TOOLS AND CHANGE: THE SHIFT FROM ATLATL TO BOW ON THE BRITISH COLUMBIA PLATEAU

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ABSTRACT

This thesis presents analyses focused on determining the function of projectile points from the Plateau Cultural area of British Columbia, including use of Shott's (1997) method designed to classify projectile points as either atlatl darts or arrows. A total of 1065 projectile points recovered from archaeological contexts throughout the Plateau, spanning the Middle through Late Prehistoric periods, were examined. While Nesikep, Lochnore and Lehman style points were classified primarily as dart points and the Kamloops horizon points predominantly as arrow points, Shuswap and Plateau horizon groups were identified as containing points from both systems. This suggests that the two technologies coexisted for many hundreds of years and that the bow and arrow was in use on the Plateau much earlier than previously believed. A discussion of the implications of this and possible factors that influenced and affected people's decision to choose one projectile system over the other is included.

Keywords: bow and arrow; atlatl and dart; British Columbia; Plateau culture Area; projectile point classification

Subject Terms: Projectile points -- British Columbia -- Classification.; Arrowheads -- North America -- Classification.; Stone implements -- North America -- Classification.; Tools, Prehistoric -- North America -- Classification.; Throwing-sticks.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Introduction

This thesis presents an exploratory study focused on examining the metric dimensions of a large collection of projectile points from the British Columbia Interior Plateau cultural area (also known as the northern Plateau) with regard to determining their original functions. It has been argued by others (Corliss 1980; Fenenga 1953; Forbis 1960; Shott 1997; Thomas 1978 and Wyckoff 1964) that the measurements of a projectile point can be used to infer the type of weapon system the point was used with, specifically the bow and arrow system, or the atlatl and dart (spear thrower) systems.

Evidence for the use of spear throwers, or atlatls, has been found all over North America and the world (Massey 1961:81). In Europe, the earliest atlatl found dates to 17,470+/- 249 B.P. (Knecht 1997b:11). In Australia the atlatl also is represented very early, during the mid to late Pleistocene (Cundy 1989; Hiscock 2008:113). North American archaeological records often include pre-contact artifacts associated with the atlatl system, such as atlatl spurs, boat stones or atlatl weights, and even in some cases complete atlatls and darts (Fenenga and Wheat 1940; Geib 1990; Goslin 1944; Massey 1961; Quimby 1940; Riddell and McGeein 1969). Though the atlatl was replaced by the bow and arrow system in much of the world (Massey 1961; Thomas 1978), there were

still North American people using it as recently as the era of European colonization and exploration. Thus, some Eskimo-Aleut, Tlingit and Central American groups were still using this technology when Europeans first made contact with them (Bushnell 1905; Massey 1961; Miles 1963; Quimby 1940). Since it was a very effective hunting tool for use in a kayak, it was not completely replaced in the north until firearms became available. Spanish conquistadores and explorers wrote about, and collected samples of, the atlatls used by the Aztec (Bushnell 1905). Spanish sources also document their use by the now extinct Guicurian peoples of the southern Baja Peninsula (Massey 1961). In most of North America, however, the atlatl had been replaced by the bow and arrow long before the arrival of European explorers and ethnographers.

Possible reasons behind when, why and how this change in projectile weapon systems happened have been discussed in varying detail by numerous archaeologists (e.g.Bettinger and Eerkens 1999; Blitz 1988; Bradbury 1997; Geib and Bungart 1989; Massey 1961; Nassaney and Pyle 1999). Some areas, such as the Great Basin, with excellent natural preservation of organic materials, have seen much more extensive atlatl research, and therefore the chronology and timing of the transition in those areas is much better understood (Flenniken and Wilke 1989). Most of North America, however, has much less preserved organic material and, not unexpectedly, has much less published information about this transition.

The British Columbia Interior Plateau (the Plateau) is one of the regions where atlatls gave way to bows and arrows in late prehistory. Within collections of projectile points from this area there is a wide variety of sizes and shapes. In much of the literature, it has simply been assumed that the larger of these points represent the use of atlatl technology and that the smaller ones relate to the use of bows and arrows (Hayden 2000; Ronaghan et al. 1982; Rousseau 2008:339; Rousseau 2004; Rousseau 1991). This division, which seems logical, is supported by the fact that most of the larger points tend to be "older" and most of the smaller points tend to be "younger", but by little other evidence.

The intent of this project is to try to clearly distinguish points associated with these two different projectile weapon systems on the Plateau by carefully examining their metric attributes, and to develop and test hypotheses about why and when this transition took place**.** Chipped stone projectile points are one of the most common formed artifacts found in archaeological sites in the Plateau, and yet very little published material that deals with the transition between atlatl and bow and arrow systems exists for that region.

Although the atlatl and the bow and arrow system are used to achieve similar goals, they have many major differences (Baugh 2003;Baugh 1998; Hamilton 1982). These differences include, but are not limited to: the stance of the user, the number of hands required to fire them, the space needed to fire them, their effective range, their rate of fire, their impact force, the number of

projectiles an individual can carry, and the size of their optimum target. The introduction of a weapon system like the bow and arrow with such a great degree of difference from the norm (the atlatl) would have very profound effects on the way people procured their food and on their military tactics. The bow and arrow would make hunting easier and more productive and it would make warfare more lethal (Chatters 2004:73), not only because it would offer the elements of surprise and prolonged attacks, but it would also eliminate much of the risk for the attacker. It is clear that the implications of the adoption of the bow and arrow to the culture of the Plateau would have been very great, affecting every part of people's lives (Chatters 2004:73). A clear understanding of how and when this transition occurred and an effective means of identifying this transition in the archaeological record are necessary to support productive future research in the Plateau culture area. A more detailed understanding of when and how this transition occurred would provide future researchers with valuable information and allow them to address more in-depth questions about the archaeological past of British Columbia and the world. This research is the first step towards accomplishing these goals and provides the groundwork for future work on this topic.

Research objectives

My primary objective was **to develop a more accurate understanding of what is and what is not an atlatl point in the archaeological record of the Plateau**. The Fraser River Drainage system provides a means of connecting

the cultures of this area more closely to each other than with those of the Columbia River Drainage system. For that reason, as well as to keep this project within a manageable size, I have focused only on the northern (Canadian) portion of the Plateau. I have reviewed the large body of research that discusses points found in that region, and attempted to associate them with one of those two weapon systems (Hayden 2000; Ronaghan et al. 1982; Rousseau 2004a; Rousseau 1991). There are not, however, currently any recognized criteria to clearly distinguish one system from the other. There is also a lack of published information explaining why researchers working on the Plateau have chosen to assign certain points to darts and other points to arrows.

My second objective was **to determine if, and to what extent, those two weapon systems overlapped in space and time on the Plateau**. There are instances where assumed dart and arrow points occur in the same stratum (Hayden 2000:55), and it is possible that these two systems may have been in use together for some time. The two technologies may have been used to best effect in different types of vegetation and for different prey species. Thus, it is valuable if it can be shown that they were used simultaneously for a while in one specific area, or that the adoption of the bow universally led to the exclusion of atlatl system.

My final objective was **to investigate possible factors leading to this change in weapon systems**. As previously mentioned, each system has

attributes that makes it more useful in certain situations. Environmental factors, hunting styles, prey species, and conflicts with other humans have all been linked to cultural and technological changes in other parts of the world. It will be of significance if I can determine that one or more of these factors is correlated with the adoption of the bow on the Plateau.

CHAPTER 2: BACKGROUND

Technological background:

As previously mentioned, the use of atlatls on the Plateau has been discussed in many reports (Hayden 2000; Rousseau 1991;Ronaghan et al. 1982). There has, however, been little actual direct evidence of them found in the archaeological record of the area. Currently, the collection of definitively atlatl related artifacts from the Plateau, if the points themselves are not included, is very small. Only one complete atlatl has been found, during mine construction at Quiltanton Lake near Merritt. Although it has been dated; 1950+/- 100 B.P.; (Lawhead 1988), as of yet no scientific reports about it have been published. There are also a small number of atlatl weights from a variety of locations throughout the Plateau (e.g.: Butler and Osborne 1959; Fladmark 1986). When this material is compared to that from the Great Basin just to the south, which has abundant dry caves yielding complete hafted darts (Aikens 1978; Beck 1995; Hester et al. 1974), it is no surprise that so little work on the subject has been done for the Plateau. Though the direct archaeological evidence of atlatls is minimal in the Plateau, there is such evidence of atlatls in adjacent areas of the province. To the north, the rapidly melting Yukon ice patches are providing many samples of complete and partially complete atlatl darts (Hare et al. 2004). Recently an atlatl weight also was discovered in the vicinity of Charlie Lake Cave in northern BC (Archer: personal communication). Again, to the south, a large

body of research exists focusing on the shift from atlatl to bow in the Great Basin (e.g. Aikens 1978; Beck 1995; Flenniken and Wilke 1989; Hester et al. 1974; Webster 1980). As one moves north into the Columbia (southern) Plateau, however, the published material contains only a few mentions of presumed atlatl dart points and rare atlatl weights (Chatters et al. 1995). To the east, on the Plains, researchers have discussed the atlatl in more depth. Davis and Keyser (1999) and Brumley (1978) have addressed stone points and hunting techniques in relation to the McKean site in southern Alberta, and Fawcett (1980) has discussed how point neck width can be used to identify the original use of points in the Plains. Karl Hutchings (1997) also has examined Paleo-Indian points to determine the possible delivery methods used with them.

Although there is a shortage of biodegradable atlatl parts so far identified on the Plateau, there is no shortage of stone points, and researchers have associated certain forms of points, in conjunction with other artifacts, with such weapons and specific date ranges. Having a more accurate understanding of what is, and is not, an atlatl dart point would clearly add to our understanding of the cultural history of the Plateau. In other projectile point rich areas of North America, including the Great Basin (Hester et al. 1974), Plains (Baker and Kidder 1937; Fawcett 1998) and Eastern Woodlands (Bradbury 1997) such stone points have been used to shed light on the transition between the two weapon systems. Where preservation allows, research has also used archaeological specimens of complete atlatl darts and arrows in an effort to determine if there is

a universal metric distinction between the points associated with those two systems (e.g.: Fawcett 1998; Fenenga 1953; Flenniken and Raymond 1986; Shott 1997).

Geographic background:

The Plateau culture area of British Columbia is located in the south central interior of the province. More specifically, its boundaries are defined by the Coastal Mountains and the Cascade Range in the west and the Selkirk and Purcell Ranges of the Rocky Mountains in the east (Prentiss et al. 2006; Rousseau 2004:3; Walker 1998:3). It includes the drainage basins of the Fraser River and the northern Columbia River (see Figure 1). To the north, the Plateau is bounded by the subarctic spruce forests of central BC, and the low extensions of the Rocky Mountains (Prentiss et al. 2006:49; Walker 1998) ending near Quesnel to the northeast and Burns Lake to the northwest (Rousseau 2004:3). While the overall Plateau culture area stretches south into the United States of America (Prentiss et al. 2006:49), for the purposes of this project the southern edge of the British Columbia (northern) Plateau will be treated as the Canada-USA border.

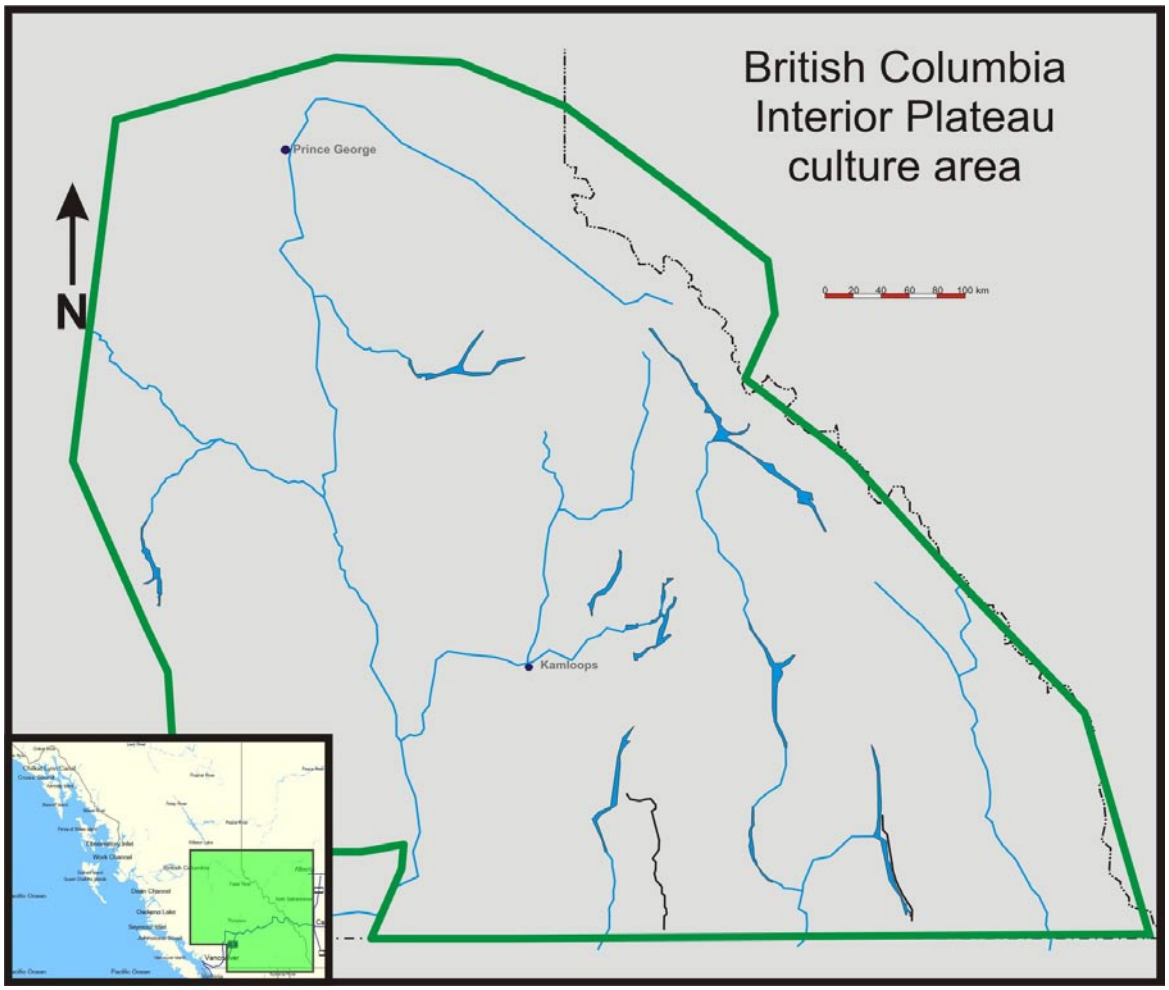


Figure 1: Map indicating the general boundaries of the British Columbia Interior Plateau Culture Area.

The Interior Plateau of British Columbia has a variety of bioclimatic zones ranging from semiarid to temperate to alpine, each with different types of soil, flora, fauna, elevation and climate (Pokotylo and Mitchell 1998:81). Some of the common useful plants include bluebunch wheatgrass, sagebrush, fescue, kinnikinick, soapolallie and balsam root (Hebda et al. 1990; Prentiss et al. 2006). There is also a wide variety of trees, ranging from deciduous poplars and aspens in low wet areas to a variety of conifers, including Ponderosa pine, Lodge Pole

pine, and Douglas fir and spruce in the semiarid and alpine areas (Hebda et al. 1990:228).

That wide variety of plants sustained an equally wide range of animal species (Chatters 1998:42; Prentiss et al. 2006:49). They provided a year-round food supply, ranging from small rodents and birds to large herbivores such as deer, elk and mountain sheep. In turn, these provided sustenance for a variety of carnivores including black bears, cougars, coyotes and bobcats.

Ethnographically, however, the most important source of protein for the people of the Plateau came from the rivers in the form of salmon (Prentiss et al. 2006:51). Each year at predictable times the five traditional species of anadromous salmon swim up the many tributaries of the large Pacific drainage rivers to spawn and die. Great numbers of these fish were, and still are, caught and hung to dry by natives, providing a food that can be kept without spoiling long after the salmon runs have finished for the year. Ungulates such as deer, and geophytes (starch rich plant roots) such as balsam root (Prentiss et al. 2006) also were integral parts of the diet of Plateau people.

Paleoenvironment

At the time of the first human occupation of the Plateau, at least as early as 11,500 B.P. (Rousseau 2008:221), the climate was warm and dry, and the vegetation was mainly dry grasslands with abundant sage and few large trees

(Mathewes and Pellatt 2000:59). This began to change about 8000 years B.P., as the weather became even warmer and rainfall began to increase. According to Hebda (1995) this warmer and wetter period lasted from about 8000 to 4500 years B.P. During this time the vegetation changed to mesic grasslands and the numbers of Douglas fir and Ponderosa pine trees increased, growing in areas in which they previously had not thrived. From 4500 B.P. to 3200 B.P. another major climactic change occurred (Pellatt 1996; Smith 1997), with temperatures becoming cooler, alpine glaciers advancing and forest fire frequencies and river sedimentation decreasing (Prentiss et al. 2006:51). During this time zones of low grassland and forest (specifically the Engelmann spruce and sub alpine fir) were developing (Mathewes and Pellatt 2000:59). The sub alpine regions of the Plateau achieved modern climate conditions a bit later, between 2435 B.P. and 1700 B.P. (Pellatt 1996; Smith 1997). Thus, much of the Plateau region experienced a climate generally similar to that of the present by at least 1700 years ago (Mathewes and Pellatt 2000:59). There is evidence, however, that conditions were a little colder and wetter from 1100-1200 B.P. and then dryer and warmer again from 900-600 B.P. (Prentiss et al. 2006:51).

Cultural background

Ethnographically, three language families are represented on the Plateau, including Salishan, Kootenain and Athapaskan (Kinkade et al. 1998:50). The largest was the Salishan group, found in the central area, while Kootenai speakers were located along the south-eastern border of BC and Athapaskan

speakers in a pocket between the Nicola and Similkameen Rivers on the south-western edge of the Plateau. Modern first nations of the area include the Secwepemc, Okanagan, Stl'atl'imc, Nlaka'pamux, Ktunaxa, Tsilhqot'in and Dakelh. Though there are a variety of different groups on the ethnographic Plateau, the archaeological material culture throughout the area shows many prominent similarities (Hayden and Schulting 1997:51).

Cultural history

Archaeology has been able to provide an understanding of the general culture history of the region over about the last 10,000 years, as defined by Sanger (1969) then redefined by Richards and Rousseau (1987), Stryd and Rousseau (1996), Pokotylo and Mitchell (1998), Rousseau (2004) and Prentiss et al. (2006). In an area as large as the Plateau it is understandable that each new major excavation will give more details and require further updating of current understandings.

Prentiss et al. (2006) noted that there are a great variety of local cultural chronologies available for the Plateau region (e.g.: Ames et al. 1998; Andrefsky 2004; Goodale et al. 2004; Pokotylo and Mitchell 1998; Rousseau 2004;Stryd and Rousseau 1996), but that no work had yet been done to connect them on a regional level. They presented a cultural historical synthesis that correlates all these areas, with specific attention to the past 3500 B.P. time period. Though that chronology has much in its favour, this study is focused solely on the British

Columbia interior Plateau and will therefore rely on the associated cultural history championed by Rousseau (2008). What follows is a brief description of its archaeological time periods and the projectile points associated with them.

According to Rousseau (2008), the cultural history of the Plateau began with the first known human incursions at the end of the Pleistocene era, as early as 11,500 B.P. (Rousseau 2008:221). The time period from this initial peopling to 7,000 B.P is referred to as the Early Period by Stryd and Rousseau (1996:176-185) and though it has been divided further by Rousseau (2008) it is still very poorly understood. Projectile points dating to this time are commonly large stemmed, corner notched and lanceolate types (Richards and Rousseau 1987). They are usually assumed to have been used with either thrusting spears or atlatl systems (Hayden 2000) and are thought to represent different cultural traditions in various sub regions of the Plateau (Stryd and Rousseau 1996).

The time period from 7,000 B.P. to present, has much more detailed information. Rousseau (2004a) sees it spanned by two major cultural traditions, the Nesikep tradition (ca. 7000-4500 B.P.) and the Plateau Pithouse tradition (PPt) (ca. 4500-200 B.P.) (See Figure 2). They are respectively subdivided into smaller units of archaeological time labelled phases and horizons. The Early Nesikep and Lehman phases (in that order) make up the Nesikep tradition, while the PPt includes, from oldest to newest, the Lochnore phase, and Shuswap, Plateau, and Kamloops horizons.

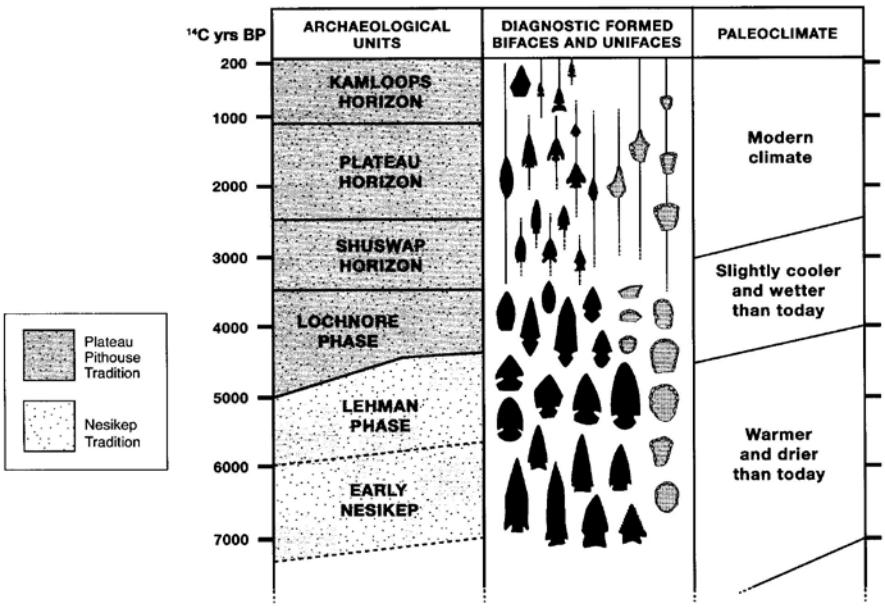


Figure 2: Archaeological Sequence, diagnostic bifaces and unifaces through time and paleo-climactic sequence for the Plateau (Rousseau 2008:330)

The Early Nesikep (Nesikep Tradition)

The Early Nesikep phase dates from ca.7000 to 6000 B.P. and is not well understood due to the very small number of associated sites. The existing data paints a picture of small groups of people who were highly mobile, staying only short periods of time in any one area and making use of a wide variety of ecological zones (Rousseau 2004a: 5). Their tool kit consisted of a wide variety of items, including microblades, bone points and distinctive formed bifaces. Bifacial points associated with the Early Nesikep phase include distinctive, well-made lanceolate styles with corner-notches, barbs and prominent shoulders, ranging in size from medium to large (between approximately 5 -10cm in length) (Rousseau 2004a:5) (Figure 3).

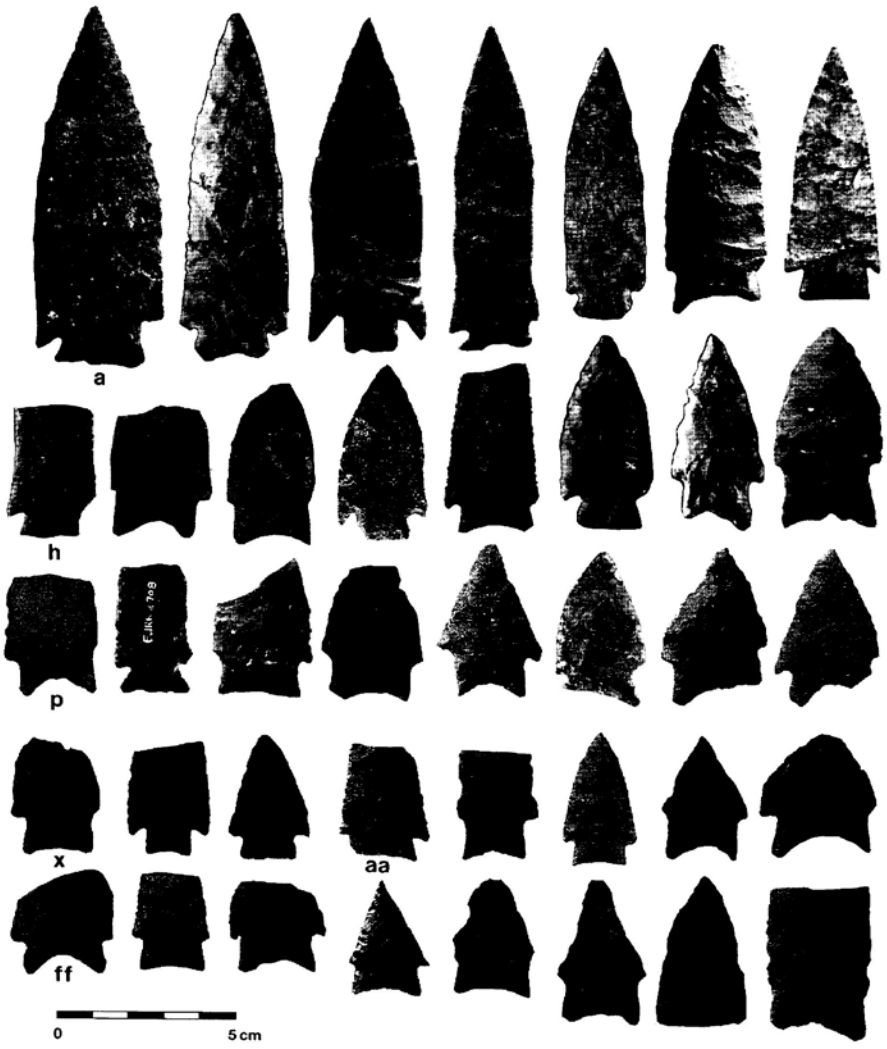


Figure 3: Examples of diagnostic bifaces from sites containing Nesikep Tradition components (Rousseau 2008:231)

The Lehman Phase (Nesikep Tradition)

The Lehman phase dates from 6000 to 4500 B.P. and is also based on only a few excavations (Rousseau 2004a:9). The way of life of Lehman phase people seems to have been much the same as those of the earlier Nesikep

phase. Many tool traditions follow through and subsistence patterns seem to have remained unchanged. The major differences between these two time periods seem related to increased familiarity with local lithic and subsistence resources (Rousseau 2004a:11). Lehman phase tool kits include large to medium-sized thin, pentagonal knives/points with obliquely oriented, U-shaped, corner or side notches, as well as a variety of other knives and scapers and occasional microblades. Of interest here are the distinctive Lehman phase obliquely notched bifaces, possibly used as knives, exclusive to Lehman phase occupations (Rousseau 2004b:11), see Figure 4.

Figure 4: Examples of diagnostic bifaces from sites containing Lehman Phase components (Rousseau 2008:233)

The following four archaeological time periods make up the Plateau Pithouse Tradition (PPt) (Rousseau 2004a:13). The major factor defining this tradition is the development and use of semi-subterranean “pithouse” dwellings. They represent an important change in the living strategies of the Plateau people

and are diagnostic of the technological and social developments associated with this tradition (Prentiss et al. 2006:55).

The Lochnore Phase (PPt):

The Lochnore phase spans 5000-3500 B.P. and, due to the association of house pits, is better understood than those of previous times, as its sites are easier to locate. Small field camps are still present, however, indicating that people were still highly mobile, but returned repeatedly to certain sites depending on the season (Rousseau 2004a:13). A major diagnostic artifact of the Lochnore phase, *Lochnore side notched points* (or possibly knives), are typically large to medium sized (approximately 5 – 10cm in length), thick bodied, lanceolate to leaf-shaped, formed bifaces (Stryd and Rousseau 1996; Rousseau 2008:235). They have wide, shallow to moderately deep opposing side notches, heavy basal edge-grinding and pointed or convex bases (see Figure 5). Other tools include a variety of other differently shaped formed bifaces, scrapers and occasional microblades (Rousseau 2008:235, 2004a:13).

Though there is still discussion as to whether Lochnore phase points represent a continuation of style and tradition from the previous Lehman phase, most researchers now think that the Nesikep tradition is not connected to the PPt and that these points represent a dramatic change in form and tradition (Rousseau 2004a:12; Prentiss and Kuijt 2004:xiii). As this paper is relying on the

cultural history developed by Rousseau, his interpretation that an important transition occurred at this time will be maintained.

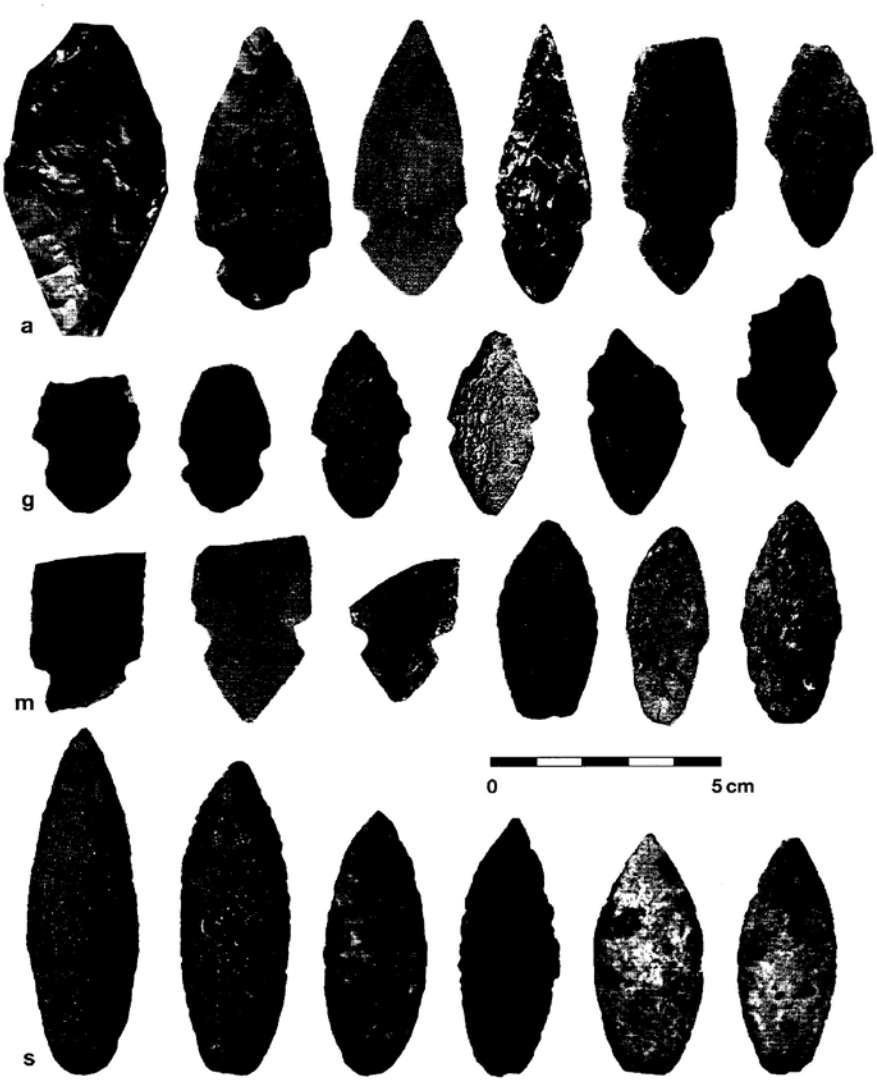


Figure 5: Examples of diagnostic bifaces from Lochnore Phase components (Rousseau 2008:236)

The Shuswap Horizon (PPt)

The Shuswap horizon dates from 3500-2400 B.P. During this period people began moving down into the valley bottoms and spending longer periods of time in one place, foraging out to resource procurement areas and then returning to a main camp. An increase in overall population during this horizon is indicated by a trend for more house pits to occur at any given site. (Rousseau 2004a:15). Typical Shuswap horizon projectile points include a variety of medium to small (approximately 3-8cm in length), basally indented and corner notched forms (see Figure 6). It has been noted (Reeves 1969; Richards and Rousseau 1987:30; Vickers 1986) that Plateau projectile point forms of this time period are similar in appearance to those of the contemporary Oxbow and McKean-Hanna-Duncan complex **atlatl dart points** (emphasis added) of the Northern Plains. This similarity has been used to support the idea that trade and exchange with other regions was now beginning to affect the lives of people on the Plateau (Rousseau 2004a:15).

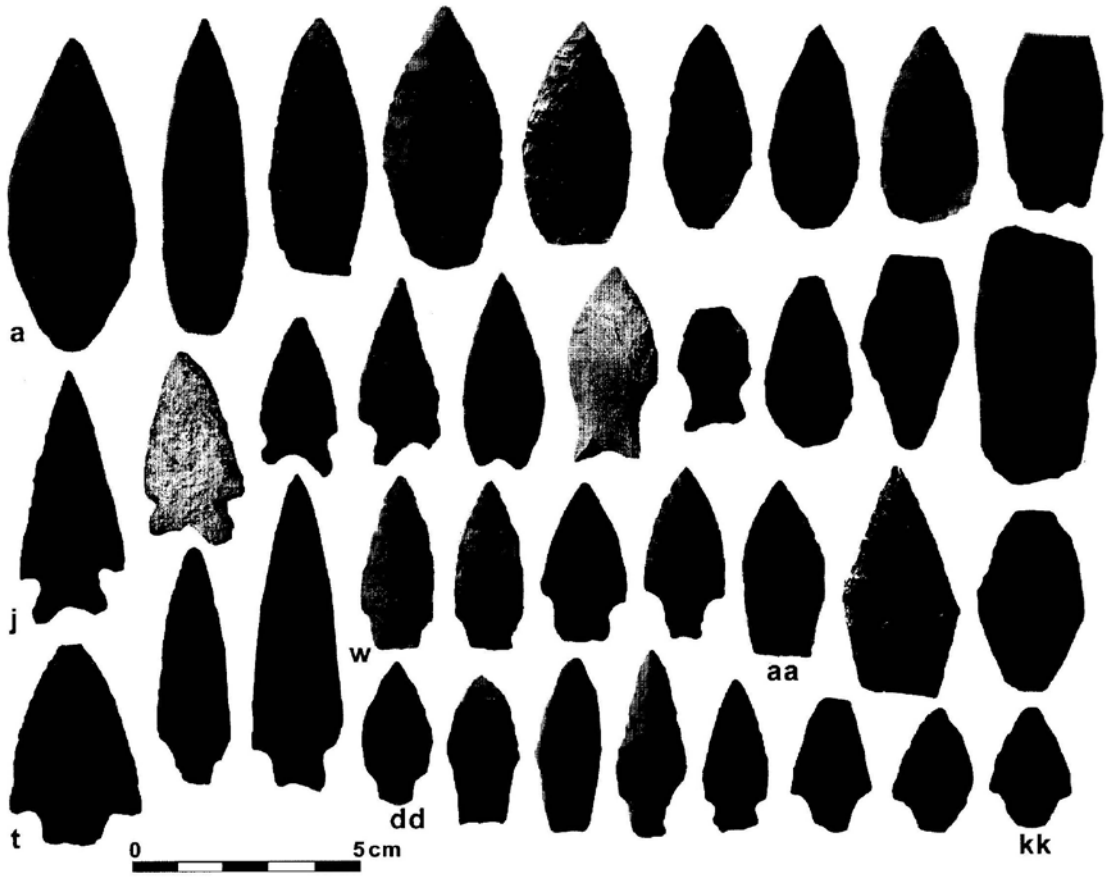


Figure 6: Examples of diagnostic bifaces from Shuswap Horizon components (Rousseau 2008:238)

The Plateau Horizon (PPt):

The Plateau horizon is the time period of the most interest to the current study. It includes the time from 2400-1200 B.P. when the presumed switch from the atlatl to bow and arrow weapon systems occurred (Chatters and Pokotylo 1998:78; Rousseau 2004:17). During that time many aspects of material culture, subsistence and settlement changed quickly and dramatically. Pit house villages became much larger, and remained in use for greater time periods; food storage in the form of storage pits became common place and the population reached its

greatest extent (Rousseau 2004a:17). The tool kit during the Plateau horizon included a variety of task specific tools, such as digging stick handles and key shaped unifaces, as well as the more common scrapers and bifaces. Projectile points typical of the time are medium-sized (approximately 2-6cm in length) and barbed, with either corner or basal notches (Hayden 2000:50), the first more common from 2400 to 2000 B.P. and the second more common from 2000 to 1200 B.P.(see Figure 7). Rare leaf-shaped and stemmed points are also present (Rousseau 2004a:17). Rousseau (2004a) has also noted that a progressive reduction in the size of points occurs during the Plateau horizon, particularly after 1600 B.P. This will be of particular interest during the analysis of my data.

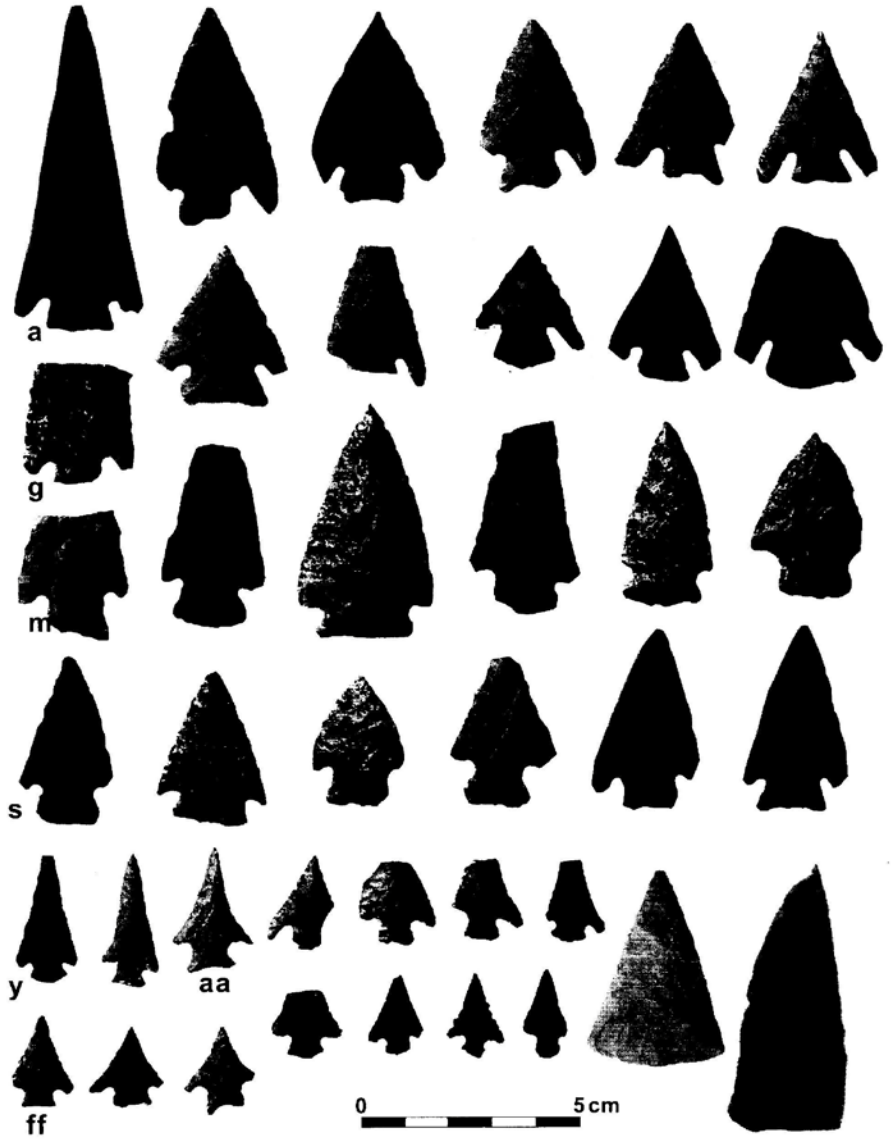


Figure 7: Examples of diagnostic bifaces from Plateau Horizon components (Rousseau 2008:240)

The Kamloops Horizon (PPt):

The most recent archaeological time period is referred to as the Kamloops horizon. It spans the time period from 1200-200 B.P. and in many ways exhibits subsistence and settlement patterns similar to those of the ethnographic period. Key differences from the Plateau horizon include variations in house size and floor plan, a decline in the use of upland plant resources and decreased populations (Rousseau 2004a:19). The other major difference is the “Kamloops side-notched” projectile point type. These triangular side notched points range from small to very small (approximately 1.5-4cm in length) (Richards and Rousseau 1987:45) with the occasional larger examples as well as multinotched specimens having one or more U-shaped notches along the lateral margin(see Figure 8) appearing in the most recent sites Rousseau 2004a:20).

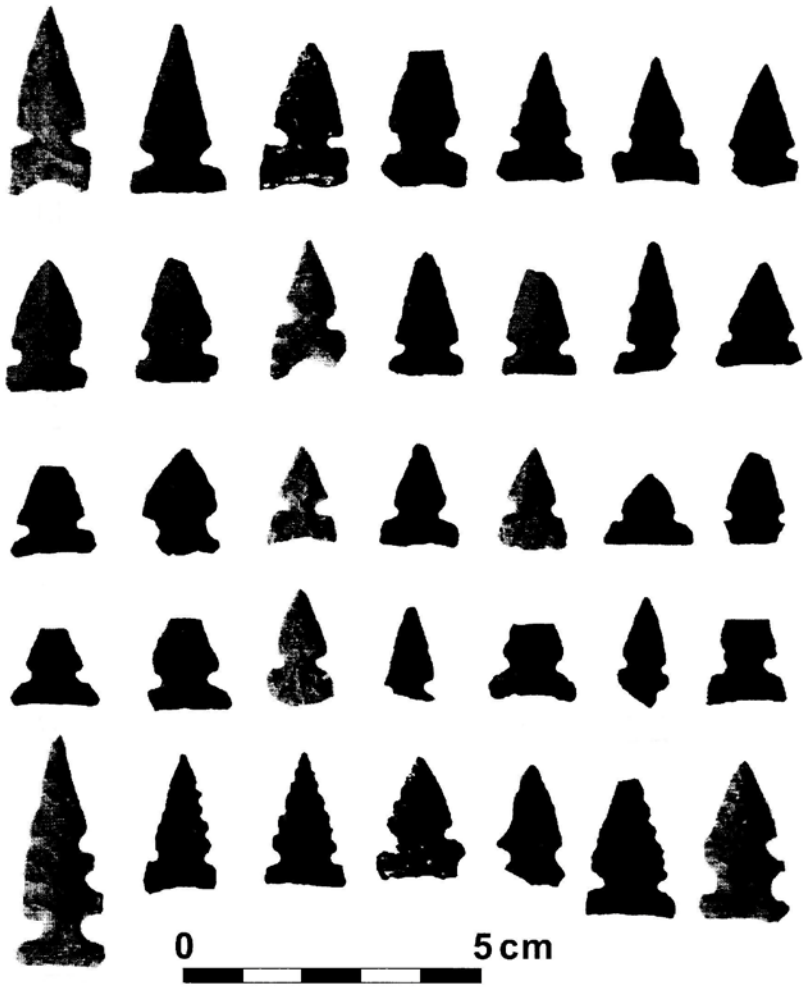


Figure 8: Examples of diagnostic bifaces from Kamloops Horizon components (Rousseau 2008:243)

The six typological time periods that have just been discussed are very important to the remainder of this work. As our current archaeological understanding of the projectile weapon systems used within each of them will be put to the test. Though the Plateau horizon is of the most interest as it is already believed to contain points used to arm both systems the Shuswap horizon will

also be interesting. It has been shown there is evidence of the bow and arrow in neighbouring regions during the Shuswap horizon so it may be possible that we have points from this weapon system appearing during this time as well.

CHAPTER 3: METHODS AND MATERIALS:

Understanding the atlatl and bow and arrow systems

A project that focuses on projectile points such as this one requires a clear set of attributes to illuminate the differences between the two projectile weapon systems being examined. The following is a brief description of the atlatl and the bow and arrow systems, with special attention to those components that might have influenced the shape and size of associated points.

The atlatl

The atlatl system involved two items, the dart and the atlatl, each of which could be composed of a variety of pieces. The dart included a point, a main shaft and possibly foreshaft elements and fletching. The atlatl included the throwing board, a spur and possibly finger loops and a weight. Each part gives the system distinct properties that should be reflected in the shape of the point.

