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## Pacific Northwest Measles Epidemic of 1847-1848

Robert T. Boyd

*Portland State University*, rtboyd@pdx.edu

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# The Pacific Northwest Measles Epidemic of 1847–1848

By Robert Boyd



Fur traders and Indians at Fort Nez Percés (Walla Walla), 1841. This well-known drawing of the Hudson's Bay Company outpost (in what is now southeastern Washington) was done by Joseph Drayton of the Wilkes Expedition. (OHS neg. OrHi 964)

ROBERT BOYD is an anthropologist who specializes in the history of Northwest Coast Native peoples.

MOST STUDENTS of Pacific Northwest history are familiar with the 1847–48 measles epidemic because of its association with the killing of Marcus and Narcissa Whitman by Cayuse Indians, on November 29, 1847, at a missionary site some four miles west of present-day Walla Walla, Washington. It is also generally known that, prior to the violence, the epidemic had ravaged the Cayuse who then lived near

*A “new” disease  
and its crippling  
effect on the Pacific  
Northwest Native  
population at  
midcentury*

the Whitmans’ Waiilatpu Mission. And, finally, it has been widely thought that the disease was brought to the region by American migrants traveling over the Oregon Trail.

This relatively well-known story about what has come to be known as the Whitman Massacre is neither complete nor altogether accurate. Clifford Drury, author of the definitive book on the Whitmans, has written that the measles epidemic was the “final precipitating cause” of the missionaries’ deaths.<sup>1</sup> While the supposed roles of Catholics and the Hudson’s Bay Company in the incident have been discredited for some time, Drury’s 1973 book relegated other “contributing” factors, such as the Cayuse fear of losing their land to the immigrants and the rumor-mongering of the disaffected Delaware Indian, Joe Lewis, to secondary status as causes of the violence.<sup>2</sup>

The measles epidemic of 1847–48 was not limited to the Cayuse Indians, nor indeed to Indians who inhabited lands along the overland route of the migrants. The disease spread from its focus, in the mid-Columbia region, northeast to the Indian peoples of the Columbia Plateau, downstream to Fort Vancouver and then south through the Willamette Valley, and north along the coast as far as Sitka (Alaska); it caused a significant mortality among most of the Indian peoples it touched. Furthermore, the epidemic was not, apparently, introduced to the Pacific Northwest by overland migrants. Measles was first recorded at Fort Nez Percés, at the junction of the Walla Walla and Columbia rivers, on July 23, two weeks before the arrival there of the vanguard of immigrants.<sup>3</sup> Indians themselves probably brought measles to the Pacific Northwest, and were likely the main agents of its spread through the Columbia Plateau. The immigrant trains, however, carried the disease down the Columbia to Vancouver, and whites were apparently the main agents of its diffusion up the Pacific Coast.

**T**HE 1847–48 MEASLES epidemic was a relatively late episode in the centuries-long spread of originally Old World diseases to the Indian peoples and populations of the Americas. After 1492, as part of what historians have called the “Columbian Exchange,” several high-mortality diseases were introduced to the Western Hemisphere. In addition to measles, smallpox, malaria, influenza, yellow fever, cholera, and other diseases came west; syphilis was the most notable American “contribution” to the disease pool of Europe, Asia, and Africa.<sup>4</sup>

Given their relative isolation, the peoples of the Pacific Northwest appear to have been spared the direful effects of most of these Old World diseases until actual physical contact with whites began in the 1770s. Although a recent archaeological study hypothesizes that the first great American smallpox epidemic, in the 1520s, may have penetrated the Pacific Northwest, there is no evidence for further disease introductions into the region until the late eighteenth century.<sup>5</sup> The diseases that entered the Pacific Northwest at that time were clearly introduced as a result of improvements in transportation and through contacts between populations. For example, the virus that caused the regionwide smallpox epidemic of the 1770s was brought either by Spanish ships that stopped along the coast, or by Indians who traveled over the Rockies on horseback (a European-derived transportation innovation), or both. The 1801–02 smallpox epidemic, which spread throughout the Columbia River drainage, definitely entered the region with Indian horsemen returning from the Great Plains.<sup>6</sup>

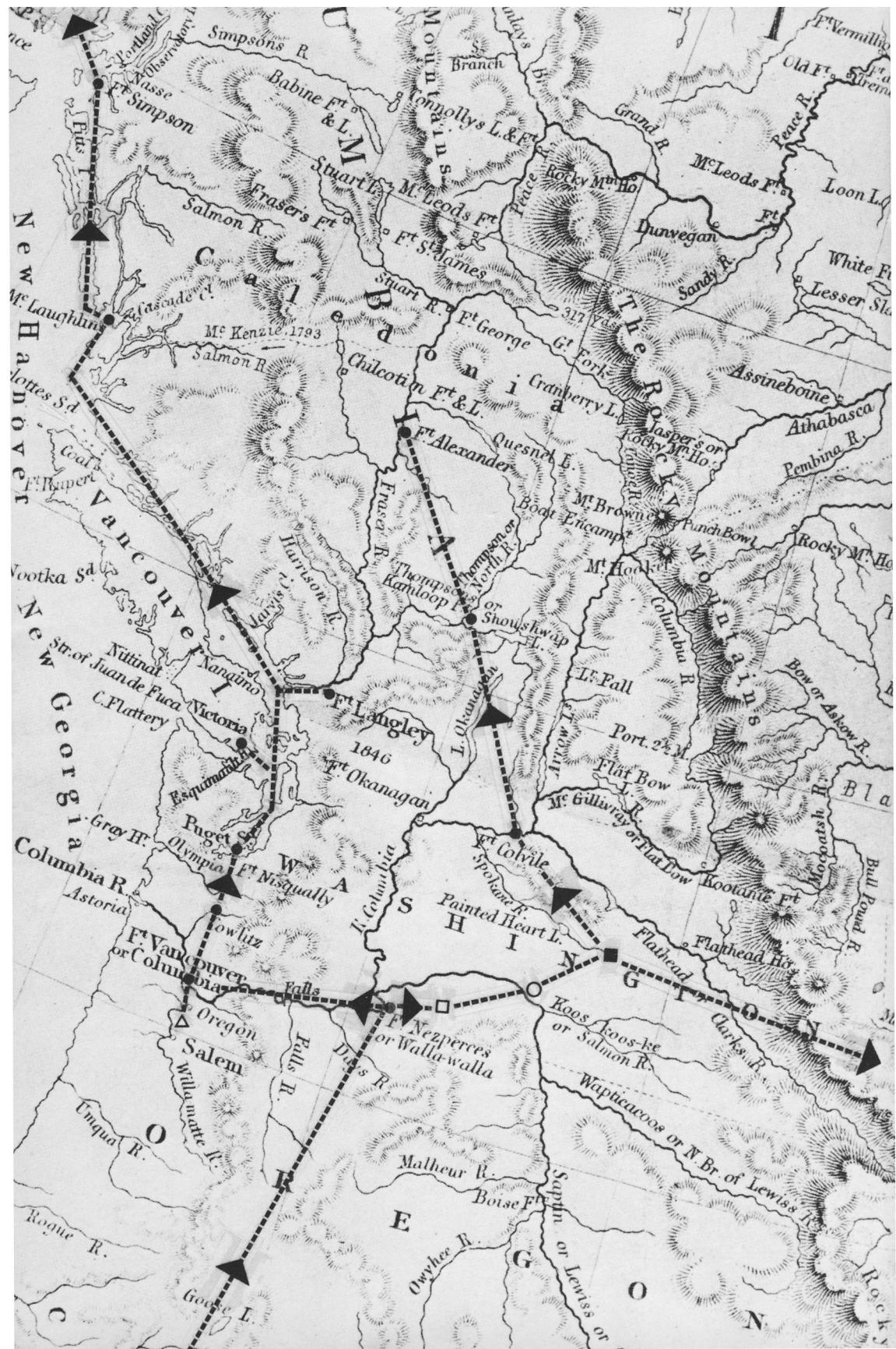
In the early nineteenth century, as the nature of contacts between Euro-Americans and Pacific Northwest Indians changed, more diseases entered the region. At permanently occupied trading posts, tuberculosis and venereal diseases took hold, and minor respiratory ailments, introduced by fur brigades or by sea contacts with densely populated areas, appeared regularly. In 1830 “fever and ague” (malaria) appeared and became established in the western valleys of Oregon. Between 1836 and 1839 influenza was epidemic in the central coast region and smallpox in the far north and south.<sup>7</sup>

A new class of ailments arrived with the overland migrations of the 1840s. The first Euro-Americans to come to the Pacific Northwest were almost exclusively male; after year-round settlements were established, they were joined by a few women who came from the states. No East Coast- or European-born children, with their characteristic inventory of childhood diseases, came to the Pacific Northwest before 1841.

The notable new diseases of the Pacific Northwest in the decade of the 1840s included several ailments that either were carried by children or disproportionately affected them. Chicken pox was first noted among Nez Perce and Cayuse Indians in the spring of 1840; scarlet fever appeared among the children of the Lapwai and Tshimakain (near Spokane) missions in the autumn of 1843; and whooping cough was epidemic at the Wascopam (The Dalles) Mission and points downstream in the winter of 1844.<sup>8</sup> Epidemic dysentery, apparently introduced by boat from Hawaii, was prevalent on the lower Columbia in the autumn of 1844.<sup>9</sup> Louse-born typhus ("camp fever") was a regular complaint among immigrants after 1845. Measles arrived in 1847, and smallpox reappeared in 1853. This list is interesting in that some of these diseases—for example, scarlet fever and typhus—apparently did not occur among Indians. The list is also interesting for the diseases it does *not* include. Cholera, though epidemic in the source areas for the migrations (e.g., the Mississippi Valley) throughout the decade, never spread to the Pacific Northwest.<sup>10</sup>

**M**EASLES ITSELF may have been present in the Pacific Northwest before 1847, but it was not definitely recorded until that year. Dr. Forbes Barclay, physician at Fort Vancouver in the 1840s, wrote: "The measles have been known to prevail in the Columbia in 1812—supposed to have been carried thither by the H. Bay Company Express from York factory where it prevailed at the same time."<sup>11</sup> Barclay's "1812" may be a transposition of 1821, the year that the Hudson's Bay Company formally entered the Pacific Northwest, and the terminal date for a measles outbreak that spread through central Canada.<sup>12</sup> In any case, no other citation in Pacific Northwest historical literature verifies either 1812 or 1821. An ambiguously identified "mortality" caused a notable population decline among Indians living along the banks of the Columbia in 1824–25, and was termed in some sources "smallpox"; but this may have been a lesser "spotted" disease, such as measles.<sup>13</sup> After the epidemic of 1847–48, measles again disappeared from Pacific Northwest Indian populations until 1868, when it spread north along the British Columbia coast.

Knowledge of a few clinical and epidemiological characteristics of measles is helpful in understanding the progress and impact of the 1847–48 epidemic. Measles is a viral disease, spread (usually via sneezing) by "droplet infection" to those in close contact



with infected individuals. Symptoms are preceded by an incubation period of approximately ten days, followed by a prodromal (precursory) period, with fever, of about three days, culminating in an average five days of rash. Communicability is greatest during the prodromal period and the first days of rash. Fatalities range up to 10 percent of those infected where care is inadequate, and mortality is typically heaviest among infants and very young children. Death is usually from a respiratory complication—generally pneumonia, sometimes influenza. Those who recover usually have life-long immunity to secondary attacks, but the disease is severe among adults who have no such acquired immunity.<sup>14</sup>

Because measles lasts for such a short period in each individual, and produces immunity in survivors, it follows that the disease requires a certain minimum population to be continually present without dying out. In a famous study of island populations, epidemiologist Francis Black determined that the pool of nonimmune susceptibles is large enough to maintain measles only when the total population exceeds approximately 300,000.<sup>15</sup> In populations below that number, according to Black's conclusions, susceptibles are too few and too widely spread, and measles dies out. After a period of absence, when the susceptible pool has again increased, measles introduced from outside the population may take hold again. The outcome of such a reintroduction is usually an epidemic.

