

Journal Of Northwest Anthropology

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Graphing Culture Change on the Plateau: A History

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Abstract *Publishing graphs that depict culture change has long been a means to illustrate what is known of the culture history of an area, including the Plateau culture area. Examination of 471 pieces of literature on Plateau archaeology published between 1895 and 2019 reveals aspects of the history of graphing culture change in the area. Different types of graphs, including tables of data, have been used across both North America and the Plateau. Graphs appear later in the twentieth century Plateau literature than for North America in general. Whereas spindle graphs (temporal frequency distributions) were popular elsewhere on the continent, they are rare in the Plateau literature. The richness of graph types used by Plateau archaeologists over time is not correlated with that evident among North American archaeologists. Plateau archaeologists have used line graphs and bar graphs to depict culture change. Excluding tables, the most popular graph type appearing in the Plateau literature consists of spatio-temporal rectangles bounding names of culture units. Graphs of temporally diagnostic projectile point forms plotted against time appear first in the 1960s, likely at the hands of Roald Fryxell. Although this graph type explicitly shows culture change, it is used less frequently by Plateau archaeologists than culture unit names within spatio-temporal rectangles.*

Keywords

Artifact illustrations, culture change, graphs, history of graphing, spatio-temporal rectangles.

Introduction

Making visualizations is integral to scientific thinking. Scientists do not use words only but rely on diagrams, graphs, videos, photographs, and other images to make discoveries, explain findings, and excite public interest. (Ainsworth et al. 2011:1096)

How do we use diagrams, which are two-dimensional, *spatial* representations, to depict the *temporal* relationships of events in time? (O'Hara 1996:9)

In their landmark volume *Indians before Columbus*, Martin et al. (1947:444) remarked "Archeological research in the Plateau has not yet developed a prehistoric chronology. It is possible on the basis of presence or absence of White trade objects to distinguish historic from prehistoric sites, but at present the prehistoric sites cannot be chronologically differentiated. On the basis of available evidence archeological remains in the Plateau do not appear to be very old, nor is there evidence of much cultural change in the prehistoric period." Less than a decade later, several local chronologies had been outlined (e.g., Smith 1950; Caldwell 1956) and evidence of an early Holocene presence of people

had been described (Daugherty 1956a). Fifty years after that, Neusius and Gross (2007:239) could report “Pre-Clovis evidence is lacking from the Plateau, and even evidence of Clovis age occupation is relatively scarce.” At the time, local evidence of Clovis had been known for several decades (e.g., Osborne 1956; Meltzer and Dunnell 1987); so-called pre-Clovis was then and is still unknown (Sappington 2019). Neusius and Gross (2007:241–242) went on to state that “following whatever Clovis occupation there was in the Plateau, the area appears to have been inhabited by small groups of mobile hunter-gatherers who exploited a wide range of subsistence resources.” They devoted the next 25 pages of their book to verbally describing what the Holocene archaeological record of the Plateau looked like and what it suggested with respect to the human behaviors and cultures represented. A single chart was presented (Neusius and Gross 2007:236) to summarize the prehistory of the area. It was made up of culture unit (more on this concept below) names arrayed against blocks of time referred to as periods (on the vertical or y-axis) and geographic space (on the horizontal or x-axis). The culture unit names were not temporally bounded, seemingly to avoid implying culture change was saltational or transformational and occurred only at the temporal boundaries of the units, but reasons for the absence of lines temporally bounding the units were not provided.

A number of articles and monographs reporting relatively limited aspects of Plateau culture (pre)history and articles summarizing areal prehistory are now available (e.g., Chatters 1995; Ames et al. 1998; Pokotylo and Mitchell 1998; Roll and Hackenberger 1998; Hicks 2004; Prentiss and Kuijt 2004; Chatters et al. 2012). Although in general the recent literature is focused less than previously on outlining a newly proposed culture chronology for a geographically limited area (e.g., Swanson 1962; Grabert 1968; Warren 1968; Nelson 1969; Leonhardy and Rice 1970; but see Scott 2016; Rorabaugh 2020) or refining an older one (Roulette et al. 1999; Pouley 2010), a

main subject of discussion continues to concern culture change of one sort or another, its nature, its timing, its cause (e.g., Carlson and Magne 2008; Chatters et al. 2012; Lohse and Moser 2014). And sometimes a depiction of the temporal array of local or regional culture phases is presented as a means to provide some culture historical context for whatever the focus of a discussion might be. In this article I examine select aspects of the history of graphing prehistoric culture change in what is referred to as the Plateau culture area (Walker 1998), with the exception that I do not include the Cascade Mountains of Oregon, the Klamath Basin, or southwestern Montana.

Some Preliminaries

Before launching into the meat of the matter, there are two issues that require attention. These concern what I mean by the key words in the title: graphing and culture change. I address these in order.

Distinctions are often made between graphs, diagrams, and charts; all are particular kinds of (non-photographic) images, often with distinct functions involving (typically) empirically observed values of one or more variables. I do not disagree with those who specify the definitive attributes of each and argue they are distinct kinds of images, but I find it convenient for my purposes here to use *graph* as a generic term for what others categorize as graphs, diagrams, and charts. This term also allows inclusion of photographic images of culture change in the discussion. For those interested in the distinctions between graphs, diagrams, and charts, there are a number of discussions on the web.

Throughout the discussion I refer to graphing “culture change.” This term is used rather than, say, artifact change, technological change, adaptive change, culture chronology, or the like for two reasons. One is that the term “culture change” seems appropriate given it is how early North American archaeologists typically conceived of and often labeled what they were observing among temporal sequences of

artifacts. In building chronologies of artifacts, for instance, early archaeologists assigned similar sets of artifacts to units they called “cultures” (e.g., Gamio 1913; Kidder 1917; Moorehead 1917; Skinner 1917; see also Boas 1913). Some working in Europe at about the same time used the same term with approximately the same meaning (e.g., Crawford 1921; Childe 1933; see Trigger 1978 for a history). Several modern textbooks indicate a similar definition of an archaeological culture (e.g., Renfrew and Bahn 2016; Kelly and Thomas 2017). A difference between temporally sequent archaeological culture units in the same local geographic area was taken by many to represent, and was referred to as culture change (various chapters in Renfrew 1973). Analytical methods for explaining culture change were, however, wanting and lead ultimately to so-called processual archaeology (Binford 1968; Lyman et al. 1997; Webster 2008). Nevertheless, many of the graphs discussed here were constructed under the notion that culture change was being diagrammed.

The second reason I use the term “culture change” is because some archaeologists refer to artifacts as “material culture.” This term implies artifacts are a distinct kind of culture, if perhaps not culture at all. The latter was Walter Taylor’s (1948) position. He argued that culture is ideational only; a culture is a set of ideas shared to some degree by the individuals comprising a group of interacting people. In Taylor’s view, behaviors are not culture but reflections thereof, whereas artifacts are results of behaviors; behavior is one step removed from culture, artifacts are two steps removed from culture. Nevertheless, archaeology textbooks have used the term material culture as a synonym for artifacts for at least the last seven decades (e.g., Childe 1956; Thomas 1974; Fagan and DeCorse 2005; Renfrew and Bahn 2016). Although I use the term, I would not argue strongly for my choice of labeling temporal sequences of artifacts as “culture change.” The accuracy of this terminology of course depends on how one defines

“culture.” I use “culture change” herein because historically it is not totally off the mark, and it is a convenient shorthand.

Culture change of any scale can be graphed. By “any scale” I mean artifacts of any scale, from the attributes of discrete objects such as lithic projectile points, to portable discrete objects regularly referred to as artifacts (lithic knives, bone awls), to house floor plans, to landuse and settlement patterns, to subsistence systems, political organizations, etc. Documenting change requires recording differences between antecedent and subsequent phenomena, and the word “change” implies some sort of connection and continuity between antecedent and subsequent. A well-known example would be biological evolutionary change; ancestors are connected genetically to their offspring, and there is continuity between them even though the offspring are formally (morphologically, metrically) different than their ancestors. Artifact inventories may change from one time to another, either in the presence-absence of particular types or in the frequencies of specimens representing types. As will be shown, examples of each of these sorts of archaeological graphs of culture change occur in the Plateau archaeological literature.

Questions and Expectations

In this article I seek answers to several questions. The overall guiding question is this: How might a regional history of archaeological graphs of culture change appear, and how might it differ from the continental history (see Lyman 2021 for the latter)? In part, I focus on the relationship between sample size and richness or the number of kinds of stuff (e.g., number of artifact types represented in a collection). I explore this relationship because it has been found time and again that as the number of artifacts examined increases, so too does the number of types of artifacts represented (Leonard and Jones 1989; Lyman and Ames 2004, 2007, and references therein; Eren and Buchanan 2022). Given the widespread occurrence of this sample

size-richness relationship, one suspects it will hold across archaeological analytical techniques and results, such as the number of graph types used to illustrate culture change. (Graphs can of course be used to diagram variability in the value of one or more variables with no relation to the passage of time; such graphs are beyond my scope here.)

The Plateau is geographically smaller than North America, hence the potential necessity of more graph types across the continent than for the Plateau culture area. Therefore, one question is: Is the richness (the number of types) of graphs less overall for the Plateau than for the North American sample of literature described in Lyman (2021)? The Plateau also had fewer archaeologists working there than the number working across North America. Thus a second question is: Does the greater number of investigators across the continent than within the Plateau influence the richness of graph types found in the Plateau? I anticipate that as the number of investigators increases, so too will the richness of graph types. A major focus in Lyman (2021) concerned the origin of spindle graphs in North America, the battle-ship shaped (unimodal) temporal frequency distribution curves or so-called frequency seriation graphs familiar to archaeologists. A third question is then: Were spindle graphs used in the Plateau, and if so, when did the first one appear in the literature and how often did they subsequently appear? If they were not used frequently, then what was the most popular graph type—that is, the type most often used?

An initial expansion in the richness of graph types across North America during the twentieth century was followed by a reduction in the number of graph types as researchers focused in on one or a few types that seemed to do the job effectively (were readily deciphered because minimal mental gymnastics are necessary) and efficiently (required minimal ink) (Lyman and Faith 2018; Lyman 2021). The early waxing in richness reflects two facts. First, there initially was a focus on building culture chronologies or

culture histories (Wiley and Sabloff 1993), and this no doubt prompted exploration of diverse graph types to determine which ones served this purpose well (Lyman 2021). The fact that chronologies and investigators varied from region to region meant culture history charts could also vary from region to region. Second, throughout the twentieth century there was minimal instruction on (or discussion of) how to construct effective and efficient graphs in introductory archaeology textbooks (e.g., Petrie 1904; Heizer 1949; Childe 1956; Wheeler 1956; Kenyon 1957; Hole and Heizer 1965); more recent textbooks are as a whole no better (e.g., Fagan and DeCorse 2005; Renfrew and Bahn 2016; Kelly and Thomas 2017). Individual researchers were (and are), as a result, on their own with respect to designing a graph to illustrate the culture change they had documented.

The narrowing of graph type richness occurs for three reasons—first, a lack of formal training in graph effectiveness and purpose (what is a graph intended to display) is eventually overcome by trial-and-error learning. Second, the implicit notion that “the discipline (or, more likely, my advisor has) always done it this way,” both reduces the magnitude of waxing and speeds up the waning as novices learn at the feet of the knowledgeable (Collier 2008). The third reason is that published graphs are largely used as summary devices, to show what has been learned or as a context for what follows, usually in text form (as in Neusius and Gross 2007). Graphs are seldom published as analytical devices, the implications of one graph leading to another graph to successively tease out details of relationships between variables. In these rare cases, the manner in which particular variables relate to one another is graphed (and published) as a step in an analysis directed toward a solution (an archaeological example of such is found in Forbis [1962]). The first and third reasons are related because formal training would provide guidance in the use of particular graph types as analytical devices as well as graphs summarizing what had been learned (Tufte 2001). An impli-

cation of all this within the history of Plateau archaeology involves determination of whether or not there is a regional tradition in graphing culture change, and what that tradition entails.

Finally, a likely contributing factor to the waning of graph type richness over time is the fact that determination and illustration of a local culture chronology—documenting culture change—was, after the 1970s or so, no longer of major importance as such things had largely been worked out. The analytical focus shifted across the discipline as a whole (e.g., Fitting 1973; Willey and Sabloff 1993) to the reconstruction of synchronic snapshots of cultures, or the doing of “paleoethnography” (Thomas 1974). A spatio-temporal synopsis of the local chronology might be used to provide an indication of the cultural/chronological context of those snapshots, but documenting culture change (or building a culture chronology) was no longer the major analytical goal. The boldly stated emphasis on “cultural process” of the late 1960s through the 1980s underscored the new analytical goal (Lyman 2007); studies of culture history and chronology were (it was alleged) merely descriptive and thus easily derogated. Yet there was, and continues to be, a deep interest on the part of all archaeologists in the subject of culture change (Lyman 2021). Such an interest nearly begs for a graph or two illustrating the relationship between the variable of *time* and the fluctuating (or static) values of one or more cultural variables. How have North American archaeologists working in the Plateau gone about graphing their evidence of culture change?

Materials and Methods

To answer the question just posed requires examination of the Plateau archaeology literature, but which literature? Given the observations of Martin et al. (1947) reported above, a knowledge of the history of archaeological research in the Columbia-Fraser Plateau, and the questions to which I sought answers, I set limits on the time

period to be investigated. The beginning date was set at 1895 to ensure inclusion of one of the earliest reports on local archaeology known to me (Hill-Tout 1895), and Harlan Smith’s (e.g., 1899, 1900) several monographs on the area. An ending date of 2019 was chosen to include recent literature, and to facilitate dividing the 125 years represented into, with one exception, temporal bins of 10-years duration. The single exception is the chronologically earliest bin, which extends from 1895 to 1909. To define bins, I started with “0” as the initial year of a decade, say 1910, and ended ten years later, in this case, 1919. Temporal binning of data facilitates circumventing the potential influence of sample size on quantitative trends over time and smooths idiosyncratic annual fluctuation in frequencies.

To determine answers to the specific questions outlined above, I inspected the major monographs on Columbia-Fraser Plateau archaeology (e.g., Smith 1910), including several unpublished (e.g., Caldwell 1956; Leonhardy 1970; Brauner 1976) and published theses and dissertations (e.g., Daugherty 1956b; Grabert 1968, 1970), plus summaries and overviews, both published and unpublished (e.g., Rice 1967; Galm et al. 1981; Ames et al. 1998). Major journals inspected include all issues of *Northwest Anthropological Research Notes/Journal of Northwest Anthropology* (1967–2020, 55 volumes), all issues of *Archaeology in Washington* (1989–2020, 19 volumes), all issues of *Idaho Archaeologist* (1978–2021, 44 volumes), many issues of *Tebiwa: Journal of the Idaho State University Museum*, and many issues of *University of Idaho Anthropological Research Manuscripts*. Early issues to which I had access of *The Washington Archaeologist* (a newsletter-like publication appearing in the mid-twentieth century) were also examined (1957–1959, 1972–1973, 1975–1979).¹ Issues of *American Antiquity*, *Journal of Archaeological Science*, and *North American Archaeologist* were examined for articles on the Plateau. I did not

¹ An anonymous reviewer pointed out that all issues of *The Washington Archaeologist* newsletter are now available online <www.chaz.org>. I have not examined the issues missing from my compilation.

examine copies of presentations at meetings, despite the potential importance of such (e.g., Leonhardy and Rice 1980), because hard copies of these are virtually impossible to find as they were often but vocal presentations and seldom if ever written down and published. I did not examine reports on the excavation of human burial sites. I examined articles on site-specific or local cultural chronologies (e.g., Pouley 2010), but did not attempt to include every single “site report” or “interim report” (e.g., David Cole’s, of the University of Oregon’s Museum of Natural History, numerous reports on his excavations in the John Day dam reservoir; the many site reports from excavations in the Chief Joseph dam reservoir) that has appeared although a lot of them were examined (e.g., Warren et al. 1963; Nelson 1969). I also examined many of the reports on-file in the Washington State Historic Preservation Office’s online database.

The table of contents of each piece of literature was examined for listings of tables documenting or figures illustrating culture change and pages of text of each report were examined either online by scrolling through a document or manually flipping through pages of paper copies. The type of graph(s) in each piece of literature was recorded, as was the occurrence of a table summarizing change or instances of a text description of chronologically distinct culture units. If a piece of literature did not contain a graph or table or text concerning culture change, it was recorded that *nothing* occurred in that piece. In total, 471 separate pieces of literature spanning 125 years make up the sample. All pieces of literature examined, along with the observations recorded for each, are given in Supplemental Table 1 (e-copy only).

I use the term *graph type* to denote a particular basic form of graph, such as a pie graph or bar graph. I use the term *graph style* to denote one or more variants of a particular graph type. For instance, a bar graph may comprise a segmented bar graph (bars arranged end to end), or two or more bars arranged side by side within the same category. Similarly,

a pie graph may be a simple pie viewed from directly above and divided into wedges, or it may be shown as a three-dimensional layer of some thickness with the wedges pulled away from the center of the circle and viewed from a side angle. The well-known spatio-temporal rectangles summarizing a regional culture chronology, with each rectangle signified by a named culture unit and representing a piece of geographic space of some extent and a span of chronological time of some duration, is a kind of graph or diagram that is common in North American archaeology, including the Plateau (e.g., Figure 1). The geological column and time scale of epochs, eras, periods, etc., is similar but is world-wide in application; the spatio-temporal rectangles of the culture history of an area are generally much more geographically limited and of much finer temporal resolution.

When the values of archaeological variables are arrayed against a known or suspected scale of historical time, such as a stratigraphic column or series of radiocarbon dates, we have a time-series analysis—the ordering of phenomena in a temporal sequence based on the respective ages of the phenomena and studying and interpreting that ordering (Chatfield 1996). As archaeologists are well aware, time can be measured at an ordinal (older than/younger than) scale, or at a ratio scale (e.g., phenomenon A is 1,500 years older than B, which is 700 years older than C). The scale of measurement is from the perspective of time. What is the scale of measurement from the perspective of the phenomena ordered, that is, the artifact forms, and the scale of the information carried by a graph irrespective of the temporal scale? From the point of view of the artifacts, an array of frequencies of artifact forms against time (at whatever scale) is a ratio scale as their frequencies vary over time. A phyletic line would represent an ordinal scale as artifact form shifts from one to another, as would a temporal series of artifact forms not displaying phyletic lines of connection. A temporal series of spatio-temporal rectangles bounding a set of named culture

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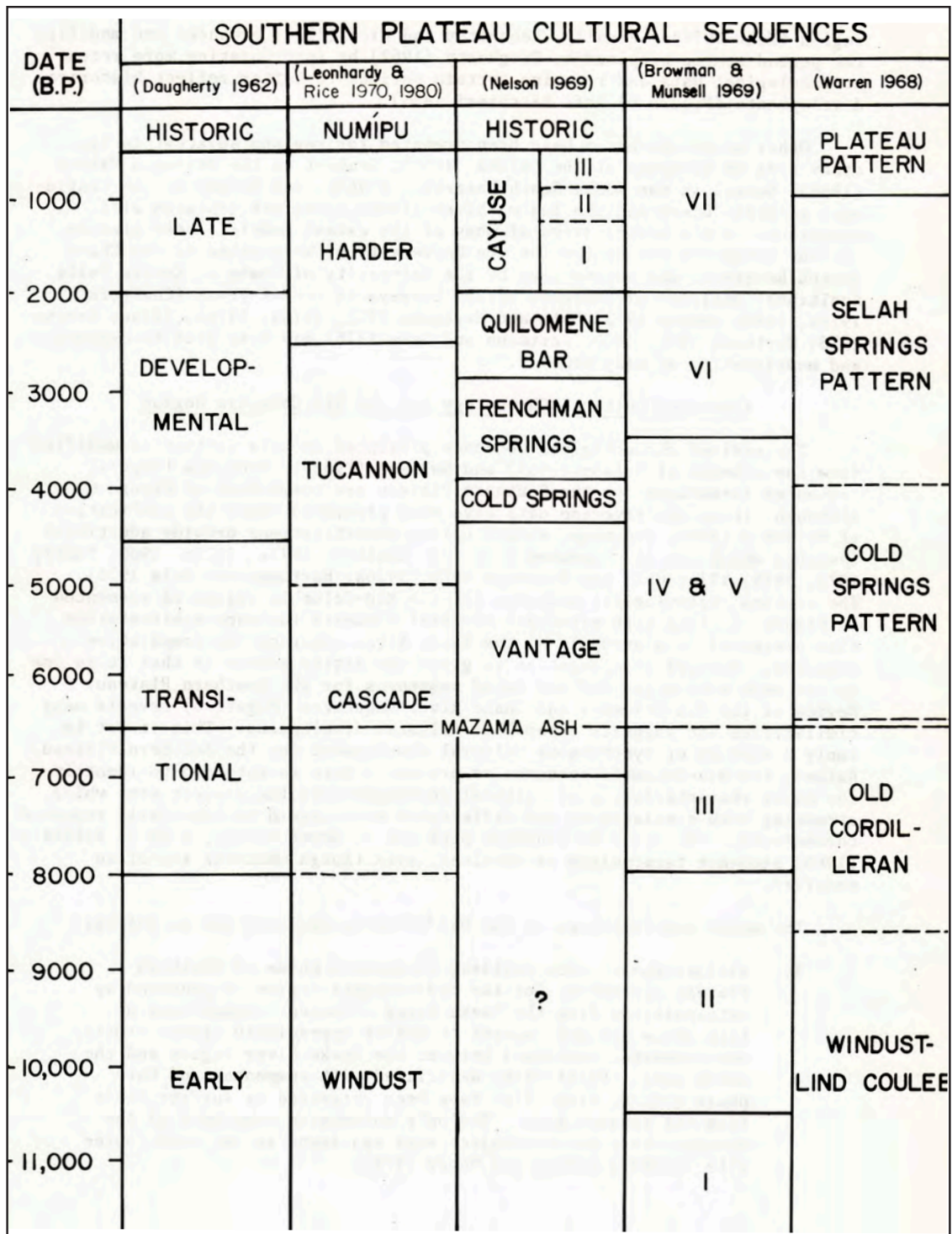


Figure 1. A graph of spatio-temporal rectangles with culture unit names. Geographic space is implicit; Daugherty's (1962) column includes all of the intermontane west; Leonhardy and Rice's (1970, 1980) column includes only the Lower Snake River region of southeastern Washington State; Nelson's (1969) column represents only the middle Columbia River region of central Washington State; Browman and Munsell's (1969) column includes the entire Columbia Plateau; Warren's (1968) column includes only the lower middle Columbia River region of south-central Washington State. From Galm et al. (1981). Reprinted courtesy of Archaeological and Historical Services, Eastern Washington University.

units would (literally) be nominal scale. To continue this line of reasoning, I turn next to a summary of the various graph types found in the Plateau archaeology literature, indicating along the way the scale of measurement of each from the artifact perspective rather than the temporal scale.

An early manifestation of how culture change was summarized by archaeologists took the form of a *table* of either the presence/absence of culture traits over time or a table of artifact frequencies (Lyman et al. 1998 and references therein). Tables may therefore be either nominal scale or ratio scale. Temporal frequency distributions of quantitative variables have been illustrated or diagramed with several distinct types of graph (Lyman 2021). *Spindle graphs* have been mentioned; these are ratio scale because they display fluctuating abundances (usually relative or percentage frequencies) of artifact types (spindle width, one spindle per type) over time (spindle length). In a *pie graph*, each pie represents a particular culture unit, and each wedge represents the relative frequency of (often, but not exclusively) a temporally sensitive artifact type. Pie graphs are ratio scale. *Time-range charts* plot the presence/absence of one or more kinds of phenomena over a span of time and as such are ordinal scale. *Ternary diagrams* plot the relative (percentage) abundances of three variables and are ratio scale. Each axis may represent a different artifact category in which case a separate ternary diagram is required for each block of time. *Cumulative frequency diagrams* or *ogives* plot the relative abundances of multiple kinds of phenomena in a collection as a cumulative curve and are ratio scale. Each curve typically represents a different time period. *Bar graphs* and *histograms* display relative or absolute frequencies of phenomena represented by bar length; bars may be independent of one another or joined end to end (segmented bar graph). In displaying artifact frequencies, they are ratio scale, one or more bars per time interval. A wide diversity of kinds of bar graphs have been used across North America to graph prehistoric

culture change (Lyman 2021); in the following I do not distinguish these and refer to all of them with the term *bar graph*. *Line graphs* display relative or absolute frequencies or magnitudes (e.g., size) based on the distance of the line from a static axis; lines may be jagged as when they join data points with straight lines, or lines may be smoothly curved from data point to data point. Typically each line represents an artifact type, and the line displays artifact frequencies plotted against time; it is a ratio scale graph. *Scatterplots* display the associated values of ≥ 1 variable of each of multiple specimens (e.g., length and width of individual specimens); they may include statistically best-fit lines summarizing the correlation between included variables. If one of the axes represents time, a scatterplot is ratio scale. *Box plots* or *box-and-whisker diagrams* compare descriptive summaries (median, interquartile range [middle 50% of the values]) and range of one variable; constructing one box for each of several time periods provides an overall impression of how a variable's values shift over time at a ratio scale. For additional discussion of the various familiar quantitative and statistical graphs, see Banning (2000, 2020).

Thus far, all the mentioned graph types are relatively discipline-free in the sense that any discipline or line of inquiry may use one of the graph types indicated. Because they focus on history, disciplines such as geology, paleontology, and archaeology have designed a couple graph types that are somewhat unique to the historical sciences in order to contend with the problem raised in the epigraph by O'Hara (1996): How does one graph the temporal dimension using a variety of forms? One way is to use a *phyletic line*, or *Petrie-like graph*, the latter name based on the fact that Petrie's (1899, 1901) famous sequence-dating technique arranged ceramic vessels based on their formal similarities in what is readily perceived as one pottery form changing gradually over time into a closely similar but distinct form. Augustus H. Lane Fox (e.g., 1868, 1874, 1875), or Pitt Rivers, had been arranging various items of material culture in

just such lines (and publishing illustrations thereof) in previous decades. North American examples are found in Kidder (1915) and Ford (1962). This type of graph may have originated in paleontology, if not in archaeology. Whatever the case, it became popular among paleontologists as exemplified by the well-known and oft-published diagram of the evolution of equid feet and teeth (e.g., Marsh 1874, 1879, 1892; Osborn 1904, 1907). These diagrams of inferred evolutionary or phylogenetic history are nominal scale and illustrate the evolving phenomena (e.g., horse feet, pottery vessels), not culture unit names evolving from one name to another.

The other type of graph that is relatively unique to the historical sciences is a set of rectangles representing a portion of geographic space and a duration of time, what I refer to as the *spatio-temporal rectangles* type of graph. Histories of archaeology suggest V. Gordon Childe (1929) published the first chart depicting spatio-temporally bounded, uniquely named culture units (e.g., Trigger 2006:244–245).² G. F. Scott Elliott (1915: facing p. 234) had published a similar chart of spatio-temporally delimited culture units more than a decade earlier, but his diagram was much less complex than Childe's. Such charts or graphs had likely precursors in Gabriel de Mortillet's (e.g., 1872) chart of divisions of the European Paleolithic into four cultural epochs (Chazan 1995). The earliest instances of spatio-temporal rectangle graphs for North American prehistory of which I am aware appeared in the 1920s and 1930s (e.g., Spinden 1922; Hawley 1930; see also Nelson 1933, 1938). As we will see, those working on the Plateau adopted this technique of graphing culture change a couple decades later. On the Plateau, a several decade time lag is not surprising for both the accumulation of knowledge of prehistory (see the first paragraph of this article) and the techniques of practice of archaeology relative to regions of North America found east

of the Rocky Mountains. As with the phyletic line graph type, the spatio-temporal rectangle graph type likely came to archaeology from geology where a world-wide temporal column of geological time periods was being constructed from local and regional columns of stratigraphic units. Also like a phyletic line, a spatio-temporal rectangle graph illustrates culture change at a nominal scale.

Throughout I use the term “culture unit” to denote what some might call a category or kind of entity that encompasses more than a single discrete object occupying a single location in time and space. Archaeology's culture units go by a variety of names. A *phase* is perhaps the most well-known and most-often utilized culture unit in North America (e.g., Phillips and Willey 1953; Willey and Phillips 1958). These units are typically made up of *assemblages* or aggregates of presumably associated artifacts, each aggregate being sufficiently similar to one or more other aggregates to be lumped together to create a *phase*, and their geographic and temporal distributions mapped. Another kind of unit found in the Plateau literature is a culture *period*, a unit including a variable duration of time occupying an historical position and represented by a particular combination of artifacts (e.g., Brownman and Munsell 1969). Other units include a culture *pattern*, similar to a phase (e.g., Warren 1968), and a culture *tradition* (e.g., Butler 1961). I use the generic term *culture unit* to signify all such units so as to avoid implying similarities or implicating differences in the kinds of units. A major difficulty accompanying use of these varied units to summarize areal prehistory is mentioned in the following discussion where necessary to make a point regarding the graphing of culture change, but otherwise I do not delve deeply into the structure and underlying meanings of these units (for a detailed discussion of the ontology and epistemology of the phase unit, see Dunnell 2008).

² Trigger (2006:244) reports Childe's (1929) graph of spatio-temporal rectangles was followed by Burkitt and Childe's (1932) “chart” for all of Europe. Burkitt and Childe refer to their synopsis as a “table” and as including “columns,” but the copy of their article I have examined contains neither and instead consists of sections, each including a paragraph or two of text describing a major culture unit (e.g., Middle Palaeolithic Period, Iron Age).

Results

The Two Samples

The focus here is to compare the sample of Columbia-Fraser Plateau culture area literature to a North American sample studied by Lyman (2021), and to describe aspects of the history of graph use in the former area. Lyman (2021) examined more than 900 pieces of archaeological literature published between 1840 and 1999, focusing particularly on the pre-1970 literature and (with the exception of introductory archaeology textbooks) not including the two most recent decades (Table 1). In that sample, 15 pieces derive from the Plateau culture area. The 471 pieces of Plateau literature examined for the present study include the 15 found in Lyman (2021) (Table 1). The temporal frequency distributions of pieces of Plateau literature in the two Plateau samples (that from Lyman [2021], and that for this article) for the 110 years of literature appearing between 1890 and 1999 (the temporal bins for which data were compiled in both studies) are not correlated (Pearson's $r = 0.498$, $p > 0.118$). This means that although the two sets of literature share 15 items, the temporal distribution of titles making up the set of 471 items compiled for the present study is different from the temporal distribution of the earlier set of 15 items. Further, the new Plateau sample of 471 items has a temporal frequency distribution (1880–1999) that bears no statistical relationship to the temporal frequency distribution of the total North American sample (Pearson's $r = -0.361$, $p > 0.275$). This indicates that temporal trends in graph use revealed by the two samples—total North American area, and total Plateau culture area—have the chance to display different temporal trends.

From Tables of Data to a Preferred Graph Type

In both samples (Plateau versus North American), the majority of the literature appearing during the early phases of research included few to no graphs. In both samples, early instances of presenting evidence of culture change involved

tableted data beginning in the 1900s in more eastern longitudes of North America and during the 1930s in the Plateau (Table 2). As implied earlier, this reflects the temporally later start of archaeological research in the Plateau than in areas east of the Rocky Mountains (see chapters in Fitting 1973). Similarly, graphs appear infrequently but considerably earlier in North America in general than in the Plateau; phyletic lines, spindles, and time range graphs appear during the 1880s in North America whereas spatio-temporal rectangles are the earliest graph type to appear in the Plateau and the earliest of these is in the 1950s. As with the North American sample, the Plateau sample indicates an increase in richness of graph types over time, but as might be expected, the increase is earlier in North America (1920s–1930s) and later in the Plateau (1960s).

The pattern of waxing and waning graph type richness in the North American sample is largely the result of several graph-types that were used only once or twice in the early middle decades of the twentieth century but seldom if ever again, in large part because of the increasingly frequent use of the spindle graph type in the 1950s and 1960s (see Ford [1962] for numerous examples). The North American one-offs include stacked line (or area) graphs, segmented bar graphs, several exceptionally difficult to decipher bar graph styles, a ternary diagram, and a couple others. There are very few one-off graph types in the Plateau literature. One of them is Morrissey's (2009) use of box plots (or box-and-whisker diagrams) to illustrate change in the metrics of projectile points, one graph per point dimension with one box plot per culture unit. Another is Scott's (2016) cladogram of early projectile point styles. That both of these one-offs appear within the past 15 years suggests innovation and experimentation in graphing culture change is not something Plateau archaeologists do very often.

One area where innovation is apparent among Plateau archaeologists concerns house floor shape and size. Several researchers have

**Table 1. Number of Pieces of Archaeological Literature Examined
by Decade in Lyman (2021:51).**

Temporal Bin	N of Pieces in Lyman (2021) ^a	N of Plateau Pieces Included in Lyman (2021)	N of Plateau Pieces Examined in this Article
1840–1849	1	-	Not included
1850–1859	5	-	Not included
1860–1869	8	-	Not included
1870–1879	31	-	Not included
1880–1889	43	-	Not included
1890–1899	64	1	2
1900–1909	61	-	2
1910–1919	53	-	1
1920–1929	47	-	3
1930–1939	98	-	2
1940–1949	120	1	1
1950–1959	119	1	11
1960–1969	127	7	52
1970–1979	74	3	52
1980–1989	30	2	71
1990–1999	5	-	70
2000–2009	Not included	Not included	110
2010–2019	Not included	Not included	94
Σ =	886	15	471

^aForty-seven introductory archaeology textbooks published after 1960 and 26 pieces of European literature published between 1840 and 1960 are not included.

graphed—diagrammed might be a better word—or at least verbally wondered about variability and change in house floor plans over time. Swanson (1958) was one of the earliest to graph house floor shape within temporally distinct rectangles. His work was subsequently revisited by Holmes (1966), and others examined this variable in other geographic areas for evidence of patterned change over time (e.g., Grabert 1971; Chatters 1986; Rousseau 2004; Galm 2006). More recently, Plateau archaeologists have published graphs of variability in camas-oven size against time (e.g., Thoms 1989). For both house floors and camas ovens, the graph typically is a bivariate plot of size against time rendered as calendric date or culture unit.

Also in contrast to North America overall, I have found only seven spindle graphs in the Plateau literature (Table 2). The first of these appears in Swanson (1962); this monograph is a revised version of Swanson's doctoral dissertation completed in 1954. It is unknown if the spindle graphs appeared in the latter (I have not examined the dissertation), but because that document had limited circulation, it unlikely had much influence on which graph type was used by others. From my perspective, Swanson's (1962:37, Fig. 18) half-spindle graph is exceptionally difficult to decipher. Multiple time periods (site-specific strata) are arrayed against two site types (habitations, and storage shelters) across the horizontal axis, and six categories of textile diameters (in ascending order) are arrayed along the vertical axis (ignoring the fact that the figure is turned 90 degrees counter-clockwise such that the figure caption is on the end [side] of the graph, at the bottom of the page, rather than under the graph). The obscurity of change in each culture variable graphed is exacerbated by the fact that spindle width changes from one spindle to the next across time, rather than the

standard of width changing within a spindle over time. That is, each spindle depicts the frequency distribution of different textile fiber diameters within a particular component.³ To detect change, one must compare spindle width of two or more (not necessarily adjacent) spindles at a particular (vertical) position on each spindle. That the graph requires more than a bit of study to decipher is found in Swanson's (1962:37) caption, which reads in part: "It should be noted that diameters increased with time in storage shelters; decreased with time in habitations." That Swanson had to verbally describe what sort of change was shown by the graph suggests he was aware the graph was not readily deciphered. Given this, one wonders why he used this same style of spindle graph in a later (non-Plateau) publication (Swanson 1972).

The other spindle appearing in the 1960s was by Nelson (1969) in a monograph that was known and read in manuscript form by others over the couple years immediately prior to its publication (e.g., Rice 1967).⁴ Nelson published a spindle graph (Figure 2) and a half-spindle graph, both showing the frequencies of projectile point types against time and culture phases (Nelson 1969:301). Both of the spindle graphs are of standard or traditional form (Lyman et al. 1998): time is on the vertical axis, each spindle represents a single artifact type, spindle length represents time, and spindle width represents the relative (percentage) frequency of the type at the corresponding time. Nelson (1969) provides no indication of the source of his inspiration to use spindle graphs in the published report, but tells me via personal communication (29 September 2022) he likely learned about spindle graphs from the 1952 edition of *The Book of Knowledge*, a multi-volume encyclopedia (Mee and Thompson 1952). With only five other spindle graphs appearing in the Plateau literature during

³ So-called "violin graphs" were said to be a "new graphical tool" by Hintze and Nelson (1998:181) thirty-five years after Swanson's (1962, 1972) original graph was published. Swanson's graph is not a spindle graph in the usual sense of the term, and not even a different style of spindle graph. It is instead a different type of graph given its distinctive grammar (rules for how and of what it is constructed). Swanson's is a violin graph.

⁴ Editorial concerns and establishing how production costs would be covered were the major issues resulting in a several-year delay of publication.

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Table 2. Number of Pieces of Literature with Graph Type per Decade for North America (after Lyman 2021:141) // Number of Pieces of Plateau Literature with Graph Type (-- on either side of // signifies data were not recorded).

Temporal Bin	Phyletic Line	Line Graph	Spindle	Bar Graph	Time Range	Table Only	Spatio-temporal Rectangles	Artifact Silhouette*	Text Description of Culture Units	Nothing
1840-1849	2//--	-	-	-	-	-	-	-	-	1
1850-1859	-	-	-	-	-	-	-	-	-	2
1860-1869	-	-	-	-	-	-	-	-	-	-
1870-1879	-	-	-	-	-	-	-	-	-	8
1880-1889	2//--	-	-	-	1//0	-	-	-	-	13
1890-1899	1//0	-	3//0	-	-	-	-	-	-	25//2
1900-1909	-	-	2//0	-	-	1//0	-	-	-	33//2
1910-1919	2//0	4//0	1//0	-	2//0	5//0	1//0	-	-	22//1
1920-1929	2//0	3//0	0//0	-	-	2//0	1//0	-	-	17//3
1930-1939	8//0	9//0	5//0	5//0	15//0	12//1	3//0	-	-	17//1
1940-1949	5//0	4//0	12//0	10//0	8//0	29//1	3//0	-	-	19//0
1950-1959	9//0	5//0	53//0	6//0	14//0	35//3	7//2	1//0	--//1	10//6
1960-1969	13//1	8//0	47//2	4//1	23//1	32//12	9//11	1//10	--//5	7//19
1970-1979	7//0	16//4	26//1	4//0	9//1	21//8	8//15	1//5	--//4	4//17
1980-1989	5//0	4//8	15//2	5//3	6//0	8//25	3//19	--//5	--//6	1//13
1990-1999	3//0	0//5	9//0	1//2	0//1	1//29	--//14	--//5	--//2	--//11
2000-2009	--//0	--//13	--//0	--//8	--//5	--//51	--//20	--//11	--//17	--//7
2010-2019	--//0	--//3	--//2	--//10	--//3	--//46	--//14	--//6	--//11	--//15

*Includes drawings and photos thereof; not consistently recorded for North America.

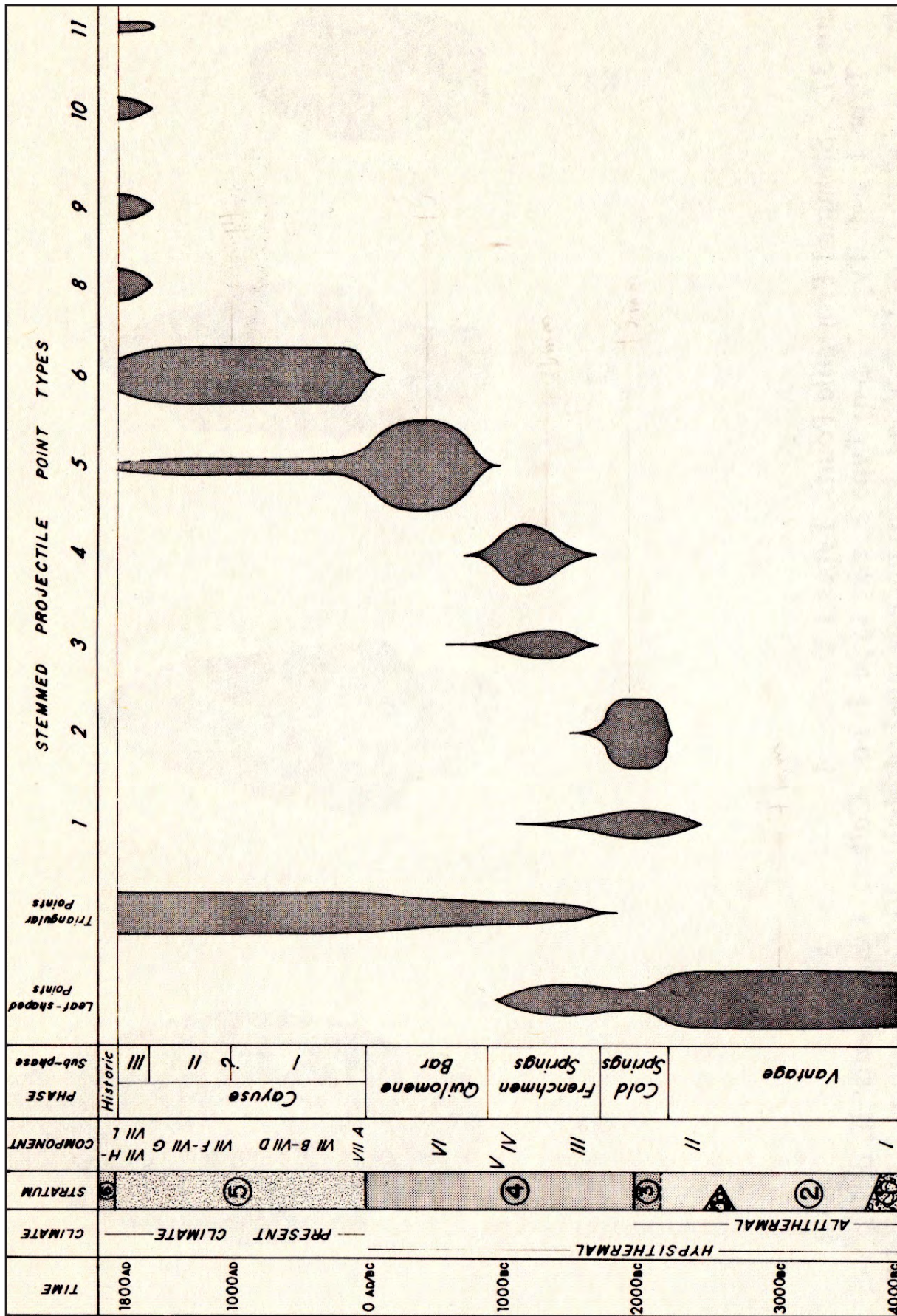


Figure 2. Nelson's (1969) spindle graph of projectile point styles against culture units and time. From Nelson (1969, Fig. 35). Reprinted courtesy of the Department of Anthropology, Washington State University.

the subsequent five decades, it is obvious this graph type was not very popular among Plateau archaeologists, though for unclear reasons. Perhaps it is because on the facing page Nelson's (1969, Fig. 34) occasionally reprinted figure of the same chronology had drawings of the diagnostic projectile points adjacent to the culture units (Figure 3). Rather than having to figure out which spindle represented which artifact form and what that form (type) looked like, here was an explicit rendering of both culture chronology and culture change.⁵ Another possible reason for largely not adopting spindle graphs resides in the fact that at about the time that spindle graphs were becoming popular across North American archaeology, a quite different graph type was invented and used on the Plateau. This later graph type clearly illustrated culture change and chronology and thus diverted attention from the spindle diagram type of graph, despite the fact this new graph type initially plotted nominal-scale data.

What appears to be the main innovation in graph type illustrating culture change evident in the Plateau literature is the depiction of silhouettes of projectile point types or styles plotted against time in various ways. The earliest example of this graph style appears in the early 1960s when Roald Fryxell and Richard Daugherty (1962a, 1962b, 1963) were able to construct, and published several times, what quickly became a culture chronology for at least the southern portion of the Plateau (Figure 4). It is unclear whether Fryxell or Daugherty should be given credit for the innovation of arraying projectile point silhouettes against time, although several lines of evidence suggest it was Fryxell's idea. First, Daugherty (1962) did not include this graph feature in his major synthetic article of the time. Second, when he included illustrations of projectile point types in his publications, Daugherty (1956a, 1959) oriented the points with the distal (pointed) end up and the proximal (base or haft) end down; the projectile point

silhouettes in Fryxell and Daugherty (1962a, 1962b, etc.) plotted against time are oriented with the distal end down and the proximal end up. And third, Fryxell is listed as first author in the several publications that introduce the graph style, and he uses the seminal illustration, and a related one (Figure 5) in publications for which Daugherty is not listed as co-author (e.g., Fryxell 1963; Fryxell and Cook 1964).

There is a fourth line of evidence suggesting Fryxell is behind the original artifact silhouette against time graph type. Fryxell was professionally trained as a geologist, and worked professionally as one of the first geoarchaeologists (Friends of Roald Fryxell 1978; Wildesen 1986). Given his training, he would have been exposed to the concept of *index fossils*—temporally diagnostic fossil taxa used to correlate strata across large expanses of geographic space under the assumption that a taxon has approximately the same limited time-span of existence wherever it occurs (for an informative history of this analytical practice, known as *biostratigraphy*, see Hancock 1977). The relevant point is that geologists initially used the presence, not the abundance, of one or a few index fossil taxa to correlate strata. The data were nominal scale. The artifact silhouettes in Fryxell and Daugherty's (1962a, 1962b) seminal graphs represent nominal-scale data. I presume Daugherty was aware that archaeologists had been plotting ratio scale frequencies of multiple temporally diagnostic artifact types since at least the late 1940s (select references and images in Ford [1962]), and sometimes using those frequencies to correlate geographically separated sequences. The graphs of Fryxell and Daugherty (Figure 4, Figure 5) more clearly reflect geological practice than archaeological practice to this point in time.

Different styles of plotting projectile point silhouettes or drawings against time were subsequently used by others. This other style provided either ordinal scale data on projectile point frequency (e.g., Nelson 1969) (Figure 3) or

⁵ Ford (1952) solved this problem by superimposing illustrations of a couple of archetypical specimens of each artifact type on each type's spindle.

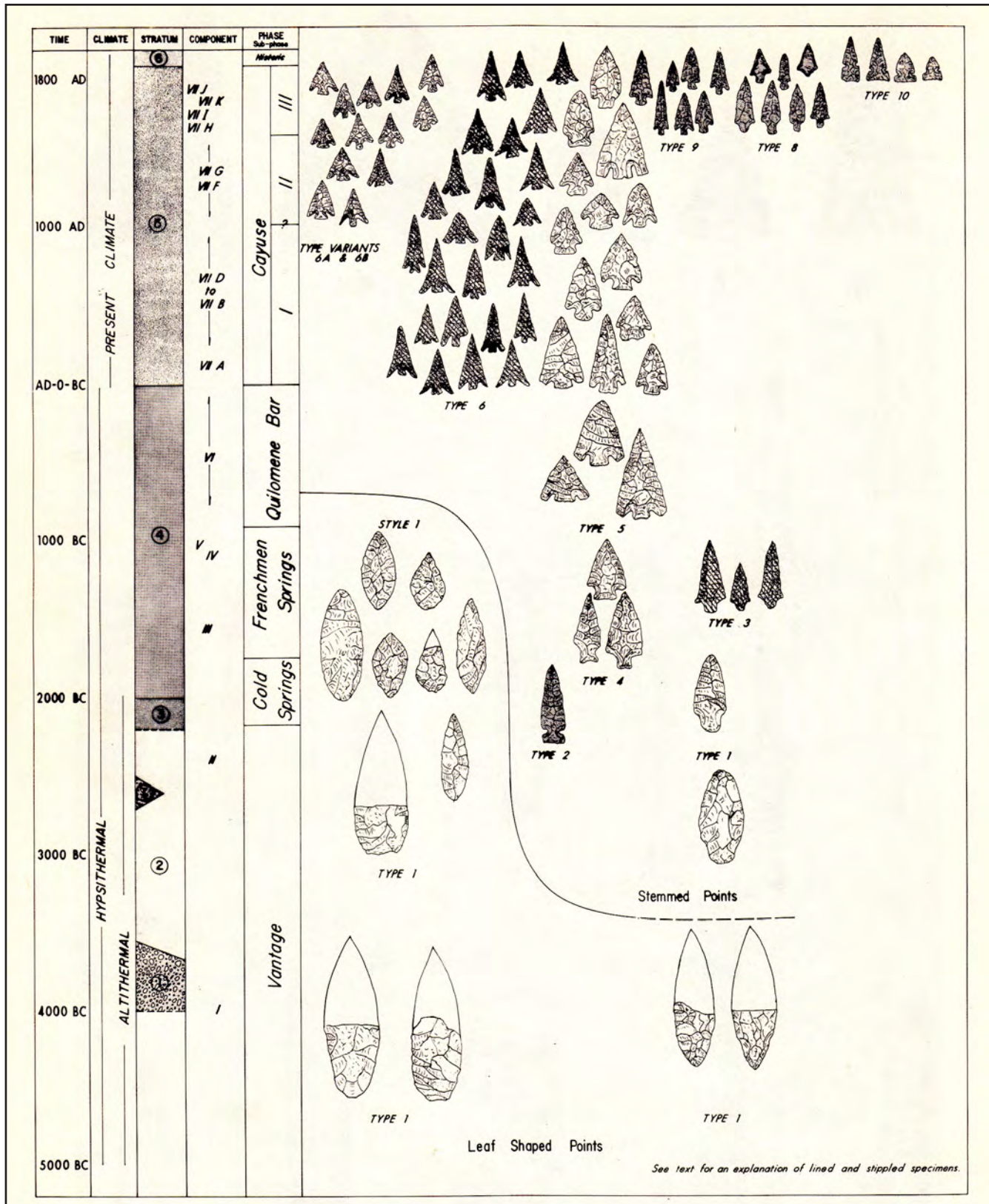


Figure 3. Nelson's (1969) diagram of projectile point drawings against culture units and time. From Nelson (1969, Fig. 34). Reprinted courtesy of the Department of Anthropology, Washington State University.

