 1981), Daniel Reff's *Disease, Depopulation and Culture Change in Northwestern New Spain, 1518-1764* (Salt Lake City, 1991), and Robert Jackson's "Epidemic Disease and Population Decline in the Baja California Missions, 1697-1834" (*Southern California Quarterly* 63(4): 308-46, 1981); 2) Southeast: Henry Dobyns' *Their Number Became Thinned: Native American population dynamics in eastern North America* (Knoxville, 1983), and Marvin Smith's *Archaeology of Aboriginal Culture Change in the Interior Southeast: depopulation during the early historic period* (Gainesville, 1987); 3) Plains: John Ewers' "The Influence of Epidemics on the Indian Populations and Cultures of Texas" (*Plains Anthropologist* 18: 104-15, 1973), Arthur Ray's "Migrations, epidemics and population changes, 1763-1821," chapter 5 of *Indians in the Fur Trade: their role as trappers, hunters, and middlemen in the lands southwest of Hudson Bay, 1660-1870* (Toronto, 1974) and "Diffusion of Diseases in the Western Interior of Canada, 1830-1850" (*Geographical Review* 66(2): 139-57, 1976), and Michael Trimble's "Chronology of Epidemics among Plains Village Horticulturalists: 1738-1838" (*Southwestern Lore* 54(4): 4-31, 1988).

II: THE PACIFIC NORTHWEST

In the Pacific Northwest, research on disease and depopulation was spotty and piecemeal until 1982. Among Northwest anthropologists, a

concern with the cultural effects of epidemic depopulation began in the 1950s when Helen Codere hypothesized that rapid population decline influenced historical changes in mid-nineteenth century Kwakwaka'wakw potlatching, and David Aberle suggested that epidemics were a factor in the rise of several post-contact nativistic religions.² Early works dealing with introduced diseases themselves include a series of articles on the "fever and ague" epidemics of the lower Columbia, Wilson Duff's summary of the disease and population history of Native British Columbia, and a few papers on the important smallpox epidemics of 1836-38 and 1862-63 on the North Coast.³

But the most important work on the disease and depopulation hypothesis itself in the Northwest dates from 1982, and is contained in four doctoral dissertations written at Washington State universities. Three of these are by archaeologists; one employs ethnohistorical methods. Two are concerned with the archaeological identification of epidemic episodes in the period between 1492 and the initiation of direct White contact (in the Pacific Northwest, the relevant cut-off date is 1774); two are concerned with post-1774 disease and depopulation in the region.

In the first category is Ann Ramenofsky's 1982 "Disease and the Archaeology of Population Collapse: Native American Response to European Contact" (Washington).⁴ While not dealing with the Pacific Northwest per se, Ramenofsky presented evidence from three other regions of North America in support of the hypothesis that several post-1492 "horizons" (discontinuities in archaeological sequences) could be explained as manifestations of epidemic depopulation.

In a 1989 dissertation, Sarah Campbell⁵ undertook a test of the Ramenofsky hypothesis in a limited area of the middle Columbia

² Helen Codere, *Fighting with Property: a study of Kwakiutl potlatching and warfare, 1792-1930* (*American Ethnological Society Monograph* 18, 1950) and David Aberle, "The Prophet Dance and Reactions to White Contact" (*Southwestern Journal of Anthropology* 15: 74-83, 1959).

³ Sherburne Cook, "The Epidemic of 1830-33 in California and Oregon" (*University of California Publications in American Archaeology and Ethnology* 43(3): 303-26, 1955), Herbert Taylor and Lester Hoaglin, "The Intermittent Fever Epidemic of the 1830s on the Lower Columbia River" (*Ethnohistory* 9: 160-78, 1962), and Robert Boyd, "Another Look at the 'Fever and Ague' of Western Oregon" (*Ethnohistory* 22: 135-54, 1975). Wilson Duff, *The Indian History of British Columbia* volume 1: *The Impact of the White Man* (*Anthropology in British Columbia Memoir* 5, 1964). James Gibson, "Smallpox on the Northwest Coast, 1835-1838" (*BC Studies* 56: 61-81, 1982) and Andrew Yarmie, "Smallpox and the British Columbia Indians: epidemic of 1862" (*British Columbia Library Quarterly* 31(3): 13-21, 1968).