Measles epidemics are most severe in populations that have no acquired immunity at all. Such epidemics can occur in places that have not experienced measles for a life-span (such as the classic case of measles in the Faeroe Islands in 1846), or among peoples who are exposed to the disease for the first time—what epidemiologists call “virgin soil” situations. (Several virgin-soil measles epidemics have occurred among Eskimo and Amazonian Indian

Map (opp. pg.) showing a portion of the Pacific Northwest region struck by the 1847–48 measles epidemic (south to north, between what is now northern California and central British Columbia; west to east, between the Pacific Coast and the Rocky Mountains). HBC posts along the course of the disease—Forts Simpson, McLoughlin, Langley, Esquimalt, Nisqually, Vancouver, Nez Percés, Colvile, Kamloops, and Alexander, and Cowlitz Farm—are indicated with black dots. Other points along the route are indicated with other symbols: St. Louis Mission, triangle; Waiilatpu Mission, square; Indian root grounds, circle; Tshimakain Mission, black square. (OHS neg. OrHi 11259-B; from a map, called “Old Oregon,” accompanying the Parliamentary Report on the Hudson's Bay Company, 1857, adapted by the author, R. Webster, and E. Winroth)

populations during the twentieth century.) It appears that fatality rates rise even higher in populations that have neither acquired biological immunity nor any cultural traditions for treating such “new” diseases.<sup>16</sup>

Measles was epidemic throughout much of Europe and North America in 1846–47, and the direction of diffusion appears to have generally been from east to west.<sup>17</sup> The spread of the disease throughout the Hudson’s Bay Company (HBC) lands in central Canada has been fully reconstructed by geographer Arthur Ray.<sup>18</sup> Measles was first reported at the Red River headquarters (Winnipeg) in June 1846; by midmonth at Norway House, north of Lake Winnipeg; and through August at all other HBC forts throughout the Canadian Shield. Boat brigades, which converged on Norway House in midsummer from all points north and west, were the agents of diffusion. Although measles did not spread across the Rockies in 1846, the epidemic indirectly affected the trade in the Columbia District. At the Tshimakain Mission the Reverend Cushing Eells wrote:

The boats which ordinarily reach Colvile not far from the 20th of Oct . . . did not arrive till the 20 of Nov. The unprecedented delay was occasioned by dreadful sickness which prevailed very extensively on the east side of the R. Mountains. Measles & influenza had caused fearful destruction of human life. At the last date the number of deaths at the Red River settlement has reached four hundred. The crew of all the HBC’s boats were thus for weeks prostrate.<sup>19</sup>

The diffusion of measles throughout the American plains has not yet been reconstructed. We know that in 1846 the disease was present among all the Native peoples of North Dakota and eastern Montana, and that by 1847 it had spread south to include the Shoshone of present-day Wyoming.<sup>20</sup> As one of the overland migrants of 1847 noted, “Measles was general that year on the Plains.”<sup>21</sup> Though most of the Oregon Trail migrants came from areas where measles was epidemic, they did not carry the disease across the Rockies. There are no reports in diaries of measles cases or fatalities among the overland migrants as they crossed the Rockies or before their arrival at the Whitman Mission. Given the short incubation and duration of the disease and the length of time required to make the overland journey, cases would certainly have been reported if the migrants had carried measles overland. Instead, as noted earlier, measles was already present in Oregon by the time the migrants arrived in August 1847.

The source for this earlier appearance of the disease on the Co-

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lumbia Plateau was central California. How measles arrived there is not yet known: Conveyance via one of the southern routes from the United States, or by ship from Mexico, are possible explanations.<sup>22</sup> However it arrived, the disease was epidemic around Sutter’s Fort (or New Helvetia, near modern Sacramento) in mid-June 1847. August Sutter’s diary for June 17–19 stated: “Great Sickness and diseases amongst the Indian tribes, and a great Number of them were dying notwithstanding of having employed a Doctor to my hospital.”<sup>23</sup> References to illness in the New Helvetia diary continued through late July. The document is perplexing, though, because it never identified the disease in question. The text did note, however, the presence of “Walla Walla” Indians in the vicinity, between the dates May 26 and June 26. The Oregon Natives left California just after the epidemic had started there.

Mounted middle Columbia River Indians had been traveling to the Sacramento Valley since at least the early 1840s. The precedent for such long-distance travel was the annual trek over the Rockies “to buffalo,” a practice that began after the adoption of the horse in the 1730s; the attraction held by central California was the hunt and Spanish cattle, for which the Oregon Indians traded horses. In 1844 the favorite son of Piupiumaksmaks, the most prominent Walla Walla chief, was murdered by whites while in California. This incident became a continued source of irritation among Columbia Plateau Indians, and a factor contributing (via “blood revenge”) to the Whitman Massacre.

The renowned Indian artist and explorer Paul Kane recorded in his journal the return of the California party to Fort Nez Percés on July 23, 1847:

A boy, one of the sons of Peo-Peo-mox-mox, the chief of the Walla-Wallas, arrived at the camp close to the fort. He was a few days in advance of a war party headed by his father, and composed of Walla-Walla and Kye-use Indians . . . numbering 200 men . . . absent eighteen months . . . [in] California. . . . The messenger now arrived bringing the most disastrous tidings, not only of the total failure of the expedition, but also of their suffering and detention by sickness. . . . After describing the progress of the journey up to the time of the disease (the measles) making its appearance, dur-

ing which he was listened to in breathless silence, he began to name its victims one after another. On the first name being mentioned, a terrific howl ensued, the women loosening their hair and gesticulating in a most violent manner. When this had subsided he, after much persuasion, named a second and third, until he had named upwards of thirty. The same signs of intense grief followed the mention of each name, presenting a scene which accustomed as I was to Indian life, I must confess, affected me deeply. I stood close by them on a log, with the interpreter of the fort, who explained to me the Indian's statement, which occupied nearly three hours. . . . The Indians . . . immediately sent messengers in every direction on horseback to spread the news of the disaster among all the neighbouring tribes, and Mr. MBain [McBean, the HBC post head] and I both considered that Dr. Whitman and his family would be in great danger.<sup>24</sup>

The significance of this crucial passage, initially overlooked in the literature on the Whitman Massacre, was first noted by anthropologist Robert Heizer in 1942. Clifford Drury then quoted much of it in his 1973 discussion of the causes of the violence at Waiilatpu Mission.<sup>25</sup>

It is likely that some of the "messengers in every direction" carried the measles virus with them. Given the disease's incubation period, we can speculate that within ten days the "messengers" were transmitting the virus to residents of their home communities, and after another two weeks large numbers of Natives were coming down with the disease. By the last week of August, according to this time frame, we could expect that people on the middle Columbia were starting to die. In fact, the next recorded mention of measles comes from a September 3 diary notation, made at the "Utila [Umatilla] crossing" of the Oregon Trail. Here settler Milton Brown "found in Camp Hodges & Taylor Co. with a man very sick with the measels."<sup>26</sup> The man died on September 4. In the next two months other journals of overland migrants recorded measles cases on the trail between the Waiilatpu Mission and Fort Vancouver.

Several sick immigrants stayed at Waiilatpu. Josiah Osborn recalled that his wife came down with measles on November 8, and as a result of the illness lost her newborn infant on the fifteenth; a second child died nine days later, and three others suffered from the disease but recovered. Osborn remarked that during this time "the Cayuse Indians were dying very fast with the measles and dysentery."<sup>27</sup>

As noted earlier, Clifford Drury called the epidemic among the



Tshimakain Mission, northwest of today's city of Spokane (and on the contemporary Spokane Indian Reservation), was headquarters for the missionary families of Revs. Elkanah Walker and Cushing Eells. Because of their willingness to follow medical advice given by the missionaries, the Spokane Indians suffered relatively few deaths from measles. This 1847 painting by John Mix Stanley, an eyewitness to the epidemic, is a probable composite; the burial scaffold, for example, is disproportionate with the rest of the painting. (OHS neg. OrHi 38781)

Cayuse the “final precipitating cause” of the famous massacre of November 29. A clarification of the Indian perspective, as expressed in two relatively unknown accounts, is pertinent. These come from painter John Mix Stanley, who interviewed what he believed were Cayuse Indians at Fort Nez Percés in December, and from the daughter of Tomahas (the slayer of Marcus Whitman), interviewed by photographer Edward Curtis in the early 1900s. On December 31, 1847, Stanley wrote to Rev. Elkanah Walker at the Tshimakain Mission:

The cause assigned by the Indians (and all the reports we hear agree in this particular) is . . . they having buried thirty this fall and winter, and three on the Morning of the Massacre. To confirm themselves, or prove the grounds of their superstition [that Whitman was causing the epidemic] they agreed to send two sick and one well Man feigning sickness for Medicine if the person feigning sickness should die then they would have the proof beyond doubt of their having been poisoned. This most unfortunately proved

true all three having died. And in addition to this experiment they have had an accuser in the person of one *Joe Lewis* . . . [who] circulated his poisonous venom through the camp already excited to frenzy by the deadly mortality of their friends. This information circulated from day to day, and what they looked upon as the convincing proofs in the deaths. They obtained the consent of the War Chief to perpetuate the horrid and inhuman butchery. . . . [After Marcus and Narcissa Whitman's deaths], Mr [Cornelius] Rogers was asked by the Indians the truth of their superstition they promising to spare his life. The Indians all concur in saying that Mr R told them that the Dr had been giving them poison and that it was his design to kill them all and take their lands. If these statements [of the Indians] be true we ought certainly to condemn his conduct although it was undoubtedly done with the view of saving his own life. Some of the Indians coming in after he had concluded his speech and not knowing the chief had agreed to spare his life shot him—I am happy to state that religion has not been the cause or in no way connected with this most lamentable occurrence.<sup>28</sup>

Whitman built a mill and the Indians there took their grain to it. . . . All at once some kind of disease came from the flour. A Nez Perce named Kulkulshmulshmul, my mother's brother, went to Wailatpu, where he had a wife. . . . His wife had died of sickness: she had taken some of the Doctor's medicine, and spots came out on her face. Two hundred people had died. An employe at the mission [Joe Lewis] . . . told the Indians that Doctor Whitman was putting poison in their medicine and killing them. One of the Indians made himself sick in order to test the Doctor, saying that if the Doctor's medicine killed him they would know that he was the cause of the death of the others. He took the medicine and died. Then the head-men met in council and made an agreement that the Doctor should be killed because two hundred of the people had died after taking his medicine.<sup>29</sup>

The two accounts agree in the basic facts: There were several Indian deaths (thirty-plus in one camp; nearly two hundred total); many Indians died *after* taking Dr. Whitman's medicine; Joe Lewis encouraged the rumor that Whitman's medicine was causing the deaths; the Cayuse conducted a logical test to determine if the rumor was true, and the results appeared to verify it. Thus, to remove the supposed source of the deaths of their people, the war chiefs decided to execute Whitman.

Records are sparse on the course of the epidemic among the Cayuse themselves. There were no more than 500 Cayuse in 1847, divided among the camps of three chiefs: Camatspelo's, near the headwaters of the Umatilla; Tawatoy's, at the Umatilla crossing;

and Tiloukaikt's, at Waiilatpu.<sup>30</sup> Records of a sort exist for the latter two. Tawatoy's camp was largely Catholic, and was located at the site of the St. Ann Mission, formally established by the Jesuits on November 27, 1847. Records of baptisms and deaths exist for the Umatilla band for approximately a month preceding late November. Between October 30 and November 16 seven deaths, all most likely from measles, were recorded. Six of the fatalities were male, and all ages were represented (approximated at one year, seven, sixteen, twenty, thirty, forty, and sixty).<sup>31</sup>

On November 22 the Reverend Henry Spalding arrived at Waiilatpu from Lapwai and noted the sickness among Tiloukaikt's band:

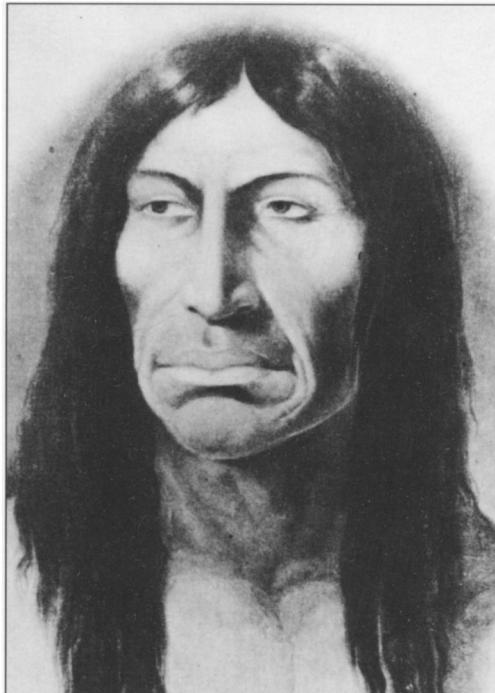
It was most distressing to go into a lodge of some ten fires and count twenty or twenty-five, some in the midst of measles, others in the last stage of dysentery. . . . They were dying . . . one, two, and sometimes five in a day, with the dysentery, which generally followed the measles.