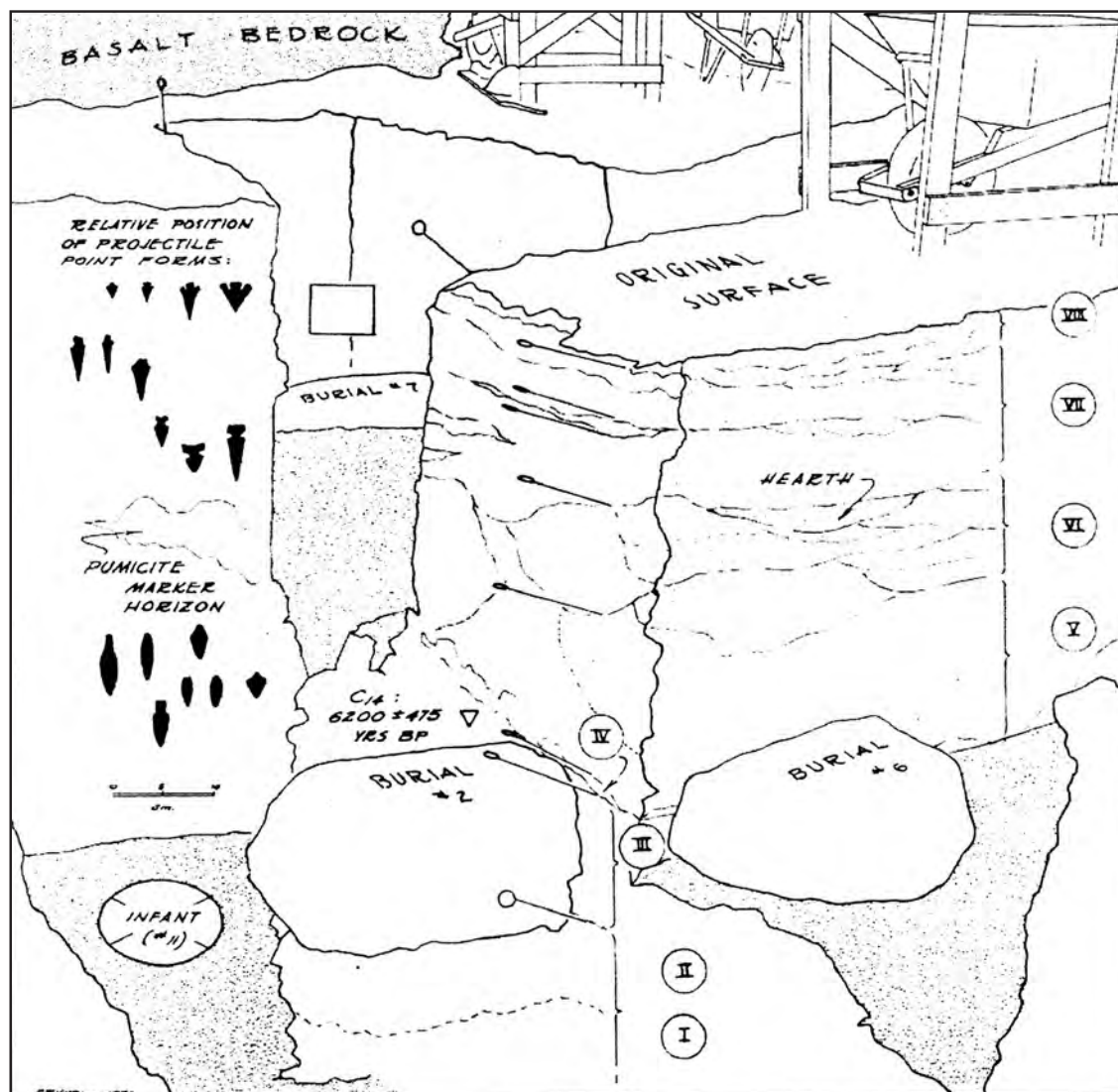


Figure 4. Diagram of the major stratigraphic units in Marmes Rockshelter (Roman numerals) and projectile point sequence. From Fryxell and Daugherty (1962a). Reprinted courtesy of the Department of Anthropology, Washington State University.

ratio scale data on such (e.g., H. S. Rice 1965; D. G. Rice 1972) (Figure 6). Although this graph type provides readily deciphered images of culture change (and chronology) effectively and efficiently, it appears infrequently after the initial burst of use in the 1960s (Table 2). This is especially so for graphs of interval scale data (Figure 6) which provide more detail than the graphs displaying ordinal scale data (Figure 3). Curiously, Nelson (1969) provides no indication of the quantitative basis for his oft reprinted graph (Figure 3), and thus his graph is not as informative in two ways as Rice's (1965). This may be why Nelson used two

graph forms (silhouettes, and spindle graphs) so as to include ratio scale data in a separate image (Figure 2) of what the evidence suggested about culture change.

What quickly became the apparently preferred graph type is the spatio-temporal rectangles with each rectangle bounding a culture unit name (often, a cultural phase, *sensu* Willey and Phillips 1958). Precursors to culturally named spatio-temporal rectangles are lists of culture traits plotted against temporally distinct culture units (Smith 1950; Caldwell 1956). These lists are quickly modified to include

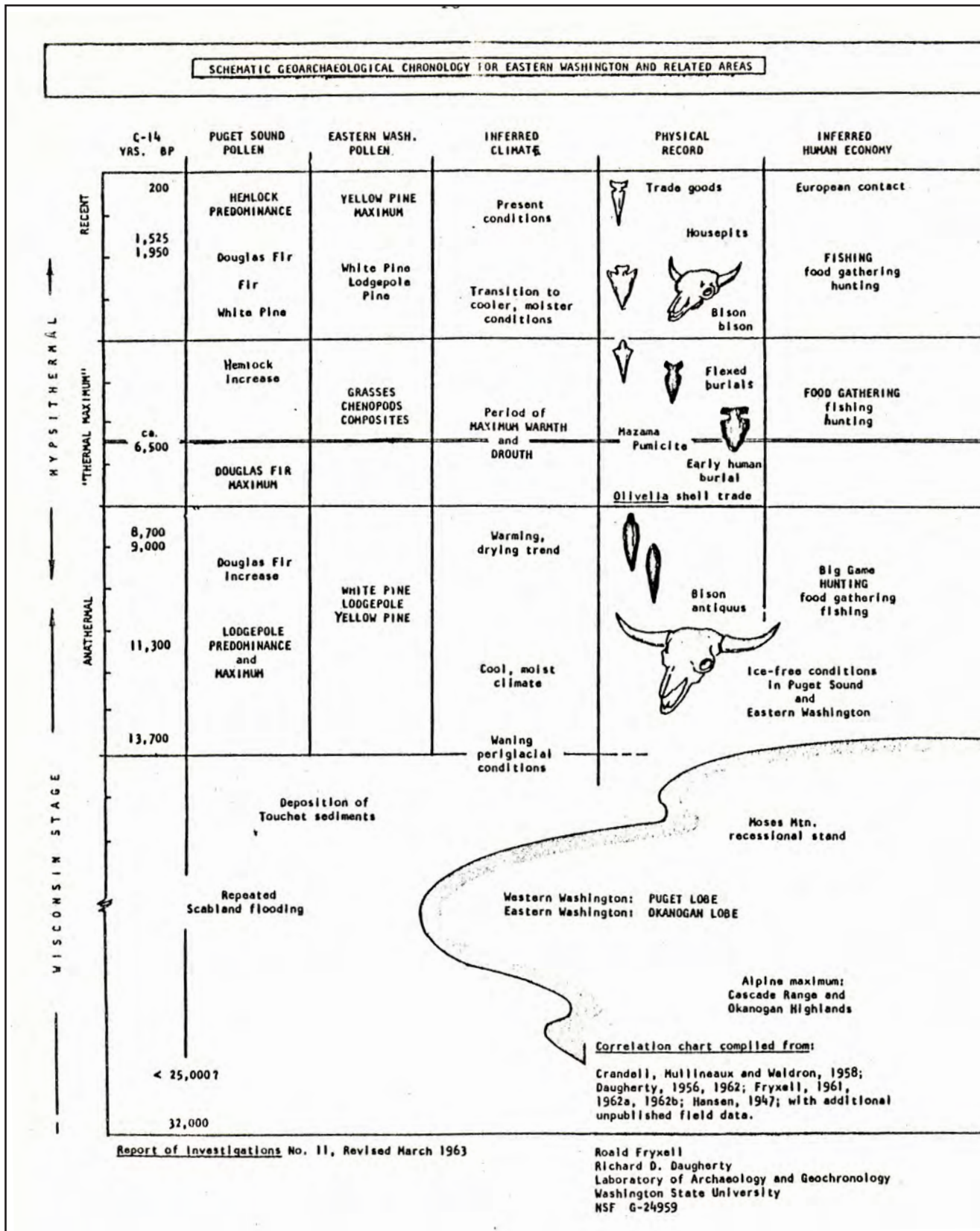


Figure 5. Schematic geochronology, paleoenvironmental, projectile point, bison, and human ecology chronology for eastern Washington. From Fryxell and Daugherty (1963). Reprinted courtesy of the Department of Anthropology, Washington State University.

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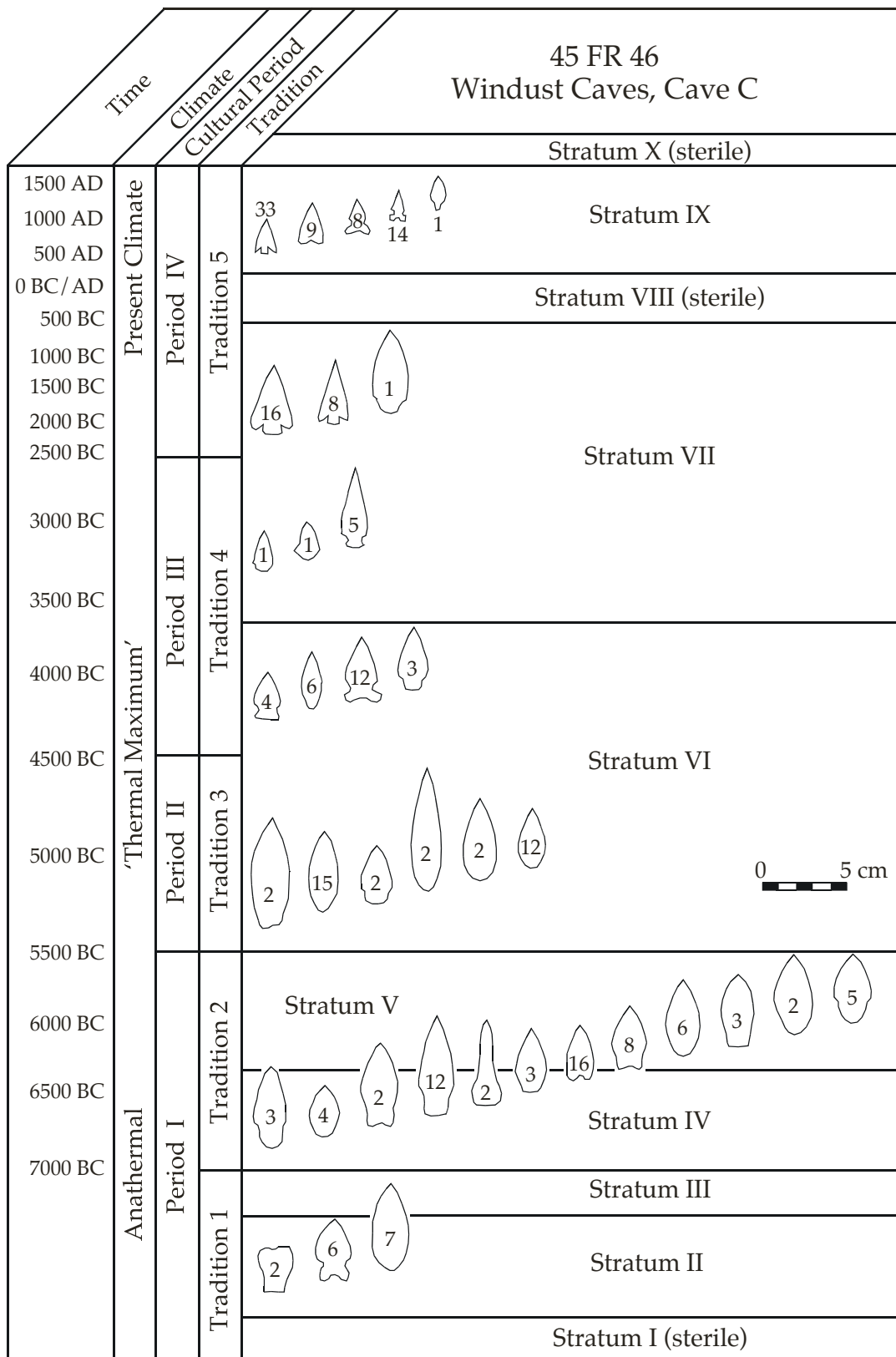


Figure 6. An exemplary diagram of culture change and chronology using frequencies of projectile point types. Chronology is founded on stratigraphy; small numbers adjacent to projectile point silhouettes represent the number of specimens of each type; scale bar is in reference to projectile point size. After Rice (1965).

frequencies of specimens representing each of several artifact types (e.g., Crabtree 1960; Cressman 1960), the types implicitly treated as representing culture traits. The lists in turn are subsequently simplified to culture unit names (e.g., Swanson 1962; Butler 1964; Caldwell and Mallory 1967; Warren 1968). Tables of artifact type frequencies per temporal or culture unit continue to appear (e.g., Ross 1963; Lynch et al. 1965; Grater 1966; Nance 1966), but the tide had turned in the 1960s to named culture units, literally nominal scale units.

More on Spatio-Temporal Rectangles

There is a bit of variation in the details of the spatio-temporal rectangle graphs. Of particular interest is the manner in which authors deal with time and its implications for culture change. Sometimes horizontal lines indicating temporal boundaries are absent (e.g., Yent 1976; Aikens 1983); other times the temporal lines between culture units are sloped straight lines or curves (e.g., Daugherty 1962). Either alternative seems to represent a nod to the near universal and long acknowledged belief that culture change is more or less continuous but not simultaneous across a geographic area or region. Sloped temporal boundaries imply that change from one cultural unit to another takes place at different times in different places within a region. The absence of a temporal boundary line implies (because the presence or absence of such boundaries is seldom explained) the fact that the culture names do not necessarily represent total internal stasis over their duration (contra Plog 1973, 1974). Neither of these details regarding how temporal boundaries are depicted is meant to deny any sort of stasis, as the concept of a cultural tradition (such as proposed by Butler [1961] for his Old Cordilleran tradition, and by Daugherty [1962] for his Intermontane West-

ern Tradition) is an explicit acknowledgment that stasis in at least some limited aspects of a cultural lineage is possible (see also Thompson 1956). A more direct statement that periods of cultural stasis occur is found in Chang's (1967:31) definition of a cultural "stationary state" as one in which "no structural alteration takes place." In a rare statement on this matter from a Plateau archaeologist, Leonhardy (1970:8) defined "a stationary state as the segment of a culture continuum in which the changes which took place are less than the changes apparent between the segments of the continuum." At base Leonhardy's (and Chang's) steady states were stratigraphically bounded aggregates of artifacts referred to as assemblages; in this his analytical protocol followed disciplinary tradition (Lyman et al. 1997).

Graphs of spatially and temporally bounded rectangles were utilized often across North America, infrequently initially in the Plateau but picking up speed in the 1950s and 1960s likely, at least in part, because of use of the analytical procedure described by Phillips and Willey (1953; Willey and Phillips 1958) or an approximation of it (e.g., Swanson 1962; Caldwell and Mallory 1967; Warren 1968; Leonhardy 1970; Leonhardy and Rice 1970; Bense 1972; Rice 1972). Phillips and Willey's conceptual scheme and analytical procedure were founded in part on earlier models that were implicitly grounded in the notion that individual *cultures* could be recognized along the temporal dimension just as they had been recognized along the spatial dimension by ethnographers (e.g., Gladwin and Gladwin 1934; McKern 1939). That the spatio-temporal polygons seemed to work well for organizing and summarizing culture chronology and change is perhaps why it was adopted across North America (e.g., Kidder 1927; Haurly 1950; Rouse 1951; Coe 1957; Lathrap 1957; Wedel 1964).⁶

⁶ Perhaps reflecting the early stage of the discipline-wide transition to spatio-temporal rectangles, no such graph appears in the nine chapters included in the 1955 *New Interpretations of Aboriginal American Culture History* (Meggers and Evans 1955). Five such graphs (including a reprint of Daugherty's [1962] for the Intermontane Western Tradition) appear in the nine chapters on North America in the 1964 *Prehistoric Man in the New World* (Jennings and Norbeck 1964). Fifteen spatio-temporal rectangle graphs (plus a single phyletic line graph) appear in Willey's (1966) *An Introduction to American Archaeology*, twelve with horizontal temporal boundaries, one with sloped temporal boundaries, and two with no indication of temporal boundaries.

The degree to which these seemingly internally homogeneous units in fact represented stasis rather than being a function of sampling (e.g., stratigraphic excavation resulting in aggregates of artifacts implicitly conceived as representing internally homogeneous, temporally static cultures) was not explicitly considered. In addition, spatio-temporally bounded named culture units were much easier to remember than shifts in the contents of lists of multiple cultural traits or frequencies of particular artifact types. It may be for this reason spatio-temporal rectangles representing culture units filled the pages of textbooks on North American prehistory virtually from the start (e.g., Willey 1966; Jennings 1968). Whatever the reason, those named spatio-temporal rectangles became the favored graph style of archaeologists working in the Plateau (Table 2).

During the period of growing popularity of spatially and temporally bounded named rectangles (1960–1980), a few individuals verbally described culture units within the body of their texts (e.g., Sanger 1967; Browman and Munsell 1969). Some placed verbal descriptions of the units in table form (e.g., Daugherty et al. 1967; Grabert 1970, 1974). As Bicchieri (1975) would subsequently note, archaeologists had to take some care in comparing one sequence with another given the potential for variability in the basis upon which unit boundaries had been drawn (temporal, spatial, formal [content], or some combination thereof).

Text Descriptions

Of some interest is the use of text descriptions of culture units as opposed to graphs. Text descriptions first appear in 1959, and their frequency increases more or less continuously thereafter (Table 2). Text descriptions appear less frequently than spatio-temporal rectangles, but their relatively regular appearance suggests Plateau archaeologists sought to accomplish two things. First, the mere listing of culture unit names within spatio-temporal rectangles, by the 1970s, demanded an intimate familiarity with

the implications of those culture unit names if a reader was to know the nature of culture content and change. Consider Figure 1. In that figure, different *kinds* of culture units are listed—minimally periods, phases, patterns. They are not the same sorts of units, making decipherment of the significance of the graph difficult, as pointed out by Bicchieri (1975). Was culture change actually synchronous or not across the local areas represented; was stasis of similar or dissimilar duration; are the chronologies formally (content) similar or different from one area to the next? This is difficult to determine without much more information on both the nature of the culture units used, the formal contents of those units, and the analytical protocol used to create them. The second thing suggested by textual descriptions of culture units is that there was an effort to provide more detail about culture unit formal content than a simple listing of temporally diagnostic artifact styles, usually projectile points. Following both a greater knowledge of the local archaeological record and the disciplinary trend to provide more anthropological kinds of conclusions (e.g., Longacre 1964; Deetz 1965; Hill 1966; Flannery 1968; Leone 1968), there was, it seems, an effort to do more than provide a simple culture chronology.

Graph Type Richness

Three questions concerning graph type richness were outlined earlier. To determine answers to these questions, the data in Table 3 were compiled. For multi-authored articles, only the first author was tallied; for edited volumes, only the editor was tallied. In part for this reason, an ordinal-scale correlation statistic (Spearman's *rho*) was calculated rather than a parametric correlation coefficient. An ordinal-scale statistic is more appropriate because there is some overlap of authors from one temporal bin to the chronologically subsequent bin; the samples are somewhat interdependent. Further, given that very few pieces of literature were published prior to 1950, I consider only those temporal bins post-dating

1949 to avoid influences of sample size in the two following tests. The first implication, that the richness of graph types may correlate with the number of pieces of literature examined per temporal bin, is not met by the sample ($\rho = 0.418, p > 0.4$). The second implication is that the richness of graph types should correlate with the number of distinct authors per temporal bin; this too is not met by the sample ($\rho = 0.299, p > 0.5$). Why neither of these pairs of variables reflects the expected sort of sample size-richness relationship is unclear, but I suspect it has to do with a number of things. An obvious one is that not all excavations revealed stratigraphically distinct materials that could be used to produce graphs of change. Similarly, the research question(s) addressed in a particular investigation may not have required graphs displaying relationships between variables meant to display culture change.

The third implication I suspected might be found is that the richness of graph types should increase as interest in establishing local cultural chronologies increases, and decrease as that interest decreases. This implication requires the level of interest in building local cultural chronologies per temporal bin be determined. To do so, I examined histories of North American archaeology (e.g., Willey 1968; Fitting 1973; Willey and Sabloff 1993) and several commentaries on early and middle twentieth century archaeology (e.g., Flannery 1967; Binford 1968; Deetz 1970; Lyman et al. 1997). In brief, prior to about 1930, because the time depth of the North American archaeological record was thought to be at best a couple thousand years, and that record was readily accounted for by consulting the ethnographic record (the two records looked the same), there was minimal interest in and no perceived necessity of building cultural chronologies. Shortly after the 1927 discovery at Folsom, New Mexico, that people had been in North America since the end of the Ice Age (even then believed to be about 10,000 B.P.), A. V. Kidder (1936) remarked that the job now was to fill in the several

thousand-year gap between Folsom and the most recent couple thousand years. Efforts to do so were facilitated at first by seriation and stratigraphic excavations. The introduction of radiocarbon dating in the 1950s facilitated the building of cultural chronologies and began to replace the previous reliance on geochronology and artifact types (Lyman 2000). The focus of much research between the late 1950s and the middle 1980s was, therefore, establishing cultural chronologies or what was, beginning in the 1970s, often derogatorily referred to as the mere description of culture history. Interest in culture chronology received no encouragement from the post-processual movement that grew out of the 1980s. This thumbnail historical sketch forms the basis for the levels of interest in culture chronology assigned per temporal bin in Table 3.

What is the nature of the relationship between graph type richness and interest in culture chronology? As anticipated, there is an increase in richness between 1950 and 1980 as interest increased. Subsequently, richness remains more or less static as interest decreases. Several local culture chronologies were more or less established by the 1980s (e.g., Swanson 1962; Sanger 1967, 1970; Grabert 1968, 1970; Warren 1968; Nelson 1969; Leonhardy and Rice 1970; Chance and Chance 1977; Chance et al. 1977; Lohse 1985; Salo 1985; Chatters 1986), which is not to say all chronological and culture historical sequences were set in stone and thus beyond modification (e.g., Pouley 2008, 2010). As previously indicated, part of the reason for poor alignment of various local chronologies is that different sorts of archaeological units (e.g., cultures, phases, periods, stages) were used by different investigators (Biccheri 1975). In addition, as Leonhardy (1968, 1970) noted on several occasions at the time, the analytical procedures used to establish these units were seldom described in any detail, so it was hardly surprising that results varied and the units used—whatever they might be called or were meant to represent—were dissimilar from

Table 3. Richness of Graph Types in the North America (N.A.) Sample, and the Plateau Sample, Author Richness in the Plateau Sample, and Level of Interest in Culture Chronology in the Plateau (--, data not recorded).

Temporal Bin	Plateau Richness ^a	N. A. Richness ^{a,b}	Author Richness ^b	Level of Interest in Culture Chronology ^c
1840–1849	0	1	--	--
1850–1859	0	0	--	--
1860–1869	0	0	--	--
1870–1879	0	0	--	--
1880–1889	0	2	--	--
1890–1899	0	2	2	None
1900–1909	0	2	1	None
1910–1919	0	5	1	None
1920–1929	0	3	1	Minimal
1930–1939	1	6	2	Minimal
1940–1949	1	6	1	Beginning
1950–1959	2	6	10	Waxing
1960–1969	7	6	30	Focus
1970–1979	6	-- (6)	40	Focus
1980–1989	6	-- (6)	45	Waning
1990–1999	6	--	44	Waning
2000–2009	6	--	64	Minimal
2010–2019	7	--	55	Minimal

^aIncludes tables as a “graph” type.

^bFor multi-authored articles, only the first author was tallied; for edited volumes, only the editor was tallied.

^cBased in part on Binford (1968), Deetz (1970), Dunnell (1978), Flannery (1967), Lyman et al. (1997), Trigger (2006), Willey and Sabloff (1993).

investigator to investigator to greater or lesser degrees.⁷

It is during this period of determination of culture chronologies (1960–1980) that the shift to culture-named spatio-temporal rectangles becomes apparent (Table 2). Other graph types (bar graphs, line graphs) continue to be used sporadically, with tables of data occurring nearly ubiquitously in the literature. The latter makes sense when samples are small and thus summary graphs are not only unnecessary but potentially misleading; tables put the data into the written record with less ink and page space. Culture-named spatio-temporal rectangles take on a new role in the 1990s; not only are they still used to occasionally summarize a newly documented or revised culture chronology, they now begin to provide a culture-historical context for projects that are focused analytically on something other than culture chronology (e.g., Litzkow 2011 [after Galm and Gough 2008]; Lohse and Moser 2014). This new role lends a degree of credence to the early-middle twentieth century suggestion of culture historians who argued that figuring out the culture history of an area must precede subsequent, more anthropologically or culture-process oriented analyses (e.g., Willey and Phillips 1958; see also Webster 2008).

Interestingly, since their early burst of popularity in the 1960s (Table 2), illustrations of artifacts ordered against time continue to appear sporadically to the present day. In one of the most intriguing examples, Chance and Chance (1985) produced a diagram that includes not just the traditionally illustrated temporally diagnostic projectile point types (e.g., Carlson and Magne 2008), but other types of artifact forms as well (Figure 7). This figure was originally printed as a 20 x 30 inch (50 x

67 cm) poster or chart (included in a pocket attached to the inside back cover of the report); it was reprinted in Roulette et al. (1999, 2000) in a much smaller format on an 8.5 x 11 inch page (as found in Figure 7). A very similar graph (Figure 8), including silhouettes of temporally diagnostic projectile point forms and also unifacial lithic artifacts appeared twenty years later (Rousseau 2004; reprinted in Rousseau 2008). Note that both of these present nominal scale (index fossil) type data.

Illustration of projectile points along with other artifact forms follows another of Leonhardy's (1968, 1970) early suggestions, specifically, to use more than projectile point types as index fossils denoting a particular time period and to instead describe suites of artifact forms (not necessarily complete inventories) to document and describe culture history (e.g., Leonhardy and Rice 1970). In a graph of such, not only are *differences* in the artifact complexes visually apparent, so too is culture *change*. Difference is just that, lack of similarity between included phenomena; change is not only difference over time but also implies there is some connection or linkage between earlier and later phenomena. This sort of graph exploits “one of the most highly developed human information processing capabilities—the ability to recognize, classify, and remember visual patterns” (Lewandowsky and Spence 1990:200). That graphs like that in Figure 7 clearly and unambiguously display *culture change* (under the assumption that artifacts represent *material culture*) makes it all the more useful for displaying an aspect of humankind's past that continues to capture much archaeological attention.

Illustrations, whether photographs, silhouettes, or detailed drawings of representative

⁷ Failure to provide an in-depth description of how to implement a particular analytical technique is characteristic not just of Plateau archaeologists, but of archaeologists working across North America. One example is the Midwestern Taxonomic Method which, as originally designed (McKern 1939), did not discuss the nuances of how it was to be implemented (Lyman and O'Brien 2003). Therefore, precisely how it was implemented varied a bit from investigator to investigator (e.g., McGregor 1941; Griffin 1943; see also McKern 1944). Another example is the perhaps more familiar Direct Historical Approach (e.g., Wedel 1938). Although typically described as “start in the present and work back in time,” it is virtually impossible to find a discussion of how exactly that is to be done (Lyman and O'Brien 2001).

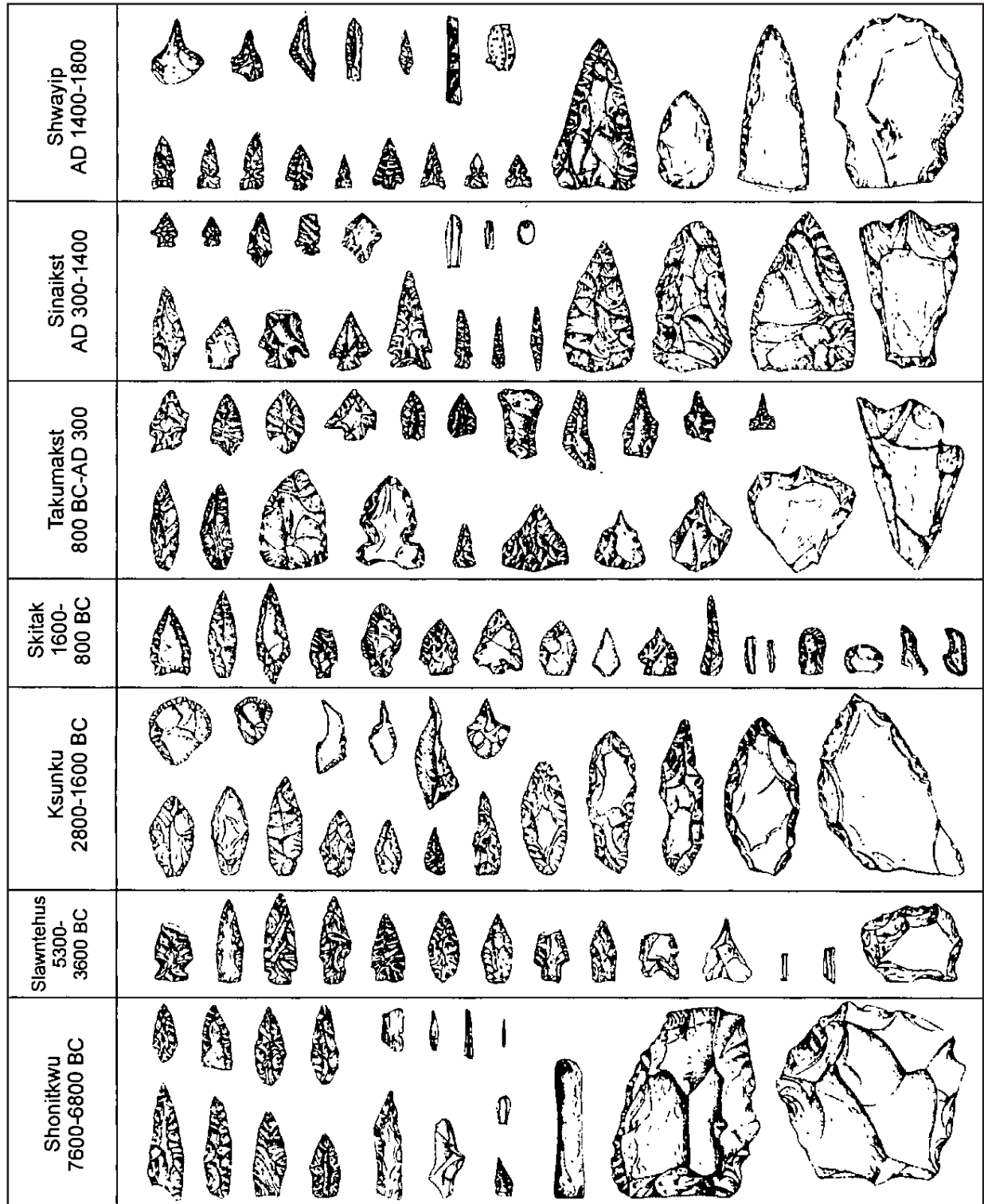


Figure 7. Chance and Chance's (1985) graph of culture change in the Kettle Falls region of northeastern Washington State. From Chance and Chance (1985). Reprinted courtesy of Jennifer Chance (artist) and Bill Roulette (for the reduction; Applied Archaeological Research).

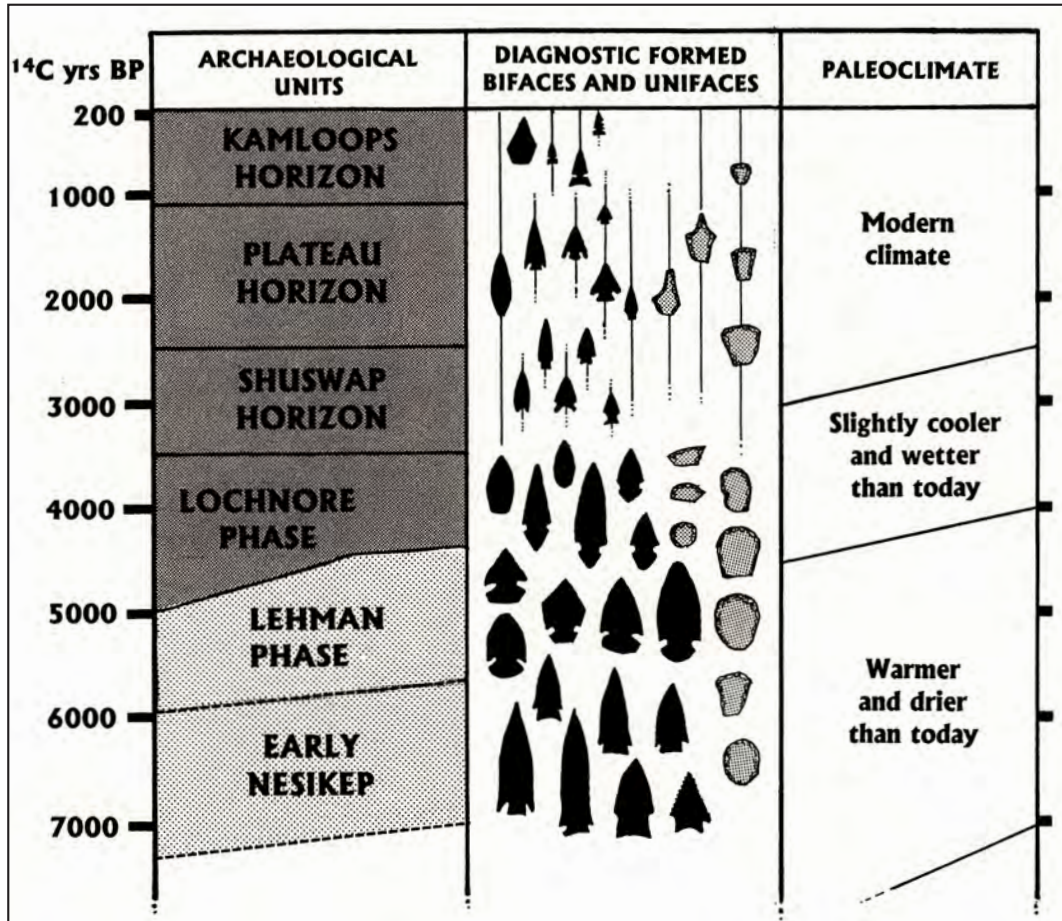


Figure 8. Rousseau's (2004:10) graph of culture change and late Holocene paleoclimates for the Canadian Plateau. From Rousseau (2004). Reprinted courtesy of the University of Utah Press.

(archetypical or modal?) artifact forms arrayed against time, whether numerical calendric ages or temporally sequent culture units (phases, periods, horizons), summarize evidence of culture change. That such graphs are relatively rare, especially when compared to the frequency of spatio-temporal rectangles bounding culture unit names, is intriguing. There are three possible reasons for this. First, the names of culture units arranged in chronological sequence are likely more easily remembered than a graph illustrating precisely of what the sequence is formally comprised. Second, graphs of artifact forms plotted against time may have become less popular in the 1970s because they implied culture history was the analytical goal, and it was at this time that this analytical goal had for the

previous decade been resoundingly derogated for various flaws and weaknesses, both real and imagined (e.g., Flannery 1967, 1973; Binford 1968; Struever 1968; Leone 1971, 1972; Martin 1971; Hill 1972; with specific reference to the Plateau, see for example Schalk 1980, 1983; Schalk and Cleveland 1983). The third reason is that, as we have seen with other analytical techniques used by archaeologists across the continent, the analytical protocol for constructing a particular graph type illustrating culture change is not always described in the associated text. If you do not know how to construct a similar graph—what is referred to as the “graph grammar” is obscure—then you might attempt to draw your own, but you may not. Whatever the case, graphs of the type exemplified in Figures 3–8 seem to

lack popularity among recent generations of Plateau archaeologists. Perhaps this will change as graphing technology continues to expand and improve (e.g., Baxter and Cool 2016).

Given the preceding, one might well ask what I recommend as an effective and efficient graph type for illustrating culture change. My answer would be in the form of a series of questions. What is the ultimate purpose of the graph? To summarize a local or regional *chronology* of named culture units? To summarize a local or regional *history* of culture units? To diagram the nature of the particular sequence of culture change? The first purpose (chronology) could be well served by a set of named culture unit spatio-temporal rectangles. The second purpose (history) may be fulfilled with a temporally sequent set of verbal descriptions of individual culture units. The third purpose (nature of change) would, I believe, be best served by some combination of the attributes seen in Figures 6, 7, and 8: frequencies of each of multiple artifact types (not just projectile point styles), plotted against time and climatic or environmental periods. The last variable reflects my own preference of knowing the environmental context of culture change (e.g., Lyman 2017; Faith and Lyman 2019); someone else may prefer a different contextual variable.

Conclusions

The history of how Plateau archaeologists have graphed evidence of culture change has met some expectations but also revealed a few unexpected features. As was found for North America in general, early documentation of culture change in the Plateau largely involved tables of data such as trait lists or frequencies of specimens representing each of the several artifact types per stratum. Also, like across North America, in the Plateau graphs were used a bit later but did not totally replace tables. Both of these things (use of tables and use of graphs) began later in the Plateau than in more eastern longitudes. The richness of graph types evident in the Plateau waxes and wanes with the analytical

focus on culture history, but unexpectedly does not correlate with either the number of pieces of literature per temporal bin or with the number of authors per temporal bin. The lack of the expected sample size-richness relationship between the two variables making up each of these pairs of variables may reflect a general local conservative attitude toward graphing. For instance, there are few one-off types of graphs in the Plateau literature, but there are quite a few of these in other areas of North America (Lyman 2021).

Maps of site locations, site and excavation plans, and stratigraphic profiles are nearly ubiquitous across the 471 pieces of Plateau archaeology literature examined. Very few of the newer types of graphs used in archaeology are represented in the Plateau literature. One instance of cladograms (Scott 2016) and one of box plots (Morrissey 2009) were found. A single instance of violin plots (Stone 2021) was also found, but it is more recent than the temporal boundaries of this history. None of these graph types necessarily represent culture change, though they can. Somewhat surprising is the apparent lack of popularity of ratio scale spindle graphs in the Plateau relative to North America. This became a rather frequently used graph type in other regions of North America, one that is mentioned in many introductory textbooks, so this phenomenon is likely not the result of a lack of awareness. The most frequently used graph type in the Plateau is that of one or more columns of nominal scale rectangles, each rectangle representing a particular span of time and expanse of geographic space, and with a culture name inserted. Why this is the case is not clear at present. It seems too easy to suspect that once the first couple such graphs appeared (e.g., Cressman 1960; Daugherty 1962), this graph type was adopted and subsequently mimicked because it was relatively easy to produce and to remember. It was, after all, made up of but six or eight names of culture units.

To this point in time, Plateau archaeologists seem largely content to exploit the traditional ground of spatio-temporal rectangles; but as

Plog (1973, 1974) noted nearly five decades ago, having the stark temporal boundaries in a graph implies stasis (intentionally or not) within the unit for its entire existence and forces all change into that moment in time represented by the temporal boundary. Precisely the same weakness attends the spatial boundaries. All difference in cultural content across space is implied to exist at the geographic boundaries. And although there is something to be said for arranging illustrations of artifact forms against time, limiting those illustrations to projectile points overlooks change or stasis in other artifact categories. Here, Leonhardy's (1968, 1970) suggestions regarding what we include in our culture units are worthy of attention. How and what we choose to graph has implications for not only how we perceive culture change but how we conceive it.

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1941 *Southwestern Archaeology*. New York, NY: John Wiley & Sons.
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1966 45WT2: An Archaeological Site on the Lower Snake River. Master of Arts thesis, Department of Anthropology, Washington State University, Pullman.
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1969 *The Sunset Creek Site (45-KT-28) and Its Place in Plateau Prehistory*. Report of Investigations No. 47. Laboratory of Anthropology, Washington State University, Pullman.

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1953 Method and Theory in American Archaeology: An Operational Basis for Culture-Historical Integration. *American Anthropologist*, 55:615–633.
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1998 Prehistory of the Northern Plateau. In *Handbook of North American Indians, Volume 12, Plateau*, edited by Deward E. Walker, Jr., pp. 81–102. Washington: Smithsonian Institution.
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1967 Prehistory of the Pacific Northwest Plateau as Seen from the Interior of British Columbia. *American Antiquity*, 32:186–197.
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- 1900 Archeology of the Thompson River, British Columbia. *American Museum of Natural History, Memoir*, 2(6):401–442.
- 1910 *Archeology of the Yakima Valley*. American Museum of Natural History, Anthropological Papers, 6(1).
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1922 *Ancient Civilizations of Mexico and Central America*, second edition. Handbook Series No. 3. New York, NY: American Museum of Natural History.
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2021 Measuring Past Networks of Cultural Transmission: The Haskett Projectile Point. Bachelor of Arts Honors thesis, Oregon State University, Corvallis.
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1974 *Predicting the Past: An Introduction to Anthropological Archaeology*. New York, NY: Holt, Rinehart and Winston.
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1989 *The Northern Roots of Hunter–Gatherer Intensification: Camas and the Pacific Northwest*. Doctoral dissertation, Department of Anthropology, Washington State University, Pullman.
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2006 *A History of Archaeological Thought*, second edition. Cambridge, U.K.: University of Cambridge Press.
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- Walker, Deward E., Jr., editor
1998 *Handbook of North American Indians, Volume 12, Plateau*. Washington: Smithsonian Institution.
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1968 The View from Wenas: A Study in Plateau Prehistory. *Occasional Papers of the Idaho State University Museum*, No. 24. Pocatello.
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1963 The Goldendale Site and Its Place in Plateau Prehistory. *Tebiwā*, 6(1):1–21.
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1938 The Direct-Historical Approach in Pawnee Archaeology. *Smithsonian Miscellaneous Collections*, 97(7):1–21.
1964 The Great Plains. In *Prehistoric Man in the New World*, edited by Jesse D. Jennings and Edward Norbeck, pp. 193–220. Chicago, IL: University of Chicago Press.
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1956 *Archaeology from the Earth*. Baltimore, MD: Penguin Books.
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1986 Roald Fryxell: A Remembrance, 1934–1974. *American Antiquity*, 51:208–210.
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1966 *An Introduction to American Archaeology, Vol. 1, North and Middle America*. Englewood Cliffs, NJ: Prentice-Hall.
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1958 *Method and Theory in American Archaeology*. Chicago, IL: University of Chicago Press.
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1993 *A History of American Archaeology*, third edition. New York, NY: W. H. Freeman and Company.
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1976 The Cultural Sequence at Wawawai (45WT39), Lower Snake River Region, Southeastern Washington. Master of Arts thesis, Department of Anthropology, Washington State University, Pullman.

SUPPLEMENTAL TABLE 1. LIST OF 471 PIECES OF LITERATURE ON PLATEAU ARCHAEOLOGY.

Supplemental Table 1 Key

- *Means the title was in Lyman 2021 book, *Graphing Culture Change in North American Archaeology: A History of Graph Types*. Oxford, U.K.: Oxford University Press.
- “Context” means the spatio-temporal rectangle of culture units was included to provide a culture-historical context for the findings or discussion.
- Bracketed text represents commentary by Lyman.

1895–1909

*Hill-Tout, Charles

- 1895 Later Prehistoric Man in British Columbia. *Proceedings and Transactions of the Royal Society of Canada* 1, series 2: 103–122. [Nothing.]

Smith, Harlan I.

- 1899 Archaeology of Lytton, British Columbia. *American Museum of Natural History, Memoir* 2(3):129–161. [p. 161: “Up to this time we have no evidence of change of type or of a material change of culture since the earliest times of which we have knowledge.”] [Nothing.]
- 1900 Archeology of the Thompson River, British Columbia. *American Museum of Natural History, Memoir* 2(6):401–442. [Nothing.]
- 1903 Shell Heaps of the Lower Fraser River, British Columbia. *American Museum of Natural History, Memoir* 3(4):133–191. [Describes and illustrates strata, but no indication in table or figure form of stratigraphic collection.] [Nothing.]

1910–1919

Smith, Harlan I.

- 1910 Archeology of the Yakima Valley. *American Museum of Natural History, Anthropological Papers*, 6(1):1–171. [Nothing.]

1920–1929

Krieger, Herbert W.

- 1927 Archeological Investigations in the Columbia River Valley. *Explorations and Field-Work of the Smithsonian Institution in 1926, Smithsonian Miscellaneous Collections*, 78(7):178–199. [Nothing.]

- 1928a Prehistoric Inhabitants of the Columbia River Valley. *Explorations and Field-Work of the Smithsonian Institution in 1927*, pp. 133–140. [Nothing.]
- 1928b A Prehistoric Pit House Village Site on the Columbia River at Wahluke, Grant County, Washington. *Proceedings of the United States National Museum*, 73(11):1–29. [Nothing.]

1930–1939

Strong, William Duncan, Egbert Schenck, and Julian H. Steward

- 1930 Archaeology of the Dalles-Deschutes Region. *University of California Publications in American Archaeology and Ethnology*, 29(1):1–154. [Tables of artifact types against depth.]

Krieger, Herbert W.

- 1935 Salvaging Early Cultural Remains in the Valley of the Lower Columbia River. *Explorations and Field-Work of the Smithsonian in 1934*, pp. 53–56. [Nothing.]

1940–1949

*Collier, Donald, Alfred E. Hudson, and Arlo Ford

- 1942 Archeology of the Upper Columbia Region. *University of Washington, Publications in Anthropology*, 9(1):1–178. [Tabled distribution of artifact type frequencies by depth (per site, 11” thick levels).]

1950–1959

Smith, Marian I.

- 1950 (completed 1948) Archaeology of the Columbia Fraser Region. *Society for American Archaeology Memoir*, No. 6. [Table of temporally distinct culture units with +/- of cultural traits per unit.]

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- Bryan, Alan L.
1955 Excavations at Meyer Caves in East Central Washington. *Davidson Journal of Anthropology*, 1(1):11–20. [Nothing]
- Caldwell, Warren W.
1956 The Archeology of Wakemap: A Stratified Site near The Dalles of the Columbia. Doctoral dissertation, University of Washington, Seattle. [List of culture units (ordinal scale) without spatio-temporal boundaries, oldest on top and youngest on bottom; time range of artifact type designations.]
- Daugherty, Richard D.
1956 Early Man in the Columbia Intermontane Province. *University of Utah Anthropological Papers*, No. 24 (revised 1953 dissertation). [Nothing.]
- Butler, B. Robert
1957 Dalles Reservoir Prehistory: A Preliminary Analysis. *The Washington Archaeologist*, 1(8):4–7. [Nothing (text descriptions of four periods).]
- Osborne, Douglas H.
1957 Excavations in the McNary Reservoir Basin near Umatilla, Oregon. *Bureau of American Ethnology Bulletin* 166 (revised 1951 dissertation). [Nothing; geographic distribution maps of traits.]
- Butler, B. Robert
1958 Ash Cave (45 WW 61): A Preliminary Report. *The Washington Archaeologist*, 2(12):3–10. [Nothing.]
- Massey, William C., and C. G. Nelson
1958 A Preliminary Report of the Archaeology of Site 45KT6. *Washington Archaeologist*, 2(1). Reissued 1976, as *Occasional Papers*, No. 4, Seattle: Washington Archaeological Society. [Table of artifact inventory by depth.]
- *Swanson, Earl H.
1958 The Schaake Village Site in Central Washington. *American Antiquity*, 24:161–171. [House type floor plan per cultural period; named culture units for local area.]
- Gallagher, Patrick.
1959 South Cave: A Site in the Lower Grand Coulee of Central Washington. *The Washington Archaeologist*, 3(5):3–26. [Tabled depth of excavation for individual projectile points.]
- Warren, Claude N., Alan L. Bryan, and Donald R. Tuohy
1959 The Goldendale Site: A Campsite in South-Central Washington. Report to the National Park Service. [Nothing.]
- 1960–1969**
- Bryan, Alan L., and Donald R. Tuohy
1960 A Basalt Quarry in Northeastern Oregon. *Proceedings of the American Philosophical Society*, 104(5):485–510. [Nothing.]
- Butler, B. Robert
1960 The Physical Stratigraphy of Wakemap Mound: A New Interpretation. Master of Arts thesis, University of Washington, Seattle. [Nothing.]
- Daugherty, Richard D.
1960 Archaeological Excavations in the Ice Harbor Reservoir, 1969. *Reports of Investigations*, No. 3. Laboratory of Anthropology, Washington State University, Pullman. [Nothing.]
- Crabtree, Robert
1960 The Rabbit Island Site (45-BN-15), Washington. Report submitted to the National Park Service, Seattle. [Tabled artifact type frequencies by component.]
- *Cressman, Luther S.
1960 Cultural Sequences at The Dalles, Oregon. *Transactions of the American Philosophical Society*, 50(10):1–108. [Table of artifact frequencies per level; line graphs of frequencies of artifact types per level (partial side-ways spindle graph; not tallied).]
- Sprague, Roderick
1960 Archaeology in the Sun Lakes Area of Central Washington. *Reports of Investigations*, No. 6. Department of Anthropology, Washington State University, Pullman. [Text description of artifact inventory by excavation level.]