The atlatl is a weapon that functions as an extension of the human arm, increasing the length of the lever that an individual can apply force to, and therefore increasing the power that can be converted to forward movement of a projectile (Baugh 1998:32). Atlatls can be made from semi rigid to flexible wood, the rigid type providing mainly leverage and the flexible type providing stored

potential energy similar to the bow (Baugh 1998:38). The bodies of atlatls can range from circular in cross section to very broad and flat (Miles 1963:35). At the proximal end they typically have some form of finger loop to facilitate holding. These can be made by attaching other materials such as leather or plant fibre or they can be carved directly into the wood (Miles 1963:35). At the distal end of the atlatl there is a spur or hook that points engages the proximal end of the dart. Again this can be made by carving into the wood or by attaching other materials such as wood or antler (Miles 1963:35). The projectiles launched from atlatls have been described both as large arrows (as archaeological examples often have fletching at their proximal ends), or as small spears (because they are typically much more robust than a common arrow. The proximal end of the projectile has a hole or indentation into which the spur of the atlatl fits. The atlatl and dart are held together by the thrower in a similar manner to a modern javelin and when thrown, the atlatl pushes the proximal end of the dart forward applying the force of the arm to the projectile for a longer period and at an increased pressure and greater leverage (Baugh 1998:32). Figure 9 illustrates the throwing of a dart with an atlatl.

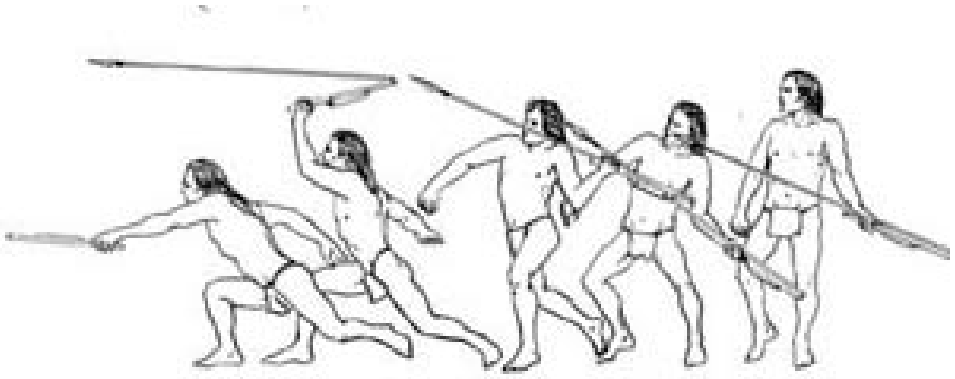


Figure 9: The throwing of a dart with an atlatl (Fladmark 1986:47).

From both archaeological and ethnographical contexts, atlatls generally are semi-rigid, rather robust, and made of wood, bone or antler (Baker and Kidder 1937; Baugh 1998; Brüchert 2000; Bushnell 1905; Fenenga and Wheat 1940; Fenenga and Heizer 1941, 1942). Some atlatls were made of multiple materials, while others were made of simply one material, usually wood (Baker and Kidder 1937; Fenenga and Wheat 1940; Fenenga and Heizer 1941, 1942; Taylor and Caldwell 1954). Darts thrown from the atlatl also would have been robust. A variety of studies have examined the various effects that properties such as length and thickness of the shaft have on the system (Baugh 1998; Couch et al. 1999; Markley 1942a). In most cases, it has been determined that the longer the length of the dart the thicker the shaft must be in order to compensate for the enormous amount of force being exerted on it at launch (Couch et al. 1999; Perkins 1992; Whittaker and Kamp 2006). By examining the basics of the atlatl and dart shaft we reveal a system that also would require a robust point. After all, if the dart shaft must be thicker, then it follows that the

point and cutting edges would also need to be bigger to enable better penetration while hunting.

Another component of the system needs to be considered, however. Most archaeological examples of atlatl darts have replaceable foreshaft elements (Gilliland 1975; Hare et al. 2004), which would connect at one end to the stone tip of the weapon and on the other to the main body of the dart. It follows then that the foreshaft diameter would directly relate to those parts of the point hafted on it and that its diameter in turn would be affected by the diameter of the shaft to which it is connected, either slightly greater or slightly smaller than the main shaft depending on the attachment system being used. A smaller diameter would be needed for a 'male' foreshaft to fit into the main shaft or larger diameter for a 'female' design foreshaft to fit over the main shaft. It quickly becomes apparent that if one is interested in identifying the type of system in which a projectile point was used one needs to examine the part of that point that was originally attached to the other components of the system: the hafting elements of the projectile shaft.

It is important at this stage to discuss the use of foreshafts. Foreshafts are present on many archaeological specimens of both atlatl darts and arrows. They are usually made of wood, bone or antler and are used as an intermediary to join the point to the main shaft of the projectile (Hare et al. 2004). Foreshafts helped to reduce damage to the shafts, which were much more time consuming

to make than the stone points they propelled. Using a foreshaft may also have given people more leeway in their construction techniques. For example, a very small light point could theoretically be hafted to a large heavy foreshaft to make a viable and effective penetrating point. In the same way, it might be possible (though impractical), depending on the means of attaching the main shaft and foreshaft, to have the opposite, a heavy point with a light foreshaft. Either way the diameter of both the main shaft and the point would still likely be related, so, though I took this into consideration in my research, I do not feel that it had any major effect on my results. It is also important to note that most of the points assessed by Thomas (1978) and Shott (1997) were hafted to foreshafts or shafts of some kind and their analysis still showed a difference between the atlatl and bow and arrow systems. Thomas (1978:469) also showed that there was a difference in the diameter of the arrow and dart foreshafts he measured. As I am basing my research on their ground work, I feel that the possibility of the existence of foreshafts did not affect my results.

The bow and arrow

This system also usually consists of multiple components; the bow and bow string (both possibly composite), the arrow shaft, possibly a foreshaft element, and the point. Each of those first three elements has characteristics that should help to shape the point hafted to the end of the arrow. Most bows are relatively slender and gracile (Hamilton 1982). They can be made of one material or many materials laminated together. Archaeological and ethnographic

collections of bows from around the world show that they can be made from, but not limited to, wood, sinew, horn and hide (Hamilton 1982). These fine flexible instruments are not designed for firing heavy shafted projectiles. The arrow shaft therefore tends to be much thinner and shorter than that of an atlatl dart. As archery currently is a modern hunting and recreation sport as well as an Olympic sport, there are large amounts of data about what diameter and length of shafts best suit each bow type, terrain type and prey type (refer to any modern archery magazine for details). What is important here, however, is simply that arrow shafts would all be relatively short and slender compared to atlatl darts and spears, and the associated points would also have to be small. Thus, the cutting area of the point would have to be large enough to be effective, yet small enough that it did not over-balance the arrow in flight and not spread the force of impact out too much when hitting the target, as this would minimize penetration (Hamilton 1982). Once again, the parts of the projectile point that would most greatly reflect the system to which it was connected would be its hafting elements.

For clarity the terms ‘arrow’ and ‘dart’ will be used respectively in this research when discussing a point and whether it belongs to the bow and arrow system or the atlatl and dart system.

Methods

As a result of the preceding considerations, the hafting elements of projectile points seem the most likely to provide information about the weapon

systems with which they were associated. This assumption is supported by the work of a variety of other researchers (Davis and Keyser 1999; Fawcett 1998; Fawcett and Kornfeld 1980; Perkins 2000; Shott 1997; Thomas 1978) who have dealt with this question in other parts of the world. Of particular interest to this study is the work of Michael Shott (1997). Building on a framework developed by Thomas (1978), he carried out metric analyses on a number of archaeological specimens of hafted points known to have been used on darts or arrows. Though the specimens that he used were from a variety of locations throughout the USA they all shared one major characteristic; they were found hafted to the wooden shaft remains and were therefore undeniably either dart or arrow points. Shott (1997) used the same attributes chosen by Thomas (1978) as he felt they best reflected the differences in the two projectile systems. He was able to show that specific measurements **can** be used to differentiate between collections of dart and arrow points with a 97% accuracy rate. As his study is similar to mine, it was decided that building on his research would be more effective in developing a functioning system of identification for projectile points on the Plateau than trying to define a new set of measurements. What follows is a list of the attributes measured by Shott (1997), as well as those that I have added.

The attributes that Shott (1997) chose to use were neck width, shoulder width, thickness and length. Thomas (1978) also included weight. In order to build on this research, the first attribute I examined was width, but three different width measurements were chosen: the **width of the point at the base,** the

width of the point at the neck and the **width of the point at the shoulder** (see Figures 6 and 7). These three measurements should provide information about the diameter and size of the shaft or foreshaft to which the point was once hafted. It also is important to note that multiple studies have focused on how the shapes of projectile points could change over time as they are broken and re-sharpened (Flenniken and Wilke 1989; Towner and Warburton 1990). By focusing on the hafting elements, it is possible to minimize confusion in this regard as the diameter of the shaft would not likely change and therefore neither would the width of the hafting elements, even if a point had to be removed and reshaped.

Shott (1997) was able to demonstrate that the three aforementioned measurements (base width, neck width and shoulder width) were by far the most reliable for differentiating between the two systems, since they are logically the most closely related to the type of system in which a point would be used. A few other measurements are also important as well. Some early research focused on the total weights of points (Perkins 2000) and their maximum dimensions (Thomas 1978). Though these attributes have turned out to produce rather unsatisfying results, it was felt that they should still be included in this study. In particular, it was hoped that used in combination with one or more other attribute they too might help to shed light on the question. Therefore **maximum length**, **maximum width** (see Figures 6 and 7) and **total weight** were added to the list of attributes to be measured.

A last attribute to be measured was **maximum thickness**. Maximum thickness is a valuable attribute as it is unlikely to change substantially as a result of resharpening and use (Knecht 1997a:205). As children, many people try to make toy bows and arrows and thus know how hard it is to attach a pointy bit of rock to the end of a 'twig arrow'. Logically if one tried to insert a very thick point into the end of a small diameter arrow shaft it would either break the shaft or weaken it so that it would be unusable. Thus, the assumed greater thickness of an atlatl dart shaft, should allow it to be used with a thicker stone point.

Collections

Different collections of projectile points often vary greatly in respect to composition and associated information. For the purposes of this study two pieces of information were deemed most important; (1) age and (2) location.

In the initial proposal for this research it was suggested that only projectile points with very specific geographical location and stratigraphic depth provenience information would be used. In a primary search of known projectile point collections, however, it soon became clear that to study only points with such detailed information associated with them would narrow it to only a few well-studied sites. In order to keep a large sample size the selection criteria ultimately became simply whether or not the general geographic area from which a projectile point came was known.

In terms of the temporal dimension, it is believed that the transition between atlatl and bow and arrow technologies on the southern Plateau took place between 400 and 100 B.C., but not until the late Plateau Horizon ca. AD 500 on the northern Plateau (Chatters and Pokotylo 1998:78). For this reason an effort was made to try to limit the collection only two points dating from this time span, as it was expected that Plateau collection (and possibly older Shuswap collections), would contain a number of points classified as dart and a number classified as arrow. Again, this proved almost impossible to do, since only a few well-studied sites have points clearly associated with such accurate dates. In order to deal with this issue, the points were all identified by type according to the typology developed by Richards and Rousseau (1987) and Rousseau (2004a). Though this means of dating gives only a vague approximation of the age-range, it was the only way to get any temporal information for more than a very small selection of points. Assigning dates to points based on typology would not allow me to answer all my questions with the precision I had hoped, but it would still allow me to gain valuable insight into the use of projectile weapon technology in each of the typological time periods on the Plateau and let me test our current understanding of this.

The Simon Fraser University Archaeology Department's collections were the first to be visited. These were comprised of materials obtained in a variety of excavations over the past two decades. A total of 475 projectile points of various sizes and forms from 29 different sites were chosen from these collections (Table 1).

Table 1: Artifacts included from the SFU Museum

SFU Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
DiPu 16	17	Bull river	RC dates available
DiPu 17	8	Bull river	RC dates available
DiRa 20	16	1.5km south of Hedley	RC dates available
DjQg 9	2	2km east of Longbeach	none available
EbRj 3	4	Lytton Indian Reserve 9b	Kamloops phase, RC dates available
EbRj 92	2	Lytton Indian Reserve 9b	none available
EdRi 11	28	Oregon Jack Creek	Early period, RC dates available
EdRi 25	6	Oregon Jack Creek	none available
EeRb 130	6	1.5km North of Kamloops	none available
EeRb 140	34	Kamloops Reserve	none available
EeRb 144	25	Kamloops Reserve	none available
EeRb 148	1	1.5km North of Kamloops	none available
EeRb 149	4	1.5km North of Kamloops	none available
EeRb 161	1	2km Northeast of Kamloops	none available
EeRb 162	1	2 km North of Kamloops	none available
EeRb 172	1	5kn east of Kamloops	none available
EeRb 177	1	5km east of Kamloops	none available
EeRb 178	1	3km north east of Kamloops	none available
EeRb 184	1	3km north east of Kamloops	none available
EeRb 190	1	6km east of Kamloops	Shuswap Horizon, RC dates available
EeRb 191	1	2.5km north east of Kamloops	none available
EeRb 192	1	2km north east of Kamloops	none available
EeRb 75	2	1km east of Kamloops	none available
EeRb 77	45	1km east of Kamloops	RC dates available
EeRf 57	4	3km west of Savona	Kamloops Horizon,
EeRi 7	38	9km south of Pavilion	Shuswap, Plateau and Kamloops Horizon, RC dates available
EfQt 1	9	5km north of Sorrento	Lochnore, RC dates available
EfQv 12	9	Squilax	none available
EfQw 2	3	1km north east of Adams lake	Plateau, RC dates available
Total:	272		

The University of British Columbia's Department of Anthropology was contacted next, and collections from several excavations since the late 1950's contained a total of 203 points from 74 different sites in the Plateau (Table 2).

Table 2: Artifacts included from the UBC Museum

UBC Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
EbRj 1	5	1.5km North of Lytton	none available
EeRl 4	2	10km north of Lillooet	RC dates available
EfRk 1	2	10km north of Pavilion	none available
EfRi 31	1	10km northwest of Cache Creek	none available
EkRo 48	1	12km west of Alkali lake	RC dates available
EkRo 16	2	14km west of Alkali Lake	none available
ElSf 1	6	14km west of Kleena Kleene	none available
EdRk 3	6	16 km south east of Lillooet	none available
EdRk 4	1	16 km south east of Lillooet	RC dates available
EdRk 8	1	16 km south east of Lillooet	RC dates available
EkRo 25	3	16km north of Gang Ranch	none available
EiRm 4	1	20km south of Gang Ranch	none available
EeRh 1	3	2km south of Cache Creek	RC dates available
DhRt 7	1	2km south of Ymir	none available
DhPt 9	6	3.5km south of Baynes lake	none available
EeRk 1	4	3km east of Fountain	none available
EbPw 1	1	3km north of Canal Flats	RC dates available
EbRc 2	1	3km north of Quilcena	Plateau Horizon, Shuswap Horizon,
EeQs 1	1	3km south of Six Mile Point	none available
EcPx 6	5	3km southeast of Windermere	none available
FlSa 7	2	3km west of Nulki	none available
EfRl 3	17	5km northwest of Pavilion	none available
EgRj 1	2	5km northwest of Pavilion	none available
EeQw 3	1	5kn southwest of Chase	none available
GaSa 1	1	5kn west of Vanderhoof	none available
EdQx 5	7	6km east of Monte Creek	none available
EbRj 7	2	6km north east of Lytton	none available
EbPx 12	1	6km north west of Canal Flats	none available
EfQu 1	1	6kn north of Sorrento	none available
GaSc 1	1	7km north east of Fort Fraser	none available
EbRj 8	1	7km north west of Lytton	none available
EeQw 2	1	7km south west of Chase	none available
EeRl 7	3	8km south of Pavilion	Kamloops, Plateau and Shuswap Horizons, RC dates available
Gaza 8	1	8km north west of Vanderhoof	none available
FeRk 1	3	8km west of Quesnel Forks	Kamloops, Dendrocronology
EeRn 2	1	9km west of Edgewater	none available
FiRx 1	3	Boat lake	none available
EhRi 1	1	Chasm	none available
EiRg 4	1	little Green lake	none available
EbRj 14	3	Lytton	none available
FiSi 1	3	Natalkuz lake	none available
FiSa 3	1	north shore of Batnuni lake	none available
EjRe 12	1	North shore of Bridge lake	none available
FlRv 1	1	North shore of Cluculz lake	none available
FlRv 2	1	North shore of Cluculz lake	none available
EdRd 1	2	north shore of Face lake	none available
FiRv 1	7	Pelican Lake	none available
EeRn 5	1	Seton Portage	none available
EiRh 9	1	South Green lake	none available
EiRh 8	1	South west green lake	none available
EhRf 15	1	spectacle Lake	none available
FiRx 2	1	takedown lake	none available
FlSa 1	17	west end of Tachick lake	none available
EjRe 13	5	west shore of Bridge Lake	none available
EhRf 9	1	young lake	none available
EiRh 4	5	Green lake	Kamloops and Plateau Horizons, Protohistoric Period,
Total:	155		

The Royal British Columbia Museum in Victoria BC contained the third large collection examined, with a total of 340 projectile points of various sizes and forms from 48 different sites (Table 3). Most were from sites that had a Borden number associated with them; however, in some cases (usually surface finds by collectors) only the larger grid numbers were given.

Table 3: Artifacts included from the Royal British Columbia Museum

Royal British Columbia Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
EfQa 3	1	0.5 km north of Kootenay Crossing	none available
DiQm 8	1	0.5km Northeast of Renata	none available
DlRj 9	3	0.5km south of Nahatlatch and Fraser River junction	Lochnore phase, RC Dates available
EeRk 4	36	1 km east of Fraser River near Fountain Valley	Kamloops, RC Dates available
EeRk 8	1	1 km east of Fraser River near Gibbs Creek	none available
DgQq 25	5	1.5 km east of Midway	Kamloops, Plateau and Shuswap Horizons, RC Dates available
EeRi 45	3	10 km west of Cache Creek on Cornwall Creek	none available
EcRi 76	1	12 km NNE of Lytton	none available
EfRh 64	1	15 Km NNE of Cache Creek	none available
DiQl 8	1	15 km west of Castlegar on Lower Arrow lake	none available
DkQx 1	1	18km west of Okanagan lake on Trout creek	none available
EeRj 15	3	20 km west of Cache Creek on Finney Creek	none available
ElRn 24	1	26 km south of Williams Lake on Porter Creek	Nesikep tradition, RC Dates available
DiQm 13	5	3 km east of Renata	none available
EeRh 241	1	3 km SSE of Cache Creek	none available
EdRi 46	1	3km west of Thompson River on Oregon Jack Creek	none available
EeRg 46	1	4 km SSW of Walhachin	none available
EeQw 7	110	5.5 km Southwest of Chase on Thompson River	none available
EdRh 89	1	5km east of Thompson River on Pukaist Creek	RC Dates available
EaQi 5	1	6 km NNW of Roseberry	RC Dates available
EeRh 61	4	6 km NW of Ashcroft on Thompson River	Lochnore and Nesikep phases, RC Dates available
DkQi 1	2	6 km south of Slocan on Slocan River	none available
EeQw 3	13	6 km Southwest of Chase on Thompson River	none available
DgQs 12	3	7km WNW of Rock creek	Kamloops, Plateau and Shuswap Horizons, RC Dates available
DgQr 33	1	8km east of Rock creek on Kettle River	Shuswap horizon, RC Dates available
EdQa 137	1	East shore of Enid Lake	RC Dates available
DgPt 18	1	Kootenay River 0.5km north of border	none available
DgPt 19	2	Kootenay River 12 km north of border	none available
DgPt 11	4	Kootenay River 13.5km north of border	none available
EbQu 15	23	Near Otter Bay on Okanagan Lake	none available
DgQo 23	7	Kettle River 1.5 km northwest of Gilpin	Plateau Horizon, RC Dates available
DgQn 43	1	North side of Kettle River north of Gilpin	Shuswap horizon
DkQj 3	5	Upper Little Slocan Lake	Kamloops and late Plateau Horizons
EcQt 12	1	West shore of Otter Lake	Kamloops and Plateau Horizons, RC Dates available
EcQv 2	8	West shore of Pinaus Lake	Kamloops horizon
Total:	254		

One long trip to smaller museums in the Interior was also undertaken, with museums in Kamloops, Chase, Kelowna, Penticton, Peachland, Princeton and Lillooet visited. Not all had artifacts appropriate for this project and some were not able to grant me access to their collections. In the end, artifacts from the Penticton (Table 4), Chase (Table 5) and Kelowna (Table 6) Museums were included in this study, comprising a total of 143 projectile points of various sizes and forms from 26 different Plateau sites.

Table 4: Artifacts included from the Penticton Museum

Penticton Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
DlQv 8	2	Westside	none available
OK lake	2	OK lake	none available
DlQv 5	9	1km south of Westside	none available
DlQv 4	15	1km south of traders Cove	none available
DlQv 2	1	1km south of Traders cove	none available
Osoyoos	4	Osoyoos lake	none available
Penticton	27	in and around the community of Penticton	none available
Total:	60		

Table 5: Artifacts included from the Chase Museum

Chase Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
C. Coles collection	14	12km north west of Chase	none available
Total:	14		

Table 6: Artifacts included from the Kelowna Museum

Kelowna Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
Manhattan Beach	7	Kelowna, Manhattan Beach	none available
Northwest Plateau	1	North West Plateau	none available
Fauguier	1	Fauguier, North of Grassy Point	none available
J11	6	North Side of Caribou Creek, old Burton town site	none available
EaQl 14	28	2km south of Makinson	none available
DkQm 5	4	1km south of Edgewood	RC dates available
EaQl 1	3	1km east of east arrow park	none available
J5	2	Burton Boat Ramp	none available
DlQm 14	2	Andres Creek	none available
EaQl 13	3	1.5km south of Carrolls landing	none available
J6	2	Sandy Beach South of Caribou Creek, BC	none available
DlQm 27	1	south end of Whatshan lake	none available
DkQm 4	2	Needles	none available
EaQl 10	2	2km south of Carrolls Landing	none available
marked ST1	1	Thompson River, east of Cement Plant Bridge	none available
DlQm 15	1	Christie Creek	none available
DkQm 9	1	3km north east of Edgewood	none available
Total:	67		

The final collection of points examined was at the museum in Kamloops run by the Secwepemc Band (Table 7). Although the museum had recently undergone a change in management, the staff were helpful in allowing me access to as many of the artifacts and records as they could. A total of 107 projectile points of various sizes and forms were chosen from this collection from sites in and around the Kamloops area.

Table 7: Artifacts included from the Secwepemc Museum

Kamloops Sequmpec Museum Collections			
Site Name	**Number of Artifacts**	**Geographical location**	**Temporal information**
EeRb10	9	2km north of Kamloops	RC dates available
EdRa 22	1	18 km east of Kamloops	RC dates available
EeRb 3	7	north of Kamloops	RC dates available
EeRa 4	1	14 km east of Kamloops	RC dates available
988.12	1	in and around Kamloops	none available
988.8	4	in and around Kamloops	none available
987.9	34	in and around Kamloops	none available
E-985-40-	48	in and around Kamloops	none available
E-985-42-	2	in and around Kamloops	none available
Total:	107		

Because these smaller museums have accepted donations from amateur archaeologists, and in some cases because of inconsistent management styles, the identification of the locations where these points were found was not as accurate as for those from the universities. Points from these museums were included as long as they were accompanied by some geographical references, ranging from information as vague as listing someone's farm, to detailed descriptions of landmarks and distances. The total number of points measured and photographed from all collections is 1065.

Instruments

A variety of attributes of each projectile point in the study needed to be carefully measured, and each point also was photographed. Below is a description of how each measurement was taken.

The tools used to take measurements of the points used in this study were two Mitutoyo digital calipers, one a model CD-8"C and the other a model CD-6"C. Readings were taken from these instruments in millimeters and recorded to two decimal places. Each point was also weighed using an Ohaus Scout Pro

electronic balance (model SP202 - 200 gram capacity). Readings were taken to the nearest 100th of a gram.

Though the total shape of the point is not an important aspect of this study, it was decided that each point also should be photographed. This allows for reconsideration if a measurement does not seem accurate and it also allows other researchers to more clearly understand how I took my measurements. All photographs were taken on one of two digital cameras, a Pentax Optio W20 (a 7 megapixel camera) and a Canon Elf SD300 (a 4 megapixel camera). All photos were taken at full resolution using the Digital Macro setting. In order to take effective photos, the cameras were mounted on photographic stands held steady at a height of 10cm above the artifact being photographed.

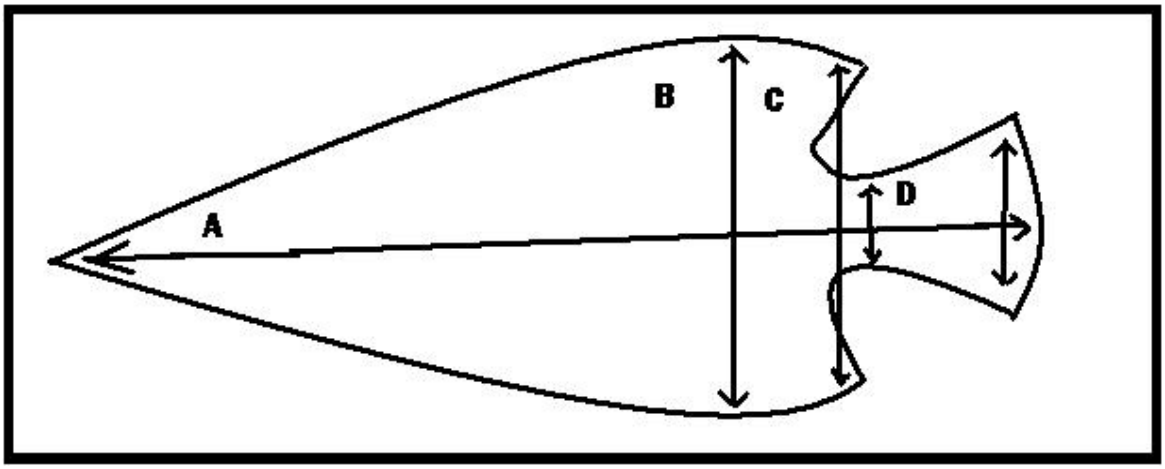
Artifacts

Measuring projectile points is not a new idea (Andrefsky 1998, Odell 2004); however doing so in such a way that anyone else can get the same measurements from the same point is not always easy. Different terminology, different interpretation of an artifact's shape and different research goals all work to create systems that do not always overlap (Andrefsky 1998; Marshall 1963; Odell 2004; Van Buren 1974). For this study, a variety of measurements were taken on each point, with a specific method (described in detail below) developed to ensure that all points were measured in the same way. Over the great scope of time and space represented by the specimens in this study, point forms varied

considerably, and therefore a description of how the measuring was conducted is required.

Measurement 1: Length

The length of each projectile point was measured using callipers. It was measured at the longest distance from the tip to the base of the point (Figure 10). In cases where the point was incomplete (i.e. missing a portion of the tip) the measurement was taken using an imaginary bisecting line and measuring the longest dimension perpendicular to the base (see Figure 10).Figure 10: Location of the various measurements on notched points used in this study



A: total length, B: maximum width, C: shoulder width, D: neck width, E: base width.

Total length has been shown to be misleading due to possible point re-use and re-sharpening (Couch et al. 1999; Fenenga 1953; Shott 1997). It was included in this study for two major reasons. The first is that no study with such a large data base has been carried out and this information may be useful for future researchers. The second is that with a sample size this large it may be possible to use the extra measurement in the statistical analysis as one more way to help differentiate the two weapon systems.

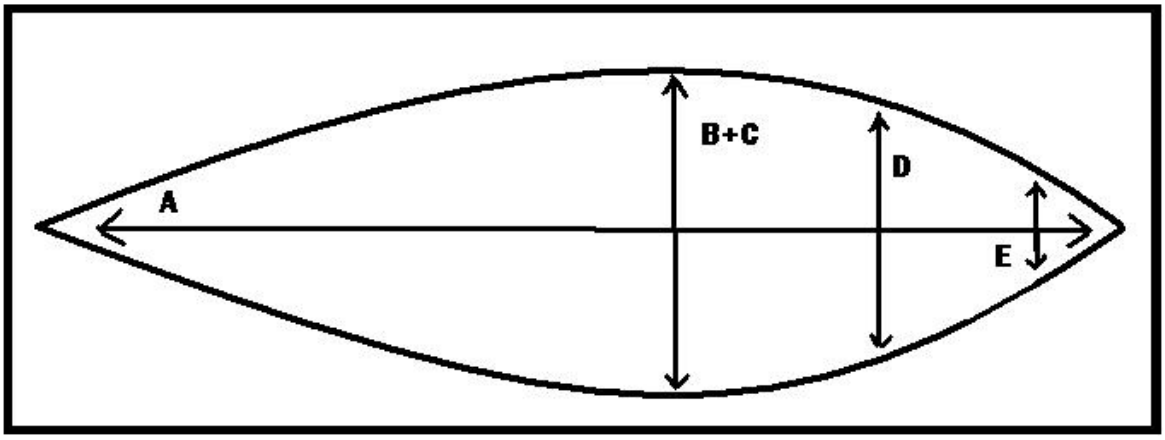
Measurement 2: Maximum Width

Maximum width of each projectile point was measured using calipers. The calipers were held in such a way that the long flat measuring surfaces ran parallel to an imaginary line bisecting the point from tip to base. The calipers were closed on the artifact so that this angle was maintained, insuring that the width measurement was as close to perpendicular to the length measurement as possible. In cases where the point was incomplete, the same procedure was used, but measuring from the widest remaining area of the point.

Measurement 3: Width at the Base

Width of the base of the point was found in the same manner as maximum width. On points with side or corner notches this measurement was taken at the widest point of the base below the notches (Figure 10). On points that had no notches, the basal width measurement was taken at the base if it was flat, or 5mm from the base if it was tapered (Figure 11).

Figure 11: Location of the various measurements used in this study on un-notched lanceolate and leaf-shaped points



A: total length, B: maximum width, C: shoulder width, D: neck width, E: base width.

Measurement 4: Neck Width

Widths of the neck of the point were taken using calipers as well. The narrow point of the measuring surface of the calipers was inserted into the notches and the smallest measurement possible was recorded (Figure 11). On points that did not have notches the neck width was measured at a point half way between the widest measurement and the location of the basal width measurement (Figure 11). Though unconventional, this allowed the incorporation of lanceolate points into the analysis.

Measurement 5: Shoulder Width

Shoulder width was shown to be the most effective by Shott (1997) in his research. It was measured using callipers at the location where the main body of the point connected to the area where the notches began (Figure 10) on all notched points. On points without notches this measurement was taken at the widest section of the point (Figure 11). Once again, this enabled the lanceolate points to be included in a metric analysis into which they would otherwise not fit.

Measurement 6: Maximum Thickness

Maximum thickness was the final measurement taken using callipers. The maximum thickness measurement was taken at the largest point along an invisible line from the tip to the base of the point while viewing it from either cutting edge.

Measurement 7: Total Weight

Though total weight has already been shown to be a measurement that is not useful for determining point function (Shott 1997), it was included in this study because it might still be important when used as a ratio with other measurements. It might also be useful in itself for identifying different point types (Van Buren 1974:11 and 29). All point weights were taken using the Ohaus Scout Pro electronic balance (model SP202 - 200 gram capacity). Measurements were recorded in grams to the second decimal point. As in the case with total length, other researchers (Couch et al. 1999; Fenenga 1953; Shott 1997) have shown that total weight is not an effective unit for statistical differentiation because it can change by processes of re-use and re-sharpening. Again, this measurement was included for the same reasons stated for the total length, simply having the data on record, and having one more dimension to explore.

Photographs

Only one photo was taken of each point, using either a Pentax Optio W30 digital camera or a Canon Elf SD300 digital camera on full resolution. With a

photo stand and a simple black canvas backdrop each point was photographed next to a metric measuring key 5cm long. Photographs were taken of the broad flat side of the point that did not have catalogue information on it whenever possible. In cases where this was not possible the more regularly shaped side of the point was photographed.

Digitizing the data

All measurements taken were entered by hand onto a paper spreadsheet that was then transcribed to digital format. All information about each artifact, including photo information, was entered onto this copy. Photo numbers were attached to the artifact spread sheet so that any discrepancies could be dealt with after the points were no longer accessible. Though the weight of the artifact could no longer be obtained, all of the measurements could be approximately replicated by using the 5 cm scale key in each photo. The vertical distance between the key and the artifact makes the measuring less accurate so it was only included as one more way to help ensure that data being used in this study could be replicated and checked for integrity.

CHAPTER 4: ANALYSIS OF THE DATA

Once all the data had been entered into a digital database it was possible to use statistical software to examine it further. Three programs were used: Microsoft Excel 2007, JMP Statistical Discovery Software version 7.0 (JMP) and Statistical Package for the Social Sciences version 17.0 (SPSS).

Microsoft Excel was used for preliminary examination of the data, as well as for assessing the various relationships between measurements. Excel proved to be an excellent tool for finding errors in transcription. By developing ratios from two columns of data any anomalies that could be data entry errors became very obvious. These could then be re-examined against the hard copies of the original data to ensure that all the measurement information was accurately transcribed. For example, by plotting total length against maximum width a variety of ratios from 0.5 to 4.5 were produced. Re-evaluating the smallest 15 as well as the largest 15 ratios of specimens in each category ensured that the artifacts with extreme values were indeed accurate, and not simply transcription errors.

The second two computer programs were used in this research for the descriptive statistical analysis. They were chosen because of their ability to handle large amounts of information quickly.

The total number of points measured and photographed from all collections is 1065. Of these only 927 were used in the following statistical analysis. If an artifact was missing data for any one of the seven measured attributes the entire artifact was removed from the study. Points were also removed because of incomplete or invalid location references, such as incorrect Borden grid designations. All the points classified as lanceolate or lacking notching were removed from the analysis as well. This was done for two reasons, first because they are very similar over great time spans and cannot easily be classified by the established typologies and second because of the possibility that they may have served other functions (e.g.: knife blades and harpoon points) and were not projectile points. All of the 927 points used in the analysis were classified into six typological groups: 1. Lehman (n=20), 2. Lochnore (n=20), 3.Nesikep (n=23), 4.Shuswap (n=234), 5. Plateau (n=373) and 6. Kamloops (n=259).

As a starting point, descriptive statistics, including mean, standard deviation, and median were calculated for all seven variables for each point type. Of the 927 artifacts included, 14 were shown to be outliers within the category to which they had been classified. This was done by calculating z-scores for each artifact in the database and using them to calculate due probabilities for each of my six typological groupings. Artifacts with a z-score greater or lower than the calculated due probability were considered outliers. Shott (1997) removed the

outliers from his data, so for consistency that was done here as well. Table 8 shows the descriptive statistics for my data with the outliers removed.

Table 8: Descriptive statistics for the various point types

Summary statistics table for BC Plateau collection							
Nesikep (n=23)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	42.86	24.09	15.96	23.71	16.98	5.87	6.23
median	39.87	23.74	16.10	23.74	16.97	5.90	5.31
stdev	14.42	3.23	3.35	3.39	3.59	1.06	3.80
std err	0.63	0.14	0.15	0.15	0.16	0.05	0.17
min	21.59	18.66	8.92	17.48	11.54	3.92	1.89
lower quartile	30.25	21.455	13.47	20.8	14.37	5.055	3.475
median	36.44	23.74	16.1	23.74	16.97	5.9	5.31
upper quartile	49.965	26.865	18.655	26.555	18.9	6.59	7.26
max	74.74	30.33	21.99	30.33	24.59	8.2	17.44
Lehman (n=20)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	39.61	27.88	16.66	27.14	21.89	5.91	6.73
median	40.07	29.84	16.88	27.68	20.81	5.88	6.55
stdev	7.33	4.68	3.21	4.83	5.24	1.50	2.85
std err	0.37	0.23	0.16	0.24	0.26	0.08	0.14
min	23.78	19.34	9.36	19.34	9.21	3.15	2.05
lower quartile	35.46	23.89	14.52	23.65	18.93	5.22	4.99
median	40.07	29.84	16.88	27.68	20.81	5.88	6.55
upper quartile	45.94	32.01	18.94	31.24	24.56	6.32	8.44
max	51.46	34.18	21.53	34.18	32.78	10.23	12.43
Lochnore (n=20)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	51.78	25.57	17.65	24.93	17.56	7.41	10.94
median	48.31	24.62	16.46	24.10	17.98	7.64	6.94
stdev	20.04	7.66	4.86	7.39	5.58	2.01	9.32
std err	0.95	0.36	0.23	0.35	0.27	0.10	0.44
min	28.83	17.29	11.27	17.29	9.17	2.84	3.19
lower quartile	38.23	21.76	14.61	20.54	12.46	5.61	5.22
median	48.85	24.65	16.61	24.12	18.17	7.79	7.68
upper quartile	62.96	27.86	20.77	27.50	22.40	8.55	15.56
max	112.21	46.79	29.21	45.10	25.93	11.99	42.27
Shuswap (N=299)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	36.74	19.62	12.57	19.36	13.90	5.88	4.34
median	35.47	19.48	12.72	19.23	13.57	5.81	3.75
stdev	10.95	4.57	3.24	4.51	4.04	1.45	2.85
std err	0.05	0.02	0.01	0.02	0.02	0.01	0.01
min	13.31	5.32	5.4	5.04	5.38	1.89	0.27
lower quartile	28.88	16.695	10.6	16.575	10.68	4.875	2.3
median	35.47	19.5	12.745	19.35	13.57	5.8	3.75
upper quartile	42.775	22.005	14.5775	21.74	16.79	6.795	6.12
max	117.04	45.11	32.51	44.06	34.37	12.94	40.74
Plateau (N=366)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	32.58	21.70	11.38	21.57	13.56	5.03	3.30
median	32.11	21.69	11.61	21.69	13.80	5.07	3.04
stdev	9.59	5.11	3.07	5.22	3.82	1.36	2.07
std err	0.02	0.01	0.01	0.01	0.01	0.00	0.00
min	11.01	10.36	4.42	7.16	0.00	1.84	0.25
lower quartile	26.42	18.35	9.40	18.29	10.72	4.15	2.06
median	32.18	21.84	11.72	21.80	13.70	5.10	3.11
upper quartile	38.25	25.22	13.77	25.17	16.07	5.94	4.46
max	74.51	43.91	20.19	43.91	24.11	9.56	16.84
Kamloops (N=259)	**total length (mm)**	**maximum width (mm)**	**neck width (mm)**	**shoulder width (mm)**	**base width (mm)**	**maximum thickness (mm)**	**total weight (g)**
mean	21.41	13.35	7.56	11.55	12.93	3.18	0.83
median	20.57	13.18	7.48	11.20	13.09	3.14	0.66
stdev	5.25	2.35	1.36	2.27	2.69	0.65	0.72
std err	0.03	0.01	0.01	0.01	0.01	0.00	0.01
min	9.32	6.10	3.48	6.10	0.00	1.83	0.12
lower quartile	17.99	11.74	6.62	9.87	11.14	2.71	0.49
median	20.68	13.36	7.52	11.30	13.09	3.18	0.67
upper quartile	24.87	14.91	8.55	13.28	14.58	3.72	1.01
max	53.05	26.66	16.44	26.92	22.27	6.56	79.00

Applying Shott's 1997 methods to the Plateau data

As previously stated I wanted to begin this analysis by exploring the possibility of applying the results of the study carried out by Michael Shott (1997) on known points from across the USA to points from the Plateau. Shott (1997) used metric data from a collection of complete arrows and atlatl darts accumulated by Thomas (1978) and added metric data from another collection of hafted atlatl darts that he gathered. His study was based on the earlier discriminant analysis carried out by Thomas (1978) using the algorithm provided by Klecka (1975). Both Shott and Thomas developed equations from points known to be used with one of the two systems. They then performed blind tests on their data to evaluate the validity of these equations. In both cases they were successful, though Shott (1997) was able to provide slightly more accurate results – 89.4% accuracy (Shott 1997:94) vs. 86% accuracy (Thomas 1978)

In both cases the researchers had artifacts known to be used with one or the other system, so accuracy was tested simply by comparing the results of the analysis with the true classification. As a second means of testing Shott (1997) also performed blind tests on some of his data. Table 9 illustrates descriptive statistics for the data compiled by Shott (1997). A summary of his data is located in the appendices.

Table 9: Table of descriptive statistics for the data gathered by Shott (1997)

Summary statistics for Shott's 1997 data																
attribute	arrow (n=133)								dart (n=40)							
	mean	std dev	std err	max value	upper quartile	median	lower quartile	min value	mean	std dev	std err	max value	upper quartile	median	lower quartile	min value
total length	31.16	9.31	0.07	75.90	36.975	30.85	24.8	13.40	51.51	13.86	0.35	85.30	60.4	53.45	39.8	21.80
shoulder width	14.69	3.91	0.03	32.40	16.825	13.45	12.175	9.20	22.97	4.37	0.11	32.00	26.2	23.25	20.075	14.00
neck width	9.97	2.85	0.03	20.90	11.725	13.45	7.6	5.10	15.13	3.26	0.08	21.90	17.55	15.30	13.1	8.30
maximum thick	3.99	1.29	0.01	9.80	4.6	3.80	3	1.70	4.96	1.00	0.03	7.20	5.5	4.95	4.275	2.90

My first analytical goal was to apply the equations used by Shott (1997) to my own data set in order to examine if data gathered from known dart and arrow points found across the United States would be similar enough to be comparable with my data from the Plateau. Shott's study applied four different sets of equations, each using a different number of metric variables starting at four, and then removing the variable contributing the least, all the way down to a one variable equation. These equations were developed originally by Thomas (1978) using stepwise variable entry and the subprogram DISCRIMINANT in the Statistical Package for the Social Sciences (SPSS) program. They were further modified by Shott (1997) as he used simultaneous variable entry and performed the analysis using within-group covariance matrices. The reader is referred to Cooley and Lohnes (1971) and Klecka (1975) for more information about these techniques. The following equations and the numbers in them, represent the discriminant functions calculated by Shott (1997). It is important to understand that the numbers within each of the various equation sets are derived from Shott's collection of 'known' artifacts and are <u>not</u> derived from my data.

The four variable solution

The following two, four variable equations supplied by Shott (1997:93), were applied first, using maximum length, shoulder width, thickness and neck width variables. The equations used are:

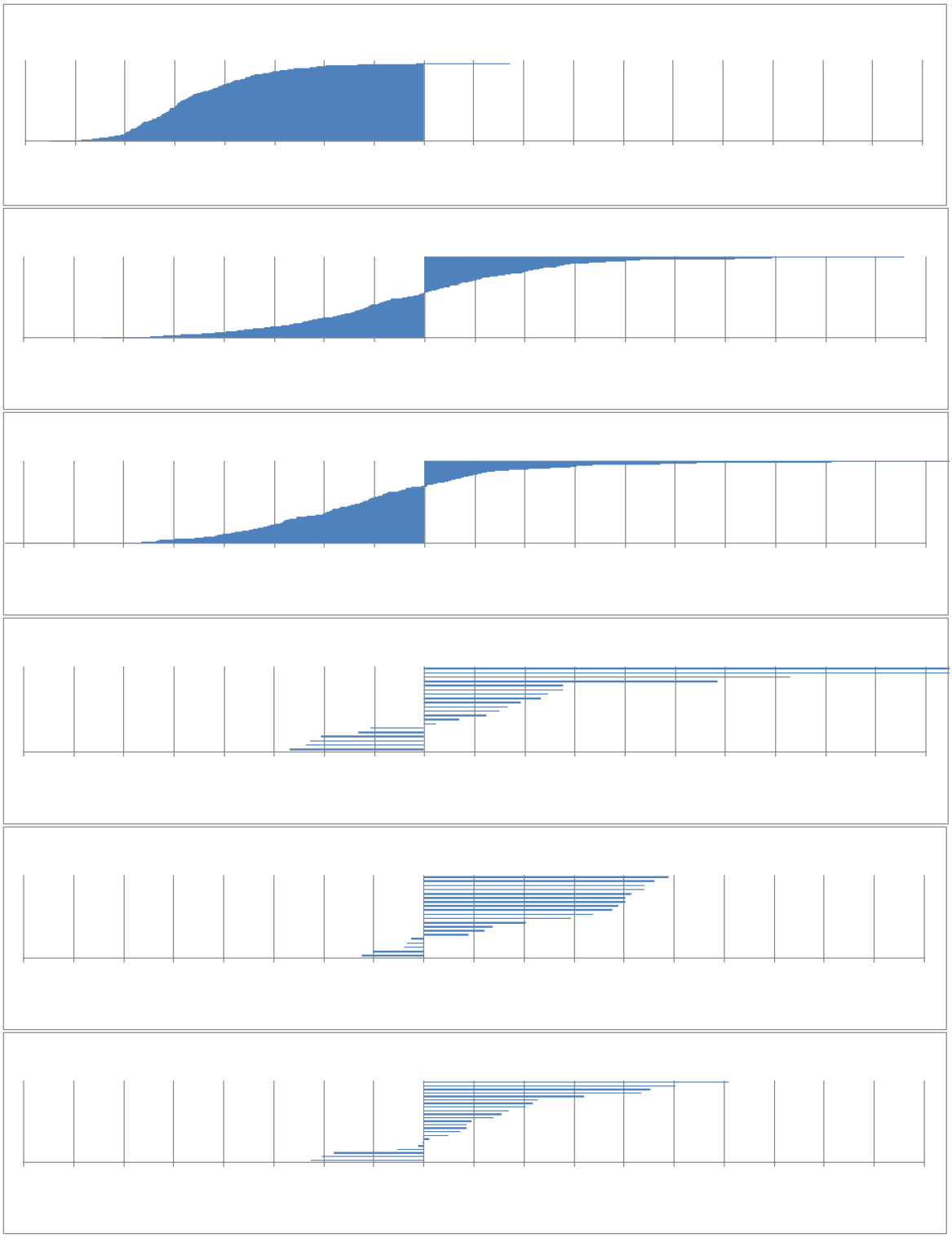
D*dart* = 0.18(length) + 0.87(shoulder width) + 0.72(thickness) + 0.21(neck width) – 18.79

D*arrow* = 0.07(length) + 0.49(shoulder width) +1.28(thickness) +0.14(neck width) – 8.60

Values for each specimen in my database were calculated using each of these equations. The two resulting values were then compared, the higher one indicating the category to which that point should be assigned (Thomas 1978). This method applied to Shott's (1997) data yielded a correct overall classification rate of 86.5%, but only classified 76.9 % of his dart collection correctly. As I do not know to what specific system each of my points belongs, it is difficult to assess this model. However, the typological information I do have enables me to at least shed some light on the validity of his system. It is well acknowledged in the literature (Henry and Hayden 2000:41; Rousseau 2008:241) that points of the Kamloops type were used solely to arm arrows. On the other hand, points of the Nesikep, Lochnore and Lehman types are all inferred as having been hafted only to atlatl darts (Henry and Hayden 2000:42, Rousseau 2004a, 2008:230).