By November 28, the day before the massacre, "about thirty" had died at Tiloukaikt's camp; six were buried on the twenty-eighth and three more on the morning of the twenty-ninth, before the massacre. On the thirtieth Father Brouillet arrived at Tiloukaikt's camp and (after learning of the massacre) baptised three children, two of whom subsequently died. On December 8 a Cayuse messenger arrived at the Lapwai Mission and reported to the assembled Nez Perce that 197 Cayuse had died in the past few months.<sup>32</sup> For a people whose total population probably did not much exceed 500, this was a devastating loss.

At least two statements from Cayuse chiefs give the impression that the deaths were disproportionately suffered by children, but no statistics exist to verify this.<sup>33</sup> It is obvious from the records that the epidemic was near its peak, at least among the Waiilatpu band, at the time of the massacre. The rapid loss of members (one to five per day in late November) among a band that probably contained fewer than two hundred certainly lent credence to Joe Lewis's claim that Whitman wanted to eliminate the Cayuse, and hence spurred the Indians to take what they regarded as corrective action.

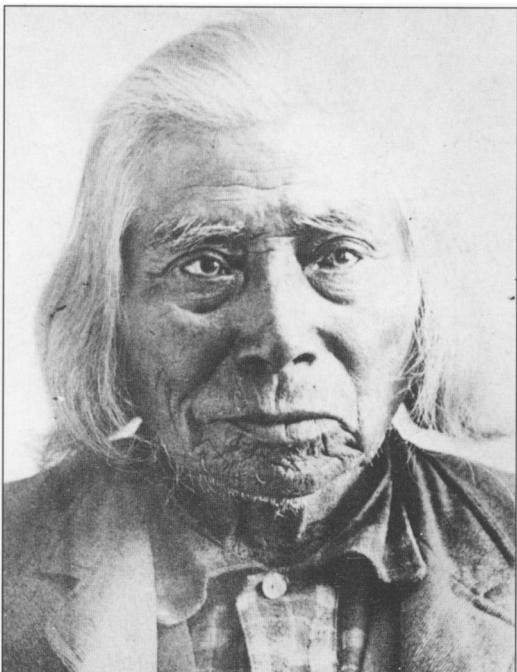
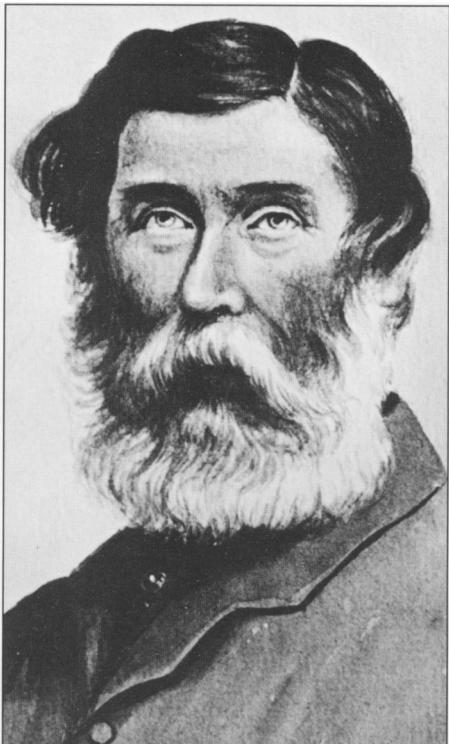


Piupiumaksmaks of the Walla Wallas was one of the most influential Native Americans in the Columbia Plateau during the 1840s and early 1850s. He was a leader of the California expedition of mounted Plateau Indians in 1846–47 that brought measles to the Pacific Northwest. This drawing was made by Gustav Sohon at the Walla Walla treaty grounds in 1855. (from H. Stevens, *The Life of Isaac Ingalls Stevens*; OHS neg. OrHi 90354)



**Tomahas**, the Cayuse Indian alleged to have killed Marcus Whitman. This painting by Paul Kane was executed from a drawing made just a few months before the Whitman Massacre. (OHS neg. OrHi 4325)

Self-portrait of Paul Kane, the keenly observant Canadian artist who traveled throughout the Oregon Territory in 1847–48. Kane was eyewitness to the return of the “infected” California expedition of mounted Indians to Fort Nez Percés, and wrote dramatically of the occasion. His sketches and oils preserve a remarkable record of contemporary Pacific Northwest Indian life. (OHS neg. OrHi 4509)



Spokane Garry (photo ca. 1890), though not mentioned in contemporary records on the measles epidemic, was certainly present at Tshimakain Mission in 1847–48, and may have been a member of the California party that brought measles to the Pacific Northwest. Garry was one of several young Indian men sent by Gov. George Simpson to the HBC Red River headquarters in 1825 for schooling. Following his return in 1831, Garry introduced elements of Christianity to the Spokane Indians. (OHS neg. OrHi 24941)

**“For want of other medicines & not knowing what is best we give them Cayenne pepper tea & light Cathartics to bring out the eruption on the skin.”**

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**S**INCE ITS founding in 1818, Fort Nez Percés had been the location of an annual “rendezvous” at which district Indians met, traded, and socialized. Among the messengers who fanned out from Fort Nez Percés in late July were certainly representatives from peoples to the west and north who visited there during the summer. On December 1 Bishop A. M. A. Blanchet wrote, “There is also talk about a great number of dead among the Yakimas and the Dalles.”<sup>34</sup> No other documentation of measles among these peoples has survived.

By contrast, considerable information exists on the spread of measles to what is now the northeastern quadrant of Washington state, at the Tshimakain Mission and the Hudson’s Bay Company’s Fort Colvile (at Kettle Falls). Tshimakain was, like Waillatpu and Lapwai, operated by the Presbyterian/Congregational American Board of Commissioners for Foreign Missions. Its principals were Elkanah Walker and Cushing Eells, and its subjects the Spokane Indians.

The journals of Elkanah and Mary Walker are both complete for the duration of the epidemic.<sup>35</sup> The first mention of the disease is on October 25; the final entry is on December 24—marking a two-month period. The Indians appear to have contracted measles at their “root grounds,” which they left in late October because of an “uncommon early fall of snow.”<sup>36</sup> The Spokane root grounds were located to the south of the mission, with the most popular area up Hangman Creek.<sup>37</sup> Significantly, this was a “joint-use” area among Spokanes and Coeur d’Alenes, as well as some Nez Perce and other outsiders. Like Fort Nez Percés, it was a meeting place for Indian peoples, and an ideal location for the transmission of disease.

Elkanah Walker noted that measles in his area was “more fatal with small children & infants,” but otherwise “of a mild kind.”<sup>38</sup> In the spring of 1848 Mary Walker wrote, “Providentially the measles proved less mortal among our people than any others perhaps in the whole country.”<sup>39</sup> There appear to be two reasons for this low mortality. First, in contrast to the epidemic among the Cayuse, the Spokane seem not to have suffered from the accom-

panying dysentery that often followed the measles and usually led to death. Neither of the Walkers' journals mentions dysentery. Second, Elkanah Walker's simple remedies and recommendations appear to have been effective, and were followed by most of the Spokane—in ironic contrast to results obtained by Dr. Whitman among the Cayuse.

According to Walker's letter of November 16, "For want of other medicines & not knowing what is best we give them Cayenne pepper tea & light Cathartics to bring out the eruption on the skin. To relieve the dryness & soreness of the throat attended with difficulty of breathing we administer Nitre."<sup>40</sup> Early anthropologist James Teit's mixed-blood Salish informant, Michel Revais, added: "Many of the Spokan tried to cure themselves by sweat bathing and bathing in cold water, and all who did this died. Two white men called Walker and Lee [certainly Eells], from Walker's Prairie, went among them and told them to keep dry and warm. After this very few died."<sup>41</sup> The sweat bath/cold-water plunge therapy, as will be noted, was implicated in sudden deaths among several Indian groups during the epidemic.

From Spokane, the measles spread to the Hudson's Bay Company's Fort Colvile, where the epidemic appears to have lasted from December through January. A few surviving letters from fort head John Lewes to Elkanah Walker described its effects. From early January:

Sickness unabated in its virulence continues to rage around me, the Mortality among the poor Indians has been distressingly great, up to this date including six at the Fools, 83 Men Women and Children have paid their last Debt, and I am grieved to say, that more undoubtedly will be yet added to this list, for many, many are still very low, with but little or no hopes of their recovery. the Measles themselves they generally overcome pretty successfully, but it is what follows that proves so fatal among them. "The Dysentery" or bloody "Flux," this malady has I believe attacked everyone belonging to my Establishment. it pays no respect to Persons this Morning it began its operations on me and at this moment 8 P.M. I feel myself rather uncomfortable . . . excuse my brevity and bad penmanship. . . . There is barely a surviving Indian here but has lost some of their Children. . . . A cold shivering fit has just come over me and I must go to Bed.<sup>42</sup>

About two weeks later Lewes recorded a total of 99 dead; Indian reports from Colvile gave the total as 127.<sup>43</sup> By the second week of February Lewes remarked that "general Health gradually is taking place" at Colvile, but travelers from the HBC's post at Thompson's

River (Kamloops) reported the disease had now reached that place.<sup>44</sup>

At Fort Kamloops the epidemic apparently reached a peak in mid-February. The Kamloops journal for 1848 is not extant, and reports received elsewhere noted that the post head, John Tod, was "quite helpless & unable to write from the effects of the Measles." All but three inhabitants of the fort (who had the disease before) were ill, and thirty-five Indians were "stated to have died in the immediate vicinity of the fort. . . . The Indians of the Rapid & [illegible] who had gone down towards Kamloops in quest of food last Fall, are lying sick, dead, or dying."<sup>45</sup>

The journal from Fort Alexandria, on the Fraser River north of Kamloops in the lands of the southernmost bands of Carrier Indians, is extant for 1848. Measles apparently traveled fast from the south, because it was first reported within the fort on January 8. On the twelfth it began to appear among the Indians, and by the fifteenth there was a "rapid spread of the epidemic among the na-



This willow-frame sweat lodge was photographed on the middle Columbia River, near Wishram, Washington, probably in the late nineteenth century. The sweat bath/cold-water plunge was an effective therapy among Native Americans in response to precontact ailments, but it was deadly when used to treat such "introduced" febrile diseases as measles, smallpox, and malaria. (OHS neg. CN 015455)

tives." But Alexander Anderson, the post head, reported only "6 or 8" Indian deaths:

The reason, under God, of their having escaped so well is, I believe, my having succeeded in enforcing upon their observance, certain simple sanative [sic] regulations; the neglect of which seems to have hastened the death of the few who fell victims, and is, I feel persuaded, the prolific cause of mortality in other quarters under similar circumstances.<sup>46</sup>

Though Anderson did not specify his "sanative regulations," the following excerpt from the fort journal, dated January 19, provides a clue:

Yesterday a Nichaotin lad . . . died after drinking cold water during a severe attack of the measles, under which he was labouring. To day Whaletah's step son (Porcepic) died of the same disease. His mother, to gratify him while in the paroxysm of fever, exposed him to the cold air, which drove in the eruption & caused the fatal result. The Indians are now nearly all suffering more or less from the disease. . . . I have given them directions how to treat the malady, & the recent examples of its serious nature makes them adhere rigidly (I believe) to my advice. I supply them with bran . . . which boiled yields a nutritive demulcent drink well adapted to the case.<sup>47</sup>

Anderson's measures may have stopped the spread of the epidemic farther north into New Caledonia; measles is not mentioned in surviving records of the region.