- Butler, B. Robert
1961 The Old Cordilleran Culture in the Pacific Northwest. *Occasional Papers of the Idaho State University Museum*, No. 5. Pocatello, ID. [Nothing, single culture unit.]
- Clinehens, Stephen S.
1961 Further Archaeological Excavations in the Lower Grand Coulee of Central Washington. *Report of Investigations*, No. 7. Laboratory of Anthropology, Washington State University, Pullman. [Nothing.]
- Daugherty, Richard D.
1961 Excavation in the Ice Harbor Reservoir, 1957–1960: A Preliminary Report. *Reports of Investigations*, No. 10. Laboratory of Anthropology, Washington State University, Pullman. [Text descriptions of cultural periods.]
- Gunkel, Alexander
1961 A Comparative Cultural Analysis of Four Archaeological Sites in the Rocky Reach Reservoir Region, Washington. *Theses in Anthropology*, No. 1. Pullman: Washington State University. [Nothing.]
- *Shiner, Joel L.
1961 [original 1954] The McNary Reservoir: A Study in Plateau Archeology. *Bureau of American Ethnology Bulletin*, 179:149–266 (*River Basin Surveys Paper*, No. 23). [Time range charts and petrie-like of artifact drawings pp. 228–229.]
- Butler, B. Robert
1962 Contributions to the Prehistory of the Columbia Plateau: A Report on Excavations in the Palouse and Craig Mountain Sections. *Occasional Papers of the Idaho State College Museum*, No. 9. Pocatello, ID. [Nothing (lots of text and corresponding climate-calendric-stratigraphic rectangle graph).]
- *Daugherty, Richard D.
1962 The Intermontane Western Tradition. *American Antiquity*, 28:144–150. [Spatio-temporal units with curved margins.]
- *Fryxell, R., and R. D. Daugherty
1962 Interim Report: Archaeological Salvage in the Lower Monumental Reservoir, Washington. *Reports of Investigations*, No. 21. Laboratory of Anthropology, Washington State University, Pullman. [Projectile point type silhouettes against Marmes Rockshelter strata; stratum rectangles with description of culture contents and culture unit names; reprint of Daugherty's 1962 intermontane western tradition figure.]
- Fryxell, Roald, and Richard D. Daugherty.
1962 Schematic Geoarchaeological Chronology for Eastern Washington and Related Areas. *Reports of Investigations*, No. 11. Laboratory of Anthropology, Division of Archaeology and Geochronology, Washington State University, Pullman. (revised 1963) [Spatio-temporal rectangles of pollen zones, inferred climate, inferred human ecology, bison (modern and *antiquus*), projectile point silhouettes.]
- Mallory, Oscar L.
1962 Continued Archaeological Appraisal of the Lower Grand Coulee, Central Washington. Laboratory of Anthropology, Washington State University, Pullman. Report to Washington State Parks and Recreation Commission. [Nothing.]
- *Swanson, Earl H., Jr.
1962 (orig. 1954) The Emergence of Plateau Culture. *Occasional Papers of the Idaho State College Museum*, No. 8. Pocatello, ID. [Spatio-temporal rectangles, half-spindles, bar graphs.]
- Fryxell, Roald
1963 Through a Mirror, Darkly. *The Record: Publication of the Washington State University Library*, pp. 1–18. [Projectile point type silhouettes against Marmes Rockshelter strata.]
- Fryxell, Roald, and Richard D. Daugherty
1963 Late Glacial and Post Glacial Geological and Archaeological Chronology of the Columbia Plateau, Washington: An Interim Report to the National Science Foundation, 1962–63. *Reports of Investigations*, No. 23. Laboratory of Anthropology, Division of Archaeology and

- Geochronology, Washington State University, Pullman. [Spatio-temporal rectangles of pollen zones, inferred climate, inferred human ecology, bison (modern and antiquus), projectile point silhouettes; projectile point type silhouettes against Marmes Rockshelter strata.]
- Ross, Richard E.
1963 Prehistory of the Round Butte Area, Jefferson County, Oregon. Master of Arts thesis, University of Oregon, Eugene. [Tables of artifact inventory by stratum or "cultural level."]
- Warren, Claude N., Alan L. Bryan, and Donald R. Tuohy
1963 The Goldendale Site and Its Place in Plateau Prehistory. *Tebiwa*, 6(1):1-21. [Nothing.]
- Butler, B. Robert
1964 A Tentative History of Self-Handled Mauls at The Dalles of the Lower Columbia. *Tebiwa*, 7(2):37-41. [Spatio-temporal cultural periods against time.]
- Fryxell, Roald, and Earl F. Cook, editors
1964 A Field Guide to the Loess Deposits and Channeled Scablands of the Palouse Area, Eastern Washington. *Reports of Investigations*, No. 27. Laboratory of Anthropology, Division of Archaeology and Geochronology, Washington State University, Pullman. [Spatio-temporal rectangles of pollen zones, inferred climate, inferred human ecology, bison (modern and *antiquus*), projectile point silhouettes.]
- Holmes, Brian G.
1964 Washington State Highways Archaeological Excavations at Site 45KL50. Department of Anthropology, University of Washington. Report to Washington State Highway Commission. [Photos of artifacts arranged by "occupation" (including projectile points).]
- Butler, B. Robert
1965 The Structure and Function of the Old Cordilleran Culture Concept. *American Anthropologist*, 67:1120-1131. [Nothing.]
- Lynch, Thomas F., Kent S. Wilkinson, and Claude N. Warren
1965 Archaeological Investigations at Bruce's Eddy. *Tebiwa*, 8(2):33-56. [Tabled depth of excavation of frequencies of projectile point styles.]
- Rice, Harvey S.
1965 The Cultural Sequence at Windust Caves. Master of Arts thesis, Department of Anthropology, Washington State University, Pullman. [Artifact silhouettes with frequency, against stratigraphic time.]
- Borden, Charles E.
1966 Radiocarbon and Geological Dating of the Lower Fraser Canyon Archaeological Sequence. In *Proceedings of the Sixth International Conference on Radiocarbon and Tritium Dating*, compiled by Roy M. Chatters and Edwin A. Olson, Paper 16, pp. 165-178. Pullman, WA. [Nothing.]
- Browman, David L.
1966 Contributions to the Prehistory of the Columbia Plateau: The Indian Dan Site. Master of Arts thesis, University of Washington, Seattle. [Nothing.]
- Grater, Barbara A.
1966 The Archeology of the Votaw Site: Lower Snake River, Washington. Master of Arts thesis, San Francisco State College, San Francisco. [Tables of artifact type frequencies by stratum.]
- Holmes, B. G.
1966 The Schaake Site—A New Study. Master of Arts thesis, University of Washington, Seattle. [Table of distribution by component of projectile point types; text description of component contents; sequence of house floor morphology.]

- Nance, Charles R.
1966 45WT2: An Archaeological Site on the Lower Snake River. Master of Arts thesis, Department of Anthropology, Washington State University, Pullman. [Table of artifact type frequencies per stratum.]
- Nelson, Charles M.
1966 A Preliminary Report on 45CO1, a Stratified Open Site in the Southern Columbia Plateau. *Report of Investigations*, No. 39. Laboratory of Anthropology, Washington State University, Pullman. [Nothing.]
- *Caldwell, Warren W., and Oscar L. Mallory
1967 Hells Canyon Archeology. *Publications in Salvage Archeology*, No. 6. River Basin Surveys, Museum of Natural History, Smithsonian Institution. [Spatio-temporal rectangles each with culture name (2 graphs).]
- Daugherty, Richard D., Barbara A. Purdy, and Roald Fryxell
1967 The Descriptive Archaeology and Geochronology of the Three Springs Bar Archaeological Site, Washington. *Report of Investigations*, No. 40. Laboratory of Anthropology, Washington State University, Pullman. [Tables of artifact type frequencies per component/culture unit; tabled component against stratum description.]
- Gaarder, Lorin R.
1967 Excavation at a Campsite on Eagle Creek (North Central Idaho). *Tebiwa*, 10(2):39–62. [Tabled depth of excavation of frequencies of projectile point styles.]
- Rice, David G.
1967 A Commentary on the Derivation of Plateau Culture. Master of Arts paper, Department of Anthropology, Washington State University, Pullman. [Reprint of figures from Daugherty 1962; Nelson 1969 (when Nelson's monograph was a 1967 unpublished manuscript).]
- Sanger, David
1967 Prehistory of the Pacific Northwest Plateau as Seen from the Interior of British Columbia. *American Antiquity*, 32:186–197. [Table listing site-components per period.]
- Solland, Sonja O.
1967 Proposed Quantitative Definitions of the Sunset Canyon and Crescent Bar Components of the Sunset Canyon Phase. Master of Arts thesis, University of Washington, Seattle. [Nothing.]
- Combes, John D.
1968 Burial Practices as an Indicator of Cultural Change in the Lower Snake River Region. Master of Arts thesis, Department of Anthropology, Washington State University, Pullman. [Tables of traits present by period ("phase").]
- Grabert, Garland F.
1968 North-Central Washington Prehistory. *Reports in Archaeology*, No. 1. Department of Anthropology, University of Washington, Seattle. [Table of named culture phases by archaeological site.]
- Sanger, David
1968 Prepared Core and Blade Traditions in the Pacific Northwest. *Arctic Anthropology*, 5:92–120. [Nothing.]
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1986 Descriptive Archaeology of Hells Canyon Creek Village. *Archaeological Reports*, No. 14. Boise State University, Boise, ID. [Tabled frequencies of projectile point types by excavation level per pit.]
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1987 Archaeological Investigations at the Kooskia Bridge Site (10-IH-1395), Middle Fork, Clearwater River, North Central Idaho. *University of Idaho Anthropological Reports*, No. 87. Moscow. [Tabled artifact frequencies by excavation level.]
- Welch, Jeanne M., and Richard D. Daugherty
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- Ames, Kenneth M.
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- Galm, Jerry R., and R. Lee Lyman
1988 Archaeological Investigations at River Mile 590: The Excavations at 45DO189. *Eastern Washington University Reports in Archaeology and History*, 100-61. Cheney. [Tables of artifact type frequencies per analytical unit (temporal units?).]
- Kennedy, Hal, and Astrida R. Blukis Onat
1988 Data Recovery for Headwaters-Extension, FS #06-17-06-30, Site 45CH208. Report to U.S.D.A. Forest Service, Wenatchee National Forest. Boas, Inc., Seattle, WA. [Tables of artifact inventories by excavation level; bar graph of frequency by depth; tables of frequencies of material by occupation unit.]
- Masten, Ruth A.
1988 Cultural Resource Investigation and Assessment of Prehistoric Site 45OK7, Okanogan County, Washington. *Short Report SR-162*. Archaeological and Historical Services, Eastern Washington University, Cheney. [Table of artifact inventory by depth.]
- Sappington, Robert Lee.
1988 Archaeological Test Excavation and Evaluation of the Proposed Clearwater Fish Hatchery Site (10-CW-4), on the North Fork of the Clearwater River, North Central Idaho. *University of Idaho Anthropological Reports*, No. 88. Moscow. [Tables of artifact frequencies by excavation level.]
- Thoms, Alson V., Deborah L. Olson, and Marilyn J. Wyss
1988 An Assessment of Archaeological Site 45PO149, Pioneer Campground, Newport Washington. Report to Okanogan National Forest, Okanogan, WA. Center for Northwest Anthropology, Washington State University, Pullman. [Tables of artifact inventory by unit/probe and depth.]
- Welch, Jeanne M.
1988 A Testing and Evaluation of 45-BN-23 in the Vicinity of the Proposed Phase II Development of Columbia Point Park. Report to the Public Works Department, Richland, WA. Western Heritage, Inc., Olympia, WA. [Text description of cultural phases (context).]
- Campbell, Sarah K.
1989 Postcolumbian Culture History in the Northern Columbia Plateau: A.D. 1500–1900. Doctoral dissertation, University of Washington, Seattle. [Spatio-temporal rectangles (context).]
- Chance, David H., Jennifer V. Chance, Elaine Anderson, Norman Bowers, Bruce Cochran, Anita L. Falen, Maynard A. Fosberg, Deborah L. Olson, Elmer Paul, Randall Schalk, R. Kirk Steinhorst, Nancy A. Stenholm, Sam Valastro, Jr., and Scott B. Whitwer
1989 Archaeology of the Hatiupuh Village. Report to the U.S. Army Corps of Engineers, Walla Walla District. Alfred W. Bowers Laboratory of Anthropology, University of Idaho, Moscow. [Tables of artifact type frequencies per component/level.]

- Draper, John, and David Brauner
1989 Archaeological Survey and Reevaluation of Prehistoric Sites within the Palouse Canyon Archaeological District. Report to the U.S. Army Corps of Engineers, Walla Walla District, WA. Department of Anthropology, Oregon State University, Corvallis, OR. [Tables of artifact frequencies by excavation depth.]
- Holmer, Richard N.
1989 Dagger Falls: A Preliminary Report. *Idaho Archaeologist*, 12(1):3–13. [Bar graph of density of stone tools per stratum against estimated age; tabled frequencies (absolute and relative) of artifact types by stratum.]
- McFarland, Janine R.
1989 An Analysis of Two Post-Mazama Flaked Stone Scatters in the Upper Deschutes River Basin of Central Oregon. Master of Arts thesis, Oregon State University, Corvallis. [Nothing.]
- Sappington, Robert Lee, and Caroline D. Carley
1989 Archaeological Investigations at the Beaver Flat and Pete King Creek Sites, Lochsa River, North Central Idaho. *University of Idaho Anthropological Reports*, No. 89. Moscow. [Tables of artifact frequencies by excavation level.]
- Thoms, Alston V.
1989 The Northern Roots of Hunter-Gatherer Intensification: Camas and the Pacific Northwest. Doctoral dissertation, Washington State University, Pullman. [Tables of text descriptions of culture periods; bar graph of frequencies per temporal bin and culture period; bivariate scatterplot of oven diameter vs C14 years; line graph of C14 date frequency per temporal bin.]
- 1990–1999**
- Brauner, David, R. Lee Lyman, Howard Gard, Stephan Matz, and Rebecca McClelland
1990 Archaeological Data Recovery at *Hatiuhpuh*, 45WT134, Whitman County, Washington. Report to the U.S. Army Corps of Engineers, Walla Walla, WA. Department of Anthropology, Oregon State University, Corvallis. [Nothing.]
- Draper, John A., and Gordon A. Lothson
1990 Test Excavations at 10NP143 and 10NP292, Lower Clearwater River, West-Central Idaho. *Project Report*, No. 12. Center for Northwest Anthropology, Washington State University, Pullman. [Tables of artifact categories by excavation level.]
- Erickson, Kevin
1990 Marine Shell Utilization in the Plateau Culture Area. *Northwest Anthropological Research Notes*, 24(1):91–144. [Table of chronological occurrence of marine shellfish species.]
- Reid, Kenneth C., John A. Draper, and Deborah L. Olson
1990 Excavations at Ellisford (45OK706) in the Oroville-Tonasket Unit Extension, Chief Joseph Project, Okanogan County, North-Central Washington. *Project Report*, No. 10. Center for Northwest Anthropology, Washington State University, Pullman. [Nothing.]
- Sappington, Robert Lee
1990 Archaeological Investigations at the Ahsahka Sportsmen's Access Site (10-CW-5), Clearwater River, North Central Idaho. *University of Idaho Anthropological Reports*, No. 90. Moscow. [Tables of artifact frequencies by excavation level.]
- Draper, John A., and William Andrefsky, Jr., editors
1991 Archaeology of the Middle Spokane River Valley: Investigations along the Spokane Centennial Trail. *Project Report*, No. 17. Center for Northwest Anthropology, Washington State University, Pullman. [Tabled artifact type frequencies by excavation level, per site and/or excavation unit.]
- Flenniken, J. Jeffrey, Terry L. Ozbun, and Jeffrey A. Markos
1991a Archaeological Data Recovery at the Teal Spring Site, 45GA200. Report to the Umatilla National Forest, Pendleton, OR. *Lithic Analysts Research Report*, No. 25, Pullman, WA. [Tables of artifact frequencies per excavation level; bar graph of artifact frequency per excavation level.]

- 1991b Archaeological Testing and Evaluation of the Kelly Camp Site, 45GA201. Report to the Umatilla National Forest, Pendelton, OR. *Lithic Analysts Research Report*, No. 21, Pullman, WA. [Tables of artifact frequencies per excavation level.]
- Hayden, Brian, and June Ryder
1991 Prehistoric Cultural Collapse in the Lillooet Area. *American Antiquity*, 56:50–65. [Nothing.]
- Hess, Sean C.
1991 Cultural Resources Background and Archaeological Testing of Maryhill State Park, Klickitat County, Washington. Report to Osborn Pacific Group and Washington State Parks and Recreation Commission. Boas, Inc., Seattle, WA. [Bar graph of flakes per excavation level.]
- Lothson, Gordon A., and Bruce L. Lothson
1991 Buffalo Eddy, Buffalo Bar Archaeology. Report to Asotin County Department of Public Works. *Reports of Investigation*, No. 17–18, Cougar Consulting, Pullman, WA. [Tables of artifact type frequencies by depth.]
- Reid, Kenneth C., editor
1991a An Overview of Cultural Resources in the Snake River Basin: Prehistory and Paleoenvironments. *Project Report*, No. 13. Center for Northwest Anthropology, Washington State University, Pullman. [Reprints of Fryxell's (1963) geochronology with projectile point silhouettes; Hammett's (1977) culture units/phases against geochronological units; Leonhardy and Rice's (1970) spatio-temporal rectangles; Rice's (1972) sequence of projectile point silhouettes; Rice's (1965) Windust Cave sequence; Leonhardy's (1970) Granite Point sequence; Caldwell & Mallory (1967) sequence; Pavesic (1971) sequence (all spatio-temporal rectangles).]
- 1991b Prehistory and Paleoenvironments at Pittsburgh Landing: Data Recovery and Test Excavations at Six Sites in Hells Canyon National Recreation Area, West Central Idaho. *Project Report*, No. 15. Center for Northwest Anthropology, Washington State University, Pullman. [Tabled summary of house floor area per analytical unit and cultural phase (some discrete tables per analytical unit, one table per AU).]
- 1991c The Riparia (45WT1) Excavations in the Lower Snake River Valley, Southeastern Washington. *Project Report*, No. 14. Center for Northwest Anthropology, Washington State University, Pullman. [Tabled frequencies of artifact material types and categories per excavation level.]
- Sappington, Robert Lee
1991 Results of Archaeological Test Excavations for Proposed Gateway Park, Port of Clarkston, Clarkston, Washington. Report to the U.S. Army Corps of Engineers, Walla Walla District. *Letter Report* 91-21, Alfred W. Bowers Laboratory of Anthropology, University of Idaho, Moscow. [Tables of artifact inventory by excavation level and test unit.]
- Stevens, Rebecca A., and Jerry R. Galm
1991 Archaeological Investigations near Rock Island Rapids: Excavations at 45CH309. *Reports in Archaeology and History* 100-63. Eastern Washington University, Cheney. [Tabled lithic type frequencies by level; tabled debitage and tool frequencies per stratum; local spatio-temporal sequences of named culture units.]
- Adams, William H.
1992 Archaeological Survey and Testing, Conboy Lake National Wildlife Refuge, Washington. Report to U.S. Fish and Wildlife Service, Portland, OR. Department of Anthropology, Oregon State University, Corvallis. [Tables of artifact type frequencies per excavation level.]

- Boreson, Keo
1992 A Report of Test Excavations at Three Sites Near Enloe Dam on the Similkameen River, Okanogan County, Washington. Report to HDR Engineering, Inc., Bellevue, WA, and Pubic Utility District No. 1 of Okanogan County, Okanogan, WA. *Short Report* SR-282. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact frequencies by depth.]
- Galm, Jerry R. Rebecca A. Stevens, Charles T. Luttrell, and Kevin J. Lyons
1992 Archaeological Investigations of the Osprey Camp and Lucky Break Sites, Chelan County, Washington. *Short Report* 298. Report to the Wenatchee National Forest. Archaeological and Historical Services, Eastern Washington University, Cheney, WA. [Tables of artifact frequencies by excavation level.]
- King, J. Scott, Lisa Mighetto, James C. Woodman, and Gail Thompson
1992 Cultural Resources Inventory and Archaeological Testing for Northwest Pipeline Corporation System Expansion Project, Washington. Report to Northwest Pipeline Corporation, Salt Lake City, UT. Historical Research Associates, Inc., Seattle, WA. [Table of major cultural phases with verbal description (context).]
- Luttrell, Charles T.
1992 Cultural Resources Testing Investigations at Site 45KL542 on SR 97 near Goldendale, Klickitat County, Washington. *Short Report* DOT92-66. Report to Washington State Department of Transportation. Archaeological and Historical Services, Eastern Washington University, Cheney. [Table of artifact inventory by depth.]
- Rousseau, Michael K.
1992 Integrated Lithic Analysis: The Significance and Function of Key-Shaped Formed Unifaces on the Interior Plateau of Northwestern North America. *Archaeology Press Publication*, No. 20. Burnaby, B.C.: Simon Fraser University. [Nothing.]
- Sanders, Paul H., editor
1992 Archaeological Investigations along the Pend Oreille River: Site 45PO149. *Project Report*, No. 18. Center for Northwest Anthropology, Washington State University, Pullman. [Table artifact type frequencies by excavation level.]
- Boreson, Keo
1993 Archaeological Test Excavations at Two Site Located on the West Shore of Moses Lake, Grant County, Washington. Report to M. H. Moore Properties. *Short Report* 350. Archaeological and Historical Services, Eastern Washington University, Cheney, WA. [Tables of artifact frequencies by depth.]
- Draper, John A., and Maury Morgenstein
1993 Archaeological Testing in the Palouse Canyon Archaeological District, 1992 Field Season. Report to the U.S. Army Corps of Engineers, Walla Walla District, WA. Boas, Inc., Seattle, WA. [Tables of artifact frequencies by excavation depth.]
- Hayden, Brian, and Jim Spafford
1993 The Keatley Creek Site and Corporate Group Archaeology. *BC Studies*, 99:106–139. [Nothing.]
- Lewarch, Dennis E., and Lynn L. Larson
1993 Cultural Resource Assessment of the Pine Creek Road Improvement Project and Analysis of Cultural Material from the Pine Creek Road Cascade Site (45KL484), Klickitat County, Washington. *LAAS Technical Report* #93-12. Report to Regional Disposal Company, Roosevelt, WA. Larson Anthropological/ Archaeological Services, Seattle, WA. [Table of artifact type frequencies by excavation level per test unit; line graph of total artifacts per level per test unit.]
- Lyons, Kevin J.
1993 The 1990 Test Excavations at the Upper Pine Lake Site (45SP284), Spokane County, Washington. *Short Report* 288. Report to U.S. Fish and Wildlife Service. Archaeological and Historical Services, Eastern Washington University, Cheney. [Table of artifact inventory by excavation depth per test unit.]

- Morgan, Vera
1993 Cultural Resource Investigations at 45AD104, An Upland Bison Site, Adams County, Washington. *Reports in Archaeology and History*, 100-81. Cheney: Eastern Washington University. [Tabled distribution by stratum of debitage; bar graph of debitage and material type by stratum.]
- Rousseau, Mike E.
1993 Early Prehistoric Occupation of South-Central British Columbia: A Review of the Evidence and Recommendations for Future Research. *B.C. Studies*, 99:140-183. [Nothing.]
- Endzweig, Pamela E.
1994 Late Archaic Variability and Change in the Southern Columbia Plateau: Archaeological Investigations in the Pine Creek Drainage of the Middle John Day River, Wheeler County, Oregon. Doctoral dissertation, University of Oregon, Eugene. [Spatio-temporal rectangles of culture phase names (context); line graphs of frequencies of artifacts by depth below surface (10 cm levels).]
- Flenniken, J. Jeffrey, and Terry L. Ozbun
1994 Big Mack Archaeological Testing and Evaluation Project. *Lithic Analysts Research Report*, No. 45. Report to the Naches Ranger District, Wenatchee National Forest. [Nothing (but nothing much found).]
- Flenniken, J. Jeffrey, and Terry L. Ozbun
1994 Swiftwater Rockshelters Archaeological Testing and Evaluation Project (45CH433). report to the Leavenworth Ranger District, Wenatchee National Forest. *Lithic Analysts Research Report*, No. 43, Pullman, WA. [Tables of artifact inventory by excavation level.]
- Galm, Jerry R.
1994 Prehistoric Trade and Exchange in the Interior Plateau of Northwestern North America. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathon E. Ericson, pp. 275-305. New York, NY: Plenum Press. [Spatio-temporal rectangles of culture names; time range of obsidian samples per site.]
- Hicks, Brent A., and Maurice E. Morgenstein
1994 Archaeological Studies in the Palouse Canyon Archaeological District. *Boas Research Report*, No. 9212.2. Report to U.S. Army Corps of Engineers, Walla Walla District, WA. Boas, Inc., Seattle, WA. [Tables of artifact category frequencies by excavation level.]
- Historical Research Associates, Inc.
1994 Results of a Cultural Resources Assessment for the Northwest Pipeline Corporation Expansion I Project, Washington Facilities. Report to Northwest Pipeline Corporation. Historical Research Associates, Inc., Seattle, WA. [Table of descriptions of named culture units against time.]
- Sappington, Robert Lee
1994 The Prehistory of the Clearwater River Region, North Central Idaho. Doctoral dissertation, Department of Anthropology, Washington State University, Pullman. [Also released as: *University of Idaho Anthropological Reports*, No. 95. Moscow.] [Individual drawings of artifact types per temporal/cultural period.]
- Chatters, James C.
1995 Population Growth, Climatic Cooling, and the Development of Collector Strategies on the Southern Plateau, Western North America. *Journal of World Prehistory*, 9:341-400. [Spatio-temporal rectangles; multiple line graphs (population size, groundwater, salmon fishery, freshet) on same figure against cultural period.]
- Hicks, Brent A.
1995 Archaeological Studies in the Palouse Canyon Archaeological District: 1994 Field Season. *Boas Research Report*, No. 9212.3. Boas, Inc., Seattle, WA. [Tables of artifact category frequencies by excavation level.]
- Lohse, E. S.
1995 Northern Intermountain West Projectile Point Chronologies. *Tebiwa*, 25(1):3-51. [Silhouettes against cultural stages (e.g., Paleoindian; Early-, Middle-, Late-Archaic).]

- Luttrell, Charles T.
1995 Cultural Resources Testing at 45KL572 and 45KL586 within the Bonneville Power Administration's Ross-Franklin Fiber Optics Project Right-of-Way, Klickitat County, Washington. Report to Bonneville Power Administration. *Short Report* 482. Archaeological and Historical Services, Eastern Washington University, Cheney. [Table of artifact inventory by test unit and excavation level.]
- MacDonald, Douglas H.
1995 Mobility and Raw Material Use at the Hunting Camp Spring Site (35WA96), Blue Mountains, Oregon. *North American Archaeologist*, 16:343–361. [Nothing.]
- Fedje, Daryl
1996 Early Human Presence in Banff National Park. In *Early Human Occupation in British Columbia*, edited by Roy L. Carlson and L. Dalla Bona, pp. 36–44. Vancouver: University of British Columbia Press. [Spatio-temporal columns with named culture units against time.]
- Fladmark, Knut R.
1996 The Prehistory of Charlie Lake Cave. In *Early Human Occupation in British Columbia*, edited by Roy L. Carlson and L. Dalla Bona, pp. 11–20. Vancouver: University of British Columbia Press. [Projectile point types against stratigraphic column.]
- Haley, Shawn
1996 The Pasika Complex Revisited. In *Early Human Occupation in British Columbia*, edited by Roy L. Carlson and L. Dalla Bona, pp. 51–64. Vancouver: University of British Columbia Press. [Spatio-temporal rectangles of named culture units against time and climate phases.]
- Hicks, Brent A.
1996 Archaeological Studies in the Palouse Canyon Archaeological District: 1995 Field Season. A Lithic Analysis of the Windust Phase Component, Hatwai Site no. 9212.4. Report to U.S. Army Corps of Engineers, Walla Walla District, WA. Boas, Inc., Seattle, WA. [Tables of artifact category frequencies by excavation level.]
- Norman, Leslie Kay
1996 Prehistoric Occupation of the Grand Coulee, an Inland, Lacustrine Environment. Master of Arts thesis, Western Washington University, Bellingham. [Spatio-temporal rectangles of culture unit/phase names; table list of projectile point names by age.]
- Perry, Madilane
1996 Subsurface Testing at Smiltaus (45 FE 71) on the Curley Lake, Ferry County, Northeastern Washington. [Line graphs per test unit of artifact frequencies by excavation level.]
- Reid, Kenneth C., editor
1996 An Overview of Cultural Resources in the Snake River Basin: Prehistory and Paleoenvironments. *Northwest Anthropological Research Notes*, 30(1–2):1–217. [Spatio-temporal cultural phase rectangles with diagnostic projectile point silhouettes; spatio-temporal cultural phase rectangles.]
- Sappington, Robert Lee, and Antony T. Plastino
1996 Results of Archaeological Investigations at Two Proposed Chinook Acclimation Sites Along the Lower Snake River in Asotin County, Washington. Report to the U.S. Army Corps of Engineers, Walla Walla District, WA. *Letter Report* 96-7. Alfred W. Bowers Laboratory of Anthropology, University of Idaho, Moscow. [Tables of artifact inventory by excavation level.]
- Stryd, A. R., and M. K. Rousseau
1996 The Early Prehistory of the Mid Fraser-Thompson River Area. In *Early Human Occupation in British Columbia*, edited by Roy L. Carlson and L. Dalla Bona, pp. 177–204. Vancouver: University of British Columbia Press. [Spatio-temporal rectangles with named culture units against time and climate phases.]
- Connolly, Thomas J., M. A. Tveskov, H. A. Gard, and D. Cutting
1997 Mapping the Mosier Mounds: The Significance of Rock Feature Complexes on the Southern Columbia Plateau. *Journal of Archaeological Science*, 24:289–300. [Nothing.]

- Hayden, Brian
1997 Observations on the Prehistoric Social and Economic Structure of the North American Plateau. *World Archaeology*, 29:242–261. [Nothing.]
- Hayden, Brian
1997 *The Pithouses of Keatley Creek*. Harcourt Brace, Fort Worth, Texas. [One column of named culture unit rectangles with projectile point silhouettes per rectangle.]
- Hayden, Brian, and Rick Schulting
1997 The Plateau Interaction Sphere and Late Prehistoric Cultural Complexity. *American Antiquity*, 62:51–85. [Nothing.]
- Miss, Christian J.
1997 The Smokian and Sam Israel Sites—Archaeological Investigations in the Lower Grand Coulee. Northwest Archaeological Associates, Inc., Seattle, WA. [Spatio-temporal rectangles of named culture units; tables of artifact inventory by depth.]
- Ames, Kenneth M., Don E. Dumond, Jerry R. Galm, and Rick Minor
1998 Prehistory of the Southern Plateau. In *Handbook of North American Indians, Volume 12, Plateau*, edited by Deward E. Walker, Jr., pp. 103–119. Smithsonian Institution, Washington. [Text description of periods.]
- Darwent, John
1998 The Prehistoric Use of Nephrite on the British Columbia Plateau. *Archaeology Press Publication*, No. 25. Burnaby, B.C.: Simon Fraser University. [Nothing.]
- Dickson, Catherine, and Manfred E. Jaehnig
1998 Test Excavation and Evaluation of the Richland Boat Ramp Site, Temporary Number 97-CTUIR-01-CRPP, Benton County, Washington. Report to the City of Richland, WA. Confederated Tribes of the Umatilla Indian Reservation, Cultural Resources Protection Program, Pendleton, OR. [Tabled artifact frequencies by excavation depth.]
- Galm, Jerry R., and Rebecca A. Stevens
1998 Osprey Camp: A Late Prehistoric Settlement on the Upper Wenatchee River. *Reports in Archaeology and History*, 100-106. Eastern Washington University, Cheney. [Tables of artifact frequencies per house (each house of different age).]
- Lucas, Steve
1998 Wenatchee Spring Archaeological Project. Heritage Resource Report to the Umatilla National Forest, Pomery. [Tables of artifact frequencies per excavation level.]
- Nakonechny, Lyle D.
1998 Archaeological Analysis of Area A, Wexpusnime Site (45GA61). Master of Arts thesis, Department of Anthropology, Washington State University, Pullman. [Spatio-temporal rectangles of culture unit names.]
- Peacock, Sandra L.
1998 Putting Down Roots: The Emergence of Wild Plant Food Production on the Canadian Plateau. Doctoral dissertation, University of Victoria, B.C. [Bivariate scatterplot of C14 dated earth oven vs rim diameter; spatio-temporal rectangles.]
- Pokotylo, David L., and Donald Mitchell
1998 Prehistory of the Northern Plateau. In *Handbook of North American Indians, Volume 12, Plateau*, edited by Deward E. Walker, Jr., pp. 81–102. Smithsonian Institution, Washington. [Text description of periods.]
- Thompson, R. Wayne, Shannon Gilbert, and T. Weber Greiser
1998 Archaeological Testing at the Government Spring Site (9N42E 09/01). Report to the Umatilla National Forest, Pendleton, OR. Historical Research Associates, Inc., Missoula, MT. [Artifact frequencies by depth.]

Gallison, James D.

1999 Archaeological Testing and Evaluation at the Wickiup Springs Site (8N43E33/01) in the Blue Mountains of Garfield County, Washington. Report to the Umatilla National Forest, Pendleton, OR. *Rare Earth Studies Report*, No. 38. Albuquerque, NM. [Tables of artifact frequencies by depth.]

Galm, Jerry R., and David R. Parks

1999 Archaeological Investigations in the Blue Lake Vicinity, Grant County, Washington. Report to the Spokane District, Bureau of Land Management. Department of Geography and Anthropology, Eastern Washington University, Cheney, WA. [Tables of artifact frequencies by excavation depth.]

Miss, Christian J.

1999 Yakima Training Center National Register Eligibility Testing: Opportunistic Lithic Procurement and Quarry Site, Kittitas County, Washington. Report to U.S. Army Corps of Engineers, Seattle District. Northwest Archaeological Associates, Inc., Seattle, WA. [Tables of artifact inventory by excavation depth/level.]

Nicholas, George P.

1999 Archaeological Investigations at EeRb 77: A Deep Floodplain Site on the South Thompson River, Kamloops, British Columbia. *Archaeological Research Reports* 3. Secwepemc Cultural Education Institute, Simon Fraser University, Kamloops, B.C. [Spatio-temporal culture units aligned with time and paleoclimate phases (from Stryd and Rousseau 1996); area line graph of frequency by depth.]

Roulette, Bill R., Julia J. Wilt, and Paul S. Solimano

1999 Supplemental Testing and Data Recovery at 45ST417 and 45FE372, Kettle Falls, Washington. Report to Avista Corporation (formerly Washington Water Power), Spokane, WA. *Applied Archaeological Research Report*, No. 23. Portland, OR. [Figure of temporal culture unit names against time; figure of named culture units with ages against "lithic artifact correlates" (from Chance and Chance 1985); spatio-temporal rectangles of named culture units against time; line graphs of artifact frequencies against excavation level; tables of artifact inventory against excavation level.]

2000–2009

Draper, John A.

2000 Archaeological Evaluation of the Cold Spring Site, Pomeroy Ranger District, Washington. Report to the U.S.D.A. Forest Service, Umatilla National Forest, Pomeroy District, Pomeroy, WA. 4D-CRM, Darrington, WA. [Tables of artifact frequencies by excavation depth.]

Gallison, James D.

2000 Archaeological Data Recovery at an Upland Lithic Workshop, Wickiup Springs Site (8N43E33/01), Blue Mountains, Garfield County, Washington. Report to the Umatilla National Forest, Pendleton, OR. *Rare Earth Studies Report*, No. 41, Albuquerque, NM. [Tables of artifact frequencies by depth; bar graphs of lithic reduction stage frequencies by excavation level.]

Hayden, Brian, editor

2000a The Ancient Past of Keatley Creek, Volume I: Taphonomy. *Archaeology Press Publication*, No. 26. Burnaby, B.C.: Simon Fraser University. [Spatio-temporal rectangles with diagnostic projectile point silhouettes per phase and paleoclimate; verbal descriptions of each phase.]

2000b The Ancient Past of Keatley Creek, Volume II: Socioeconomy. *Archaeology Press Publication* No. 27. Burnaby, B.C.: Simon Fraser University. [Nothing.]

- Jaehnig, Manfred E. W.
2000 Cultural Resource Investigation of Hood Park and Site 45WW36, Walla Walla County, Washington. Report to U.S. Army Corps of Engineers, Omaha District. Confederated Tribes of the Umatilla Indian Reservation, Pendleton, OR. [Tables of artifact category frequencies by depth.]
- Lucas, Steven W.
2000 Origin of the Tucannon Phase in Lower Snake River Prehistory. *Anthropology Northwest*, No. 11. Department of Anthropology, Oregon State University, Corvallis. [Temporal rectangles of named culture units (from Leonhardy and Rice 1970).]
- Miller, Fennell de Forest
2000 "Lillard Hill Lithics:" Archaeological Field Testing of Site 45KT1718, Kittitas County, Washington. Report to Boise Cascade Corporation, Ellensburg, WA. [Table of artifact inventory by depth; text description of cultural phases.]
- Ozbun, Terry L., R. Todd Baker, and John L. Fagan
2000 Archaeological Impact Assessment at the Wenas Lithic Scatter Site. *Report*, No. 217. Report to Kiewit Construction Co., Vancouver, WA. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact inventory by depth.]
- Roulette, Bill R., Julia J. Wilt, Paul S. Solimano, Aimee A. Finley, Steven Hamilton, and Charlie Hodges
2000 Results of Supplemental Testing and Data Recovery Excavations at 45ST63, the Deadhorse Site, Lake Roosevelt, Conducted as part of the 1999 Grand Coulee Dam Cultural Resources Project. Report to The Confederated Tribes of the Colville Reservation, Nespelem, WA. *Applied Archaeological Research Report*, No. 50. [Spatio-temporal rectangles of named culture units against time; figure of named culture units with ages against "lithic artifact correlates" (from Chance and Chance 1985); tables of artifact inventory by excavation level.]
- Schalk, Randall, Carolyn D. Dillian, Stephen C. Hamilton, Charles M. Hodges, Deborah L. Olson, and Mary K. Stratford
2000 Archaeological Investigations at 45OK2A, 45OK5, and 45OK20 in the Chief Joseph Reservoir. Report to the U.S. Army Corps of Engineers, Seattle District. International Archaeological Research Institute, Inc., Honolulu, Hawai'i. [Tables of artifact inventory by depth and test unit.]
- Davis, Loren G.
2001 Lower Salmon River Cultural Chronology: A Revised and Expanded Model. *Northwest Anthropological Research Notes*, 35(2):229-247. [Text of phase descriptions with drawings of associated projectile point types for each phase.]
- Goodale, Nathan B.
2001 Evolution of Hunter-Gatherer Socioeconomic Systems During the Middle to Late Holocene in the Upper Columbia and Interior Northwest. Master of Arts thesis, University of Montana, Missoula. [Text descriptions of culture units; spatio-temporal rectangles; line graphs of frequency of variables against time; bar graphs of frequencies per time period; table of frequencies per time period; line graph (area) of environment and adaptive pattern per area.]
- Hannum, Michelle M.
2001a Evaluations of 29 Archaeological Sites Located within the Water Resources Development Act of 1996 Conveyed Lands, Benton and Franklin Counties, Washington. Report to U.S. Army Corps of Engineers, Walla Walla District, WA. Hemisphere Field Services, Inc., Minneapolis, MN. [Tables of artifact type frequencies by depth; spatio-temporal rectangles of named cultural phases.]
2001b Evaluations of 23 Cultural Properties along the McNary Reservoir, Umatilla County, Oregon, and Benton, Franklin and Walla Walla Counties, Washington. Report to U.S. Army Corps of Engineers, Walla Walla District, WA. Hemisphere Field Services, Inc., Minneapolis, MN. [Tables of artifact type frequencies by depth.]

- Lenert, Michael
2001 Calibrated Radiocarbon Dates and Culture Change: Implications for Socio-Complexity in the Mid-Fraser Region, British Columbia. *Northwest Anthropological Research Notes*, 35(2):211–228. [Spatio-temporal rectangles of named culture units against paleoclimate phases (from Stryd and Rousseau 1996); table of time periods with average house sizes for each.]
- Ozburn, Terry L., Judith S. Chapman, John L. Fagan, and William F. Willingham
2001 Evaluation of Cultural Resources for the Lake Chelan Hydroelectric Relicensing Project, FERC no. 637. *Report*, No. 232. Report to Chelan County Public Utility District No. 1, Wenatchee, WA. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact inventory by excavation depth.]
- Ozburn, Terry L., Matt F. Goodwin, Ronald J. Kent, and John L. Fagan
2001 Cultural Resources Survey and Archaeological Evaluation for the Northwest Pipeline Corporation Protection Project at Wood Gulch Creek Crossing, Klickitat County, Washington. *Report*, No. 219. Report to Northwest Pipeline Corporation, Salt Lake City, UT. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact inventory by excavation depth.]
- Roulette, Bill R., editor
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2002 Archaeological Data Recovery at the Wickiup Spring Site (8N43E 33/01), Northern Blue Mountain, Garfield County, Washington. Report to the Umatilla National Forest, Pendleton, OR. Historical Research Associates, Inc., Missoula, MT. [Spatio-temporal rectangles of cultural phases with descriptions; temporal ranges of projectile point types; tables of artifact category frequencies per excavation level.]
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- 2004 Middle Period Hunter-Gatherers of the Thompson River Drainage, British Columbia: A Critical Review. Master of Arts thesis, Simon Fraser University, Burnaby, B.C. [Spatio-temporal rectangles of named culture phases and paleoclimate (sloped temporal boundaries); table of culture phases with verbal description; diagnostic projectile point photos against age.]

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- Stevens, Rebecca A., and Sara L. Walker
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- Beat, Alcia D.
2005 Cultural Resource Inventory and Excavation Report for the Sherman Scenic Byway Project with a Determination of Eligibility for the West Gateway Site. Colville National Forest, Ferry County, WA. [Bar graphs of artifact frequencies per excavation level.]
- Crisson, Fred
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- Davis, Loren G.
2005 Geoarchaeological Lessons from an Alluvial Fan in the Lower Salmon River Canyon, Idaho. *Idaho Archaeologist*, 28(1):3–12. [Projectile point type silhouettes against named culture units (phases) and time.]

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2005 Cultural Resource Survey and Testing for the Proposed Smith Hollow Bridge Replacement, Columbia County, Washington. Report to the Columbia County Office of County Engineer, Dayton, WA. Confederated Tribes of the Umatilla Indian Reservation, Cultural Resources Protection Program, Pendleton, OR. [Tabled artifact frequencies by excavation depth.]
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- Hogan, Matthew C.
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- Schumacher, James
2005 The Dalles Project—North Side: National Register Evaluations of Selected Cultural Resources Sites. Report to U.S. Army Corps of Engineers, Portland District. *Technical Report* 0226. Western Shore Heritage Services, Inc., Bainbridge Island, WA. [Tables of artifact inventory by depth.]
- Sharley, Ann, and Ryan Ives
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- Arneson, Kathryn
2006 Salvage Archaeological Investigations at SIR-R4-0001, Cayuse Cove, Lincoln County, Washington. Report to Bonneville Power Administration and Reclamation. Spokane Tribal Culture Preservation Program. [Tables of artifact type frequencies per excavation level.]
- Becker, Thomas E., Stephen C. Hamilton, and Bill R. Roulette
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- Copp, Stanley A.
2006 Similkameen Archaeology (1993–2004). Doctoral dissertation, Simon Fraser University, Burnaby, B.C. [Table of phase names and ages; table of projectile point types and C14 ages; table of phase names with verbal descriptions and ages.]
- Galm, Jerry R., editor
2006 *The Archaeology of Salishan Mesa (45GR445): A View from the Uplands*. Eastern Washington University Reports in Archaeology and History, 100-100. Cheney. [Bivariate scatterplot of house floor area against time; tabled distribution of artifact types against analytical units; pie graphs of artifact types per analytical unit, one pie per analytical unit.]
- Harder, David A., and Michelle M. Hannum
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- Hicks, Brent A., Maury E. Morgenstein, Stephen C. Hamilton, and A. Dawn Laybolt
2006 Section 106 Historic Properties Evaluation Technical Report, Spokane River Project. Avista report to Spokane River Hydroelectric Relicensing Project[?]. [Tables of artifact category frequencies by excavation depth; spatio-temporal culture unit rectangles (context).]
- Pouley, John O.
2006 2002 Examination of 59 Archaeological Sites Along the Chief Joseph Dam Reservoir, Douglas and Okanogan Counties Washington. Report to the U.S. Army Corps of Engineers, Seattle District. Confederated Tribes of the Colville Reservation. [Nothing.]
- Weaver, Dean R., and John O. Pouley
2006 National Register of Historic Places Evaluation of Archaeological Site 45FE497: A Multicomponent Site Along the Kettle River, Ferry County, Washington. Report to the Bonneville Power Administration. Confederated Tribes of the Colville Reservation. [Spatially distinct temporal lines for culture units/phases; text descriptions of culture units; tables of artifact inventory by test unit and level/depth.]

- Beidl, Jacqueline
2007 Passport in Time Test Excavations at Lost Meadow: 1999–2000 Field Seasons. Forest Service report on file, Naches Ranger District, Wenatchee National Forest, Yakima County, WA. [Line graph of artifact frequencies per excavation level.]
- Carlisle, Kendra
2007 Central Place Foraging and the Winter Village: A Settlement Pattern Analysis in the Lower Salmon River Canyon of Idaho. Master of Arts thesis, Oregon State University, Corvallis. [Nothing.]
- Chilvers, Stuart E.
2007 Enigmatic Lithics: Apty Named, Archaeological Excavation of the Enigmatic Lithics Site, Republic Washington: 2007. *CR Report* #2008062104004. U.S. Forest Service, Colville National Forest, Republic, WA. [Line graph of artifact frequencies by excavation depth (not by type but total count).]
- Jones, Jason M.
2007 Results of an Archaeological Site Damage Assessment at 45SP500, the Hutterian Brethren Site: A Traditional Lithic Quarry Inadvertently Discovered in Eastern Washington. Report to the Spokane Hutterian Brethren. Spokane Tribe of Indians. [Tables of artifact category frequencies by depth.]
- Jones, Jason M.
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2007 Archaeological Activity Report: Post-Review Discovery of Archaeological Site 45BN1422 at Solid Waste Site 128-B-3. Report to the U.S. Department of Energy. Washington Closure Hanford. [Tables of artifact inventory by depth and test unit.]
- Miss, Christian J., Nicholas J. Smith, and Nicole Gillis.
2007 Evaluation of National Register Eligibility for Five Archaeological Sites, Airway Heights, Spokane County, Washington. Report to Kalispel Tribe of Indians, Usk, WA. *NWAA Report*, No. WA07-026. Northwest Archaeological Associates, Inc., Seattle. [Table of artifact frequencies by depth below surface; tables of artifact inventory by depth.]
- Pouley, John O.
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- Prentiss, Anna M., N. Lyons, L. E. Harris, M. R. P. Burns, and T. M. Godin
2007 The Emergence of Status Inequality in Intermediate Scale Societies: A Demographic and Socio-Economic History of the Keatley Creek Site, British Columbia. *Journal of Anthropological Archaeology*, 26:299–327. [Line graph of frequencies of C14 dated house floor per stratum (lots of tables and graphs of house rim vs roof vs floor frequencies of various things).]
- Sappington, Robert Lee, and Jared Norman
2007 Results of Archaeological Testing for the Proposed Swimming Pool/Spa and Resort Expansion at the Granite Lake RV Resort, Port of Clarkston, Asotin County, Washington. [Tables of artifact inventory by excavation depth and level per test unit.]
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- Goodale, Nathan B., Ian Kuijt, and Anna M. Prentiss
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- Herbel, Brian, and Weber Greiser
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2008 Indigenous Occupation of Cayuse Cove–SIR-R4-0001: Phase II Investigations and Determination of Eligibility, Lake Roosevelt Reservoir Archaeology 2007. Report to Bonneville Power Administration & Reclamation. Spokane Tribe of Indians Culture Program, Wellpinit, WA. [Spatio-temporal rectangles of culture unit names (context), tables of artifact category frequencies by depth.]
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2008 The Southern Columbia Plateau Projectile Point Sequence: An Informatics-Based Approach. In *Projectile Point Sequences in Northwestern North America*, edited by Roy L. Carlson and Martin P. R. Magne, pp. 187–208. *Archaeology Press Publication*, No. 35. Burnaby, B.C.: Simon Fraser University. [Projectile point silhouettes against time.]
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2008 Analysis of the Kettle Falls Chronology Temporal Gaps. *Archaeology in Washington*, 14:3–20. [Spatio-temporal rectangles with named culture per rectangle.]
- Pouley, John O.
2008 Archaeological Investigations and National Register of Historic Places Evaluation of the North Gorge Site (45ST44), Stevens County, Washington: Technical Report. Report to Bonneville Power Administration and U.S. Bureau of Reclamation. Confederated Tribes of the Colville Reservation. [Bar graphs of artifact frequencies recovered by depth and unit; tables of artifact inventory recovered by excavation level and unit.]
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2008 Evolution of a Late Prehistoric Winter Village on the Interior Plateau of British Columbia: Geophysical Investigations, Radiocarbon Dating, and Spatial Analysis of the Bridge River Site. *American Antiquity*, 73:59–82. [Bar graph of house size frequency per time period.]