When applied to my data, the four variable equations produced unexpected results. Only about 69.47% of the points in my database were classified as arrow points, which is a very low number, considering that Lochnore, Lehman and Nesikep types only make up 6.8% of the total database. Of the Kamloops type points, 99% were classified as arrow points. Though it is not the 100% one would expect, it does support the utility of Shott's equations. On the other hand, the three atlatl dart point types, Lochnore, Nesikep and Lehman were classified as 70%, 73.9% and 75% dart points respectively. The result for Lehman is the closest to the 100% dart classification that was expected; in all cases, however, these results were surprisingly low. Figure 12 illustrates the results of Shott's four variable solution.

Figure 12: Graphs of the results (D*dart*–D*arrow*) of the four variable equations on the six different types of points.



Given the Plateau Horizon is the cultural time period on the Plateau in which the presumed shift from atlatl to bow happened, it was expected that the Plateau collection, (and possibly the older Shuswap collection), would contain points classified as dart and as arrow. This was the result for both point types. The results of the four variable equations classified the Plateau point types as both, but the arrow group was slightly larger. The same occurred for the Shuswap points, though a slightly larger group of them were classified into the arrow category. In many of these cases, the difference between the two equation's results was small and it is difficult to be sure to which group the points truly belong (see Table 10).

Table 10: The results of Shott's (1997) equations on Plateau data

Results of Shott's (1997) equations on the Plateau data						
	four variable solution	three variable solution	two variable solution	one variable solution	number of specimens	% of total collection
Nesikep					23	2.51
% classified as darts	73.91	95.65	91.30	91.30		
number classified as darts	17	22	21	21		
% classified as arrows	26.09	4.35	8.70	8.70		
number classified as arrows	6	1	2	2		
Lehman					20	2.18
% classified as darts	75.00	95.00	100.00	100.00		
number classified as darts	15	19	20	20		
% classified as arrows	25.00	5.00	0.00	0.00		
number classified as arrows	5	1	0	0		
Lochnore					20	2.18
% classified as darts	70.00	85.00	75.00	80.00		
number classified as darts	14	17	15	16		
% classified as arrows	30.00	15.00	25.00	20.00		
number classified as arrows	6	3	5	4		
Shuswap					229	24.97
% classified as darts	31.44	56.33	53.71	54.59		
total classified as darts	72	129	123	125		
% classified as arrows	68.56	43.67	46.29	45.41		
total classified as arrows	157	100	106	104		
Plateau					366	39.91
%classified as darts	43.72	70.49	71.86	72.13		
Total classified as darts	160	258	263	264		
%classified as arrows	56.28	29.51	28.14	27.87		
total classified as arrows	206	108	103	102		
Kamloops					259	28.24
% classified as darts	0.77	1.16	1.54	1.54		
total classified as darts	2	3	4	4		
% classified as arrows	99.23	98.84	98.46	98.46		
total classified as arrows	257	256	255	255		

total classified as arrows	637	469	471	467
total classified as darts	280	448	446	450
total artifacts	917	917	917	917

total % classified as arrows	69.47	51.15	51.36	50.93
total % classified as darts	30.53	48.85	48.64	49.07

The three variable solution

Shott achieved a greater degree of correct classification when he incorporated fewer variables into his analysis. In order to see if this trend would also be visible in my data, Shott's three variable equations were applied next. The variable that Shott (1997:94) removed was length, his reasoning being that length can easily be highly affected by use and re-sharpening. The three-variable solution equations are as follows:

D*dart* = 1.24(shoulder width) + 1.94(thickness) + 0.38(neck width) – 22.7

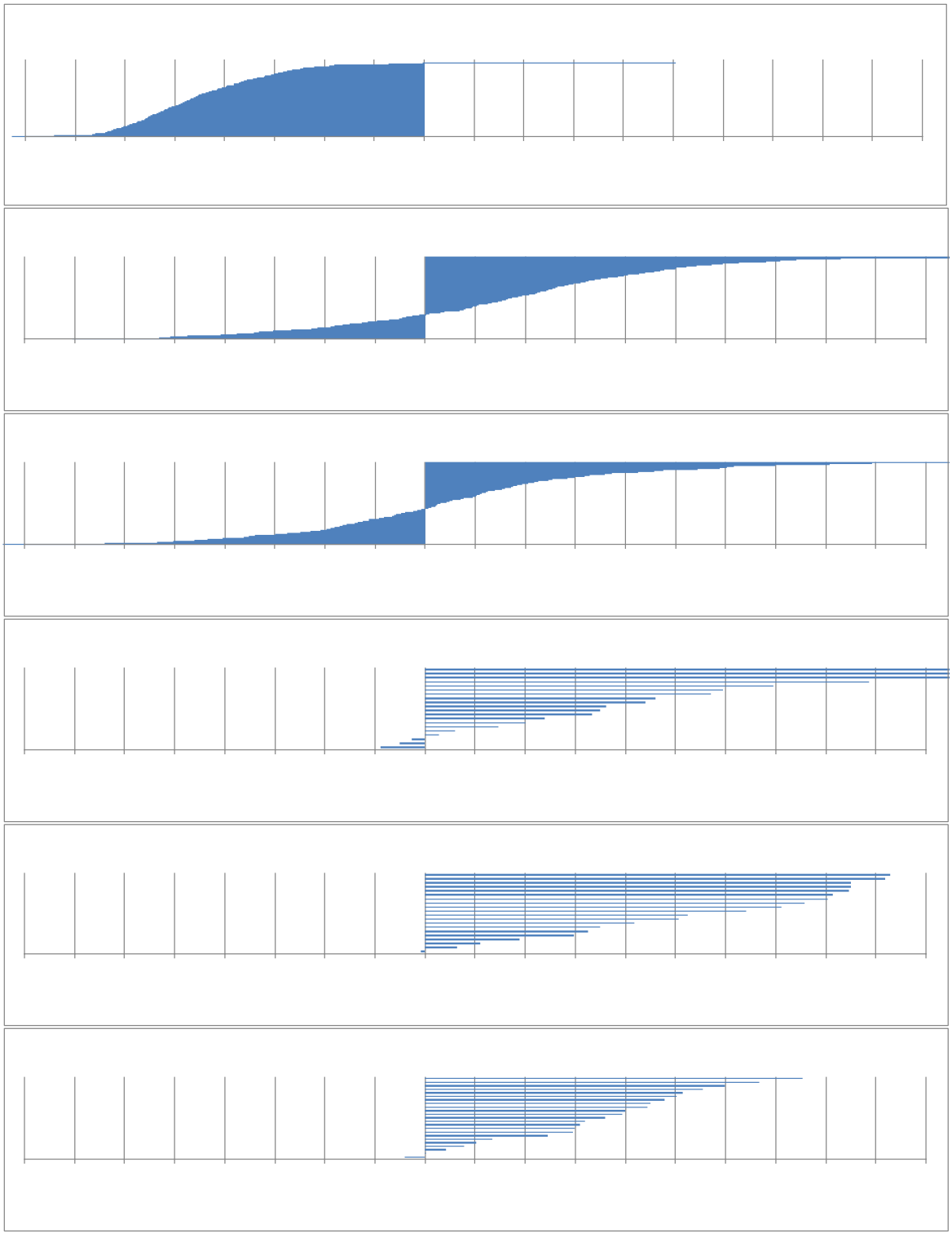
D*arrow* = 0.69(shoulder width) + 2.05(thickness) + 0.19(neck width) – 10.7

These equations, applied to each specimen in my database, provided two values, the higher one indicating the category to which the point belongs. These are graphed in Figure 13. This method applied to Shott's (1997) data yielded a slightly higher correct classification rate of 89.4% overall, and a higher rate of 84.6 % correct classification for his dart collection. When applied to my data, a similar outcome was produced for some point types, but for others the results were again ambiguous. The number of points in my database classified as dart points was still high, at 48.85% of the total. Maintaining the assumption that all Kamloops points are likely arrow points and that all Lochnore, Nesikep and Lehman points are atlatl dart points we can use these four types as test categories. Using the three variable solution the number of accurately identified points in these four test categories is in most cases visibly higher. The exception is in the Kamloops type points, one of which is reclassified as a dart giving the

group a slightly lower correct classification. For the three atlatl types, the result is much closer to the expected outcome (100%) of the three variable equations and supports the theory. Figure 13 clearly illustrates the way that the classification of the three variable solution changed from that of the four variable solution seen in Figure 12.

Of the three presumed atlatl dart point types, 85% of the Lochnore, 95.65% of the Nesikep and 95% of the Lehman specimens were classified as dart points. The result for each of these is closer to the expected 100% correct classification. This not only supports the validity of applying these methods but also the validity of Shott's (1997) assumption that the exclusion of the 'length' variable provides more accurate results. Again the Shuswap and Plateau point types produced unexpected results. The Plateau points, which in the initial analysis were predominantly identified as arrow points, change to being predominantly (70.49%) identified as darts. The Shuswap point types, however, showed a completely different trend. The Shuswap point types changed from being predominantly classified as arrow points to slightly more than half being classified as darts. It is apparent that the removal of the length variable affected the results of this group the most (see Table 10).

Figure 13: Graphs of the results of the three variable equations (D*dart*-D*arrow*) on the six different types of points.



The two variable solution

The improvement in correct classification using the three variable equation prompted Shott (1997:94) to continue removing variables to see if it was possible to get an even higher rate of correct classification. The next variable removed to get a two variable equation was the neck width measurement. Shott (1997) removed that variable because he thought that it was not conducive to including all different forms of points. By removing it from the equations Shott (1997:94) felt that he could then use his equations with points other than the side notched forms that predominantly make up both the Thomas (1978) and Shott (1997) collections. The overall success rate was only 88.2%, lower than that of the three-variable equations. However the percentage of darts classified accurately stayed the same (84.6%). The two-variable solution equations are:

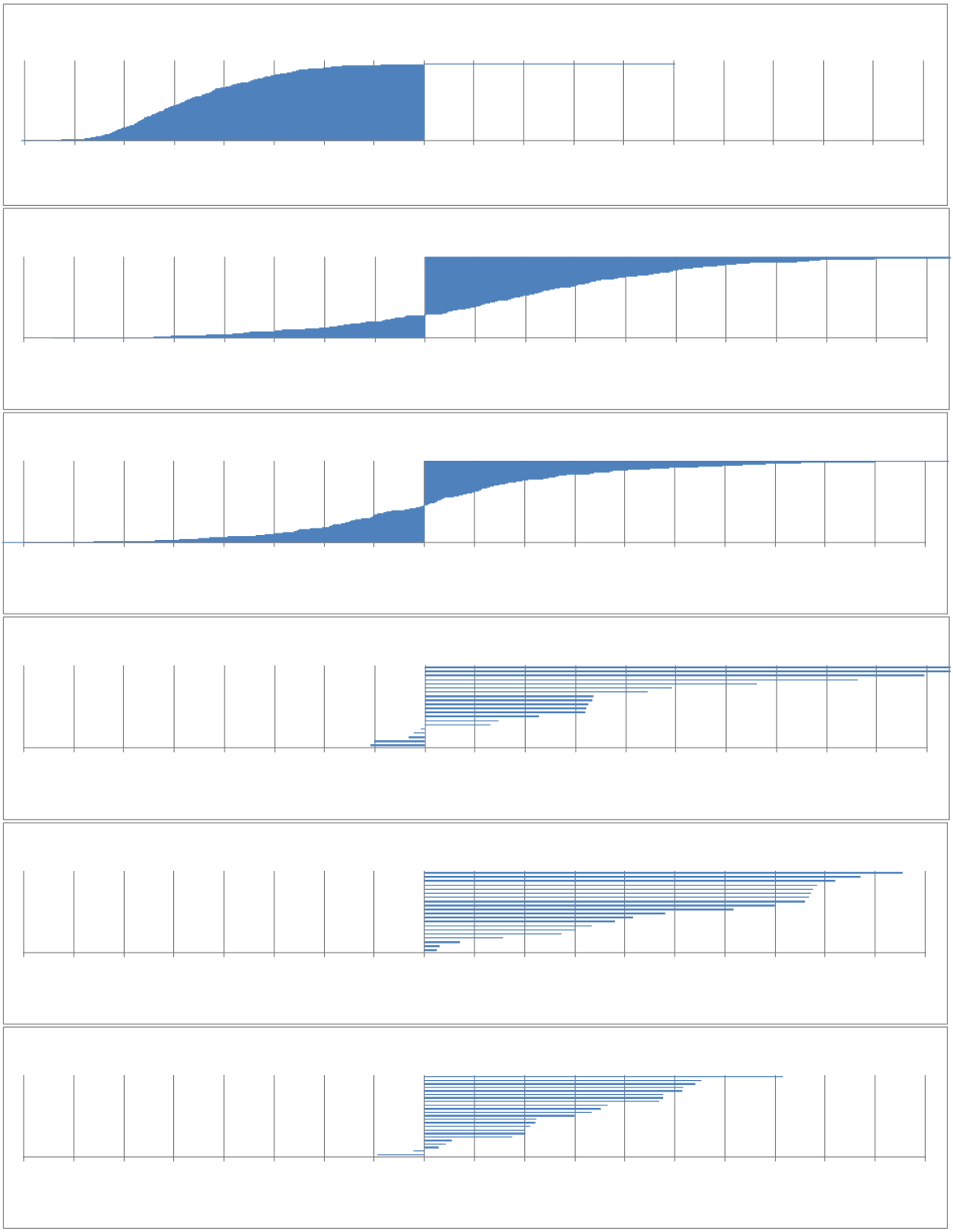
D*dart* = 1.42(shoulder width) + 2.16(thickness) – 22.5

D*arrow* = 0.79(shoulder width) + 2.17(thickness) – 10.6

Again, the equations were applied to each specimen in the Plateau database the results of which can be seen in Figure 14. The number of points in the Plateau database that were classified as darts was still high at 48.6% of the total sample. The number of specimens in the Kamloops designations classified as dart or arrow stayed almost exactly the same as those from the three variable solution (255 artifacts or 98.46% calcified as arrow points). The three dart types, however, showed two different trends. This equation classified 100% of the Lehman points as darts. The Nesikep and Lochnore points, on the other hand,

both showed a trend towards less consistent classification. In both cases, the percentage of specimens classified as dart points is lower than in the three-variable solution, Nesikep being classified as 91.3% dart points down from 95.65%, and Lochnore being classified as 75% dart points down from 85%. The Shuswap point types, once again produced an unexpected result, a predominant classification as darts, although the number of points classified as darts dropped by six artifacts from 56.3% to 53.7%. The Plateau point types in this equation classified slightly more (71.8% vs. 70.4%) in the dart category, continuing the previously noted trend. Two things are of note: 1) it is apparent that the removal of a variable affected the results of this group of points the most, and 2) in all the analyses, Shuswap points are the most equally divided between dart and arrow categories (see Table 10).

Figure 14: Graphs of the results of the two variable equations (D*dart*-D*arrow*) on the six different types of points.



The one variable solution

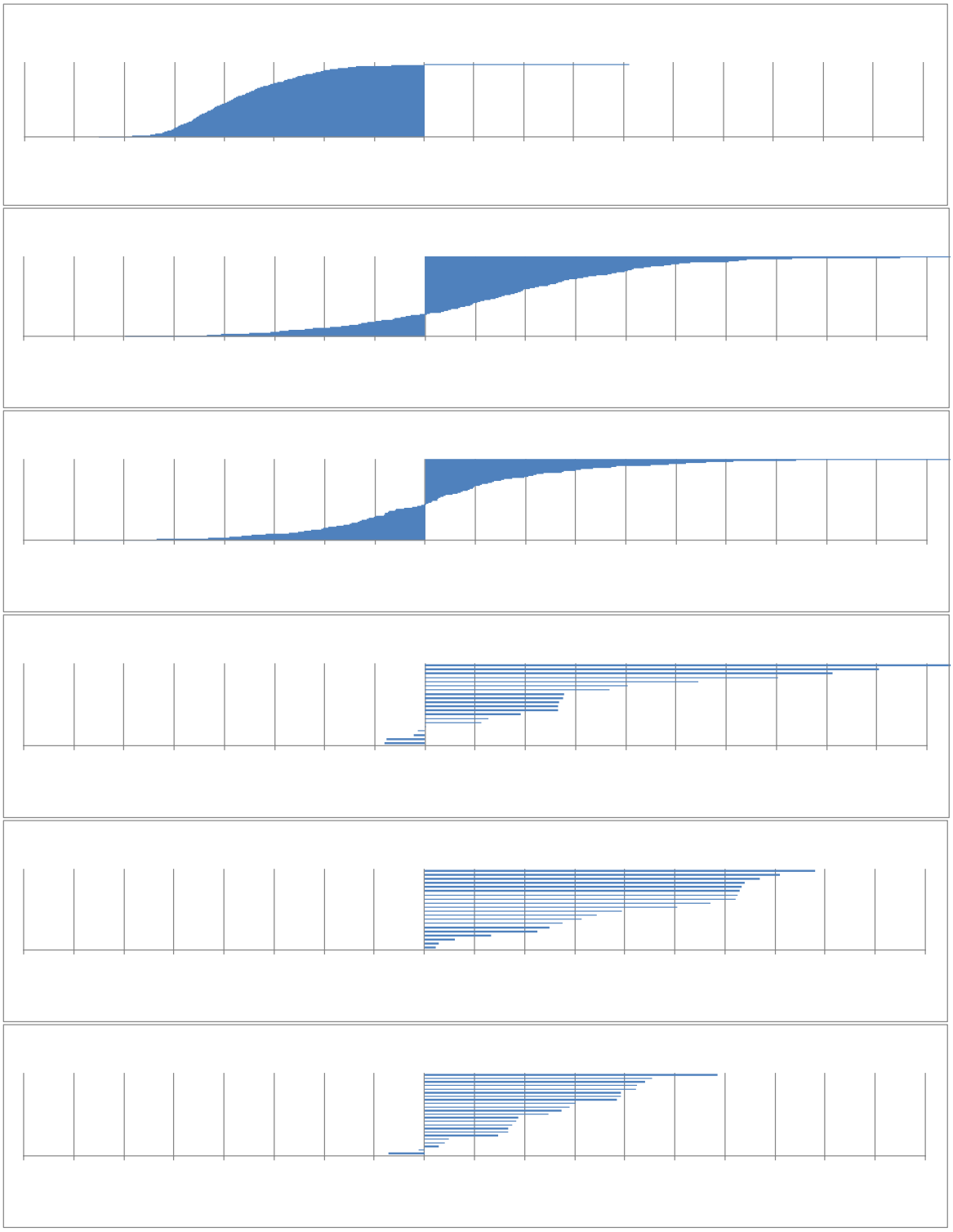
Finally, Shott (1997) reduced his equation to one variable, shoulder width. His results in this case were similar to those for the two variable solutions and yet, because the classification rate is still high and it only requires one measurement, Shot felt that this was the most useful equation (1997:95). That was because many points are broken when found, and if this one variable solution works it would enable future researchers to reach a classification without needing complete points. The one variable solution equations are:

D*dart* = 1.40(shoulder width) – 16.85

D*arrow* = 0.89(shoulder width) – 7.22

Each specimen in my database was calibrated using both of these equations and the results were graphed for visual clarity (see Figure 15). This set of equations produced similar results on my data as those that Shott obtained from his. With the exception of the Shuswap and Lochnore points, all the others were classified into the same categories as they had been in the two variable solution.

Figure 15: Graphs of the results of the one variable equations (D*dart*-D*arrow*) on the six different types of points.



The Shuswap points classified slightly more as atlatl darts, from 53.7% in the three variable solution up to 54.6% in the one variable solution. This was due to two artifacts changing categories. One of the artifacts in the Lochnore collection was classified differently as well, changing from an dart to arrow point (see Table 10). This was an unexpected change that will be discussed in detail later.

A general comparison to Shott's data

The historical basis of this research is derived from data that come from projectile points found in regions of North America that are both culturally and environmentally different from the Plateau. Therefore, I will begin this discussion by focusing on the data provided by Shott (1997) and comparing them to the much larger collection I gathered for the BC Plateau. A good place to start in comparing these two data sets is the tables of summary statistics for both Shott's (1997) data (Table 8) and my Plateau data (Table 9). As Shott (1997) discuses the mean, standard error, and maximum and minimum values in his work I will begin by comparing them. In each case I will then compare box plots created for Shott's two categories and my six Plateau collections enabling me to compare relationships between the median and the inter quartile ranges of each of these groups.

Some of the salient similarities and differences within my data set and that provided by Shott (1997) are discussed below. For ease of discussion, they

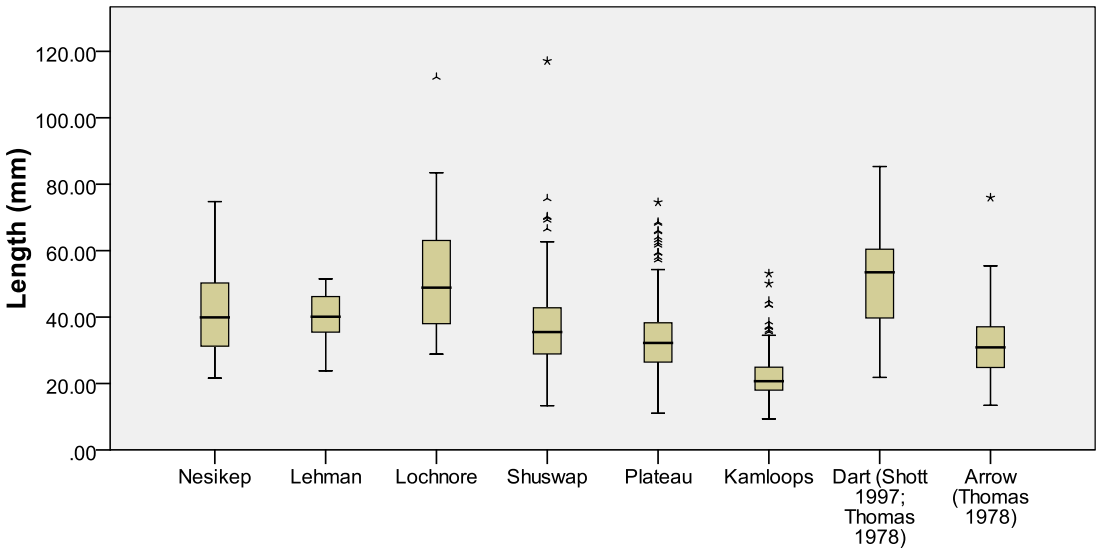
have been broken down into the four main attributes for which Shott (1997) provides data. In each case, Shott's (1997) arrow and dart categories will be compared to my six typological categories. Special focus will be on the four presumed 'known' categories of my data: the Kamloops points (presumed to be arrows), and the Lehman, Lochnore and Nesikep points (presumed to be darts).

Total length:

The "maximum value" for the arrow category in Shott's (1997) collection is 75.9mm, greater than my Kamloops type, and the "maximum value" for darts in Shott's collection is 85.3mm, less than my Lochnore type. The minimum value for the arrow points in Shott's collection is 13.4mm, slightly greater than my minimum value for Plateau and Kamloops types and the minimum value for dart points in Shott's collection is 21.8mm, less than my minimum value for both Lehman and Lochnore types. All my other types fall within the range of measurements provided by Shott's (1997) data. The standard error provided for Shott's arrow groups is 0.07; all but my Lochnore group have standard errors less than this. The mean measurement for four of my six types (Lehman, Nesikep, Kamloops and Shuswap) falls between the mean measurements for the dart point (51.51mm) and arrow point (31.16mm) groups that Shott (1997) provides. The mean for Plateau falls below that of Shott's arrow point group and the mean for Lochnore falls above that of Shott's dart point group. It appears that the measurement 'total length' indicates similarity within these two collections of artifacts (refer to Tables 8 and 9).

Figure 16 illustrates the box plots of my six typological groups and Shott's (1997) arrow and dart categories. It is clear that the medians of each of these groups are widely dispersed. The two middle quartiles, however, in many cases do show some degree of overlap of values. It is of note that in all the Plateau groups that were shown to contain arrows, as well as Shott's arrow category all have outliers. It is also noteworthy that the collection with the largest spread for its two middle quartiles is the Lochnore collection with Shott's dart collections coming in a close second. It is interesting that the Nesikep, Lehman and Lochnore groups (all 'known' dart groups) all have both upper and lower quartile ranges that are smaller than those for Shott's dart collections. On the other hand the lower quartile of the Kamloops collections contains values that are lower than the lowest in Shott's arrow collection.

Figure 16: Box plot showing total length measurements (mm) for my six typological categories and Shott's dart and arrow categories.



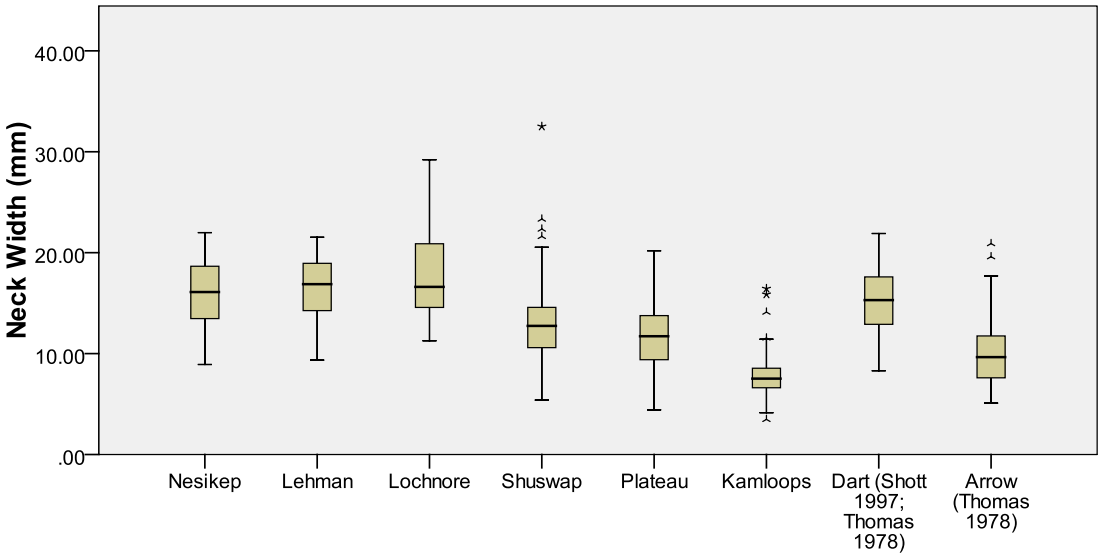
Neck Width:

The maximum value for arrow points in Shott's collection is 20.9mm, higher than my Kamloops and Plateau types and the maximum value for dart points in Shott's collection is 21.9mm, less than my Lochnore, Shuswap, and Nesikep types. The minimum value for arrow points in Shott's collection is 5.1mm, greater than the minimum value for my Kamloops and Plateau types. The minimum value for dart points in Shott's collection is 8.3mm, less than my minimum value for Lehman, Nesikep and Lochnore types. The Kamloops points as a group appear to have smaller neck widths than the smallest arrows measured by Shott. On the other hand, the opposite applies to my three presumed atlatl groups, Lehman, Nesikep and Lochnore, which appear to have larger neck widths than the largest of Shott's artifacts (see tables 8 and 9). The mean measurement for my Kamloops and Shuswap groups falls between the mean measurements for the dart point (15.13mm) and arrow point (9.97mm) groups that Shott provides. The mean for Plateau falls below that of Shott's arrow point group and the mean for Lochnore, Lehman and Nesikep falls above that of Shott's dart group. The attribute 'neck width' indicates that the range of measurements in Shott's collection is smaller than in mine. This is very possibly related to the sample size. Since my sample is so much larger than Shott's it is possible that it would contain a greater range of variability.

The box plots of my six typological groups and Shott's (1997) arrow and dart categories can be seen in figure 17. The spread of values for neck width is

much less than those for total length discussed above. The medians of Shott's dart group and my three 'known" dart categories are much closer together as well. It is interesting that the Kamloops collection, which has such a tight central grouping, also has the greatest number of outliers. The two middle quartiles of the Kamloops collection only have a few values that overlap with that of Shott's arrow group indicating that though the Kamloops collection is very closely related they have much narrower neck widths than most of the arrow points that Shott measured.

Figure 17: Box plot showing neck width measurements (mm) for my six typological categories and Shott's dart and arrow categories.



Shoulder width:

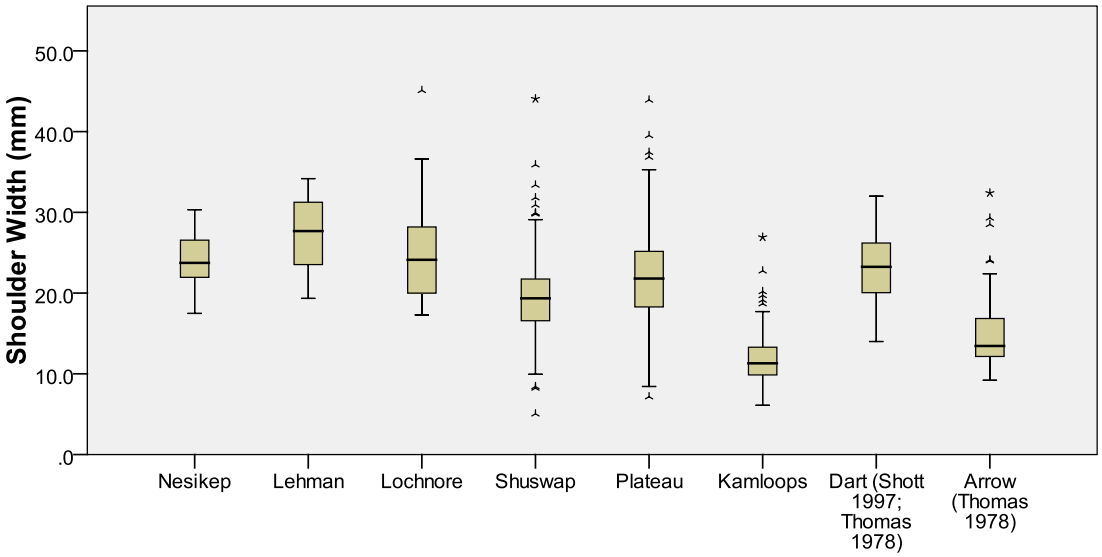
The maximum value for arrow points in Shott's collection is 32.4mm, greater than my Plateau and Nesikep types, but the maximum value for dart points in Shott's collection is14mm, less than all my other types. The Kamloops,

Plateau and Shuswap collections all have minimum values less than the minimum value for arrow points in Shott's collection (9.2mm), and Lehman, Lochnore and Nesikep all have greater minimum values than the minimum value for dart points in Shott's collection (14mm). The mean measurement for Kamloops and Shuswap, in my six types, falls between the mean measurements for dart (22.97mm) and arrow (14.69mm) groups that Shott (1997) provides. The mean for Plateau falls below that of Shott's arrow group and the mean for Lochnore, Lehman and Nesikep falls above that of Shott's dart group (see tables 8 and 9). Once again it appears that the range of measurements in my collection is greater than that of Shott's. Even though only two of my six groups have means that fall above Shott's mean for arrow points and below his mean for dart points it is important to remember that the Shuswap and Plateau groups contain the bulk of the items in my data set.

Figure 18 illustrates the box plots created for my 6 typological groups and Shott's (1997) arrow and dart categories for the shoulder width measurement. The item that is the most noticeable on this figure is the number of the collections that have outliers both on the high and low end. Though the spread of the two middle quartiles is similar in each case, the upper and lower quartiles have a lot more variation between collections. It is interesting that the two middle quartiles for Shott's arrow category do not appear to share any values with either the Plateau and Shuswap collections two middle quartiles, both of which have higher ranges of values, or the two middle quartiles of the Kamloops collections, which

have lower ranges of values. Also of interest is the large range of values in the upper and lower quartiles of the Plateau collection, most likely a result of the greater variety of point shapes during the Plateau horizon.

Figure 18: Box plot showing shoulder width measurements (mm) for my six typological categories and Shott's dart and arrow categories.



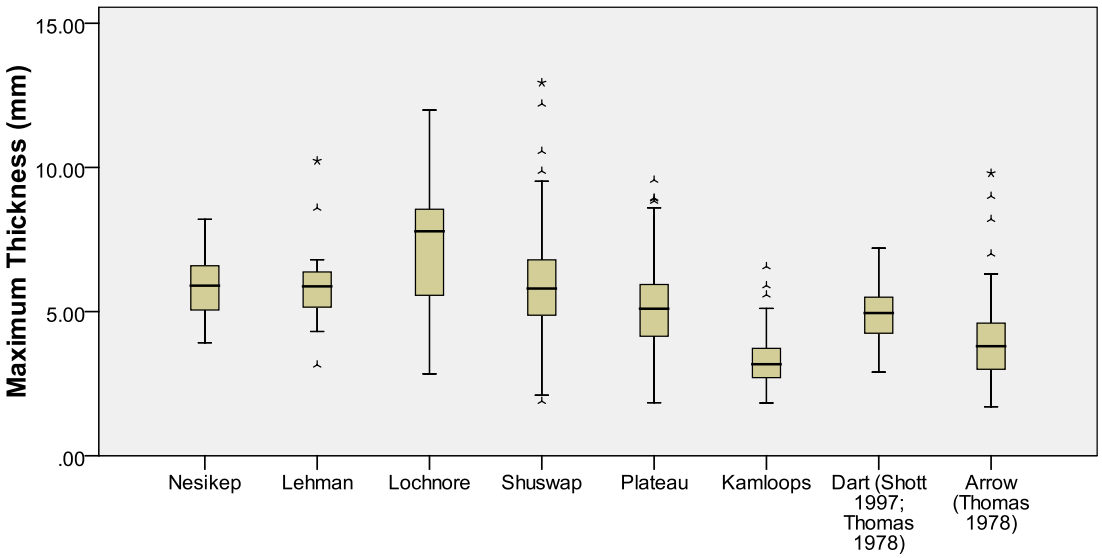
Maximum thickness:

The maximum value for both arrow points (9.8mm) and dart points (7.2mm) in Shott's collection is greater than my Kamloops type. All my other types, however, have a maximum value greater than both of Shott's collections. Kamloops, Plateau, Shuswap and Lochnore all have minimum values that fall between the minimum values of Shott's arrow (1.7mm) and dart (2.9mm) groups. Lehman and Nesikep types, however, both have greater minimum values than the minimum value for dart points in Shott's collection. The mean measurements for all six of my groups are either higher (Nesikep, Lehman,

Lochnore, Shuswap, Plateau) or lower (Kamloops) than the mean measurements for Shott's two types. My Plateau type has a mean with a lower value than the mean of Shott's arrow category and all my other types have a greater mean value than the mean of Shott's dart category (see tables 8 and 9).

The box plots generated for my 6 typological groups and Shott's (1997) arrow and dart categories are displayed in figure 19. It is once again noticeable on this figure that many of the collections have a wide range of values as well as a variety of outliers both on the high and low ends. Even the spread of the two middle quartiles shows a great degree of variability, with collections such as the Lehman and Kamloops showing very tight groupings and the Lochnore and Shuswap collections showing much more dispersed groupings. Though there is a small amount of overlap within the measurements encompassed by the various boxes, it is much less obvious here than in the previous cases.

Figure 19: Box plot showing maximum thickness measurements (mm) for my six typological categories and Shott's dart and arrow categories.



The 'maximum thickness' attribute seems to be different within these two collections of artifacts. There are three readily available explanations for this. It could be that the means for the artifacts in my collections are greater because my collection contains more dart points (i.e.: thicker). Another explanation could be that the stone most commonly used on the Plateau, predominantly a dark gray volcanic dacite, commonly referred to as fine grained "basalt", cannot be shaped with the same ease as the various other materials (chert, obsidian, etc.) that make up some of the points in Shott's (1997) collection. A third possibility (discussed below) exists as well. It is that my collection contains a number of knives, a tool function that would require a greater thickness.

My collection contains artifacts with metric attributes both greater and smaller than the artifacts in the collection assembled by Shott (1997). The vast majority of the artifacts in my collections, however, have metric attributes very

similar to the metric attributes of the points in his collections. Here it is important to mention one more piece of information that could be adding to the differences seen between the means for these two collections in the various measurements. Shott (1997) had access to the organic components of the projectiles that he was researching. Thus, in each case he was able to ascertain the true use of the point, be it arrow or dart. I do not have that information for my collection, and had to assume that all my points were from one or the other of those two weapon systems. It is important to note that there are other possibilities for the function of some of the "points" in my collection. It has been put forward by Rousseau (2008) and others, that some notched "points" found on the Plateau actually were originally used as small hafted knives. If this is so, it could explain some of the outliers (See items; 1479, 1882, 1211, 1216 in appendix A) in my collection, especially the large points in the Shuswap category. Another possible use for some of the points in my collection is as harpoon armature. Shott (1997:89) discussed how projectiles fired from an atlatl can be used for aquatic and marine hunting, but notes that in most cases the associated points are made of different materials. He does, however, mention that chipped stone points used for composite harpoon heads may affect his data, and this is also a possibility for my data. Distinguishing knife blades and harpoon heads within a collection of points is, however, outside the scope of this project. It must be sufficient to note that the possibility exists and assume that if there are a few examples of these artifacts in my database that they do not skew my data. It is hoped that if artifacts belonging to either of these groups exist they would only extend the

range of dimensions for the particular group in which they have been placed. In general, it is probable that the wider range of measurements, both small and large, in my collection is simply due to the larger sample size I was able to procure. This is supported by the overlap of the standard deviations calculated for each of my measurements and those that Shott (1997) calculated.

CHAPTER 5: PRESENTATION OF ANALYSIS USING SHOTT'S FORMULAE

In the previous chapter it was demonstrated that both Shott's and my collections of artifacts have a great degree of similarity with regard to the various measured values. The overlapping means and standard deviations indicate that the two collections are comparable, justifying the further use of Shott's data. It is now possible to discuss the results of applying each of Shott's (1997) four different solutions to my six typological categories.

Nesikep

The total number of artifacts in the Nesikep collection that I was able to amass was 23. Such points all come from a time when archaeologists think that the bow and arrow was not yet in use. Nesikep points are typically found in contexts that indicate a strong association with deer hunting and no reliance on salmon fishing. It is therefore presumed that all these points should be classified as dart points by the system that Shott (1997) developed.

The results, however, do not provide a 100% dart classification for this set of artifacts. The four variable set of equations identifies only 73.91% of the collection as dart points, a surprisingly low number. The removal of the 'length'

attribute in Shott's (1997) three variable set of equations yields results much closer to those expected. With this equation set all but one badly broken artifact was classified as a dart point (see Figure 15), giving a 95% correct classification. The removal of further variables in the two and one variable equation sets changes the classification of only one artifact, producing a 91.3% dart classification for both. Assuming that Nesikep points are all dart points, these results are very similar to those of Shott (1997) in his original research (89.4% accurate classification). This solidly supports the idea that Shott's data can be applied to other cultural areas. These findings strongly support our current archaeological understanding of the use of Nesikep style points, i.e.: they were used to arm atlatl darts.

Lehman

Once again the collection of artifacts is small, only 20 Lehman style points. Lehman points have long been assumed by the archaeological community to have been used with the atlatl (Rousseau and Richards 1985). It is expected that the system developed by Shott (1997) would again place all these artifacts in the dart category. This was indeed the case, but only for the two and one variable equations sets. The three variable solution put forward by Shott classified one artifact as an arrow point and the four variable solution classified five artifacts as arrow points. These classification rates of 95% and 75% respectively, though not as high as was expected, still identify the majority of the collection as dart points. This again supports the idea that Shott's (1997) method can be used to correctly identify the projectile system to which points from other

regions belong. Also firmly supported by these findings are Shott's (1997) conclusions that fewer variables yielded more accurate results. Like the Nesikep points, this research firmly supports the current archaeological understanding about the past use of Lehman style points, i.e. they were used to arm atlatl darts.

Lochnore

The collection of Lochnore artifacts is again very small, only 20 specimens. Lochnore points are the third group accepted as atlatl armature by Plateau archaeologists (Rousseau 2004a) and were therefore also expected to be all classified as dart points using Shott's (1997) system. Of the three typological groups presumed to be used with atlatls, the Lochnore type was the one that produced the most unexpected results. Of all the equation sets, Shott's (1997) three variable solution produced results closest to the expected 100%, classifying 17 of 20 (85%) of the Lochnore style points as dart points. Shott (1997) noted that the greater number of variables produced less accurate results, and this is supported here. The four variable solution classified only 14 artifacts (70% of the total collection) as dart points. In the two variable equation set, 75% of the points were classified as dart points and in the one variable equation set 80% (16 of 20) were classified as darts. These results are the least similar to the predicted outcome of 100%. Though all four of Shott's equation sets do classify the majority of Lochnore style points as dart points there appears to be a greater variation of sizes within this style of point than the previously discussed types (refer to table 8). This variation within the group could be explained in a number of ways. It could be related simply to the highly mobile way of life during the

Lochnore phase. People moving around regularly will use what they can where and when they can. It is likely that a great degree of re-sharpening and re-using of points was occurring at this time. Another possibility that could explain the variation within the Lochnore points is Stryd and Rousseau's (1996:204) theory of a coastal origin for the Lochnore culture. They propose that the Lochnore tool kit represents an interior adaptation of tools used by Coast Salish peoples and indicates an information exchange between these two areas. This proposed information exchange may have had an influence on the shape, style and production of chipped stone points. The possibility for the introduction of new tools, such as harpoons, would require people to learn to make new forms of points and the introduction of point styles from other areas could also influence the design decisions of individuals. A third possible explanation for this degree of variation is the argument put forward by Prentiss and Kuijt (2004:58-59) that Lochnore style points are simply Lehman style points re-sharpened along the edges producing their "skinny" appearance. Prentiss and Kuijt (2004) believe that this may indicate that these points are much more similar than previously believed. This explanation however, is not supported by the data. It is very unlikely that these two groups are related given that the maximum thickness and length measurements for the points associated with them are so very different. Though the data provides varying degrees of support for each of these possibilities, they are all valuable suggestions that should be explored further in order to refute or accept them and further our understanding of the Plateau culture area.

Shuswap

Unlike the first three point types discussed, the collection of Shuswap type points was very large, (229 specimens). That is beneficial to this research because, unlike the previous typological groups, all assumed to be dart points, there is less certainty about the original use of Shuswap points. Most researchers think that the bow and arrow did not appear on the Plateau until the Plateau horizon (Chatters and Pokotylo 1998:78; Richards and Rousseau 1987:34; Rousseau 2004a:17; Hayden 2000:25). It is possible, however, that this may have happened earlier, near the end of the Shuswap horizon. Chatters (2004) indicates that the bow and arrow system was present on the Southern Plateau to the south during the end of the Shuswap period, so it is possible that the bow and arrow could have found its way onto the Plateau much earlier than previously believed.