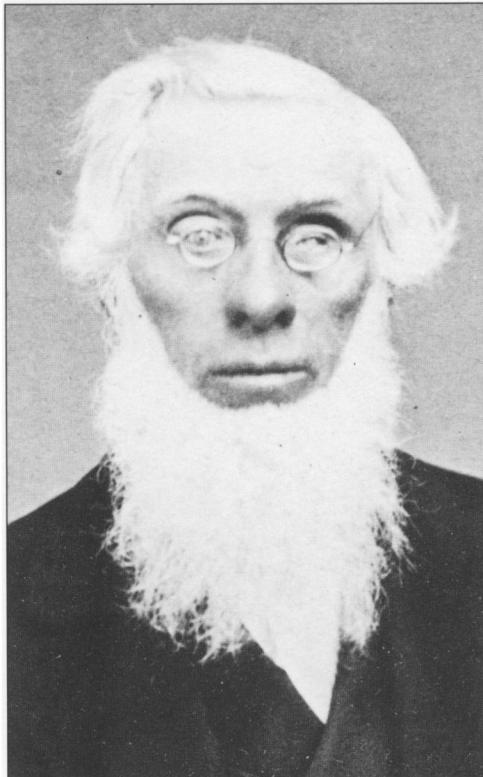
Measles also appeared among the Flathead Indians at the Jesuit mission of St. Mary's on the Bitterroot. Father Gregory Mengarini wrote that the disease was communicated to all the Flatheads "by a party of Indians returning from Fort Hall on the upper Snake." But the outbreak also followed closely the return of Indians who had been hunting bison on the Plains, where measles was rampant. Eighty-six people in the St. Mary's band died, leaving 500 survivors.<sup>48</sup> As Mengarini described it, the outbreak coincided with a period of active resistance to the missionaries' proselytizing efforts by a segment of the Flathead population:

During that same day an epidemic of Smallpox [measles] erupted. A young girl died that evening. Again I called the chiefs and openly spoke to them, reminding them that forty others were dying. . . . Perhaps, I suggested, this was a warning from God to shock them into at least controlling the scandalizing talk in church . . . [but] the scandalizer continued his harangue. . . . He shouted at the missionaries and urged them to leave. Then he turned upon the chiefs calling them puppets. . . . Three weeks would pass before there would be relief from this harassment. . . . In the meantime the scan-

dalizer was struck with the disease. The throat, mouth and tongue swelled, yet he continued his attacks each day. And he recovered. But on that same day the youngest of his children was attacked with a cancer[?] in the mouth which in three days spread across his face. It was accompanied by such a stench that all were obliged to leave the house. The fourth day he died. . . . The missionaries were exhausted of resources. They . . . had worked for months using all means to shake the Flatheads, especially since many were dying each day from Smallpox. Finally, God moved the heart of one man of advanced age . . . to address the scandalizer . . . [who] allowed himself to be conducted before the chiefs who flogged him and subjected him to a scathing exhortation. In a matter of one day all took on a new aspect.<sup>49</sup>

Despite the use of the term “smallpox,” the described symptoms—oral and respiratory swelling and lesions, as well as the distinctive odor—are all complications of measles.<sup>50</sup>

**Dr. Forbes Barclay was the Hudson's Bay Company physician at Fort Vancouver during the measles epidemic of 1847–48. Although most of his records have not survived, the house he occupied after 1849 still stands in Oregon City. (OHS neg. OrHi 66045)**



**C**ONTEMPORANEOUS WITH the diffusion of measles to the northern plateau, but ultimately independent of it, was the transmission of the disease from its focus at Fort Nez Percés west to the Pacific Coast. Unlike the situation on the Columbia Plateau, where Indians appear to have been the agents of spread, west of the Cascade range whites were responsible for most long-distance transmission of the disease.

For example, there is no doubt that overland migrants carried the epidemic from Fort Nez Percés to Fort Vancouver. At least two immigrant journals mention measles on the trail at The Cascades of the Columbia in November, well after the first cases were reported in the interior and preceding the earliest reports of illness at Fort Vancouver, and fort records are unanimous in attributing the introduction to the Americans.<sup>51</sup> Peter Skene Ogden, for instance (on March 10, 1848), wrote:

The Immigrants numbering upwards of 4000 Men women and Children made their appearance about the usual time and with [them] came Measles Dysentery and Typhus Fever, Cholera alone being wanting to complete the catalogue but still with the first three the deaths have been great at the French Settlement 65—Cowlitz 1—here 12 of the Servants and an equal number of Americans but it would be impossible to form any idea of the Indian's population they were swept of[f] by hundreds.<sup>52</sup>

In a letter written just one week later, Dr. Barclay claimed that “the Indian population have suffered about a ninth.”<sup>53</sup> This reference was to “the Columbia”—perhaps the entire Columbia District, but more likely the environs of Fort Vancouver were meant.

Two remarkable documents kept by Catholic missionaries allow certain conclusions about the duration of the epidemic and its effects on different segments of the local population. These are the registers of baptisms, burials, and marriages made at Fort Vancouver and at St. Louis, on the French Prairie of the Willamette Valley.<sup>54</sup> Neither, unfortunately, gives causes of death, but the pronounced clustering of fatalities in a certain time frame suggests that the vast majority resulted from the newly introduced disease, measles.

At Vancouver deaths clustered between the last week of November (the first casualty was a half-Cayuse child) through the third week of February, a three-month span. Thirty-nine deaths were recorded during this period, with a peak during the first week of 1848, when eleven died. Judging by the names, almost all of the recorded mortalities were local Indians, though one Iroquois and two Hawaiians died as well. There is no significant difference be-

tween the sexes among those who died, but there is a marked pattern to the fatalities by age group. Of those whose ages were recorded, seventeen were five years old or younger and eighteen were between thirteen and thirty-five. There were no deaths of anyone between the ages of six and twelve, two whose ages were estimated at thirty-seven, one forty-year-old, and one sixty-year-old. The latter two were Hawaiian and Iroquois, respectively.<sup>55</sup>

**A**T ST. LOUIS seventeen deaths clustered between December 15, 1847, and January 23, 1848, within a French Canadian/mixed-blood population. Ten of the total were babies; only one of the dead was over thirty. In both these populations measles typically showed no favoritism by sex, but hit infants and young adults disproportionately hard. A concentration of fatalities among the very young (as noted earlier) is usual for measles, but the lack of recorded deaths among older adults may be significant. Among elderly people with no acquired immunity to the disease, measles is deadly. The paucity of deaths in the over-thirty-five age group at Vancouver and French Prairie could be related to several factors, but the most likely explanation is that most individuals over thirty-seven had acquired immunity from a previous bout with the disease. Among those of white ancestry, the resistance was probably acquired in their homelands to the east. But it is also interesting to note that subtracting thirty-seven from the year of the epidemic (1848) yields 1811, one year from Dr. Barclay's previously noted date of 1812 for the initial appearance of measles in the Pacific Northwest.<sup>56</sup>

Among Willamette Valley Indians, there are at least five accounts of the measles epidemic. All note the Indian method of treating the new disease, and in each case the effort appears to have been counterproductive and led to increased mortality. The following is an ethnographic account, collected by anthropologist Melville Jacobs from his Clackamas Indian informant, Victoria Howard, circa 1929–30:

I do not know how long after [the fever and ague] . . . they got measles. Now they were again just like that, they died. They drank quantities of water in the same manner again, they died quickly. They were like that (one of the people after catching measles) for a considerable time. It (the rash) would come out on a child, he would get cold, it (the disease) would (because he had not kept sufficiently warm) go in (into his heart or stomach), and presently

Victoria Howard, Melville Jacobs's chief informant for his *Clackamas Texts*, was a proficient storyteller in the Clackamas language and an authority on the traditional culture of her people. (from M. Jacobs, *The People Are Coming Soon*; courtesy University of Washington Press)



Quinaby, labeled "chief of the Chemeke-tas" in this 1870 photograph, was the Santiam Kalapuya informant of historian S. A. Clarke (*Pioneer Days of Oregon History*, 1905). Quinaby referred to the Santiam encampment on the Willamette that was struck by measles, and was himself a probable survivor of the outbreak. (OHS neg. OrHi 76207)



he would die. Some of them went to sweat (in their sweathouse). It would come out all over on them, the measles would come out on their eyes. Some of them would come out (from the sweat-house) they would pour cold water on (themselves), they would die soon after that. Some came out, they lay down, they put covers over them, they would recover. After a long time then they did not die much more from that. But it was quite a while before the disease left.<sup>57</sup>

Mrs. Howard's description constitutes the most explicit record of the dynamics of death among south coast Indians from the 1847–48 epidemic. It also points out the role played by certain inappropriate treatments in increasing the fatality rate. Mrs. Howard notes the similarity of treatment for measles and the preceding "fever and ague" (malaria); the same methods, significantly, were used again during the 1853 smallpox epidemic. Malaria, measles, and smallpox are all fever-causing, or febrile, diseases; they are all also *introduced*, that is, nonnative, to the Americas. South coast natives, judging by the records, appear consistently to have treated the symptom of fever by exposing themselves to cold water; when fever was not present, they used sweat lodges, a traditional therapy used to alleviate aches and pains, cleanse the body, and remove spiritual contamination.<sup>58</sup> But with measles, malaria, and smallpox—according to a considerable body of primary accounts—this traditional treatment hastened death, though the exact physical mechanism of death has not yet been identified. For the mid-nineteenth-century Pacific Northwest measles epidemic, cold water or sweating was associated with increased mortality among the Cayuse, upper Chinook, Cowlitz, and Kalapuya Indians;<sup>59</sup> sweating and the sweat lodge were culturally important throughout the entire Columbia drainage and western Oregon, but not in coastal regions to the north.

A second Willamette Valley account that includes a description of a sweat lodge comes from Joseph Henry Brown, an immigrant of 1847. The Indians in question were probably the Santiam band of Kalapuya; the location was their winter home "along the [Willamette] shore below the present town of Salem."<sup>60</sup>

In the year 1847 the measels [sic] followed the immigration over the plains. The Indians contracted it. It was just as fatal to them as the Smallpox. . . . In the lower part of Salem there was an Indian encampment containing 300 or 400 persons. The measels broke out among them & swept away at least one-half of the Indian population of the Willamette Valley. There system of doctoring was: the Indians would make a wickeup. . . . They would take poles 6 to 8

or 10 feet long and put them in the ground making a circle. Then they would gradually bring them together at the top and lash them with grass or straw and cover them all over with earth and make it entirely air tight like a potato heap except at one place they would make a door sufficiently large to crawl in. The Indians would gather in that place as thick as they could set in a circle and in the midst of them they would have their tin pans and drums . . . and sing. . . . At the door they would have a fire with hot rocks in it and on these they would throw water to make steam. They would sit in there until they reeked with perspiration especially the sick ones affected with measles. Then they would all come out and plunge into a cold creek. The water would be ice cold in winter. The effect would be that most of them would die. One of them did not get out of the water alive. He only lived a short time after he got in. I do not think there was ever seen an Indian that ever recovered from that kind of practice. They doctor everything in that way, so they applied it to measles also. The Americans and missionaries attempted to prevent it.<sup>61</sup>

Several additional accounts verify the presence of measles in the Willamette Valley. How far south and west it spread from there is unknown, and just a few cryptic references point to its presence in the vast area beyond the valley. A March 16, 1848, letter written by HBC factor James Douglas stated:

The fur returns of the Indian shops of Fort Vancouver, Fort George and Umpqua River are inferior in value to those of last year, a result accounted for by the distressed state of the Natives, who have been suffering with measles since the month of December last, and have not recovered from the stunning effects of that severe visitation.<sup>62</sup>

A single statement in the *Oregon Spectator* in July 1848 noted: "It is said that all the lower Umpqua Indians except seven died with the measles and dysentery during the last winter."<sup>63</sup>

**T**HE PRESENCE of the epidemic on the coast north of the Columbia is well documented. From Fort Vancouver measles spread quickly to the HBC farm on the Cowlitz River, where progress of the epidemic was fully recorded in the journal of George B. Roberts.<sup>64</sup> Initial exposure must have occurred at the beginning of December; on December 16 eleven individuals at the farm, Hawaiian and Indian, experienced symptoms. On December 17 twenty people were ill; by the twenty-first measles was "spreading thro the settlement." On the twenty-seventh the first fatality, as well as several convalescents, was reported (again, the timing

points to an early December infection). On December 30 Roberts wrote, “The poor Indians taking the measles fast & are suffering extremely.” It appears that the Indian community was infected later than those at the farm itself, and thus constituted a second wave of the disease at Cowlitz:

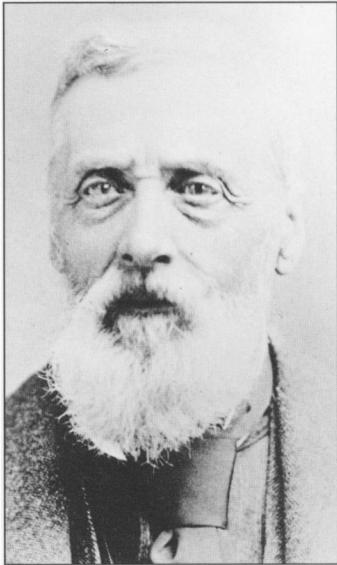
[Dec. 31] The greatest alarm prevails on account of the still spreading disease. It assumes two forms here. Those in whom the fever subsides immediately after the eruption suffer but little comparatively & are quickly restored to health. On the other hand the most part have their sufferings increase after the breaking out of the measles & remain a long time in a sinking state. There is a languor, a want of appetite & dreadful thirst. The Owyhyees are nearly well but have been troubled with a bad diarrhea, which I fortunately have the means of stopping by administering small doses of opium & Tonic mixture.<sup>65</sup>

The epidemic apparently peaked in mid-January:

[Jan. 14] Poor William ended his suffering to day. His wife [who died two days later] with a babe in the month and two other very young children lie also in a most pitiable & helpless state. We have to feed & assist all the Indians about us, draw fire wood for them & etc. 3 died to day. All hands either ill themselves or attending their sick families.<sup>66</sup>

Belatedly, measles attacked a third group: On January 30 Roberts wrote, “Measels now very prevalent among the settlers.” These were largely French Canadians, who had traveled overland in 1841 from the settlement at Red River.

Roberts last mentioned the disease on February 21, when he wrote, “The dregs of the measles seem to hang about many.” At Cowlitz, as at the Tshimakain Mission before, the epidemic lasted roughly two months. Like at Vancouver, there appear to have been minor waves within the total duration of the epidemic, as relatively discrete communities or subgroups were infected in sequence. Unlike Vancouver, though (and like most other places), other diseases accompanied or followed measles among the infected at Cowlitz. In the same passage where Roberts noted the “dregs” of measles, he mentioned that some of the convalescents had “severe colds.” This, however, was probably a symptom of yet another disease, typhus, which the journal identified by name on the next day. Several non-Indians subsequently acquired “camp fever,” certainly brought with the overland migrants of 1847. And as if this was not enough, in mid-May influenza was introduced to Cowlitz Farm from Fort Vancouver.



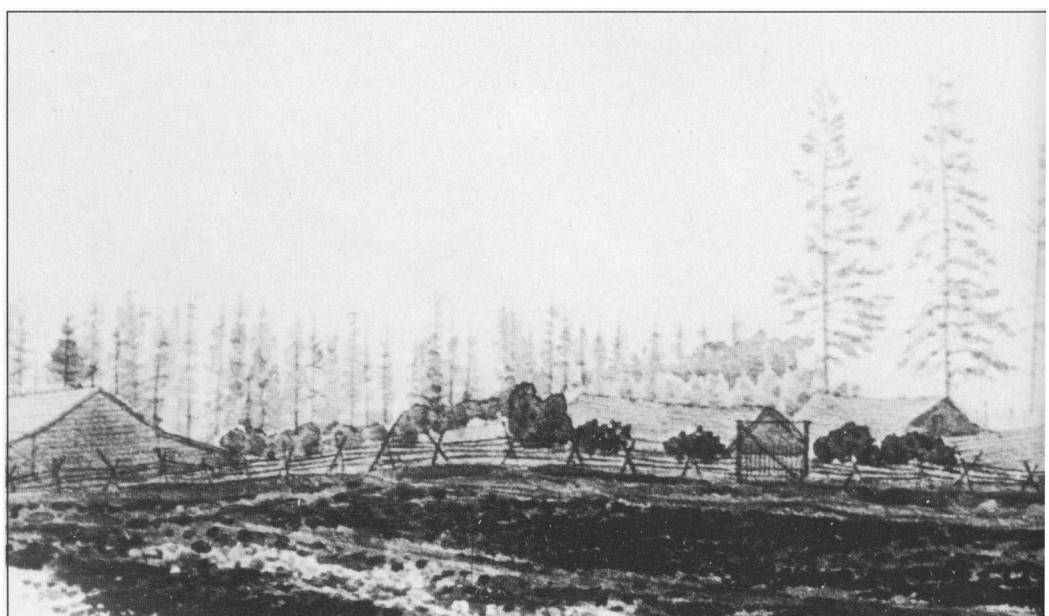
George B. Roberts, Hudson's Bay Company principal at Cowlitz Farm. His journal (published in vol. 63, nos. 2-3, of the *Oregon Historical Quarterly*) gives a detailed account of the measles epidemic at Cowlitz. (OHS neg. OrHi 5295)

EXISTANT RECORDS describe the measles epidemic at four more locations to the north of the Columbia: Forts Nisqually, Victoria, and Simpson—all Hudson's Bay Company establishments—and Sitka, a Russian outpost. The key to how the epidemic spread to these locations is contained in a letter from HBC employee John Work, dated February 10, 1848. Work had been sent from Vancouver via the Cowlitz Trail and the HBC vessel, the *Beaver*, to Fort Simpson, where he was to assume the position of post head:

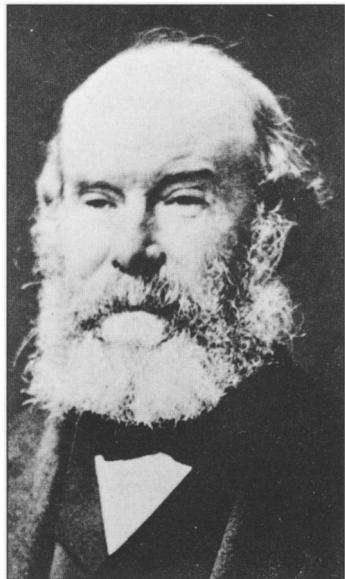
I left Fort Vancouver 26th Nov. (with the East side Otters for the Russians), and Nisqually with the Steamer 14th Dec. and Fort Victoria on the 20th and reached this place [Fort Simpson] 5th January. . . . As I passed the different establishments to the Southward all were well. The immigrants had brought Measles and dysentary to the Columbia and the Indians were dying fast of these complaints. When I left Vancouver there were a few cases of Measles in the hospital. A Sandwich Islander who with other men for Fort Langley accompanied me across the Cowlitz portage, brought the measles with him; he was ailing when we left him at Point Roberts and some days before, but it was thought it was the ague he had till about a week after when four men and two boys on board the Steamer were taken ill with the measles. On arrival here the disease soon spread both in and outside the fort, four men and most of the Women and children in the fort have had the disease, two of



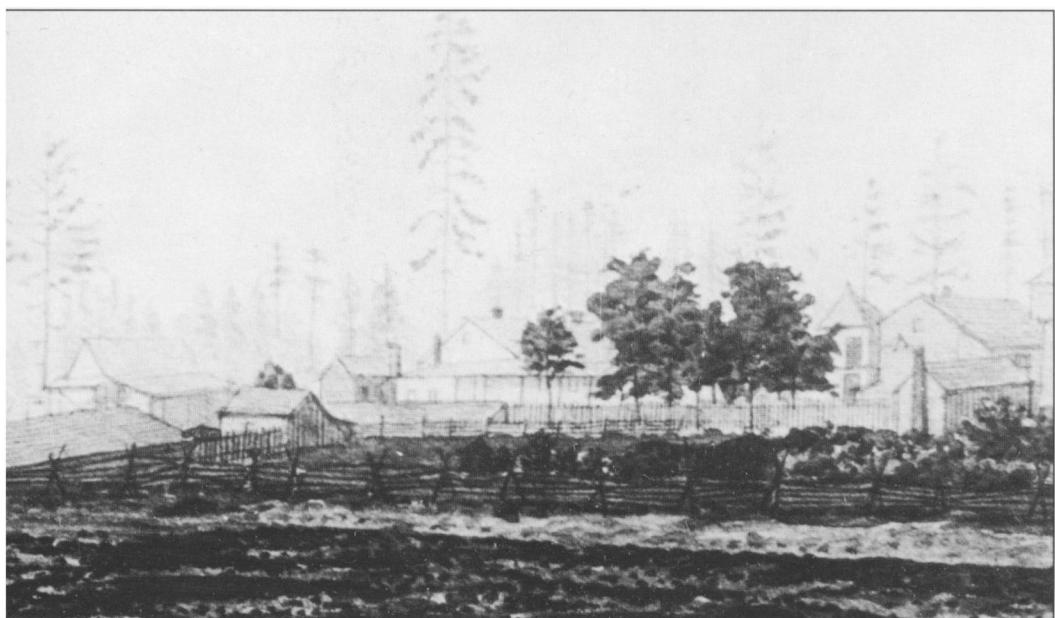
An 1881 photograph of the s.s. *Beaver* of the Hudson's Bay Company. Passengers on this small vessel (101.4 feet in length, 11 feet deep, with a beam of 20 feet) transmitted measles from Fort Nisqually to coastal settlements as far north as Chilkat, as recorded by John Work. (OHS neg. OrHi 109)



**Dr. William Tolmie**, a Hudson's Bay Company physician, arrived at Fort Vancouver in 1833, was stationed at Fort Nisqually in 1848, and spent his last years serving the company at Fort Victoria. His journal is one of the most important documents on the HBC presence in the Pacific Northwest. (OHS neg. CN 008712)



**Fort Nisqually**, the HBC post midway between present-day Olympia and Tacoma, Washington. This rendering includes fortifications that may reflect those built under post head William Tolmie in 1848, when the fort's inhabitants were supposedly concerned that Indians frightened by the measles epidemic might attack. (OHS neg. OrHi 37631)



the men's children have died of it, there have also been several deaths among the natives, and from the almost utter impossibility of getting them to take proper care of themselves while under the disease it is to be feared it will prove fatal to numbers more of them. . . . Captain Dodd now starts with the Steamer for Sitka . . . and then . . . North to attend to the trade.<sup>67</sup>

Work's route may be reconstructed with some detail from this letter and other sources. On November 26 he left Vancouver; on December 1 George Roberts recorded his arrival at Cowlitz Farm; he left on the third and reached Fort Nisqually on the seventh.<sup>68</sup> Embarking on the steamer on the fourteenth, landfalls were made on the fifteenth at Victoria; on the twenty-first at "Youcalters" (Lekwiltak Kwakiutl; probably the Cape Mudge or the Campbell River village); on the twenty-second at "Cogholes" (Kwakiutl); two days after Christmas at "Bellacolla"; on the thirtieth at "the forte" (probably McLoughlin); and on January 5 at Fort Simpson. Leaving Work at Fort Simpson on February 10, the *Beaver* proceeded to Sitka (on the twenty-third), to Chilkat (twenty-seventh), to Cross Sound (twenty-eighth), back to Chilkat (March 8), to Taku (fifteenth), and then to the Stikine River (nineteenth).<sup>69</sup> Measles subsequently appeared at all these locations for which records are extant.