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2008 Chipped Stone Bifaces as Cultural, Behavioural, and Temporal Indices on the Central Canadian Plateau. In *Projectile Point Sequences in Northwestern North America*, edited by Roy L. Carlson and Martin P. R. Magne, pp. 221–250. *Archaeology Press Publication*, No. 35. Burnaby, B.C.: Simon Fraser University. [Silhouettes with time range (vertical line) against time and cultural phase (reprint of Rousseau 2004).]
- Senn, Amy K.
2008 Testing and Evaluation of Site 45BN885 for a Proposed Sewer Line within Columbia Park Golf Course, Benton County, Washington. Report to the City of Kennewick Parks, Streets, and Facilities. Confederated Tribes of the Umatilla Indian Reservation, Pendleton, OR. [Tables of artifact inventories by depth and shovel probe.]
- Wilson, Jennifer, and Dana Komen
2008 Beebe Springs Natural Area Project, Phase 2: Site 45CH216 National Register of Historic Places Evaluative Testing, Chelan County, Washington. Report to Washington Department of Fish and Wildlife. *Short Report* 984. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact inventory by stratum, level, depth and horizontal area; bar graphs of artifact frequencies by depth.]
- Adams, Ron L., and Terry L. Ozbun
2009 Interim Report on the Archaeological Evaluation of Site 45KL1400, Windy Flat Wind Farm Project, Klickitat County, Washington. Report to Windy Flats Partners, Goldendale, WA. *Report*, No. 2299. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact frequencies per excavation level.]
- Adams, Ron L., Terry L. Ozbun, and Michele L. Punke
2009 Archaeological Damage Assessment of Site 45KL1479, Klickitat County, Washington. Report to Ecology and Environment, Inc., Portland, OR. *Report*, No. 2408. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact frequencies per excavation level.]
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2009a Archaeological Damage Assessment of Sites 45KL590, 45KL504, and 45KL1505, Klickitat County, Washington. Report to Ecology and Environment, Inc., Portland, OR. *Report*, No. 2409. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact frequencies per excavation level.]
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- Armstrong, Steve
2009 Early Occupations Along the Selway River: The Rackliff Site (10-IH-2737). *Idaho Archaeologist*, 32(1):1–9. [Tables of artifact frequencies by excavation level.]
- Boersema, Jana, Mike Wolverson, Teresa Trost, and Sarah Thompson
2009 Archaeological Testing of 45FR1 for the Story Circles Project at Sacajawea State Park. Report to The Confluence Project, Vancouver, WA. *Cascadia Archaeology*, Seattle, WA. [Artifact frequencies by depth per shovel test or test unit.]
- Komen, Dana, and Ryan Ives
2009 Evaluative Test Excavations at Site 45GR1995, Washington State Department of Transportation SR 142 Safety Improvement Project, Klickitat County, Washington. Report to Washington State Department of Transportation. *Short Report* DOT09-11. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact frequencies by excavation level.]

Komen, Dana, and Ryan Ives

2009 Evaluative Test Excavations at Site 45KL1481, Grant County Public Works R-NE Road Widening Project, Grant County, Washington. Report to Grant County Public Works Department. *Short Report* 1044. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact frequencies by excavation level.]

Kuntz, Aaron L.

2009 Mesa Tops and Pit Houses: A Case Study of the Lee Site 45GR756, Grant County, Washington. Master of Science thesis, Central Washington University, Ellensburg. [Spatio-temporal rectangles of culture unit names/phases; tables of artifact frequencies by depth per test unit.]

McKenney, Pamela, Danna Komen, Stan Gough, and Ryan Ives

2009 Data Recovery Excavations at Site 45SP440, Valley Chapel Road, Spokane County, Washington. Report to Spokane County Public Works Department. *Short Report* 858. Archaeological and Historical Services, Eastern Washington University, Cheney. [Table of artifact inventory by test unit and excavation depth.]

Morrissey, Greg

2009 Tools and Change: The Shift from Atlatl to Bow on the British Columbia Plateau. Master of Arts thesis, Simon Fraser University, Burnaby, B.C. [Spatio-temporal culture phase named rectangles with diagnostic projectile points and time ranges (from Rousseau 2008); text descriptions of phases; table of point (arrows vs darts) frequencies per phase; box and whisker plots of a point metric vs culture phase; bivariate scatterplots of point metrics (arrow vs dart).]

Pouley, John O.

2009 Archaeological Investigations in the Grand Coulee Dam Cultural Resources Project Area, Ferry County, Washington. Report to the Bonneville Power Administration and United States Bureau of Reclamation. Confederated Tribes of the Colville Reservation. [Tables of artifact inventory by test unit and excavation depth.]

Schalk, Randall F., and Margaret A. Nelson

2009 Archaeological Excavations at 45FR1 at the Columbia-Snake River Confluence. Report to Washington State Parks and Recreation Commission. Cascadia Archaeology, Seattle, WA. [Bar graphs of frequencies by depth per excavation unit; line graphs of frequencies of weight classes by depth.]

Sharley, Ann

2009 Cultural Resource Assessment for the Pend Oreille Fiber Optic Line Project, Pend Oreille County, Washington. *Report Number* WA 09-85. Report to JBR Environmental Consultants, Inc., Sandy, UT. Northwest Archaeological Associates, Inc., Seattle, WA. [Tables of artifact inventory by shovel probe and depth.]

2010–2019

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2010 Dart and Arrow Points on the Columbia Plateau of Western North America. *American Antiquity*, 75:287–325. [Spatio-temporal rectangles; bivariate scatterplot of projectile point dimensions against culture phase; bar graphs of projectile point dimensions against culture phases.]

Arthur, Edward, Margaret Berger, Jason Cowan, Jeremy Ripin, and Kelli Shoaf

2010 Interim Report of Archaeological Resources Assessment for the Grant County PUD, Priest Rapids Hydroelectric Project FERC Re-Licensing. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by excavated level.]

- Herbel, Brian, Brent Hicks, Kevin Lyons, Shari Silverman, and Weber Greiser
2010 Archaeological Site Evaluation of Sites 45PO150, 45PO185, 45FS2075, and CNF-517, Box Canyon Hydroelectric Project (FERC no. 2042). Report to Public Utility District No. 1 of Pend Oreille County. Historical Research Associates, Inc. [Tables of artifact frequencies by excavation level/depth; spatio-temporal culture unit rectangles (context).]
- Jones, Jason M.
2010 Suyepi Beach-45LI389: Phase II Investigation and Determination of Eligibility, Lake Roosevelt Reservoir Archaeology 2009. Report to Bonneville Power Administration & Reclamation. Spokane Tribe of Indians Culture Program, Wellpinit, WA. [Spatio-temporal rectangles of culture unit names (context), photographs of artifacts with depth of recovery.]
- Kelly, Katherine M., Jason Cowan, Ed Arthur, Margaret Berger, Charles Reed, James Schumacher, Melanie Diedrich, Jeremy Ripin, and Kelli Shoaf
2010 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing. Report No. CRC 20. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by depth of excavation.]
- Komen, Dana
2010 Investigations at Archaeological Site 45KL1250, Horsethief Butte Trailhead Parking Safety Improvement Project, Columbia Hills State Park, Klickitat County, Washington. Report to Washington State Parks and Recreation. *Short Report 1069*. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact frequencies by excavation depth; bar graphs of frequency of artifacts by depth.]
- Komen, Dana, and Ryan Ives
2010 Evaluative Test Excavations at Site 45BN157A, Washington State Department of Transportation Vernita Safety Rest Area Improvement Project, Benton County, Washington. Report to Washington State Department of Transportation. *Short Report DOT10-02*. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact frequencies by excavation depth.]
- McClure, Richard H., Jr.
2010 The Island Corral Site (45KL281), Columbia River Gorge National Scenic Area, Archaeological Assessment and Condition Survey. Heritage Program, U.S. Forest Service, Pacific Northwest Region, Gifford Pinchot National Forest, and Columbia River Gorge National Scenic Area. [Table of artifact inventory by depth and test unit; line graph of artifact frequency against depth.]
- Noll, Christopher D., and David A. Harder
2010a Archaeological Excavation at the Julian Bay Site (45FE72), Lot 45, Curlew Lake, Ferry County, Washington. Report to Don and Wendy Paton, Sedro Wolley, WA. Plateau Archaeological Investigations, LLC, Pullman, WA. [Table of artifact inventory by depth below surface.]
2010b Archaeological Probing, Site Testing, and Monitoring for the Omak Eastside Park Water System Improvement Project, Okanogan County, Washington. Report to the City of Omak, WA. Plateau Archaeological Investigations, LLC, Pullman, WA. [Tables of artifact inventory by depth and level.]
- Pouley, John O.
2010 Archaeological Investigations at 45ST417, Stevens County, Washington. Report to Avista Utilities. Confederated Tribes of the Colville Reservation. [Spatio-temporal rectangles of named culture units/phases; text descriptions of phases; bar graphs of frequencies per level by test units; rectangles of diagnostic projectile point style names against time and cultural phases.]

- Pouley, John O.
2010 Archaeological Investigations at 45ST438, Grand Coulee Dam Reservoir, Lake Roosevelt National Recreation Area, Stevens County, Washington. Report to the Bonneville Power Administration and United States Bureau of Reclamation. Confederated Tribes of the Colville Reservation. [Tables of artifact inventory by excavation depth.]
- Pouley, John O.
2010 Kettle Falls Culture Chronology: Prehistoric Varied Land Use, Traditions, Innovation and Adaptation Along the Upper Columbia River. Report to the Bonneville Power Administration and United States Bureau of Reclamation. Confederated Tribes of the Colville Reservation. [Spatio-temporal rectangles of named culture units/phases; text descriptions of phases; bar graphs and tables of artifact frequencies per level; spindle graph of diagnostic projectile point types per level.]
- Pouley, John Oliver
2010 Kettle Falls Chronology: Prehistoric Varied Land Use, Traditions, Innovation and Adaptation Along the Upper Columbia River. *Archaeology in Washington*, 16:3–88. [Spatio-temporal rectangles with named culture per rectangle; centered and stacked bar graph of projectile point types per arbitrary level.]
- Root, Matthew J., and Daryle E. Ferguson
2010 Test Excavations at the Desert Aire Recreation Area, PUD No. 2 of Grant County, Washington. Report to Public Utilities District No. 2 of Grant County, Ephrata, WA. *Project Report*, No. 236. Rain Shadow Research, Inc., Pullman, WA. [Tables of artifact inventory by excavation level and test unit.]
2010 Test Excavations in the Priest Rapids Dam Locality, Public Utilities District No. 2 of Grant County, Washington. Report to Public Utilities District No. 2 of Grant County, Ephrata, WA. *Project Report*, No. 238. Rain Shadow Research, Inc., Pullman, WA. [Tables of artifact inventory by excavation level and test unit.]
- Sakaguchi, Takashi, Jesse Morin, and Ryan Dickie
2010 Defensibility of Large Prehistoric Sites in the Mid-Fraser Region on the Canadian Plateau. *Journal of Archaeological Science*, 37:1171–1185. [Nothing.]
- Sappington, Robert Lee, Jared Norman, and Ryan Harrod
2010 Results of Recent Test Investigations at the Dalosto Property Near Tenmile Creek, Asotin County, Washington. [Tables of artifact inventory by excavation depth.]
- Wilson, Jennifer
2010 US 2 Wenatchee River Bridges Replacement Project, Site 45CH703 Remote Sensing Anomaly and Retaining Wall Test Excavations, Chelan County, Washington. Report to Washington State Department of Transportation. *Short Report* DOT10-06. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact inventory by test unit and depth.]
- Adams, Ron L., and Terry L. Ozbun
2011 Archaeological Testing of Site 45KT3185 for the Kittitas Valley Wind Power Project, Kittitas Valley, Washington. Report to Sagebrush Power Partners. *Report*, No. 2638. Archaeological Investigations Northwest, Inc., Portland, OR. [Tables of artifact type frequencies per excavation level.]
- Berger, Margaret, Ed Arthur, Jason Cowan, Katherine M. Kelly, Doug Mitchell, Phil Pedack, Jeremy Ripin, and Kelli Shoaf
2011 Final Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing Project 23—Test Excavations 17. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Cultural Resources Consultants Report*, No. CRC23. [Tables of artifact category frequencies by excavation depth.]

- Coutts, Allison, Troy Wilson, Jennifer Wilson, Arielle Danielson, Fred Crisson, Stephen Emerson, and Ryan Ives
2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites, Project Number 13, Test Excavations 6, Grant County Public Utility District No. 2, Grant County, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1085. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact type frequencies by depth.]
- Coutts, Allison, Troy Wilson, Jennifer Wilson, Stephen Emerson, Stan Gough, and Ryan Ives
2011 (revised; original 2010) National Register of Historic Places Evaluative Test Investigations of Twelve Site: 45GR2291, 45GR2292, 45GR2293, 45GR2294, 45GR2295, 45GR2296, 45GR2297, 45GR2299, 45GR2308, 45GR2312, 45KT2322, and 45KT2323, Test Excavations 4, Project Number 11, Grant County Public Utility District, Grant and Kittitas Counties, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata WA. *Short Report* 1078. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact type frequencies by depth.]
- Cowan, Jason
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (TI-45, 45DO6, 45DO673, 45DO676, 45DO713, 45DO800, 45DO802, 45DO859, 45DO861, and 45GR2328). Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC6. [Tables of artifact inventory by excavated level.]
- Cowan, Jason
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (45KT1155, 45KT1160, 45KT2298, 45KT2300, 45KT2301, 45YA08, 45YA337, 45YA603, 45YA998, 45YA1007). Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC22. [Tables of artifact inventory by excavated level.]
- Cowan, Jason, Tasha Bailey, Jesse Burehaus, Kat Kelly, Phil Pedak, Jeremy Ripin, Kelli Shoaf, and Clint Wiltse
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Grant Project 30–Test Excavations 23 (45GR1700, 45GR1701, 45GR1702, 45GR1703, 45GR1705, 45GR2171, 45GR2172, 45GR2173, 45GR2174, 45GR2404, 45GR2405, 45GR2406, 45GR2408, and DI39). Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report* No. CRC30. [Tables of artifact inventory by excavated level.]
- Cox, Matthew, Leslie Reyes, Troy Wilson, Arielle Danielson, Jennifer Wilson, Stephen Emerson, and Ryan Ives
2011 National Register of Historic Places Evaluative Test Investigations of Eleven Sites: 45GR2249, 45GR2250, 45GR2251, 45GR2252, 45GR2253, 45GR2223, 45GR2307, 45GR2309, 45GR2310, 45GR2311, and JI-27, Test Excavations 7, Project Number 14, Grant County Public Utility District, Grant County, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report* No. AHS14 (SR1083). [Tables of artifact inventory by excavated level.]
- Cox, Matthew, Allison Coutts, Jennifer Wilson, Troy Wilson, Alex Neumann, Matthew Joyce, Stephen Emerson, and Ryan Ives
2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites: 45GR1567, 45GR1573, 45GR2099, 45GR2100, 45GR2101, 45GR2105, 45GR2520, 45GR2521, 45GR2522, 45GR2531, 45GR2537, and 45GR2539, Project Number 17, Test Excavations 9, Grant County Public Utility District No. 2, Grant County, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1087. Archaeological and Historical Services, Eastern Washington University, Cheney, WA. [Tables of artifact inventory by excavated level.]

- Cox, Matthew, Allison Coutts, Troy Wilson, Jennifer Wilson, Stephen Emerson, and Ryan Ives
2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites, Project Number 19, Test Excavations 11, Grant County Public Utility District No. 2, Grant County, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1090. Archaeological and Historical Services, Eastern Washington University, Cheney, WA. [Tables of artifact inventory by excavated level.]
- Crisson, Fred, Allison Coutts, Matthew Cox, Troy Wilson, Jennifer Wilson, Stephen Emerson, and Ryan Ives
2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites, Project Number 18, Test Excavations 10, Grant County Public Utility District No. 2, Grant County, Washington. Report submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1089. Archaeological and Historical Services, Eastern Washington University, Cheney, WA. [Tables of artifact inventory by excavated level.]
- Kelly, Katherine, Ed Arthur, Margaret Berger, Jason Cowan, Alexander Cragg, Melanie Diedrich, Leandra Medina, Marcia Montgomery, and Josh Watrous
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Project 4a-Test Excavations 1 (45GR1522, 45GR1523, 45GR1524, 45GR1525, 45GR1526, 45GR1532, 45GR1570, 45GR1571, 45GR1575, 45GR1580, 45GR1582, 45GR1583). Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC 4. [Tables of artifact inventory by depth of excavation.]
- Kelly, Katherine, Ed Arthur, Margaret Berger, Jason Cowan, Leandra Medina, Jesse Buerhaus, Jeremy Ripin, Charles Reed, Kelli Shoaf, and Melanie Diedrich
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (45CH644, 45DO690, 45GR1501, 45GR1502, 45GR1569, 45GR1584, 45GR1585, 45GR1599, 45GR1634, 45GR1741, 45GR1760, 45GR1778, 45KT2299, 45KT2302, 45KT2515). Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC 21. [Tables of artifact inventory by depth of excavation.]
- Kelly, Katherine, Ed Arthur, Margaret Berger, Jason Cowan, Leandra Medina, Jesse Buerhaus, Jeremy Ripin, Kelli Shoaf, and Melanie Diedrich
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (45GR1623, 45GR2359, 45GR2389, 45GR2393, 45GR2396, 45KT370/45YA339, 45KT2309, 45KT2317, 45YA155, 45YA997, 45YA1006, 45YA1008). Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC 26. [Tables of artifact inventory by depth of excavation.]
- Kelly, Katherine, and Jason Cowan
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Grant Project 32-Test Excavations 25 (45BN566, 45KT730, 45KT1861, 45KT1862, 45KT2312, 45YA153, and 45YA1000). Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Report*, No. CRC 32. [Tables of artifact inventory by depth of excavation.]
- Kopperl, Michael Shong, and Brandy Rinck
2011 Archaeological Testing of 45DO917, 45DO923, 45GR2888, and 45GR2889 for the Columbia to Rocky Ford Transmission Line Project, Grant and Douglas Counties, Washington. Report to HDR, Inc., Bellevue, WA. Northwest Archaeological Associates, Seattle, WA. [Tables of artifact inventory by depth of excavation.]

- Litzkow, Jamie M.
2011 Late Paleoinian Subsistence and Settlement at Sentinel Gap (45KT1362). Master of Arts thesis, Eastern Washington University, Cheney. [Spatio-temporal rectangles of culture unit names; projectile point silhouettes against time within three geographical areas (last from Galm and Gough 2008).]
- Prentiss, Anna Marie, J. C. Chatters, N. Lyons, and L. E. Harris
2011 Archaeology of the Middle Fraser Canyon, British Columbia: Changing Perspectives on Palaeoecology and Emergent Cultural Complexity. *Canadian Journal of Archaeology*, 35:143–174. [Nothing.]
- Root, Matthew J., and Daryle E. Ferguson
2011a Test Excavations and Site Evaluations in the Wanapum Dam Locality, Project 012, PUD No. 2 of Grant County, Washington. Report to Public Utilities District No. 2 of Grant County Washington, Ephrata, WA. *Project Report*, No. 248. Rain Shadow Research, Inc., Pullman, WA. [Tables of artifact inventory by excavation depth and test unit.]
2011b Test Excavations at Priest Rapids, Project 008, PUD No. 2 of Grant County, Washington. Report to Public Utilities District No. 2 of Grant County, Ephrata, WA. *Project Report*, No. 242. Rain Shadow Research, Inc., Pullman, WA. [Tables of artifact inventory by excavation level and test unit.]
- Schumacher, James, Jesse Buerhaus, Marcia Montgomery, Jeremy Ripin, and Kelli Shoaf
2011a Interim Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Project # 29—Test Excavations #22. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *CRC Report*, No. CRC29. Cultural Resource Consultants. [Tables of artifact inventory by depth and unit.]
2011b Interim Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Project # 27-E – Test Excavations 20. *CRC Report*, No. CRC27-E, Cultural Resource Consultants, report to Public Utility District No. 2 of Grant County, Ephrata, WA. [Nothing.]
- Schumacher, James, and Jeremy Ripin
2011 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Relicensing: Project 34—Burkett Lake Project. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *CRC Report* 034. [Tables of artifact frequencies by depth.]
- Senn, Amy K.
2011 Cultural Resource Survey and Testing for the Proposed Skookum Habitat Management Unit Irrigation Improvements, Franklin County, Washington. Report to the U.S. Army Corps of Engineers, Walla Walla District. Confederated Tribes of the Umatilla Indian Reservation. [Tables of artifact inventory by shovel test and depth.]
- Sharpe, J. J., R. DeMaris, K. Mendez, J. Gutzeit, K. Easton, and B. Roulette
2011 Report of Findings: The Analysis of the Archaeological Materials from Site 45BN423 in 1991 and 1992, Benton County, Washington. [Table of cultural phase descriptions and ages; bar graphs of frequencies by excavation level.]
- Shong, Michael V., Eileen M. Heideman, and Robert E. Kopperl
2011 Cultural Resources Assessment for the Columbia to Rocky Ford Transmission Line, Grant and Douglas Counties, Washington. Report to HDR Engineering, Bellevue, WA. Northwest Archaeological Associates, Seattle, WA. [Tables of artifact inventory by shovel probe and depth.]

Wilson, Jennifer, Allison Coutts, Matthew Cox, Leslie Reyes, Ryan Ives, and Fred Crisson

2011 National Register of Historic Places Evaluative Testing Investigations of Thirteen Sites: 45DO522, 45DO717, 45GR122, 45GR138, 45GR440, 45GR1503, 45GR1504, 45GR1505, 45GR1514, 45GR1515, 45GR1516, 45GR1517, and 45GR1519, Project Number 7, Test Excavations 1, Grant County Public Utility District No. 2, Grant and Kittitas Counties, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1074. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact inventory by excavation unit and level.]

Wilson, Jennifer, Matt Cox, Robert Gleaton, Ryan Ives, and Troy Wilson

2011 National Register of Historic Places Evaluative Testing Investigations of Thirteen Sites: 45GR1598, 45GR2092, 45GR2120, 45GR2121, 45GR2361, 45GR2362, 45GR2364, 45GR2365, 45GR2366, 45GR2383, 45KT3131, 45KT3135, and 45KT3137, Project Number 8, Test Excavations 2, Grant County Public Utility District No. 2, Grant and Kittitas Counties, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1077. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact inventory by test unit and level.]

Wilson, Jennifer, Troy Wilson, Matthew Cox, Fred Crisson, Sean Stcherbinine, and Ryan Ives

2011 National Register of Historic Places Evaluative Test Investigations of Thirteen Sites, Project Number 20, Test Excavations 12, Grant County Public Utility District No. 2, Grant County, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1094. Archaeological and Historical Services, Eastern Washington University, Cheney. [Tables of artifact inventory by test unit and level.]

Wilson, Jennifer, Matthew Cox, Arielle Danielson, Allison Coutts, Troy Wilson, Alex Neumann, Stephen Emerson, and Ryan Ives

2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites, Project Number 12, Test Excavations 5, Grant County Public Utility District No. 2, Grant County, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1084. Archaeological and Historical Services, Eastern Washington University, Cheney. [Line graph of total artifact frequencies by excavation level and test unit; tables of artifact inventory by tests unit and level.]

Wilson, Troy, Jennifer Wilson, Matthew Cox, Ryan Ives, and Allison Coutts

2011 National Register of Historic Places Evaluative Test Investigations of Twelve Sites, Project Number 22, Test Excavations 13, Grant County Public Utility District No. 2, Grant County, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *Short Report* 1097. Archaeological and Historical Services, Eastern Washington University, Cheney. [Bar graph of total artifact frequencies by excavation level and test unit, and total site; tables of artifact inventory by tests unit and level.]

Woody, Dave M., Noah Oliver, Eugene Billy, and Corrine Camuso

2011 Archaeological Testing of 45IL867, the Locke Lake Site, and the USFS Courtney Road-Highway 8 Trailhead Project APE, Klickitat County, WA. Report to the U.S. Forest Service. Yakama Nation, Toppenish, WA. [Tables of artifact inventory by tests unit and level and depth.]

Ahlman, Todd M., Michael Falkner, Sylvia Tarman, Eric Carlson, and Steven Dampf

2012 Archaeological Excavation and Monitoring at Site 45ST931 Associated with the Colville-Republic No. 1 Rebuild Project: Structures 1/1 to 14/5, Stevens County, Washington. Report to Bonneville Power Administration, Portland, OR. Historical Research Associates, Inc., Missoula, MT. [Spatio-temporal rectangles of named culture units.]

- Berger, Margaret, Ed Arthur, Jason Cowan, Alexander Cragg, Melanie Diedrich, Phil Pedack, Charles Reed, Jeremy Ripin, James Schumacher, and Kelli Shoaf
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing Project 24—Test Excavations 19. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. Cultural Resources Consultants *Report*, No. CRC24. [Tables of artifact category frequencies by excavation depth.]
- Berger, Margaret, and James Schumacher
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Project 31—Test Excavations 24. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. Cultural Resources Consultants *Report*, No. CRC031. [Tables of artifact category frequencies by excavation depth.]
- Chatters, James C., Steven Hackenberger, Anna M. Prentiss, and Jayne-Leigh Thomas
2012 The Paleoindian to Archaic Transition in the Pacific Northwest. In *From the Pleistocene to the Holocene: Human Organization and Cultural Transformation in Prehistoric North America*, edited by C. Britt Bousman and Bradley J. Vierra, pp. 37–65. College Station: Texas A&M University Press. [Nothing.]
- Cowan, Jason
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing Project 37—Priest Rapids Tailrace B. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by excavation depth.]
- Cowan, Jason, Ed Arthur, Tasha Bailey, Margaret Berger, Matt Breidenthal, Alexander Cragg, Melanie Diedrich, Mikk Kaschko, Kat Kelly, Leandra Medina, Doug Mitchell, Phil Pedack, Charlie Reed, Jeremy Ripin, Jim Schumacher, Kelli Shoaf, and Josh Watrous
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (45GR1694, 45GR1695, 45GR1696, 45GR2489, 45GR2490, 45GR2491, 45GR2493, 45GR2494, 45GR2495). *Report*, No. CRC11 submitted to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by excavated level.]
- Jones, Jason M.
2012 The Three Oven Site-45LI31 and Mud Flats-45LI374: Phase II Investigation and Determination of Eligibility, Lake Roosevelt Reservoir Archaeology 2011. Report to Bonneville Power Administration & Bureau of Reclamation. Spokane Tribe of Indians Culture Program, Wellpinit, WA. [Spatio-temporal rectangles of culture unit names (context).]
- Kelly, Katherine, Ed Arthur, Margaret Berger, Tasha Bailey, Jennifer Chambers, Jason Cowan, Alexander Cragg, Melanie Diedrich, Doug Mitchell, Phillips Pedack, Charles Reed, Jeremy Ripin, James Schumacher, Kelli Shoaf, and Josh Watrous
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing (45GR1244, 45GR1627, 45GR1630, 45GR1635, 45GR1716, 45GR1717, 45GR1718, 45GR1719, 45GR1721, 45GR1753, 45GR1756, 45GR1758). *Report*, No. CRC 16 to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by depth of excavation.]
- Kelly, Katherine, and Margaret Berger
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing Project 36—Test Excavations 27. *Report*, No. CRC 36 to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by depth of excavation.]

- 2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing Project 41—Test Excavations 28. *Report*, No. CRC 41 to Public Utility District No. 2 of Grant County, Ephrata, WA. [Tables of artifact inventory by depth of excavation.]
- Noll, Christopher D.
2012 The Development of Lithic Extraction Areas in the Okanogan Highlands During the Late Holocene: Evidence from Curlew Lake, Washington. *Journal of Northwest Anthropology*, 46:227–242. [Nothing.]
- Noll, Christopher D., David A. Harder, Kelly M. Derr, and Kristin N. Safi
2012 An Archaeological Evaluation of 45GR139, Grant County, Washington. Plateau Archaeological Investigations, LLC, Pullman, WA. [Text description of culture units/phases; table of distribution of total artifacts by depth; tables of artifact inventory by depth of excavation and level.]
- Prentiss, Anna M., T. A. Foor, G. Cross, L. E. Harris, and M. Wanzenried
2012 The Cultural Evolution of Material Wealth-Based Inequality at Bridge River, British Columbia. *American Antiquity*, 77:542–564. [Table of prestige artifact counts per component; table of correlation coefficients; bivariate plot of Principal Component Analysis (PCA) factor score vs floor thickness; bivariate plot of PCA factor score vs number of floors per component.]
- Root, Matthew J., and Daryle E. Ferguson
2012 Test Excavations in the Crescent Bar Recreation Area, Project 0016, PUD No. 2 of Grant County, Washington. Report to Public Utilities District No. 2 of Grant County, Ephrata, WA. *Project Report*, No. 251, Rain Shadow Research, Inc., Pullman, WA. [Tables of artifact inventory by excavation level and test unit.]
- Schumacher, James, Margaret Berger, and Marcia Montgomery
2012 Report of Archaeological Resources Assessment for the Grant County PUD Priest Rapids Hydroelectric Project FERC Re-Licensing, Project 38—Test Excavations 27. Report to Public Utility District No. 2 of Grant County, Ephrata, WA. *CRC Report*, No. CRC038. Cultural Resource Consultants. [Tables of artifact inventory by depth and unit.]
- Shea, Holly Ann C.
2012 The Grissom Site (45KT301): A Review and Synthesis of Investigations and Exploration of the Site’s Research Potential. Master of Science thesis, Central Washington University, Ellensburg. [Tabled culture unit names against time with verbal descriptions; tables with minimally descriptive data on artifact categories against depth; bar graph of projectile point type absolute frequencies against temporal periods.]
- Smith, Ross, and Robert Kopperl
2012 Determination of Eligibility Report for Site 45BN583, Howard Among Park, Richland, Benton County, Washington. Report to City of Richland, WA, and Confederated Tribes of the Umatilla Indian Reservation, Pendleton, OR. *Report Number* WA11-011. Northwest Archaeological Associates, Seattle, WA. [Spatio-temporal rectangles of named culture units/phases (context); tables of artifact inventory by depth.]
- Wilson, Troy, Fred Crisson, Jennifer Wilson, Josh Moss, Sean Stcherbinine, and Ryan Ives
2012 National Register of Historic Places Evaluative Test Investigations of Twenty-Four Sites, Project Number 27, Test Excavations 18, Grant County Public Utility District No. 2, Chelan, Douglas, and Kittitas Counties, Washington. Report to Public Utility District No. 2 of Grant County, Ephrata, WA, and U.S. Bureau of Land Management, Spokane, WA. *Short Report* 1110. Archaeological and Historical Services, Eastern Washington University. [Tables of artifact inventory by excavation depth.]

- Lepofsky, Dana, Sue Formosa, D. M. Schaepe, M. Lenert, and M. Blake
2013 Mapping Sxwóxwiyemelh: A Pre-Contact Settlement in the Upper Fraser Valley, Southwestern British Columbia. *Journal of Field Archaeology*, 38:309–323. [Nothing.]
- Longstaff, Laura
2013 Archaeological Investigations at the Kelly Forks Work Center Site (10CW34): Clearwater River National Forest, North Central Idaho. Master of Arts thesis, University of Idaho, Moscow. [Spatio-temporal rectangles of named culture units/phases; bar graphs of tool type frequencies per excavation level.]
- Davis, Loren G., A. J. Nyers, and S. C. Willis
2014 Context, Provenance and Technology of a Western Stemmed Tradition Artifact Cache from the Cooper's Ferry Site, Idaho. *American Antiquity*, 79:596–615. [Nothing (not surprising as no temporal variability).]
- Lohse, E. S., and Coral Moser
2014 The Western Stemmed Point Tradition on the Columbia Plateau. *Journal of Northwest Anthropology*, 48(1):45–68. [Spatio-temporal rectangles of named culture units, with projectile point silhouettes.]
- Oliver, Kali Dene-Varen
2014 Adopting an Orphaned Archaeological Collection: Walla Walla, Washington's Hussey Collection. Master of Arts thesis, University of Idaho, Moscow. [Nothing.]
- Solimano, Paul S., and Daniel M. Gilmour
2014 Modeling Precontact Land-Use in The Dalles: Site Types, Assemblage Structure, and Data Adequacy. *Journal of Northwest Anthropology*, 48(2):123–158. [Bar graphs of type frequencies by temporal period; spatio-temporal rectangles with named culture units and a few attributes of each; bivariate scatterplot of type richness against sample size per time period; table of land use pattern per temporal period.]
- Garrison, Patrick
2015 Organization of Technology at the Sanders Site (45KT315): Analysis of Formed Tools from the Yakima Uplands, WA. Master of Science thesis, Central Washington University, Ellensburg, WA. [Text summary description of cultural phases; end to end bar graph of biface breakage type by stratum.]
- Grisham, Abram
2015 Prehistoric Use of Quartz Crystal Lithic Material in the Clearwater River Basin, North Central Idaho: A Replicative Study in Manufacture and Use-Wear Analysis. Master of Arts thesis, University of Idaho, Moscow. [Nothing.]
- Lancaster, JD L.
2015 Progress in the Search for Early Sites in the Lower Salmon River Canyon, Idaho: A Case Study in Geoarchaeological Prospection. Master of Arts thesis, Oregon State University, Corvallis. [Text descriptions of cultural phases.]
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Whitewashing Washington State History: The 1889 Project

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Abstract *On August 2019, the New York Times (NYT) commenced an ongoing initiative, “The 1619 Project,” in the New York Times Magazine seeking to reframe the nation’s history. The state of Washington was admitted to the Union on 11 November 1889. In alignment with the NYT’s aim to reframe the history of the country, this article examines the truthful history of Washington State and underlines the necessity of introducing an honest narrative into the state’s instructional discourse and educational curriculum in an effort referred to as the The 1889 Project.*

Keywords

The 1619 Project, Washington State, Tribal history, Senate Bill 5433, Samuel Thurston.

“In August of 1619, a ship appeared on this horizon, near Point Comfort, a coastal port in the English colony of Virginia. It carried more than 20 enslaved Africans, who were sold to the colonists. No aspect of the country that would be formed here has been untouched by the years of slavery that followed. On the 400th anniversary of this fateful moment, it is finally time to share our story truthfully.”

—*New York Times*

Introduction

Those who cannot remember the past are condemned to repeat it.

—George Santayana, 1863–1952¹

History is almost always written by the victors and conquerors and gives their view.

—Jawaharlal Nehru, 1889–1964²

There is a price to pay for speaking the truth. There is a bigger price for living a lie.

—Cornel West³

In 2015, the Washington State Legislature enacted Senate Bill 5433 requiring that a Tribal curriculum be taught at all public schools in the state of Washington. The bill is codified at RCW 28A.320.170 which provides, among other things, that “school districts shall collaborate with the office of the superintendent of public instruction on curricular areas regarding tribal government and history that are statewide in nature, such as the concept of tribal sovereignty and the history of federal policy towards federally recognized Indian tribes.” Unfortunately, the bill stopped short of requiring school districts to provide instruction on the complete history of Washington State policy toward Indian Tribes

¹ Santayana, George. 1905. *Life of Reason, Reason in Common Sense*, p. 284. New York, NY: Charles Scribner’s Sons.

² Nehru, Jawaharlal. 1946. *The Discovery of India*, pp. 287–288. Kolkata, India: Signet Press.

³ West, Cornel. 17 June 2011. Twitter, < <https://twitter.com/CornelWest/status/81791836582187008?s=20>>.

or other historically disenfranchised people. As addressed below, the curriculum for the teaching of Washington State history in the public schools of this state is woefully inadequate in terms of presenting an unbiased and historically accurate portrayal of Washington State history. However painful or embarrassing to disclose, the students destined to become the future leaders of the Pacific Northwest ought not to be shielded from shameful events in the state's history in favor of a more rosy history.⁴

Our public education system has a responsibility to learn and then teach our students about the history of Indigenous and immigrant peoples, not merely provide a partial and cursory list of cultural traits, such as geographic location, outdated subsistence patterns, cuisine, clothing, and simplistic descriptions of ceremonies. Washington State history involves a complex array of interactions between European settlers; Indigenous communities in other states; and other peoples, involving past and contemporary displacement, forced migration, warfare, treaties and violations of treaties, repression of spiritual practices, boarding schools, population decline, historic trauma, and racial violence that has marked Indigenous life for two centuries. Despite these obstacles, Indigenous survival, resistance to colonization, political mobilization, and more recent flourishing, in some cases, must be the processes Washington State youth and residents need to learn about in order to become and create responsible and responsive communities.

One representative example of this important linkage can be found both in the official name of Washington State and the official Washington State flag. These two symbols that

are designed to signify the power of the statehood give prominence to the name and the image of George Washington, perhaps the most popularly known founding father who owned and punished slaves and relentlessly pursued the acquisition of Indigenous Tribes' lands by the means of ruthless military violence. Washington was given an infamous sobriquet, *Conotocaurius*, by the Iroquois leaders. It translates as "town taker," "devourer of villages," or "burner of towns."⁵ In 1779, Washington ordered General John Sullivan to launch a military attack against the Iroquois confederacy and to cause "the total destruction and devastation of Iroquois settlements and the capture of as many prisoners of every age and sex as possible." He further noted to "ruin their crops now in the ground and prevent their planting more."⁶ This resulted in the complete destruction of more than 40 Iroquois villages and their food supplies. Should not this history be taught to students in public schools in our state that pays political homage to George Washington?

The roots of Washington State history date back to the establishment of Oregon Territory by the United States Congress in 1848, since Washington Territory was carved out of a portion of Oregon Territory in 1853. A cursory review of the *Congressional Globe*—the predecessor of the *Congressional Record*—discloses that much of the congressional debates on whether to recognize Oregon as a territory of the United States centered on whether slavery would be allowed in the territory⁷ since versions of the bill allowed citizens to take their "property"⁸ into the territory. Representative Smith opposed the bill until the "vexatious" issue of slavery in the new territory was resolved, stating that:

⁴ In August 2019, the New York Times commenced an ongoing initiative, "The 1619 Project," in the *New York Times Magazine* seeking to reframe the nation's history <www.nytimes.com/interactive/2019/08/14/magazine/1619-america-slavery.html>. The state of Washington was admitted to the Union on 11 November 1889.

⁵ Colin Gordon Calloway. 2018. *The Indian World of George Washington: The First President, the First Americans, and the Birth of the Nation*. Oxford, U.K.: Oxford University Press.

⁶ A letter from George Washington to Major General John Sullivan, 31 May 1779, National Archives of Founders.

⁷ See, e.g., *Congressional Globe*, 30th Congress, 1st Session, 1007, 28 July 1848.

⁸ Africans, and African Americans, were not fully considered to be "people" (U.S. Const., Art. 1, §2, cl. 3). Nor were they "citizens." Rather, they were items of property, to be counted in the census as three-fifths of a person for purposes of determining the number of Congressional representatives a state may have. See, e.g., *Dred Scott v. Sandford*, 60 U.S. (19 How.) 393 (1857).

Its southern advocates contended that it would be the means of extending slavery over that territory in which slavery did not now exist; and if that was its character, he should not give it his sanction.

What is now the state of Washington was carved out from land formerly within Oregon Territory. Samuel Thurston (Figure 1), who was the first delegate from Oregon Territory to the U.S. Congress, feared that free Black slaves would migrate into the Oregon Territory and enthusiastically supported the Black Exclusion Law of 1849 which declared a ban on “any negro or mulatto to enter into, or reside” in Oregon. Thurston also preyed upon the white settlers’ fear of non-white people to invoke the threat of future hostility and rebellion against them and remarked:

“[T]he Canakers and negroes, if allowed to come here, will commingle with our Indians, a mixed race will ensue, and the result will be wars and bloodshed in Oregon[.]”⁹ Whereas situated as the people of Oregon are, in the midst of an Indian population, it would be highly dangerous to allow free negroes and mulattoes to reside in this Territory, or to intermix with the Indians, instilling into their minds feelings or hostility against the white race.”¹⁰

The Act establishing Oregon Territory provided that only “white male inhabitants” could vote.¹¹ The same language appeared in the 1853 Organic Act establishing Washington Territory.¹²

Samuel R. Thurston championed the causes of white colonial settlers and their white supremacist ideology in the Pacific Northwest and was a master legislator and strategist of the removal of Indigenous Tribes from their ancestral lands through the Donation Land Claim Act of 1850.

This law, which intended to replace the Indigenous Tribes with white settlers, redistributed the dispossessed lands by entitling every white male 18 years of age or older and his wife to 320 acres each.¹³ By 1856, more than 7,000 white settlers had purchased over 2.5 million acres, while Indigenous Tribes of the Willamette Valley were forced to succumb to the pressure of signing a series of treaties and were eventually removed to reservations in destitute conditions.¹⁴

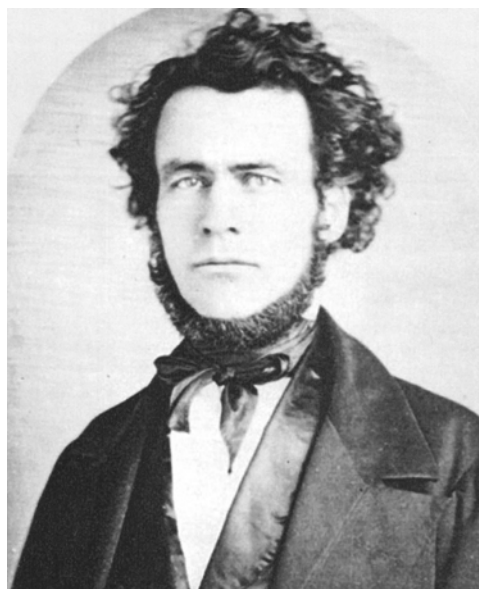


Figure 1. Samuel R. Thurston, after whom Thurston County, Washington, was named. The capitol city of Washington State is situated within Thurston County.

⁹ *Congressional Globe*, 31st Congress, 1st Session, 28 May 1850, 1079 (quoted in Kenneth R. Coleman’s “We’ll All Start Even”: *White Egalitarianism and the Oregon Donation Land Claim Act*, Oregon Historical Society, 120[4]).

¹⁰ Statutes of a General Nature Passed by the Legislative Assembly of the Territory of Oregon: At the Second Session, Begun and Held at Oregon City, 2 December 1850, 181 (quoted in Kenneth R. Coleman’s “We’ll All Start Even”: *White Egalitarianism and the Oregon Donation Land Claim Act*, Oregon Historical Society, 120[4]).

¹¹ Act of August 14, 1848, 30th Congress, 1st Session, Ch. 177.

¹² Act of March 2, 1853, 32nd Congress, 2nd Session, Ch. 90.

¹³ Margaret Riddle, “Donation Land Claim Act, spur to American Settlement of Oregon Territory, takes effect on September 27, 1850.” HistoryLink.org, accessed on 9 August 2010.

¹⁴ “Native American Peoples of Oregon, Dispossession and the Reservation System.” Wikipedia.

Thurston, as a lawyer and the Oregon Territory's First delegate to the U.S. Congress, was a powerfully influential statesman who explicitly and undisguisedly made his contempt for Black, Indigenous, and other people of color known throughout his political career which was largely built on giving birth to white settlements in Oregon. Here are some representative remarks of his open and virulent denigration of Native Hawaiians, Black, and Indigenous people (see Figures 2–5).

“Canakers, or Sandwich Islanders who are a race of men as black as your negros of the South, and a race, too, that we do not desire to settle in Oregon.”

—Samuel R. Thurston opposing the presence of Native Hawaiians and Pacific Islanders in Oregon (1850)¹⁵

“I am ashamed that there is one man in Oregon who would if he could curse Oregon by the introduction of a servile race whose presence would at one blast the very heart of our property—free white labor.”

—Samuel R. Thurston supporting the Black Exclusion Law in Oregon (1850)¹⁶

“I have now got a bill under way before the committee on Indian affairs in the Senate, providing for the extinguishment of the Indian title to all the land west of the Cascade mountains, and to remove the Indians East of the Cascades.... This is the first step towards our land law.”

—Samuel R. Thurston on his plan for the removal of the Indians¹⁷

“[N]o very considerable time would elapse before the demand of the white settlements, before whose march this [Indian] race melts away like the frost of the morning, would call for a portion of the country east of those [Cascade] mountains.”

—Samuel R. Thurston's report on the Donation Land Act to Congress¹⁸

Olympia, the capital of the state of Washington, is the center of democratic governance for all of the people in this state. It houses the offices of the Governor, of many state agencies, the Washington State Legislature, as well as the Washington Supreme Court—the highest court in the state of Washington that attempts to preserve justice for all. Thousands of people visit our capital every year to take part in or to influence the decisions made here, and the name of the county must represent these values. As stated by Washington State Supreme Court Justice Steven C. Gonzales:

“As the highest court in the State of Washington, the mission of our court is to uphold the constitution and when called upon through cases, interpret laws passed by the legislature and enforced by the executive branches of government. We recognize that our decisions, how we reach them, and how people are treated when they come to court, matters. Justice matters.”¹⁹

¹⁵ Samuel R. Thurston. *Congressional Globe*, 28 May 1850, 1079. Accessed at the Library of Congress (quoted in *Savage*, Amanda Lee Heikialoha, “From Astoria to Annexation: The Hawaiian Diaspora and the Struggle for Race and Nation in the American Empire,” 2011).

¹⁶ James Perry, Richard H. Chused, Mary Delano, editors. “The Spousal Letters of Samuel R. Thurston, Oregon's First Territorial Delegate to Congress: 1849–1851,” *Oregon Historical Quarterly*, 96:1, Spring, 1995:49.

¹⁷ James Perry, Richard H. Chused, Mary Delano, editors. “The Spousal Letters of Samuel R. Thurston, Oregon's First Territorial Delegate to Congress: 1849–1851,” *Oregon Historical Quarterly*, 96:1, Spring, 1995:49.

¹⁸ Samuel R. Thurston. A report by the Oregon delegate in Congress. 15 November 1850.

¹⁹ <[88](https://www.courts.wa.gov/appellate_trial_courts/supremecourt/#:~:text=We%20recognize%20that%20our%20decisions,Justice%20matters.></p></div><div data-bbox=)

A photograph of a handwritten letter on aged paper. The text is written in cursive and includes the date 'Washington June 22 1850' and the recipient's name 'Hon Wesley Shannon'. The main body of the text reads: 'My dear sir: I don't know when I received any news which gratified me more than that our first Assembly had excluded by law the introduction of free negroes. There is'.

Figure 2. “My dear sir: I don’t know when I received any news which gratified me more than did that about our first Assembly had excluded by law the introduction of the negroes.” Parts of the letter dated 22 June 1850 from Oregon Territorial Representative Samuel R. Thurston to Honorable Wesley Shannon.²⁰

A photograph of a handwritten note on aged paper. The text reads: 'It is no new thing to me, to meditate upon the condition of the races. They are as wide apart in their advancement to greatness and civilization, as they are in their physical formation. Whether their natural'.

Figure 3. “It is no new thing to me, to mediate upon the condition of the races. They are as wide apart in their advancement to greatness and civilization, as they are in their physical formations.”

A photograph of a handwritten note on aged paper, split into two sections. The top section reads: 'California is free—Oregon is free. We are the Pacific Coast. Of what benefits could free negroes be to us? None. But who does not know, that there is a northering blight surrounding the negro. He is degraded, and will continue to be so—it proceeds from the aversion of the white to the negro race. His presence beside our freemen, will bring a stigma upon labor, for it is well known what an influence association has upon the human mind. It is there, and it'.

Figure 4. “California is free—Oregon is free. We are the Pacific Coast. Of what benefits could free negroes be to us? None. But who does not know, that there is a northering blight surrounding the negro. He is degraded, and will continue to be so—it proceeds from the aversion of the white to the negro race. His presence beside our freemen, will bring a stigma upon labor, for it is well known what an influence association has upon the human mind.”

²⁰ Letter from Samuel R. Thurston to Wesley Shannon, 22 June 1850, regarding Oregon’s Black Exclusion Law, published in the *Oregon History Project*.