If it was during the end of the Shuswap horizon that the bow and arrow system made its way onto the Plateau it would be expected that the results of applying Shott's (1997) equations to the Shuswap data would show both dart and arrow points to be present, but dominated by dart points. The data, however, do not support this. Shott's (1997) four variable solution identifies 68.56% of the Shuswap collection as arrow points. This result in itself is interesting, but it becomes even more so when compared to the results for the three, two and one variable solution data. After removing the attribute of total length, many points change from being classified as arrows points to being classified as dart points.

The three variable solution classifies only 43.65% or the collection as arrow points, the two variable solution 46.29%, and the one variable solution 45.41%. It is clear that the length variable has a major effect on this data set as it is the only attribute that needs to change to shift the major part of the collection from one classification to the other. More discussion of the individual attributes and the roles they play within the Shuswap collection will follow.

One other item that needs to be addressed in the Shuswap collection is the lack of greater accuracy within the classification as attributes are removed. In each of the previously examined typological collections there was an expected outcome based on the understanding that points from those periods were used with only one system. This provided a way to gauge the effectiveness of the classification scheme. In the Shuswap collection, however, we are forced to rely on the accurate classification of our 'known' categories to support the accuracy of Shott's classification for the points in this 'unknown' category.

Given the vast differences between the classifications of the four variable solution and the other three solutions, we also do not have any obvious trends to follow. Within the three, two and one variable solutions the lack of trends continues, with results that do not show any consistent increase or decrease in the classification of points to one group or the other. As a whole, the Shuswap points exhibit some major differences from the three previously discussed point types. There is more going on within this collection than can be explained using

only Shott's (1997) classification system. One possible factor affecting these results is the aforementioned possibility that some of these points actually functioned as hafted knives or harpoon heads, as will be discussed further below.

Plateau

The collection of Plateau horizon points contains the greatest number of specimens (366). Again this large number is valuable to the research because of the interesting developments presumed to be happening during this time period in projectile weapon technology. As stated above, it is commonly believed that the Plateau horizon is the first time period in which the use of the bow and arrow is indicated (Richards and Rousseau 1987:34; Rousseau 2004a:17; Hayden 2000:25). Rousseau (2004a) also has indicated that the atlatl is completely replaced by the bow and arrow prior to the end of the Plateau Horizon. The Plateau horizon collection therefore is expected to contain point types that would fall into both dart and arrow categories. Though this is generally the case, the results of Shott's (1997) classification scheme again produce some unexpected results.

Shott's (1997) four variable solution classifies the collection into two almost equally sized groups: 56.28% arrow and 43.72% dart points. This is consistent with the premise that both weapon systems existed and possibly overlapped in use during the Plateau horizon. The results of the three, two and one variable solutions, however, are different. As seen with the Shuswap

collection discussed above, the removal of the ‘total length’ measurement from the equation shifts the majority of the points classified from one group to the other. The results of the three, two and one variable equation sets show the collection being classified as predominantly (70.49%, 71.861% and 72.13% respectively) dart points. That could reflect a variety of things, as discussed below.

It is interesting that, unlike Shuswap points, the Plateau points show a trend towards a more accurate classification with the removal of attributes from the classification equations. Though the difference between the four variable and three variable equations is enormous, each equation set progressively classifies a greater number of points as darts. Unfortunately, we do not have a single known use for points in the Plateau horizon and cannot gauge the accuracy of the system. Instead we must rely on the accuracy of classification in the other groups to infer that the classification of the Plateau collection is accurate. Then, further discussion is required in order to explain why the Plateau points produced the result they did with Shott’s (1997) system.

Kamloops

The Kamloops Horizon provides the only group of points that are accepted by the archaeological community as exclusively used to arm arrows. The 269 specimens in the collection of Kamloops points should, therefore, all be classified as arrow points by Shott’s (1997) system. When put through the four different

sets of equations the vast majority of the Kamloops points are classified as arrow points using Shott's (1997) system. Although not all were classified as arrows, the 98.46% or greater arrow classifications for the four equation sets provide a conclusive identification. In this case, the fewer variables in the solution did not result in a greater percentage of arrow classifications. Instead we see that the two artifacts classified presumably incorrectly as dart points are joined by two more with the removal of the length and then the neck width variable. Three artifacts are "misclassified" in the three variable equations, these same artifacts are also misclassified in the two and one variable equation sets with the addition of one other artifact. They all have very large shoulder widths that contribute to these classification results. As with some of the larger outliers in the already discussed point type categories it is once again possible that these artifacts are really knife blades. Apart from the four artifacts that make up the very small (1.54% of the total) sample of points from the Kamloops horizon not identified as arrow points, this group once again provides solid support for the use of Shott's (1997) system for point collections from the Plateau and provides data that support the argument that the points classified by it have been classified correctly.

It has now been shown that the similarities between the results obtained by Shott's (1997) and my collections justify the application of his system to my data. It also has been demonstrated that Shott's (1997) classification scheme can be applied to my data to produce valid and accurate results. In all the cases where I had a group of points assumed to be used with the atlatl (Nesikep,

Lehman, and Lochnore) this system classified the vast majority as dart points. Likewise, the Kamloops points, the one group of artifacts assumed to have been entirely used with the bow and arrow, were classified almost entirely as arrow points. Of these four groups of artifacts, all but the Lochnore collection produced results that had a higher accuracy rate than that produced by Shott in 1997. The best accuracy rate that Shott achieved in his research was 89.4%. My accuracy rates included 95.65% for the Nesikep points using the three variable solution, 100% for the Lehman points using both the two and one variable solution, 85% for the Lochnore points using the three variable solution and 99.23% for the Kamloops points using the four variable solution.

All of these very high accuracy rates for points suspected to belong only to one of the two systems provide strong support for the accuracy of the classification of the points from my unknown Shuswap and Plateau categories. Both contain artifacts classified as dart and arrow points, but Shott's (1997) system was not able to provide any more than a simple identification. To examine these groups further, the analyses of their individual attributes must be discussed.

CHAPTER 6: ANALYSIS OF THE VARIABILITY WITHIN THE SHUSWAP AND PLATEAU HORIZON DATA

The two point types that provided the most interesting results when put through the equations provided by Shott (1997) were the Shuswap and Plateau types. Both showed a great degree of variability and, contrary to the expected results, a high percentage of each were classified in the dart category. The next step was to see if it is possible to identify what factors contributed to these results.

The Shuswap collection

As with the Plateau collection, the first step in further investigation was to graph each attribute independently. Figure 20 shows histograms of each of the seven attributes measured for the Shuswap point collection and Figure 21 shows rank order graphs of the same.

Figure 20: Histograms of the seven variables measured for the Shuswap points

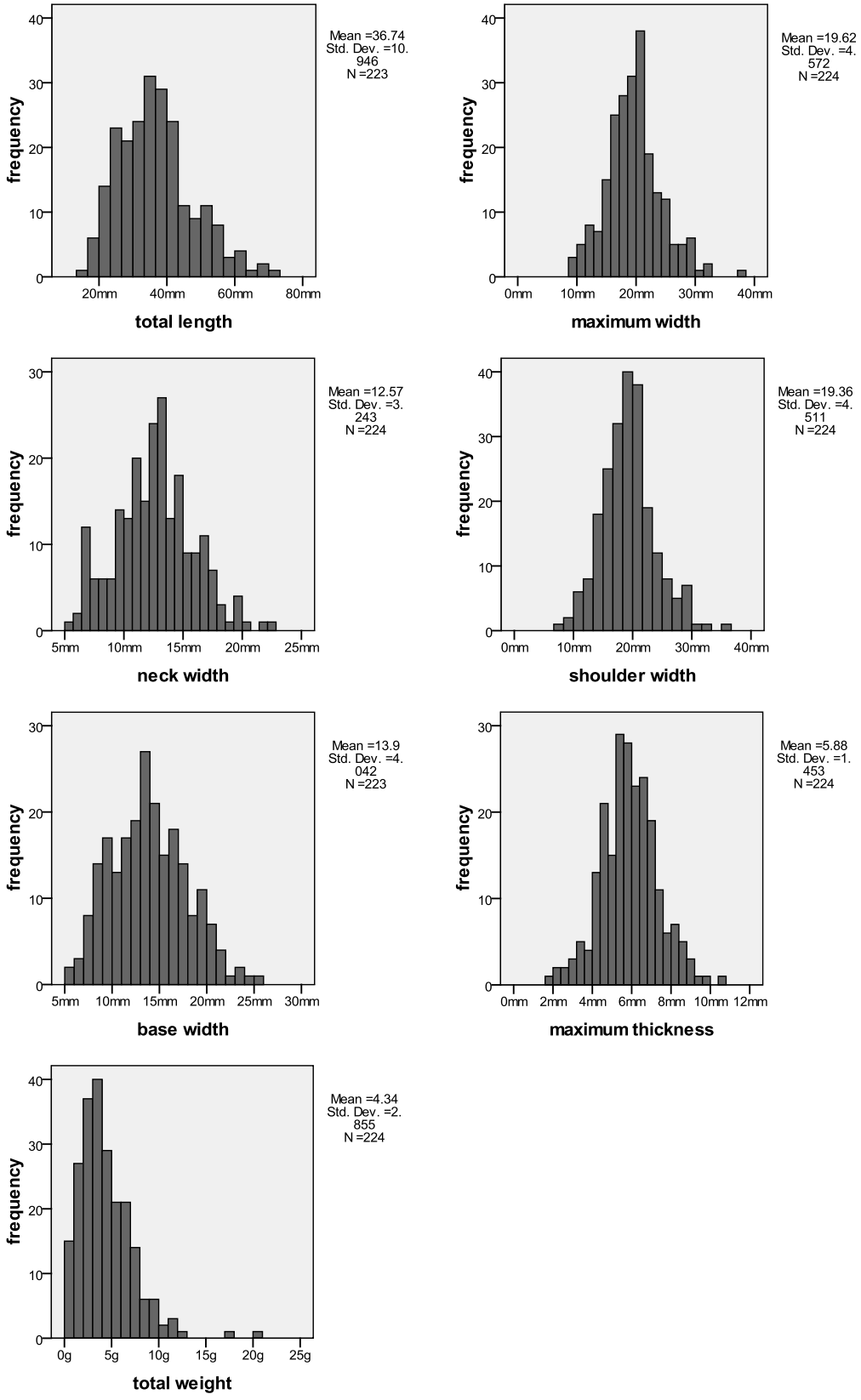
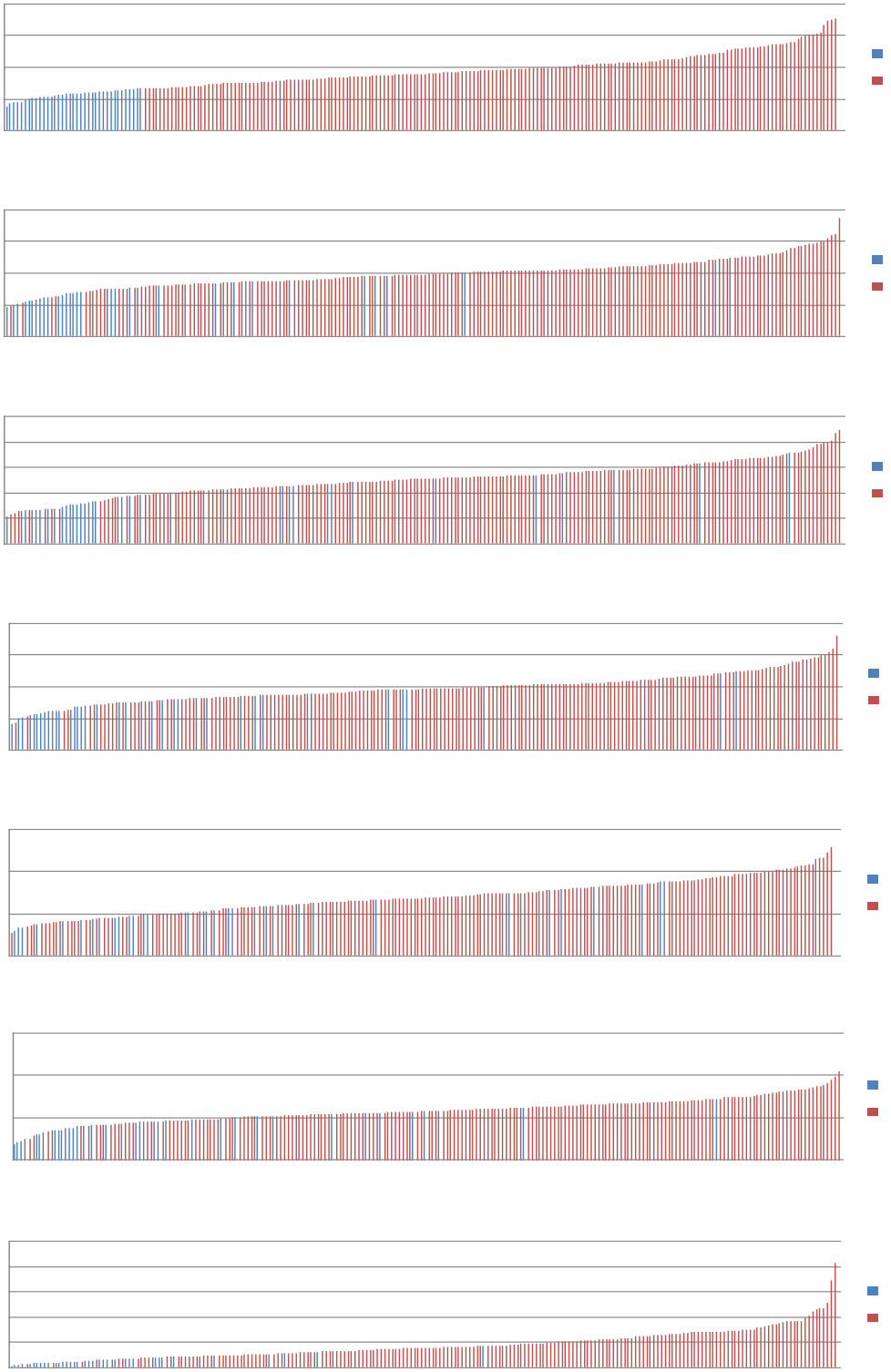
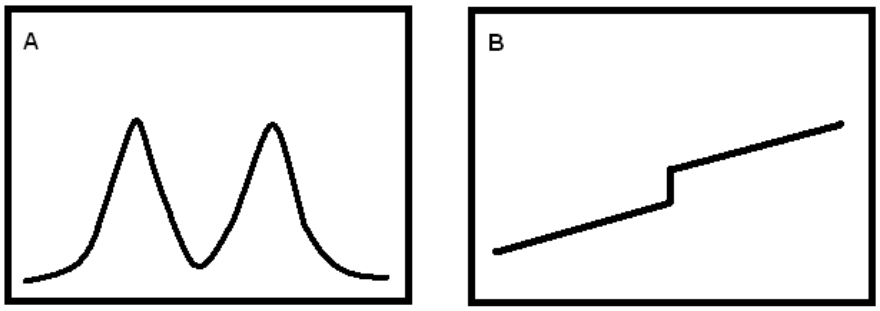


Figure 21: Rank order graphs of the seven variables measured for the Shuswap points



While the distribution for each variable is generally normal, four variables display a slight break in their distribution. Of note were the graphs for neck width, total length, base width and maximum thickness (Figure 20). Each, to varying degrees, demonstrates this. Of these the two most pronounced are neck width and base width, each showing very subtle double peaks. None of these histograms, however, demonstrate the obvious twin peaks of a distinct bimodal distribution (see figure 22 A). All of the attributes for the Shuswap points demonstrate a visually normal distribution on the rank order graphs, with slight skewing to the high ends of some of the graphs. None of the attributes demonstrated the distinct visual break that would be expected as the result of graphing two distinct populations (see figure 22 B). These results indicate that, though not obvious, it is possible that more than one weapon system is represented by this collection of points. Unfortunately they do not provide enough information to explain why these points fall into two different categories.

Figure 22: Stylized schematics of a histogram and a rank order graph showing bimodal distributions



A) histogram showing bimodal distribution, B) rank order graph showing bimodal distribution.

As no other obvious jumps or shifts were noted in these graphs a second test was conducted to examine the question further. Bivariate scatter plots were

graphed for each possible pair of variables. It was hoped that the combinations of measurements might show more than one trend or clustering, indicating the two weapon systems. To gain insight into how individual artifacts relate to each other, they were plotted using coloured points corresponding to their earlier classification as dart point or arrow point. When carrying out the initial classification of my data I used all four of Shott's (1997) classification equations. For the classification scheme used for the following graphs I chose to use the results of the three variable equations. Not only did Shott (1997) demonstrate that this set of equations provided the best rate of correct classification for his data, but it also produced a very high rate of correct classification in my four presumed known categories. Figure 23 shows these graphs. It is unclear if there are any clustered groupings present on any of these graphs. A few, however, do show that inferred dart and arrow points show some clustering along different linear orientations that may reflect different relationships between the variables plotted for each point. This will be discussed further below.

Figure 23: The seven metric attributes in millimeters for Shuswap points plotted against each other in pairs.