Two sets of documents exist for Fort Nisqually (Puget Sound): the letters of Dr. William Tolmie, the HBC official in charge of the fort; and the journal of Joseph Heath, a farmer settled near Steilacoom. Tolmie recorded the first case at the fort on December 27: "I am sorry to inform you that two of our Sandwich Islanders are laid up with Measles. No cases have yet been heard of amongst the Indians."<sup>70</sup> Heath's journal noted an Indian case on January 7; on the eighth Tolmie wrote: "Measles, as yet I am thankful to say, of a mild type are prevalent here, and at the present three fourths of our Establishment are either on the sicklist, or employed in tending the sick."<sup>71</sup>

By January 31 the epidemic had spent itself among the personnel at Fort Nisqually, but a second wave was in progress among the Indians. The first recorded cases were among the family of Lehalet, chief of the Sequalatchew Nisqually, on January 17.<sup>72</sup> Heath, who was in daily contact with and tended local Indians, recorded what happened during the first two weeks of February:

[Feb. 1] Visiting the sick and I believe there is only one lodge that has not two or three.

[Feb. 4] Brought home three cows to give milk to the Indian babies, their mothers, ill with measles, having none and the poor children almost starving.

[Feb. 6] Visited and gave provisions to the sick the number of whom is daily increasing. great difficulty in preventing them going into the cold water.

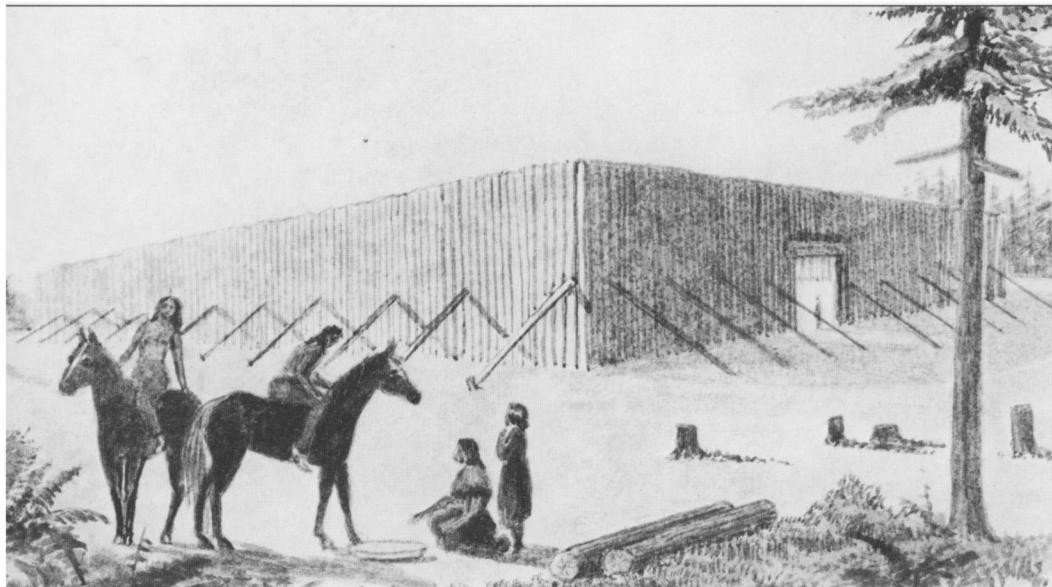
[Feb. 7] Visiting and giving medicine to the sick.

[Feb. 9] As usual, visiting the sick. much trouble in keeping them in their houses and preventing them getting into the cold water as well as drinking it. Two who have done so and would not follow my advice are now suffering more than any of the others.

[Feb. 12] Number of sick increasing daily, many of the poor creatures in a sad state, the strongest men suffering the most.

[Feb. 14] All my people now laid up, excepting the shepherd. . . . Visited the sick, cut up the deer and divided amongst them as well as giving them other provisions.<sup>73</sup>

After the measles had run its course, dysentery and pneumonia followed, and claimed still more lives, according to Tolmie's remark on March 11: "Sickness still lingers in this quarter I am sorry to say, and Indians are occasionally dying of Dysentery, and Inflammation of the Lungs succeeding Measles."<sup>74</sup> Since Nisqually was a hub of trade for most Indian peoples of Puget Sound, the potential for spread of the infection was great. . . . From 12-8-



The Wilkes Expedition's Joseph Drayton sketched this stockaded Whidbey Island "Sachel" (Skagit) village in 1841. The Snohomish curer who fled to Fort Nisqually after failing to cure measles victims in his village was from Whidbey Island. (OHS neg. OrHi 46195)

1847 to 4-3-1848 Steilacoom, Nisqually, Puyallup, Snoqualmie, Snohomish, Soquamish, Sinuamish, Skagit, Cowlitz, Tawewisomis (Prairie de Buttes), Yakima, Klickitat and perhaps Lummi were doing business at the fort.<sup>75</sup>

No records survive from the northern part of Puget Sound or from the HBC fort at Langley (present-day Vancouver, British Columbia), but the epidemic certainly spread to this area as well, as it was present to the south, west, and north. Two references point to the havoc the disease must have caused in northern Puget Sound and the Gulf of Georgia:

In 1847 [1848 is more likely] the measles prevailed extensively over Puget Sound, and Dr Tolmie used his best exertions to save the lives of those around him. The Whitman massacre caused a great sensation around the country and not the least among the Indians themselves [word of the massacre was received on December 20 at Nisqually, but not until February at Victoria]. There were no stockades or bastions at Nisqually then. A fugitive Indian conjurer or curer of the sick, flying for his life from the Sinahomish country (on S. River Possession Sound and south end of Whidbey Island), arrived at Nisqually and stated that the Whites had brought the measles to exterminate the Indians, were coming to massacre the whites at Nisqually. . . . On this being reported at Ft Vancouver the Doctor was instructed to erect forts and bastions.<sup>76</sup>

The Fort Victoria journal entry for April 3 noted the arrival of “a Canoe of Sinahomish” who gave “a woful account of the deaths amongst their tribe from measles & Dysentery.” On April 13 the journal noted measles at Fort Langley; on the fourteenth, “to the North.” On April 15 the Nisqually letterbook reported “the Klal-lum and Sinahomish ready to attack because of the measles.”<sup>77</sup>

Chronologically, the next place the epidemic reached was Fort Simpson (near present-day Port Rupert, British Columbia), John Work’s destination, where he arrived from Fort Nisqually on January 5, 1848. The epidemic among the local Tsimshian Indians began later in the month and continued through February and March. Work’s family all came down with measles at the same time, and he nearly lost two of his four daughters to the “fever” (influenza) that followed.<sup>78</sup> Chief Factor James Douglas’s summary report to HBC headquarters in London, dated December 5, 1848, stated:

The natives of Fort Simpson were unfortunately attacked with measles in the month of January 1848, and that highly contagious disease spread with frightful rapidity among the neighbouring Tribes, producing an amount of destitution, wretchedness and mortality perfectly heart rending; and which altogether has no par-

allel in other countries, where the appliances of relief exist abundantly, and the hand of charity is ever open to relieve distress. Food, medicine and advice were liberally dispensed to the Indians living about the establishment, but these formed a small part of the suffering thousands who were crowded into distant villages beyond the reach of our aid. Some idea may be formed of the fatal effects of that disease among Indians, from the number of deaths which occurred at Fort Simpson alone being estimated at 250 in a population of about 2,500 persons. The ignorant Indians in despair at the loss of so many of their dearest relatives, conceived a suspicion that the disease had been propagated through the Agency of the whites, and were at one time thinking seriously of attacking the establishment, but their better feelings prevailed over the passion of the moment. . . . The violence of the disease abated or more properly it had run its course, before the beginning of April, but the evil did not cease with the disease: it was impossible to efface so soon, from the minds of the Indians the scenes of misery they had witnessed and the remembrance of whole families of their dearest friends swept off by the destroying pestilence.

Douglas's letter continued by noting the spread of the epidemic to the Tlingit peoples of the Alexander Archipelago during the spring of 1848:

The Indians of Fort Stekine were also attacked with the Measles, but much later in the season, when they were less exposed to cold and vicissitudes of weather and did not suffer to the same extent as the natives of Fort Simpson. . . . The measles also severely afflicted the Natives of the District wherein the Steam vessel carries on trade.<sup>79</sup>

The itinerary of the *Beaver* was noted earlier. As for the epidemic's penetration into the interior, there is again a documentary gap, and we have only hints.

Russian sources describe the epidemic's progress farther north. From Stikine measles spread to Sitka, where it was present until "mid-summer," and then to the Aleutians. About 300 deaths were recorded in the Russian territories, mostly among Aleuts (both in their homeland and at Sitka). Very few Tlingit or Russian fatalities were noted.<sup>80</sup>

**T**HE LAST OF THE Hudson's Bay Company north coast forts to be afflicted with measles was Fort Victoria. In this case, though, the company vessel, the *Beaver*, was not responsible for its introduction. The ship had stopped at Victoria Harbor on December 15, but no cases of the disease were recorded in the fort journal until March 13. The disease probably came with Indians who crossed the Gulf of Georgia in canoes. There are several possibilities: on February 14 four canoes of Makahs arrived at the Songish village at Esquimalt; and on February 20 Indians (perhaps Halkomelem) from the Fort Langley area appeared at the fort. It is also possible that Indians from the island itself brought measles back from a trip to the mainland.

Indian transmission of the disease to Fort Victoria is also likely in that the first "wave" of the epidemic occurred among Natives, not whites. The initial cases were reported at the Songish village, and after exactly one month (on April 12) the fort journal stated, "Liealthae the Songs Chief who had been troubled with Dysentery after having recov. from the Measles, is now I am happy to say getting better."<sup>81</sup>

At the fort itself an Indian wife of one of the company employees was "convalescing" on April 3, but the first non-Indian cases (four Hawaiians) were not reported until the seventh. The inhabitants of the fort, like the Songish before them, were treated with medicines prescribed by Dr. Tolmie from Nisqually. On April 18 two deaths were reported, and by the nineteenth all the Hawaiians were sick. In a letter to Nisqually dated May 2, fort head Roderick Finlayson wrote, "The Measles . . . are now raging in this place and the neighbourhood."<sup>82</sup> Throughout the remainder of the month, cases of dysentery, recoveries, and a few deaths are noted in the fort itself, the epidemic having spent itself by the beginning of June.

But measles lingered in other quarters. Workers at the HBC mill were exposed later, and were still ill in June. In addition, there was a resurgence of measles among the Songish. On April 26, a day after two deaths in the village, Finlayson wrote, "The Measles do not appear to be abating for the Indians in the Camp are being daily laid up with them." The second Indian wave peaked within a month, on May 25: "Some of the Indians are very ill with the dysentery, & I fear the small pox is making its appearance amongst them, a woman having every appearance of having that Complaint being in the Camp." (The latter was certainly a virulent case of measles.) On June 2, again from Finlayson: "The Natives



This 1853 etching, from Isaac I. Stevens's *Pacific Railroad Survey report*, shows Flathead (Salish) Indians fording a river. The Flathead mission at St. Mary's, on the Bitterroot River in western Montana, was visited by the measles epidemic in the winter of 1847–48, as recorded by Father Gregory Mengarini. (OHS neg. OrHi 4475)

have not as yet recovered from the complaints [dysentery] attending the measles, some being dying off daily.”<sup>83</sup> Measles is not mentioned again after June 2, but on June 5 a ship arrived from Nisqually, carrying the missionary Father Auguste Veyret and a fresh outbreak of influenza. The weakened Indians succumbed to this, too, and more died. On July 14 the journal stated:

The Revd Monr Vegnet [sic] appears to be rather unsuccessful in making the Sanges attend his lectures; they appear to be impressed with the idea that he brought sickness amongst them, the influenza, with which some have died, having unfortunately broke out amongst them on his arrival here.<sup>84</sup>

M EASLES DISAPPEARED from the Pacific Northwest after June 1848, approximately ten months following its introduction from California.<sup>85</sup> But between late July 1847 and early June 1848 the measles epidemic proceeded from one location in the Pacific Northwest to another, lasting from two to three months

at each place until the local pool of susceptibles was exhausted. Measles appears to have affected nearly every ethnolinguistic group in the Pacific Northwest Coast and Columbia Plateau culture areas, with the probable exception of those in southern Oregon.