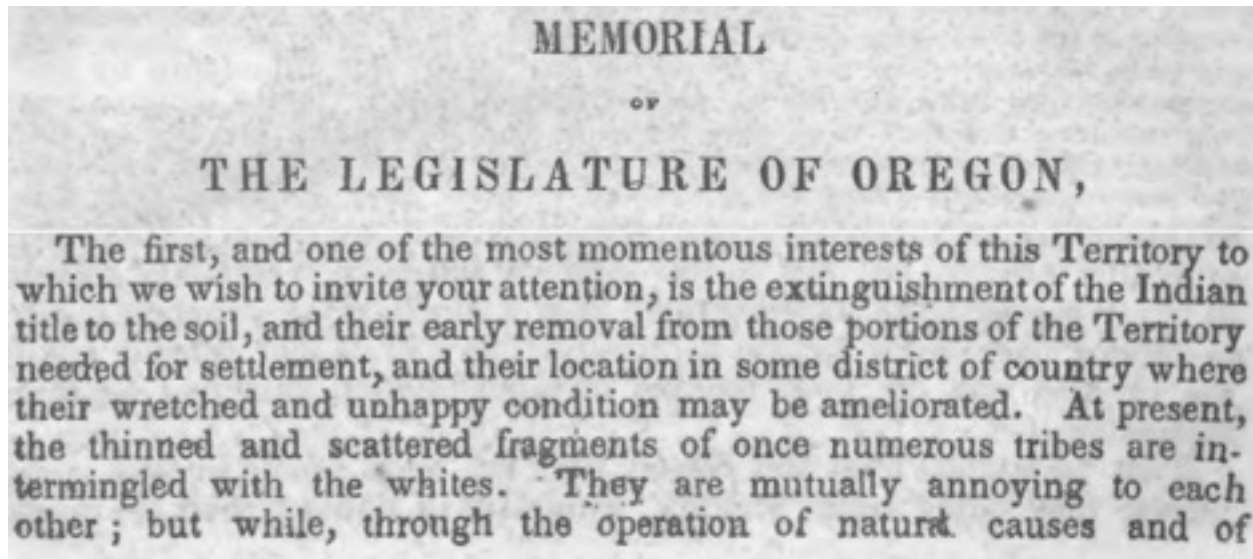


Figure 5. Memorial of the Legislature of Oregon, 6 January 1851, of which Samuel R. Thurston was the chief sponsor.

Although it is commendable that the state of Washington Superintendent of Public Instruction now mandates a curriculum which includes references to treaties and Tribal sovereignty,²¹ the history taught in most public schools about Washington State history falls far short when it comes to exposing the dark side of the state's historical policies. As was once succinctly stated by former United States President Andrew Jackson, "they have made their laws, now let them try to enforce them." Washington State education officials stood idly by while Tribal children were removed from their families to Indian boarding schools, just as the state of Washington as a government failed for decades to address racial segregation in its school system until forced to by the decrees of federal courts. Unequal incarceration in the state's penal institutions, discriminatory enforcement of criminal laws, police shootings, and internment of Japanese Americans are, unfortunately, an undeniable chapter of our state history. Notwithstanding that law enforcement agencies in the state of Washington devoted tremendous time

and resources to the investigation of Ted Bundy and the "Green River Murderer," little attention was paid to the scores of missing and murdered Indigenous women until the Washington State Legislature was prompted to address it in 2019.

The historical decisions of Washington State courts were, until recently, almost uniformly antithetical to Tribal rights,²² leading one court of appeals to note that the efforts of the state of Washington and its then Attorney General, Slade Gorton, to avoid compliance with the landmark "Boldt Decision" confirming Tribal treaty rights constituted "except for some desegregation cases" the greatest effort "to frustrate a decree of a federal court witnessed in this century."²³ According to the documentary *As Long as the Rivers Run*, Nisqually Tribal member Billy Frank, Jr., was arrested over 40 times by Washington State law enforcement officers when attempting to exercise his treaty fishing rights. Apparently, such prejudice remains official state policy. As stated in the Revised Code of Washington (RCW 77.110.040):

²¹ See <<https://www.k12.wa.us/student-success/resources-subject-area/time-immemorial-tribal-sovereignty-washington-state>>.

²² See, e.g., *Leschi v. Washington Territory*, 1 Wash. Terr. 13 (1857) (Leschi hung for defending tribal lands); *State v. Towessnute*, 89 Wash. 478 (1916) (denial of Yakama treaty fishing rights); *State v. Wallahee*, 143 Wash. 177 (1927) (denial of treaty hunting rights).

²³ *Puget Sound Gillnetters Ass'n v. United States District Court*, 573 F. 2d 1123 (9th Cir. 1978).

The people of the state of Washington declare that under the Indians Citizens Act of 1924, all Indians became citizens of the United States and subject to the Constitution and laws of the United States and state in which they reside. The people further declare that any special off-reservation legal rights or privileges of Indians established through treaties that are denied to other citizens were terminated by that 1924 enactment, and any denial of rights to any citizen based upon race, sex, origin, cultural heritage, or by and through any treaty based upon the same is unconstitutional.

No rights, privileges, or immunities shall be denied to any citizen upon the basis of race, sex, origin, cultural heritage, or by and through any treaty based upon the same. (Initiative No. 456, enacted 6 November 1984)



Figure 6. Whitewash is a cheap white paint or coating of chalked lime that was used to give a clean appearance. The first known use of the term is from 1591 in England.

At present, there appears to be no mention in any Washington State history high school text referencing the historically woeful treatment of Washington Natives by the state's social service agencies (Figure 6). According to the Association on American Indian Affairs, as recently as 1977, Native American children in Washington State were removed from their families and placed in foster care at a rate many times higher than other children.²⁴

According to a January 2020 report, the Washington State Patrol has historically searched the vehicles of Native Americans at a rate five times higher than other citizens, and African American drivers were twice as likely to be stopped and searched as white drivers. As such information is a part of our Washington State history, it merits mention in the textbooks provided to our children rather than shielding them from uncomfortable eras of our history.

Unfortunately, a cursory review of most freshman class textbooks on Washington State history discloses that the long discredited "Doctrine of Discovery" still appears in them. The Doctrine of Discovery is a doctrine established by the 4 May 1493 Papal Bull *Inter Cetera* of Pope Alexander VI pronouncing that any land not inhabited by Christians was deemed to be "discovered" and subject to claims of, and exploitation of resources by, Christian rulers.²⁵ The United States Supreme Court in the 1823 case of *Johnson v. M'Intosh* applied the doctrine to hold that European immigrants possessed a superior right to land in North America than the backward Native inhabitants that merely wandered about over it with little concept of private ownership. Imagine my surprise to read in a high school textbook that in 1792 Captain George Vancouver (Figure 7) "discovered" the Columbia River—known in native Sahaptin language as *n'chiwana*—that Juan de Fuca "discovered" the body of water known as the Strait of Juan de Fuca, and that Puget Sound—known in the native Lushootseed language as *x'wəlč*—was appropriately named in 1792 after Peter Puget, the British Royal Navy lieutenant who found it.

²⁴ S. Unger, editor. 1977. *The Destruction of American Indian Families*, Association on American Indian Affairs.

²⁵ A 1453 predecessor Papal Bul of Pope Nicholas VI, *Dum Diversas*, granted Portugal the right to reduce "pagans and any other unbelievers" to slavery.

“In order to make an Indian school successful, the children must be taken from the influence of their parents, separation of young from the old.”
—The U.S. Secretary of Interior Commission Report on the Puyallup Boarding School (1867)

“Transfer the infant white to the savage surroundings, he will grow to possess a savage language, superstition, and habit. Transfer the savage-born infant to the surroundings of civilization, and he will grow to possess a civilized language and habit....”
—Captain Richard H. Pratt (1892),
Founder of Carlisle Indian Industrial School

Children are the indispensable nexus that ties intergenerational bonds and the carriers of the community’s cultural and historical knowledge which manifests in the independent political foundation for communal existence.



Figure 7. Captain George Vancouver is often credited with discovery of the Columbia River and Pacific Northwest in numerous history texts.

Eradicating the Indigenous way of life and “Indianness” itself was openly promoted and sanctioned by the U.S. government during what is known as the Assimilation era. The federal government’s commitment to launch this scheme paved the way for the establishment of more than 350 Indian boarding schools in the nineteenth and twentieth centuries. Thirteen of these schools were opened in Washington State, including the Puyallup Indian School (later named the Cushman School) in 1864 and St. George’s Indian School in 1888.²⁶ The Boarding School & Cushman Project,²⁷ the report prepared by the Puyallup Tribe’s Historic Preservation Department, details the purpose of the boarding schools and the Indian hospitals that reflect white Christian superiority and the lasting effects of trauma inflicted on the Tribes based on first hand testimonies by elders who attended these schools.²⁸ An elder who attended St. George’s Indian School shared his experience:

“The sisters continually told me that I was born to hang. They used corporal punishment. Some kids were punished to death in the school. They would whip kids that wet the bed and make them walk around the room with wet sheets wrapped around them.”

Two other elders who attended the Cushman school reported:

“I was constantly locked in a closet for not listening to the staff. It was horrible.” “I was so institutionalized by Cushman school.” “Kids would run away at night and try to catch the train that was passing by the school. They would get caught and were brought back.” “Letters, money

²⁶ Dick Caster, Father Peter Hylebos, St. George’s Indian School and Cemetery. 2009. Prepared for and published by the *Historical Society of Federal Way*.

²⁷ The Boarding School & Cushman Project. <www.puyalluptriballanguage.org/history/cushman.php>.

²⁸ Amber Sterud Hayward, a Puyallup and Salish Indigenous elder, worked in the Puyallup Tribal Historic Preservation Department for almost 10 years with Judy Wright, Tribal Historian. Judy Write gave Ms. Hayward permission to interview elders across the United States who attended the Cushman boarding schools or hospital. <<https://www.puyalluptriballanguage.org/history/cushman.php>>.

WHITEWASHING WASHINGTON STATE HISTORY

and gifts were sent to the children by their parents but the staff didn't give it to them. Kids wondered why their family didn't write them."

Other elders who were taken to Cushman Indian Hospital and Sanatorium shared their experience.

"Kids got their hair cut as soon as they arrived, military style. There was a general round up for Indian kids to get tonsillectomies and to treat tuberculosis. Kids would often cry themselves to sleep. A nurse said they use patients to study the effects of treatment." "They remember what happened to them at Cushman: the surgeries, the blood, the ether, needles, medicine, getting their stomachs pumped, x-rays, hospital smell, naps, cod liver oil, being held down to a gurney, operating table, etc."

The efforts to "Kill the Indian, Save the Man" by removing Indigenous children from their cultures and families and dispossessing them of their most vital resources continued even after the closure of most of the boarding schools in 1940s. Between the 1950s and 1970s, many states' child welfare agencies, empow-

ered by the Indian Adoption Project of 1958, collaborated with the Child Welfare League of America and churches to remove thousands of Indigenous children from their homes and take them to white families for adoption or placed in foster care without any due process provided to Indigenous families. As of 1977, the adoption rate of Indigenous children was 19 times greater and the foster care rate ten times greater in Washington State while as many as one third of Indigenous children were taken from their families between 1941 and 1967 nationwide (Figures 8–9).

Justice Raquel Montoya-Lewis, the first Indigenous justice to serve on the Washington State Supreme Court, reminded the parties who attempted to restrict the Indian Child Welfare Act (ICWA) applicability of the trauma that Indigenous Tribes in Washington State endured in the opinion.

Washington State engaged in removals (of Indian children) without due process, which left tribes and families without a way to find their children. The children themselves would often never learn of their true homes, and many were not raised with the

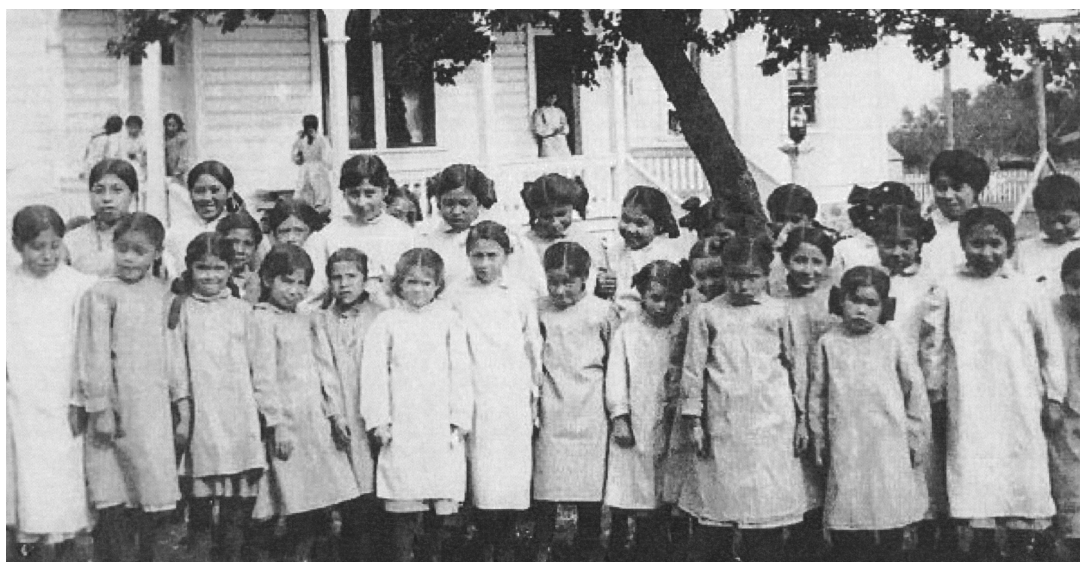


Figure 8. Yakama girls at Fort Simcoe, Washington, in early 1900s (U.S. Department of Interior photo).

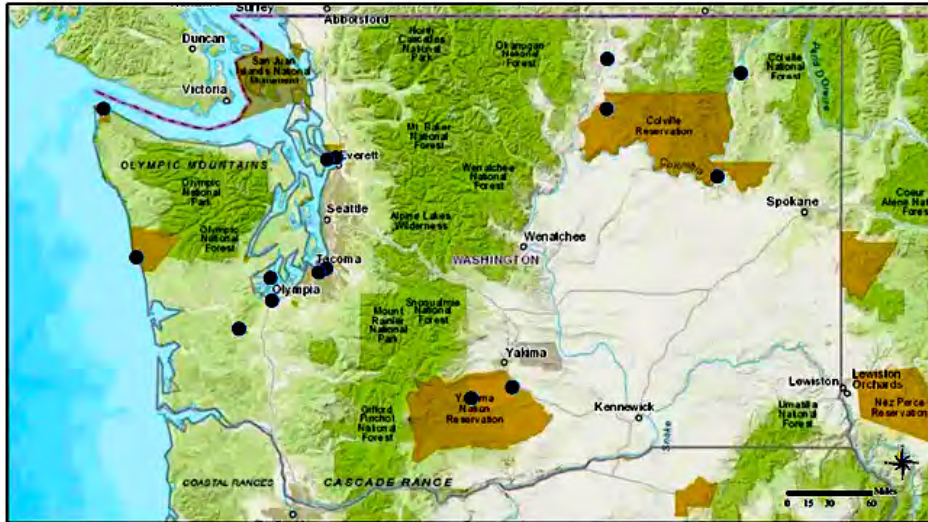


Figure 9. The U.S. Department of the Interior has identified 15 boarding school sites in Washington State where Indigenous children were sent by the federal government in an attempt to assimilate them. Contributed by the U.S. Department of the Interior.

knowledge that they were Native children or tribal members. In 1974, tribal leaders testified before Congress about the problems Native families and tribes faced under current state child welfare practices. Mel Sampson recounted statement of an adopted child who said, “My second grade teacher was the one that told me I was an Indian. My adoptive parents told me when I was between the age of 9 and 10, not mentioning a tribe or where I was from” (statement of Mel Sampson, Northwest Affiliated Tribes, Washington State; accompanied by Louie Cloud, Vice Chairman, Yakima Tribal Council). Roger R. Jim, Sr., explained multiple occasions of Native children being removed from their homes in Washington and taken across the country for adoptions without tribal notice (statement of Roger R. Jim Sr., Yakima Tribal Councilman, President, Affiliated Tribes of Northwest Indians).

—In *re Dependency of Z.J.G.*, 196 Wn.2d 152, 472.

In June 2020, the nine justices of the Washington State Supreme Court were “compelled by recent events to join other state supreme courts around the nation in addressing our legal community” and issued a letter to “members of the legal community” stating *inter alia* that:

“As judges, we must recognize the role we have played in devaluing black lives. This very court once held that a cemetery could lawfully deny grieving black parents the right to bury their infant. We cannot undo this wrong—but we can recognize our ability to do better in the future. We can develop a greater awareness of our own conscious and unconscious biases in order to make just decisions in individual cases, and we can administer justice and support court rules in a way that brings greater racial justice to our system as a whole.”²⁹

Essentially, the Washington State Supreme Court announced to the judiciary and members of the bar over which it presides that, when circumstances warrant, the blind application

²⁹ Open Letter from the Washington State Supreme Court to the Members of the Judiciary and the Legal Community. 4 June 2020.

of prior precedents should be viewed through a current lens. True to its commitment, one month later, the court unanimously repudiated its century-old decision portraying members of Native American Tribes as “savages” who merely “wandered about” squandering vast acreages of fertile lands.³⁰ Three months later, the Washington Court, in a footnote, quietly yet expressly overruled *Price v. Evergreen Cemetery Company of Seattle*,³¹ which had upheld the exclusion of those of African American descent from being buried in a “white” cemetery:

“The tribal people have been really good to my family and the Japanese community for the last 75 to 80 years and this is a way for us to return the favor.”

—Lon Ianaba, the Japanese American farmer, on selling his family’s farm back to the Confederated Tribes and Bands of the Yakama Nation (13 December 2021)

“Decolonization requires the full support and active participation of the descendants of settlers, enslaved Africans, and colonized Mexicans, as well as immigrant populations.”

—Roxanne Dunbar-Ortiz, *An Indigenous Peoples’ History of the United States* (2019)

The first significant wave of Japanese immigrants arrived in Washington State in the 1890s. This relocation was precipitated by various factors, such as the demand for cheap labor to replace Chinese railroad workers, whose presence was being drastically reduced due to the Chinese Exclusion Act of 1882; the United States’ annexation of Hawai’i, where hundreds

of Japanese workers were being exploited as a cheap source of contract labor on Hawaiian sugar plantations; and the desire of Japanese farmers in the rural areas of Japan to escape the extreme poverty, caused in part by the economic transformation and industrialization, which followed the 1868 Meiji Restoration. Japanese laborers suffered the severe repercussions of anti-Asian racism in Hawai’i, and were often classified as “cattle” and were requisitioned as “supplies,” in the same category as “fertilizer.” They were routinely “flogged, beaten, imprisoned, and even killed on the plantations,”³² and after migrating to the mainland, often faced the same hatred in Washington State.

After the passage of the Chinese Exclusion Act of 1882, anti-Asian hatred was also directed against the Japanese and Filipinos. In 1921, Washington State Governor Louis Hart signed the “Alien Land Law,”³³ effectively prohibiting non-white immigrants from buying or owning any land in Washington State. This law, although refraining from explicitly stating it, targeted Japanese immigrants in order to make Japanese farmers ineligible from gaining permanent landowner status and labeling them as perpetual foreigners (Figure 10).

Japanese farmers who were publicly shunned and legally prohibited from being able to own and farm their own lands found friends in an unlikely place—the Yakama Indian Reservation. Japanese farmers first settled in the Yakima Valley in 1891 and started farming in the valley from 1906. The Yakama Nation lost most of their original 10 million acres of ancestral lands to the U.S. Government, under the Treaty of 1855 (one-fourth of the territory of the entire state of Washington). They consequently faced serious socioeconomic challenges, but asserted their

³⁰ *State v. Towessnute*, 197 Wn.2d 574, 486 P.3d 111 (2020).

³¹ *Price v. Evergreen Cemetery Company of Seattle*, 57 Wn.2d 352 (1960), overruled by *Garfield Cty. Transp. Auth. v. State*, 196 Wash. 2d 378, 390 n.1, 473 P.3d 1205 (2020).

³² Candace Fujikane. Asian Settler Colonialism in the U.S. Colony of Hawaii—Introductory Chapter. *Asian Settler Colonialism: From Local Governance to the Habits of Everyday Life in Hawai’i*. 2008. Honolulu: University of Hawaii Press.

³³ Nicole Grant. White Supremacy and the Alien Land Laws of Washington State. Seattle Civil Rights & Labor History Project. <https://depts.washington.edu/civlr/alien_land_laws.htm>.

status as an independent sovereign nation, not bounded by Washington State's land laws, in order to enable Japanese farmers to lease reservation land for the cultivation of crops. This gesture of solidarity came with significant political risks for the Yakama and thus established a meaningful bond between two communities which can be felt to this day.

One illustration of this bond is the recent decision of Inaba Produce Farms, a vibrant and successful enterprise, owned and operated by a third-generation Japanese family, on the leased land on the Yakama reservation, to sell their farm *back* to the Yakama Nation on 1 November 2021. Virgil Lewis, Sr., the Yakama Tribal Council Vice Chairman and Yakama Nation Farms Board Chair made the following remarks: "When the Inaba family began farming here on the Yakama Reservation in the early 1900s, Yakama tribal members supported their efforts, leasing land

to them when the laws of the United States did not permit Japanese immigrants to be landowners. Today, the Inaba family honors our historic relationship by selling Inaba Produce Farms to the Yakama Nation to support our sovereignty and food security."³⁴

Lon Inaba, the owner of Inaba Produce Farms, made the following remarks:

"It's always been important to us to support our neighbors, our workers, and our community. Today, we honor the elders of both the Inaba family and the Yakama Nation, and look forward to building on their knowledge and experience for the benefit of generations to come. We are thankful for the continued support of our loyal customers and suppliers and hope to continue and expand upon those relationships."



Figure 10. Japanese internment camp, Puyallup, Washington. Photo courtesy King 5 News archive.

³⁴ Yakama Nation acquires Inaba Produce Farms. News Release, 2 November 2021. Confederated Tribes and Bands of the Yakama Nation. <<https://indiancountrytoday.com/the-press-pool/yakama-nation-acquires-inaba-produce-farms>>.

Washington State has a history to be both proud and ashamed of. However, history will judge us harshly if our k–12 educational institutions continue down the path of omitting from teaching our students many uncomfortable events in Washington State history. *Oxford English Dictionary*³⁵ defines “history” as “the study of past events, particularly in human affairs.” Public officials and policymakers responsible for establishing curricula for the teaching of history of the state of Washington have fallen short of requiring the true history of the state to be taught in our public schools.

³⁵ *Oxford English Dictionary*. Oxford English Dictionary Online. Oxford, U.K.: Oxford University Press.

ABOUT THE AUTHOR

Jack Fiander is a lawyer, Yakama, and former Yakama Nation elected Tribal council member, with children in Washington schools, one of which expressed concerns about the school’s Washington State History textbook; such was the genesis of this project and his concerns expressed in this article. His ancestors include Puyallups resettled at Yakama when Tacoma tried (but failed) to abolish that urban reservation in 1907. With degrees from the University of Washington and its law school, he has represented local Tribes as well as veterans, Makah whalers, and social justice issues, such as the State Supreme Court’s repeal of racist decisions. He is two time recipient of a Reginald Heber Smith Community Lawyer for the Poor fellowship from Howard University and the Legal Services Corporation.

Big Parcels: Modernist Planning in Washington State History

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Abstract *In anthropology's spatial turn, cultural anthropologists directed portions of their attention to the spaces in which human habitation takes shape. This article concerns the large planned spaces configured in the Modernist era of the twentieth century. Utilizing a fieldwork-based methodology that draws on the ethnographic toolkit, analysis compares and contrasts three large planned spaces located in Washington State: the former site of the Northern State Mental Hospital in Sedro-Woolley, the location in central Spokane at which Expo 74 was hosted, and the rural location of the never-completed Satsop Nuclear Facility near Elma, Washington. Our analysis suggests the singular use for which these sites were once constructed poses challenges for reconfiguring them to contemporary use. Notably, those sites with interconnections to nearby communities, and those that conjure or draw upon a broader social memory of place, have fared better in their path to the present.*

Keywords

Urban planning, Washington State, urban space, urban anthropology.

Introduction: Modernist Urban Planning

This article, the accompanying photographs, and the project underlying it are concerned with the expansive units of urban development that emerged as the quintessential spatial form in the Modernist era of urban planning. Those units of urban planning are one sort of large parcel to be found in the contemporary landscape of the city, of the state, and of the nation. Although “big plans” and other sorts of spatially grandiose ambitions trace their taproots to the very origins of the city, it was in the Modernist era that those parcels became

the commonplace vehicle for the progressive aspirations of the nation-state and its varied constituents (Kolson 2001). Chronologies of the Modernist era remain a matter of much debate, but there's no need for them to detain us here: we envision the Modernist era stretching from the latter portions of the nineteenth century into the early 1970s.¹ What came next, as many have suggested, was post-Modernist. Perhaps it's also worth noting that the Modernist paradigm with which we are inevitably concerned has had a massive impact on our planet's built landscape, particularly in terms of the planning and the design of our cities, our towns, and their constituent structures. And while Modernism

¹ And perhaps, as Jencks (1977:23) once suggested, the Modernist era decisively concluded on July 15, 1972, at 3:32 PM, with the planned demolition of architect Minoru Yamasaki's Pruitt-Igoe public housing complex in St. Louis.

first arose in the context of the developed global north, in the twentieth century this paradigm's influence and its impact suffused the planning and design of almost everything on the planet (Holston 1989; Scott 1998; Lu 2011).

Defining the content of the Modernist paradigm poses its own challenges, and attempts to extrapolate that definition have been the subject of entire books and durable scholarly conversations, both of which permeated much of the past century. Although the ideas comprising twentieth century Modernism sprawl across various realms of our societies, James Scott (1998:89–90) famously glimpsed “high modernism” in the “supreme self-confidence about continued linear progress, the development of scientific and technical knowledge, the expansion of production, the rational design of social order, the growing satisfaction of human needs, and, not least, an increased control over nature (including human nature) commensurate with scientific understanding of natural laws.” Thinking about cities and urban space more specifically, James Holston (1989:9) emphasized the abstract nature of Modernist thinking, and the concomitant “total decontextualization” of plans and planning from the local milieu and what preceded the present. Luckily, in cities and the built landscape of contemporary society, the abstractions of Modernism often take material and infrastructural form.

One aspect of this paradigm's deep influence on the shape of our cities today can be found in the sort of buildings that we've inherited from that era. Consider, for example, one of the aging shopping malls you might have encountered in a recent decade. Or think of the hulking Brutalist towers that pepper the centers and suburbs of the American urban landscape, and many other places as well. Basic, efficient, undecorated—both Brutalist towers and the aging shopping mall are quotidian manifestations of urban planning in the Modernist image. One might also sight the Modernist legacy in the zoning policies that spatially structure and organize many cities. Indeed, these zoning policies actually reveal

another important feature of the Modernist paradigm: nestled deep in its folds is a penchant for organization and a commitment to order, the twin objectives to which zoning policies were long dedicated (Montgomery 2013). By those policies' logic, order might be created by sorting and organizing society in space. Industry was to be located here; residential districts were thought to belong there and there and there; commercial districts might occupy a spot here and another there; public housing should be located over there; and parks and other green spaces—the “lungs of the city,” as Frederick Law Olmsted famously called them—should permeate the urban landscape as much as possible. We should recognize this penchant for order, foremost, as a form of governance. And in that sense, those sorts of policies reveal the progressive ambitions at the heart of the Modernist paradigm, and return us to the abstractions of the paradigm's definition: in constructing the ideal city, the Modernist planner sought to engineer a better society (Holston 1989; Scott 1998).

As an ambitious and dedicatedly progressive paradigm that reached its apex midway through the twentieth century, Modernism's historical legacy is replete with notoriously ambitious men. One interesting premise underpinning this project is that those grand ambitions took spatial form in the built landscape of that era. Consider the implications: the progressivist ambitions of the Modernist paradigm are woven into the urban landscapes that we've inherited from that recent past. With this project, we are interested foremost in the very size of the parcels that accommodated Modernist planners' plans (Koolhaas and Mau 1995; Kolson 2001; Augé 2008) (see Figure 1). We suggest these big parcels and the plans they accommodate yield a vista point on the urban spatial discourse undergirding the planning of that era. That is, we think an analysis of these big Modernist parcels might reveal something about the paradigm that produced them, and about the way of thinking that normalized these spaces and these progressivist ambitions.



Figure 1. An image of a map of the Northern State Hospital's central campus area, on display at the Sedro-Woolley Museum. Photograph by Andrew Gardner, 2022.

As this suggests, in part our concerns are academic in nature. We are interested in the global proliferation of these big parcels in the urban landscape, and more broadly, with the proliferation of the urban spatial discourse they exemplify. We're interested in the permutations and the evolution of these sorts of big parcels over the arc of the Modernist era. And with numerous scholars pointing to the enduring Modernist elements to be found in the post-Modernist era, we are equally interested in the perseverance and the various fates of these big parcels in our present world (Augé 2008). But there's more of potential value here than simply these academic issues, for our concerns are also practical and applied in nature. What features or aspects of these different parcels' historical experiences overlap, and what patterns might we discern therein? What sorts of problems seem to percolate to the fore in the various cases we consider? Are there viable strategies for retrofitting these parcels and spaces, and how might that retrofitting better serve our needs in the contemporary era? Should we draw any

lessons from this history, and how might those lessons shape planning today? Under what conditions might these and other big parcels emerge as vibrant and functional features of the contemporary built landscape?

To address these questions and explore these concerns, we utilized a small constellation of different methods and approaches. To assemble a set of comparable cases for our analysis, we relied heavily on archival research, and coupled that archival research with interviews and various other sorts of interactions with community members and other persons somehow tethered to one or the other of these three different parcels. Our concerns with the spatial aspect of these parcels' existence resulted in a reliance on photography and cartography, both of which were deeply integrated into our research plan. Finally, we sought to gauge the contemporary vitality of these spaces using a set of methods that are essentially ethnographic in nature: at each of the three sites considered here, we conducted observations specifically tailored to assess these parcels' contemporary social life.

Altogether, our methods blended ethnography, and its emphasis on “being there,” with the observational commitments pioneered long ago by the Parisian Situationists who endeavored to discern the “psychogeography” of a place, and to do so with the experiential method of the *dérive* that might reveal it (Debord 1956; Mumford 1961; McDonough 2009; Saunders 2010; Wolfe 2016; Gardner n.d.).

Although large parcels, and, therefore, the vestiges of the ambitious, totalizing plans that once produced these spaces can be found in an array of different contexts around the world, in this article we analyze three of these big parcels found in the United States, and more specifically, here in Washington State, where both authors reside. Our selection of these parcels was haphazard—we selected parcels that had previously piqued our interest, and parcels that were geographically diverse. Coincidentally, those three parcels bookend the span of the Modernist era in urban planning: in historical order, our exploration examined the Northern State Mental Hospital grounds, first established in 1909 near the town of Sedro Woolley; the Expo 74 site located in central Spokane, whose construction commenced in 1973; and the Satsop Nuclear Facility in rural western Washington, where construction commenced in 1977 and ceased before completion in 1982.

In this article, we present the summaries of the three case studies before turning to the crux of our analysis.

The Northern State Hospital

Frederick Law Olmsted pioneered the field of landscape architecture; led the movement to weave parks and green spaces into America’s urban landscapes; and was singlehandedly responsible for a stunning constellation of plans for entire cities, tracts of suburbs, various campuses, and dozens of other features in the cities of his time. With such a stunning array of accomplishments, it’s been suggested that Olmsted singlehandedly shaped the look of an entire

continent with his life’s work (Cultural Landscape Foundation 2022). As one of the progenitors of the Modernist planning paradigm with which this article is concerned, his designs sought a sense of place that might be stimulated via the layout of the site itself, and by the integration of his designs with the regional landscape in which they were fitted (Buras 2019). The crown jewel and opening chapter of his life’s efforts was Manhattan’s Central Park. By the time his life drew to a close in a suburban Boston institution that he himself had designed, Frederick had also successfully passed the torch of his life’s work to his sons. Their designs and efforts would continue the Olmsted legacy (Ott 2019). As a result, the Olmsted brothers were particularly invested in the commission they received from Washington State in the early twentieth century—to design a mental institution in Skagit Valley, well north of Seattle. Working in conjunction with architects Saunders and Lawton, the Olmsted Brothers produced a holistic master plan for a campus that would provide patient care, foremost in the form of occupational therapy to be conveyed via the productive activities of a self-sustaining farm and other assorted manufacturing and productive on-site activities.

Commissioned in 1909 and operational by 1911, the Northern State Hospital campus is located on a low bluff some two miles east of the community of Sedro-Woolley, which had a population of about 2,100 at that time. Within years of opening, the parcel had expanded to more than 1,000 acres, and in addition to hospital facilities comprising more than a hundred buildings designed in the Spanish Colonial Revival style, the parcel included a lumber mill, a reservoir, a creamery, a quarry, a steam plant, various agricultural fields, an orchard, a greenhouse, assorted livestock, and an active dairy. In its heyday, the Northern State Hospital was the most crowded hospital in the state, and as many of the former employees relate, the patients and the employees formed a vibrant community in-and-of-themselves. Moreover, for decades of operation the parcel surpassed

the objective of sustainability—for much of its history, the working farm actually supplied other state institutions with food, goods, and other services produced on the working farm. In the oral histories woven into her book concerning the hospital, Mary J. McGoffin's interlocutors make it clear how the hospital and its operations were deeply entwined with the nearby community of Sedro-Woolley (McGoffin 2011). As one town resident related to us, "so many people in town still have personal connections with the hospital, either through their family or through work." Sedro-Woolley's history was interwoven with that of the hospital, and those connections were built over many successive decades in the twentieth century.

Operations at Northern State came to a halt in 1973, and many patients once housed there were shifted to community mental health centers or various other residential facilities. Still others were simply given a one-way bus ticket and the outdated street clothes in which they had once arrived. The book and popular film *One Flew Over the Cuckoo's Nest* was perhaps the most widely-recognized capstone of the broader public and political movement that, in the decade previous to the movie's release, had galvanized public sentiment against the institutional model for mental health care. Certainly, a wider awareness of the Nazi atrocities presaged the growing antipathy to the idea of institutionalized mental health care. But certainly, a variety of complex and interrelated processes coalesced in the broad movement to close institutions like Northern State Hospital.

In the decades following its closure, the parcel on which the hospital was located has fragmented into different uses and ownership. Skagit County purchased 726 acres of the parcel from the state of Washington, and the farm and pastures now comprise the Northern State Recreational Area. This portion of the parcel includes the field in which an estimated 1,500 deceased former patients are buried in unmarked graves. The Port of Skagit took ownership of the main campus in 2018, and under the moniker

of the SWIFT (Sedro Woolley Innovation for Tomorrow) Center, and in collaboration with Skagit County and the city of Sedro Woolley, the port operates the facilities as it continues to map the parcel's path into the future. Portions of the hospital campus are open to the public; other portions have been demolished; still other portions are used for job corps training programs, for drug rehabilitation in-patient programs, and by an in-patient mental health facility like those that replaced the Northern State Hospital. Although much of the campus is now off-limits to the public, it retains a park-like sense of place. With the Olmsted's design and the Spanish Colonial Revival architecture of the remaining campus buildings, the site is also registered with various organizations that mark its cultural and architectural importance. A museum in Sedro-Woolley maintains a collection of material culture and other items garnered from the hospital's era of operation, and in the summer of 2022, a coalition of groups hosted a two-day event entitled "Remembering Northern State Public History Days."

Our multiple visits to the parcel were illuminating. On the campus itself, roofs were crumbling and impressive plate-glass windows lay shattered and broken (Figure 2). The dairy barn and other buildings on the former working farm were covered with graffiti, and combined with the fact that portions of the central campus were off limits to visitors, much of the parcel felt uncertain in nature, and unwelcoming to visitors. Conversely, although off limits, other portions of the campus were clearly in use, and the surrounding farmland, now the recreational area, was sometimes busy with visitors and members of the nearby community. Over multiple visits, we took note of people walking for exercise, numerous visitors walking their dogs on the various trails, and many children enjoying the afternoon in the northwestern sun. Indeed, traversing from the trails and open fields of the Northern State Recreational Area to the architectural remnants on the SWIFT campus felt like moving between two different



Figure 2. Both the Spanish Colonial Revival style of architecture, as well as the general decay of the structures, are clearly visible in the buildings accessible on the main campus. Photograph by Andrew Gardner, 2021.

settings—the former configured for visitors, and the latter containing an uncertain collage of signs that welcome, that seek to direct, or that otherwise warn visitors against entry into off-limits buildings and securitized portions of the campus.

Although the Northern State Hospital grounds were designed by the world’s most esteemed planners of the period, in the contemporary era it is clearly a challenging parcel to manage and use, and a costly one to maintain. As Mary McGoffin (2011:102) noted, the parcel had been configured for “only one thing: the idea of an asylum for the mentally ill, an idea now extinct.” Configured for a singular large tenant, the verdant surrounding landscape has morphed into a seemingly successful recreational area. The central campus has been more difficult to steer through the contemporary world, and despite efforts, portions of the campus and the encompassing parcel remain in abandoned disrepair. The task of maintaining, retrofitting, and renting the campus buildings is only further challenged

by the aging structures and their design: the stucco of the Spanish Colonial Revival period is not ideal in the wet climate of the Northwest, and the small rooms commonplace a century ago feel claustrophobic to modern sensibilities. Moreover, these challenges and associated costs are borne by a rural county with a minimal tax base. In summary, the Northern State Hospital site is clearly an albatross in the twenty-first century—an unwieldy accumulation of aging structures tucked into the foothills of the Northern Cascades. Despite these many and significant challenges, however, we encountered many links between the parcel and the community some two miles distant. The aforementioned museums and the weekend-long celebration of the memory of the hospital are just two facets of this durable tether to the community. Although it remains to be seen how the memory of this place will endure when the last generation of former employees passes away, the vibrant social memory of Northern State Hospital is clearly a vital factor in the successes that the parcel has encountered.

Expo 74 and Riverfront Park

In the waning decades of the nineteenth century, the city of Spokane was established around Havermale Island—the island that splits a set of large waterfalls and cataracts on the Spokane River. The waterfalls surrounding the island were an important fishing site for the Spokane people indigenous to the area, and the first American settlers to the region also periodically inhabited the island. As railroads began to reach into the Washington Territory, the island at the heart of the city became a key industrial site for the surrounding region and for the city at its core. Both the Northern Pacific and the Union Pacific railroads built extensive yards atop the island, and the river itself was increasingly harnessed for hydroelectric production (Youngs 1996). By the early 1960s, the largest urban waterfalls in the country were mostly obscured by a maze of urban infrastructural growth that had accumulated there over nearly a century. That same decade was a period of stagnation and blight for the industrial core of the city's central business district. Determined to revitalize the whole of the city, and inspired by Seattle's success hosting the 1962 World's Fair, a group of local businessmen formed Spokane Unlimited. Under the guidance of urban planner King Cole, the organization mapped out the process of remaking the dingy urban core of the city. They eventually settled on a plan to host an environmentally-themed world's fair, an event that would not only draw a legion of visitors to the city, but would also catalyze the urban redevelopment of the central business district and leave the city with an attractive recreational park at its heart.

The 100 acre Havermale Island became the centerpiece of these efforts to revitalize the city. In 1970, area businessmen contributed \$1.3 million to seed efforts to begin the process of bringing an exposition to Spokane. The next year, President Nixon officially recognized these efforts, and reflecting the ethos of the time, the Bureau of International Expositions subsequently

authorized the fair's tentative theme, "Progress Without Pollution." This theme would eventually morph into "Celebrating Tomorrow's Fresh, New Environment." Both versions reflected the convergence of Spokane's interests in revitalizing the urban core of the city with the growing public commitment to better stewardship of our planetary environment. Expo 74 President King Cole then persuaded Great Northern Railroad to donate 100 acres of Havermale and adjacent Cannon Islands to the city. Train yards, depots, and a variety of other industrial structures were quickly razed, and midway through 1973 the construction of the fairground's pavilions was underway. Opening day was May 3, 1974, and over the coming six months some five million visitors would stream to the site. Spokane became the smallest city to ever host a world's fair, and amongst other highlights, Expo 74 was the first exposition attended by the Soviet Union since 1928. In the final accounting, the exposition was widely considered an economic and thematic success, and the city of Spokane was left with the exposition site—the 100 acre island park—to anchor the city center. In dedicating the former site of the exposition as Riverfront Park in 1978, President Jimmy Carter noted that the park, "shows very clearly what can be accomplished in urban redevelopment. You've transformed an area that was declining, that was far short of its great potential, into one of the nation's most innovative and refreshing urban settings" (Carter 1978).

In the intervening years, almost all of the structures from Expo 74 have been removed or replaced with other facilities. In 2014, the citizens of Spokane overwhelmingly approved a bond for \$64 million to further redevelop and improve the park, thereby yielding much of the greenspace and the various facilities that one encounters in Riverfront Park today. Additionally, adjacent to the park are numerous other key urban features—the River Park Square shopping mall, the Spokane Convention Center, a performing arts center, and various other facilities now crowd the park's periphery. Indeed, the park itself was

recently named by *National Geographic* as one of America's most beautiful urban parks. In summing up her experiences with the whole of this revitalization process, Margaret Shields put it thusly: "To this day whenever I am in the city park I am taken back to when the area was dark and then Expo appeared... [leaving] a beautiful park for all to enjoy" (Spokesman-Review 2014).

Our engagement with the space corroborated aspects of the park's broader reputation. Over multiple visits conducted at different times of the day, we noted the continually busy pedestrian use of the park. Our observations suggested a diversity of constituents—tourists were visiting the park as a destination in-and-of-itself; groups of school-age children and their chaperones made use of various park facilities; office workers on lunch break took advantage of the food trucks congregated in a designated area of the park (Figure 3); a variety of the city's inhabitants seemed to be passing through as part of their daily commute between the central business district and the primarily

residential district located on the north side of the river bifurcating the city; some used the park for jogging and other sorts of exercise; homeless Americans drifted through the park or napped in the shade available here and there on the islands. In our observations, none of these particular constituencies seemed to dominate the public spaces of the park. We were also attuned to some of the efforts to attract and organize this diversity of users. In the park's Welcome Center, the board of official events mentioned a wedding photo session, a family reunion, a birthday party, a fun run, the scheduled period for the aforementioned food trucks, a yoga session, an upcoming outdoor movie night at the central pavilion, a children's daycare visit, and a forthcoming "Shakespeare in the park" event. Throughout our various times in the park, rangers, police, and various maintenance workers patrolled or moved about the public space, and security cameras were discretely trained on almost all spaces on the islands.



Figure 3. Food trucks are one of numerous activities that draw people to and through Riverside Park in Spokane, Washington. Photograph by Andrew Gardner, 2022.

Of the three parcels analyzed here, Riverfront Park was far and away the most bustling and socially electric space, and in comparison to the other parcels, aspects of its trajectory through the twentieth century seem exceptional. One obvious aspect of this exceptionality is the parcel's urban setting. As our brief description here makes clear, Riverfront Park is interwoven with the surrounding urban fabric of Spokane in highly functional ways, and the parcel seems to benefit from the dense population of the surrounding urban landscape. Another notable aspect of the urban parcel's trajectory is the quantity of capital devoted to its improvement and its ongoing operation. In part, at least, this investment is a result of the initial successes of the parcel's revitalization: the park was a popular enough feature of city that it readily attracted additional public investment a decade ago. Finally, a third notable feature of this parcel's experience in past decades concerns how interconnected the site is with the broader surrounding community. By its mere location, the park serves as a quotidian feature in many urban residents' daily lives. But offices and various park personnel also help organize and facilitate those connections to the community, and the public successes of the park have lodged it as a key and representative feature of the city's image.

The Satsop Nuclear Facility

In every era it seems that Americans have conceptualized their present as precariously balanced between the receding traditions of the past and an impending, uncertain future. But despite the recurring nature of such claims, the 1970s seem an exceptionally tumultuous decade for the United States. An active and ongoing war in Vietnam sprawled into the decade. For the first time in history, the president of the country resigned his office. The Organization of the Petroleum Exporting Countries (OPEC) embargo raised the price of oil to unforeseen heights, placing the whole of the country under a new set of stresses. And the American public

grew increasingly conscious of the deleterious impact of the decade's status quo upon the planetary environment. At the outset of the decade, an expansion of the nation's capacity to generate nuclear power seemed like an ideal component of a partial solution to some of these challenges. In Washington State, these various energies culminated in a consortium of public power utilities' plan to build several new nuclear reactors in the state. These new reactors were not only envisioned as a means to address the state's rapid and ongoing economic growth, but were also in cadence with a national strategy that sought to reduce American dependence on the oil-producing countries of the Middle East and beyond. All of these forces coalesced in plans for Washington Nuclear Project (WNP) No. 3 and WNP No. 5, nuclear reactors to be built outside the small western Washington town of Elma.

Although construction and operating permits were first obtained in 1973, construction commenced nearly four years later, in 1977. The 600 acre parcel was surrounded by another 1,200 acres of forested terrain perched above the Chehalis River Valley. The \$4.1 billion budgeted for the project would eventually balloon to nearly \$25 billion. As a massive infrastructural project located in a rural Washington county, the construction process enveloped the nearby town for many years in the 1970s. With a population of about 2,200 at the time, residents recall well-paid construction jobs and plenty of overtime pay for anyone interested in work. In the ensuing years, that work would continue as the project began to falter and unravel: various stakeholders and bond investors began to equivocate, and in alignment with the growing national anxieties about the societal risks of nuclear power, the Seattle City Council voted to withdraw its commitments for investment in the project in 1976. Seattle would, instead, address the energy crisis through conservation efforts and other types of programs. Seattle councilman John Miller summarily encapsulated the decision to withdraw in two pithy sentences: "It costs too much. And we don't need it." Combined with

cost overruns and construction delays, the consortium of public power utilities eventually defaulted on the bonds funding the construction of both plants. Altogether, this was the largest bond default in America to that date, and construction efforts withered and then eventually ceased in the early 1980s.

The uncompleted facility lay dormant for much of that decade. In the years to come, however, local business leaders and county officials formulated a plan to redevelop the parcel into the rural county's premier business park. Located several miles outside the small community of Elma, the business park today possesses some 547,000 square feet of office, warehouse, and manufacturing space. Operating now as the Satsop Business Park, the parcel is owned by the Grays Harbor Public Development Authority, and is associated with the Port of Grays Harbor, which itself lies some 22 miles to the west. In its promotional materials, the business park boasts of "premier office space, manufacturing facilities for light and heavy industry, a four-lane highway to Interstate 5, nearby access to rail, deep-water shipping and air transport, and robust telecommunications, industrial water and electrical infrastructure." With a small on-site staff, the business park has attracted a handful of tenants to the sprawling rural campus. The most significant current tenant is an indoor cannabis-growing facility owned by Northwest Cannabis Solutions, the largest legal grower in the state of Washington. Other tenants include various logistics companies and a manufacturer that handcrafts Christmas wreaths. The site has also been used for training various rescue teams and military units, assorted crews of workers, and for a small constellation of educational concerns. The eerie, gargantuan cooling towers looming over the parcel have also been the locational backdrop for portions of several Hollywood movies. Although a taco truck evidently maintains an occasional presence at the business park, it was absent during our several visits, and there are no other commercial amenities present on the site.

The gargantuan cooling towers rise well above the evergreen canopy, and are hence visible from miles away (Figure 4). To access the site from Elma, one travels on a short drive through a verdant valley and then crosses a bridge over the Chehalis River. In our multiple visits, we encountered almost no other humans. Only the cannabis-growing facility contained a parking lot peppered with vehicles, and activities there were entirely contained indoors, out of sight. As previously noted, the Satsop Business Park's management office housed several persons, and while various signs indicated businesses and activities purportedly resident in other parts of the parcel, we observed almost no other business activities during our visits. Indeed, our only interaction with tenants of the business park was limited to a solitary individual, working in logistics, who was monitoring a shipment of solar panels awaiting approval by U. S. Customs before it could proceed, by truck, to other regions of the continental United States. As the logistics officer noted, he had flown in from the East Coast to monitor and process the shipment. Much of the rest of the site was essentially mothballed—buildings and structures were behind chain fences, shuttered or otherwise boarded up. In other cases, buildings seem to have been previously bulldozed and leveled.

When comparing it to the other cases evaluated in this article, the parcel first carved from the woodland for the Satsop Nuclear Facility remains the most desolate and most inactive of the three. In part, this results from its geographic distance from the community of Elma, for beyond the towers themselves, the activities of the business park are truly out of sight for residents of the closest community, and are hence spatially distant from their everyday activities. But our interviews with residents suggested this separation runs even deeper: while some community members recollect the flurry of activity constructing the site nearly fifty years ago, the facility had no operational lifespan at all, and other than a few jobs for a few years in the period of its construction, the community



Figure 4. One of the cooling towers at the Satsop Business Park looms over the largely empty grounds of the large parcel. Photograph by Andrew Gardner, 2022.

established no durable ties to the parcel. The horizons of the business park are also clouded by a broader set of factors, for its location in a rural area of a mostly rural county means that few of the tenants envisioned for the Satsop Business Park actually exist. Additionally, the burdens of upkeep and maintenance—monies and energies just to maintain the vast infrastructure of the site as it is—are borne by a county with a relatively diminutive tax base. All of these various factors coalesce in the Satsop Business Park, and have shaped the parcel's trajectory over the past four decades.