Figure 23 A

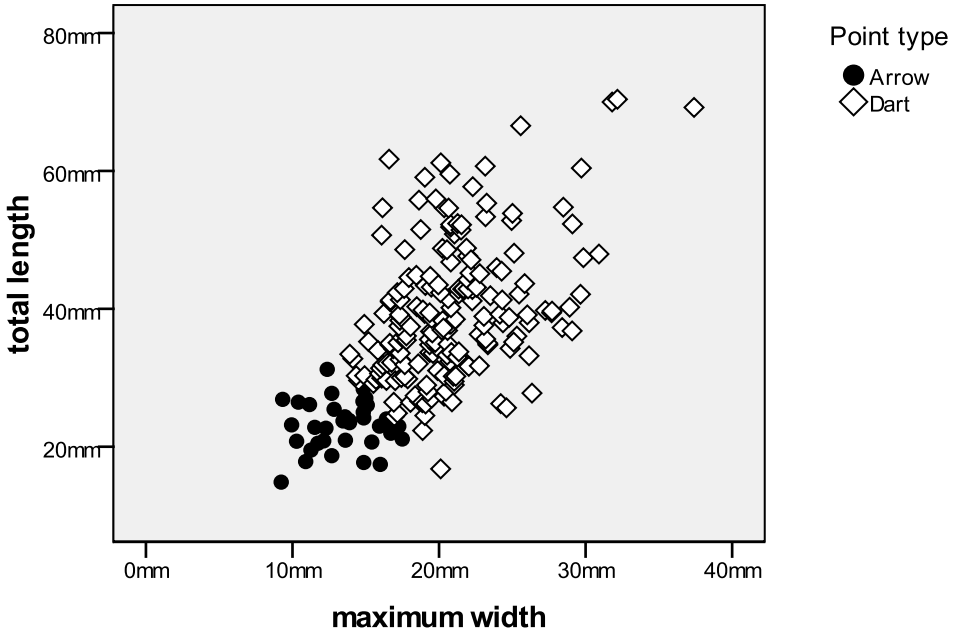


Figure 23 B

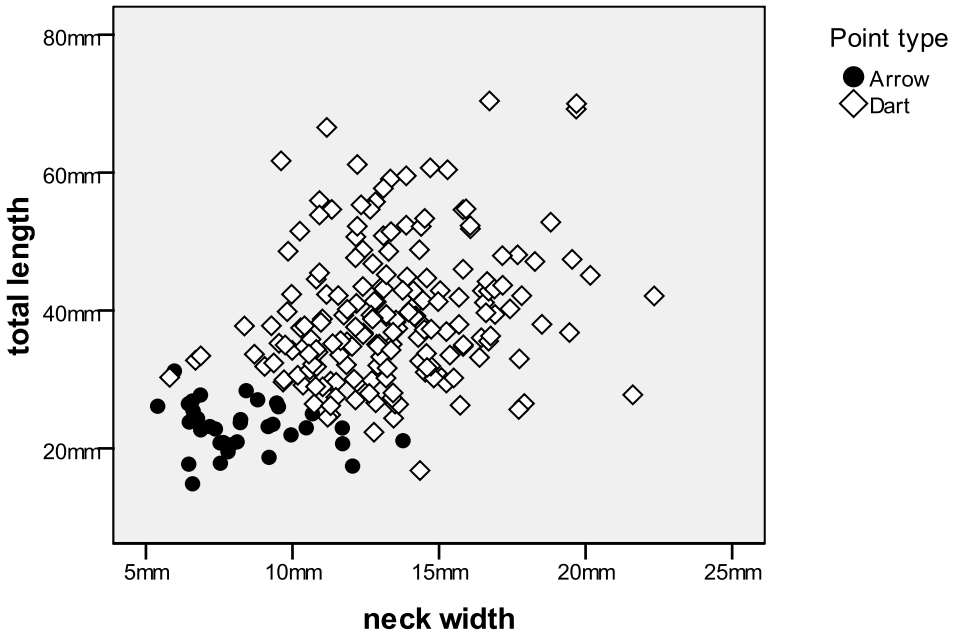


Figure 23 C

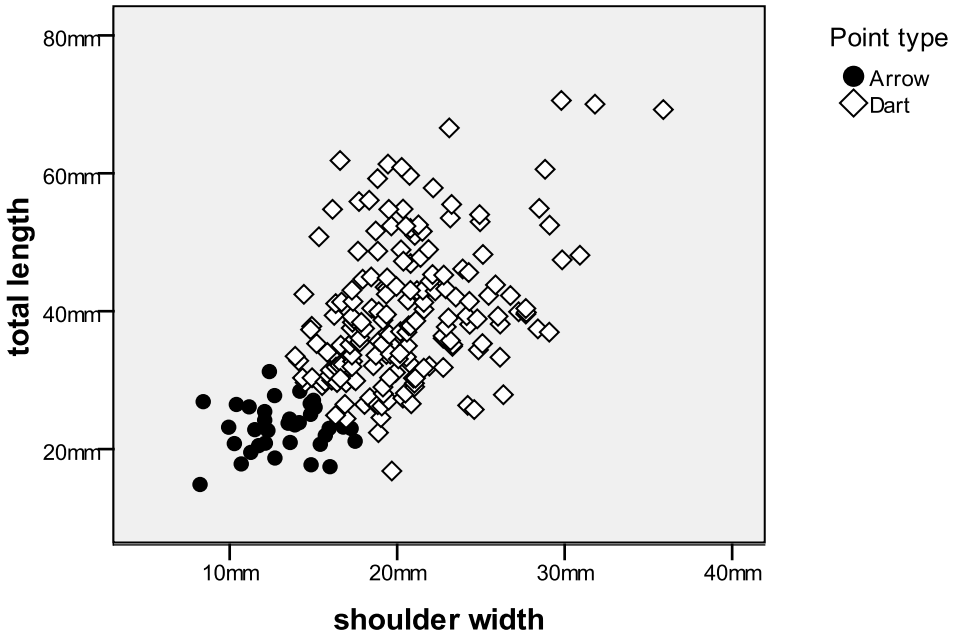


Figure 23 D

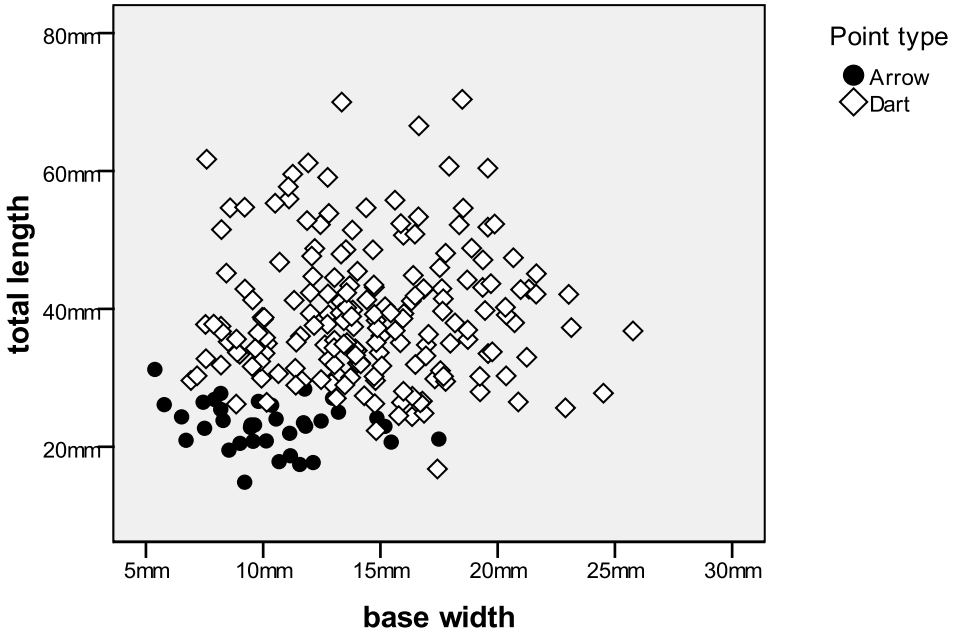


Figure 23 E

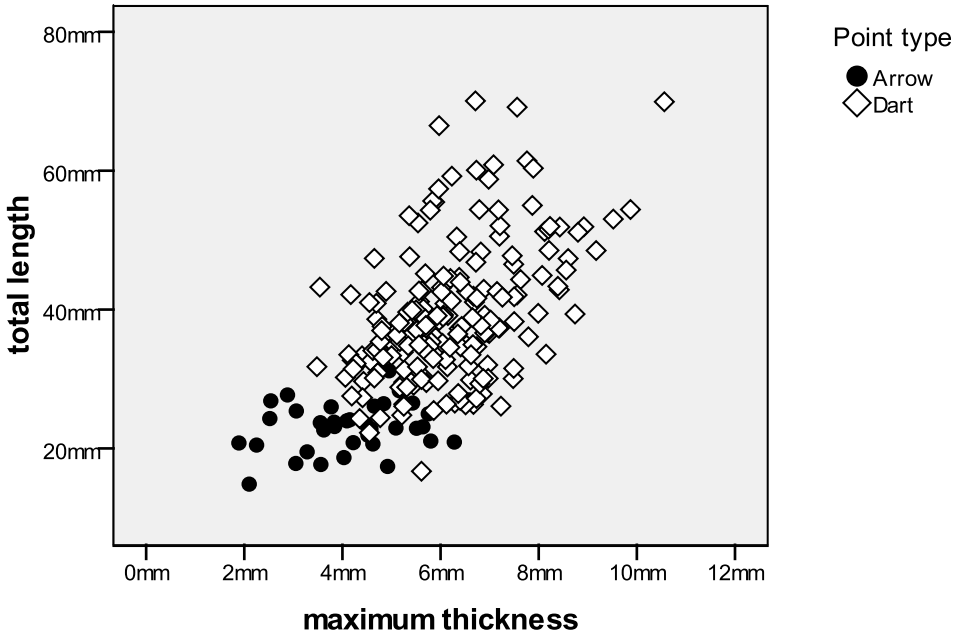


Figure 23 F

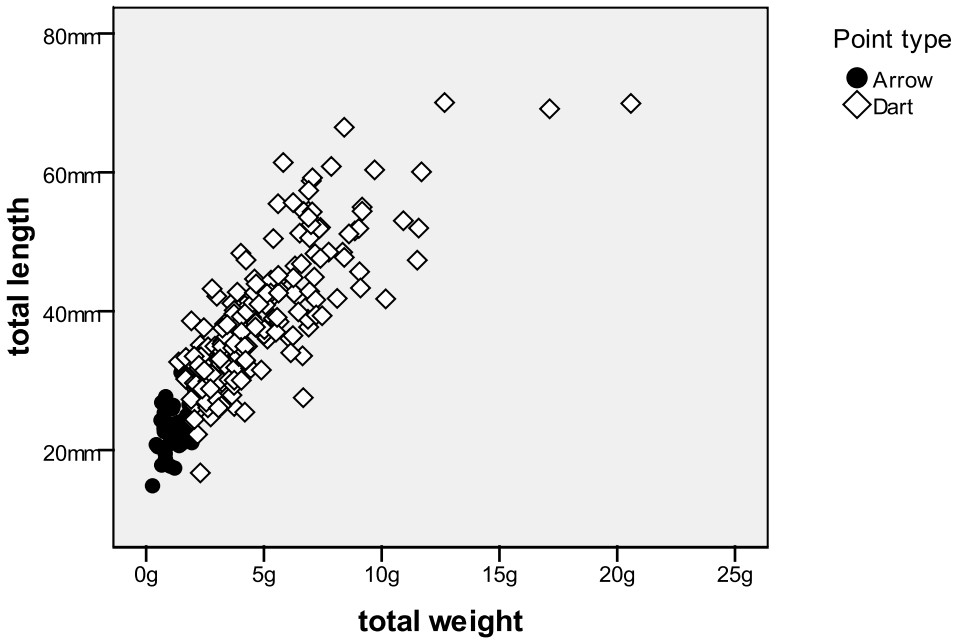


Figure 23 G

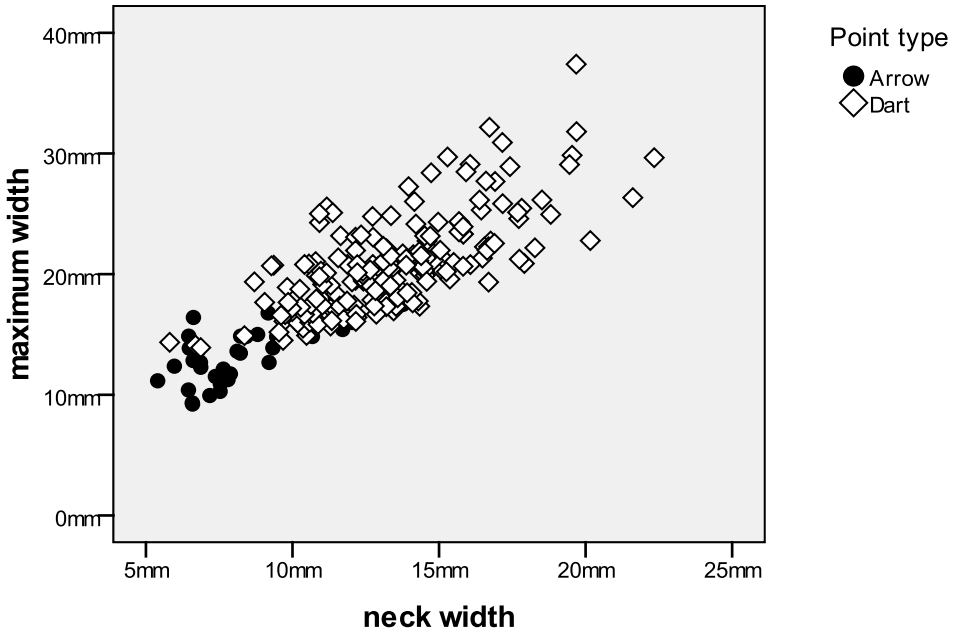


Figure 23 H

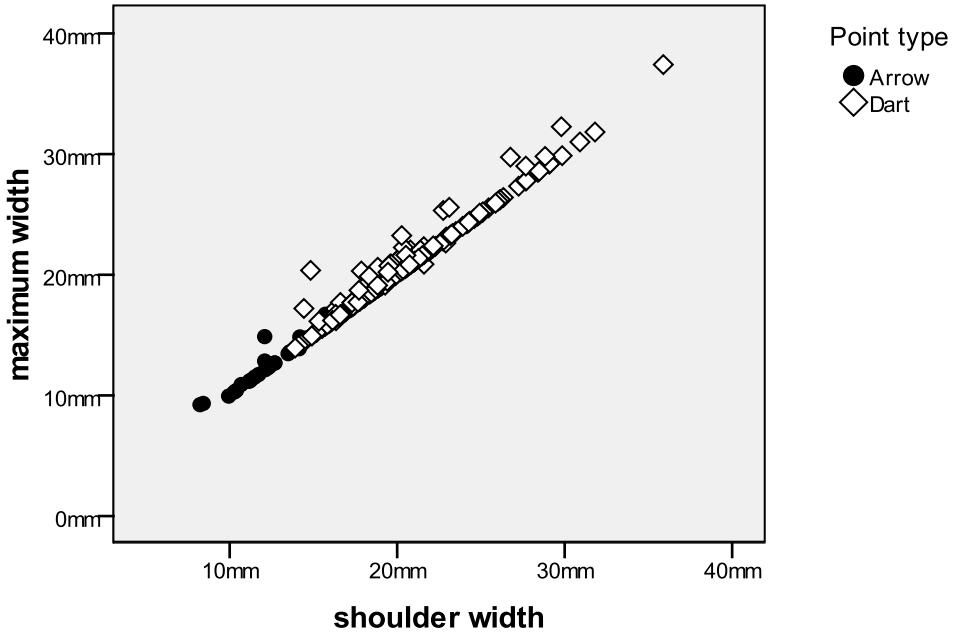


Figure 23 I

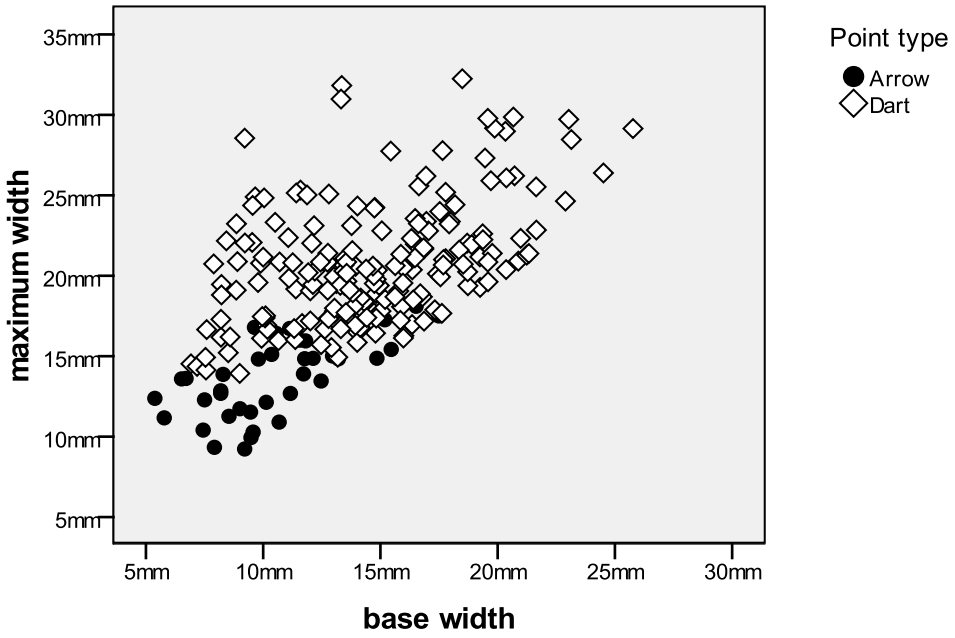


Figure 23 J

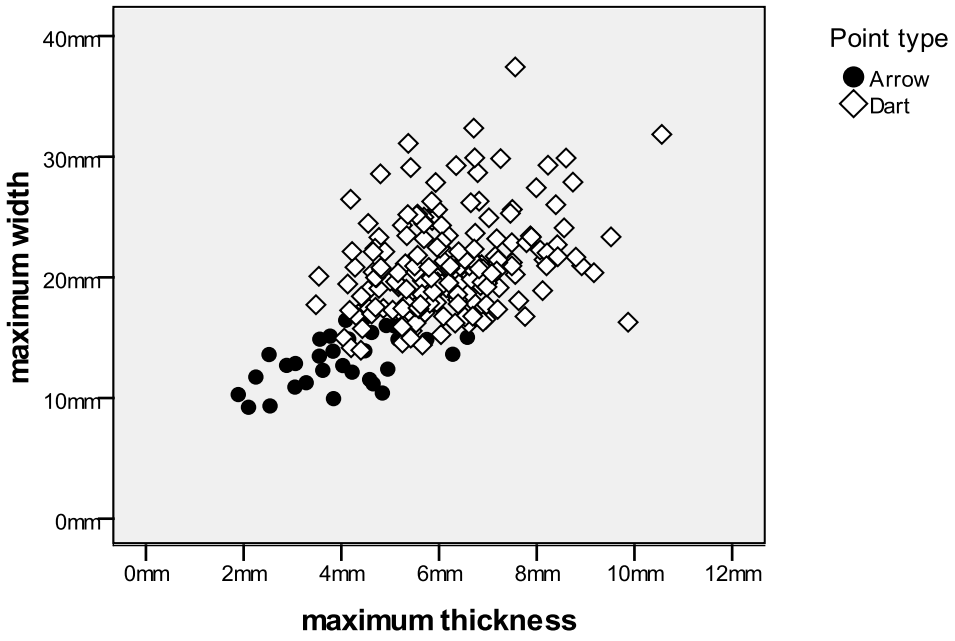


Figure 23 K

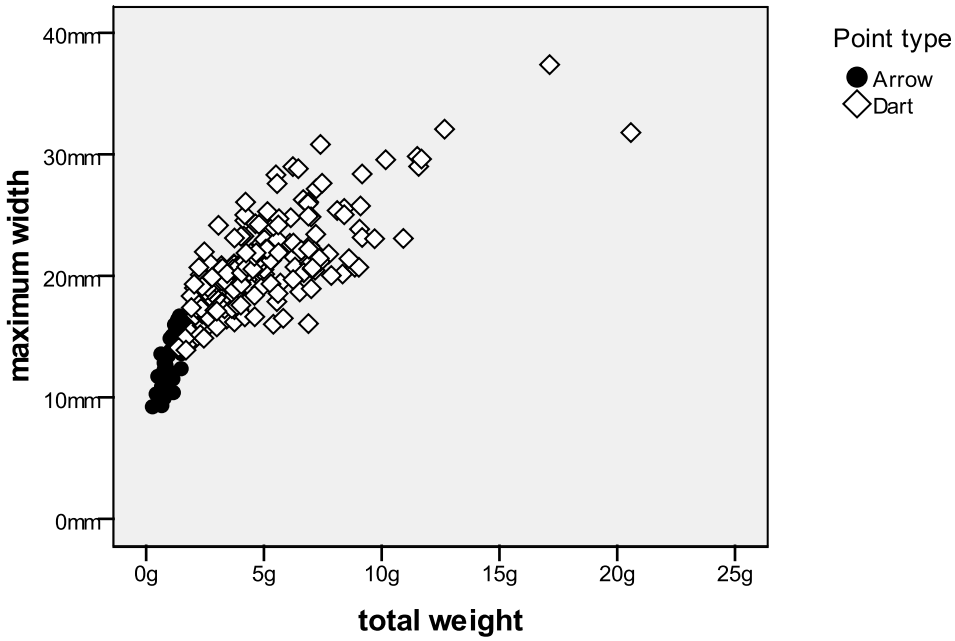


Figure 23 L

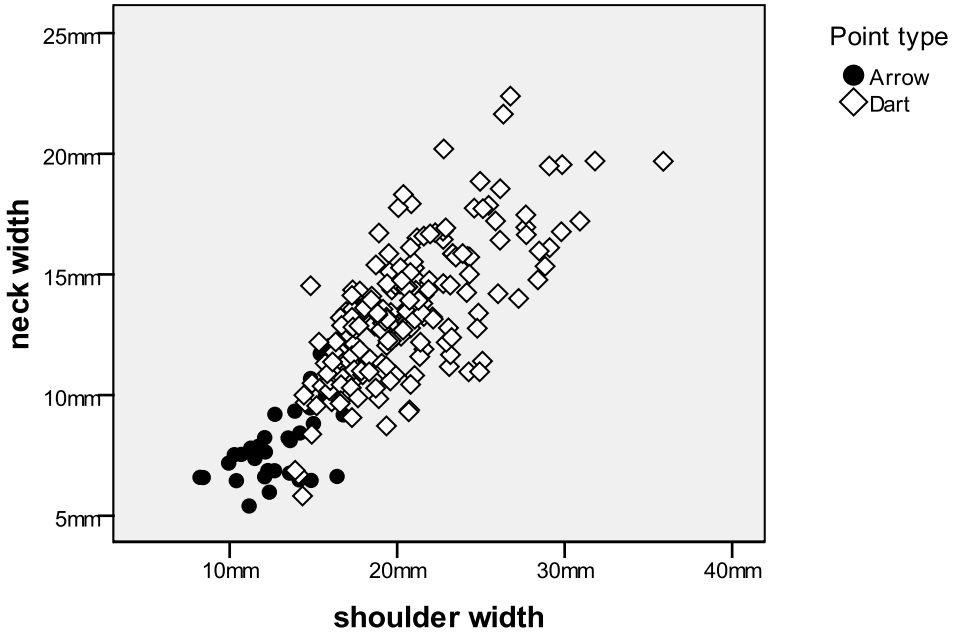


Figure 23 M

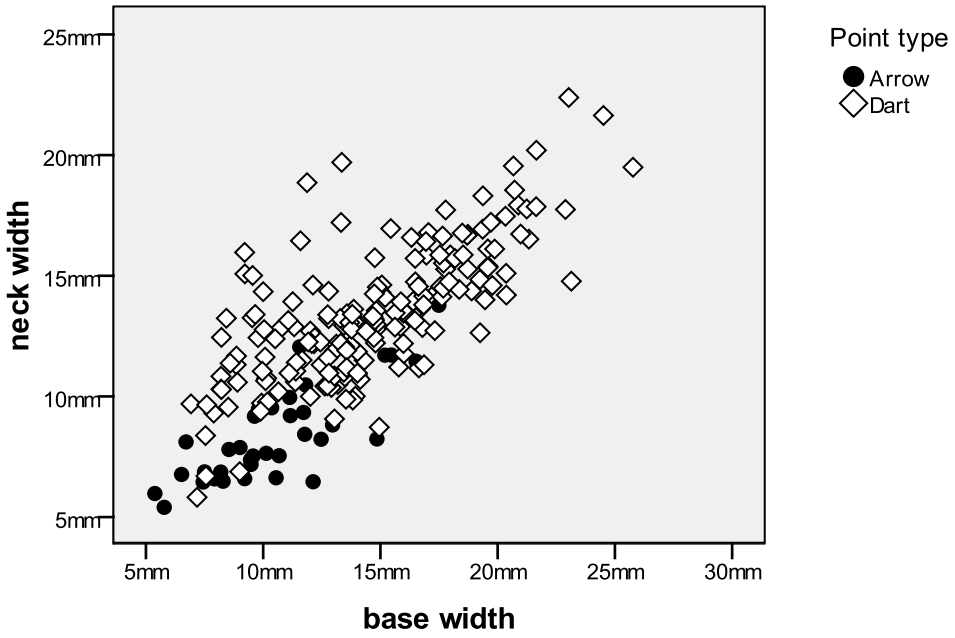


Figure 23 N

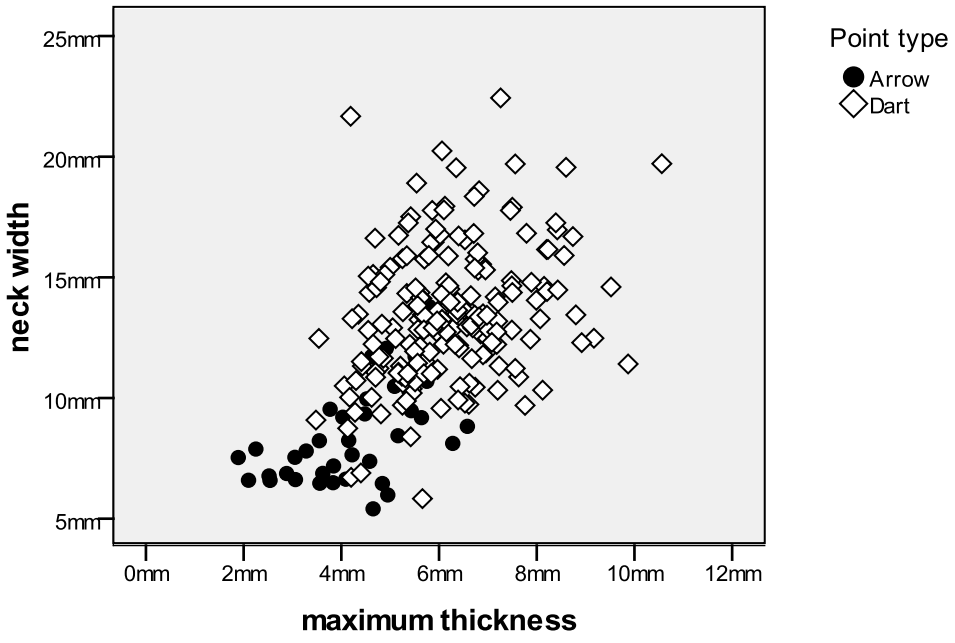


Figure 23 O

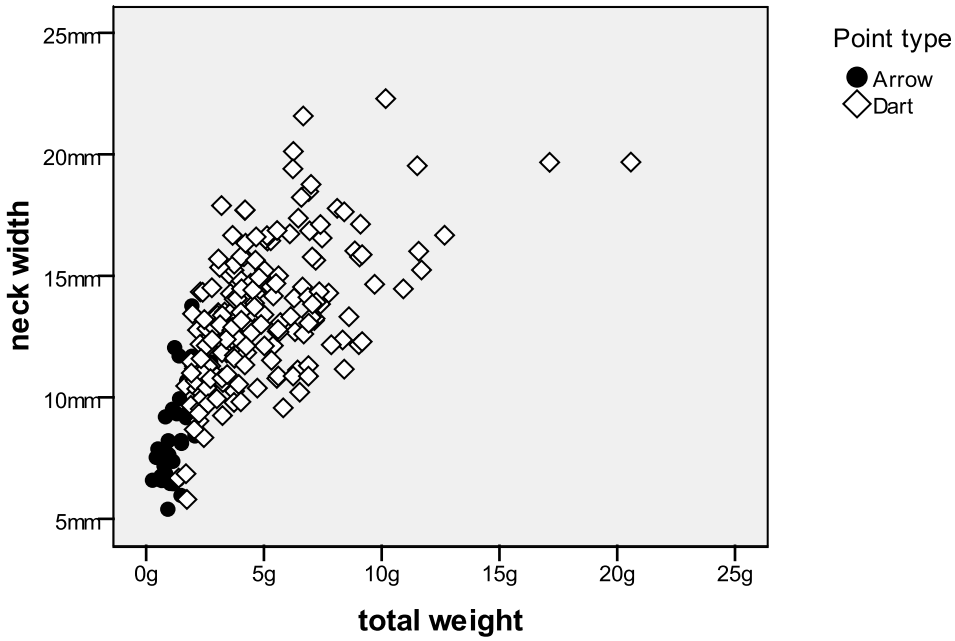


Figure 23 P

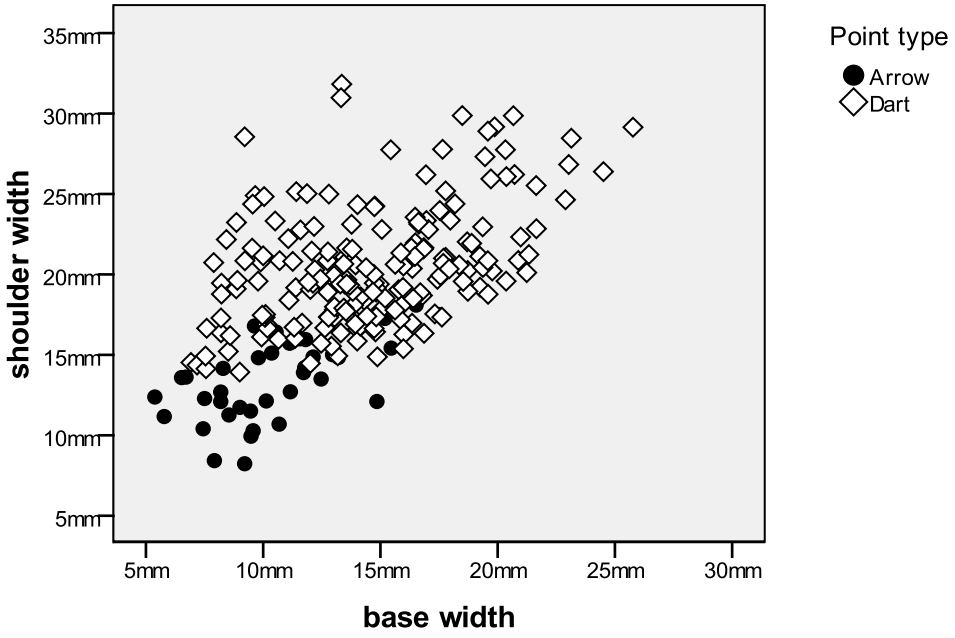


Figure 23 Q

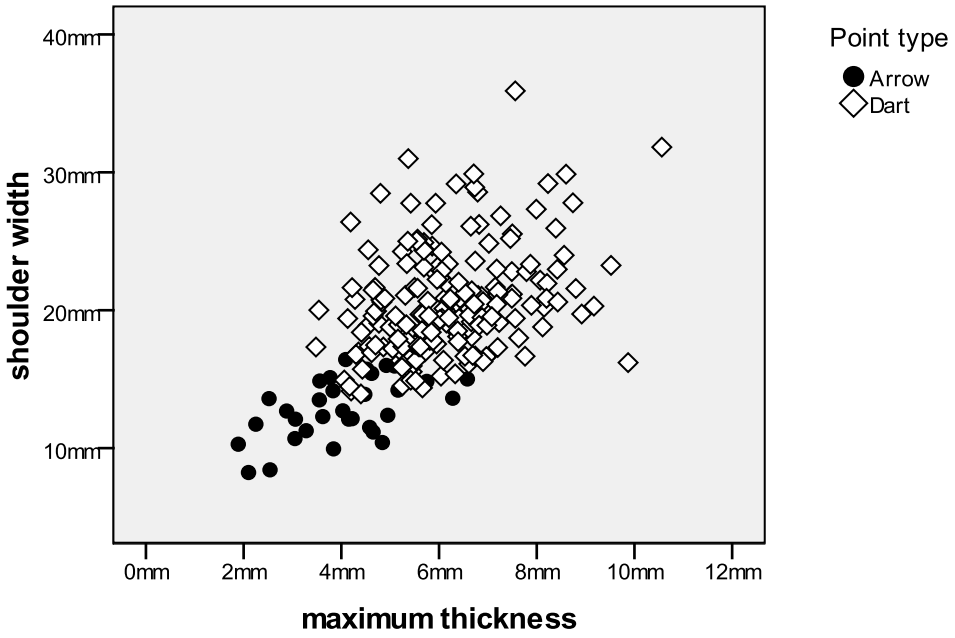


Figure 23 R

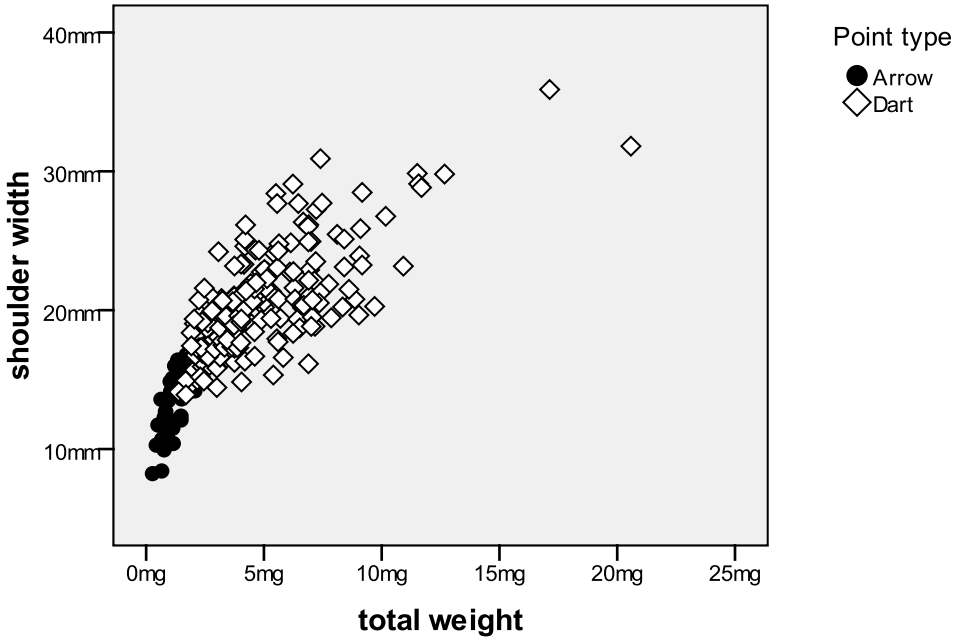


Figure 23 S

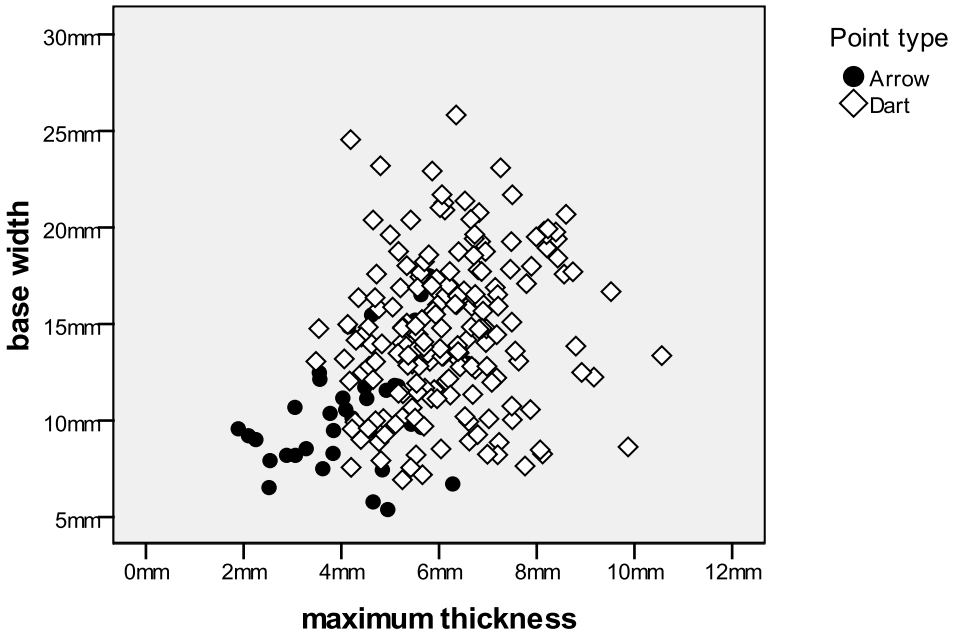


Figure 23 T

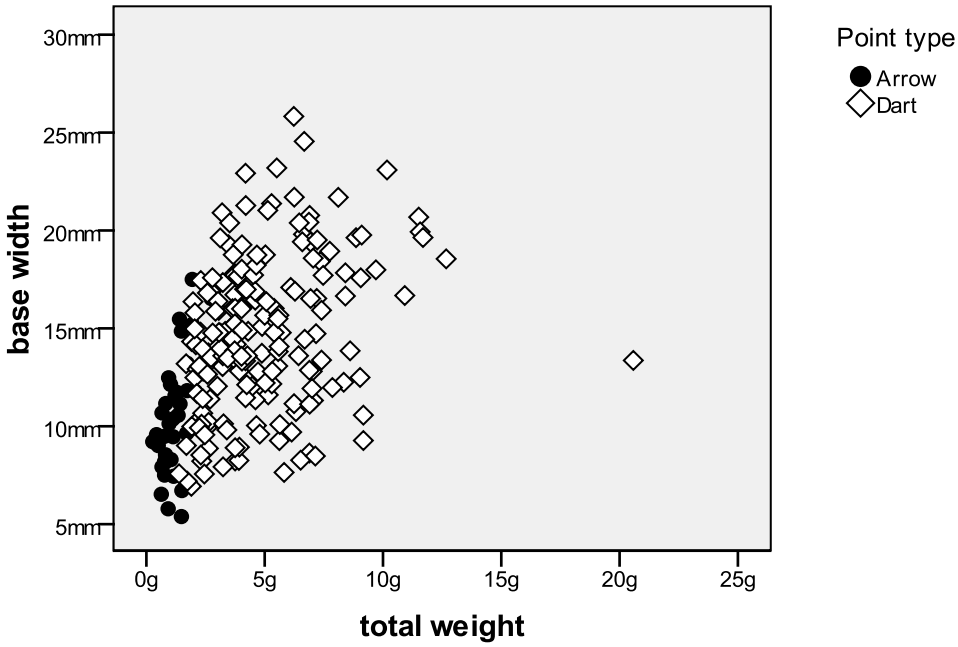
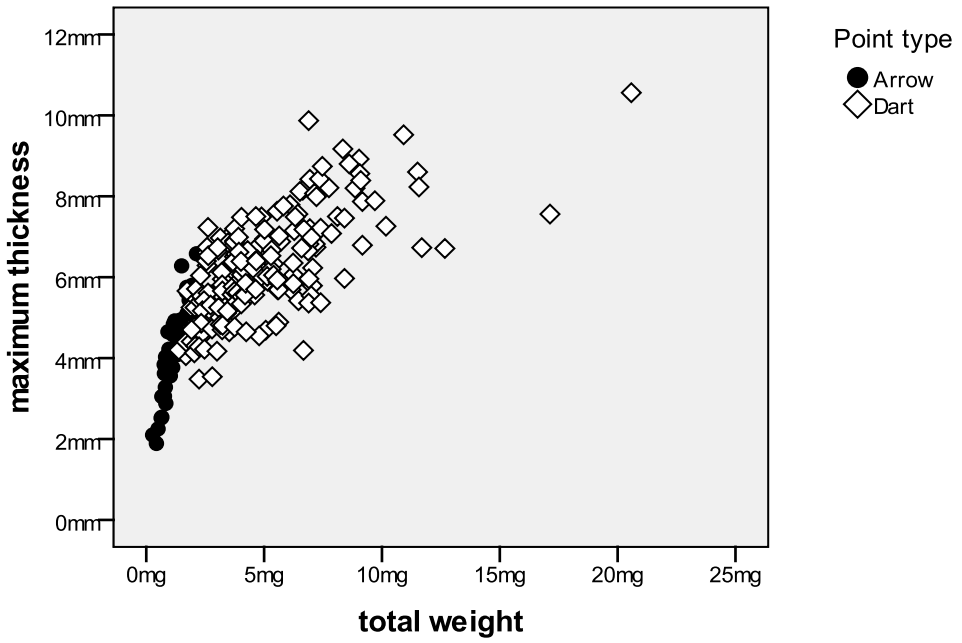


Figure 23 U

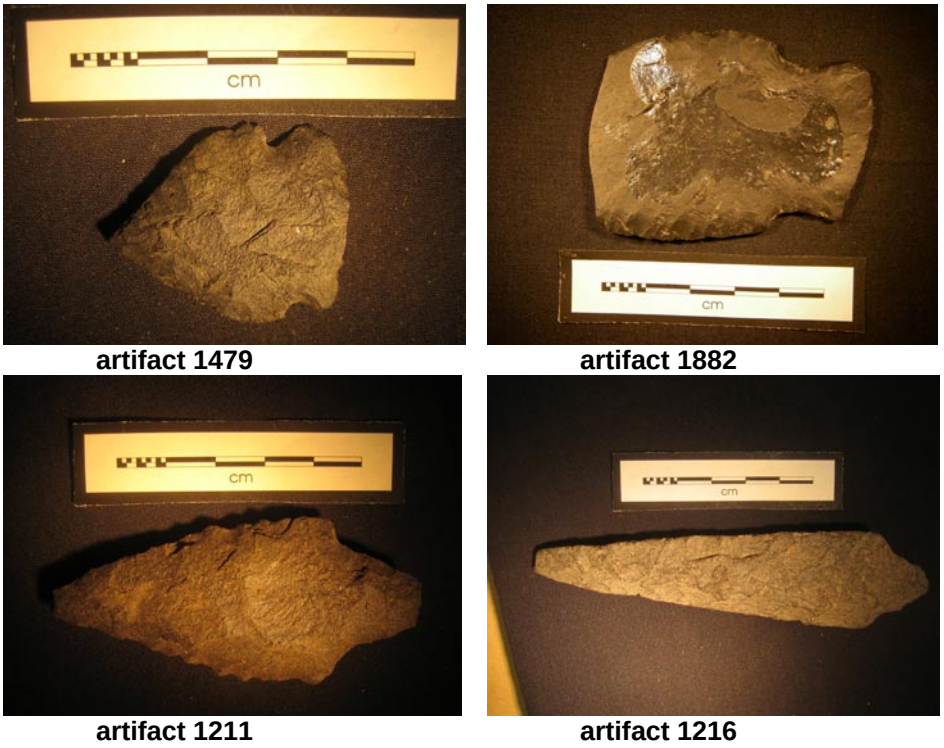


Discussion of the Shuswap collection data

In the analysis described above, we took the first steps towards gaining a better understanding of this collection. There are two major occurrences that could be expected to arise in a culture where two such distinct weapon systems were in use. First, it could be expected that if the bow and the atlatl were being used at the same time those people would have also possessed at least visually distinct types of stone points. On the other hand, if they did not have differently shaped points, they would at least have large and small versions of the same style of point. In either case, graphing the individual measurements of a collection of points from that area and time period would likely show obvious distinct groupings. That is not the case within the collection of points from the Shuswap horizon. As the distribution of each of the individual attributes were displayed on a rank order graph all seven provided the same visual result (see

Figure 21). There are no easily visible breaks or jumps in the steady, gradual gain in dimension. The few outliers are on the high end of the scale and appear in all the measured dimensions. These most likely represent points that were not ever meant to be used within a projectile weapon system and in all probability are, as was mentioned earlier, hafted knives. The photographs in Figure 24 enable a closer examination of this.

Figure 24: Photographs of extreme outliers from Shuswap horizon point collection.



artifact 1479 **artifact 1882**

artifact 1211 **artifact 1216**

A visual inspection of these outliers (see figure 24) indicates that their overall shape is not different from the rest of the Shuswap collection. Artifacts 1211 and 1216 are the same shape, but have exaggerated dimensions of length and width. The other two artifacts (1479 and 1882) are both similar to other

Shuswap styles; however they once again show exaggerated dimensions of width. As these points still appear to mimic the style of other Shuswap points they cannot be excluded from the Shuswap groups and another explanation for their differences must be found. As previously stated, the most plausible explanation for these points is that they were used for other purposes, such as hafted knives, thrusting spears or harpoon heads.

If it is accepted that such outliers are knives or points for thrusting spears then there is still the question of the seemingly continuous gradient in size seen for all the other points. If these two weapon systems are different enough that most artifacts from periods when only one existed can be easily classified, then how is it that points from the Shuswap horizon do not show two distinct groups. One explanation for this was proposed by Rousseau (2008:237) who suggested that the wide variety of point styles during the Shuswap horizon reflects highly mobile residential groups, in contact and trade relationships with neighbouring groups. Rousseau (2008:237) also believes that individual craft person's point style preferences and/or a great degree of experimentation with different point styles and prey species contribute to these results. Another explanation for why points from the Shuswap horizon appear to have such a steady continuum of sizes is provided by the sample itself. At the time that this research was being conducted, the largest and best documented Plateau culture area point collections in British Columbia were included. Though unlikely, it is still possible that the points that I was able to study do not provide an accurate representative

sample of the projectile weapon technology used on the Plateau during the Shuswap horizon. It is important to note that even if that were the case, this is the most comprehensive sample available and must serve the purpose of this research.

The next step in the analysis was to examine the relationships between sets of attributes. The results of this analysis (see Figure 23) provided some interesting results. First, it is intriguing to note that in almost all the bivariate plots, the group of points classified as arrow points cluster more closely to each other than those classified as dart points. Another trend that is of interest is that in most cases the arrow group and the dart group cluster in such a way that only the largest arrow points and the smallest dart points overlap on the graphs. Though this was expected there are, however, a few exceptions. The graph showing the maximum thickness measurement, plotted against the base width measurement (Figure 23 S), shows overlap of the two types. A similar distribution is shown for both the graph of maximum thickness plotted against neck width (Figure 23 N) and the graph of base width plotted against total length (Figure 23 D).

It is difficult to infer any substantial conclusions from these graphs as none of them displays the clustering that one would expect when two distinct populations are being compared. There is, however, another pattern manifesting itself within these graphs that does need to be discussed. If one were to add a

best fit line through the group of darts and one through the group of arrows in many cases the two lines would be on very different angles. These slopes indicate that the two groups of artifacts do indeed have differences. Good examples of this phenomenon can be seen in Figures 22 F, K, O, R, and U. In each case, as the various measurements get larger, the trends for the arrow points and dart points take different trajectories. Though a full linear regression analysis is beyond the scope of this project it is important to note that there are some linear relationships visible on these scatter plots.

One possible factor that could be affecting the outcome should be addressed here. As mentioned earlier, the atlatl and bow can be used best for different prey species. It is possible that people during this period were experimenting with the limits of each of these two systems. This could have led to the development of a range of point sizes for each weapon, larger and smaller groupings of points used for different large and small prey species.

Shott (1997) noted in his research that the measurement with the greatest impact on how a point would be classified was shoulder width. As Shott's system was heavily weighted towards this variable it is understandable that all the graphs that display this measurement plotted against any other show the smallest overlap between the "dart" and "arrow" groups. Unfortunately, this does not help us to determine what is going on within the Shuswap horizon collection.

It only indicates that Shott's system was heavily weighted towards this one variable.

Though the bivariate scatter plots in Figure 23 do not readily display any obvious trends identifying either a single measurement, or set of measurements, that can be demonstrated to be directly related to the atlatl or the bow and arrow system they do provide other valuable information. The various linear relationships they demonstrate indicate that with future analysis (specifically linear regression analysis) more information about the two types of points may be recovered. It appears that without further analysis the Shuswap points classified by Shott's (1997) system into the arrow and dart categories do not have any easily discernable metric differences. Though some of the graphs demonstrate less overlap between the metric attributes of points from the two systems and others show possible linear relationships, there is not enough information provided by them to sufficiently answer the questions posed herein.

One other item of interest that could be having an effect on how the points from the Shuswap horizon are classified could be the raw materials from which they are made. Both Richards and Rousseau (1987:51) and Prentiss et al. (2006:67) indicate that the quality of raw materials used during this time was not as high as during other time periods. It is possible that these coarser grained raw materials resulted in the construction of less uniformly sized points. Both small points (made due to smaller, less predictable flakes) and large points

(made that way because of a fear of breakage) could be explained with this hypothesis. This explanation, touches on a significant possibility, however, further analysis of it is beyond the scope of this project. An in-depth look at the various raw materials used on the Plateau and the metric attributes of the points made from them would be a valuable area for future research.

The Plateau collection

As with the Shuswap points the first things to examine in the Plateau collection are individual attributes. Once again each such attribute was graphed in an effort to see if it demonstrated anything other than a visually normal distribution. Figure 25 shows histograms of each of the measured attributes and Figure 26 shows rank order graphs of the same, broken down into dart and arrow groups.

Figure 25: Histograms of the seven variables measured for the Plateau points

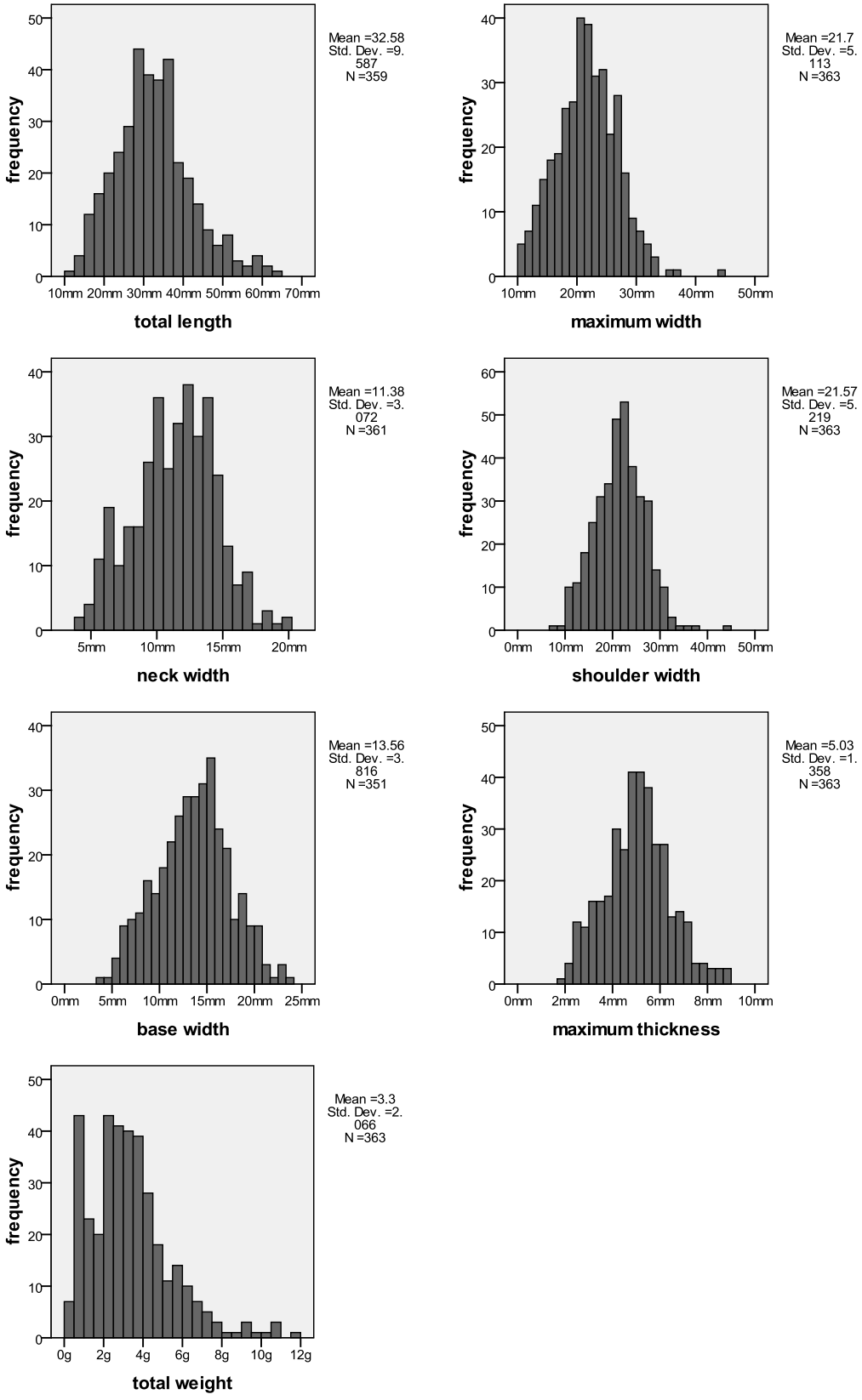
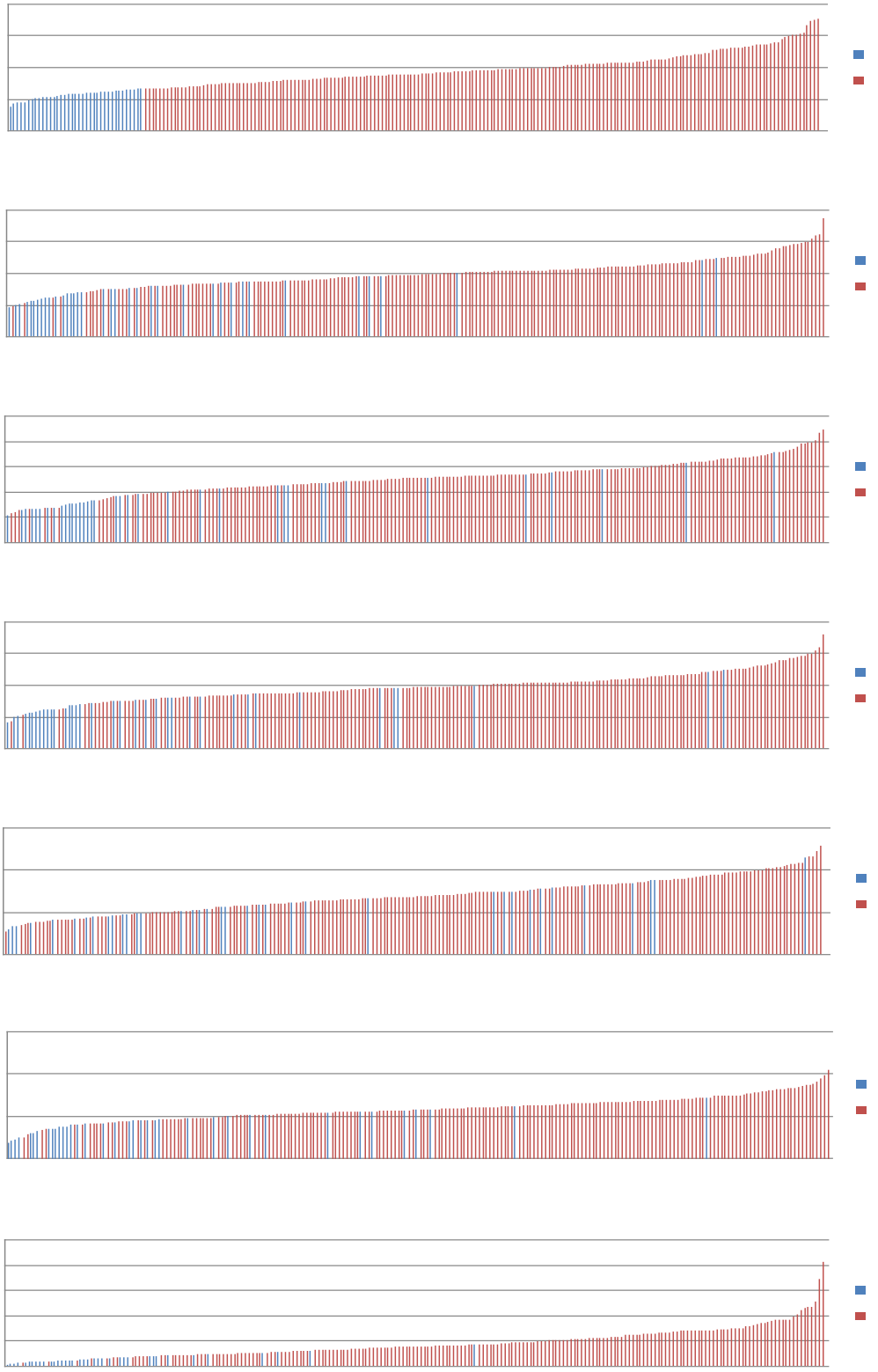


Figure 26: Rank order graphs for the seven variables measured for the Plateau points



Once again a few of the histograms demonstrate slight breaks in their distribution. The graphs for neck width, total weight, maximum width and maximum thickness (Figure 23) all show this to varying degrees. Of these the two most pronounced are neck width and total weight, each showing very subtle double peaks. Though there is a lack of pronounced bimodal tendencies, these results indicate that it is possible that more than one weapon system is represented by this collection of points. The level of detail is, however, on such a small scale that it is not possible to pursue it further here.

All of the attributes for the Plateau points demonstrate a visually normal distribution on the rank order graphs, with slight skewing to the high ends of some of the graphs. This does not help explain why these points fall into two different categories. As with the Shuswap points, a second attempt was made to examine this question by plotting all the attributes for the Plateau points against each other in pairs. Once again, for the purpose of gaining insight into how the individual artifacts relate to each other the points were labelled using the results of Shott's (1997) three variable equations. For the reasoning behind this please see the previous discussion of the Shuswap collection. Figure 27 shows these graphs.

The graphs of attributes plotted against each other do not demonstrate any obvious divisions or groupings. What was expected would have been two clusters of points that were separated from each other indicating two different

ratios for the two measurements being compared. This however was not the case. A few of the graphs (see Figure 27 E, F, J and K) do show clustering in the form of different linear alignments of the respective dart-arrow plot points indicating that there may be two different things happening, but this is very subtle and hard to interpret. This will be discussed further below.

Figure 27: The seven metric attributes in millimeters for Plateau points plotted against each other in pairs