Generally, the disease was transmitted from one location to another by means of transportation introduced by Euro-Americans, and involved individuals who were infected with the virus but did not yet show symptoms of the disease. For example, Indians mounted on European-introduced horses brought measles from California, overland migrants carried the disease from Fort Nez Percés to Fort Vancouver, a Hudson's Bay Company brigade transmitted it from Vancouver to Fort Nisqually, and the HBC steamer *Beaver* carried infected individuals to several locations along the north coast between Nisqually and Sitka. Purely Native transmission is recorded only incidentally and occasionally: at the multi-tribal collocation at the Hangman Creek root grounds (Sahaptian to Interior Salish), and by trading canoes venturing across the Gulf of Georgia or the Strait of Juan de Fuca. Rumors of the role of whites in the epidemic and their supposed intentions spread rapidly among the Indians of the Columbia Plateau and large segments of the coast, usually well in advance of the disease itself.

Recorded mortality from the epidemic varies widely from one location to another, dependent upon several variables. In most places dysentery or respiratory diseases accompanied or followed the measles. Mortality appears to have been lower at those locations, such as the Tshimakain Mission, where no such complications were noted. Among a few groups, such as those around Fort Vancouver, there may have been a small segment of the population (those over thirty-seven years of age) with acquired immunity from an earlier outbreak. At all locations, as is typical of measles, fatalities were concentrated in the under-five-year-old segment of the population, resulting surely in a numerically diminished generation that persisted through the remainder of the century.

We will never know for certain the total number of deaths among the Indian peoples of the Pacific Northwest attributable to the 1847–48 measles epidemic. Our best estimates, based on sources earlier cited in this article, are as follows: Close to a thousand Natives, from various Pacific Northwest groups, are recorded as having died from the disease. For some groups—the Cayuse and the Willamette Valley tribes, for example—perhaps as much as 40 percent of the population died. For other groups—the Tsimshian and Aleuts resident at Sitka, for example—probably no more than 10 percent died. HBC Chief Factor James Douglas, in

**“Specific unusual procedures of the whites, such as the administration of new medicines or the ritual of baptism, were sometimes assumed to have ‘caused’ disease.”**

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his letter of March 16, 1848, estimated that, in the area “from Fort Hall to Nisqually,” measles “destroyed about one tenth of the Indian population.”<sup>86</sup> Though this is only an estimate, it comes from the one individual in the best position to know, and is identical with (later) losses recorded from Fort Simpson and Sitka. In lieu of other documentation, it is the best estimate of total mortality we are likely to obtain.

A major, if not the most significant, factor in accounting for different mortality rates appears to have been variations in treatment of the disease. In areas where Indians persisted in exposing themselves to cold water (either through drinking or bathing), or where (as in the Columbia River drainage) Natives treated the disease by placing infected individuals in sweat lodges, mortality appears to have been higher. The high number of deaths among the Cayuse and (apparently) the Willamette Valley peoples are examples. It should also be emphasized that differences in treatment were correlated with differences in survival among and between various groups and subgroups. The less acculturated and more traditional groups (e.g., the Cayuse), who would not submit to proper treatment, seem to have experienced greater mortality than more tractable groups (such as the Spokane). The importance of proper treatment in recovery from measles (as opposed to genetic or immunological differences in susceptibility) among “virgin soil” American Indian groups has been noted in more recent outbreaks, such as the classic case of measles among the virgin-soil South American Yanomamo in 1968, described by epidemiologist James Neel and his colleagues.<sup>87</sup>

In several cases the mortality produced by measles engendered such fear among Indians that they were provoked to take more general aggressive actions. The germ theory of disease was not understood in the mid-nineteenth century by either Indians or whites, and there was naturally a tendency among Pacific Northwest Natives to explain the “new” disease of measles in terms of traditional theories of disease causation. Thus Indians assumed that curers, both Indian and white, who were known to have the

“power” to treat and sometimes “cure” ailments, might have the power to cause illness and death as well. Specific, unusual procedures of the whites, such as the administration of new medicines or the ritual of baptism, were sometimes assumed to have “caused” disease. Marcus and Narcissa Whitman, and the Snohomish curer who fled for his life to Fort Nisqually, were victims of such assumptions. At HBC Forts Nisqually and Simpson, frightened Indians threatened to attack the white establishments, leading to construction of defensive walls at Nisqually. The execution of Marcus and Narcissa Whitman was part of a massacre of fourteen people, and the measles epidemic has been recognized as a major contributing factor to the Cayuse War that followed.

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1. Clifford Drury, *Marcus and Narcissa Whitman and the Opening of Old Oregon* (Glendale, CA 1973), vol. 2, 206.
2. William Marshall, *Acquisition of Oregon and the Long Suppressed Evidence about Marcus Whitman* (Seattle 1911), vol. 2, chap. 8; Drury, *Marcus and Narcissa Whitman*, vol. 2.
3. J. Russel Harper, ed., *Paul Kane's Frontier* (Austin, TX 1971), 117.
4. See Marshall Newman, “Aboriginal New World Epidemiology and Medical Care, and the Impact of Old World Disease Imports,” *American Journal of Physical Anthropology* 45, 3 (1976), 667-72, for a list of imported diseases. The long controversy over the origin of syphilis seems finally to have been settled by the discovery of a sizable body of pre-1492 Indian bones with syphilitic lesions. See Brenda Baker and George Armelagos, “The Origin and Antiquity of Syphilis,” *Current Anthropology* 29 (1988).
5. Sarah Campbell, “Postcolumbian Culture History in the Northern Columbia Plateau: A.D. 1500–1900” (Ph.D. dissertation, University of Washington, 1989).
6. Robert Boyd, “Smallpox in the Pacific Northwest: The First Epidemics,” *BC Studies*, no. 101 (spring 1994).
7. Robert Boyd, “The Introduction of Infectious Diseases among the Indians of the Pacific Northwest, 1774–1874” (Ph.D. dissertation, University of Washington, 1985). See also, by the same author, “Demographic History, 1774–1874,” in Wayne Suttles, ed., *Handbook of North American Indians, Volume 7: Northwest Coast* (Washington, DC 1990), 135–48. On the malaria and smallpox epidemics, see Robert Boyd, “Another Look at the ‘Fever and Ague’ of Western Oregon,” *Ethnohistory* 22, 2 (1975), 135–54; and James Gibson, “Smallpox on the Northwest Coast, 1835–1838,” *BC Studies*, no. 56 (1982), 61–81.
8. A summary of the whooping cough outbreak appears in Robert Boyd, *People of the Dalles: The Indians of Wascopam Mission, 1838–1844* (Lincoln, NE, forthcoming).
9. Dr. Forbes Barclay, in “J. R. Dunn’s Journal on H.M.S. Fisgard” (Manuscript [1846], Adm. 101/100/4XC/A/3930, Public Record Office, London).

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10. John Wyeth, in *Oregon* (Cambridge 1833), commented on cholera in the Mississippi Valley as early as 1832. On the role of cholera in the migrations of 1849 and 1850, see Georgia Reed, "Diseases, Drugs and Doctors on the Oregon-California Trail in the Gold-Rush Years," *Missouri Historical Review* 38 (1944).
11. Quoted in Olof Larsell, *The Doctor in Oregon* (Portland 1947), 90.
12. Arthur Ray, in *Indians in the Fur Trade: Their Role as Trappers, Hunters, and Middlemen in the Lands Southwest of Hudson Bay, 1660-1870* (Toronto 1974), 106-8, discusses the epidemic in the Canadian prairie provinces; John Taylor, in "Sociocultural Effects of Epidemics on the Northern Plains: 1734-1850," *Western Canada Journal of Anthropology* 7, 4 (1977), 80, notes measles among Indians of North Dakota and Montana; and Shepard Krech, in *Indians, Animals, and the Fur Trade: A Critique of Keepers of the Game* (Athens, GA 1981), 85, cites references to the epidemic among subarctic Athapaskan Indians. A measles epidemic spread among the missionized California Indians in 1827-28. See Rosemary Valle's "James Ohio Pattie and the 1827-1828 Alta California Measles Epidemic," *California Historical Quarterly* 52, 1 (1973), 28-36, which established that the disease in question was measles, not smallpox, as Pattie maintained in his personal narrative of 1833.
13. This is my own hypothesis, originally stated in Boyd, "Demographic History."
14. This discussion is summarized from Abram Benenson, *Control of Communicable Diseases in Man* (Washington, DC 1990), 269-75; Franklin Top, *Communicable and Infectious Diseases* (St. Louis, MO 1981), 407-17; and Frank Babbott and John Gordon, "Modern Measles," *American Journal of the Medical Sciences*, no. 228 (1954), 334-61.
15. Francis Black, "Measles Endemicity in Insular Populations: Critical Community Size and Its Evolutionary Implication," *Journal of Theoretical Biology* 11 (1966), 207-11.
16. Peter Panum's classic *Observations Made during an Epidemic of Measles on the Faroe Islands in the Year 1846* (New York 1940) discusses the first variety (no measles for a life-span); James Neel et al., "Notes on the Effect of Measles and Measles Vaccine in a Virgin Soil Population of South American Indians," *American Journal of Epidemiology* 91, 4 (1970), 418-29, which describes a 1968 outbreak of measles among the Yanomamo Indians of the Brazil-Venezuela border region, and Robert Wolfe, "Alaska's Great Sickness, 1900: An Epidemic of Measles and Influenza in a Virgin Soil Population," *Proceedings of the American Philosophical Society* 126, 2 (1982), which describes an epidemic among Bering Sea Eskimos, are two of the better analyses of the second variety (exposure to measles for the first time).
17. August Hirsch, *Handbook of Geographical and Historical Pathology* (London 1883), 160.
18. Arthur Ray, "Diffusion of Diseases in the Western Interior of Canada, 1830-1850," *Geographical Review* 66, 2 (1976), 151-54.
19. "Letters and Papers of the American Board of Commissioners for Foreign Missions, Volume 138, Oregon Indians, 1838-1844," vol. 1 (Oregon Historical Society, Portland), 114.
20. Taylor, "Sociocultural Effects of Epidemics," 80-81.