Assessing Washington's Big Parcels

In Michel Foucault's boundlessly influential conceptualization, discourse was the term he used for the social system, ideological context, and institutional infrastructure in which meanings, truths, and knowledge were generated (Foucault 1972). In transposing that concept from its linguistic origins to the domain of urban planning, our conceptualization of an *urban spatial discourse*

seeks to direct attention from the results of urban planning—the big parcels considered in this article—to the broader social, institutional, and ideological context that called forth these sorts of spaces and normalized their production (Gardner 2013, n.d.). In our examination of the circumstances surrounding these particular big parcels' trajectory through history to the present, our concerns are directed at the Modernist urban spatial discourse that once produced them. In part, that interest results from the fact that so much of the contemporary built environment inherited from the past is a product of this Modernist era in urban planning, leaving us with the formidable task of attempting to revitalize these gargantuan sorts of urban spaces and structures (Dunham-Jones and Williamson 2011; van Ulzen et al. 2017). Moreover, it's uncertain that these gargantuan planned parcels have vanished with the end of the Modernist era. Instead, some have noted that big parcels and the grandiose ambitions that they embody seem to have persisted into the post-Modern era as well (Augé 2008; Easterling 2014; Buras 2019). This suggests that the lessons

learned from the analysis presented here might be more than retrospective in nature: some of the problems and challenges observed in the spaces produced in the Modernist era may have analogues in the sorts of spaces being designed and constructed by urban planners today as well.

One clear thread in our analysis of these three big parcels concerns the variable connections between these spaces and the communities that surrounded them (or with which they were otherwise associated). In the case of Spokane's Riverfront Park, the 1974 exposition itself, as well as the subsequent bond to revitalize the park, were both community-based efforts. In its current manifestation, Riverfront Park continues to actively seek and build those community interconnections. Atop of that, or perhaps because of it, the park has emerged as symbolically central to the identity of the city itself. While the Northern State Hospital parcel in Sedro-Woolley is far less bustling than the river islands in downtown Spokane, our analysis revealed that the social memory of the hospital, built upon its decades of operation, is clearly an important factor in the parcel's relative success in navigating the demands of the contemporary era. Conversely, the Satsop parcel is burdened by its disconnectedness: out of sight from the nearby town and highway, with no operational history and no meaningful social memory of the place tethering it to the nearby community, attempts to retrofit and revitalize the parcel have been difficult. This suggests that the social threads connecting these big parcels to the surrounding community clearly have some inherent value.

Social memory, and the broader community's investment in these parcels' future, is partially shaped by the population density of the regions surrounding these planned spaces. Two of the three parcels considered here were located in rural areas of the state, and while population density is obviously related to the capacity to successfully cultivate the social memory that might buoy their fates, the demographic density of the parcel's setting seems to play an even larger role in these parcels' trajectory through history

and into the contemporary era. The Spokane Expo site, for example, accrued substantial other benefits from its place at the heart of the city. It is for that reason, at least in part, that it drew vastly larger sums of capital investment for revitalization than the other parcels. And it's for that reason that it remains in active use by a constellation of different people moving about or visiting the city. Conversely, both the Sastop and Northern State Hospital parcels are located in rural areas. As a result, not only do these rural sites simply have less community with which they might be connected, but also a more diminished tax base from which monies might be accrued for capital investment. In summary, this suggests that prospects for the revitalization of urban parcels are, by nature, brighter than those located in more rural areas.

A third and final thread woven through the case studies examined here concerns the singular function around which these parcels were originally designed. This functional singularity was a hallmark of Modernist planning. As those underlying singular purposes collapsed or otherwise vanished—Expo 74 drew to its conclusion, Northern State Hospital shuttered after decades of operation, and the Satsop Nuclear Site financially collapsed before completion—the parcels remained challenged by the homogenous singularity of the purposes for which they were originally designed. In our small and non-representative sample, the big parcels that more successfully adjusted to the contemporary era are those that configured ways to diversify their uses and to expand the constituencies involved in their quotidian existence. For example, the Northern State Hospital parcel split in two, with portions now operating as a park, and the hospital grounds now leased to a small variety of different tenants. Similarly, the site of Expo 74 also diversified its functionality, and works daily to continue serving and accommodating a variety of different users. Satsop has been less successful in diversifying its functionality moving forward, and seems pinned in place by the singular purpose for which the site was once designed.

Conclusion

What all of this suggests is a set of recommendations and lessons that are, in some sense, already well-worn elements of our critical output. For example, in his magisterial critique of what he termed “authoritarian high modernism,” James Scott (1998:353) contended that better institutions and spaces should be “multifunctional, plastic, diverse, and adaptable,” the very antithesis of the grandiose results typical of Modernist planning. The expansive and purposeful singularity of the three parcels considered here is equally emblematic of this Modernist penchant, and those spaces’ current managers and owners struggle against the homogenous functionalities for which each was originally designed. And in the same decade that Scott was writing, architect Witold Rybczynski (1994) added that a site’s sense of place is, in reality, generated less by its design and its architecture, and more via the social events and the social life that takes place within it. Our analysis would seem to corroborate this sensibility, and like these intellectual forebears, we suggest the importance of a human-centered tenor to urban planning and to our ongoing attempts to revitalize the built landscape we’ve inherited from the past.

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Patterns of Lithic Raw Materials and Heat-Treatment within Tryon Creek (35WA288)

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Abstract *Tryon Creek (35WA288) is an ancestral Nez Perce dwelling within Hells Canyon National Recreation Area in northeastern Oregon. The site consists of several household features located on an alluvial terrace west of the Snake River, dating between 1600–500 B.P. Here various flake attributes, abundance of heat-treatment, and raw material composition are compared across occupation levels. The spatial distribution of raw materials and heat-treatment across the site are quantitatively explored using measures of abundance and autocorrelation. The overall abundance of heat-treatment changes significantly through time, reflecting concomitant curation and lithic preparation. Clusters of heat-treated material, separated by raw material type and positioned away from fire-cracked rock (FCR), are also present through time, perhaps reflecting differences in activity zones. Overall, these methods provide a clearer picture of lithic preparation within the household and across time.*

Keywords

Hells Canyon, heat-treatment, spatial statistics.

Introduction

Protected by its remoteness and steep landscape, Hells Canyon contains more than 1,000 archaeological sites, with material evidence of human occupation spanning more than 8,000 years (Chatters et al. 2003). The Tryon Creek site (35WA288) is located at the mouth of Tryon Creek on the western side of the Snake River within the Hells Canyon National Recreation Area. The site contains a cluster of at least 8 housepits and multiple cairn features located on an alluvial terrace approximately 40 meters west of the Snake River (Figure 1) (Hackenberger and Thompson 1995; Chatters et al. 2003; Fairbanks et al. 2015). Originally described in 1978, one of the housepits, House 2, was excavated in 1991–1992 as part of a fieldschool and the Passport in Time

Project (Hackenberger and Thompson 1995; Fairbanks et al. 2015). Thirty-eight 1x1 meter units were excavated by stratigraphic levels and/or 10-centimeter arbitrary levels within known stratigraphic boundaries. Ten distinct levels were identified within the housepit with an alternating pattern of dark and light layers.

The sediment color and particle size within House 2 suggest distinct but repeated occupation through time. Dark, compact, and gravely levels correspond to periods of occupation, while lighter levels correspond to periods of abandonment or less-intense use (Schiffer 1987; Hackenberger and Thompson 1995). Ten levels were distinguished during excavation. Odd-numbered levels are thought to represent house floors, while even-numbered levels represent sub-floors and/or fill (Hackenberger and

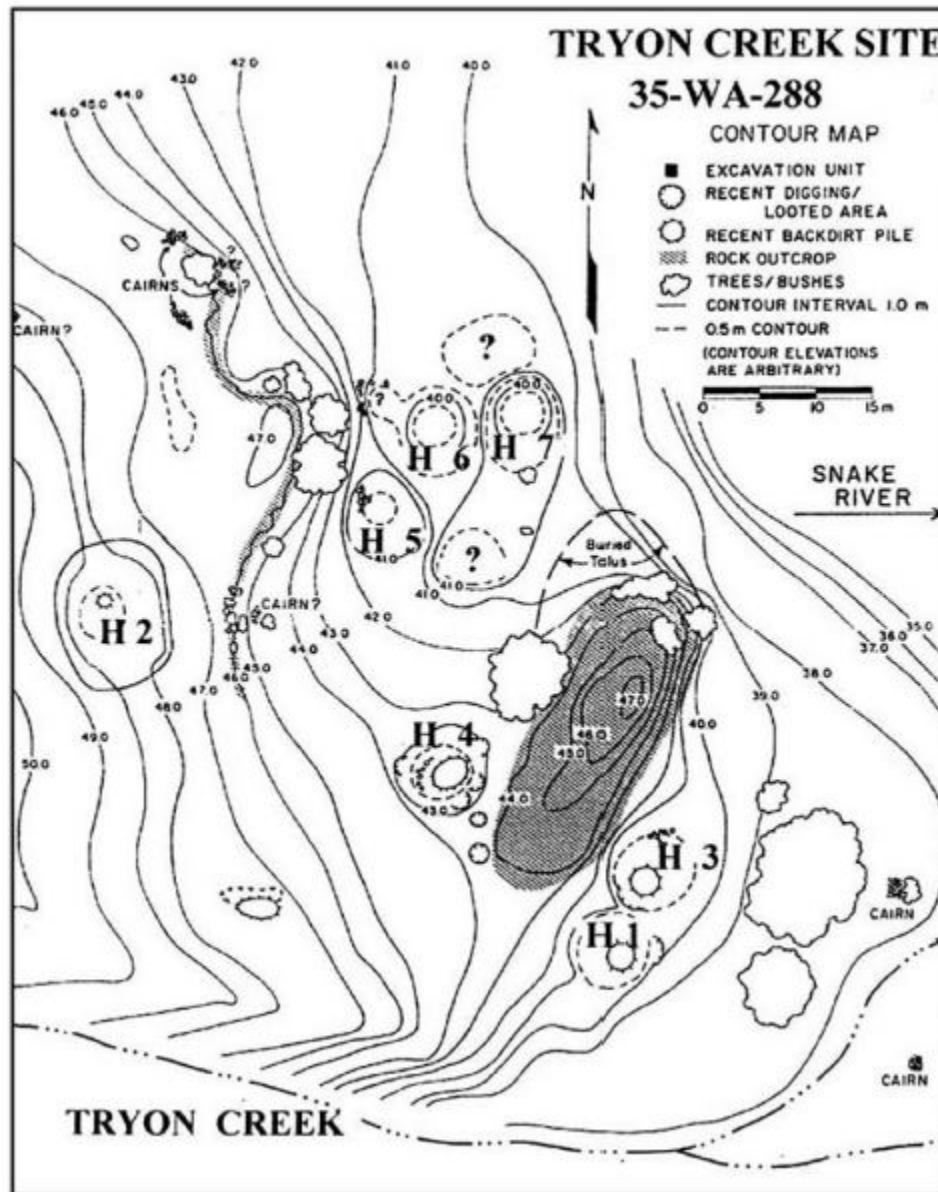


Figure 1. Map of the Tryon Creek Site (35WA288), from Hackenberger and Thompson (1995).

Thompson 1995). Radiocarbon dates from the basal occupation (Level 1) revealed an age of approximately 1640 ± 100 B.P.; the upper levels revealed an age of 1085 ± 50 B.P. (Leonhardy and Thompson 1990; Thompson 1993; Hackenberg and Thompson 1995; Chatters et al. 2003).

Tryon Creek sits squarely within the Harder Phase of the Snake River cultural chronology proposed by Leonhardy and Rice (1970). The site likely represents a winter village, common

in the area, perhaps sheltering two families at a time (Hackenberger and Thompson 1995). The structure was a circular earth lodge in the earlier occupations (Levels 1–8) and changed to an oval mat lodge in the most recent occupation (Levels 9 and 10) (Hackenberger and Thompson 1995; Chatters et al. 2003). The size of the housepits as well as their location on an alluvial fan with a gentle slope corresponds with a typical Nez Perce winter household;

Nez Perce winter villages were often located at the confluence of tributaries, such as Tryon Creek, and the Snake River (Ray 1932; Chalfant 1974; Marshall 1977; Chatters et al. 2003). These families would often use the same location year after year for winter villages (Chalfant 1974). Faunal remains from the site include deer (*Cervidae* sp.), small amounts of sheep (*Ovis* sp.), salmonids (*Salmonidae* spp.), and, most commonly, mussel (*Arcidae* sp.) and snail (*Fossaria* sp.) remains (Olson and Hackenberger 1995), typical for a winter village pattern. The site likely relates to the ethnographically-known village *Tak-in-pal-loo* (Thompson 1993).

Heat-treatment of various raw materials is common across Hells Canyon (Chatters et al. 2003). Heat-treatment is typically conducted either to enhance the overall quality of the toolstone and/or to fracture rounded nodules in order to produce angular facets (Domanski and Webb 2007). Ultimately, the controlled heating of cherts and other silicious rock transforms the internal fracture toughness and yields a more uniform flaking material (Domanski and Webb 1992; Schmidt et al. 2019). Heat-treatment has been identified on Clovis points (Wilke et al. 1991; Nami et al. 1996) and, at least within Oregon, through the Holocene (Cole and Leonhardy 1964; Tsekov and LeCheminant 2001). Heat-treatment is especially useful when using soft hammer percussion flaking and pressure flaking (Flenniken 1987; Domanski and Webb 2007). The production of projectile points has similarly been associated with the presence of heat-treatment within Hells Canyon (Chatters et al. 2003). In addition, heat-treatment has been argued as a method to conserve raw material and create a portable toolkit (Binford 1979; Domanski and Webb 2007). In order to conserve raw material in uncertain or harsh environments, groups may manufacture blades and microblades through pressure flaking (Flenniken 1987; Binder and Gassin 1988; Owen 1988). In the same way, certain raw materials may be heat-treated to better curate them over time. For example, the

Kirkwood Bar site (10IH699) in Hells Canyon contains a mixture of curated and expedient technologies depending on the raw material. Exotic obsidian was used for formal tools and sharpening flakes, but no manufacturing debitage is present. Local cherts were heat-treated and used to make bifaces, while local greenstones were percussion flaked for expedient choppers or other tools (Chatters et al. 2003).

This article seeks to analyze how heat-treatment varies within the site and through time. While previous studies have attempted to qualitatively describe distinct activity zones, such as lithic production and food preparation, little quantitative analysis has been conducted on the lithic assemblage (Thompson 1993; Hackenberger and Thompson 1995). In addition, no studies have yet analyzed how the proportion of heat-treated lithic artifacts changes through time and across raw material type. These changes in heat-treatment and toolstone may shed light on raw material procurement and curation strategies within Hells Canyon during the Harder Phase.

Methods

The Tryon Creek lithic assemblage was analyzed in two separate ways: flake attributes from debitage within Unit 2 and the abundance of heat-treatment and toolstone across the site. In both cases, the flaked stone artifacts were categorized by material and presence of heat-treatment. Although materials such as opal, red-glassy basalt, and obsidian were identified at the site, the analyses here are restricted to chert/jasper and chalcedony as these were the most abundant across the site and between levels. In addition, while important for larger interpretations of technological organization, this article is largely focused on debitage and flake attributes, rather than specific tool classes. Flaked stone artifacts were initially sorted by raw material and thermal alteration during the course of fieldwork, following a protocol developed by R. Lee Sappington (University of

Idaho) (S. Hackenberger, pers. comm., 18 September 2022). Thermal alteration was originally identified by the presence of lustrous flake scars and/or a glossy appearance (Hackenberger and Thompson 1995). The sorted material from Units 2 and 4 were subsequently re-analyzed using an updated protocol as described in Sheldon (2015) in order to check for consistency.

The categories of thermal alteration were as follows:

1. No Thermal Alteration: No evidence of thermal alteration is present.
2. Lustrous/Nonlustrous Flake Scars: Artifact exhibits lustrous flake scars which intersect or are juxtaposed to nonlustrous flake scars.
3. Lustrous Flake Scars: Artifact only exhibits lustrous flake scars, where the luster is equivalent to that seen on Category 2.
4. High-Temperature Alteration: Artifacts exhibit potlidding, crazing, and/or crenulated surfaces.

Artifacts were categorized as heat-treated if they conformed to either Category 2 or Category 3 (see Figure 2). The nonlustrous flake scars seen in Category 2 can indicate the loss of the thermally-altered surface after subsequent reduction. Category 3 can indicate intentional heat-treatment as well as post-depositional thermal alteration. Ultimately, the spatial distribution and depositional context are also important to consider. Comparing the field-sorted material of Unit 4 while using the updated protocol, approximately 73% of the previously-sorted heat-treated artifacts conformed to Category 2 or 3, and 86% of the previously-sorted non-heat-treated artifacts were identified as Category 1. While beyond the scope of this article, it is recommended that more of the collection be re-assessed for heat-treatment based upon updated protocols.

All statistics and associated graphics were produced using R software, version 4.0.0 (R Core Team 2020).

Intra-Unit Debitage

Debitage within Unit 2 was categorized by material, presence of heat-treatment (i.e., Category 2 or 3), termination type, platform type, dorsal scar count, and amount of cortex (0%, 1–33%, 34–66%, or 66–100%). Quantitative measures included flake length, width, maximum thickness, weight (grams), percent dorsal cortex, platform width and thickness, and surface area. Significant differences in the numeric variables between levels were assessed using One-Way Analysis-of-Variance (ANOVA). Chi-squared tests were performed to assess significant differences in the categorical variables between levels. All resulting p-values were adjusted using the Benjamini-Hochberg method in order to control for multiple testing (Benjamini and Hochberg 1995).

Inter-Unit Spatial Statistics

The distribution of lithic artifacts and FCR across the site were quantitatively assessed using a variety of spatial statistics. Lithic artifacts were categorized by raw material and whether they showed evidence of heat-treatment. Only the chert/jasper and chalcedony artifacts are considered here as they showed the greatest abundance and greatest evidence of heat-treatment across the site and between levels. Each variable was subsequently rescaled relative to the total volume (m³) of sediment collected from each level and unit.

Next the degree of spatial autocorrelation was measured using Global Moran's I. Global Moran's I measures whether the distribution of a variable is clustered, dispersed, or spatially-random. A clustered distribution would refer to one or more groups of either high or low values situated together in space. Similar values positioned away from each other would represent a dispersed distribution. Global Moran's I ranges between negative one and one. When values of adjacent units are similar (e.g., high values are located next to other high values), Global Moran's I will be close to one. When values of adjacent units are highly dissimilar



Figure 2. Examples of thermal alteration categories from within Unit 2: Category 2 (left), Category 3 (middle), Category 4 (right). Arrows point to areas of differential luster.

(e.g., high values are next to low values), Global Moran's I will be close to negative one. When values are distributed completely randomly, Global Moran's I will be close to zero. Both a z -score and p -value are also calculated given the number of features and variance of the variable in question in order to assess significance. A more complete treatment of Global Moran's I and measures of spatial autocorrelation is given in Anselin (1995) and Chen (2013).

Although Global Moran's I can identify if spatial autocorrelation exists across the site, it cannot identify where clusters of similar values are located. In cases where the Global Moran's I results were significant (p -value < 0.05), Local Moran's I was calculated for each unit and the results plotted to identify where clusters were located. Local Moran's I is a local autocorrelation statistic that decomposes Global Moran's I into the degree of spatial autocorrelation observed for each unit (i.e., how similar is each observation to its neighbors). Local Moran's I , and other local spatial autocorrelation statistics, gives the extent of clustering of similar values around each observation (Anselin 1995). A fuller description of Local Moran's I , local measures of spatial autocorrelation, and their applications are given in Anselin (1995), Fu et al. (2011), and Miller-Atkins and Premo (2018).

Results

Within Unit 2

Table 1 shows the ANOVA results for each variable compared across levels. Flake length, maximum thickness, and striking platform thickness all show significant differences (FDR p -value < 0.05) between levels within Unit 2. The chi-squared results are shown in Table 2.

Heat-treatment, flake termination type, raw material, and dorsal scar count all vary significantly between levels. Heat-treatment generally becomes less frequent through time (Figure 3A), becoming rare and nearly non-existent in the last, most-recent occupation (Levels 1 and 2). Within Unit 2, the overall abundance of heat-treatment reaches nearly 30% in Level 7 and over 50% in Level 8. These proportions are primarily driven by Category 3 alteration which may result from post-depositional heating. Heat-treatment drops precipitously with Level 2 exhibiting only approximately 4% of material with evidence of heat-treatment. When isolating chalcedony within Unit 2 (Figure 3B), heat-treatment is non-existent in Levels 8, 9, and 10 while the majority of chalcedony is heat-treated in Levels 4, 6, and 7. No chalcedony was identified in Level 5. As with chert/jasper, very few chalcedony artifacts were heat-treated in Levels 1, 2, and 3. This pattern is similar when

Table 1. Anova Results for Flake Attributes Within Unit 2.

Quantitative Measures	Mean	Standard Deviation	F-value	P-value	FDR P-value
Length (mm)	12.86	7.04	3.26	4.19x10 ⁻⁴	4.19x10 ⁻³
Width (mm)	10.08	5.89	1.79	0.06	0.10
Maximum Thickness (mm)	2.53	2.20	2.68	3.24x10 ⁻³	0.11
Weight (g)	0.73	2.40	1.42	0.17	0.24
Percent Cortex	0.03	0.14	0.68	0.75	0.75
Striking Platform Width (mm)	4.48	3.09	2.09	0.03	0.07
Striking Platform Thickness (mm)	1.49	1.31	3.18	8.61x10 ⁻⁴	4.31x10 ⁻³
Flake Surface Area (mm ²)	159.68	215.52	1.96	0.29	0.33

Table 2. Chi-Squared Results for Flake Attributes Within Unit 2.

	X² Statistic	P-value	FDR P-value
Heat-Treatment	75.68	5.00x10 ⁻⁴	1.5x10 ⁻³
Termination Type	36.96	0.01	0.02
Platform Type	45.01	0.26	0.31
Raw Material	179.76	5.00x10 ⁻⁴	1.5x10 ⁻³
Cortex Value	22.13	0.87	0.87
Dorsal Scar Count	52.19	5.00x10 ⁻³	0.01

isolating only the chert/jasper artifacts, as well (Figure 3C). Levels 8, 9, and 10 show the majority of chert/jasper debitage is heat-treated, and heat-treated chert/jasper debitage is non-existent in Levels 1 and 2. When isolating only Category 2 thermal alteration, though, the proportion is more subdued; however, the general pattern holds. Overall, chert and jasper display more heat-treatment than chalcedony, but heat-treatment becomes rare across all materials in Unit 2 within Levels 1, 2, and 3. The rates of heat-treatment are driven by Category 3 thermal alteration in nearly all cases, though. The position of Unit 2 within the site may have subjected some of the artifacts to post-depositional or late-stage heating. When isolating only the Category 2 artifacts (i.e., those with adjacent nonlustrous and lustrous flake scars), the pattern of decreasing heat-treatment over time still generally applies.

When analyzing the entire site, heat-treatment is common from Levels 4 to 10 (Figure 3D). As with Unit 2, the majority of heat-treatment is seen in Levels 8 to 10 with fewer heat-treated artifacts in later occupations. Like the Unit 2 material, heat-treatment becomes less common through time, and approximately 40–50% of artifacts display heat-treatment in Levels 1 to 7. When isolating chalcedony (Figure 3E), the proportion of heat-treated artifacts does not change widely across levels. The majority of chert/jasper artifacts across the site show heat-treatment in Levels 8 to 10, but the proportion remains around 40–50% in Levels 1 to 7 (Figure 3F). It is likely, however, as with the Unit 2 material, that post-depositional thermal alterations are driving the higher counts, especially in the lower levels. The original protocol, categorizing heat-treatment by lustrous flake scars and/or glossy appearance, may account for some of the differences too.

Across the Site

The significant Global Moran's I results are presented in Table 3. Significant clustering was identified at every level. Significant clustering

of high values (Moran's I greater than one) was found in each variable interest in Levels 1, 4, 5, 6, 7, and 8. FCR clustered significantly in each level except for Level 3. Heat-treated chalcedony was significantly clustered in every level.

For both the heat-treated lithic artifacts and FCR, the Local Moran's I results show clusters of high values, or areas of high concentration. On the whole, though, the Local Moran's I results show fewer cases of individual units with significant autocorrelation. In other words, while artifacts are clustered together at the larger site-level, on the smaller scale, fewer individual units show significant patterning with their immediate neighbors. Levels 2, 4, and 5 show the clearest patterns of spatial patterning on the unit-by-unit level. The heat-treated chalcedony, chert, and jasper cluster in the same area as FCR within Level 4. In Levels 2 and 5, though, the heat-treated lithic artifacts cluster apart from the FCR on other ends of the site. These results are plotted in Figure 4. Levels 7 through 10 do not show clear patterns of significant clustering in heat-treated lithic artifacts across units.

Discussion

Heat-Treatment Through Time

Across the entire site, the majority of heat-treated artifacts occur in the earliest occupation phase (Levels 9 and 10). The proportion of heat-treatment remains stable and/or decreases through the later occupations (Levels 1 through 8). While this pattern generally holds for both chalcedony and chert/jasper, the earliest occupation shows a discrepancy. While both materials are found in similar abundance, the majority of chert and jasper are heat-treated while heat-treatment is rare among the chalcedony artifacts in Levels 9 and 10. The proportion of both chalcedony and chert/jasper is similar and subsequently stabilizes in later occupations. The abundance of heat-treated chert and jasper relative to chalcedony and other materials signal a curated toolkit and preferences in raw material procurement. Chert and jasper artifacts

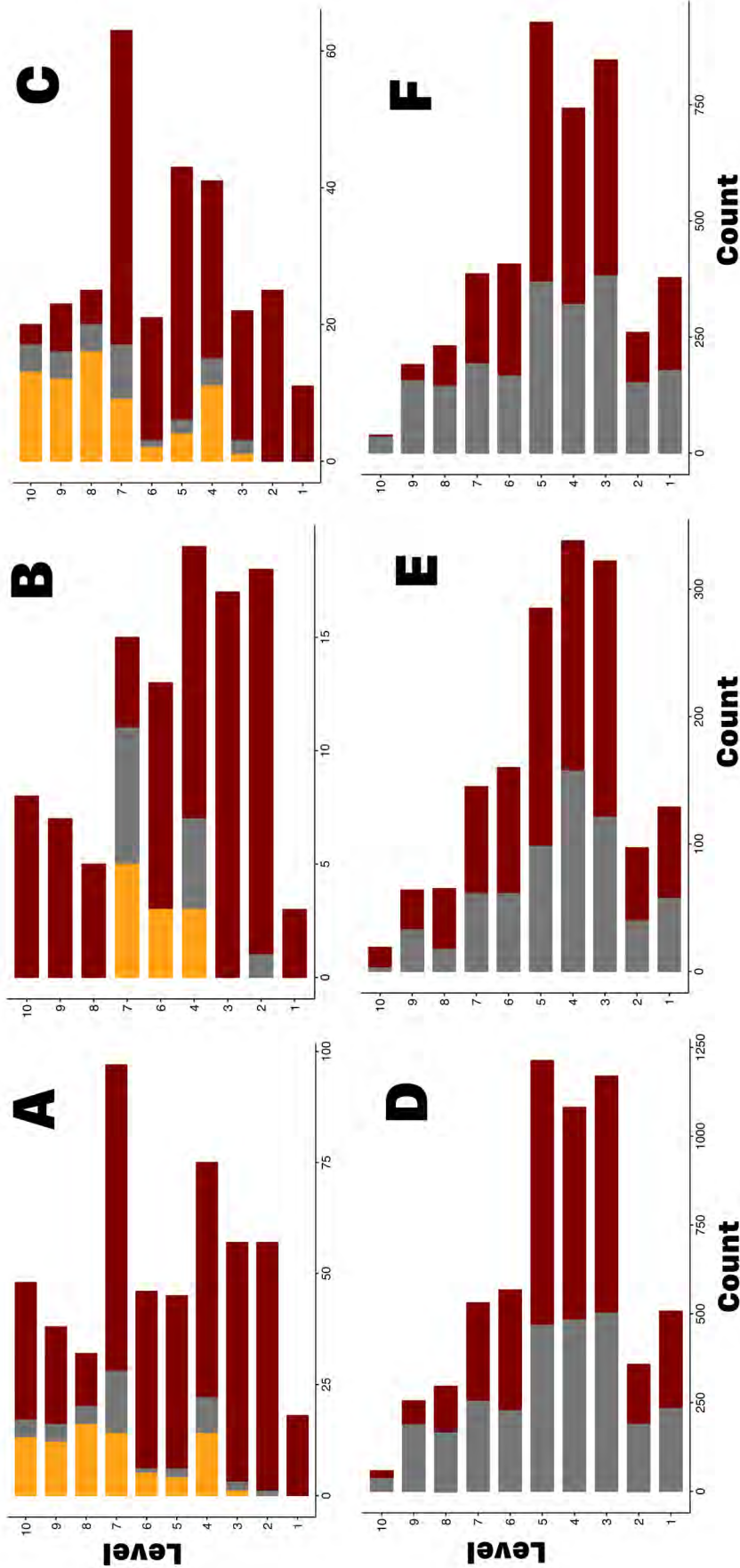


Figure 3. Proportion of heat-treatment by raw material type within Unit 2 (A, B, C) and across the entire site (D, E, F). Thermal alteration Categories 2 and 3 are depicted in gray and yellow, respectively, for the Unit 2 materials. Heat-treatment, characterized by a previous protocol, across the entire site is depicted in gray, and non-heat-treated lithic artifacts are shown in red in the second row. The first column (A, D) depicts all the proportion of heat-treatment regardless of raw material, the second column (B, E) shows only chalcedony, and the third column (C, F) shows only chert/jasper.

Table 3. Significant Global Moran’s I Results.

Level	Variable	I-Statistic	P-value
1	FCR ^a	0.3	0.01
1	CTJHT ^b	0.29	0.01
1	CLHT ^c	0.28	0.01
2	FCR	0.3	0.01
2	CTJHT	0.25	0.01
2	CLHT	0.32	0.01
3	CTJHT	0.23	0.01
4	FCR	0.28	0.01
4	CTJHT	0.4	0.01
4	CLHT	0.26	0.01
5	FCR	0.23	0.01
5	CTJHT	0.21	0.01
5	CLHT	0.27	0.01
6	FCR	0.43	0.01
6	CTJHT	0.35	0.01
6	CLHT	0.26	0.01
7	FCR	0.37	0.01
7	CTJHT	0.31	0.01
7	CLHT	0.33	0.01
8	FCR	0.19	0.03
8	CTJHT	0.19	0.01
8	CLHT	0.25	0.01
9	CLHT	0.17	0.04
10	FCR	0.68	0.01
10	CLHT	0.44	0.04

^a Fire-cracked rock, ^b Heat-treated chert/jasper, ^c Heat-treated chalcedony.

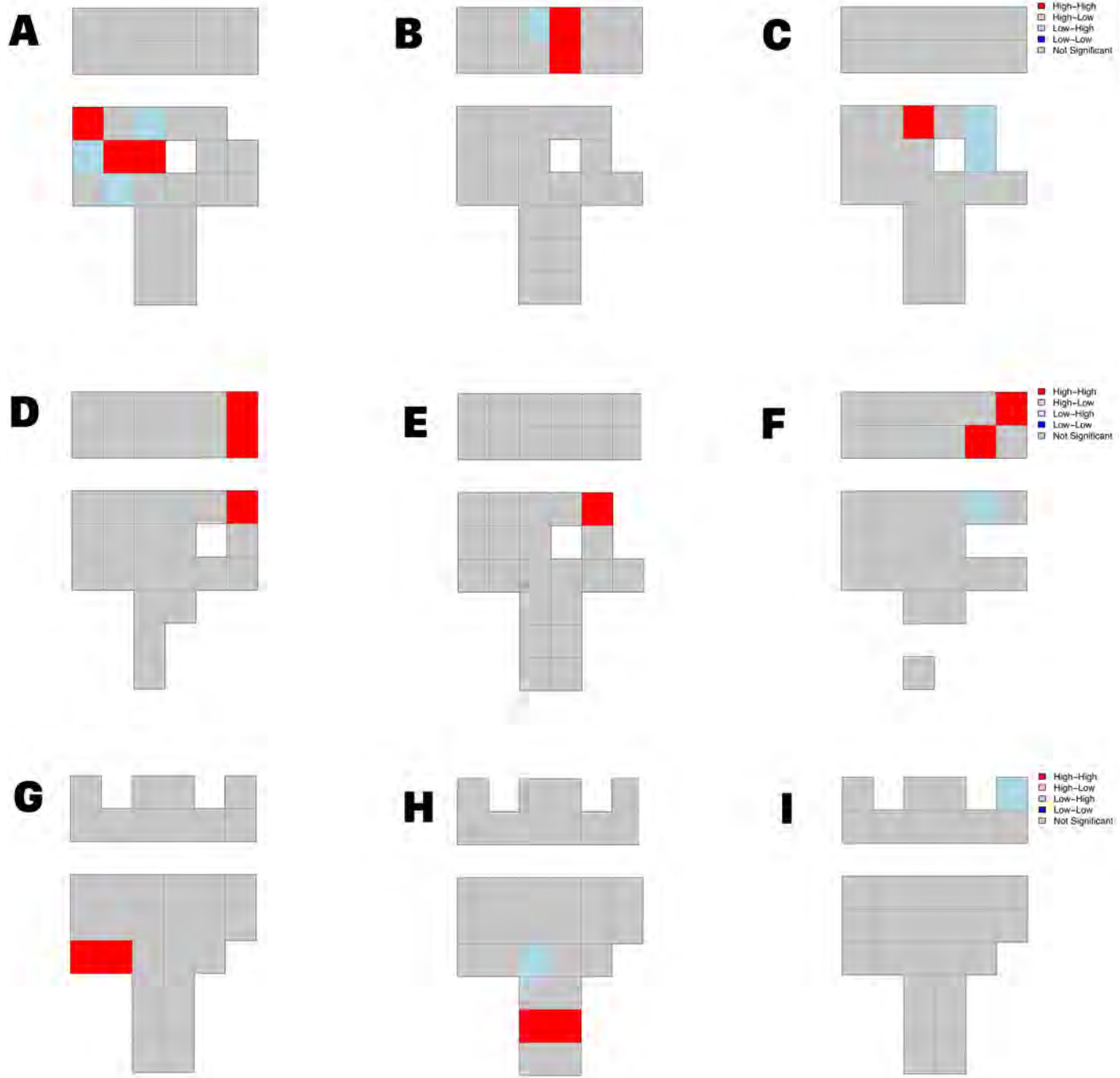


Figure 4. Local Moran's I results for the abundance of FCR (A, D, G), heat-treated chalcedony (B, E, H), and heat-treated chert/jasper (C, F, I). Level 2 is depicted in the first row (A, B, C), Level 4 is shown in the second row (D, E, F), and Level 5 is shown in the third row (G, H, I). Red indicates a statistically-significant cluster of high values, blue a statistically-significant cluster of low values, and grey no significant patterning.

represent the majority toolstone within Tryon Creek, and high rates of heat-treatment in early occupations may indicate efforts to extend the material's use-life during uncertain conditions and/or long-distance transport. If Tryon Creek does represent a winter hunting camp (Hackenberger and Thompson 1995; Chatters et al. 2003), high proportions of heat-treated material also signal more intensive tool manufacture and preparation, perhaps relating to the production of projectile points and a specialized toolkit. The proportion of heat-treated material decreases relative to Levels 9 and 10 but remains consistently between about 40% and 50% across the site.

The similar rates of heat-treatment in both chalcedony and chert/jasper in later occupations demonstrate that both materials were treated similarly in terms of procurement and curation behaviors. Coupled with low amounts of cortex and higher dorsal scar counts, both materials were likely brought into the site as prepared cores and subject to late-stage and bifacial reduction. A subsequent sample of the cores from Units 2, 3, 4, 5, and 6 revealed that only 36% showed evidence of heat-treatment which may suggest that heat-treatment generally occurred at later stages of reduction. Flake blanks may have been preferentially used for heat-treatment, rather than cores. While heat-treatment may produce a more uniform material and ease flaking, the result may also reduce the durability of worked edges. While outside the scope of this initial work, a larger proportion of heat-treated projectile points compared to edge-modified flakes and other cutting tools may point to technological organization and decision-making processes at the site. In addition, the high proportion of heat-treated projectile points and bifacial-thinning flakes compared to cores and larger debitage may point to heat-treatment occurring at later stages of reduction.

The patterns of heat-treatment within Unit 2 differ from the site-wide analysis. The differences between chalcedony and chert/jasper seen within the Unit 2 material may stem more from its location than site-wide behavioral

changes. As Unit 2 is interpreted as existing between multiple activity zones (Thompson 1993), the differences in the proportion of heat-treatment between chalcedony and chert/jasper may result from the location of separate work areas for different toolstone. If heat-treated material of chalcedony and chert/jasper are located in different areas across the site, Unit 2 may only reflect one material or reduction stage. Post-depositional thermal alteration is also likely. The high proportion of Category 3, rather than 2, may result from nearby hearths or other thermal features heating small artifacts. Other post-depositional changes such as site cleaning would only serve to further distort these patterns.

Heat-Treatment Across the Site

Significant clusters of FCR, chalcedony, and chert/jasper were identified across the site and across levels, reflecting various work areas and activity zones. These generally conform to the activity areas proposed previously (Thompson 1993). In Level 2, the FCR, heat-treated chalcedony, and heat-treated chert/jasper all display significant clustering apart from each other (Figure 4:A,B,C). The FCR clustering on the western side of the site probably represents a hearth, while the separate clusters of chalcedony and chert/jasper represent separate work zones. This pattern of distinct locations for chalcedony and chert/jasper suggests separate work areas for different raw materials and reduction strategies. In Level 4, the spatial distribution changes and FCR, heat-treated chalcedony, and heat-treated chert/jasper are located close together in the northeast of the site (Figure 4:D,E,F). The location of heat-treated material adjacent to a probable hearth feature may indicate a nearby work area or the likely location of heat-treatment within the site. These clusters again conform to a projected food processing hearth and secondary lithic artifacts area proposed in Thompson (1993). The presence of a nearby hearth could also result in post-depositional alterations as well. In Level 5, the FCR and heat-treated materials

again cluster separately (Figure 4:G,H,I). While these clusters may represent separate hearth and work areas as in Level 2, the clusters do not readily conform to the activity zones proposed in Thompson (1993). This discrepancy may result from the finer level-by-level analysis rather than aggregating both Levels 5 and 6 as done previously. As in Level 2, the distinct clusters may indicate different reduction strategies and/or work areas for chalcedony and chert/jasper.

The presence of distinct work areas for both heat-treated raw materials indicates a curated toolkit as well as suggests the use of separate raw materials for different activities. For example, the presence of hammerstones, modified flakes, and projectile points clustered separately from other unifacial scraping implements, cobble spall, modified flakes, and bone tools in Levels 5 and 6 has been argued as separate food preparation and hide processing areas (Thompson 1993). The overlapping area of FCR, heat-treated chalcedony and chert/jasper identified in Level 4 is likely the combination of a working and food processing area. The presence of hammerstones, cores, an antler tine, and abrasive stones indicate that lithic reduction and wood-working likely occurred near the hearth and food-processing area (Hackenberger and Thompson 1995). As in Level 5, the distinct areas for FCR, chalcedony, and chert/jasper likely represent separate food preparation and lithic reduction zones. One unifacial scraping tool; a perforator; and cobble tool, likely used for hide processing, are located in the heat-treated chert/jasper cluster while a core, bifaces, projectile points, and modified flakes were found near the heat-treated chalcedony cluster in Level 5 (Hackenberger and Thompson 1995).

Conclusions

The Tryon Creek site (35WA288) represents an important source of information on household activity patterns, subsistence, and raw material procurement within Hells Canyon. To date, little in-depth quantitative research has explored

this site, especially how it fits within the larger context of household organization within Hells Canyon during the Harder Phase. Hells Canyon is unique for both its steep landscape and its location between the Columbia Plateau and northern Great Basin. The landscape, with little easy access to nearby toolstone, must have presented unique challenges for raw material procurement. Heat-treatment and curation likely represents an effort to extend the use-life of certain raw materials and economize what material existed within the site. Legacy collections, such as those considered here, would benefit from further study and advanced methodology. Future work should consider how the patterns identified at Tryon Creek conform to the wider Hells Canyon area and how other artifacts, such as bone tools, factor into the household activity areas. In addition to region-wide analyses, future work should compare the proportion of heat-treatment within and across tool classes (e.g., cores vs. projectile points), especially when using updated protocols.

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Archaeological Wet Sites Indicate Salal Berries and Acorns were Staple Foods on the Central Northwest Coast

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Abstract *Three central Northwest Coast wet sites have begun to highlight the significance of berries and nuts, particularly salal and acorns, to ancient subsistence practices (Figure 1). At the Ozette site (45CA24), located on the Olympic Peninsula of Washington, mudslide-encased houses and middens dating to 300–450 years ago produced flotation samples of 250,000 seeds of Salal (*Gaultheria shallon*; and/or its close look-alikes of genus *Vaccinium*). At the Sunken Village site (35MU4), located on Sauvie Island, Oregon, over 100 hemlock-lined acorn leaching pits dated to 150–700 years ago have been recorded. It is estimated that these leaching pits may represent processing of 2,500,000 acorns (*Quercus garryana*) in a season. Finally, at the Qwuʔgwəs site (45TN240), located at Mud Bay on Eld Inlet, Olympia, Washington, reanalysis of macrobotanical artifacts lead to the recognition that acorns were also abundant in the wet site midden. Acorn remains were seven times more common than hazelnut (*Corylus cornuta*) remains here, indicating that acorns might have been the most ubiquitous plant food at this south Salish Sea site. In this article it's argued that salal and acorn ecofacts from the central Northwest Coast represent substantial ancient resources in the diets of this region.*

Keywords

Salal, acorns, wet sites, Ozette, *Qwuʔgwəs*, Hoko River, Sunken Village, Hoko Rockshelter, Pitt Polder, hazelnuts, camas, wapato, geophytes, Oregon white/Garry oak, oak savannas/parklands, acorn weevils, filbert worm/moth, acorn leaching pits, dried berry cakes, red elderberry, John R. Jewitt, participant observation, American ship *Boston*, Chief Maquinna, archaeobotany/paleoethnobotany, Chinookan people, mid-Holocene, Old Cordilleran, St. Mungo, Locarno Beach, Marpole, hand stones/grinding slabs, fern rhizomes, carbohydrates/sugar, wool dogs, Coast Salish loom, husbandry/wifery, domestication, incipient agriculture, alpacas.

Introduction

Northwest Coast archaeological wet sites, preserving wood and fiber materials, have begun producing significant new insights on the use of plant foods by ancestral peoples not well-recognized in the recent anthropological

literature. I will discuss two main “crops” that reflect these archaeological acumens, salal berries (*Gaultheria shallon*) (Figure 2) and acorns (*Quercus garryana*) (Figure 3).

Considerable literature recently has been published on the plant use and cultivation on the Northwest Coast of North America, mostly lead

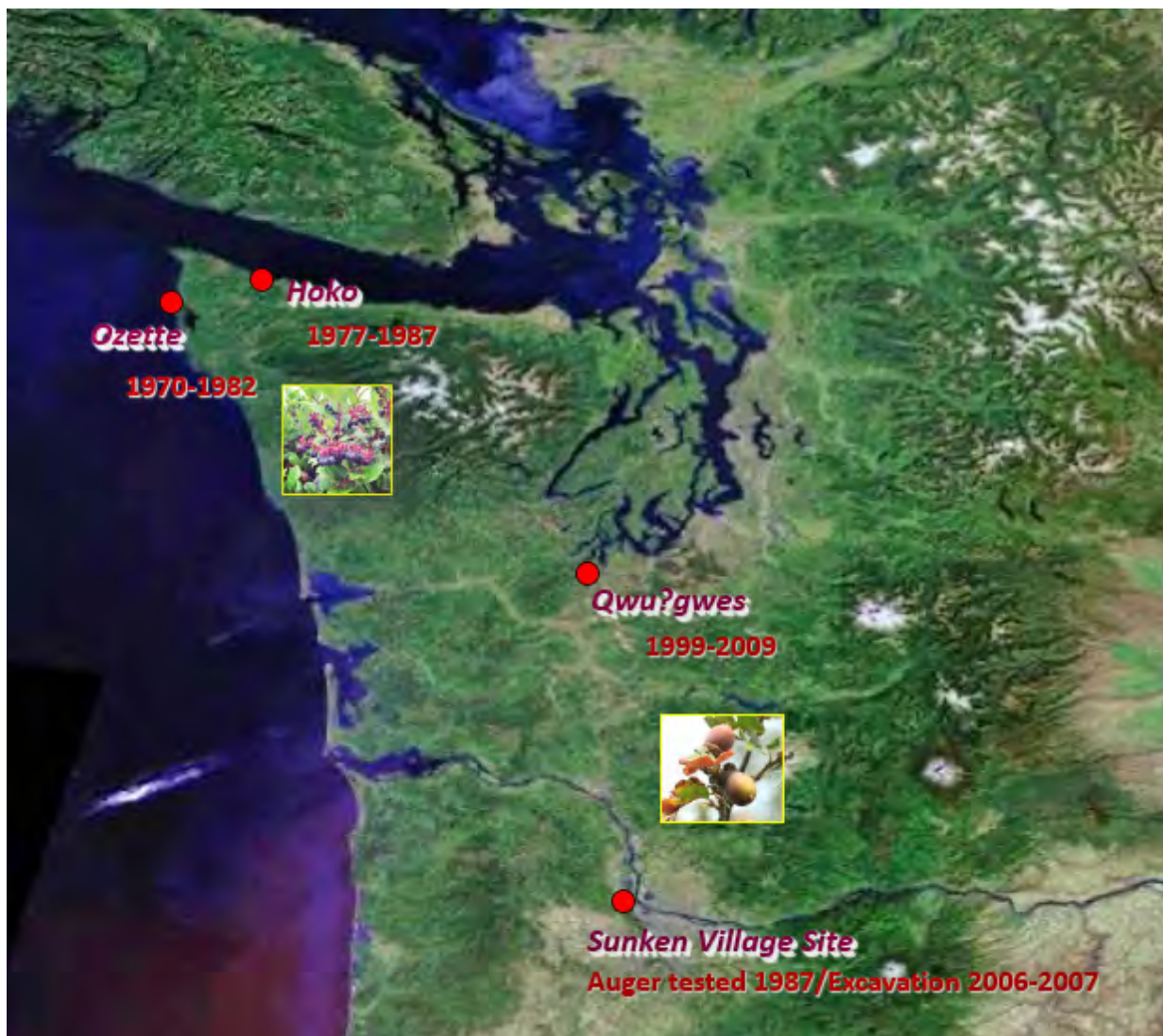


Figure 1. Map of Northwest Coast wet sites reflecting use of salal berries and acorns as major part of subsistence (and years excavated).



Figure 2. (Left) Small, approximately a mm, salal berry seeds as found in wet site, and (right) ripe salal berries along a stem that is often taken as a whole to prune the bush too (Source: Native Foods Nursery).



Figure 3. (Left) Acorn nuts as found in the Sunken Village wet site (35MU4) leaching pits—note hemlock branch pieces from pit lining; (right) example of an Oregon White/Garry oak acorn on the tree.

by Nancy J. Turner and Douglas Deur (Deur and Turner 2005; Turner 2014a, 2014b). Of most note is Nancy J. Turner's excellent 2014 two volume set covering her ethnobotanical career's work, focused on ancestral plant use knowledge of Indigenous peoples, is presented in over 1,100 pages of observations (Turner 2014a, 2014b). In the 2005 Deur and Turner edited volume, use of salal berries are referenced 10 times; however, the use of acorns has *zero* references. In the two volume set in 2014, Turner references salal plant use (food, material, and medicines) 21 times and oak/acorns 11 times. The new reference to oak grooves often refers to burning practices to enhance surrounding camas growth (e.g., Turner and Peacock 2005:126) without reference to the additional and significant need to control acorn weevils (*Curculio occidentis*) and the Filbert worm/moth (*Cydia latiferreana*), highly destructive insects to the acorn nuts that can be controlled/killed through burning the leaf matting under oak trees, with no damage to mature trees. Other referencing of acorns as a crop by Turner links to the 2006–2007 excavations and documenting of over 100 acorn leaching pits recorded at the Sunken Village archaeological wet site, Portland, Oregon, occurring after the Deur and Turner edited volume (Deur and Turner 2005; Croes et al. 2009).

Salal berries and acorns may not be readily recorded in the anthropological literature in part because they play little to no part in Euroamerican diets, similar to the lack of referencing the shellfish chitons in the literature, even though it was important to Northwest Coast Indigenous diets and cultures (Croes 2015b). I will address each of these plant foods separately, pointing out their mention in the literature over the past 200+ years and their ancient significance as seen in archaeological sites.

Salal Berries (*Gaultheria shallon*) in the Ethnographic Context

Though not a Euroamerican preferred food, its importance for Northwest Coast Indigenous diets is often reflected in the literature. In Turner's recent two volume set, she records 32 languages that record names for salal, including 17 Salish and 7 Wakashan language families (Turner 2014a:159). As a berry widely eaten by Coastal peoples, she points out in two references:

1. Salal berries are without doubt the most plentiful and widely used fruit on the coast....They picked them in clusters in late summer, and ate them fresh or dried them in cakes for winter. The Kwakwaka'wakw ate the ripe berries at

large feasts; they dipped the berry clusters in Grease and ate the berries one at a time, then threw the stems in the fire. The usual procedure for preparing the berries for winter storage was to mash them and either boil them in boxes using red hot rocks or allow them to stand for a day or two. The thickened “jam” was then poured into rectangular cedar frames set on Skunk Cabbage leaves and dried for a few hours on a rack over an alder-wood fire [Figure 4]. The cakes were about 3 cm thick and could be as large as 30 cm wide by 90 cm long. The cooks folded or rolled the cakes and stored them in cedar boxes in a warm area of the house. Salal cakes were highly prized. The Kwakwaka'wakw would only use the pure cakes for a family meal or for chiefs at feasts. Cakes made to trade or sell and those given to commoners at feasts were usually mixed with currant or Red Elderberry cakes to make them last longer. Salal berries of poorer quality, or not yet ripe, were used in these “cheap” cakes.