Figure 27 A

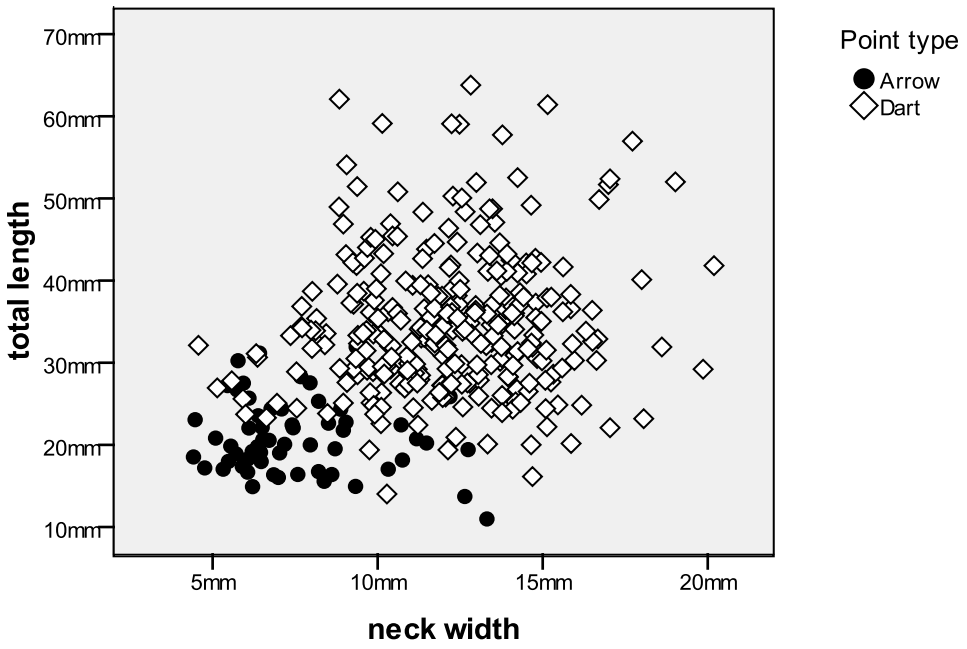


Figure 27 B

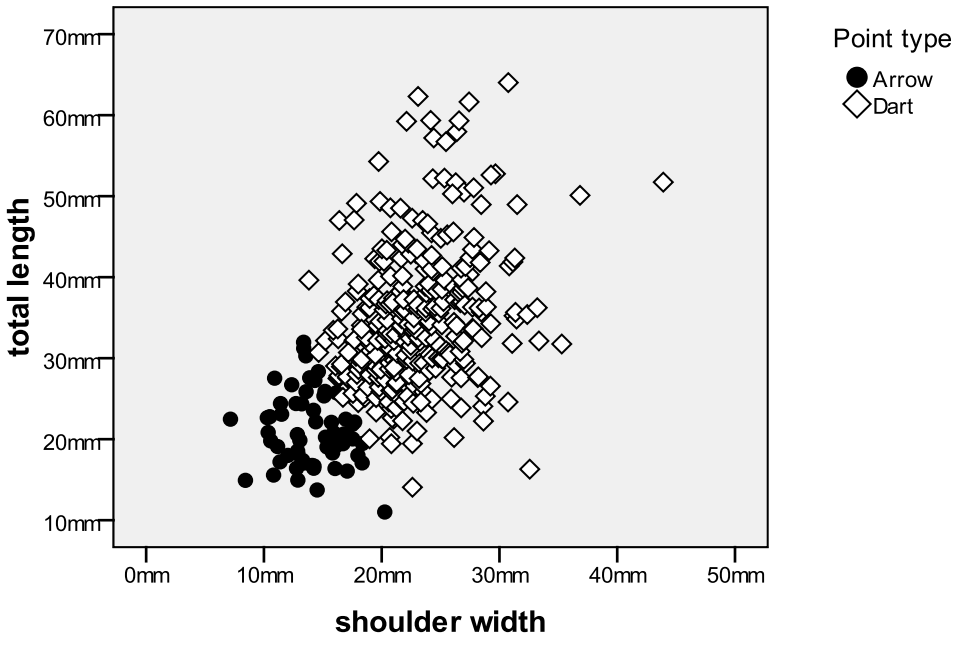


Figure 27 C

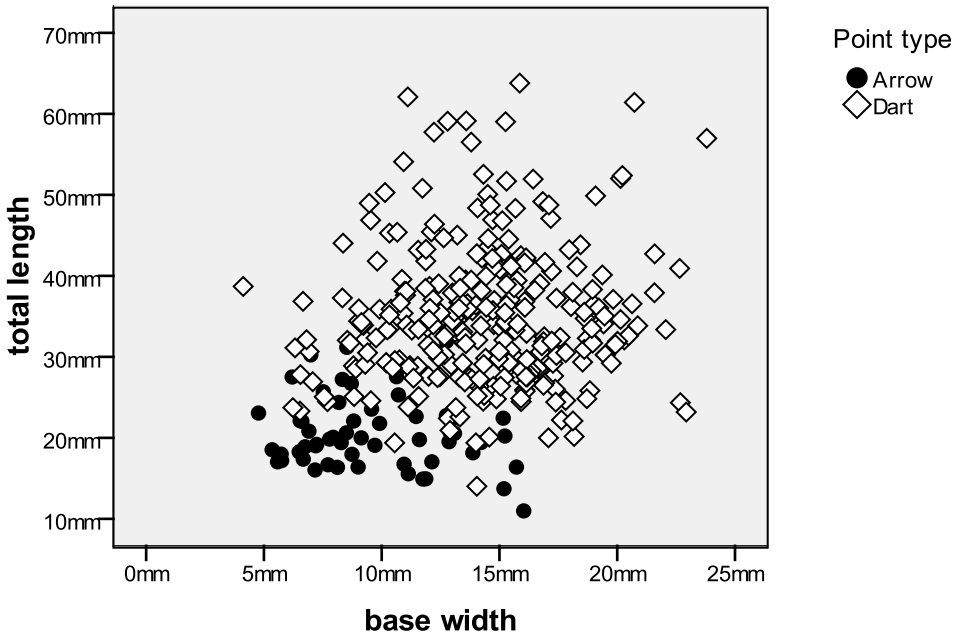


Figure 27 D

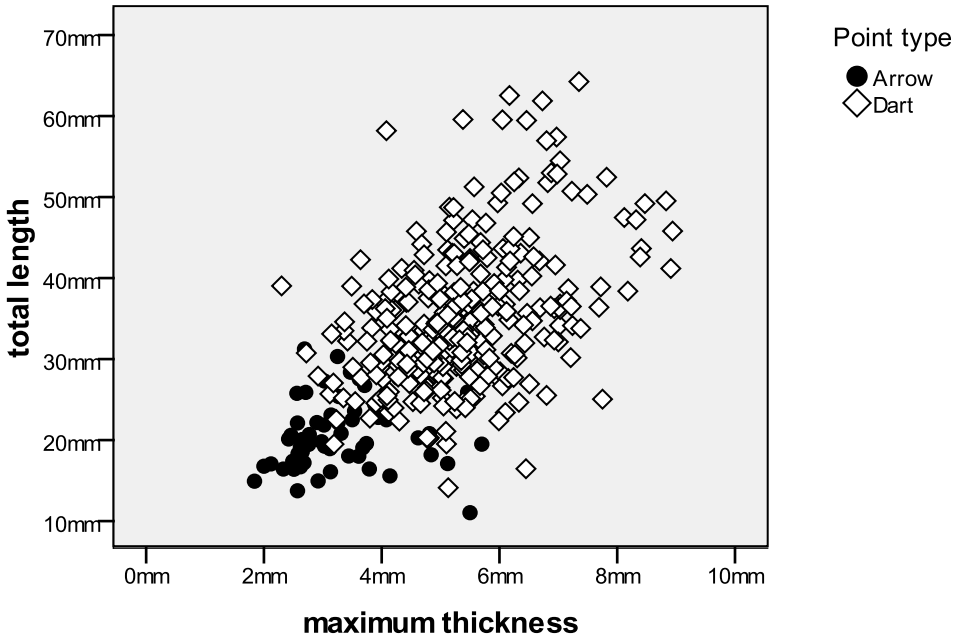


Figure 27 E

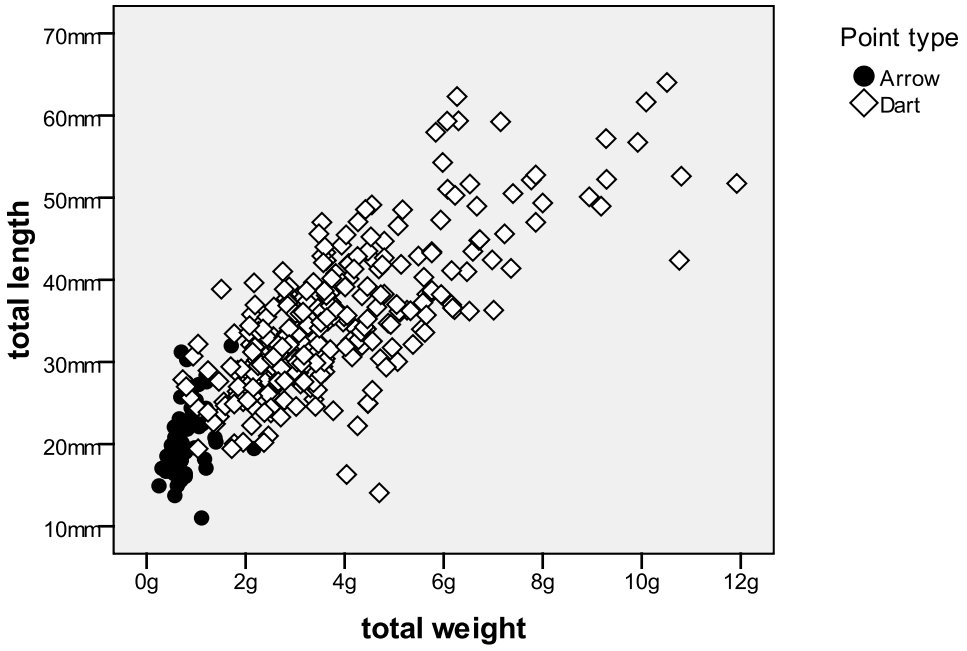


Figure 27 F

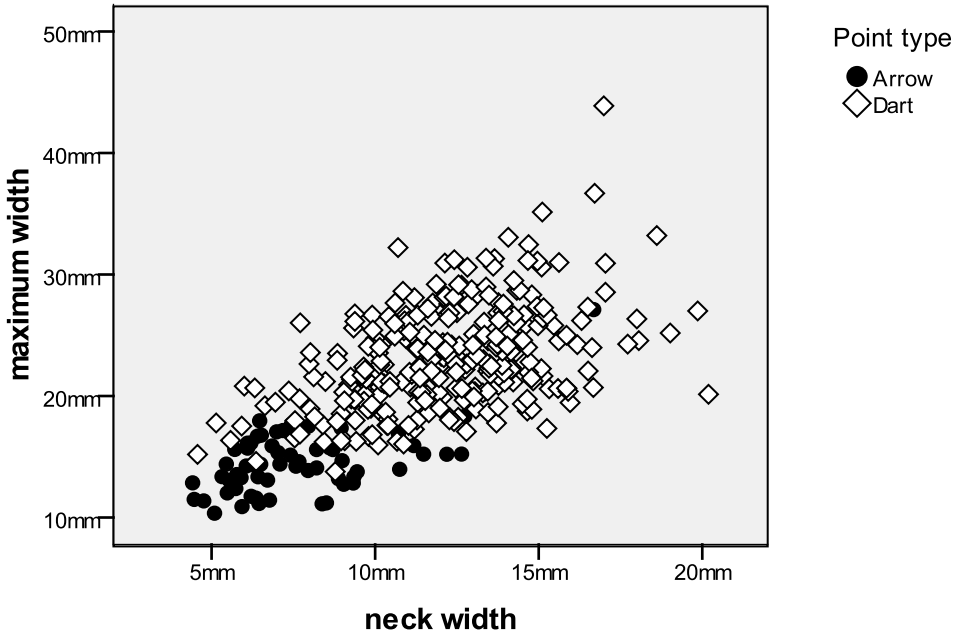


Figure 27 G

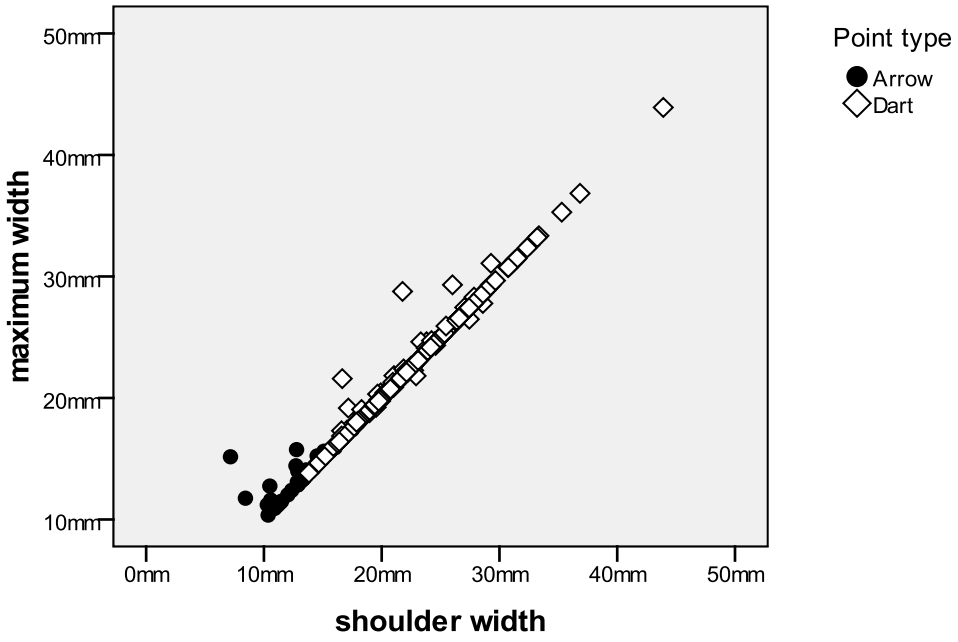


Figure 27 H

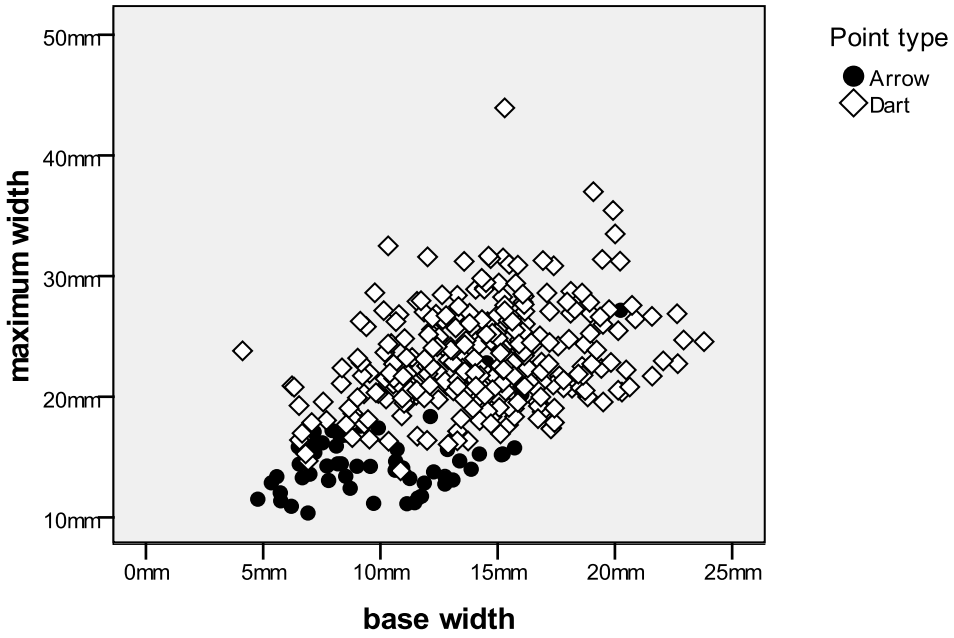


Figure 27 I

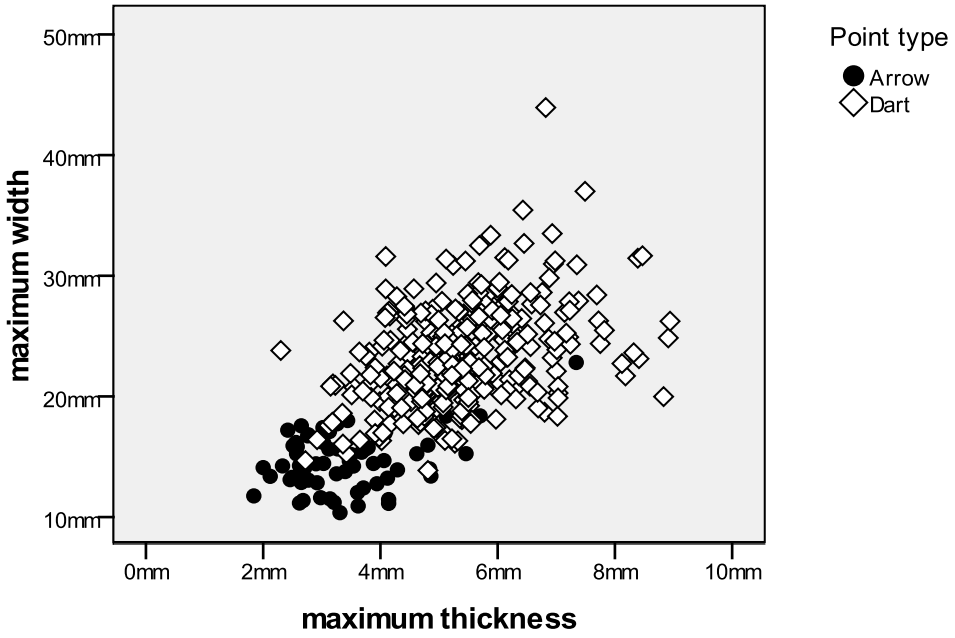


Figure 27 J

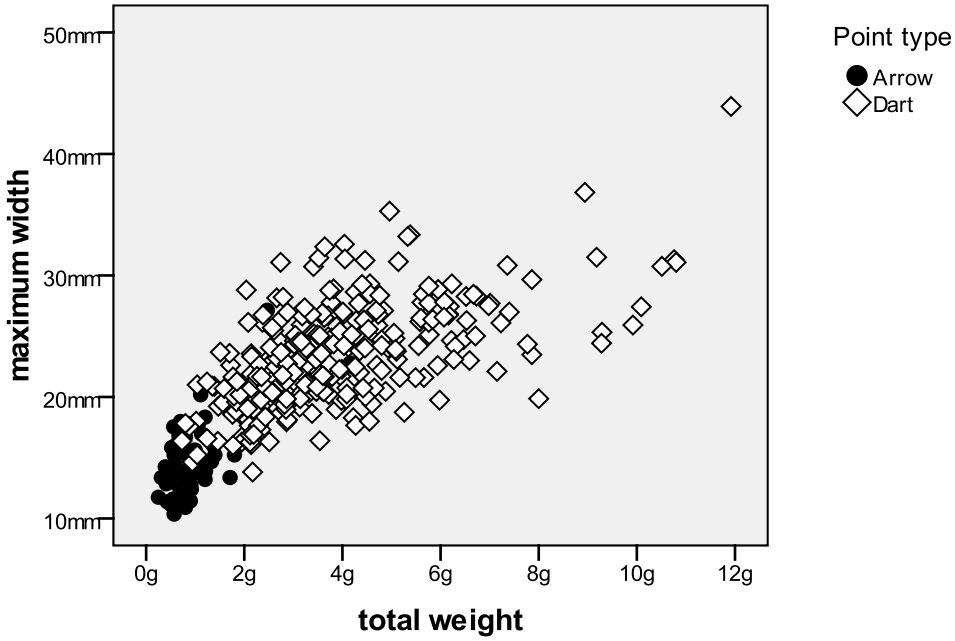


Figure 27 K

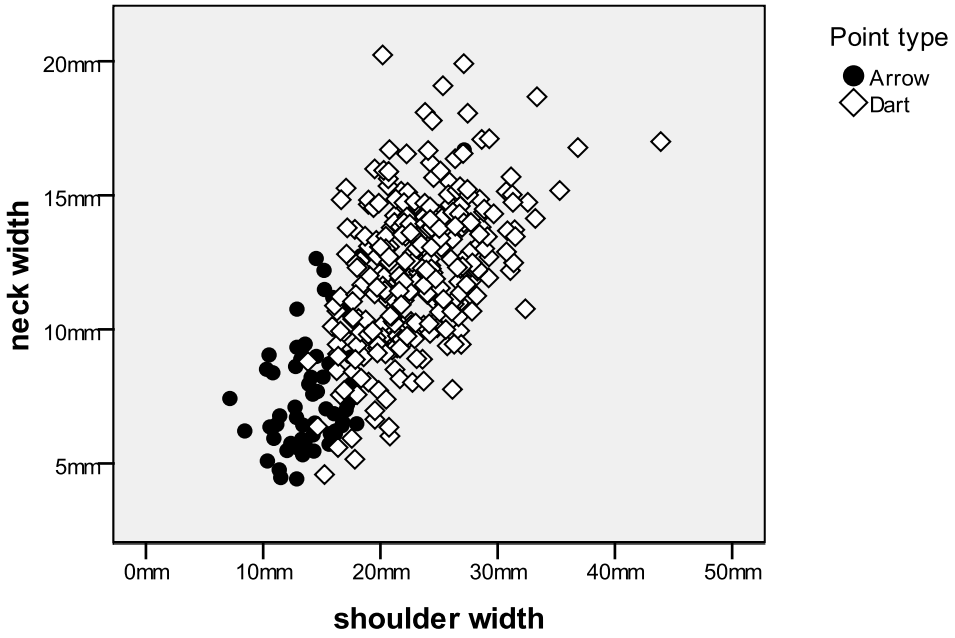


Figure 27 L

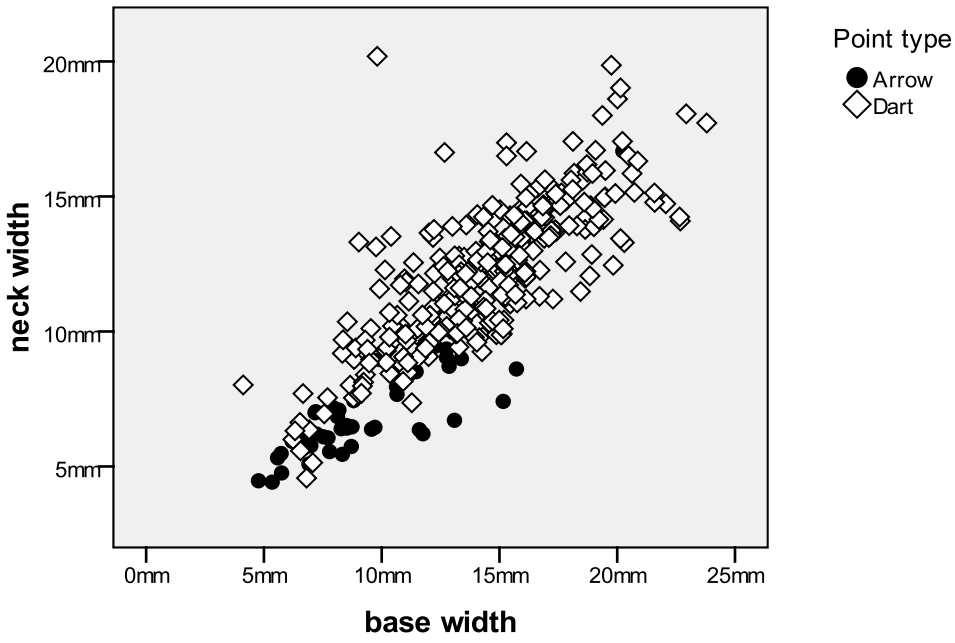


Figure 27 M

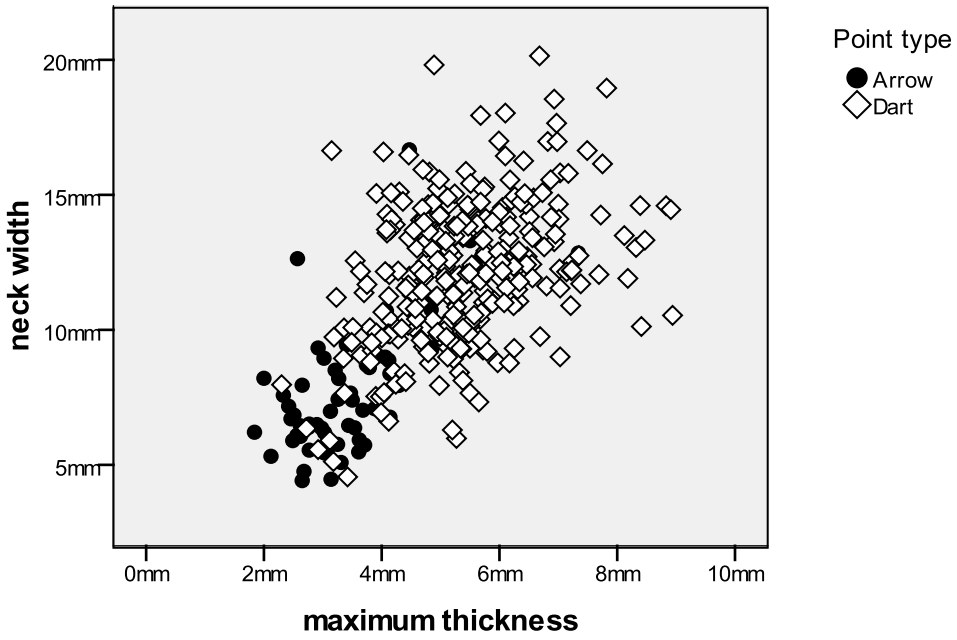


Figure 27 N

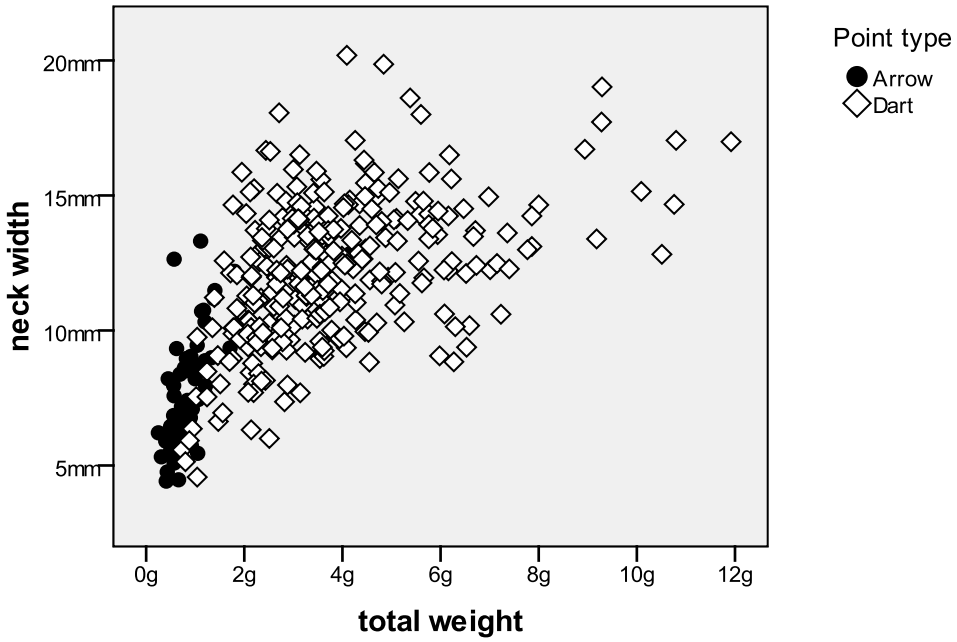


Figure 27 O

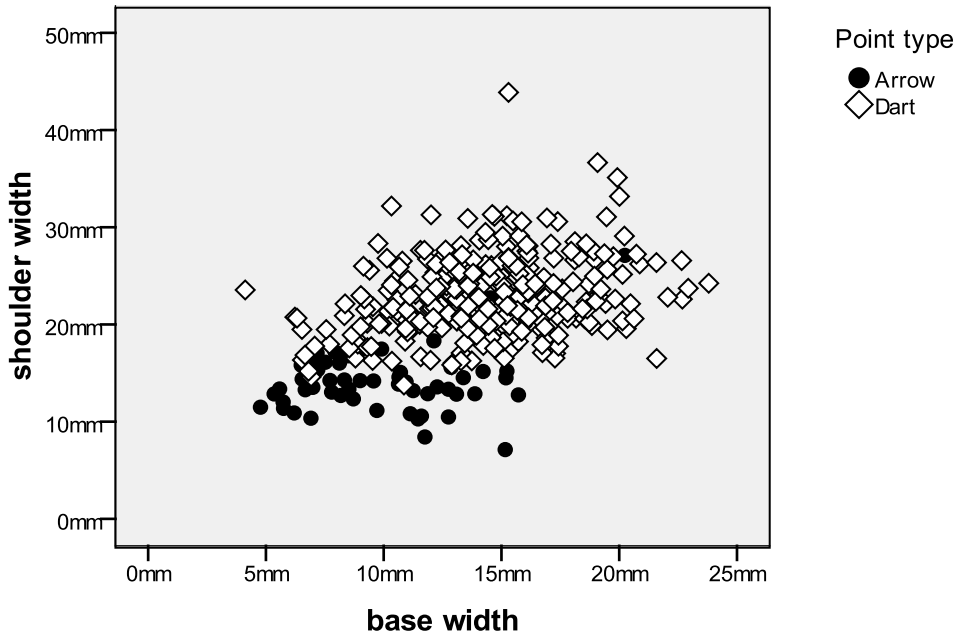


Figure 27 P

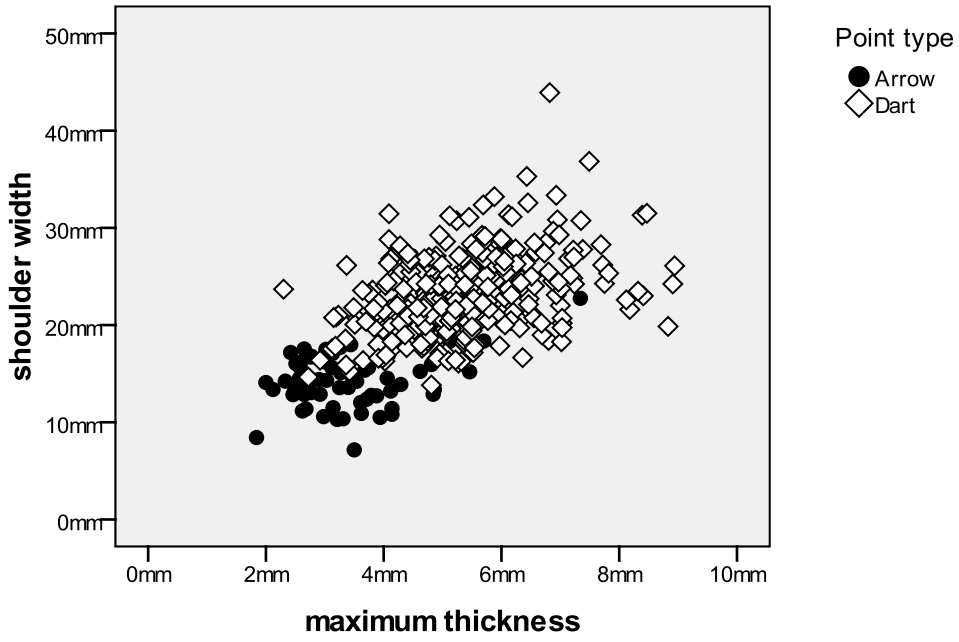


Figure 27 Q

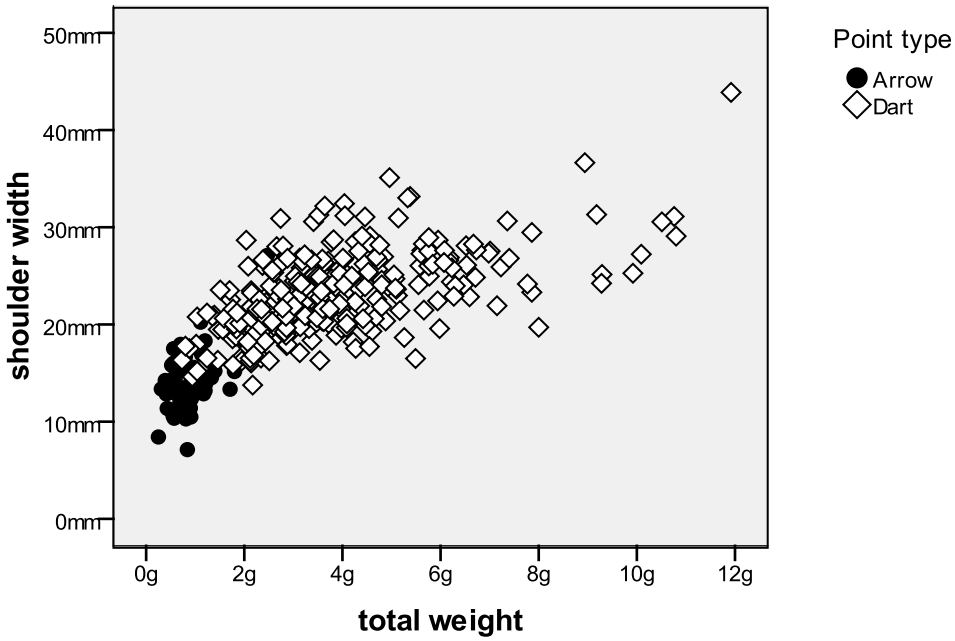


Figure 27 R

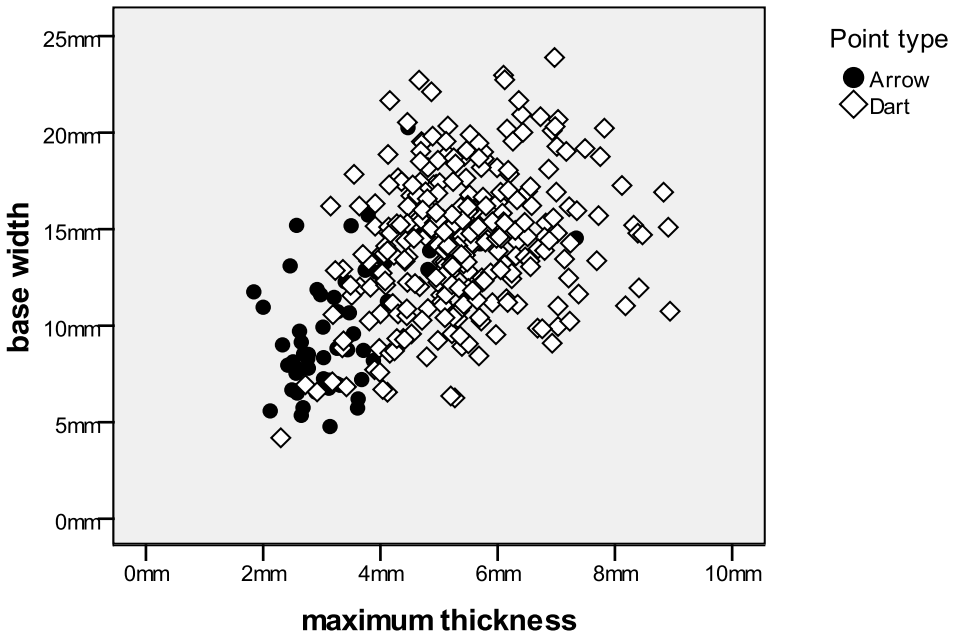


Figure 27 S

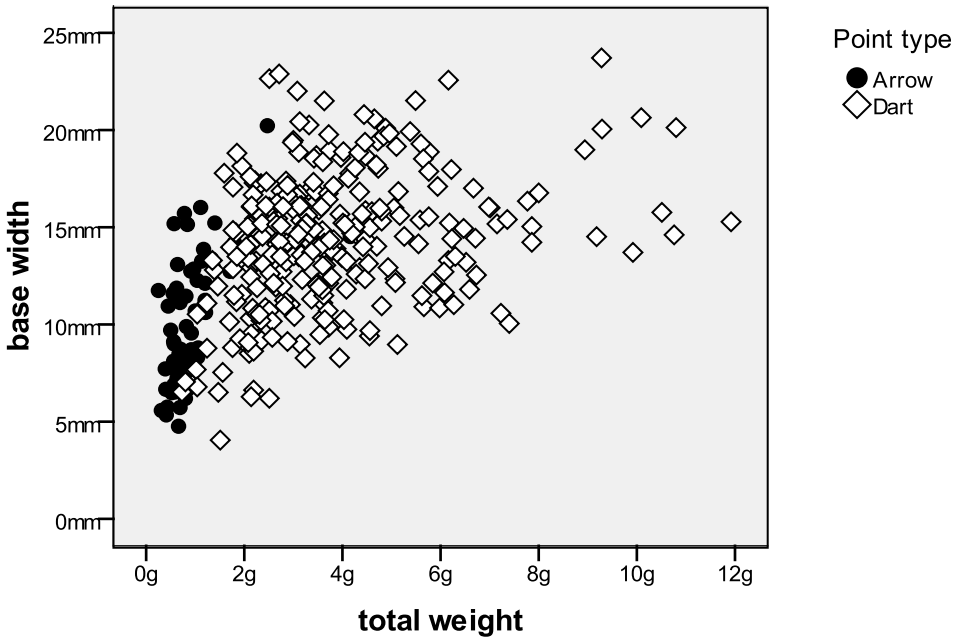


Figure 27 T

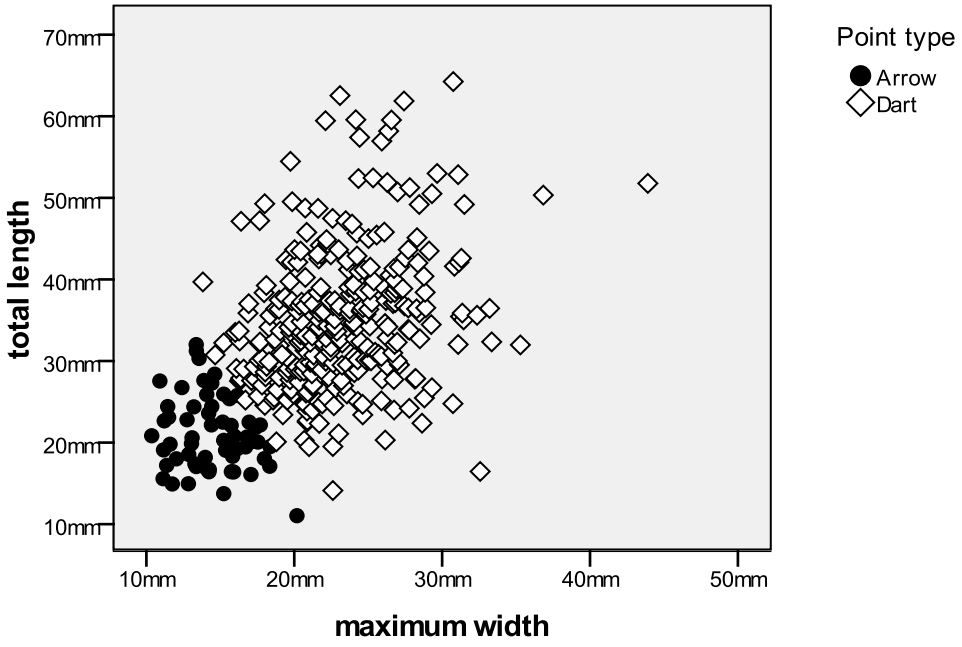
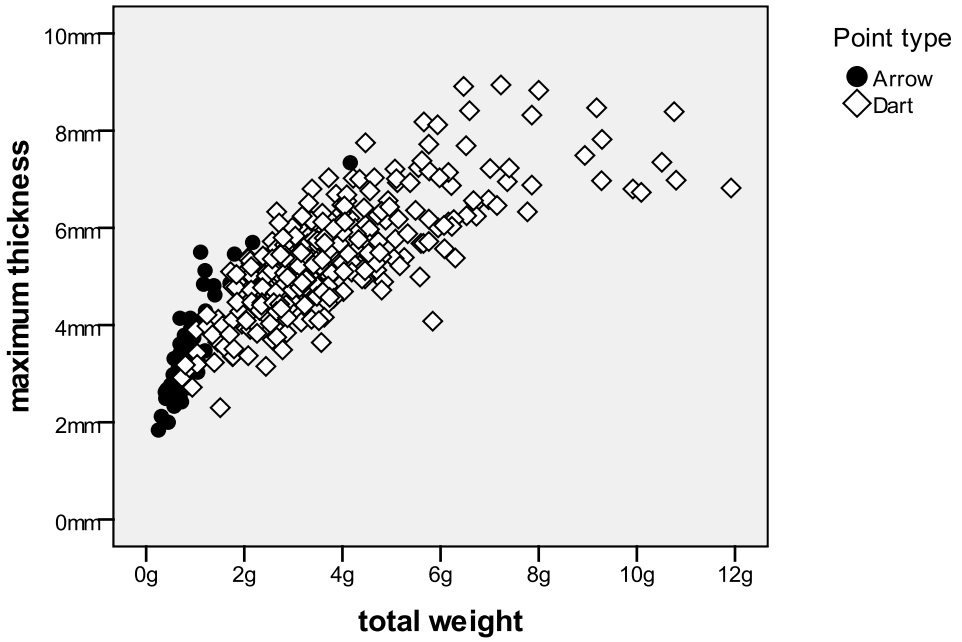


Figure 27 U



The Shuswap and Plateau groups, as mentioned above, contain artifacts classified both as arrow points and dart points. Though this was expected, seeing that these time periods are the ones in which the transition between these two systems occurred, it was not expected that there would be such an even distribution of artifacts in the two weapon categories. It also was unexpected that the general metric dimensions of the points from each of these groups would show the same gradual trend from large to small in each of the various metric attributes that were measured. In both cases, though the predicted results would have been simpler to interpret, the actual results may provide information that has not previously been addressed adequately for the Plateau culture area. So, next the results of the more in-depth analysis of the Shuswap and Plateau points

will be discussed with the goal of identifying two distinct functional groups within each of the collections.

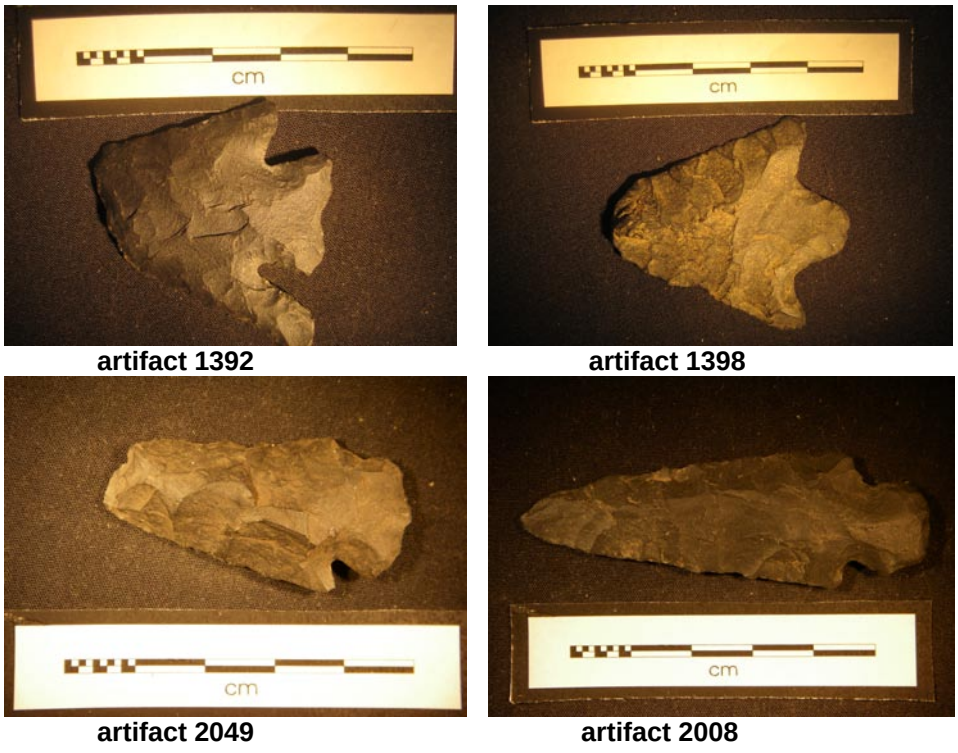
Discussion of the Plateau collection data

The major difference between the points of the Shuswap horizon and Plateau horizon groups involves the introduction of the bow and arrow and the disappearance of the atlatl. The predicted outcome of this would be a Shuswap horizon collection predominantly comprised of atlatl dart points and a Plateau horizon collection predominantly comprised of arrow points. We have already determined, however, that this was not the case for the Shuswap points, and the following discussion will show that it was also not the case for the Plateau points. In fact, in many ways the Plateau horizon point collection is very similar to that of the Shuswap horizon, comprised of points classified as both dart and arrow points. We also see the same general pattern of a consistent increase in the metric dimensions of all the points in the collection. While the only things of note on the Shuswap graphs were a few extreme outliers, there is, however, slightly more to explain on the Plateau graphs.

While the Plateau graphs also appear to have a few outliers, they seem to group together much more closely. For example, in the graph for total length (Figure 26), at the high end of the spectrum there is a minor steep incline in the curve. This could indicate that the points with total lengths greater than this had a different purpose then the others. While the same feature can be noted in the graph for maximum width and shoulder width (Figure 26), in these two categories

it appears to be much less pronounced. A clear trend is appearing here, which is made even more interesting because it does not correspond to the dart point classifications. This small group of outliers only makes up a fraction of all the Plateau points classified as dart points. One possible explanation for this phenomenon is the use life of these points. It could be possible that these few larger points simply represent new, unused and unsharpened points, and that all the others are at later stages of their use life. To investigate further it is necessary to re-examine the photographs of these points to determine if there is some visual difference between them and the rest of the collection that the metric analysis overlooked (see Figure 28).

Figure 28: Photographs of the outliers from the Plateau Horizon collection



artifact 1392 **artifact 1398**

artifact 2049 **artifact 2008**

artifact 1550

artifact 1079

artifact 1125

artifact1968

artifact 1896

Having examined the graphs of the individual attributes and the photos of the outlying group it is possible to note that once again, the points with dimensions large enough to identify them as outliers do not appear overly different in outline then the rest of the group to which they have been assigned. Artifacts 1392, 1398, 2049, 2008, 1550, 1079 and 1968 all have the same outline as many of the other points in the Plateau categories, but have exaggerated length and widths. Based simply on the appearance of these points it is less

likely that they were meant to be anything other than projectile points. Artifacts 1896 and 1125, on the other hand, do appear slightly different from the commonly accepted Plateau forms. The shape of these two artifacts makes them both more likely candidates for alternate functions.

Examination of the graphs of sets of attributes plotted against each other reveal that they also provide some interesting results (see Figure 27). Unlike the Shuswap points, the Plateau points do not appear to cluster as tightly together in their respective dart and arrow groupings, and for the most part there appears to be more variation within each of these groups. Another sharp contrast from the Shuswap collection is the degree of overlap exhibited in the various ratios. In a few of the graphs there appears to be a distinct and abrupt break between the points classified as “dart” and those classified as “arrow”. This can be seen on the graphs as an obvious lack of overlap between the two groups, with the artifacts classified as dart points on one side and those classified as arrows on the other (See figure 27 b and t). Though this appears to be a factor for separating these two groups of artifacts, it is not valid beyond the parameters of Shott’s (1997) system. This line is simply a by-product of Shott’s (1997) formulae that weighs shoulder width as the most useful variable for determining differences between the two groups. As was mentioned above, though beyond the scope of this project, a full linear regression analysis would be a valuable addition to this research. In many of the graphs in Figure 27 if one were to add a best fit line through the cluster of arrow points and then another through the

cluster of dart points the two lines would have very different angles. As a direction for future research it would be of interest to examine these linear relationships closer to determine if they could provide another means of classifying arrow and dart points.

Though most of the graphs of attributes of Plateau points are very different than those for Shuswap points, there are still a few similarities. The Plateau points also appear to have a few attributes that, when graphed against each other, show specific trends. It is likely that if it were examined, these measured attributes would show a weak correlation. Thus, the graph of neck width measurement plotted against that of total length (see Figure 27 A) shows a broad scatter, with those classified as “dart” covering much of the same range as those classified as “arrow”. A similar distribution is shown in the graphs for base width plotted against total length, maximum thickness plotted against total length, base width plotted against neck width, and maximum thickness plotted against base width (see figure 27 C, D, L and R). One possible explanation for this is that all projectile points, no matter what projectile system they are built to function with, require a specific fundamental length/width ratio. Though this possibility exists, discussion of the concept is beyond the scope of this project. It must simply be mentioned and indicated as needing further research and consideration.

It appears that when the Plateau points are classified using Shott’s (1997) system they tend to cluster, though loosely, into two groups reflecting “atlatl” and

“bow” delivery systems. When graphed against each other the metric dimensions of these points appear to illustrate some degree of difference between those used by the two different projectile systems. However, it is difficult to measure that difference because, even though there is a distinct break on many of the graphs, it is tied to Shott’s (1997) classification scheme and nothing else. In most cases, if the points were plotted without the colour and shape identifiers it would be impossible to identify them as representing two distinct groups. None of the graphs display a trend identifying any single measurement, or set of measurements that can be demonstrated to be directly related to the atlatl or the bow and arrow system. It is interesting that some sets of attributes on the bivariate plots demonstrate no or almost no overlap in the metric attributes of the points from the two systems, but once again, this does not provide the information required to sufficiently answer the questions posed herein.

In both the Shuswap and the Plateau points, there is a great degree of variability. However, this variability is relatively consistent, meaning that there is a continuum from large to small in all the various measurements. The lack of any pronounced discontinuity in the graphs of the various attributes for these two point types makes the identification of points used specifically with either of these two distinct projectile weapon systems very difficult. Even with the addition of the graphs comparing sets of attributes, obvious conclusive evidence for two distinct groups of points is elusive. In all of these different forms of analysis, it appears

that the wide range of point sizes indicates that the shape of the point was important to the people making them and that the size was not. It is possible that people generally were making larger points for the atlatl system and smaller ones for the bow and arrow system, but that apart from this there were no other major differences. This could indicate that points in the "middle" of the range of sizes could have been used with both projectile weapon systems, returning us full circle to the original assumption of most archaeologists working on the Plateau.

A comparison of the Shuswap, Plateau and Kamloops Horizon points classified as arrow points

As another tool for examining the similarities and differences between these two groups of points, the artifacts identified as arrow points from both the Shuswap and Plateau groups were compared to the Kamloops points. Table 11 shows the descriptive statistics for these three groups.

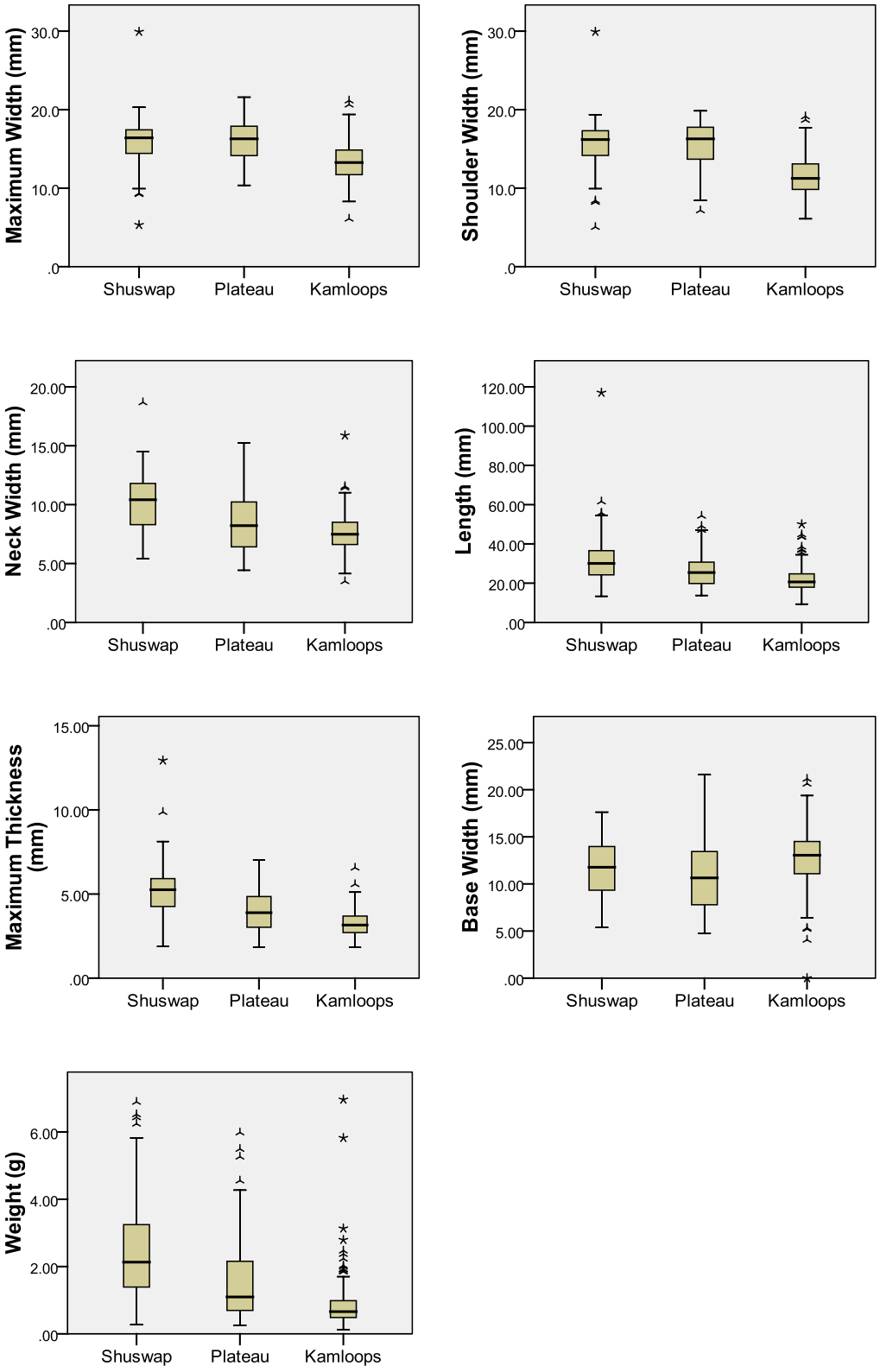
Table 11: Descriptive statistics for the Shuswap, Plateau and Kamloops arrow groups.

Summary Statistics Table for Arrow Points							
Kamloops Arrow (n=217)	**Total Length**	**Max Width**	**Neck Width**	**Shoulder Width**	**Base Width**	**Max Thickness**	**Total Weight**
Mean	20.11	12.77	7.37	11.11	12.30	3.10	0.72
stdev	3.87	1.88	1.27	1.98	2.26	0.62	0.70
std err	0.02	0.01	0.01	0.01	0.01	0.00	0.00
min	9.32	8.30	4.14	6.67	5.22	1.83	0.12
lower quartile	17.38	11.49	6.53	9.74	10.83	2.62	0.46
median	19.76	12.77	7.28	10.80	12.52	3.05	0.62
upper quartile	22.51	14.10	8.16	12.26	13.95	3.52	0.83
max	30.19	18.68	11.01	18.68	16.86	5.11	7.90
Plateau Arrow (n=65)	**Total Length**	**Max Width**	**Neck Width**	**Shoulder Width**	**Base Width**	**Max Thickness**	**Total Weight**
Mean	20.95	14.82	7.84	14.45	10.13	3.44	0.91
stdev	4.43	2.84	2.47	3.17	3.30	1.01	0.58
std err	0.07	0.04	0.04	0.05	0.05	0.02	0.01
min	11.01	10.36	4.42	7.16	4.77	1.84	0.25
lower quartile	18.00	13.09	6.10	12.84	7.38	2.68	0.57
median	20.10	14.42	7.06	14.23	9.57	3.25	0.79
upper quartile	23.57	15.94	8.97	16.04	12.75	3.94	1.05
max	31.97	27.14	16.68	27.14	20.24	7.34	4.16
Shuswap Arrow (n=37)	**Total Length**	**Max Width**	**Neck Width**	**Shoulder Width**	**Base Width**	**Max Thickness**	**Total Weight**
Mean	23.07	13.61	8.40	13.42	10.48	4.23	1.22
stdev	3.47	2.41	1.98	2.49	2.93	1.20	0.55
std err	0.10	0.07	0.05	0.07	0.08	0.03	0.01
min	14.86	9.23	5.40	8.23	5.38	1.89	0.27
lower quartile	20.83	11.73	6.76	11.73	8.29	3.55	0.81
median	23.15	13.61	7.88	13.58	10.13	4.22	1.13
upper quartile	25.56	15.10	9.46	15.10	11.81	5.09	1.50
max	31.20	18.10	13.77	18.09	17.49	6.58	2.74

It can be seen that the Shuswap and Plateau arrow groups do have a degree of overlap on many of their physical parameters. It is also evident that these two groups are similar to the Kamloops arrow group. The box plots in Figure 29 help to illustrate the similarities between these groups. In most cases, though the Kamloops points generally have a smaller range of measurements than those of the other two categories, the boxes representing the central

tendencies of each group do overlap. There are, however a variety of other interesting observations that can be made about these box plots. It is of note that the box plot for weight shows that the Kamloops group has not only the smallest range of measurements in the two middle quartiles, but also has the greatest number of both outliers and extreme outliers. The Plateau collection appears to have the greatest range for both base width and neck width (see figure 29).and yet the Shuswap collection has the greatest range of weights. In general, though it shows similar characteristics to the other two groups, the Kamloops collection groups much more closely together and indicates much less variation. The Plateau and Shuswap groups appear to be more similar to each other than either of them is to the Kamloops assemblage.