⁴ Published in 1987 as *Vectors of Death: the Archaeology of European Contact* (Albuquerque).

⁵ Sarah Campbell, *Postcolumbian Culture History in the Northern Columbia Plateau, A.D. 1500-1900* (University of Washington). Published in 1990 by Garland Press (New York).

River basin and found evidence for considerable depopulation in the early 1500s, which she hypothesized was due to the smallpox "pandemic" which spread throughout much of the hemisphere after its introduction to the American mainland with Cortez in 1519. Campbell's conclusions are provocative, and have many implications for ensuing Northwest Native American culture history if they are true. But at this time it is not yet possible to eliminate other, non-epidemic reasons for the perceived archaeological discontinuity. The hypothesis needs to be tested in other parts of the Pacific Northwest before we can accept an early 1500s epidemic in the region as fact.

The third of the archaeological dissertations (Draper 1989)⁶ assembled evidence which demonstrated a major shift in settlement and subsistence patterns on the southern Oregon coast in the late 1700s, the time of the first historically recorded Pacific Northwest smallpox epidemic.

Ethnohistorical evidence for the smallpox epidemic of the late 1770s, as well as reconstructions of two later epidemics and summaries of post-contact depopulation in three subregions of the Northwest, appear in Robert Boyd's 1985 dissertation, "The Introduction of Infectious Diseases among the Indians of the Pacific Northwest, 1774-1874" (Washington). A summary chapter in the 1990 Northwest Coast volume No. 7 of the *Handbook of North American Indians* presents a narrative chronology of important epidemics and discusses the process of population decline in several "epidemic areas" of the Northwest.⁷

As of 1993, the state of knowledge on the sequence of epidemic outbreaks among Native Americans in our region includes the following:

CIRCA 1520S (STILL HYPOTHETICAL)

smallpox epidemic (Campbell 1989, based on archaeological evidence from the middle Columbia), probably part of Henry Dobyns' hypothesized "pandemic," which began in Hispaniola, spread with Cortez to Mexico, and from thence south and north to the rest of the Americas (see Crosby 1972 chapter 2 for a summary)

CIRCA 1775-1781

smallpox epidemic: region-wide, according to several ethnohistorical references, and probably related to the early 1780s epidemic which spread through most of the middle section of North America (see Dobyns 1966: 441)

⁶ John Draper, A Proposed Model of late Prehistoric Settlement Systems on the Southern Northwest Coast, Coos and Curry Counties, Oregon (Washington State University).

⁷ Both sources *ibid*.

CIRCA 1801-02

smallpox epidemic: central coast, with mortality less than its predecessor

1824-25

an unidentified "mortality" (perhaps smallpox), throughout most of the Columbia River drainage

1830 FOLLOWING

the "fever and ague" or "intermittent fever" epidemics of the lower Columbia River drainage. Annual outbreaks of a high-mortality disease now generally accepted as "virgin soil" malaria (see S. Cook 1955, Boyd 1975).

1836-38

smallpox epidemic: most of Alaska, northern British Columbia, northern California and southwest Oregon (but not the intervening central coast), no demonstrable tie to the well-known 1838 Plains epidemic (see Gibson 1982).

1840 FOLLOWING

several localized outbreaks of introduced diseases (chicken pox, whooping cough, dysentery, etc.) along the overland migration route from the United States (see Boyd in press b)⁸.

1847-48

measles epidemic: transmitted from central California to the mid-Columbia; spread from there down the river and up the coast to Alaska (Boyd in press a)⁹.

1853

smallpox epidemic, central coast

1862-63

major smallpox epidemic, British Columbia

⁸ The forthcoming papers are: Robert Boyd, "The 1847-1848 Pacific Northwest Measles Epidemic" (*Oregon Historical Quarterly* 95(1), 1994); and "The Columbia River as a Corridor for Disease Introduction: 'New Diseases' of the 1840s in the Pacific Northwest" in William Lang and Robert Carriker (eds.), *Essays in Columbia River History and Culture* (University of Washington Press, in press).

⁹ Ibid.