To prepare the dried cakes for eating, the cook soaked them overnight in water, kneaded them until they broke into small pieces and mixed them with Grease. Feasters ate them with special black spoons made of Mountain Goat horn which would not show the berry stains. Guests were not permitted to drink water after a Kwakwaka'wakw Salal feast. Salal berries were frequently used to sweeten other foods. The Haida used them to thicken salmon eggs (Turner [1975] 1995:77–78).

2. On the Northwest Coast, salal berries are one of the most important fruit species. These berries were also harvested in enormous numbers—adding up to 100,000 to 200,000 berries per family per year, and millions if one considers an entire community (Deur and Turner

2005:14). They were generally cooked, using hot rocks and dried in cakes, some weighing as much as 10 to 15 pounds (4.5 to 7 kilograms) each (Gunther 1973 [1945]), which were stored in large pack baskets of 20 litres or more capacity, with quantities equivalent to those of saskatoon berries stored by Interior Plateau families (Turner 2014a:273, 298) (Figure 4).

In his often-cited thesis, *Nutrient Composition of Selected Important Plant Foods of the Pre-Contact Diet of the Northwest Native American Peoples* (1980), Patrick Keely singles out salal berries in discussing their nutritional composition, and observes that:

Salal berries were the most abundant fruit available to the coastal Indians. They were consumed in larger quantities than any other berry in the coastal aboriginal diet. Clusters of salal berries were picked in August, September, and October. When eaten fresh, the berries were usually dipped into eulachon grease and eaten one at a time. Preparation for winter storage involved mashing, and then drying the berries into berry cakes. These berry cakes were approximately 30 cm. (1 ft.) wide, 90 cm. (3 ft.) long and 2.5 cm. (1 in.) thick. Pure cakes were used for family meals and feasts; berry cakes containing a mixture of berries of different species were used in trade. Dried salal berries were eaten alone, mixed with eulachon grease before eating, or used to sweeten or flavor other foods such as salmon eggs and dried roots. (Turner [1975] 1995; Keely 1980:31; Keely et al. 1982) (Figure 4)

Undoubtedly the first detailed reference to the great importance of salal berries in West Coast diets is provided by a 2.5 year *involuntary participant observer*, John R. Jewitt, as a slave in



Figure 4. Example of woman preparing berry cakes (Stewart 1984:102).

the Nuu-chah-nulth village of Yuquot (1803–1805); he was an Euroamerican allowed to survive as the valued blacksmith after the takeover of the American ship, the *Boston*, where the victors obtained, as stated by Jewitt: “cutlasses, pistols, and three thousand muskets and fowling pieces”—making John an important person to let survive and own as a slave (Stewart 1987:35) (Figure 5). To live, John, age 20, agreed to become a slave of Chief Maquinna through the 1803–1805 years (only 25 years after the first European observation of the Northwest Coast and Yuquot peoples by Captain James Cook’s expedition of 1778—so very early and as a 24/7 [total] *participant observer*).

Fortunately, John’s father sent him to an academy in hopes he would go into medicine, so he was one of few literate crew members on the *Boston*, and, after capture, kept a daily journal as best he could (Jewitt 1807), and later used this to write up his narrative of his experiences (Jewitt 1815; annotated and illustrated by Hilary Stewart 1987) (Figure 6). Though not an anthropologist (the field did not formally exist for another 100 years), Jewitt did everything he could to survive

and understand his cultural setting, though as a slave. He learned Nuu-chah-nulth language in part to learn about neighboring communities and information about ships in the area, and to better understand what his master’s family and community were doing.

Our interest here was the importance of food resources used by the Nuu-chah-nulth and particular berry crops. Probably the biggest eye-opener in Jewitt’s published narrative was his discussion of *Yama*, his reference to salal berries, and their particular importance (Jewitt 1815:78; Stewart 1987:100). He states:

Among the provisions which the Indians procure at Tashees [their up-inlet salmon trapping site used in fall], I must not omit mentioning a fruit that is very important, as forming a great article of their food. That is what is called by them the *Yama*, a species of berry that grows in bunches like currants, upon a bush from two to three feet high, with a large, round and smooth leaf.

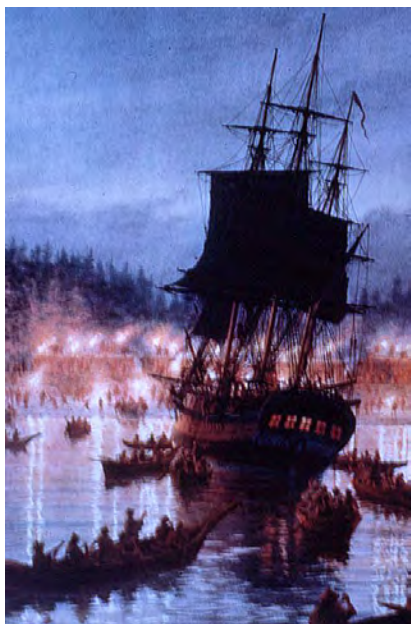


Figure 5. Painting depicting the capture of the American ship the *Boston* by Chief Maquinna on 22 March 1803 off Nootka. The community members are on their longhouses with torches celebrating as they bring in the ship. This was the first complete takeover of a trading ship—the result of a grave insult. A wounded John Jewitt is on board, likely pondering his fate as a slave of Maquinna’s (Stewart 1987).



Figure 6. John R. Jewitt holding his narrative book in 1815 after his return to England. The scar on his forehead was the result of a blow to his head while the *Boston* was being taken over in 1803 (Stewart 1987:13).

This berry is black, and about the size of a pistol shot, but of rather an oblong shape, and open at the top like the blue whortleberry. The taste is sweet but a little acrid, and when first gathered, if eaten in any great quantity, especially without oil, is apt to produce cholics. To procure it, large companies of women go out on the mountains, accompanied by armed men, to protect them against wild beasts, where they frequently remain for several days, kindling a fire at night, and sheltering themselves under sheds constructed of boughs. At these parties, they collect great quantities. I have known Maquina’s queen and her women return loaded, bringing with them upwards of twelve bushels. In order to preserve it, it is pressed in the bunches between two planks, and dried and put away in baskets for use. It is always eaten with oil.

Of berries of various kinds, such as strawberries, rasp-berries, black-berries, &c. there are great quantities in the country, of which the natives are very fond, gathering them in their seasons, and eating them with oil, but the *yama* is the only one that they preserve.

Fish is, however, their great article of food, as almost all the others, ***excepting the yama, may be considered as accidental*** [bold emphasis added]. (Jewitt 1815:94–95; Stewart 1987:114–115)

If I calculate that a fresh salal berry, ~1 cm in diameter, equals approximately 0.5 cubic cm, and there are 35,239 cubic cm in a bushel, or 70,478 berries, then the upwards of twelve bushels collected by “Maquina’s queen and her women” would be 845,736 salal berries collected for their household and/or trade. In Jewitt’s daily journal (1807), he

reports on 6 November 1803, “Our chief’s wife and her attendants went to gather bramble berries” (1807:18), and on 7 November 1803, “Our chief’s wife returned with two bushels of berries” (1807:19) (Figure 7), no doubt salal at that season, and two bushels would be approximately 140,956 berries on that trip. Again, on 15 November 1803, he reports, “Fine and clear. Our chief’s wife out gathering bramble berries” (1807:19), and on 18 November 1803, “Our chief’s wife returned” (1807:20), with no indication of the amount gathered; however, a three-day trip was recorded versus the one-day trip earlier. It is interesting how he points out that these groups were led by nobles, “our chief’s wife,” who undoubtedly was the household resources manager, and possibly owner of berry patches, and she observed when it was the best times to go and whether they collected enough to see their house through the winter. On his second trip to Tashees in 1804, he mostly talked about salmon fishing weirs and traps and doesn’t mention the berry collecting trips.

Another way to calculate, provided by Nancy Turner, is how many dried salal berries this would equal (Turner 2014b:174). She charts that there are 2,000 dried salal berries per liter, and since there are 35.24 liters per bushel (U.S., dry), this would equate to 70,480 dried berries per bushel \times 12 bushels = 845,760, which is almost identical to the calculations for 12 bushels above. Turner further calculates that there would be 40,000 dried berries per 20-liter storage baskets, so 12 bushels would fill 21 storage baskets (Deur and Turner 2005:14; Turner 2014b:174). She additionally estimates 4 baskets per family/year, so these 12 bushels should provide for a bit over 5 families—probably conservatively the number of families in an average Nuu-chah-nulth extended family plank household, to which one must add visitors and slaves, which can add a lot more household members.

Estimated nutritional values for a salal berry is four calories per berry and one gram of carbohydrate/carbs. Therefore, 845,760 salal



Figure 7. (Left) Illustration of a woman collecting salal berries into a burden basket (Stewart 1987:114), and (right) salal berries along stems that were picked off to prune the bush to enhance future growth (Lizzie Harper, Natural History Illustration).

berries could provide up to 3,383,040 calories and 845,760 grams of carbohydrates. If the household had an average of 40 individuals, and they needed approximately 1,600 calories a day (from all foods) and about 200 grams of that as carbohydrates, the dried cakes could provide the daily carbohydrates needs for 40 individuals for over 100 days, equating the low food income of the 3 winter months and providing the needed carbohydrates/sugar to maintain their health until spring shoots and other renewed plant foods appear.

I should point out that 60 storage type baskets (types OB29, OB38) were recovered from the Ozette House 1 archaeological site area, providing plenty for storing dried salal berry cakes (~20 baskets) and the remaining ~40 storage baskets for dried salmon, shellfish, and other foods (Croes 1977, 2003:62–64, 2019). The size of Ozette storage baskets ranged from 1 liter to 37 liters, with an average size of 15.4 liters. This size of storage baskets, from Turner's calculations, would hold 30,800 dried salal berries (no doubt in cakes), so each family may require 4–5 storage baskets per year (Croes 2003:62–64). Makah Elder Meredith Parker, when considering these Ozette twill and open twined, splint cedar bough storage baskets recovered, mentioned that these baskets “stored the dried foods, fish and shellfish [and no doubt berry cakes] and were kept high on shelving so that the food would stay dry and well preserved” (Croes 1977:332, 2003:65–66, 2019:248).

The use of Ozette House 1 storage baskets to estimate the amount of dried food that might have been kept in these ancient West Coast houses I characterized as follows: “These estimates are not unlike today's estimates of the capacity of the pantry or freezer and were probably used by household managers (certainly noble women) to calculate the progress and/or current state of dried foods accumulated or needed to support the household (longhouse) through the winter season” (Croes 2003:63). In terms of dried berry cakes, this would mean the critical carbohydrates/sugars required for

household health along with the protein/fat-rich dried fish and shellfish as well as oils.

Another consideration is ethnographic knowledge and possible ownership of the most productive berry patches (Turner 2014b:187). Northwest communities tended to have berry patches to which they returned (note Tashees as location for Jewitt's owners to collect). Turner points out that “In Clayoquot Sound, for example, a place called “*tl'uulhapi*” (Tonquin Beach) was a preferred place for Nuu-chah-nulth people to pick salal berries (*Gaultheria shallon*) because the berries are large and sweet here, according to Mary Hayes” (Bouchared and Kennedy 1990:513; Smith 1997; Deur and Turner 2005:115). In 1982 Isabelle Ides (age 82, Makah Elder) in reference to the work at the Hoko River Archaeological Site Complex indicated “there used to be lots of salal berry bushes to the west of the Hoko River mouth (present day San Juan Vista housing). Not so much salal berry bushes around Neah Bay now since the branches are collected to sell to florists for floral arrangements. Ladies get good money for them. Before this there used to be lots of them” (Croes 1982:5). The commercial harvesting today is large and regulated “and there is a concern that heavy harvesting of these greens will eventually reduce their potential to produce fruit” (Turner 2014b:395; also a recent study on harvesting greens for floral arrangements: Ballard et al. 2022:187–215).

Salal berries were said to be pruned by taking whole branchlets with berry rows in harvesting (Figure 7). For Nuxalk it is reported that 10 berries per branchlet are harvested and about 150 mL are harvested in 8 minutes per person (~1 L/32 minutes per person) (Lepofsky et al. 1985:Table 6; Turner 2014b:169). At that rate Maquina's queen and her group of women (estimated group of ~10 people) could collect 12 bushels (1 bushel per 35 liters, at 1 hour per 2 liters) in 210 hours/10 collectors = 21 hours each, in 2–3 days—about the time periods indicated by Jewitt (1807:18–19).

In terms of enhancing salal berry crops, Turner (2014b:187) indicates “patches tended

by burning (Makah, Nuxalk, other Northwest Coast peoples); harvesting berries by their stems said to increase future productivity (Figure 7); patches 'owned' by chiefs and families or clans (general, Northwest Coast); possibly transplanted (Heilsuk)." Again, tending the patches (often an incipient agriculture reference [Smith 2005]) and ownership is indicated.

Salal Berries (*Gaultheria shallon*) in the Archaeological Context

The archaeological significance of salal berries is now being recorded and should greatly augment the post-contact ethnographies reflecting this berry's great importance. Through new techniques of recovery and different forms of preservation (especially wet sites), we are beginning to recognize the critical part salal berries played in ancient central Northwest Coast diets as suggested above (Table 1).

The oldest wet site on the Northwest Coast to date, Kilgii Gwaay (1325T), southern Haida Gwaii, B.C., Canada, revealed a 10,700-year-old hearth complex and an activity area at the edge of a paleopond (Table 1). The archaeobotanical assemblage yielded several plant macrofossils, including a salmonberry and elderberry processing area, suggesting a seasonal summer occupation. Salal seeds were the third most common berry seed from the hearth activity area, representing 28 seeds. The hearth area was the only portion of the site containing salal seeds (Cohen 2014:iii, 108). The recovery of salal seeds and several other plant food remains in the earliest Northwest Coast Paleo time period vividly demonstrates the potential for finding plant food remains from the wet sites for as long as peoples occupied the post-glaciated, early Holocene Pacific Northwest.

A second example on the lower Fraser at the Barnett and Scowlitz archaeological sites, Turner reports that "huge quantities of seeds of elderberry (*Sambucus* sp.), *Rubus* species (possibly *R. spectabilis*, *R. leucodermis*, or *R. ursinus*), salalberry (*Gaultheria shallon*), and/

or blueberry or huckleberry (*Vaccinium* sp.) were identified from a series of shallow cooking features; apparently the berries were being processed together for winter use" (Lepofsky 2004; Turner 2014a:27) (Table 1).

The biggest contribution to recognizing berries in ancient diets comes from the study of botanical samples from the Ozette wet site (45CA24) (Gill 1983, 2005) (Figure 1, Table 1). As Turner summarizes:

Remains of food found at Ozette included two hazelnut fragments (*Corylus cornuta*) and almost 90,000 red elderberry seeds mixed together in various proportions with over 100,000 salmonberry seeds, suggesting that these two types of berries were mixed, possibly to increase the palatability of elderberries. There were also nearly 250,000 seeds of salal/or its close look-alikes of genus *Vaccinium*, probably evergreen huckleberry (*V. ovatum*). There were also a few wild rose (*Rosa nutkana*) seeds and some smaller *Rubus* (possibly thimbleberry) seeds. (Gill 1983, 2005; Turner 2014a:110) (Figure 1)

Since salal berry seeds are very small (about a mm long), about the size of a sand grain, they can be missed in the general archaeological contexts, including wet sites, unless they are in concentrations (Figure 2). At the 3,000-year-old West Coast Hoko River wet site, they are found in what appears to be human coprolites in the off-shore river waterlogged areas, and visible because of the seed concentrations. In these proposed coprolites, 20% of the *Gaultheria-Vaccinium* seeds were charred, reflecting human processing (Croes 1995:69–70) (Figure 1, Table 1).

At Ozette the concentrations of salal berry seed types, 236,317 seeds, were found in four contiguous 2x2 meter excavation squares (56, 57, 80, and 91) and a separate square (149; producing 99.9% of the *Gaultheria-Vaccinium* seeds), all from middle Unit V exterior midden (Gill 2005:75). Gill further notes that "only 10

ARCHAEOLOGICAL WET SITES INDICATE BERRIES AND ACORNS WERE STAPLE FOODS

Table 1. Wet Site Ages, Prominent Berries, Approximate Counts, and References.

Wet Site	Location	Approx. Age B.P.	Prominent Berry 1	Approx. Count	Prominent Berry 2	Approx. Count	Prominent Berry 3	Approx. Count	Reference
Ozette Village (45CA24)	West Coast, WA	300-400	<i>Gaultheria shallon</i> (salal)	250,000	<i>Sambucus</i> sp. (elderberry)	100,000	<i>Rubus spectabilis</i> (salmonberry)	90,000	Gill 1983, 2005
Hoko River (45CA214)	West Coast, WA	2,600-3,000	<i>Rubus</i> (salmonberry?)	15 (in human (?) corprolites)	<i>Gaultheria shallon?</i> (salal)	10 (in human (?) corprolites; 20% charred)	<i>Prunus (emarginata?)</i> (bittercherry)	10 (in human (?) corprolites)	Croes 1995:68-69
[Non-wet site: Hoko Rockshelter (45CA21) sheltered dry shell midden]	West Coast, WA	150-900	<i>Sambucus racemosa</i> (red elderberry)	601	<i>Rubus parviflorus</i> (thimbleberry)	188	<i>Rubus spectabilis</i> (salmonberry)	26	Ecklund-Johnson 1984; Croes 2005:67-70
Kilgii Gwaay (1325T)	So. Haida Gwaii, B.C.	10,700	<i>Rubus spectabilis</i> (salmonberry)	6,536	<i>Sambucus racemosa</i> (red elderberry)	5,005	<i>Gaultheria shallon</i> (salal)	28 (only seeds in hearth activity area)	Cohen 2014
Scowlitz (DhR16)	Junction of the Harrison and Fraser Rivers B.C.	1,500-3,000	<i>Gaultheria shallon</i> or <i>Vaccinium</i> sp.	“huge quantities; cooking feature” (Lepofsky 2004:403)	<i>Sambucus</i> sp. (elderberry)	“huge quantities; cooking feature” (Lepofsky 2004:403)	<i>Rubus</i> species (possibly <i>R. spectabilis</i> , <i>R. leucodermis</i> , or <i>R. ursinus</i>)	“huge quantities; cooking feature” (Lepofsky 2004:403)	Lepofsky 2004; Turner 2014a:27

of the 240,624 *Gaultheria-Vaccinium* seeds recovered were from House floor middens (four from House 5, six from House 2)” and further:

The reason for this are straight forward. The Makah historically made sun-dried berry cakes of mashed salal berries and, to lesser extent, huckleberries. At least the drying, and probably the mashing, portions of the process would have been conducted outside of the houses. The mashing stage of the cake manufacturing procedure is most likely to produce spillage. Any spillage of the dried cakes in the house would be relatively easy to clean up, and would thus leave little evidence in the house floor midden. (Gill 2005:91)

In detailed analysis of Ozette house floor stratigraphy and housecleaning, Samuels (1991) describes considerable sweeping and cleaning. Croes reports 66 braided cedar bough brushes found in just the House 1 area, reflecting the active cleaning/sweeping processes in houses (Croes 2021:153–155).

This middle Unit V exterior midden area dates to about 400 B.P. (Gill 2005:61–62). Gill believes these concentrations in external middens possibly represent waste material from berry cakes deposited in these locations (Gill 2005:75). In terms of these potential remnants of berry cakes, Gill further points out “the 96,575 *Gaultheria-Vaccinium* seeds from squares 56 and 57 were not associated with the seeds of any other berries,” therefore not mixed with other berries (Gill 2005:75). Further “the 120,000 seeds from square 149 were associated with one seed each of *Rubus spectabilis* and *Sambucus racemose* var. *arborescens*. I believe this to be a casual relationship, however, and not of cultural significance. Thus 91.7% of the *Gaultheria-Vaccinium* seeds were not associated with the salmonberry-elderberry material” (Gill 2005:75).

To calculate what 2.5 million salal seeds actually represents, in terms of numbers of berries, requires a Minimum Number of Indi-

viduals (MNI) procedure, where each berry contains approximately 100 very small, sand grain sized seeds (see Figure 2; so hard to recover archaeologically unless concentrated). Therefore, 2.5 million seeds recovered in concentrations outside Ozette houses actually would represent an MNI of approximately 25,000 berries. These probably represent waste berries, discarded with any stems, as immature or damaged berries, so it would be a considerable number at the location since many more would have been put into the preserved dried cakes. The assumption here is that these waste berries were a very small percentage of the salal berries processed into the actually stored cakes.

The Ozette Village wet site certainly reflects the abundance and significance of salal berries in the diets of this ancient West Coast community. As more wet sites are explored, the importance of dried salal berries as a main source of carbohydrates/sugar through Northwest Coast ancient times will be demonstrated.

A Contrast of Ancient Macroflora Remains in Stratigraphically Inter-linked Wet and Dry Sites and Rockshelters

Two of the wet sites I directed had a stratigraphically inter-linked “dry” site component, with no waterlogging, so these areas were like most sites excavated on the Northwest Coast. The first is Hoko River wet/dry site (45CA214) (Table 1) dating from 2600–3000 B.P. (Croes 1995). The associated dry site had charcoal stains and only lithic preservation (and one carbonized bone artifact), so dry activity areas are very degraded. In this case no seeds or nuts were found in this living area, even in a carbonized condition (Croes 1995). The second site is the *Qwu?gwās* wet/dry site (45TN240) (Table 2) dating later, from 300–750 B.P., and the stratigraphically inter-linked dry shell midden living and food processing area had abundant preserved charcoal, shellfish, and fauna, but virtually no floral remains as found in the inter-linked wet site area (Diedrich and Fullmer 2013:272–278; Mathews 2013:199–204). Therefore, these two

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Table 2. Wet Site Ages, Prominent Nuts (and Tubers/Geophytes), Approximate Counts, and References.

Wet Site	Location	Approx. Age B.P.	Prominent Nut 1	Approx. Count	Prominent Nut 2	Approx. Count	Prominent Root/Tuber (Geophytes)	Approx. Count	Reference
Sunken Village (35MU4)	Portland, OR	150–700	<i>Quercus garryana</i> (acorn)	890; potentially 2,500,000 in the 110 leaching-pits recorded	<i>Corylus cornuta</i> (hazelnut)	502	-	-	Croes et al. 2009
<i>Qwu?gwəs</i> (45TN240)	Olympia, WA	300–750	<i>Quercus garryana</i> (acorn)	2,217	<i>Corylus cornuta</i> (hazelnut)	312	-	-	Croes et al. 2013
Pitt Polder (DhRp-52)	Upper Fraser River Delta, B.C.	3,800	<i>Corylus cornuta</i> (hazelnut)	3,213	-	-	<i>Sagittaria latifolia</i> (wapato)	3,767	Hoffman et al. 2016; Hoffman 2017

sites demonstrate the preservation of floral remains in their wet site areas, but zero preservation in their stratigraphically inter-linked dry site living areas.

A third site I directed was the “dry” and ~3 m deep shell midden site in a sheltered setting, the Hoko Rockshelter (45CA21) (Table 1) (Croes 2005). We did find relatively small amounts of preserved seeds, both charred and uncharred (Ecklund-Johnson 1984), possibly because the site is in a rockshelter and better protected from the elements than most Northwest Coast shellmiddens. Red elderberries were the dominant seed (Table 1), and as Ecklund-Johnson (1984:71) points out, these relatively large seeds ethnographically were often spit out when the berry was eaten, possibly resulting in their higher numbers in the site.

Acorns (*Quercus garryana*) in the Ethnographic Context

Though not referenced as a food source in *Keeping it Living* (Deur and Turner 2005), Erna Gunther did recognize it much earlier in her *Ethnobotany of Western Washington* (1973 [1945]:27–28) as follows:

Quercus garryana Dougl. Oak (Figure 8).

The oak occurs in this area only where there is open prairie country.

Chehalis *sk'wi'sl; skEkslaloX,*
 little oak; *kiloi*, little
 leaves

Cowlitz *ts' u'nips*

Klallam *q'aput*

Squaxin *tca'dzats*

Food

The Nisqually, Chehalis, Cowlitz, and Squaxin, who live in sections where oak trees are most numerous, use the acorn as food, but in the true evergreen forest area that is an unknown dish. The Chehalis roast acorns in the fire. Acorns are

stored in baskets of young maple bark and buried in mud of a slough all winter. In the spring when they are taken out to eat, they look as though they were spoiled, but they are delicious. The Cowlitz bury acorns in the mud to leach them. The Squaxin roast them on hot rocks. The Klallam eat the acorn as a nut without preparation. The Quinault never use them as food. Since they are eaten in such small quantities, the amount of tannic acid in them is not dangerous, and the elaborate leaching process used in northwest California, where the acorn is a basic food, is not necessary (Gunther 1973 [1945]:27–28).

Acorns (*Quercus garryana*) in the Archaeological Context

Sunken Village Wet Site (35MU4)

As mentioned, Turner does give reference to acorns as a Northwest Coast food source in her two volume set, *Ancient Pathways, Ancestral Knowledge, Ethnobotany and Ecological Wisdom of Indigenous Peoples of Northwestern North America* (2014a, 2014b), with most referencing given to the recently excavated over 100 acorn leaching pits from the Sunken Village archaeological wet site, Sauvie Island, Portland, Oregon (35MU4) (Croes et al. 2009) (Figure 1, Figure 9). As the largest acorn pit leaching archaeological site anywhere along the entire West Coast of North America (including Oregon/California), this wet site certainly reflects the importance of this food on the central Northwest Coast of North America (Figure 9).

With this developed identification skill, the archaeological crew that explored Sunken Village for two summer seasons began to recognize, in their continuing excavations, the significant abundance of acorns at the *Qwu?gwās* wet site (45TN240) on southern Puget Sound (previously acorns were not identified correctly, mistakenly described as Douglas fir cone scales) (Figure 1, Figure 13).

To not fully repeat the excellent characterization of Sunken Village's 114 acorn leaching pits documented and mapped in the published final



Figure 8. (Left) Example of Oregon white oak tree (*Quercus garryana*) in an open prairie/parkland; (right) Oregon white oak acorns in the tree with some already fallen leaving their caps (Ecological Landscape Alliance).

report, the summary from this volume describes the site as in Portland, Oregon, “on Sauvie Island, where a major aquifer pumps under the natural levee into Multnomah Channel, providing a unique 125 m wide beach area where acorns placed in shallow hemlock bough-lined pits were leached in huge numbers by ancient Multnomah Peoples” (Croes et al. 2009:15; Mathews 2009a, 2009b) (Figure 9, Figure 10). Dr. Curt Peterson’s Portland State University student, Fiona Seifert, conducted tests on parts of this Sunken Village aquifer and found the water flow in the aquifer seepage to be 5 ml/second (5 gallons/hour) (Figure 10). Also the dissolved oxygen in the aquifer seepage measured 2.8 parts per million (ppm) versus the surface and adjacent river water content of 10.1 ppm, demonstrating the low oxygen leading to preservation of wood and fiber in this wet site (Croes et al. 2009:192–193).

Mathews, based on a calculated volume of a cross-sectioned pit, estimates that they would contain an: “estimate of 25,000 acorns per pit, and [with] a minimum of 100 pits, there may have been approximately 2,500,000 acorns being processed at the site every winter, if these pits were filled annually” (Mathews 2009a:92, 2009b:134–135) (Figure 11).

Further it is important to characterize the natural cycles of Oregon white oak tree production of acorns:

large crops are produced once every three years on the Oregon white oak, followed by a year of moderate production, and a year of crop failure before the bumper crop year returns so not a consistent annual yield (Peter and Harrington 2002:198). One study showed that Oregon white oaks in the Willamette Valley can produce up to 1737 kilograms of acorns per hectare (Stein 1990:657). The average mature acorn from *Q. garryana* weighs 5.35 grams (Young 1992:292) meaning that about 325,000 acorns can be collected from a hectare of Oregon white grove in the Willamette Valley south of Sauvie Island, which means that less than eight hectares of oak would have to be collected to fill those pits during bumper years. (Mathews 2009a:92–93)

In reviewing acorn nutrition, it was estimated that *Q. garryana* acorns contained 23.75

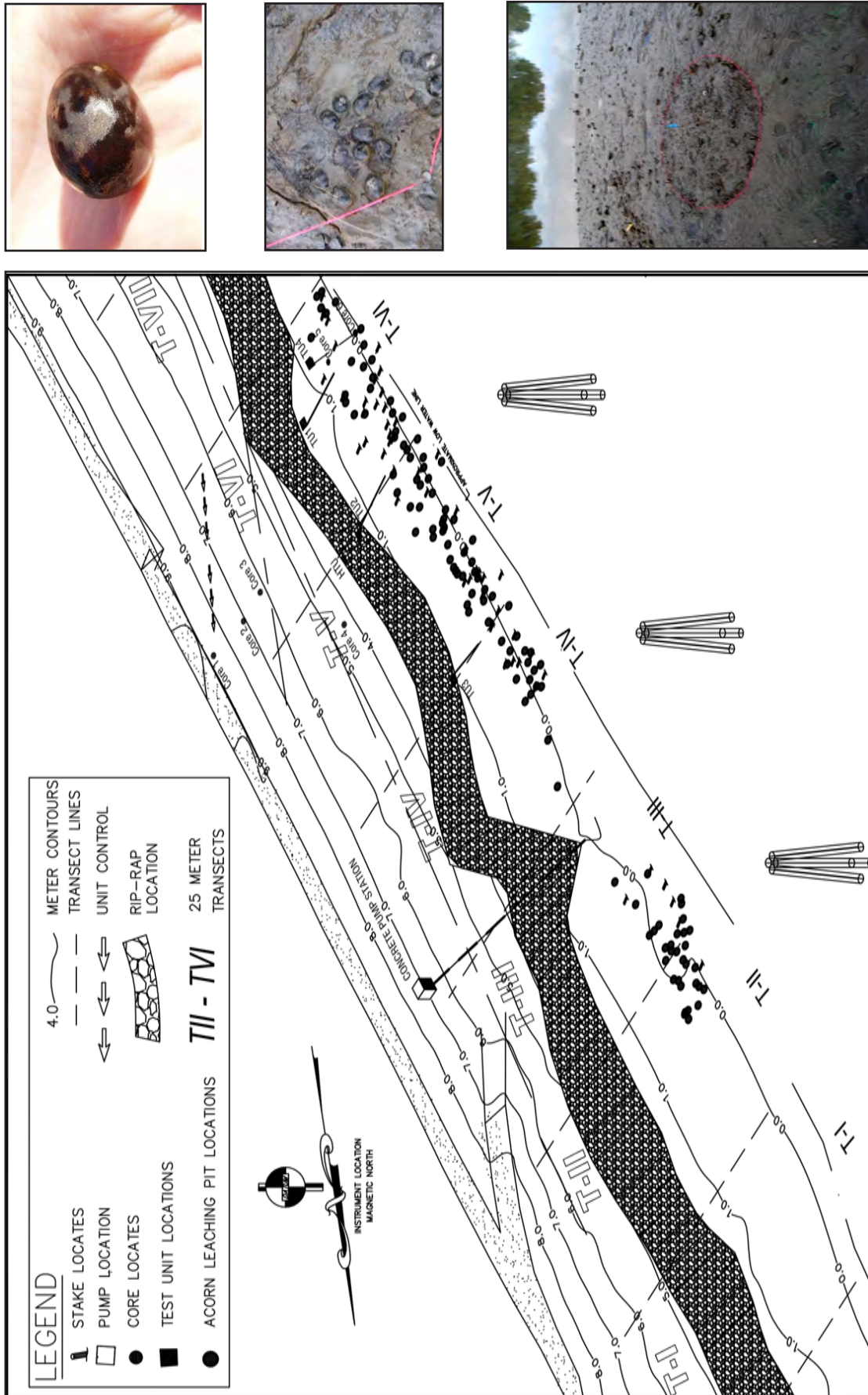


Figure 9. 3-D perspective of the acorn leaching pits and wooden stakes along intertidal beach divided into 25 meter Transects I-VI. Map shows wooden pilings (dolphins) for log rafts and the rip rap placed on the steep bank of site. Accompanying images show surface outline of a pit and acorn remains. (Map by Michael Martin, Computer Aided Design [CAD], South Puget Sound Community College [SPSCC]; Croes et al. 2009:40–47.)

ARCHAEOLOGICAL WET SITES INDICATE BERRIES AND ACORNS WERE STAPLE FOODS

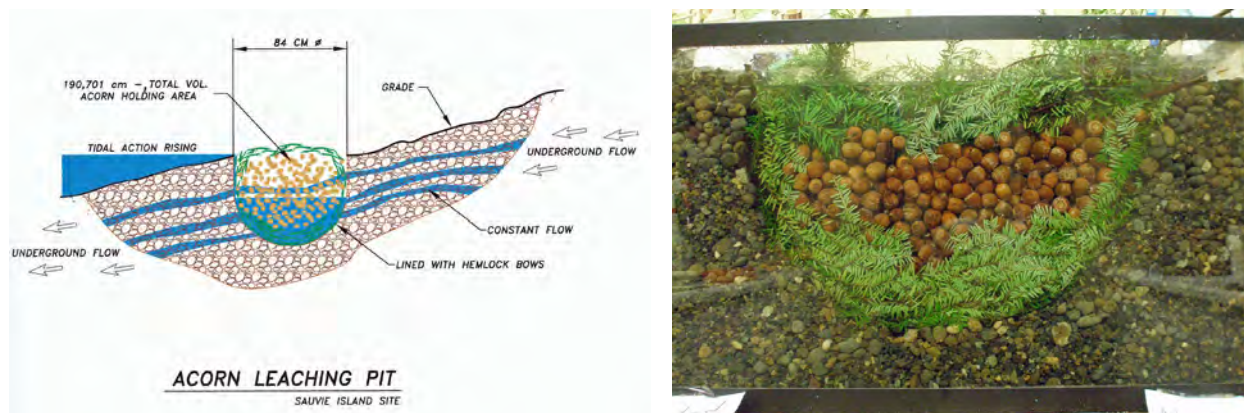


Figure 10. (Left) Schematic diagram of acorn leaching pit, showing aquifer pumping water through the acorns in the pits (drawing by Professor Michael Martin, CAD, SPSCC); (right) experimental acorn-leaching pit; a half-pit constructed in a fish aquarium, lined with hemlock boughs and filled with acorns. Water was pumped through the model for five months, to remove tannic acid from acorns and were edible following experiment (Tyler Graham, experimental archaeologist; Croes et al. 2009:196, 216).

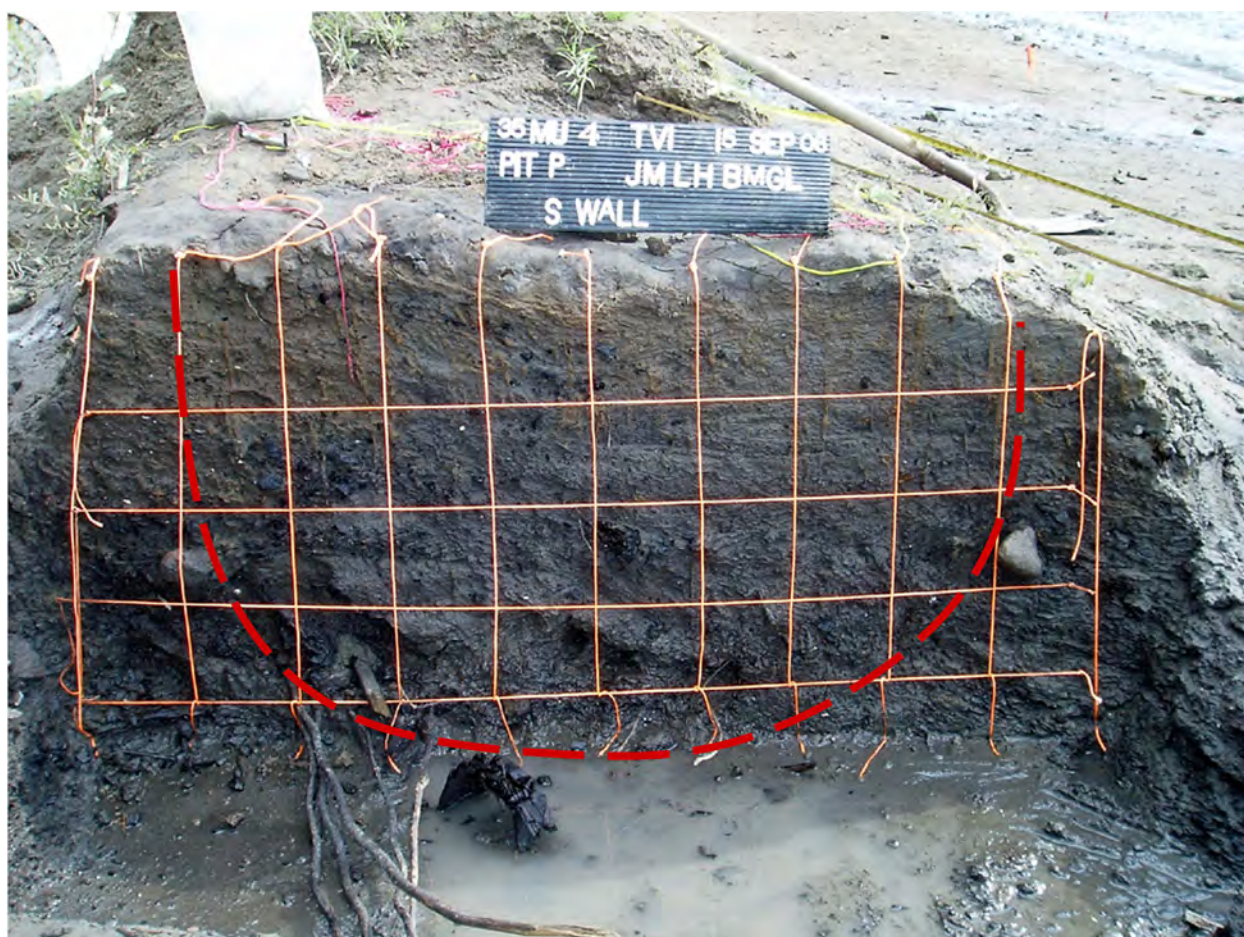


Figure 11. The volume of the leaching pits was calculated using Pit P in Transect VI as a model (grid 10 cm sq). Note the hemlock bough lining near base and rocks to either side of outer edges, which help to define the pit boundaries (Croes et al. 2009:91).

calories each when consumed raw. Mathews further states:

If the site has 2.5 million acorns leaching for use every year, these leaching pits on Sauvie Island could provide over 59 million calories to the group or groups who owned them. About seventy percent of the Oregon white oak acorn's nutrition is in the form of carbohydrates (Bainbridge 1986:2), which people in the area might have had a great need for it in the winter months when the acorns might have been retrieved from pits after leaching for as much as a year. (Mathews 2009a:93)

The Mono Indians of California, a group that depended on acorns as a staple throughout the year consuming an estimated 39 acorns a day, meaning every individual consumed 14,250 acorns annually, are used as a comparison for maximum acorn use. With 2.5 million acorns potentially available at Sunken Village leaching pits, and if they depended on it as a staple food to the extent the Mono did, these resources, at a minimum, could support 175 individuals. Since Mathews believes the Sauvie Island peoples may have been dependent on wapato as a carbohydrate source more than acorns (though it should be pointed out that no wapato was found in excavations; see wet site with wapato, below), and the leached acorns may have been a major trade commodity, so the sources of carbohydrates at this location may well support a much larger population, especially in the spring when the acorns were sweet/leached and historically larger numbers of people came to the area for spring foods becoming abundant in this area (Mathews 2009a:93–94).

Once acorns were placed and covered in the over 100 acorn leaching pits at Sunken Village, they were often marked with a stake (40 wooden stakes found) so that after the fall/winter silting in, they could be re-located for recovery (Figure 9). Probably a major concern is protecting these leaching pits over the fall/

winter from predators and possibly other people. The site appears to have a shelter built on the top of the natural levee, and one can easily imagine sentries watching over this valuable asset, especially over nights when animals such as racoons (often in Chinook stories where they try to get grandma's acorns from her storage pit) would be attracted to this large source of foods (Croes et al. 2009:192). We found a number of projectile points on the beach, possibly shot at predators who came onto the area (Croes et al. 2009:176–184).

As emphasized to us by California archaeological researcher, Wendy N. Pierce (Archaeological Research Center, Institute of Archaeology and Cultural Studies, California State University, Sacramento), who is familiar with both passive and aggressive acorn leaching, even with water moving through the acorns, it takes from four–five months for them to become completely sweet or tannic acid-reduced (Pierce, pers. comm., 2006). Ground-water flow is therefore essential, and the fact that aquifers only pump through this 125 m section of the beach was certainly noticed by the ancient Multnomah people. The fact that this is a protected slough with low discharge also provides the ideal mud cap (Figure 9) for processing pits that are thus less likely to erode. The aquifer movement through the hemlock needles and acorns would eventually and effectively remove the tannic acid. Some pits were marked on their south side with a wooden stake and no doubt capped with a layer of boughs and matrix (Figure 10).

As mentioned, it is thought that the Sunken Village site is the largest passive acorn leaching pit site so far identified along the West Coast of North America. Pits have been recorded in California, but only a few at a time—certainly not an entire beach covered with over 100 pits capable of containing millions of acorns. Not only does this level of processing acorn have important implications for Northwest Coast researchers, but it is equally significant to researchers in California, where the heart of acorn subsistence exists along the North American

Pacific Coast. Arguably this facility for passive acorn leaching in bulk, and possibly others in the Portland Basin area, helped sustain what is often considered the highest population density north of Mexico (Darby 2005:194). It may be that the acorn processing technologies spread south from here, rather than in the opposite direction, enhancing acorn use throughout Oregon and perhaps parts of California.

The technique of passive leaching is remembered in Northwest Tribes today: “the Siletz of western Oregon call acorns that are leached in stream banks for several months to a year ‘tuxa’, and acorns are still gathered, stored, and eaten by people living there” (Bud Lane, pers. comm., 2007). Siletz, Grand Ronde, and Warm Springs Tribal members often speak of acorns mashed and used as a common soup or stew stock with meals.

In summary, this National Historic Landmark site seems to have functioned for several centuries as a place where people exploited ideal conditions for acorn leaching. Sunken Village (35MU4) certainly adds a unique new dimension to our understanding of Northwest Coast subsistence practices, resource intensification, probable ownership and management of oak grooves and acorn leaching pits, predicted surplus production for trade, and the importance of plant foods in an area best known for its fisheries focus. All these practices were argued for wapato in the Portland Basin (“Wapato Valley”) by Melissa Darby (2005). Wapato was not found at the Sunken Village wet site, suggesting the main focus of the site was using the 125 meters of aquifer ground waters for the acorn leaching opportunity (Croes et al. 2009:186–187).

If we combine the dual potential of wapato and acorn for this unique region, the influence of the Chinookan peoples throughout the Northwest Coast and beyond becomes easier to explain. Unlike wapato, however, acorns require months of oversight while they leach. This considerable labor probably reflects a unique value attached to acorns as a product worth the time and energy to process; perhaps

as a delicacy of considerable value in trade as well as consumption. The Multnomah family or families owning this particular prime section of aquifer leaching beach would have greatly enhanced their wealth through exchange of this high-cost food. Trade is a particularly well-developed and recorded activity amongst the Chinookan peoples.

Actual Root/Tuber (Geophytes) Plant Foods in Wet and Dry Sites in the Northwest

Though we mostly consider Northwest Coast wet site berry and nut plant foods here, we need to note a highly important wet site on the upper Fraser River delta that additionally demonstrates the actual preservation of wapato root plant food tubers along with evidence of enhanced “gardening” to aid in harvesting these important geophyte resources as a major component of the diet (Pitt Polder [DhRp-52]) (Table 2) (Hoffman et al. 2016; Hoffman 2017). A submerged rock pavement measuring 42 sq m was found consisting of tightly-packed, thermally-altered rocks/and some smooth cobbles, one rock course thick. Wet site excavations recovered approximately 3,800 wapato specimens on this wetland garden (Table 2) (Hoffman et al. 2016; Hoffman 2017).

Another highly important geophyte resource to Native peoples of the Northwest are camas (*Camassia* spp.) bulbs usually recognized archaeologically through large earthen roasting oven features, with occasional carbonized bulbs preserved (Thoms 1989; Prentiss et al. 2007; Prentiss and Kuijt 2012; Lyons and Ritchie 2017; Lyons et al. 2018, 2021). Though none appear to be preserved in wet sites, undoubtedly these, and other eatable tubers, will be seen from preserved waterlogged deposits as more wet sites are explored in the Northwest (Croes 2023).

Qwu?gwās Wet Site (45TN240)

As mentioned, once we became thoroughly introduced to acorn remains at the Sunken Village wet site, we then began to recognize their importance at the south Puget Sound

Qwu?gwās wet site (45TN240) that the same crews had been excavating for five summer seasons. This was a true case of “You don’t see the thing because you don’t know how to look” (Smith 2005:37). After two seasons at Sunken Village, we knew “how to look,” and realized the importance of acorn remains as a source of carbohydrates at the *Qwu?gwās* wet site (Figure 1, Figure 12, Table 2). Prior to this we saw them, but considered them Douglas fir cone scales, a common macroflora in the site (Figure 13). Without a doubt, this not seeing them possibly has happen at other excavated wet sites along the Northwest Coast, especially in the Central Coast, and the macroflora remains should be re-checked for acorns.

From 1999–2005 we believed that plant food processing was minimal at the *Qwu?gwās* shellfish processing camp, with scattered hazelnuts (*Corylus cornuta*) being the most common plant food represented (Table 2). Following Sunken Village work, we began tabulating and comparing the abundance of acorns and hazelnuts (Figure 14) and readily concluded that acorns were an important plant food at 45TN240 and that hazelnuts were consumed regularly, but probably processed as needed/wanted, based on the distribution patterns in the intertidal midden (Mathews 2013:288–294; also note the importance of hazelnuts at the Pitt Polder wet site, Table 2; an additional reference on use of hazelnuts in the Northwest is: Armstrong et al. 2018).

Distribution of Salal and Acorn Food Products

Paleoclimatologists have long suspected that the “middle Holocene,” a period roughly from 7,000 to 5,000 years ago, was warmer than the present day. We have used terms like the Altithermal or Hypsithermal or Climatic Optimum to refer to this warm period that marked the middle of the current interglacial period. Though these terms are somewhat obsolete, it’s clear the mid-Holocene, roughly 6,000 years

ago, was generally warmer than today during summer in the Northern Hemisphere. Surely this affected the distribution of salal and Garry oak in the Northwest Coast region, likely expanding oak savannas and possibly reducing or moving to higher elevations concentrations of salal foliage (Figure 15).

Probably this was a period of significantly increased acorn use, during the Old Cordilleran-Olcott/ St. Mungo Periods (9,000–4,000 years ago), possibly similar to rates of ethnographic California usage, including up further into the central corridor of the central Northwest Coast, impacting their overall ancient subsistence patterns during these formative periods.

Actual stone and bone artifacts that may reflect acorn grinding are not present from the Old-Cordilleran/St. Mungo Phases, and become present following these periods on the central Northwest Coast in the Locarno Beach and Marpole Phases—3,250–1,500 years ago with the appearance of hand stones (mullers) and grinding slabs (Mitchell 1971, 1990; Ames and Maschner 1999:103–104). Possibly this reflects earlier Old Cordilleran/St. Mungo passive leaching in pits by aquifers as seen at Sunken Village when oaks were more abundant versus aggressive acorn leaching by grinding and water leaching as seen in California sites and possibly in Locarno Beach and Marpole sites (Ames and Maschner 1999:103–104; Croes et al. 2009:194). One contradiction is the hand stones and grinding slabs found at the classic Locarno Beach phase site of Hoko River (45CA213) (Croes 1995:222), well out on the West Coast where oak trees would not be anywhere nearby. At Hoko we concluded these hand stones and stone “bowls” were used to grind the common fern rhizomes in the wet site layers into flour to make cakes or bread, as seen ethnographically (Norton 1979:392). Therefore, it is likely that these hand stones and grinding slabs were used for a number of plants in the Gulf of Georgia region, including fern rhizomes, and possibly acorns. Interestingly Gunther records passive leaching of acorns in wet/mud pits for groups

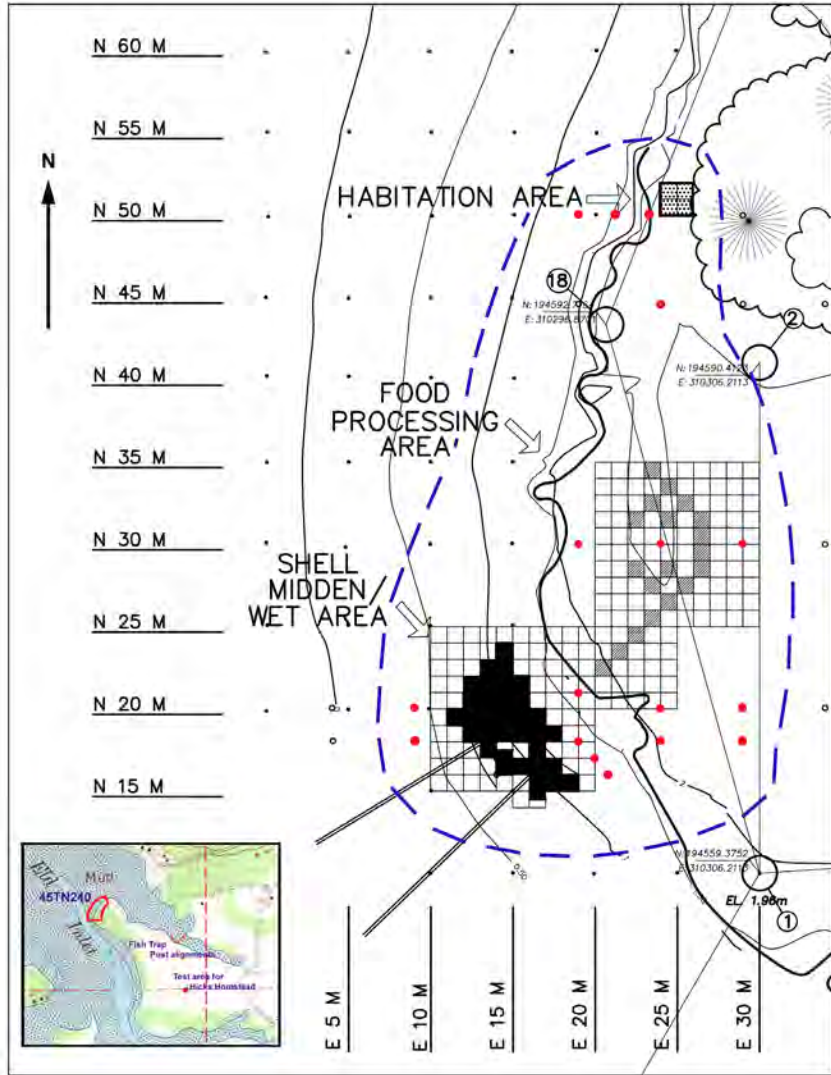


Figure 12. (Top) Map showing the overall grid established by SPSCC CAD program and the auger locations for defining the *Qwu?gwās* site in 1999 (circles on grid in red [filled] show where midden was encountered). Black squares are the preserved shell midden wet site. Dashed line shows predicted site midden area; (bottom) 2006 intertidal shell-midden showing log exposed in the furthest square and the vegetal mat stratigraphy showing the slowing edge of an ancient channel. Also to the left, by the photo board, is the 1 meter wide mouth of an open weave basketry mouth made of cedar bough extending into the next square (Croes et al. 2013).