Figure 29: Box plots of the seven measured variables for the Plateau, Shuswap and Kamloops arrow groups.



Identifying that there is a great degree of similarity within all the arrow groupings does not help to clarify what was happening with regards to projectile points during the Plateau and Shuswap Horizons, but it does offer a valuable piece of information about the nature of these collections. Because the research is relying on simple typological categories for classifying the points it is possible that the way the points from the Plateau and Shuswap collections were classified (either to dart or arrow categories) was a product of the groups themselves. Comparing one part of these groups to the Kamloops group, however, allows for one more means of comparison. The Kamloops points, which were predominantly classified as arrow points and have very little within group variation, are a solid indicator that they were correctly classified. Comparing only the artifacts classified as arrows from the Plateau and Shuswap groups to this, indicated that these two groups have similar characteristics to the Kamloops group and that Shott's (1997) system had consistently grouped all points of similar dimensions as arrow points.

CHAPTER 7: FURTHER DISCUSION

The question of timing: When did it happen?

Having first carried out a classification of the artifacts in my collection into either dart or arrow points it is now time to address the other questions presented in the original proposal for this project. My second goal, as stated in the introduction, was to '**determine if, and to what extent, these two weapons systems overlapped in space and time on the Plateau'**. The first part of this is easy to answer. Shott's (1997) classification scheme clearly indicates that the atlatl and the bow and arrow system were both present on the Plateau during the Shuswap and the Plateau Horizons. Prior to this time only the atlatl system was present on the Plateau and after this time, only the bow and arrow system was present. Shott's (1997) system also indicates that some of the artifacts from the Lochnore collection could have been used with the bow and arrow. This is, however, highly improbable and most likely represents either the high degree of variability within those early groups and/or the very small collection.

Unfortunately, with the available data it is not possible to gauge the length of time in which the use of those two systems overlapped. The lack of individual dates for specific points in my collection forced me to rely on typologies as the only means of gaining dating information. As I have shown, this information is

enough to provide insight about the original uses of the points, but it is not sufficient to allow the deeper understanding that I had hoped to find.

With regards to the collection of Shuswap horizon points I am able to state first that there are slightly more dart points from that horizon than there are arrow points. I can also state that the Shuswap horizon contains artifacts whose original function was to arm arrows. This disputes the commonly held belief that the bow and arrow were not found on the Plateau until the Plateau horizon. This much earlier than previously inferred appearance of the bow and arrow in the Plateau Culture area could aid in explaining some of the cultural and political changes that lead to the development of the Plateau horizon.

It is also possible to make some other statements about the atlatl and bow and arrow during the Plateau horizon. Like the Shuswap horizon, the Plateau horizon contains projectile points used to arm both atlatl darts and arrows. Thus, the Plateau horizon is the most recent time period in which the atlatl was used, indicating that it definitively was during this time period that the atlatl became obsolete in this area. Even so, a portion of the collection of points from the Plateau horizon are still dart points. One suggestion to explain this would be that the atlatl remained dominant for a much longer period even while the bow and arrow was being introduced. Though this explanation complies with the commonly held belief that the bow and arrow did not completely replace the atlatl till the later part of the Plateau horizon, it has another problem. If the period in

which the bow and arrow appears to have been introduced (the Shuswap horizon) produced approximately a 50% division between those two weapon systems then it would be expected that such a division also would carry forward at least slightly into the Plateau horizon. Although this is difficult to identify given that actual dates were not available for a large number of the points in this database, it is possible to state that given the information we do have, it does not appear to have happened. Since this is not the case, I believe that other hypotheses must be examined.

This high percentage of dart points (approximately 70%) in the Plateau horizon could be interpreted in a variety of ways. The first possible explanation is simply that the sample used for this research was biased and does not accurately represent this time period. If, however, the sample is taken as is, other explanations can be put forward. It is possible that the large number of dart points present in the Plateau collection, when compared to the smaller number from the Shuswap collection, could indicate a resurgence of the atlatl during the Plateau horizon. It is very possible that environmental or political circumstances could have made the atlatl a more suitable and more desired weapon, explaining the large number of points from that system. On the other hand, it is just as plausible that the development of an elite class caused the bow and arrow to be associated with status and therefore reserved for use only by a few individuals. Brian Hayden (Hayden 2000, 2005; Hayden and Schulting 1997; Hayden et al. 1996) has conducted research focused on the development of complex societies

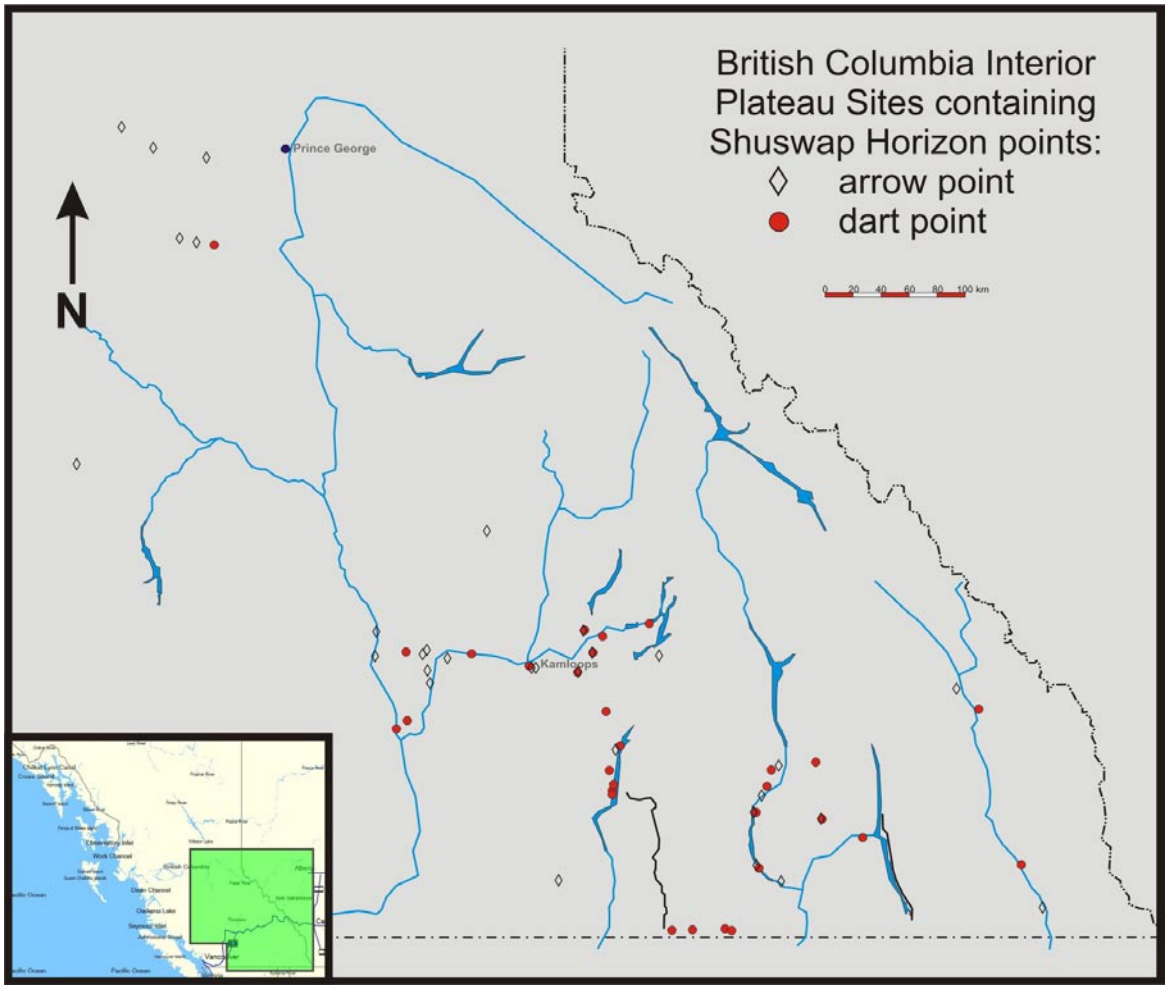
in the Plateau using data from one large site called Keatley Creek. He has shown that there is a great deal of stratification evident during the Plateau and Kamloops Horizons (Hayden and Schulting 1997:52). Some of the evidence and/or indicators of social stratification on the Plateau that Hayden identifies during this time includes prestige creatures, such as dogs (Hayden 2005:98), prestige goods, such as rare lithic material and stone tools such as adzes that require a large amount of labour to produce (Hayden and Schulting 1997) and access to, and use of, valuable food resources such as salmon (Berry 2000). It is not unlikely, therefore, that many other aspects of culture, including the use and access to particular tools during the Plateau Horizon, might also relate to this pattern of developing elites. The use of the long sword in feudal medieval Europe can be taken as a good analogy for this, as swords were carried by feudal rulers as one of the many signs both of their office and of the power they had over the common people (Rogers 2000:300).

Another aspect of the way that the development of an elite class can affect the people living in an area is discussed by Hayden and Schulting (1997). It is the concept of an interaction sphere. An interaction sphere is defined as the interactions of several distinct cultures that share a set of common values, rituals, styles and technologies (Hayden and Schulting 1997:52). Though the concept of interaction spheres is usually applied to areas that show a relatively homogeneous variety of cultures, it is possible that the trade and exchange networks developed in any given interaction sphere may overlap with a

neighbouring, independent sphere. This possibility provides for more speculation as to the introduction and use of the bow and arrow on the Plateau. If it could be shown that the bow and arrow was really linked to the exchange of prestige items within the Plateau, it follows that it likely made its way into the Plateau through communication and trade between elites on the peripheries of the adjacent cultural areas. Further research in this area could produce valuable information about the transfer of knowledge and how it related to large scale trade and exchange networks across North America.

Mapping the locations of each site and whether it contained dart or arrow points can also shed some light on the question of timing. Figure 30 shows that arrow points are present in Shuswap Horizon collections from a very wide variety of locations all over the Plateau. This is similar to the distribution of dart points (Figure 30). These maps indicate that the bow and arrow was used by people all over the Plateau at that time. How fast that spread of technology occurred is not possible to identify. Its relative frequency on the Plateau, however, indicates that it was likely available to everyone. This challenges the statement made by Henry and Hayden (2000:52) that the use and ownership of the bow and arrow was likely limited to the elite, because it predates the rise of what Hayden and Schulting (1997) term the Plateau interaction sphere.

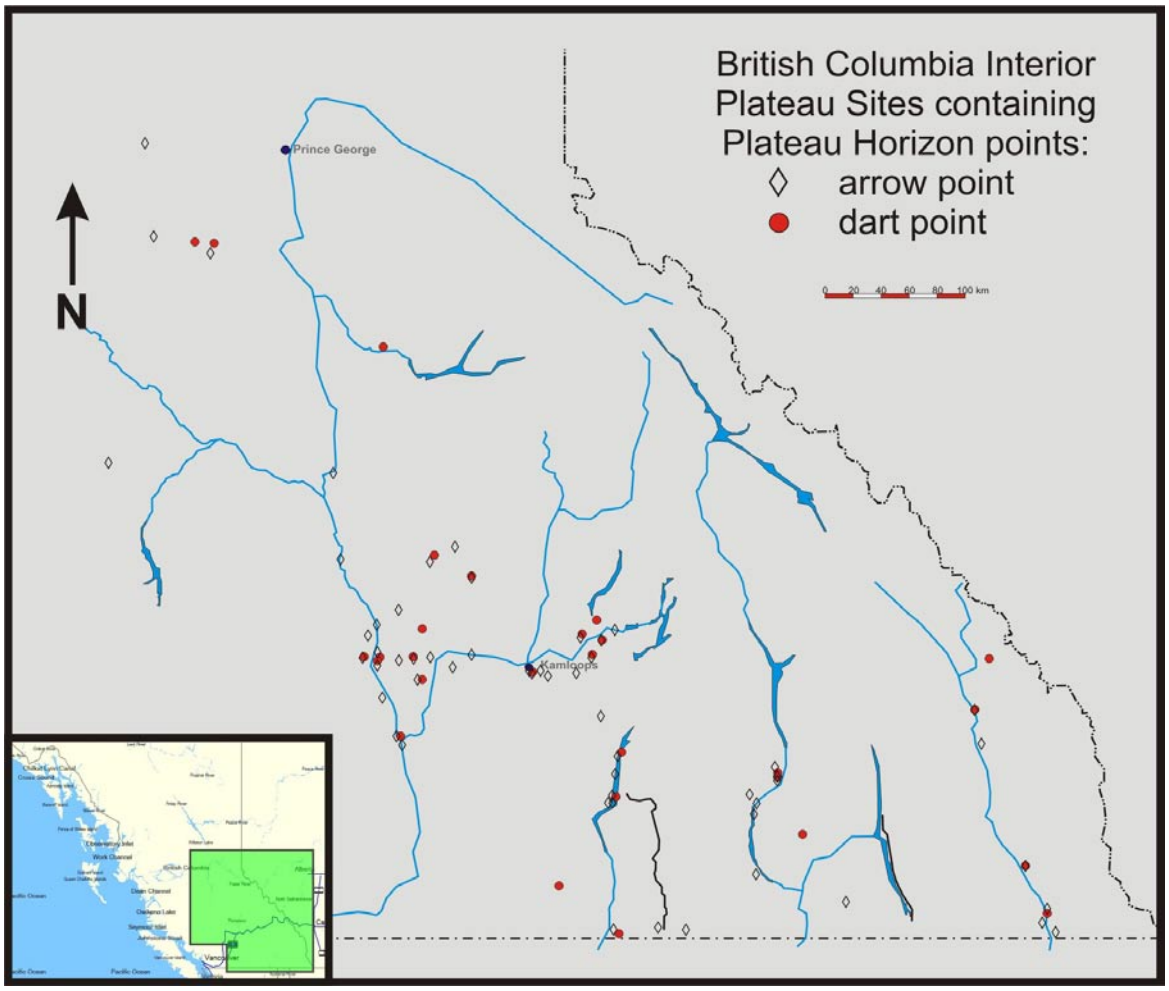
Figure 30: Map of the BC Plateau culture area showing distribution of arrow and dart points from the Shuswap Horizon.



This dispersed distribution also suggests, among other things, the possibility for an adoption of the bow on the Plateau much earlier than previously considered by the archaeological community. It also indicates that the bow and arrow system was used by everyone and not reserved for the elite. If the bow and arrow had been reserved for the elite, it would be expected that, even with a very early introduction date, the overall number of arrow points would remain

much smaller. During the Plateau Horizon, another unexpected trend appears; that of an increased use of the atlatl and a decreased use of the bow and arrow. A possible explanation for this could be that the bow and arrow did become a status symbol by that time. If it became a symbol of power or prestige, the elite would control not only who was using it, but also who was able to build it. If this were the case, it would indicate that the bow and arrow was actually being suppressed at that time, rather than the atlatl becoming more popular. The geographical distribution of sites containing Plateau points classified as dart points and Plateau points classified as arrow points (Figure 31), however, is almost the same as that for all Shuswap points (Figures 30).

Figure 31: Map of the BC Plateau culture area showing distribution of arrow and dart points from the Plateau Horizon.



This study has been able to show that throughout the Plateau cultural area the bow and arrow and the atlatl were both used during the Shuswap and Plateau Horizons. Unfortunately, it has been unable to provide anything more than conjecture as to the exact timing of either the arrival of the bow or the departure of the atlatl in those cultural horizons.

The question of causes: Why did it happen?

My final objective as stated in the introduction was to **investigate possible factors leading to this change in weapon systems**. Having established that the atlatl was present until the Plateau Horizon and that the bow and arrow was present as early as the Shuswap Horizon, we are now able to examine further the environmental and political factors present during these time periods and speculate about how they may have influenced people's choices to use one or the other.

Environmental factors

The environment has had a major impact on the cultural choices of humans in many parts of the world and this is no different for the Plateau. Many of the pre-contact cultural changes seen on the Plateau can be related to, if not directly connected to, environmental factors (e.g.: group mobility and available food sources), so examining the possible effects of the environment on people's choice of projectile weapon is logical.

As mentioned in the background section, a variety of environmental changes occurred from the beginning of the Shuswap Horizon to the end of the Plateau Horizon, between 3500 B.P. and 1200 B.P. They include the tail end of a major cooling trend, and then a gradual climatic warming to the modern temperature range. Temperature fluctuations directly influence two major factors

that could greatly affect a people's choice of weapon system, the variety and number of prey species, and the variety and density of ground cover.

The atlatl dart is a weapon well suited for large game. It can be used over a greater distance than the arrow and it has much more force and weight behind it giving it greater penetrating power (Baugh 1998). Another advantage of the atlatl is that it can be used with one hand, from a boat or on steep mountain terrain. The atlatl dart's steep arcing trajectory causes it to be much more effective in open grassy environments. In such areas, the hunter is able to easily determine a clear flight path for the dart and is not constrained in any way during the actual throwing of the dart. In contrast, even open forests inhibit the use of the atlatl, as both the initial throwing movements and determining a flight path through the branches would be very difficult (Yu 2006:209). Using an atlatl in dense forest cover would be almost impossible because of the obstacles provided by the branches.

The arrow, on the other hand, is much better suited for hunting medium to small game. It travels at a higher speed then the dart and follows a flatter trajectory (Markley 1942b) making it ideal for smaller faster targets. Because it has less mass it has less penetrating power than the atlatl dart; but it is still made lethal by its greater speed. The range of movement required by the hunter to use the bow is much less than that required to use an atlatl (Yu 2006:210). Thus, a bow and arrow can be used easily even in very dense forests, from many

different stances. The bow and arrow does, however, require two hands to use, something that could make it less advantageous in certain situations.

The question that needs to be answered here is, could the fluctuating environment during the Shuswap and Plateau horizons have had such an effect on either the variety of prey species available, or on the type of vegetation in which they lived, that one weapon system would have appeared superior to the other.

There are no documented major changes in the climate, precipitation, vegetation or fauna, from the beginning of the Shuswap horizon, approximately 3500 years B.P. to the end of the Plateau Horizon, approximately 1200 years B.P. There is, however, a change in all these things that begins just before this, ca. 4000-3500 B.P.(Kuijt 1989:50). Kuijt (1989) discussed the effects of this environmental change on the cultures of the Plateau area in detail. He was able to show that the changing climate had a visible effect on both the flora and the fauna of the area and went on to argue that they directly affect and change cultures. Kuijt (1989) argues that a variety of social responses to deal with and maximize resource stability on the Plateau during this time of climactic change are the principal causes of the cultural changes that typify the late prehistoric period. One of the major changes that Kuijt (1989) discussed is the decrease in open grassland and the accompanying decrease in large herbivores. Though according to his research, this change occurred prior to the evidence of bow and

arrow use discussed here (ca. 4000-3500 B.P.), it does support the concept that the people were hunting smaller prey and would likely be very eager to adopt any tool that would make this task easier. The decrease in grassland also indicates a growth of forests, and as mentioned above, the bow and arrow would be a much more useful tool for hunting in this environment.

Political factors

Evidence for socio-political factors such as warfare, the development of elite classes, and resource control is predominantly derived from large scale excavations in only a few sites on Plateau. Such research has shown that important socio-political changes were occurring at that time when the bow and arrow and atlatl systems overlapped. Some of these changes include an increase in number of individuals in winter villages (Hayden et al. 1996; Prentiss et al. 2006), the development of specialist labour and elite classes (Hayden and Schulting 1997), and increased warfare relating to resource use and access (Chatters 1989; Hayden and Schulting 1997). Each of these could have had an effect on the use and/or the control of the use of either the atlatl or the bow and arrow.

As more food became available and people gathered together in larger groups for longer periods of time, it was inevitable that certain socio-political developments would occur. Hayden (1990, 1992, and 1995) argues that competitive individuals able to produce food surpluses may have sought to elevate themselves further by manipulating access to labour through establishment of debts and the accumulation of rare goods. These elite

individuals would then have sought ways to maintain their power and control by a variety of means, including inter-group trade and marriage as well as by fostering ideology (Hayden and Schulting 1997:51). Hayden and Schulting (1997) also suggest that military ties could have been important in the establishment of an elite class, because of the ability to control who had access to new technology, like the bow and arrow. That ensured not only that a leader would be able to defend his amassed wealth from within the group, but also helped to ensure security from other groups. This should not be interpreted in the sense that the population as a whole did not know how to make and/or use the new technology, it simply means that there were rules established about who could and could not use it. As noted earlier, the long-sword used by European nobles during the Middle Ages is an excellent analogy for this. Common people knew about them and any metal-smith likely knew how to make them, but they were a sign of elite office, and the peasantry were forbidden to own them.

As the numbers of people in one area increased, not only were there effects on the relationships between people within that group, but there were also effects on the way that group would interact with another. There is archaeological evidence for increased warfare on the Plateau throughout the late period (Hayden and Schulting 1997:52; Chatters 1989) which supports this. As mentioned earlier, the bow and arrow is an effective weapon for use against medium to small targets, including other humans. The bow and arrow is also able to be used in a more diverse array of settings, making it a very effective tool

for warfare. Chatters (2004) explored the possibility that the bow and arrow was a leading cause of the increase and lethality of conflict, as well as the greater concern for fortified and defensible village locations in the southern Plateau in late prehistory. His arguments are in many ways applicable to the northern Plateau as well, but as of yet no work has been done in this regard. Although the data gathered herein did not enable me to provide information about the way in which the bow and arrow found its way onto the Plateau, if I had been able to do that, it may have shown that certain parts of the Plateau had access to the bow and arrow much earlier than others. Recognizing the effectiveness of this new technology, those people may have gone to great pains to keep it from their enemies. Though archaeological evidence to support this idea does not yet exist, the evidence of increased warfare during the late period (Hayden and Schulting 1997:52) indicates that researchers may be able to recover information about this in the future.

A final political factor that should be addressed is that of craft specialization. Once again, increased numbers of people living in close proximity for the winter provided an opportunity for individuals to showcase that which made them different from others, such as their ability to do or make something better, prettier, or more desirable than others. Hayden and Schulting (1997:58) indicate that there are many examples of crafted prestige items relating to the late period on the Plateau, providing evidence for craft specialization. It is possible that the manufacture of the bow and arrow was one of these specialty

crafts. If only a few people knew how to make them, not only would there be less evidence of them in the archaeological record, but that would have strengthened the likelihood that they would have become prestige goods, feeding the cycle mentioned above. Though this argument is not well supported by my data because of the large number of arrow points in the Shuswap horizon collection, it could still be playing a role in the overall choices of people living on the Plateau during this transition.

CHAPTER 8: SUMMARY AND CONCLUSIONS

This thesis has presented a study focused on examining the metric dimensions of a large collection of projectile points from the BC Plateau culture area with regard to their original functions, be they points for arrows fired from bows, or darts fired from atlatls. The three goals of this research were to: A; develop a more accurate understanding of what is and what is not an atlatl point on the Plateau, B; to determine if, and to what extent, these two weapons systems overlapped in space and time, and C; to investigate the possible factors leading people to chose one over the other.

To accomplish the first objective, seven attributes (length, width, base width, neck width, shoulder width, thickness and weight) on each point in a large collection of artifacts from various locations on the Plateau were measured. These data were then analysed using a set of formulae developed by Thomas (1978) and refined by Shott (1997) designed to classify projectile points into either dart or arrow armature. Shott's (1997) system identified artifacts from my Nesikep, Lochnore and Lehman groups almost exclusively as dart armature, it also identified the vast majority of my Kamloops group as arrow armature. The Shuswap and Plateau horizon groups were classified differently; each of these groups was identified as being made up of both dart and arrow points. Archaeological evidence supports the classification of the first four groups and

their correct classification indicates that the Shuswap and Plateau horizon classifications are correct as well. Summary statistics of the six temporal groups from the Plateau were also compared to summary statistics for Shott's dart and arrow groups and they indicated that these groups had many similarities.

It is possible to conclude that the system provided by Shott (1997) does function as a valuable tool for classifying projectile points from the Plateau into these two weapon systems. There are however, some limitations that need to be addressed in regards to this system. Though the system did identify two groups of artifacts within the Plateau collection, arrows and darts, there does not appear to be any distinct size variation between them. This lack of variation needs to be addressed further to gain a better understanding of what is happening within these collections. Another limitation of this system of classification is that it does not allow for the identification of points that may have been used for other purposes, such as hafted knives or harpoon heads. As the possibility of other tool types being a part of the Plateau collection does exist, it is important that future research into these matters take them into consideration. Some directions for valuable future research in this regard include examination of the use wear on the points to help determine how the artifact was being used, the examination of flake scars to gain insight into how the tool was made and reshaped, and finally a study of fracture patterns on broken points to gain insight into their impact velocity. Even with these limitations, Shott's (1997) system is still a valuable tool for identifying the previous use of a projectile point on the Plateau.

Having demonstrated that it is possible to identify dart and arrow points on the Plateau, my next objective was to determine if, and to what extent, these two weapons systems overlapped in space and time. The analysis described above determined that these two systems were present in both the Shuswap and Plateau horizons on the Plateau. This is an important piece of information as most researchers believe that the bow and arrow was not introduced into the Plateau until the Plateau horizon. Though no date was produced for this much earlier than assumed introduction of the bow, the ground work has been laid for future research in this area. Further analysis was carried out on these two groups as well, to examine if any further information was available. A wide variety of different analyses were conducted, but because of the lack of accurate dates for most of the artifacts it was difficult to produce any meaningful information. It was demonstrated that the arrow points from these two time periods had very similar properties to those of the Kamloops horizon. It was concluded that both groups of points show a gradient of small points used with arrows to large points used with atlatls. Suggestions as to what could cause this were put forward, including large scale factors such as cultural control of technology by an elite class and small scale factors such as individual choice of point size for specific prey types. It also was indicated that the two technologies were present during the same time in the same places, giving rise to even more questions about the social structures and trade networks on the Plateau during these time periods and emphasising this new earlier date for the introduction of the bow and arrow. In conclusion, this research was able to demonstrate that

these two weapon systems did coexist for a long period of time, although the actual dates of this coexistence remain elusive.

The final goal of this research was to investigate the possible factors that influenced and affected people's decision to choose one projectile system over the other. Two avenues were explored, environmental factors and political factors, and both provided a great deal of information. The atlatl and dart and the bow and arrow are very different weapons and function best in such different environments that it is difficult to identify a single dominating factor that would influence people to choose one over the other. It is most likely that environmental factors and political factors both played important roles in first the adoption, and then the control of the bow and arrow in the Plateau.

This research was designed to provide the answers to questions asked all over the world, the questions of when, why and how the bow and arrow was adopted and the atlatl forgotten. Parts of some of these questions have been answered, a valuable tool for classifying projectile points has been tested and the date for the arrival of the atlatl on the Plateau has been pushed further back in time. Although this research has provided valuable information about the transition between these two tool types and the factors affecting it, the most significant results of this research are simply more questions and a variety of suggestions for directions of further research.

APPENDIX

Chart of all Plateau collection data

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1000	Chase Museum	Carryl Coles	A	48.63	20.23	12.40	20.23	12.20	9.17	8.34	Shuswap
1001	Chase Museum	Carryl Coles	B	51.37	18.75	10.25	18.72	8.22	8.12	6.52	Shuswap
1002	Chase Museum	Carryl Coles	C	35.88	24.53	14.14	24.52	14.72	4.17	3.10	Plateau
1004	RBC Museum	E R y	1127	22.47	26.66	14.11	26.92	22.27	4.07	2.46	Kamloops
1005	Chase Museum	Carryl Coles	f	37.55	18.61	13.96	18.61	17.73	5.46	3.93	Lochnore
1006	Chase Museum	Carryl Coles	g	38.24	21.60	11.95	21.60	10.97	8.18	5.66	Plateau
1007	Chase Museum	Carryl Coles	h	33.44	16.01	10.09	15.89	12.89	3.36	1.77	Plateau
1008	Chase Museum	Carryl Coles	i	29.97	25.08	11.15	25.08	14.41	5.83	3.04	Plateau
1009	Chase Museum	Carryl Coles	j	37.09	20.50	12.97	20.46	14.78	5.77	3.59	Plateau
1010	Chase Museum	Carryl Coles	k	38.50	19.50	13.53	19.15	15.96	5.97	4.02	Shuswap
1011	Chase Museum	Carryl Coles	l	31.63	22.75	14.59	22.75	15.06	7.49	4.89	Shuswap
1012	Chase Museum	Carryl Coles	m	38.24	17.33	13.53	17.33	14.82	5.26	3.33	Shuswap
1013	Kelowna Museum	Manhattan Beach	7-51	20.10	17.18	7.18	17.18	7.94	2.42	0.72	Plateau
1014	Kelowna Museum	North West Plateau	9-2	50.03	13.69	6.54	13.36	12.23	3.89	2.23	Kamloops
1015	Penticton Museum	DlQv 4	434	26.99	21.27	10.82	21.27	13.53	4.47	1.85	Plateau
1016	Kelowna Museum	Manhattan Beach	7-21	62.31	23.09	8.84	23.09	11.11	6.17	6.27	Plateau
1017	Kelowna Museum	Manhattan Beach	7-44	26.21	15.99	9.05	13.86	15.99	5.00	1.56	Kamloops
1018	UBC Museum	EfRi 31	4	30.70	19.17	13.76	17.17	16.74	5.52	3.13	Plateau
1019	Kelowna Museum	Manhattan Beach	7-45	22.93	17.25	11.70	17.25	15.19	5.51	1.94	Shuswap
1020	Penticton Museum	unknown	261	17.38	13.28	5.90	13.29	6.67	2.49	0.40	Plateau
1021	Kelowna Museum	Fauquier	42-88	36.74	20.58	13.43	20.58	15.63	6.90	5.00	Shuswap
1022	Penticton Museum	DlQv 5	490	27.58	26.74	10.94	26.74	12.37	6.24	3.18	Plateau
1023	Kelowna Museum	J11	42-141	46.58	23.91	12.15	23.91	12.24	5.77	5.08	Plateau
1024	Kelowna Museum	J1 - EaQl13 (EAQL)	42-158	35.48	18.35	8.15	18.35	10.91	5.38	2.43	Plateau
1025	Kelowna Museum	K1 - EaQl14	42-2	29.04	16.08	10.87	16.08	12.95	5.27	2.14	Plateau
1026	Kelowna Museum	E2 - DkQm5	42-127	40.05	20.81	11.87	21.60	13.56	5.50	4.27	Shuswap
1027	Kelowna Museum	K1 - EaQl14	42-21	27.35	18.37	11.48	18.37	14.31	4.41	1.91	Shuswap
1028	Kelowna Museum	K1 - EaQl14	42-11	27.64	16.35	9.07	16.35	11.99	3.65	1.46	Plateau
1029	Kelowna Museum	K1 - EaQl14	42-111	35.19	15.19	9.54	15.19	8.51	6.04	2.30	Shuswap
1030	Kelowna Museum	K1 - EaQl14	42-105	26.10	11.16	5.40	11.16	5.78	4.65	0.92	Shuswap
1031	Kelowna Museum	E2 - DkQm5	42-133	37.41	17.26	10.28	17.26	8.20	7.20	3.75	Shuswap
1032	SFU Museum	EeRb 140	1492	26.09	14.18	7.07	14.18	14.18	3.09	0.81	Kamloops
1033	Kelowna Museum	E2 - DkQm5	42-126	54.53	16.14	11.34	16.14	8.59	9.87	6.89	Shuswap
1034	Kelowna Museum	K1 - EaQl14	42-108	32.73	14.12	6.69	14.12	7.56	4.20	1.38	Shuswap
1035	SFU Museum	EeRb 140	1681	31.2	20.73	6.32	20.73	6.32	5.2	2.14	Plateau
1036	Kelowna Museum	K2 - EaQl1	42-100	36.16	25.04	10.60	25.04	12.05	5.22	3.54	Plateau
1037	Kelowna Museum	K1 - EaQl14	42-28	30.00	17.62	11.02	17.62	15.46	4.65	2.21	Plateau
1038	Kelowna Museum	J5	30	54.28	19.74	9.06	19.74	10.93	7.03	5.98	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1039	Kelowna Museum	D4 - DlQm14	88	48.96	28.45	13.48	28.45	17.10	6.56	6.67	Plateau
1040	Kelowna Museum	K1 - EaQl14	945	41.16	16.68	12.86	16.68	11.32	6.69	4.61	Shuswap
1042	Kelowna Museum	J6	452	55.62	18.63	12.83	17.72	15.62	5.88	5.60	Shuswap
1043	Kelowna Museum	H1 - DlQm27	135	35.24	31.24	14.96	31.24	19.46	5.12	4.46	Plateau
1044	Kelowna Museum	K1 - EaQl14	793	41.81	28.36	12.17	28.36	16.07	5.49	4.76	Plateau
1045	Kelowna Museum	K1 - EaQl14	780	59.37	20.74	13.88	20.74	11.26	6.23	7.06	Shuswap
1046	Kelowna Museum	K1 - EaQl14	898	30.27	14.92	10.48	14.92	13.18	4.06	1.68	Shuswap
1047	Kelowna Museum	J1 - EaQl13 (EAQL)	349	37.72	19.38	9.90	19.34	11.01	5.07	2.82	Plateau
1048	Kelowna Museum	J5	25	33.44	19.59	15.37	18.73	19.59	5.00	3.12	Shuswap
1049	Kelowna Museum	E3 - DkQm4	207	41.23	17.36	12.79	17.36	14.42	5.57	3.64	Shuswap
1050	Kelowna Museum	K1 - EaQl14	820	41.97	19.81	9.36	19.81	11.87	5.50	4.08	Plateau
1051	Kelowna Museum	J6	479	41.02	22.26	16.55	21.59	16.32	4.69	5.07	Shuswap
1052	Kelowna Museum	K2 - EaQl1	626	25.66	11.96	6.35	11.96	10.88	2.94	0.86	Kamloops
1053	Kelowna Museum	K1 - EaQl14	817	33.10	20.42	11.32	20.42	13.11	5.12	2.56	Plateau
1054	Penticton Museum	DlQv 4	420	30.92	19.06	11.98	19.06	15.48	5.07	2.68	Plateau
1055	Kelowna Museum	E2 - DkQm5	190	48.47	17.66	9.85	17.66	13.53	6.39	4.02	Shuswap
1056	Kelowna Museum	K1 - EaQl14	769	42.35	21.66	9.25	21.66	14.26	5.79	3.63	Plateau
1057	Kelowna Museum	K1 - EaQl14	830	37.68	20.69	9.28	20.69	7.89	4.81	3.24	Shuswap
1058	Kelowna Museum	K1 - EaQl14	984	28.59	18.03	9.39	18.03	8.90	5.39	2.08	Plateau
1059	Kelowna Museum	K1 - EaQl14	786	37.69	14.90	8.36	14.90	7.54	5.42	2.45	Shuswap
1060	Kelowna Museum	K1 - EaQl14	864	22.67	12.28	6.87	12.28	7.50	3.62	0.77	Shuswap
1061	SFU Museum	EeRb 77	73	36.23	33.21	14.07	33.21	NA	5.88	5.33	Plateau
1062	UBC Museum	EfRl 5	414	30.26	22.14	16.25	22.48	17.29	4.17	3.40	Nesikep
1063	Kelowna Museum	J2 - EaQl10	411	23.92	13.07	7.40	12.86	13.07	4.65	1.01	Kamloops
1064	Kelowna Museum	D2 - DlQm4	84	42.84	22.47	11.36	22.47	15.09	5.23	4.26	Plateau
1065	Kelowna Museum	marked ST1	10	22.32	14.92	7.37	12.76	14.92	3.65	0.43	Kamloops
1066	UBC Museum	EdRk 3	24	26.87	18.97	7.54	15.97	18.95	3.55	1.90	Kamloops
1067	RBC Museum	EeQw 7	331	16.39	8.39	5.34	8.19	8.45	2.73	0.31	Kamloops
1068	Kelowna Museum	J2 - EaQl10	405	22.17	10.86	6.72	10.06	9.54	3.41	0.60	Kamloops
1069	Kelowna Museum	K1 - EaQl14	968	23.14	16.78	9.17	16.78	9.63	5.64	1.70	Shuswap
1070	Kelowna Museum	K1 - EaQl14	854	24.88	21.65	9.88	21.65	14.87	4.11	1.77	Plateau
1071	SFU Museum	DiPu-17	3	25.86	14.08	NA	13.58	NA	2.71	0.87	Plateau
1072	Kelowna Museum	J11	511	27.94	18.98	13.08	18.98	15.71	4.96	2.41	Plateau
1073	Kelowna Museum	K1 - EaQl14	958	33.61	16.27	8.44	16.27	10.35	5.32	2.12	Plateau
1074	Kelowna Museum	D5 - DlQm15	101	33.91	15.83	10.87	15.83	14.01	5.24	3.00	Shuswap
1075	Kelowna Museum	J11	537	45.23	25.57	9.93	25.57	13.21	5.48	4.53	Plateau
1076	Kelowna Museum	K2 - EaQl1	605	47.28	22.59	13.55	22.59	17.18	8.12	5.94	Plateau
1077	Kelowna Museum	K1 - EaQl14	893	61.01	20.12	12.21	19.45	11.92	7.08	7.86	Shuswap
1078	Kelowna Museum	J1 - EaQl13 (EAQL)	368	59.35	24.16	10.14	24.16	13.59	5.38	6.30	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1079	Kelowna Museum	E4 - DkQm9	222	68.22	30.74	15.79	30.74	18.59	6.72	9.73	Plateau
1080	Kelowna Museum	J11	519	70.22	32.17	16.72	29.80	18.49	6.71	12.67	Shuswap
1082	Penticton Museum	OK lake	Ne75-822(86)	40.77	24.37	13.74	24.37	17.21	4.55	3.82	Plateau
1083	Penticton Museum	OK lake	Ne75-822(73)	29.53	17.01	11.49	16.95	11.66	5.71	2.13	Shuswap
1085	Penticton Museum	DlQv 5	517	25.89	19.94	12.06	19.94	18.84	4.13	1.85	Plateau
1086	Kelowna Museum	Manhattan Beach	7-46	26.99	17.82	5.14	17.82	7.07	3.18	0.80	Plateau
1088	Penticton Museum	DlQv 4	483	29.73	21.08	10.27	21.08	10.75	5.35	2.51	Plateau
1089	Penticton Museum	DlQv 4	429	40.10	20.75	12.47	20.75	13.29	6.55	4.09	Plateau
1090	Kelowna Museum	K1 - EaQl14	838	30.92	25.47	10.88	25.47	12.18	4.46	2.60	Plateau
1091	Penticton Museum	DlQv 4	415	39.06	17.30	13.20	17.30	12.79	5.59	3.93	Shuswap
1094	Penticton Museum	DlQv 4	408	32.23	24.49	12.07	24.49	14.08	5.32	3.47	Plateau
1095	Penticton Museum	unknown	399	32.53	28.49	13.13	28.49	9.76	6.76	4.56	Plateau
1097	Penticton Museum	unknown	397	69.96	31.81	19.69	31.81	13.35	10.56	20.58	Shuswap
1098	Penticton Museum	unknown	207	59.31	26.57	12.24	26.57	12.80	6.05	6.07	Plateau
1099	Penticton Museum	unknown	211	41.01	23.67	10.10	23.69	15.16	4.34	2.75	Plateau
1100	Kelowna Museum	Manhattan Beach	7-49	17.38	11.62	7.03	9.50	11.62	3.00	0.52	Kamloops
1101	RBC Museum	EeQw 7	1676	22.47	15.16	7.41	7.16	15.16	3.50	0.84	Plateau
1102	Penticton Museum	unknown	279	30.01	24.29	12.34	24.29	14.88	6.30	3.59	Plateau
1103	RBC Museum	EeQw 7	1194	19.22	16.07	7.92	9.96	16.07	3.95	0.82	Kamloops
1104	Penticton Museum	unknown	278	16.69	14.25	6.06	14.25	7.72	2.62	0.39	Plateau
1105	Penticton Museum	unknown	254	20.94	13.37	6.21	11.03	13.37	3.02	0.66	Kamloops
1106	RBC Museum	DgQn 43	2	26.41	16.91	10.74	16.88	10.15	5.25	2.07	Shuswap
1107	Penticton Museum	unknown	247	32.38	13.57	8.35	12.30	13.57	4.76	1.60	Kamloops
1108	Penticton Museum	unknown	245	30.28	13.56	5.77	13.56	6.99	3.25	0.81	Plateau
1109	Penticton Museum	unknown	270	18.75	12.97	7.43	10.02	12.97	3.62	0.60	Kamloops
1110	Penticton Museum	unknown	238	29.28	18.13	10.39	18.13	13.44	5.36	2.08	Plateau
1111	Penticton Museum	unknown	249	26.41	18.83	10.12	18.83	14.74	4.78	1.83	Plateau
1112	Penticton Museum	unknown	217	26.42	19.80	9.77	19.80	14.14	4.99	2.13	Plateau
1113	Penticton Museum	unknown	227	24.68	20.69	12.58	20.69	17.81	3.55	1.59	Plateau
1114	Penticton Museum	unknown	A534	32.94	21.21	10.19	21.21	12.76	5.50	2.77	Plateau
1115	Penticton Museum	DlQv 2	A526	40.17	28.77	10.85	21.77	14.43	4.57	3.74	Plateau
1116	Penticton Museum	unknown	A550	32.13	33.35	18.61	33.35	20.01	6.93	5.38	Plateau
1117	Penticton Museum	unknown	A538	33.06	26.14	16.38	26.14	16.94	5.85	4.22	Shuswap
1118	UBC Museum	ElSf 1	7	43.50	25.84	17.17	25.87	19.71	8.39	9.10	Shuswap
1119	Penticton Museum	DlQv 5	A60	23.29	24.63	18.06	23.81	22.93	6.10	2.71	Plateau
1120	SFU Museum	EeRb 77	1306	29.37	23.23	12.10	23.23	15.40	4.71	3.15	Plateau
1121	Penticton Museum	DlQv 5	528	44.82	21.15	15.87	17.58	21.15	6.56	5.82	Kamloops
1122	RBC Museum	EbQu 15	25	30.39	22.03	11.05	22.03	12.43	5.73	3.61	Plateau
1123	UBC Museum	FiRv 1	48	29.98	17.43	12.10	17.43	13.73	5.61	2.62	Lochnore