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21. H. S. Lyman, "Reminiscences of James Jory," *Oregon Historical Quarterly* 3 (1902), 283.
22. Although the great Mormon migration did not occur until the summer of 1847, some immigrants preceded it. The "sick detachment" of Mormons spent the winter of 1846-47 at Pueblo, Colorado.
23. *The Diary of Johann August Sutter* (San Francisco 1932), 40.
24. Harper, *Paul Kane's Frontier*, 117. A related account, likely penned from information supplied by Kane during a visit to the Tshimakain Mission, appears in the notebook of Myra Eells (Manuscript, Whitman College), under the date January 25, 1848: "The Kayuses who have ever been eager for property started a party last summer to go to California for cattle & horses. They took the measles & many of them died before reaching their own country others were sick at the time of their arrival so that the disease spread not only through their camp but through almost a large sector or the whole country."
25. Robert Heizer, "Walla Walla Indian Expeditions to the Sacramento Valley, 1844-1847," *Quarterly of the California Historical Society* 21 (1942); Drury, *Marcus and Narcissa Whitman*, vol. 2, 183.
26. Milton Brown diary (typescript), MSS. 268, Oregon Historical Society, Portland (hereafter OHS).
27. Josiah Osborn, letter of April 7, 1848, in Archer Hulbert, *Marcus Whitman, Crusader* (Denver 1941), 260-61.
28. John Mix Stanley, in Elkanah and Mary Walker Papers, MSS. 1204, folder 10, OHS.
29. Edward Curtis, *The North American Indian* (New York 1911), vol. 8, 81.
30. Most early estimates of Cayuse numbers appear to have overlooked some bands. In 1841 Horatio Hale, of Charles Wilkes's U.S. Exploring Expedition, estimated 500 (see Hale's *Ethnography and Philology* [Philadelphia 1846], 214); the first reservation period count, in 1861, gave 384. The three Cayuse bands, their locations, and chiefs, as of 1847, are given in Theodore Stern, "Cayuse, Wallawalla and Umatilla" (see *Handbook of North American Indians, Volume 12: Plateau*, forthcoming). On the size of an average Cayuse band the Reverend Asa Smith, in 1840, noted (for the neighboring Nez Perce) a range of "usually from 10 to 100 [presumably the smaller range represents warm-season foraging units] or 150. One band numbers 235" (see Clifford Drury, ed., *The Diaries and Letters of Henry H. Spalding and Asa Bowen Smith Relating to the Nez Perce Mission, 1838-1842* [Glendale, CA 1958], 134).
31. Harriet D. and Adrian R. Munnick, comp., *Catholic Church Records of the Pacific Northwest* [volume 7] *Missions of St. Ann and St. Rose of the Cayouse, 1847-1888. Walla Walla and Frenchtown, 1859-1872. Frenchtown, 1872-1888* (Portland 1989), 2-8.
32. All information on mortality in this paragraph comes from U.S. government documents. For the citation from Henry Spalding, see U.S. House, *The Indian War in Oregon and Washington* (1857-58), H. Ex. Doc. 39 (Serial 955), 32; for the December 20 statement of the Cayuse chiefs noting the burials on the twenty-eighth and twenty-ninth, see *ibid.*, 43-45; and for James Craig's June 11, 1848, letter containing the information on total mortalities, see *ibid.*, 25-27. William

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| McBean's November 30, 1847, letter, the source for the figure of thirty deaths in Tiloukaikt's camp, comes from U.S. House (1848), H. Mis. Doc. 98 (Serial 523), 11-12.  | 42. John Lewes letter (Jan. 2, 1848), Walker Papers, OHS.  |
| 33. See "Indian War in Oregon and Washington," 43-45; and Edward J. Kowrach, ed., <i>Journal of a Catholic Bishop on the Oregon Trail</i> (Fairfield, WA 1978), 82.  | 43. Walker, quoted in Drury, <i>Nine Years with Spokane Indians</i> , 437. According to Paul Kane, on September 17, 1847, there were "about five hundred souls" in the Kettle Falls village (Harper, <i>Kane's Frontier</i> , 123).  |
| 34. Kowrach, <i>Journal of a Catholic Bishop</i> , 82.   | 44. John Lewes letter (Feb. 10, 1848), Walker Papers, OHS.   |
| 35. An abridged version of Elkanah Walker's diary is reprinted in Clifford Drury, <i>Nine Years with the Spokane Indians: The Diary, 1838-1848, of Elkanah Walker</i> (Glendale, CA 1976). The original handwritten document is housed at the Huntington Library, Pasadena, California; Drury's unabridged typescript is housed in the manuscripts collection of the Washington State University Library. Mary Walker's diary for 1847 is housed among the Walker papers, OHS. | 45. "Fort Alexandria Journal," MSS. B. 5/a/7, Hudson's Bay Company Archives (hereafter HBC), Winnipeg, Manitoba.   |
| 36. Elkanah Walker letter (Nov. 16, 1847), in "Letters and Papers of American Board," OHS.   | 46. Alexander Anderson to George Simpson, Alexandria (Feb. 24, 1848), MSS. D. 5/21, folio 294, HBC.  |
| 37. Stuart A. Chalfant, "An Ethno-historical Report on Aboriginal Land Use and Occupancy by the Spokane Indians," in <i>Interior Salish and Eastern Washington Indians</i> , vol. 4 (New York 1974), 86-87.  | 47. "Fort Alexandria Journal," HBC.  |
| 38. Walker letter (Nov. 16, 1847), in "Letters and Papers of American Board," OHS.   | 48. Gregory Mengarini, <i>Recollections of the Flathead Mission</i> (Glendale, CA 1977), 193, 196-97.  |
| 39. Drury, <i>Nine Years with Spokane Indians</i> , 441.   | 49. Mengarini, <i>Recollections</i> , 235-36, letter of February 21, 1848. The identification of the disease as smallpox is a probable mistranslation of Mengarini's original Italian. There was no smallpox in either the Pacific Northwest or the northern Great Plains in 1847.   |
| 40. Walker letter (Nov. 16, 1847), in "Letters and Papers of American Board," OHS.   | 50. The effect of the epidemic on the process of conversion is instructive. In areas of the Pacific Northwest where missionaries were associated with failed attempts at curing, Christianity lost out. The case of Marcus and Narcissa Whitman provides the classic example. But when a segment of the Indian population more closely associated with the missionaries suffered less than the more traditional segment, Christianity often benefited. Besides the Flathead and Spokane cases, another example is Anglican Father William Duncan's flock among the British Columbia Tsimshian. When smallpox appeared at the Hudson's Bay Com- |

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pany's Fort Simpson in 1862, Duncan removed his band of followers to Metlakahtla, where, isolated and with access to vaccine, there were no deaths. Hundreds died at Fort Simpson. To this day, Christianity (though of different denominations) remains strong at Metlakahtla, as well as among the Flathead and Spokane Indians.

51. See, for instance, the journals of Anna Green Lee (Mss. 283) and Loren Hastings (Mss. 660), OHS.

52. Letter (Mar. 10, 1848), MSS. 635, Donald Ross Collection, Royal British Columbia Archives (hereafter RBC), Victoria.

53. Forbes Barclay letter (Mar. 18, 1848), MSS. D. 5/21, folio 541, HBC.

54. *Catholic Church Records of the Pacific Northwest [volume 1] Vancouver, volumes I and II, and Stellamaris Mission*, trans. by Mikell De Lores Wormell Warner and annotated by Harriet Duncan Munnick (St. Paul, OR 1972); [volume 3] *St. Louis Register, volume I* (1845–1868). *St. Louis Register, volume II* (1869–1900). *Gervais Register* (1875–1893). *Brooks Register* (1893–1909), comp. by Harriet Duncan Munnick (Portland 1982).

55. Thomas Lowe's manuscript "Private Journal Kept at Fort Vancouver" (MSS. E/A/L95A, RBC) first mentioned measles on November 26, 1847; by December 8, "Almost all our working hands are laid up with the measles"; and on December 16, "Most of the sick are gradually recovering." Lowe recorded seven deaths at the fort between December 11, 1847, and January 5, 1848; all were Hawaiians.

56. It is also interesting to note that the seven deaths of Cayuses recorded at St. Ann during the short period when records were kept show no such age breakdown. The fatality of some

two hundred Cayuse out of a total of around five hundred also suggests that more than just babies and young adults died. Although the documentary evidence is sparse, it suggests that, if there indeed was a previous measles outbreak in 1812, it was centered on the lower river and did not affect upstream peoples such as the Cayuse.

57. Melville Jacobs, *Clackamas Chinook Texts*, part 2 (Bloomington, IN 1959), 548.

58. Deward Walker, "The Nez Perce Sweat Bath Complex: An Acculturational Analysis," *Southwestern Journal of Anthropology* 22 (1966).

59. In the appendix to my 1979 manuscript "Old Cures and New Diseases: The Sweat Bath Treatment and Febrile Illnesses on the Northwest Coast in the First Century of Contact" (unpublished, in author's possession), I listed all the accounts, primary and secondary, from these peoples then known to me.

60. Quinaby (Santiam chief), in S. A. Clarke, *Pioneer Days of Oregon History* (Portland 1905), vol. 1, 131.

61. Joseph Henry Brown, Interview by H. H. Bancroft, Supplementing Brown's Autobiography (Salem, Oregon, 1878). Manuscripts Collections, Bancroft Library, University of California, Berkeley. Although Brown's mortality figures are certainly exaggerated, other information in his account is ethnographically accurate. Three other descriptions of Willamette Valley Indian measles fatalities are provided in Fred Lockley, "Reminiscences of Mrs. Frank Collins, Nee Martha Elizabeth Gilliam," *Oregon Historical Quarterly* 17 (1916), 369–70; Lewis Alderman, "Mission Rose Farm," *Champoeg Pioneer* (1957); and Mrs. Elliot, "The Story of the Evolu-

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| tion of the County from a Primitive State," Hillsboro Argus (Nov. 15, 1927).   | Pages |
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| 62. James Douglas letter (Mar. 16, 1848), MSS. D. 5/10, folio 479, HBC.  | 29-41 |
| 63. <i>Oregon Spectator</i> (July 13, 1848), 2, col. 3.  |       |
| 64. "The Round Hand of George B. Roberts: The Cowlitz Farm Journal, 1847-51," <i>Oregon Historical Quarterly</i> 63 (1962), 112-74.  |       |
| 65. <i>Ibid.</i> , 141.  |       |
| 66. <i>Ibid.</i>   |       |
| 67. John Work letter (Feb. 10, 1848), MSS. A. 11/67, folios 5-6, HBC.  |       |
| 68. "Cowlitz Farm Journal," 136; "Fort Nisqually Letterbook," William F. Tolmie Papers, University of Washington Manuscripts Collection (hereafter uw), Seattle.   |       |
| 69. "Log of S.S. Beaver," MSS. C. 1/207, HBC.  |       |
| 70. "Fort Nisqually Letterbook," uw.   |       |
| 71. Joseph Heath, <i>Memoirs of Nisqually</i> (Fairfield, WA 1979).  |       |
| 72. Dr. Helen Norton, letter to author (Mar. 31, 1992).  |       |
| 73. Heath, <i>Memoirs</i> .  |       |
| 74. "Fort Nisqually Letterbook," uw.   |       |
| 75. Norton, letter to author.  |       |
| 76. William Tolmie, "History of Puget Sound and the Northwest Coast" (Victoria, B.C. 1878), 31. Manuscripts Collections, Bancroft Library, University of California, Berkeley.   |       |
| 77. Roderick Finlayson, "Fort Victoria Journal," MSS. B. 226/a/1, HBC; Norton, letter to author.   |       |
| 78. John Work letter (Nov. 9, 1848), MSS. 319, OHS.  |       |
| 79. James Douglas letter (Dec. 5, 1848), in <i>Fort Victoria Letters, 1846-</i> 1851 (Winnipeg, Manitoba 1979), 21-23.   |       |
| 80. Robert Fortune, <i>Chills and Fever: Health and Disease in the Early History of Alaska</i> (Fairbanks, AK 1990), 206. The unpublished manuscript "Journal and Correspondence of the Russian-American Company" contains firsthand information (in Russian) on the outbreak.   |       |
| 81. "Fort Victoria Journal," HBC.  |       |
| 82. "Fort Nisqually Letterbook," uw.   |       |
| 83. "Fort Victoria Journal," HBC.  |       |
| 84. <i>Ibid.</i>   |       |
| 85. Measles continued its march westward after it disappeared from the Pacific Northwest: "In September 1848, an American warship brought the disease known as measles to Hilo, Hawaii." See Samuel Kamakau, <i>The Ruling Chiefs of Hawaii</i> (Honolulu 1961), 237-38. Mortality from the ensuing epidemic was high. Robert Schmitt, in "The Okuu—Hawaii's Greatest Epidemic," <i>Hawaii Medical Journal</i> 29 (1970), 363, estimated 10,000 fatalities. In 1835-36 Hawaii's population was estimated at nearly 108,000; the 1850 census returned 84,165. See Robert Schmitt, <i>Demographic Statistics of Hawaii: 1778-1965</i> (Honolulu 1968). |       |
| 86. Douglas letter (Dec. 5, 1838), in <i>Fort Victoria Letters</i> .   |       |
| 87. Neel et al., "Notes on Effect of Measles." It is important to note that we should not expect Indian peoples of the Americas, for whom diseases such as measles were new and unprecedented, to have developed any cultural traditions or treatments that would be effective against such unanticipated ailments.  |       |