Figure 13. Example of typical macroflora assemblage, including acorns and hazelnuts. *Corylus cornuta* (C) shells at top, *Quercus garryana* (Q) shells at center right, *Pseudotsuga menziesii* (P) cone scales in center (Mathews 2013:288–294).

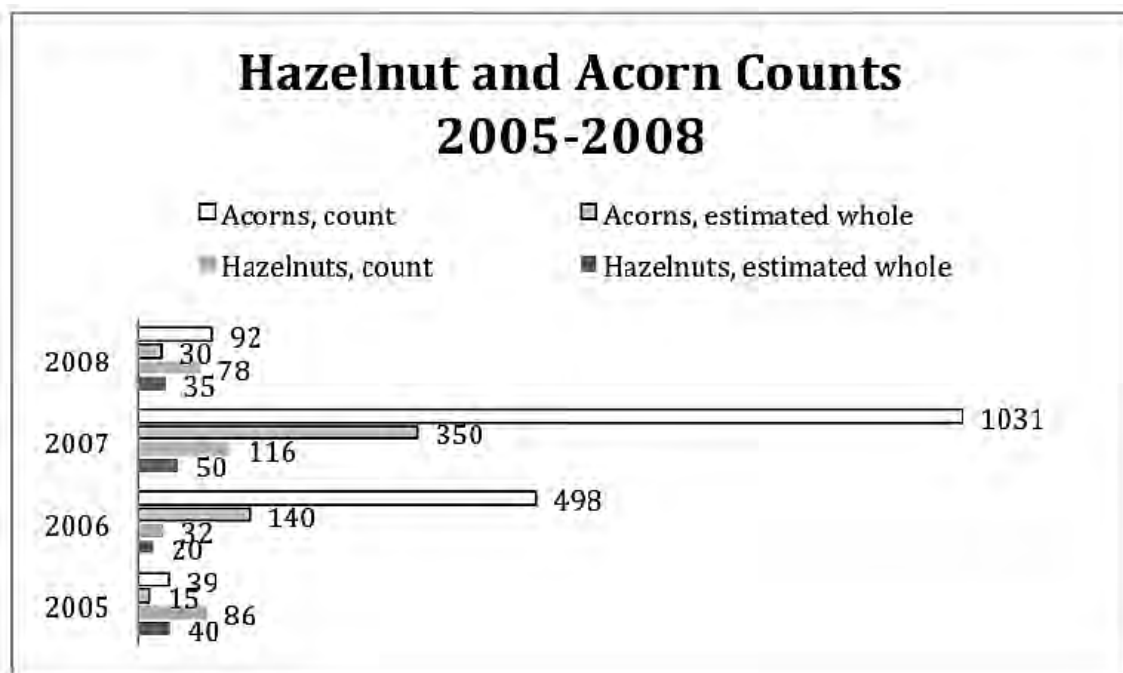


Figure 14. Counts of *Quercus garryana* (acorns) and *Corylus cornuta* (hazelnuts) from the *Qwu?gwəs* wet site, southern Puget Sound 2005–2008 (Mathews 2013:288–294) (Table 2).

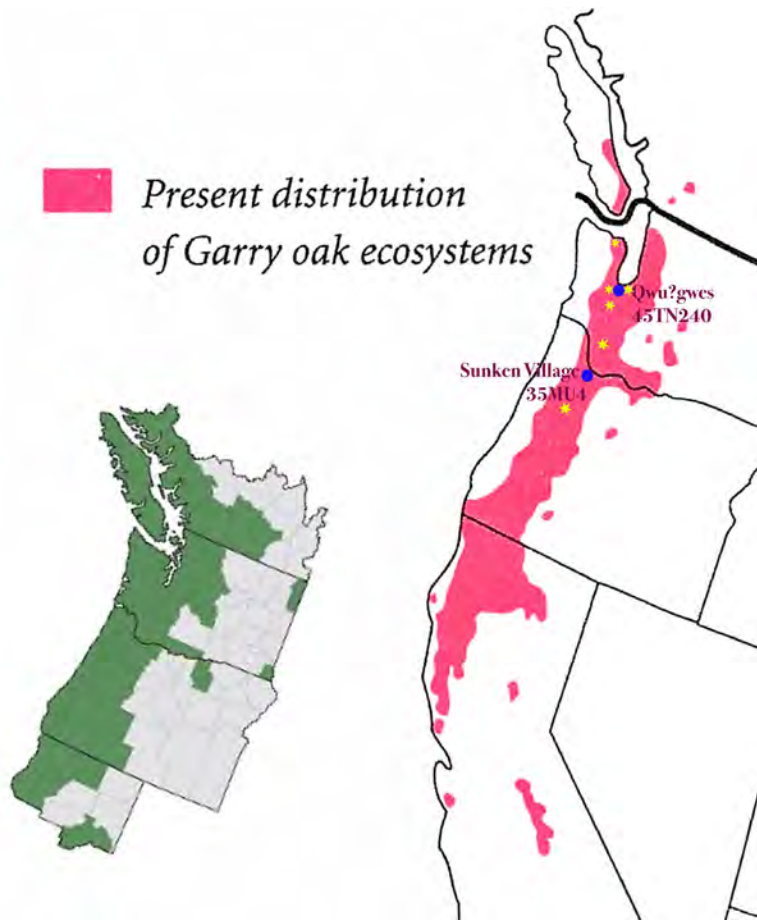


Figure 15. Distribution of salal (left, Native Plants PNW 2015) and Oregon white/Garry oak (right, Province of British Columbia, Ministry of Environment 1993) on the current Northwest Coast of North America. The two wet sites with abundant acorn remains are shown, as well as stars where ethnographic use is indicated. In the middle Holocene oak savannas/parklands probably expanded north and south along this corridor and west down river valleys and the Strait of Juan de Fuca.

in the central Northwest Coast into historic periods (1973 [1945]:27–28). Future wet sites from these areas and time periods should bear that possibility out.

Following 3,000 years ago, the salal and oak ecosystem became similar to what they are today. From the present distribution map of the Garry oak ecosystem we can see the positions of the current Northwest Coast wet sites with an abundance of acorn remains, as well as denote the ethnographic recording on their use (Figure 15). One can easily see that the middle Holocene distribution may have extended north, but still would have been confined in the corridor between the Coastal Ranges and the Cascade Ranges, possibly extending west well down the Columbia and Chehalis drainages and along the Strait of Juan de Fuca.

Since access to Garry oak may still have been limited along the West Coast, except through

trade, these populations probably had to still heavily depend on salal for a major source of carbohydrates/sugar.

Enhancing Salal and Acorn Plant Food Production

As mentioned above, Turner and others discuss pruning and tending salal bushes while harvesting them by their stems (Figure 2, Figure 7). Several references speak to particular, and probably owned, patches that produce the most abundant and largest berries.

Turner and others also discuss burning oak savannas/parklands to enhance blue camas (*Camassia quamash*) production around these areas, and no mention of efforts to enhance actual acorn production, though they do point out that these burns do not cause damage to the oak trees themselves. In California, Tribes do attribute burning

to reduce competition for acorns, especially insect predators (Anderson 2007; Halpern et al. 2022). The burning on the central Northwest Coast would aim to eliminate damage done by acorn weevils (*Curculio occidentis*) and the Filbert worm/moth (*Cydia latiferreana*) (Figure 16). Both these insects over-winter in the soil as larvae and pupate in the spring (Waller 2006:8–9). Therefore, burning of the leaf mats under oak trees would be best in the fall and spring to reduce/kill off these insect predators, and also enhance the camas grounds.

Protection or Domestication

Much ink has been spilled on discussing whether Northwest Coast peoples practiced forms of plant cultivation/protection and even plant domestication (e.g., Lyons et al. 2021; though more behavioral domestication). Clearly actions were taken to enhance plant production (even

gardening) and certainly steps to protect crops (e.g., burning) and guarding leaching/storage pits from predators.

If one wanted to declare full-blown domestication in this part of the Northwest Coast, one only has to look at animals, not plants. From archaeological and ethnographic research, a breed of dog was separated and bred for its hair quality in large numbers, the wool dog. This practice is often called animal husbandry when referring to complex agricultural societies, a term that is patronizing as it could easily be wifery, since a central Northwest Coast woman's wealth was certainly somewhat calculated by the number of hair dogs she maintained for making the wealth/currency, woolen blankets on true Coast Salish looms (Croes 2014, 2015a).

From archaeological research, this distinct hair dog has been carefully bred separately from



Figure 16. (Upper row) Acorn weevil, larva in acorn, and hole as larva leaves the nut (Louisiana State University, Bugwood.org); (lower row left) the Filbert worm/moth that also lays eggs in acorn nut for nutrients while growing (Oregon State University, Oregon IPM Center); (lower row right) controlled burnings by Native peoples that would disrupt the life cycle of both predator insects (KarubBannerImage, Weather Nation Mets 2018).

the village/common dog for over a thousand years, as also reflected by the spindle whorls found for at least this period of time to make the yarn for blanket weaving (Croes 2014, 2015a). In a sense the debates over whether Northwest Coast people were tending plants and animals, as done in incipient agriculture, is easily answered for animals with the genetic engineering of a source of wool to make their wealth/blankets for a significantly long, yet to be determined, ancient history. (Note: only two places on the entire American continents demonstrate that animals were domesticated for their hair quality for yarn/blankets; the other being the highly complex agricultural societies/civilizations where they breed alpacas for their hair quality in Peru [Croes 2014, 2015a].) I also would claim that similar knowledge and practices of tending salal patches, Garry oak trees, gardens for wapato, and burning to enhance camas and acorn production has a critically important and deep rooted history.

Conclusion

At the six wet sites discussed here, even from 10,700 years ago, we have a waterlogged environment preserving berry seeds, nut remnants, and wapato gardens, among other wood and fiber resources. Therefore, wet sites are important opportunities to identify parts of ancient diets that might otherwise be underrepresented or completely absent. In “dry” midden sites, there is usually scarce evidence of their significance to ancient diets. Unfortunately, so far, few wet/waterlogged sites have been excavated on the Northwest Coast, and even fewer have involved thorough archaeobotanical research (Mathews and Keener 2010; Croes 2023). The plant foods identified in the six wet sites explored here likely do not represent particularly unique local traditions, but are probably representative of a much larger, though underrepresented, regional resource-use pattern from the earliest time periods. I hope, in the coming future, it will be better revealed through expanded wet site explorations on the Northwest Coast of North America (Croes 2023).

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ABOUT THE AUTHOR

Dale R. Croes received his B.A. in anthropology from the University of Washington (UW). He did his Ph.D. dissertation research on basketry and cordage artifacts from the Ozette Village wet site (Croes 2019, 2021); conducted post-doctoral research with the Makah Tribal Nation at the Hoko River wet site (Croes 1995) and Hoko Rockshelter shell midden (Croes 2005); directed the first-ever archaeological excavations at the National Historic Landmark wet site of Sunken Village with the Confederated Tribes of Siletz Indians, Confederated Tribes of Grand Ronde, and the Confederated Tribes of the Warm Springs Indians (Croes et al. 2009); and co-directed excavations of the *Qwu?gwəs* wet and dry site with the Squaxin Island Tribe (Croes et al. 2013). As seen above Croes is a Northwest wet archaeological site specialist who encourages others to pursue investigating these well-preserved archaeological sites, where approximately 90% of the ancient material culture is preserved (Croes 2023). In retirement he is working with Ed Carriere, Suquamish Elder and Master Basketmaker, and they together wrote *Re-Awakening Ancient Salish Sea Basketry, Fifty Years of Basketry Studies in Culture and Science, Memoir 15, Journal of Northwest Anthropology* (Carriere and Croes 2018). This book highlights their work analyzing and replicating 2,000-year-old Biderbost wet site basketry housed at the UW Burke Museum. They define this work as a new approach called Generationally-Linked Archaeology (Croes et al. 2018). To review the above references and others by Dale Croes, please follow this link: <https://wsu.academia.edu/DaleCroes>. In large part from Ed Carriere's work in replicating archaeological baskets from Northwest museums, he was awarded a national Community Spirit Award (2022) from the Native American-based First Peoples Fund program: <https://www.firstpeoplesfund.org/2022-fellows>. Recently Carriere was awarded a National Endowment for the Arts (NEA) 2023 National Heritage Fellowship. And, on the science side, Croes and Carriere received the Society for American Archaeology (SAA) 2023 Award for Excellence in Archaeological Analysis. These awards demonstrate that the synergy of science and culture produces much more together than separately.

Edmond Meany's Linguistics Suspicions

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Abstract *Careless, silly, trivial, and incompetent is how T.T. Waterman, Ph.D., described the extensive place name work of Edmond Meany, M.A., mainstay of the University of Washington, Seattle, and Washington politics. Among Meany's own papers is this handwritten speech probably intended for local (men's) civic clubs advocating a misguided program for recording local Native languages, even as he misconstrues the skillful work of university scholars like Franz Boas at Columbia and others at Berkeley like Pliny Earle Goddard. Meany's foil throughout is the very first linguistic anthropology class at UW taught by John Peabody Harrington (The Science of Language, 17 June to 15 August, Kinkade and Seaburg 1991). T.T. Waterman followed Harrington some years later for several years of full-time teaching and research. After Waterman left UW, he publicly mocked in print Meany's work (see Appendix), and in revenge Meany effectively blocked any publication of Waterman's extensive and accurate place name study, which had been funded by the state (Hilbert, Miller, and Zahir 2022).*

Keywords

Linguistics, phonemics, place names, Edmond Meany, Pliny Earle Goddard, John Peabody Harrington, Thomas T. Waterman.

Introduction

Ironically, our only known report of the very first University of Washington (UW) anthropology class (and indeed the first in the entire Northwest), comes from deeply suspicious Edmond Meany (1862–1935), the embodiment of UW for decades (Frykman 1998).¹ He grew up in Seattle after his father drowned during the brief Skagit River Gold Rush, and supported his demanding mother and sickly wife at a variety of tasks, including delivering newspapers that led to becoming a sometime journalist. In 1905 he visited and reported on each reservation in Washington, relying, as he notes, on Chinuk Wawa jargon and boarding school graduates,

though his articles are steeped in white settler privilege, and patronizing paternalism.

His pedigree was a 1901 M.A. from Wisconsin (on Chief Joseph) from Frontier historian Frederick Jackson Turner, who declared the end of the U.S. Frontier in 1890 and famously moved on to Harvard in 1910. Wisconsin Historical Society, also in Madison, was the bastion of Lyman Draper, who wrote little and instead amassed interviews and documents of key figures in Midwest history. Meany likewise gathered materials, particularly documents stored from under the dome of the Olympia capitol while he served as an elected official. Meany's own papers were retained by his family, later donated to UW by his son Ned, headmaster at an eastern boarding school.

¹ Though Meany's papers are at UW Special Collections, his biography was written and published at "rival" Washington State University in keeping with its greater interest with the Evergreen State itself.

On these carefully handwritten legal size pages, Meany, as local talent, is unaware that the English alphabet is wholly inadequate for recording other languages, already well exemplified by the local work of New Yorker George Gibbs (Northwest resident, 1849–1860), who developed his own nuanced alphabet, and especially visiting Franz Boas and his students, using a modified International Phonetic Alphabet (IPA), developed in France. Meany was the perfect “company man,” starting and continuing UW annual traditions, the famous Mountaineers, the Alaska Yukon Pacific exposition, and he was editor of *Pacific Northwest Quarterly* (PNQ) for decades. In Seattle, especially the University District, his name adorns or has adorned a hotel, arts building, and classroom. His grave is among Seattle Pioneers and near Bruce Lee and son, but his family home beside the campus was not saved when the University Bridge was built.

The document below is undated in his UW files, but internal evidence citing Goddard 1912 establishes that date, and its fair copy suggests it was a speech delivered to local civic and social clubs. {Additions in curved brackets add details, updates, comments, or clarifications.} [Commentary in square brackets divides up his text.] <Angle brackets designate page numbers.>

Opportunities for Linguistic Research among the Indians of the State of Washington

Edmond Meany

This is a field in which comparatively little scientific work has been done. The opportunities for linguistic research among the Indians of the State of Washington are therefore numerous and, moreover, the work presents attractive and valuable phases. At the present time there are two important facts that facilitate an approach to such studies. In the first place, the State of Washington is in the zone of the Chinook Jargon {Chinuk Wawa}. That jargon is easily acquired by any earnest investigator and with it he can converse readily with any of the numerous

tribes. In the next place there is scarcely a single tribe that does not number in its thinning living remnants one or more who have been away to school attaining a skill, which, with patience, can usually be turned to good account for interpreting {interpreting}. The field is wide; the opportunities are ripe. In this connection the new investigator should be warned on two points. The Indians of this State, as of other localities, are quick in response to sincerity. They also love a joke. Before beginning researches the worker should get all possible information well in hand, such as a history of the tribe and of its treaties. With such information and with sincerity he will soon find the way to genuine progress. Unfortunately, the photographers and others have established the custom of paying the Indians sums often out of all proportion to the services rendered. The question of such payments will probably confront investigators from this time on.

[Meany's warnings about Native humor are well taken, then as now, but his criticism of photographers would not have included Edward Curtis, with whom he sometimes worked closely, especially among Lakota. His fallback references were official government reports, not yet updated and improved by university-trained scholars. Today, many of these language labels proposed by JW Powell are still in use.]

The annual *Report of the Bureau of Ethnology* for 1885–1886 contains a valuable treatise by Major JW Powell on the Linguistic Stocks of American Indians North <2> of Mexico. It is accompanied by a map which shows the relative areas occupied by the several stocks. Of these there are 58 in all. The majority of these, or 32 of the stocks, are on the Pacific Coast, a wonderful grouping being shown for the shore lands of California. This condition has given rise to much conjecture about possible periods of contact with peoples from lands beyond the sea. The State of Washington is credited with seven linguistic stocks distributed as follows: Salishan, embracing nearly the entire State; Shahaptian {Sahaptian}, east of the Cascades and south of

Snake River; Wailatpuan, an island-like area around Walla Walla; Athapascan, another island-like region on both banks of the lower Cowlitz river; Chinookan, along the banks of the Columbia River from its mouth back to the Cascade Mountains; Chimakuan, two small island-like areas, one near Port Townsend and the other at the mouth of the Quillayute River on the Ocean beach; Wakashan {Nootkan}, a small group at Cape Flattery and Neah Bay, seemingly, an overflow from the larger area of that stock on Vancouver Island and the mainland of British Columbia.

Within these seven stocks there were, of course, many tribes. These had dialects often so different as to be unintelligible to tribes of the same stock. I do not know what means they had of communicating with other tribes in the old times but I have on occasions observed them employing interpreters among themselves or using Chinook Jargon.

The tribes of Western Washington and especially those living on the shores of Puget Sound or the Ocean were wonderfully expert with the canoe. Those of Eastern Washington had horses. As nearly as can be estimated they had been using these animals <3> for about one hundred and fifty years when the first white men, the Lewis and Clark expedition, visited them in 1805. There is no doubt but that their lives had been profoundly affected by the rise of the horse. It would be well for all investigators to keep in mind the canoe and the horse as influences on the kinds of life led by the Indians of this region.

The first result of such linguistic researches will be the accumulation of vocabularies. With these may be recorded sentences from which the structure of the language may be {analyzed} analysed. My respect for the quality of one of these primitive {sic} languages once received as surprising impetus. In 1903 I visited Nootka Sound to erect a monument to mark the meeting place of Vancouver and Quadra, Briton and Spaniard, in 1792. Returning I met Rev AJ Brabant (McDowell 2012) who had been a missionary along that coast for more than thirty years. He

was a Belgian and, being educated as a Priest, he was familiar with Latin. He also conversed readily in German, French, and English. "With all these languages," he said, "when I wish to express myself with all the eloquence that is in me, I instantly resort to the Nootka Indian tongue."

[Much of Meany's continuing fame rests on his successful instillation of such historical markers, including the impressive tombstone for Chief Joseph, and, of course, epic speechifying, usually including, as here, a nod to his Wisconsin M.A. While acknowledging colonial devastation and genocide, he limits his examples of a few loan words but not the name of the Carribean native deity Hurricane.]

It is therefore worth while to record the vocabularies and languages of these people. With these may then be gleaned an approximate record of the life of the peoples. There has been found but few evidences of institutions or organization, none at all comparable to those among the Indians of the Southwest, of Mexico or Peru. But there is a wealth of myths and legend and it would be well if every one of these could be recorded in the best way possible. <4>

Charles Kendall Adams, formerly President of the University of Wisconsin, in his "Columbus," page 150, says: "The work began by the Admiral was completed by bloodhounds in less than a generation. The race perished and may be said to have left only a single work as a monument. The Spaniards took from them the word 'hammock' and gave it to all the languages of western Europe." This is a double exaggeration for there are still a few Caribs living in British Honduras and in Venezuela and we have other words from their languages such as "tobacco" and "potato." But, nevertheless, the statement is interesting and it leads to the suggestion that studies of primitive {sic} languages may be helpful in the enrichment or explanation of our own. In this enriching our language we do not always cling to the original meaning of form of the words. Tobacco originally meant the pipe and not the plant. In our own locality we have the name of

a town, Issaquah, which in the original Indian tongue was 'Showk {IPA: sk^wax^w}. No possible good purpose would prompt any attempt to keep that original pronunciation in our language.

[Comparison of stilted English spellings and IPA clearly demonstrates the significant loss to the richness of the phonology of the language, in this case Lushootseed. When Boas and his students were transcribing, the raised letter to indicate pursed lips was a u^u, but reanalysis by a younger generation of linguists changed this to the more appropriate raised w^w now in use. The diatribe in the next section fully demonstrates his suspicion of the earliest anthropologists at UW, students of Boas at Columbia and sometime faculty at University of California at Berkeley. John Peabody Harrington, long employed at D.C., studied in Germany and remained idiosyncratic throughout, as demonstrated by his lab use of beef throats and tongues. That Meany actually knew the number of students and fate of that class says volumes. Later, he was flummoxed to deal with a couple of Ph.D.s, Leslie Spier and Erna Gunther, and then with Erna alone as head of the Burke Museum and anthropology department for decades. The Burke grew out of an informal Young Naturalist club founded by Meany.]

This suggests a kindly but heart-felt protest against some methods of research now in vogue, or perhaps a sort of re-evaluation of such methods. A few years ago a gentleman {John Peabody Harrington} from the American School of Archaeology gave two courses of lectures in the {1910} Summer Session of the University of Washington. His study of the Indians gravitated to a minute consideration of the guttural phonetics. He illustrated the making of these sounds by displaying beef throats obtained at the slaughter house. At last a promising <5> class dwindled to one student, who stuck it out and earned the two credits toward a degree. At the same time another lecturer {Meany ?} told of the Indians' mode of life, the materials used in their arts and quaint {sic} stories revealed in their legends. His class comprised a hundred

students who sought no university credits for the lectures. Of course, the one student would have been wholly in the right if the phonetics of a vanishing tongue had any possible value {!!}.

[Endangered languages had yet to become a public and professional concern, but Meany's callus and wrongheaded dismissal of the uniqueness of Tribal language sounds (phonemes) stand out. His quoted description of the new Rousselot sound equipment is best read while looking at the picture of Thomas T. Waterman so rigged out (Figure 1).]

The university of California is conducting some of the most valuable ethnological and archeological studies pursued at present in America. Everyone interested in such themes will find these studies helpful. However, the most recent monograph seems like an awful waste of time, energy and money. It is called {Pliny Earl Goddard 1912} "Elements of the Kato Language." Here are 87 pages of text giving a praiseworthy study of elements but there follow 45 plates by which it is endeavored to show by wave records the minutiae of Kato phonetics. The author says <p.86>: "These are made as follows: a glass bulb open at each end is inserted in one nostril, from the outer end of which a rubber tube passes to a tambour having a rubber membrane rather tightly stretched. To this rubber membrane a straw lever ending in a horn tracing point is attached. As long as the posterior orifices of the nostrils are closed by the velum the line will be straight, but as soon as the velum falls the tracing point rises. The tracings show that the <6> vibrations are recorded both in the nasal consonants and nasalized vowels, when the breath passes through the nose, and in the pure vowels, when the nasal passage is closed. In the latter case the vibrations must be transmitted through the soft and hard palate." Other lines are from the larynx. "A metal tube ends in a cup-shaped termination over which a sheet of thin rubber is stretched. This is applied to one side or in front of the larynx. In these tracings the attachment was in most cases to the front near the notch of the Adam's apple." And still



Figure 1. T.T. Waterman using the Rousselot's speech inscription apparatus.

others are from the mouth “by the air column of the breath taken from the lips by a metal mouthpieces fitting closely and transmitted by a small rubber tube to a Marcy tambour.”

[Indeed until he went deaf in one ear, Alfred Kroeber and his Berkeley team made great advances in linguistics on technical and comparative levels, which continue now as a stand alone linguistics department staffed by famous Americanists like Mary Haas, a Sapir student.]

These beef throats and rubber tubes are extreme examples of the effort to introduce the laboratory method into the study of Indian linguistics. I greatly admire the enthusiasm of the zoologist, the botanist, or the chemist, forgetful of time while at work on a problem. Their work has to do with life or with things that affect life. The principal reason assigned for the other work is that it pertains to a vanishing

{sic} race. It is for that precise reason that I wish the investigators to fix some sane {sic} bounds within which to gather the data and arrange it in some scientific and usable order.

If the study is made to understand an enrichment of our own languages, the method of forming unusual phonetics is useless {?} for the words come robbed of the unusual or difficult sounds and will remain so stripped while embedded in our language.

If the study is made for the sake of the primitive {sic} <7> language itself, it is here contended that the vocabularies and grammar are sufficient for there is no literature cut, carved, written or pictured {sic}. There is only the myths and legends. These are most useful when recast into our own forms of speech, but there is no denial of the fact that good purposes will also be served by recording them carefully in the original tongues.

[But there are indeed other forms of writings and depictions in Native artistic expressions on rock, skin, clothing, and other surfaces. They are much more than myths and legends, imbued with their rules and grammars of ethnopoetics. And there is a strong tradition of wood carving, including local story poles to be distinguished from totem poles of the north Pacific.]

If it is argued that such a study may aid in the unfolding knowledge of the evolution of man, it is then a link in the chain back to the man who secured himself in an iron cage in Africa to study the speech of apes. To my mind that makes it a part of physiology or zoology and, if it can serve any good purpose there, let it go on.

If anyone would revive Macaulay's prophecy of the South Sea Islander on London Bridge² and say that when one of these Indian tribes becomes ascendant we will be glad to know how his hard or soft palates worked in forming his harsh gutturals, I can only say that in such a case we are now mistaken about his tribe being a part of a vanishing race.

To me these extreme cases seem clearly to be the futile {?} employment of ingenious talent that would serve its own cause more, if better directed.

In conclusion allow me to repeat that the opportunities for linguistic research among the Indians of the State of Washington are important as well as numerous. The main objects should be to save records of these vanishing forms of speech and with them all possible records of the vanishing {sic} primitive {sic} peoples. <End>

Summary

In 1912, Meany reverted to racist stereotypes to oppose increasing machine-based precision helping to better understand the sounds to be carefully written in the International Phonetic Alphabet by academically-trained linguists at Columbia and Berkeley. Though unnamed, his offending anthropologists are clearly John

Peabody Harrington of beef tongue fame, a hyper-correct linguist if questionable human (Laird 1975), who actually taught that UW Summer term of 1910 (and whose notes for both class are in D.C.); Pliny Earl Goddard, a former Quaker missionary among Hupa, turned anthropologist who taught phonetics to T.T. Waterman at Berkeley, before Waterman came full time to UW 1918–1920, followed by Leslie Spier and Erna Gunther, who left and returned to UW. Though Boas trained students at Columbia, the University of California at Berkeley actually provided these anthropologists to UW. Waterman, of note, in the *American Anthropologist*, mocked Meany's blundering study of local Washington place names, published as a series by letter of the alphabet before being bound into a book (see Appendix). The brief note provided such ire that Meany blocked publication of Waterman's extensive IPA study of local Native place names, later archived in manuscript in D.C., and now linguistically re-analyzed on Amazon (2022). It is also important to remember that for prior decades Franz Boas from Columbia University in New York City had been doing specialized linguistic and ethnographic work in Washington State among Chinooks, Chehalis, and Salish, using Chinuk Wawa and IPA scrupulously.

² Thomas Babington Macaulay (1800–1859)—British historian, writer, and politician—wrote in 1840: The Catholic Church “may still exist in undiminished vigour when some traveller from New Zealand shall, in the midst of a vast solitude, take his stand on a broken arch of London Bridge to sketch the ruins of St Paul's.”

ACKNOWLEDGMENTS

Enthusiastic devotion to Americanist endeavors has been exemplified for me by the Old Guard of Erna Gunther, Viola Garfield, Amelia Susman, Ruth Underhill, Esther Goldfrank, Ethel Aginsky, Harry Basehart, Ray Fogelson, Bill Seaburg, Dale Kinkade, Nancy and Tony Mattina, and Bill Holm; while Native sensitivities have been instilled by Nora Dean, Vi Hilbert, Isabel Arcasa, and Lily Whitehorn.

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APPENDIX. WATERMAN'S ANTI-MEANY IN AMERICAN ANTHROPOLOGY AFTER HE LEFT THE UNIVERSITY OF WASHINGTON.

An Essay on Geographical Names in the State of Washington

T.T. Waterman, 1922, *American Anthropologist*,
24(4):481–483.

{Additions in curved brackets add details,
updates, comments, or clarifications.} <Angle
brackets designate page numbers.>

The derivation and meaning of geographical names of Indian origin is always a matter of interest. An essay dealing among other things with Indian names, by Edmund {Edmond} S Meany, is now being printed in installments in a publication known as the Washington historical quarterly, issued, according to the title page, by “The Washington University State Historical Society.” Acquaintance with the region in which this publication appears indicates that “Washington University” means in this case the University of Washington. The essay began with volume 8 of this quarterly (1917), and with the issue of January of 1922 extends as far as the letter S.

Every effort to account for the origin and history of geographic names is a move in the right direction and is to be received with due thanksgiving. This is especially the case in the Northwest, which is <482> an extremely interesting region; and is more especially the case where names go back to Indian expressions. Our author is therefore to be applauded for his effort.

There is, however, no great amount of care or scholarship evident in any part of his work.³ The essay is somewhat unsystematic, rather diffuse, decidedly anecdotal, and tiresomely sentimental. The author exercises himself with a mass of letters and books, to find explanations for the occurrence of certain geographical

names. In this process he makes many slips and blunders—blunders both of fact and in presentation. No great amount of confidence can be inspired in the reader by such a work.

A few examples may not be amiss. The French expression Nez Perce is said by our author to be “an Idaho Indian term.” The Welsh name Bryn Mawr is said to be “Scotch.” The Spanish expression Sierra Madre becomes Sierra Madras. The Spanish word *orilla* is said to mean a “lesser bank.” These slips occur in connection with the easiest part of the author’s task. The effort to give an account of items running back to a native Indian origin is a rather more difficult matter. As would be expected from what has just been said, on such points the essay becomes totally unreliable. The errors existing in the literature prior to Meany’s essay are faithfully reproduced, I think without missing one; and numerous others are added through misquoting the older authorities and through quoting half-informed and careless correspondents. The principal weakness in this part of the work lies in the fact that the author has made inquiries of Tom, Dick, and Harry, concerning the meaning of Indian names, but has never, curiously enough, consulted a single Indian. This helplessness and lack of enterprise is hard to understand.

The most instructive part of the work is the account which the author gives of numerous silly and trivial considerations which lie back of our present-day geographical names. Thus the name Ralston was given to a place by the following process. A certain railroad official, during the survey of the road, was sitting in a cook house selecting names for what were to be the future stations. Having run out of ideas, his eye suddenly lighted upon a package of breakfast-food standing on a shelf; so he

³ Meany actually sent printed fill-in-the-blanks questionnaires to locals, hence these less than rigorous responses. These thick files are not among Meany’s papers but in those of his successor in place name research, Robert Hitchman, who was more thorough and knew to consult Arthur Ballard on Native terms.

promptly put down the name of the next station as Ralston. The name thus inflicted on the site may very likely remain there for a thousand years and be an offense to all thinking men for every moment of that time. Meany's <483> account of this incident conforms exactly to what was recounted to the present writer by the hero of the occasion himself.

The geographical names published by Meany are thus a quaint and curious medley of words from the most unexpected languages, and from the most incongruous sources.

We ought, I think, to feel grateful for this essay, which represents at least a beginning. If properly revised and edited by some competent person, it would be an important contribution to our knowledge of this interesting region.

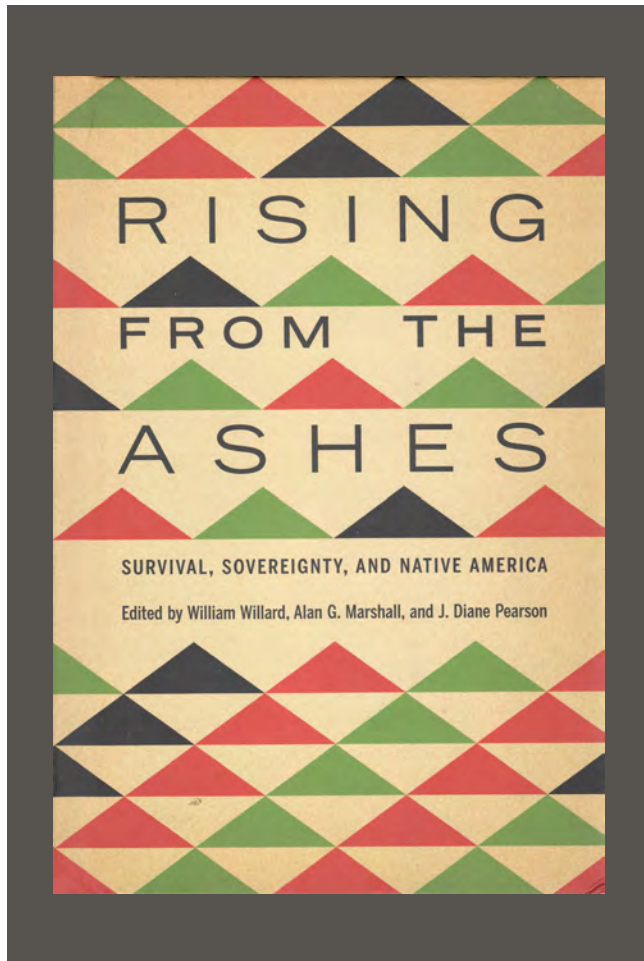
ABOUT THE AUTHOR

Raised in the Southwest, long resident in the Northwest, Miller's research includes these regions as well as the Northeast and Southeast, mainly among communities forced to the national center in Oklahoma. Of special concern are Keres, Lenape, Caddo, Creek, Colville, Numa, Tsmshian, and Lushootseed—involving the four quarters.

BOOKS RECEIVED

Rising from the Ashes: Survival, Sovereignty, and Native America

William Willard, Alan G. Marshall, and J. Diane Pearson, editors



nation-building among the Numiipuu and other Pacific Northwestern tribal nations. Anchoring the collection is a twenty-first-century analysis of American Indian decolonization, sovereignty, and tribal responsibilities and responses.

Rising from the Ashes explores continuing Native American political, social, and cultural survival and resilience with a focus on the life of Numiipuu (Nez Perce) anthropologist Archie M. Phinney. He lived through tumultuous times as the Bureau of Indian Affairs implemented the Indian Reorganization Act, and he built a successful career as an indigenous nationalist, promoting strong, independent American Indian nations.

Rising from the Ashes analyzes concepts of indigenous nationalism and notions of American Indian citizenship before and after tribes found themselves within the boundaries of the United States. Collaborators provide significant contributions to studies of Numiipuu memory, land, loss, and language; Numiipuu, Palus, and Cayuse survival, peoplehood, and spirituality during nineteenth-century U.S. expansion and federal incarceration; Phinney and his dedication to education, indigenous rights, responsibilities, and sovereign Native Nations; American Indian citizenship before U.S. domination and now; the Jicarilla Apaches' self-actuated corporate model; and Native

Print Length: 348 pages

*Publisher: University of Nebraska Press,
Illustrated edition*

Publication Date: 1 June 2020

Dimensions: 6 x 0.94 x 9 inches

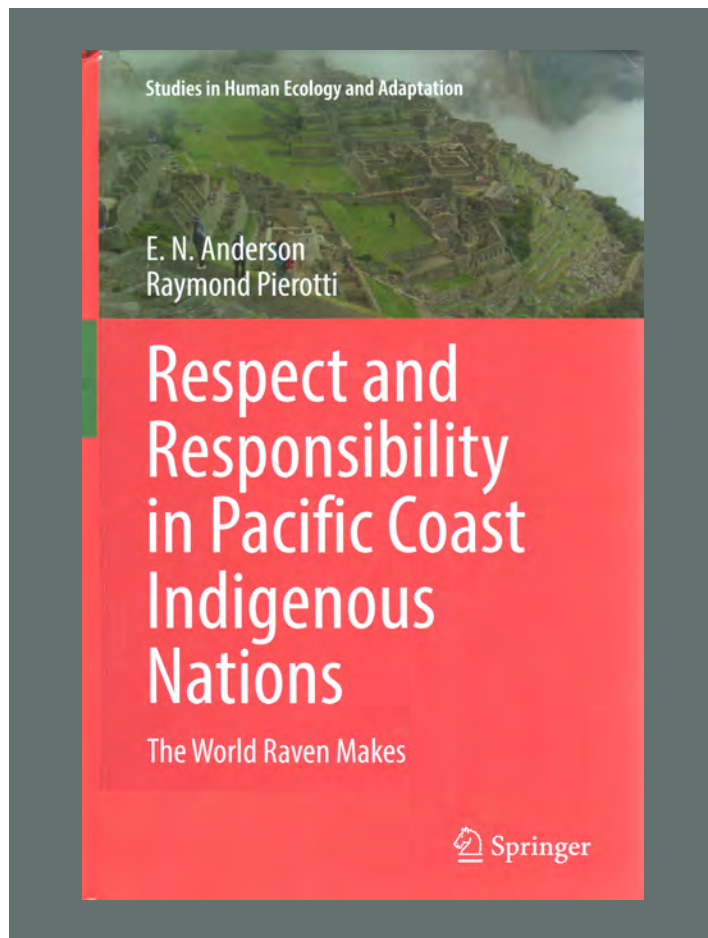
ISBN-10: 1496219007

Available on Amazon.com

BOOKS RECEIVED

Respect and Responsibility in Pacific Coast Indigenous Nations: The World Raven Makes (Studies in Human Ecology and Adaptation, 13)

E. N. Anderson and Raymond Pierotti



This book examines ways of conserving, managing, and interacting with plant and animal resources by Native American cultural groups of the Pacific Coast of North America, from Alaska to California. These practices helped them maintain and restore ecological balance for thousands of years. Building upon the authors' and others' previous works, the book brings in perspectives from ethnography and marine evolutionary ecology. The core of the book consists of Native American testimony: myths, tales, speeches, and other texts, which are treated from an ecological viewpoint. The focus on animals and in-depth research on stories, especially early recordings of texts, set this book apart. The book is divided into two parts, covering the Northwest Coast, and California. It then follows the division in lifestyle between groups dependent largely on fish and largely on seed crops. It discusses how the survival of these

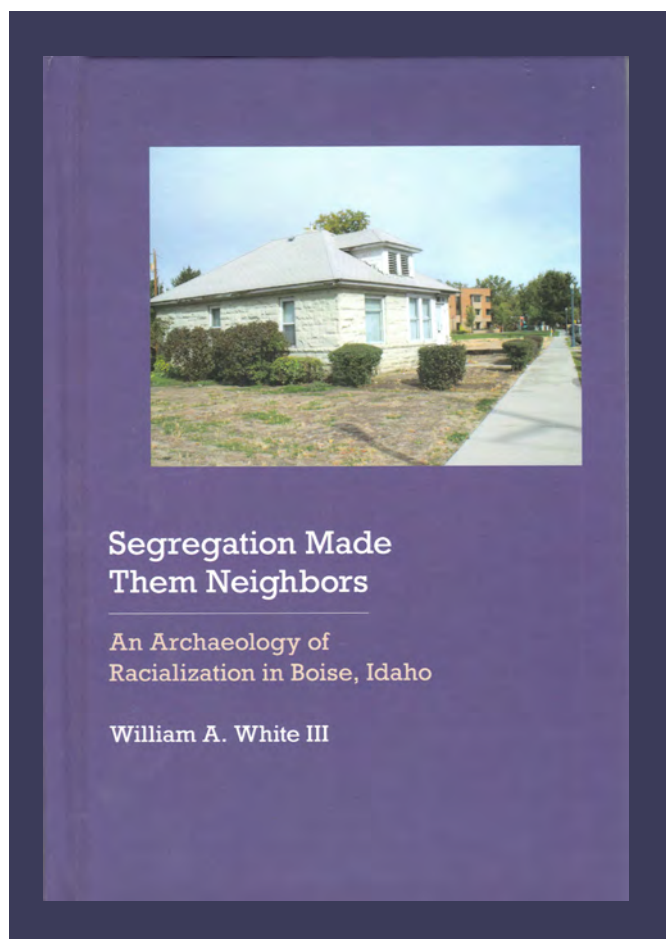
cultures functions in the contemporary world, as First Nations demand recognition and restoration of their ancestral rights and resource management practices.

Print Length: 330 pages
Publisher: Springer; 1st edition
Publication Date: 13 October 2022
Dimensions: 6 x 1 x 9 inches
ISBN-10: 3031155858
Available on Amazon.com

BOOKS RECEIVED

Segregation Made Them Neighbors: An Archaeology of Racialization in Boise, Idaho

William A. White III



Segregation Made Them Neighbors investigates the relationship between whiteness and nonwhiteness through the lenses of landscapes and material culture. William A. White III uses data collected from a public archaeology and digital humanities project conducted in the River Street neighborhood in Boise, Idaho, to investigate the mechanisms used to divide local populations into racial categories. The River Street Neighborhood was a multi-racial, multiethnic enclave in Boise that was inhabited by African American, European American, and Basque residents. Building on theoretical concepts from whiteness studies and critical race theory, this volume also explores the ways Boise's residents crafted segregated landscapes between the 1890s and 1960s to establish white and nonwhite geographies.

White describes how housing, urban infrastructure, ethnicity, race, and employment served to delineate the River Street Neighborhood into a nonwhite space, an activity that resulted in larger repercussions

for other Boiseans. Using material culture excavated from the neighborhood, White describes how residents used mass-produced products to assert their humanity and subvert racial memes.

By describing the effects of racial discrimination, real-estate redlining, and urban renewal on the preservation of historic properties in the River Street Neighborhood, *Segregation Made Them Neighbors* illustrates the symbiotic mechanisms that also prevent equity and representation through historic preservation in other cities in the American West.

Print Length: 234 pages
Publisher: University of Nebraska Press
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Dimensions: 6.25 x 0.75 x 9.25 inches
ISBN-10: 1496217136
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WHAT ARE WE SEARCHING FOR? ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST

JONA SPECIAL PUBLICATION #7



WHAT ARE WE SEARCHING FOR?

ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH
IN THE PACIFIC NORTHWEST—2023

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JONA Special Publication #7, What Are We Searching For? Anthropological and Archaeological Research in the Pacific Northwest—2023, presents twelve essays describing current research from the Pacific Northwest that provide insight into the types of research that are ongoing across the region. The collection suggests a healthy balance of research touching on ethnography, linguistics, prehistory, ethnobotany, history, experimental, method, and theory. The collection includes cases from the earliest inhabitants (10,000+ years ago) at the Lind Coulee rock shelter, ethnohistoric groups in the Cascades, and farmers and ranchers living in Teton Valley, Idaho, today. Some authors comment on research that was conducted decades ago, others describe research being conducted today, and still others detail the research they hope to pursue, or have others pursue, in the future.

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CALL FOR ESSAYS

ANTHROPOLOGY CLASS-SPONSORED STUDENT RESEARCH IN THE PACIFIC NORTHWEST

JONA SPECIAL PUBLICATION #9

MANUSCRIPT SUBMISSION DEADLINE: OCTOBER 1, 2023

Involving students in anthropological and archaeological research has long been a standard part of the Anthropology B.A. and M.A. degrees. The aim of *JONA* Special Publication #9 is to present the variety of research being conducted by anthropology classes across the Pacific Northwest. The goals of Special Publication #9 are to provide models for research projects that that others can adapt, and to assist these research projects in publishing and sharing their findings. As with recent collections, essays should follow the *JONA* short essay format (i.e., 1,500 words, plus or minus 500 words, not including figures, tables, and references).

Manuscripts should be submitted to the *JONA* offices by October 1, 2023; feel free to contact us with questions or to discuss ideas. Check the *JONA* website to see the previous *JONA* short essay collections at: <www.northwestanthropology.com/short-essay-collections>.

PUBLISH WITH THE *JOURNAL OF NORTHWEST ANTHROPOLOGY*

The *Journal of Northwest Anthropology (JONA)* is a peer-reviewed scholarly, biannual publication. We welcome contributions of professional quality concerning anthropological research in northwestern North America. The journal has been dedicated to publishing all anthropological research—archaeological, physical, cultural, linguistics, social, and applied—relevant to the past and present cultures of the Northwest Coast and Plateau regions.

ARTICLES

The *Journal of Northwest Anthropology* is a peer-reviewed, scholarly, biannual publication. We welcome contributions of professional quality concerning anthropological research in northwestern North America. Theoretical and interpretive studies and bibliographic works are preferred, although highly descriptive studies will be considered if they are theoretically significant. The primary criterion guiding selection of papers will be how much new research the contribution can be expected to stimulate or facilitate.

MEMOIR SERIES

The primary goal of our *Memoir Series* is to capture the wisdom emerging from the lifelong work of scholars and specialists, and to make that wisdom available to others, be they young professionals, the communities that anthropologists serve, or the public. Our decision to publish a book-length manuscript as a memoir is based upon the anthropological value of the research. Past memoirs include, but are not limited to, the collected works of distinguished anthropologists in the Pacific Northwest, Native American language dictionaries, reprints of historical anthropological material, archaeological research, and efforts of Native American and academic collaboration.

SUBMISSIONS

Please visit the following link to submit an abstract: <<https://www.northwestanthropology.com/submissions>>.

NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS



The *Journal of Northwest Anthropology (JONA)* is pleased to announce that the 2023 Northwest Anthropological Conference (NWAC) Proceedings is scheduled for publication this summer. This is the third year that *JONA* has teamed with the Northwest Anthropological Association to publish the conference papers and posters.

All of the papers and posters submitted to *JONA* will be included along with the runner-up papers from the Student Paper Competitions. The winning student papers are being published in the Fall 2023 regular issue of *JONA* (volume 57, number 2).

We firmly believe that the NWAC Proceedings has the potential to play a major role in disseminating the contributions of anthropological research to peoples of the Northwest. We sometimes forget that although the number of anthropologists in the Northwest may be relatively small, the number of people with an interest in Northwest anthropology is broad. If we can develop the NWAC Proceedings into a publication that includes a significant number of papers and presentations from the annual conference, we have an opportunity to build a Northwest anthropology community that includes this diverse group of people.

To view the 2021 and 2022 NWAC Proceedings, or for more information on submitting papers and posters to *JONA* for inclusion in the 2023 NWAC Proceedings, please visit:
<<https://www.northwestanthropology.com/nwac-proceedings>>.

Attending the 2023 Northwest Anthropological Conference? Visit the *JONA* table in the book room to meet with us!