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1124	SFU Museum	DiPu-16	119	27.49	16.30	10.67	16.29	13.74	4.02	1.95	Plateau
1125	Penticton Museum	unknown	531	65.69	31.51	13.77	31.51	11.86	6.75	11.63	Plateau
1129	Penticton Museum	DlQv 5	484	45.47	24.23	9.79	24.23	10.33	5.10	4.03	Plateau
1130	Kelowna Museum	J11	42-142	27.58	13.89	7.95	13.89	10.63	4.29	1.21	Plateau
1131	Penticton Museum	unknown	223	27.62	19.71	12.72	19.71	12.47	5.03	2.13	Plateau
1132	Penticton Museum	unknown	250	25.13	19.53	6.95	19.53	7.56	3.99	1.56	Plateau
1133	Penticton Museum	unknown	201	27.69	28.21	11.20	28.21	16.13	5.80	2.79	Plateau
1134	RBC Museum	EeQw 7	1717	23.89	12.44	7.08	9.60	12.44	2.74	0.61	Kamloops
1135	Penticton Museum	unknown	271	18.01	14.61	7.97	9.43	14.61	2.84	0.52	Kamloops
1136	RBC Museum	EeRk 4	2.117	35.02	19.62	13.40	19.62	13.57	5.66	3.23	Shuswap
1137	Penticton Museum	osoyoos lake	823 (59)	22.12	17.70	7.44	17.70	8.81	3.26	1.06	Plateau
1138	Penticton Museum	osoyoos lake	822 (91)	17.20	11.37	4.76	11.37	5.75	2.68	0.43	Plateau
1139	Penticton Museum	osoyoos lake	822 (58)	57.96	26.38	13.78	26.38	12.22	4.08	5.84	Plateau
1140	Penticton Museum	DlQv 5	A28	29.37	27.11	19.86	27.11	19.75	4.89	4.84	Plateau
1142	Penticton Museum	unknown	202	50.10	36.84	16.71	36.84	19.08	7.49	8.94	Plateau
1143	RBC Museum	DgPt 18	1	29.44	20.68	15.59	20.67	18.53	4.98	3.56	Plateau
1144	RBC Museum	DkP8r-y:1	1	27.32	20.32	11.94	20.30	13.83	6.01	3.11	Plateau
1145	RBC Museum	DgPt 19	2	22.15	15.20	9.71	15.20	15.07	4.16	1.22	Kamloops
1146	RBC Museum	DgPt 11	4	26.59	22.80	14.56	22.81	16.87	6.05	3.45	Plateau
1147	RBC Museum	EcQv 2	60	30.56	15.94	10.18	15.94	10.65	5.45	2.38	Shuswap
1149	RBC Museum	EbQu 15	53	36.41	19.54	12.41	19.54	9.78	5.11	3.40	Shuswap
1150	RBC Museum	EbQu 15	54	29.58	14.51	9.68	14.51	6.92	5.25	1.90	Shuswap
1151	RBC Museum	DgQs 12	59	15.75	15.16	7.79	9.97	15.16	3.18	0.56	Kamloops
1152	RBC Museum	DgQs 12	14	30.83	26.66	10.42	26.66	14.99	4.87	3.18	Plateau
1153	RBC Museum	DgQs 12	11	23.86	26.75	9.91	26.75	13.15	5.42	2.38	Plateau
1154	RBC Museum	DgQq 25	124	31.86	26.79	14.55	26.81	18.96	4.69	4.02	Plateau
1155	RBC Museum	DgQq 25	52	31.58	22.47	9.65	22.47	11.97	4.67	2.64	Plateau
1156	RBC Museum	DgQq 25	111	38.17	20.25	10.97	17.86	13.44	5.16	3.44	Shuswap
1157	RBC Museum	DgQq 25	134	36.02	21.87	13.52	21.87	10.40	5.24	3.59	Plateau
1158	RBC Museum	DgQq 25	63	18.74	12.19	8.12	12.19	10.01	3.59	0.77	Kamloops
1159	RBC Museum	EdQa 137	5	42.80	21.68	13.76	21.53	16.84	5.56	4.60	Shuswap
1160	RBC Museum	EaQi 5	1	29.56	16.41	12.20	16.41	14.79	5.40	2.29	Shuswap
1161	RBC Museum	EaQi y	4	32.89	21.24	17.74	20.07	21.24	6.10	4.20	Shuswap
1162	RBC Museum	DgQo 23	59	34.02	26.33	16.31	26.37	20.87	6.41	4.44	Plateau
1163	RBC Museum	DgQo 23	25	25.65	17.56	5.92	17.56	?	3.12	0.88	Plateau
1164	RBC Museum	DgQo 23	29	18.92	15.62	5.71	15.62	6.75	3.12	0.66	Plateau
1165	RBC Museum	DgQo 23	11	20.93	13.61	8.11	13.61	6.71	6.28	1.50	Shuswap
1166	RBC Museum	DgQo 23	8	14.95	12.84	9.33	12.88	11.87	2.92	0.62	Plateau
1167	RBC Museum	DgQo 23	0.5	28.62	20.42	13.05	19.92	15.34	4.60	2.60	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1168	RBC Museum	DgQo 23	5	27.34	22.49	11.96	22.59	14.16	5.58	2.66	Plateau
1169	Penticton Museum	unknown	236	26.41	13.73	7.50	11.86	13.73	3.74	1.11	Kamloops
1170	RBC Museum	DbQx 24	1	34.26	29.26	12.64	29.26	15.77	4.95	4.40	Plateau
1171	RBC Museum	DkQx 1	1	48.72	30.33	18.81	30.33	21.27	6.55	8.79	Nesikep
1172	RBC Museum	DiQl 8	8	33.19	20.55	13.01	20.55	13.94	4.83	3.14	Shuswap
1173	RBC Museum	DkQi 1	2	39.32	19.36	13.20	19.36	13.29	6.06	4.04	Shuswap
1174	RBC Museum	DkQi 1	3	34.93	16.64	9.75	16.63	10.18	6.53	2.63	Shuswap
1175	RBC Museum	DkQj 3	9	18.54	12.86	4.42	12.86	5.35	2.65	0.41	Plateau
1176	RBC Museum	DkQj 3	19	17.05	13.37	5.32	13.37	5.58	2.12	0.31	Plateau
1177	RBC Museum	DkQj 3	14	19.81	15.95	9.77	14.96	15.74	3.92	1.16	Kamloops
1178	UBC Museum	EeRl 7	22	24.99	25.89	15.46	25.89	15.91	5.51	4.47	Plateau
1179	RBC Museum	DkQj 3	12	21.34	10.88	6.93	9.77	10.32	3.23	0.57	Kamloops
1180	RBC Museum	DlRj 9	61	49.38	24.68	15.76	24.09	18.35	5.66	6.91	Lochnore
1181	RBC Museum	DlRj 9	60	70.85	24.86	14.50	21.36	16.38	9.36	15.50	Lochnore
1184	RBC Museum	EeRi 45	2	34.14	24.85	13.36	24.85	9.66	5.69	6.14	Shuswap
1185	RBC Museum	EeRi 45	5	46.52	30.13	16.96	30.08	23.62	6.08	8.52	Lehman
1186	RBC Museum	EeRi 45	8	16.74	13.13	7.95	10.65	13.13	2.43	0.49	Kamloops
1187	RBC Museum	EeRg 46	2	29.84	26.97	14.10	26.97	16.16	4.77	3.13	Plateau
1188	RBC Museum	EcQx y	1	34.67	23.33	15.82	23.30	16.96	6.19	4.15	Shuswap
1192	RBC Museum	EcQv 2	2	29.67	12.69	6.20	11.88	10.93	3.91	0.94	Kamloops
1193	RBC Museum	EcQv 2	49	34.47	17.66	7.47	15.13	17.66	4.20	1.85	Kamloops
1194	RBC Museum	EcQv 2	48	26.80	14.91	8.73	13.38	14.91	3.90	6.96	Kamloops
1195	RBC Museum	EcQv 2	66	36.86	21.29	10.45	20.95	13.28	4.42	2.85	Plateau
1196	RBC Museum	EcQv 2	64	38.65	26.89	9.38	26.89	11.86	5.34	3.59	Plateau
1197	RBC Museum	EbQu 15	63	22.65	11.21	8.51	10.29	11.46	3.21	0.81	Plateau
1198	RBC Museum	EbQu 15	18	42.75	21.98	15.04	20.79	9.22	4.89	5.62	Shuswap
1199	Penticton Museum	unknown	520	30.39	25.89	14.98	25.80	19.49	6.26	4.72	Plateau
1201	RBC Museum	EbQu 15	15	34.56	24.02	11.97	24.02	12.99	6.56	4.93	Plateau
1203	SFU Museum	EeRb 149	59	36.19	22.74	16.76	22.74	17.05	7.79	6.10	Shuswap
1204	RBC Museum	EbQu 15	65	45.05	22.11	13.20	22.11	8.43	8.07	7.14	Shuswap
1205	RBC Museum	EbQu 15	85	32.70	26.28	11.03	26.28	12.66	5.88	4.28	Plateau
1206	RBC Museum	EbQu 15	76	38.05	23.79	13.89	23.79	13.00	5.23	4.35	Plateau
1207	RBC Museum	EbQu 15	74	28.54	19.51	11.30	19.51	16.70	4.52	2.18	Plateau
1208	RBC Museum	EbQu 15	52	24.66	21.89	10.11	21.89	9.54	4.53	2.14	Plateau
1209	RBC Museum	EbQu 15	73	17.07	18.34	10.32	18.34	12.13	5.12	1.20	Plateau
1210	RBC Museum	EbQu 15	50	50.57	16.08	12.16	15.33	15.98	6.33	5.40	Shuswap
1211	RBC Museum	EbQu 15	88	75.64	35.38	20.54	33.38	10.67	12.20	27.75	Shuswap
1216	RBC Museum	EbQu 15	91	117.04	29.92	18.67	29.92	12.44	12.94	40.74	Shuswap
1218	RBC Museum	EfQa 3	792	112.21	38.46	26.44	36.61	9.79	9.84	42.27	Lochnore

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1219	RBC Museum	E R y	1005	36.64	19.42	12.42	19.42	8.22	6.99	3.91	Shuswap
1220	RBC Museum	E R y	1006	37.33	18.05	13.59	18.05	13.86	6.38	3.68	Shuswap
1222	RBC Museum	E R y	995	39.23	19.02	12.68	19.02	12.01	6.15	4.47	Shuswap
1223	RBC Museum	E R y	1069	35.36	24.39	16.23	25.03	20.86	6.16	5.40	Lehman
1224	RBC Museum	E R y	998	47.00	16.40	8.96	16.40	9.53	5.22	3.54	Plateau
1225	UBC Museum	EfRi X	12	33.58	19.36	8.70	19.36	14.95	4.13	2.04	Shuswap
1226	RBC Museum	E R y	1010	26.56	14.81	9.46	14.81	9.80	5.43	1.82	Shuswap
1227	RBC Museum	E R y	1039	20.93	11.49	6.13	10.27	11.49	3.94	0.88	Kamloops
1228	RBC Museum	E R y	1062	31.96	18.58	12.91	18.58	14.16	6.57	3.80	Shuswap
1229	RBC Museum	E R y	1034	18.00	12.03	5.48	12.03	5.73	3.61	0.69	Plateau
1230	RBC Museum	E R y	1064	23.80	13.86	6.48	14.15	8.29	3.83	1.04	Shuswap
1231	RBC Museum	E R y	1036	20.49	11.73	7.88	11.73	9.01	2.25	0.50	Shuswap
1232	RBC Museum	E R y	1018	29.21	15.86	7.59	15.26	14.19	4.31	1.92	Kamloops
1233	RBC Museum	E R y	1038	20.21	11.53	6.52	11.53	7.19	2.71	0.49	Kamloops
1234	RBC Museum	E R y	1033	15.61	14.10	6.31	8.66	14.10	3.31	0.58	Kamloops
1235	RBC Museum	E R y	1041	27.25	14.42	5.45	14.32	8.33	3.03	1.05	Plateau
1236	RBC Museum	E R y	1004	40.99	24.72	14.51	24.23	15.02	8.91	6.47	Plateau
1237	RBC Museum	E R y	990	42.73	21.61	14.12	21.61	16.85	7.15	6.28	Shuswap
1239	RBC Museum	E R y	997	45.95	20.99	16.43	20.99	13.10	6.37	5.29	Lancolate
1240	RBC Museum	E R y	1065	35.54	24.09	12.51	23.76	20.66	4.31	3.78	Lehman
1241	RBC Museum	E R y	1027	22.48	15.44	7.89	15.44	9.86	3.85	1.08	Kamloops
1242	Penticton Museum	unknown	258	22.47	16.95	10.71	16.95	13.27	4.08	1.13	Plateau
1243	RBC Museum	E R y	1067	33.98	24.22	12.57	24.22	14.21	7.24	5.55	Plateau
1244	RBC Museum	E R y	1015	31.84	21.92	14.72	21.92	16.49	6.14	4.44	Shuswap
1245	RBC Museum	E R y	993	35.50	23.18	11.64	23.18	8.86	4.77	3.75	Shuswap
1246	UBC Museum	ElSf 1	6	30.23	17.82	13.71	17.82	17.42	4.68	2.22	Plateau
1247	RBC Museum	E R y	1002	38.25	24.70	11.83	24.70	11.03	6.34	4.80	Plateau
1248	RBC Museum	E R y	1013	30.13	24.81	16.10	24.81	16.97	6.39	4.22	Nesikep
1249	RBC Museum	E R y	997	34.11	25.11	11.49	25.11	12.19	5.74	3.49	Plateau
1250	RBC Museum	E R y	1003	41.35	20.62	14.45	20.64	17.68	6.22	4.53	Shuswap
1251	RBC Museum	E R y	1000	35.05	25.09	11.37	25.09	11.41	5.56	4.19	Shuswap
1252	RBC Museum	E R y	1007	32.61	17.34	14.34	17.34	12.79	4.57	2.40	Shuswap
1253	RBC Museum	E R y	1014	27.91	19.25	12.62	19.18	19.25	6.85	3.47	Shuswap
1254	RBC Museum	E R y	1017	24.34	16.95	13.45	16.95	16.35	4.35	1.97	Shuswap
1255	RBC Museum	E R y	1035	23.72	13.45	8.22	13.49	12.47	3.55	0.94	Shuswap
1256	RBC Museum	E R y	1040	19.42	13.90	7.10	11.79	13.90	2.99	0.68	Kamloops
1257	RBC Museum	E R y	1032	24.51	18.01	7.55	18.01	7.70	3.90	1.02	Plateau
1258	RBC Museum	E R y	999	41.32	27.11	13.91	27.11	18.29	5.28	4.69	Plateau
1259	RBC Museum	E R y	1001	41.12	26.74	14.24	26.74	22.65	6.12	6.16	Plateau

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1260	RBC Museum	E R y	1068	37.13	28.40	14.73	28.40	23.14	4.80	5.51	Shuswap
1261	RBC Museum	E R y	994	52.22	21.27	13.88	21.27	15.87	7.21	7.40	Shuswap
1262	RBC Museum	E R y	996	52.64	24.95	18.81	24.95	11.87	5.54	7.00	Shuswap
1263	RBC Museum	E R y	989	60.24	29.71	15.29	28.83	19.58	6.73	11.69	Shuswap
1264	RBC Museum	E R y	988	51.73	43.91	16.99	43.91	15.30	6.82	11.92	Plateau
1265	RBC Museum	EdRi 46	5	28.87	19.15	11.03	19.15	11.39	5.17	2.38	Shuswap
1266	SFU Museum	DiPu-17	17	25.97	21.10	NA	18.77	18.50	4.67	2.56	Triangular
1267	RBC Museum	EdRj 3	382	28.99	19.59	9.86	19.59	11.20	5.04	1.84	Plateau
1268	RBC Museum	EdRj 3	415	24.78	13.63	9.24	13.52	13.63	3.41	1.01	Kamloops
1269	RBC Museum	EdRj 3	367	35.66	31.36	12.42	31.36	15.23	6.12	4.05	Plateau
1270	RBC Museum	EbRj 3	114	32.12	26.96	13.75	26.96	17.22	4.15	2.88	Plateau
1271	RBC Museum	EbRj 3	210	24.00	16.41	6.62	16.41	10.55	4.09	1.34	Shuswap
1272	RBC Museum	EbRj 3	334	18.81	10.01	6.05	9.76	10.01	3.12	0.50	Kamloops
1273	RBC Museum	EbRj 3	126	55.53	26.08	22.45	26.08	24.36	8.27	10.98	Lochnore
1275	RBC Museum	EcRi y	2	27.66	26.34	21.61	26.34	24.51	4.19	6.67	Shuswap
1276	RBC Museum	EcRi 76	1	29.70	15.70	11.30	15.70	12.47	4.43	2.05	Shuswap
1278	RBC Museum	EeQw 7	1850	35.57	24.85	10.01	24.85	12.50	5.06	3.78	Plateau
1279	RBC Museum	EeQw 7	1845	53.19	23.17	14.51	23.17	16.62	9.52	10.92	Shuswap
1280	SFU Museum	EfQw 2	129	46.65	26.28	21.53	25.63	18.04	8.59	9.59	Lehman
1281	RBC Museum	EeQw 7	1836	48.43	20.54	13.28	18.84	14.68	6.82	7.17	Shuswap
1282	RBC Museum	EeQw 7	1822	41.15	24.31	14.97	24.31	9.55	4.55	4.79	Shuswap
1283	UBC Museum	EfRl 3	158	37.07	18.06	14.16	17.39	17.98	6.88	4.08	Lochnore
1284	RBC Museum	EeQw 7	1821	24.82	17.16	11.30	16.32	16.86	5.21	2.74	Shuswap
1286	RBC Museum	EeQw 7	1766	27.11	17.86	9.87	15.87	17.86	3.79	1.39	Kamloops
1287	RBC Museum	EeQw 7	1679	24.47	19.03	11.20	19.03	15.78	4.77	2.05	Shuswap
1288	RBC Museum	EeQw 7	1680	24.36	13.21	8.88	13.21	11.25	4.12	1.20	Plateau
1289	RBC Museum	EeQw 7	1690	22.26	17.51	8.81	11.34	17.51	3.79	0.82	Kamloops
1290	RBC Museum	EeQw 7	1754	18.65	13.34	8.39	10.78	13.39	2.98	0.62	Kamloops
1291	RBC Museum	EeQw 7	1784	16.74	11.86	7.21	8.33	11.86	2.95	0.49	Kamloops
1292	RBC Museum	EeQw 7	1681	20.79	10.28	7.53	10.28	9.57	1.89	0.43	Shuswap
1293	RBC Museum	EeQw 7	1749	14.60	12.74	8.85	9.83	12.75	3.18	0.52	Kamloops
1294	RBC Museum	EeQw 7	1693	24.14	14.98	8.62	11.07	14.98	4.47	1.12	Kamloops
1295	RBC Museum	EeQw 7	1726	22.34	17.27	10.04	13.38	17.27	2.60	0.83	Kamloops
1296	RBC Museum	EeQw 7	1689	21.29	13.13	8.34	13.13	11.69	3.99	0.90	Kamloops
1297	RBC Museum	EeQw 7	1709	20.27	15.42	9.14	10.37	15.42	3.06	0.62	Kamloops
1298	RBC Museum	EeQw 7	1720	25.43	10.73	6.98	10.13	10.73	3.66	0.42	Kamloops
1299	RBC Museum	EeQw 7	1742	20.83	10.36	5.09	10.36	6.91	3.31	0.57	Plateau
1300	RBC Museum	EdRh y	1	25.97	13.58	8.10	11.50	14.24	4.02	1.20	Kamloops
1301	RBC Museum	EeQw 7	1777	22.02	14.06	7.45	10.64	14.06	3.15	0.71	Kamloops

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1302	RBC Museum	EeQw 7	1781	17.52	12.50	7.40	10.48	12.50	3.43	0.62	Kamloops
1303	RBC Museum	EeQw 7	1733	22.78	12.75	9.04	10.50	12.75	3.94	0.91	Plateau
1304	RBC Museum	EeQw 7	1734	15.49	12.28	6.53	9.34	12.28	2.38	0.39	Kamloops
1305	UBC Museum	EiRg 4	2	19.20	14.54	7.95	10.27	14.54	2.94	0.63	Kamloops
1306	RBC Museum	EeQw 7	1711	20.42	11.60	7.21	8.05	11.60	3.82	0.63	Kamloops
1307	RBC Museum	EeQw 7	1791	18.29	15.44	10.61	11.20	15.44	2.90	0.73	Kamloops
1308	RBC Museum	EeQw 7	1724	21.74	13.74	7.22	11.34	13.74	3.86	1.05	Kamloops
1309	RBC Museum	EeQw 7	1721	19.80	12.50	7.73	12.01	12.50	2.52	0.66	Kamloops
1310	RBC Museum	EeQw 7	1685	18.53	11.06	5.96	8.30	11.06	2.82	0.42	Kamloops
1311	RBC Museum	EeQw 7	1761	15.13	12.49	6.71	9.18	12.49	2.62	0.45	Kamloops
1312	RBC Museum	EeQw 7	1770	20.90	13.80	8.31	12.18	13.80	4.66	1.17	Kamloops
1313	RBC Museum	EeQw 7	1695	21.49	10.62	6.36	10.55	10.62	2.77	0.51	Kamloops
1314	Penticton Museum	unknown	244	23.89	21.24	8.48	21.24	11.12	4.21	1.24	Plateau
1315	RBC Museum	EeQw 7	1737	15.09	8.40	5.57	8.40	7.88	2.14	0.23	Kamloops
1316	RBC Museum	EeQw 7	1687	15.72	11.54	7.43	8.09	11.54	3.57	0.47	Kamloops
1317	RBC Museum	EeQw 7	1718	20.52	9.32	7.02	8.98	9.38	3.33	0.58	Kamloops
1318	RBC Museum	EeQw 7	1762	23.16	9.94	7.18	9.94	9.48	3.84	0.76	Shuswap
1319	RBC Museum	EeQw 7	1694	16.47	12.01	7.61	10.38	12.01	3.05	0.51	Kamloops
1320	RBC Museum	EeQw 7	1715	19.49	14.30	9.04	9.89	14.30	2.78	0.64	Kamloops
1321	RBC Museum	EeQw 7	1692	19.21	13.01	7.60	9.70	13.01	2.41	0.44	Kamloops
1322	RBC Museum	EeQw 7	1731	22.43	13.12	8.25	10.03	13.12	3.77	0.85	Kamloops
1323	RBC Museum	EeQw 7	1740	20.30	10.48	5.68	8.86	10.48	3.02	0.49	Kamloops
1324	Chase Museum	Carryl Coles	e	22.47	20.87	11.22	21.01	12.83	3.23	1.39	Plateau
1325	RBC Museum	EeQw 7	1722	18.02	14.31	7.28	9.89	14.31	3.68	0.67	Kamloops
1326	RBC Museum	EeQw 7	1684	18.36	11.31	6.61	11.31	10.09	2.38	0.40	Kamloops
1327	RBC Museum	EeQw 7	1698	20.72	12.72	8.50	10.80	12.72	3.92	0.79	Kamloops
1328	RBC Museum	EeQw 7	1696	19.01	12.62	6.36	9.75	12.62	3.01	0.48	Kamloops
1329	RBC Museum	EeQw 7	1792	12.92	14.86	6.75	9.84	14.86	2.58	0.39	Kamloops
1330	RBC Museum	EeQw 7	1795	18.50	15.02	6.61	10.01	15.02	2.45	0.45	Kamloops
1331	RBC Museum	EeQw 7	1683	23.00	11.64	6.54	11.13	9.61	2.94	0.59	Kamloops
1332	RBC Museum	EeQw 7	1702	20.15	15.71	7.90	10.61	15.31	2.45	0.49	Kamloops
1333	RBC Museum	EeQw 7	1708	21.99	11.42	8.20	9.89	11.42	2.99	0.67	Kamloops
1334	RBC Museum	EeQw 7	1775	15.11	13.97	9.78	10.61	13.97	2.73	0.54	Kamloops
1335	RBC Museum	EeQw 7	1728	20.84	11.75	6.50	9.06	11.75	3.68	0.66	Kamloops
1336	RBC Museum	EeQw 7	1774	14.95	6.10	3.48	6.10	4.06	2.72	0.21	Kamloops
1337	RBC Museum	EeQw 7	1796	18.30	14.31	7.65	9.55	14.31	3.14	0.59	Kamloops
1338	RBC Museum	EeQw 7	1708	20.84	12.13	7.64	12.13	10.13	4.22	0.96	Shuswap
1339	RBC Museum	EeQw 7	1727	16.53	13.74	5.99	8.95	13.74	2.46	0.43	Kamloops
1340	RBC Museum	EeQw 7	1677	22.82	13.65	7.35	10.41	13.65	3.07	0.71	Kamloops

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1341	RBC Museum	EeQw 7	1706	18.83	8.98	6.25	8.12	7.65	2.98	0.41	Kamloops
1342	RBC Museum	EeQw 7	1682	19.76	13.73	7.72	10.55	13.73	3.19	0.76	Kamloops
1343	RBC Museum	EeQw 7	1212	21.93	16.71	9.95	15.71	11.13	4.52	1.42	Shuswap
1344	RBC Museum	EeQw 7	1216	23.08	11.50	4.47	11.50	4.77	3.14	0.66	Plateau
1345	RBC Museum	EeQw 7	1215	21.88	13.23	8.58	11.17	13.23	3.86	0.92	Kamloops
1346	UBC Museum	EiRh 8	3	16.41	15.75	8.61	12.77	15.72	3.79	0.78	Plateau
1347	RBC Museum	EeQw 7	1228	20.57	13.09	6.71	12.84	13.09	2.46	0.64	Plateau
1348	RBC Museum	EeQw 7	1159	39.25	16.24	11.75	16.24	16.00	6.90	3.75	Shuswap
1349	RBC Museum	EeQw 7	1210	28.95	16.58	7.54	16.58	8.80	3.98	1.24	Plateau
1350	RBC Museum	EeQw 7	1205	28.49	13.86	8.51	12.59	13.86	3.22	1.08	Kamloops
1351	RBC Museum	EeQw 7	1206	25.85	14.41	9.16	12.08	14.37	3.39	0.88	Kamloops
1352	UBC Museum	FeRk 1	165	21.82	17.39	8.96	17.50	9.91	3.02	0.82	Plateau
1353	UBC Museum	EbRc X	1	23.01	14.10	7.60	14.08	13.84	3.70	1.24	Kamloops
1354	RBC Museum	EeQw 7	1208	21.62	11.74	7.94	9.45	11.74	3.05	0.59	Kamloops
1355	Penticton Museum	unknown	255	19.22	16.15	6.20	16.15	7.24	3.03	0.63	Plateau
1356	RBC Museum	EeQw 7	1197	21.91	13.80	5.62	13.80	7.66	3.20	0.60	Kamloops
1357	RBC Museum	EeQw 7	1201	19.79	11.60	6.36	10.58	11.60	2.98	0.55	Plateau
1358	RBC Museum	EeQw 7	1203	17.44	13.13	7.60	10.10	13.13	2.15	0.41	Kamloops
1359	RBC Museum	EeQw 7	1204	18.12	12.04	7.11	8.46	12.04	2.56	0.36	Kamloops
1360	RBC Museum	EeQw 7	1202	16.10	12.18	6.29	8.90	12.19	2.48	0.40	Kamloops
1361	RBC Museum	EeQw 7	1195	17.03	14.86	9.19	10.84	14.86	3.87	0.81	Kamloops
1362	UBC Museum	EdRk 8	553	32.16	20.59	13.21	17.48	13.93	4.83	1.89	Nesikep
1363	SFU Museum	EdRi 11	34	32.07	23.24	11.72	23.24	NA	3.75	2.66	Plateau
1364	RBC Museum	EeQw 7	323	25.87	14.00	9.02	13.34	14.00	2.49	0.89	Kamloops
1365	RBC Museum	EeQw 7	322	22.38	16.49	10.64	12.20	16.49	3.89	1.05	Kamloops
1366	RBC Museum	EeQw 7	334	21.49	11.84	7.14	10.72	10.12	3.64	0.67	Kamloops
1367	RBC Museum	EeQw 7	388	21.23	12.52	7.65	10.14	12.52	3.27	0.65	Kamloops
1368	RBC Museum	EeQw 7	329	20.04	12.27	7.02	11.65	12.27	3.14	0.69	Kamloops
1369	RBC Museum	EeQw 7	391	19.81	13.12	8.20	11.12	13.12	2.67	0.57	Kamloops
1370	RBC Museum	EeQw 7	344	19.63	14.18	8.14	10.65	14.18	2.86	0.55	Kamloops
1371	RBC Museum	EeQw 7	382	18.33	16.86	10.03	12.26	16.86	3.51	0.82	Kamloops
1372	RBC Museum	EeQw 7	390	19.24	13.00	6.80	9.57	13.00	3.00	0.66	Kamloops
1373	RBC Museum	EeQw 7	335	18.26	10.18	6.39	10.18	9.18	3.20	0.49	Kamloops
1374	RBC Museum	EeQw 7	330	18.06	11.72	6.34	9.06	11.72	2.14	0.41	Kamloops
1375	Kelowna Museum	J11	494	16.39	10.95	5.68	7.46	10.95	2.96	0.40	Kamloops
1376	RBC Museum	EeQw 7	332	16.29	10.56	7.74	10.56	8.41	2.54	0.37	Kamloops
1377	RBC Museum	EeQw 7	214	20.02	11.37	5.78	11.37	10.03	3.20	0.58	Kamloops
1378	RBC Museum	EeQw 7	216	20.28	11.99	6.49	8.69	11.99	2.38	0.52	Kamloops
1379	RBC Museum	EeQw 7	212	25.96	14.68	7.94	13.08	14.68	3.58	1.12	Kamloops

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1381	RBC Museum	EeQw 7	133	30.13	21.14	14.82	21.09	19.24	7.48	4.04	Shuswap
1382	RBC Museum	EeQw 7	195	38.38	21.11	14.31	21.11	10.00	7.50	4.65	Shuswap
1383	RBC Museum	EeQw 7	197	24.70	14.82	9.32	12.31	14.82	3.02	0.83	Kamloops
1384	RBC Museum	EeQw 7	199	21.99	16.95	6.08	10.74	16.95	2.64	0.61	Kamloops
1385	SFU Museum	EbRj 3	1	33.50	17.35	11.61	17.30	10.08	4.86	2.33	Shuswap
1386	RBC Museum	EeQw 7	26	32.52	23.10	11.73	23.10	13.54	5.21	3.11	Plateau
1387	RBC Museum	EeQw 7	32	35.76	17.48	10.63	17.48	10.10	5.51	3.26	Shuswap
1388	RBC Museum	EeRj 15	164	36.32	28.89	12.95	28.89	14.44	5.98	3.82	Plateau
1390	RBC Museum	EeRj 15	175	16.11	13.77	7.18	9.78	13.77	2.55	0.45	Kamloops
1391	RBC Museum	EeRp 47	2	43.53	19.39	10.43	17.71	14.31	3.98	2.79	Kamloops
1392	RBC Museum	EeRp 47	4	35.84	37.67	14.46	37.44	18.01	5.39	5.43	Plateau
1394	RBC Museum	ElRn 24	5	39.13	26.99	12.50	26.99	15.30	5.91	4.01	Plateau
1395	SFU Museum	EeRb 77	115	36.30	27.71	12.25	27.71	16.08	7.22	7.01	Plateau
1396	RBC Museum	EhRmn Y	96	44.70	22.18	11.72	21.99	15.39	5.40	4.80	Plateau
1397	RBC Museum	EhRmn Y	50	35.71	28.46	14.79	28.46	18.60	5.68	5.65	Plateau
1398	RBC Museum	EhRmn Y	33	43.24	39.51	15.78	39.51	10.70	4.86	6.62	Plateau
1400	RBC Museum	Egh Rm-Y	24	28.89	21.37	12.72	20.07	19.01	3.15	2.38	Lehman
1401	RBC Museum	Egh Rm-Y	3	42.08	23.56	12.22	23.56	16.12	3.64	3.57	Plateau
1402	RBC Museum	Egh Rm-Y	19	46.41	24.62	20.66	24.14	24.62	5.47	6.16	Lochnore
1404	RBC Museum	Egh Rm-Y	32	52.61	31.08	17.04	29.28	20.22	6.98	10.80	Plateau
1405	RBC Museum	Egh Rm-Y	4	42.07	31.98	18.93	31.98	28.03	6.27	8.25	Lehman
1406	RBC Museum	DgQr 33	3	26.14	19.08	11.30	19.08	8.85	7.23	2.62	Shuswap
1408	RBC Museum	DiQy 5	310	48.56	20.74	12.65	20.74	14.07	5.15	4.42	Plateau
1409	RBC Museum	DiQy 5	115	38.69	17.43	11.02	17.43	9.96	4.70	1.92	Shuswap
1410	RBC Museum	DiQy 5	24	30.19	13.77	7.18	13.77	13.14	4.20	1.92	Kamloops
1411	RBC Museum	DiQy 5	17	29.32	11.99	5.77	11.99	10.78	3.52	1.04	Kamloops
1412	RBC Museum	DiQy 5	124	18.72	9.77	6.20	9.77	8.95	2.98	0.51	Kamloops
1413	RBC Museum	DiQy 5	231	20.56	12.37	6.93	10.03	12.37	3.41	0.69	Kamloops
1415	SFU Museum	EeRi 7	3613	22.51	13.11	5.02	8.58	13.11	2.51	0.46	Kamloops
1416	RBC Museum	DiQy 5	134	33.48	14.72	8.55	14.72	14.47	3.51	1.26	Kamloops
1417	RBC Museum	DiQy 5	177	32.17	15.23	4.57	15.23	6.81	3.42	1.04	Plateau
1418	RBC Museum	DiQy 5	170	16.68	13.75	7.44	10.94	13.75	2.30	0.44	Kamloops
1419	RBC Museum	DiQy 5	220	28.56	11.71	6.66	11.23	11.71	3.47	0.83	Kamloops
1420	RBC Museum	DiQy 5	163	19.86	13.05	5.55	13.05	7.79	2.77	0.50	Plateau
1421	RBC Museum	DiQy 2	43	31.97	13.37	9.35	13.37	12.75	4.86	1.71	Plateau
1423	UBC Museum	FiSi 1	474	34.83	13.24	10.87	13.24	6.50	4.35	1.71	Lancolate
1424	RBC Museum	DiQm 13	18	60.38	26.46	13.44	26.40	16.06	5.18	7.05	Nesikep
1425	RBC Museum	DiQm 13	3	29.13	15.52	10.36	15.52	12.91	5.45	2.15	Shuswap
1426	RBC Museum	DiQm 13	19	36.84	20.20	15.25	20.20	18.72	6.95	5.03	Shuswap

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1427	SFU Museum	EeRb 77	107	35.39	32.36	10.70	32.36	10.33	5.69	3.64	Plateau
1428	RBC Museum	EeQw 3	1016	39.61	27.25	13.96	27.25	19.46	7.99	7.22	Shuswap
1429	RBC Museum	EeQw 3	1017	43.46	23.00	10.18	23.00	11.88	8.41	6.59	Plateau
1430	RBC Museum	EeQw 3	1015	47.06	17.66	10.39	17.66	14.71	5.54	4.27	Plateau
1431	RBC Museum	EeQw 3	1028	34.79	20.61	12.91	20.61	13.44	5.77	3.68	Shuswap
1432	RBC Museum	EeQw 3	1010	29.94	20.63	11.43	16.32	20.63	4.02	1.65	Kamloops
1433	RBC Museum	EeQw 3	1014	26.97	19.49	12.15	19.49	13.12	6.40	2.55	Shuswap
1434	RBC Museum	EeQw 3	1009	27.43	16.16	8.34	14.61	16.16	3.68	1.45	Kamloops
1435	RBC Museum	EeQw 3	1011	22.44	16.73	10.40	12.88	16.73	3.78	1.22	Kamloops
1436	RBC Museum	EeQw 3	1008	27.23	15.81	9.10	11.77	15.81	3.47	1.06	Kamloops
1437	RBC Museum	EeQw 3	1059	27.96	13.93	9.15	12.51	13.93	4.01	1.29	Kamloops
1438	RBC Museum	EeQw 3	1093	24.60	12.76	6.89	11.85	12.76	3.83	0.86	Kamloops
1439	RBC Museum	EeQw 3	1087	19.54	14.10	8.55	10.94	14.10	2.47	0.59	Kamloops
1440	RBC Museum	EeQw 3	1002	18.52	11.81	6.67	10.00	11.81	1.83	0.32	Kamloops
1441	RBC Museum	EeRk 4	23.559	38.62	24.78	12.73	24.78	10.04	7.02	5.64	Shuswap
1443	RBC Museum	EeRk 4	22.465	52.23	25.33	19.02	25.33	20.14	7.82	9.29	Plateau
1444	RBC Museum	EeRk 4	22.424	61.64	27.42	15.15	27.42	20.73	6.73	10.09	Plateau
1445	RBC Museum	EeRk 8	13.177	19.09	11.16	6.45	11.16	9.71	2.62	0.50	Plateau
1446	RBC Museum	EeRk 4	13.18	21.84	13.91	8.42	11.82	13.91	2.45	0.63	Kamloops
1448	RBC Museum	EeRk 4	11.46	31.82	31.08	12.13	31.08	13.57	5.45	2.74	Plateau
1449	UBC Museum	EkSa X	10	20.64	14.47	7.28	16.58	14.47	3.77	0.87	Kamloops
1450	RBC Museum	EeRk 4	11.26	18.30	15.83	6.07	15.83	6.50	2.58	0.52	Plateau
1451	RBC Museum	EeRk 4	11.2	17.23	11.11	6.97	9.28	11.11	2.57	0.42	Kamloops
1452	RBC Museum	EeRk 4	11.47	18.20	11.90	7.55	9.04	11.90	2.15	0.30	Kamloops
1453	UBC Museum	EbRj 1	129	22.60	13.99	7.65	13.88	13.51	3.87	1.00	Kamloops
1454	RBC Museum	EeRk 4	11.48	15.63	11.04	6.31	9.82	11.04	2.41	0.32	Kamloops
1455	RBC Museum	EeRk 4	6.1051	41.94	29.65	22.34	26.76	23.03	7.26	10.17	Shuswap
1456	RBC Museum	EeRk 4	6.1049	44.96	22.78	20.16	22.78	21.65	6.06	6.25	Shuswap
1457	RBC Museum	EeRk 4	6.612	47.78	30.91	17.16	30.91	13.32	5.37	7.40	Shuswap
1459	RBC Museum	EeRk 4	6.327	36.64	29.08	19.45	29.08	25.77	6.35	6.23	Shuswap
1460	RBC Museum	EeRk 4	6.302	25.73	16.15	6.10	16.15	7.52	2.56	0.69	Plateau
1461	SFU Museum	EeRb 130	5	40.22	17.10	14.68	17.10	12.01	6.64	4.24	Lancolate
1462	RBC Museum	EeRk 4	6.74	37.85	26.15	18.51	26.15	20.72	6.82	6.90	Shuswap
1463	RBC Museum	EeRk 4	4.9	42.74	21.33	16.48	21.18	21.33	6.53	5.29	Shuswap
1464	RBC Museum	EeRk 4	4.23	41.99	25.46	17.82	25.46	21.64	7.50	8.11	Shuswap
1465	RBC Museum	EeRk 4	2.1186	26.44	20.88	17.91	20.84	20.88	6.12	3.20	Shuswap
1466	RBC Museum	EeRk 4	2.1179	60.52	23.15	14.70	20.27	17.93	7.89	9.70	Shuswap
1467	RBC Museum	EeRk 4	2.1183	42.42	27.51	14.95	27.51	16.13	6.58	6.98	Plateau
1468	RBC Museum	EeRk 4	2.99	47.91	25.12	17.68	25.12	17.78	7.46	8.41	Shuswap

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1471	RBC Museum	EeRk 4	2.239	30.79	17.39	9.68	11.99	17.39	3.48	1.42	Kamloops
1472	RBC Museum	EeRk 4	2.21	18.00	17.98	6.47	17.98	8.74	3.44	0.70	Plateau
1473	RBC Museum	EeRk 4	2.22	14.92	11.75	6.21	8.43	11.75	1.84	0.25	Plateau
1474	RBC Museum	EeRk 4	2.28	22.08	15.73	6.10	15.73	6.61	2.57	0.56	Plateau
1475	RBC Museum	EeRk 4	2.93	40.07	28.91	17.42	27.68	20.33	5.42	6.46	Shuswap
1476	RBC Museum	EeRk 4	1.612	54.46	20.65	15.82	19.50	18.53	5.79	7.05	Shuswap
1477	RBC Museum	EeRk 4	1.53	50.70	21.05	13.10	21.05	16.47	7.20	6.94	Shuswap
1478	RBC Museum	EeRh 241	1	41.39	30.83	13.61	30.83	15.49	6.95	7.36	Plateau
1479	RBC Museum	EeRh 61	7429	35.97	29.93	23.33	29.90	27.93	4.49	5.35	Shuswap
1480	RBC Museum	EeRh 61	7430	44.34	32.61	15.92	26.59	19.64	5.29	7.41	Lehman
1481	RBC Museum	EeRh 61	7433	35.04	19.74	12.96	19.12	14.82	6.66	4.30	Shuswap
1482	RBC Museum	EeRh 61	7434	55.65	25.15	14.65	24.34	16.95	7.64	11.11	Lochnore
1483	Secwempec	EeRb10	119	42.22	20.10	11.16	19.35	13.56	7.56	6.43	Shuswap
1484	Secwempec	EeRb10	200	31.34	16.01	10.59	16.01	11.37	5.26	2.69	Shuswap
1485	Secwempec	EeRb10	227	58.92	19.03	13.34	18.83	12.75	6.98	7.01	Shuswap
1486	Secwempec	EeRb10	95	55.79	19.78	10.92	18.33	11.10	5.84	6.24	Shuswap
1487	Secwempec	EeRb10	77	42.84	17.62	14.10	17.30	17.62	5.62	3.87	Shuswap
1488	Secwempec	EdRa 22	2-28	43.32	20.43	9.04	20.43	11.55	5.12	3.62	Plateau
1489	Secwempec	EeRd 10	75	35.47	19.34	16.69	18.91	18.73	5.17	3.67	Shuswap
1490	Secwempec	E-985-40-	676	31.83	17.66	9.05	17.30	13.04	3.48	2.24	Shuswap
1491	Secwempec	E-985-40-	535	34.27	19.89	10.81	19.89	13.02	4.70	3.22	Shuswap
1492	Secwempec	E-985-40-	647	40.94	16.67	12.18	16.33	13.31	6.09	4.19	Shuswap
1493	Secwempec	E-985-40-	998	29.90	16.09	9.71	16.09	9.93	6.61	2.58	Shuswap
1494	UBC Museum	FiSi 1	430	26.38	18.05	13.50	18.05	15.90	6.67	3.06	Shuswap
1495	Secwempec	E-985-40-	459	34.15	16.89	9.99	16.89	13.93	4.62	2.38	Shuswap
1496	Secwempec	E-985-40-	395	23.57	14.21	6.38	14.21	9.57	3.54	0.92	Plateau
1497	SFU Museum	EeRi 7	3648	18.69	12.68	9.20	12.70	11.16	4.03	0.82	Shuswap
1498	SFU Museum	EeRb 77	546	34.72	20.46	13.44	20.46	20.14	6.16	4.88	Plateau
1499	Secwempec	E-985-40-	543	29.84	18.30	12.54	18.30	15.72	4.75	2.31	Plateau
1500	Secwempec	E-985-40-	548	36.54	23.07	12.97	23.07	14.00	5.15	3.46	Plateau
1501	Secwempec	E-985-40-	539	29.35	21.43	9.28	21.43	10.20	5.72	2.57	Plateau
1502	Secwempec	E-985-40-	908	50.50	26.99	12.28	26.99	10.14	7.23	7.40	Plateau
1503	Secwempec	E-985-40-	879	45.31	24.27	10.92	24.27	14.02	5.69	5.61	Shuswap
1504	Secwempec	E-985-40-	219	38.78	23.06	12.75	23.06	13.77	5.69	5.57	Shuswap
1505	Secwempec	E-985-40-	770	48.96	31.50	13.39	31.50	14.61	8.47	9.18	Plateau
1506	Secwempec	E-985-42-	259	47.51	21.96	12.15	21.39	12.07	4.65	4.24	Shuswap
1507	Secwempec	E-985-40-	218	28.89	21.04	10.79	21.04	13.48	5.31	2.73	Shuswap
1508	Secwempec	E-985-40-	584	20.38	15.30	5.38	9.19	15.30	3.38	0.66	Kamloops
1509	RBC Museum	Egh Rm-Y	29	41.96	19.17	16.35	19.17	11.30	6.89	6.07	Lancolate

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1510	Secwempec	E-985-40-	348	49.12	18.00	8.83	17.86	9.47	5.97	4.55	Plateau
1511	Secwempec	E-985-40-	772	61.56	16.59	9.61	16.59	7.59	7.76	5.82	Shuswap
1512	SFU Museum	EeRi 7	3782	16.13	8.30	4.18	6.67	8.07	2.60	0.22	Kamloops
1513	Secwempec	E-985-40-	632	45.60	20.84	10.45	20.84	12.11	4.59	3.48	Plateau
1514	Secwempec	E-985-40-	432	26.57	18.67	12.84	18.67	16.79	6.29	2.58	Shuswap
1515	Secwempec	E-985-40-	538	34.19	22.26	14.15	22.26	19.42	4.72	2.98	Plateau
1516	Secwempec	E-985-40-	908	23.47	13.89	9.33	13.89	11.72	4.48	1.30	Shuswap
1517	Secwempec	E-985-40-	905	28.02	10.45	5.11	9.69	10.04	3.36	0.83	Kamloops
1518	Secwempec	E-985-40-	895	33.38	13.91	6.87	13.91	9.00	4.40	1.69	Shuswap
1519	SFU Museum	EeRi 7	3466	22.64	9.34	4.88	9.22	9.50	2.34	0.40	Kamloops
1520	Secwempec	E-985-40-	833	24.61	13.02	7.86	12.31	13.02	3.86	1.10	Kamloops
1521	Secwempec	E-985-40-	391	28.08	13.58	6.78	13.58	10.01	4.10	1.14	Kamloops
1522	Secwempec	E-985-40-	931	27.85	16.38	5.58	16.38	6.55	2.92	0.73	Plateau
1523	UBC Museum	EfRl 3	289	28.34	21.19	13.96	21.19	16.36	6.01	2.98	Plateau
1524	Secwempec	E-985-40-	397	16.92	9.58	6.55	9.52	9.63	3.08	0.48	Kamloops
1525	Secwempec	E-985-42-	250	34.02	19.64	9.66	19.64	11.06	5.42	2.94	Plateau
1529	Secwempec	E-985-40-	196	19.45	22.61	12.13	22.61	14.00	5.10	1.72	Plateau
1530	Secwempec	E-985-40-	683	33.72	21.70	9.56	21.70	11.94	3.83	2.26	Plateau
1531	Secwempec	E-985-40-	688	29.22	26.29	10.90	26.29	14.33	4.43	2.72	Plateau
1532	Secwempec	E-985-40-	967	25.00	14.83	10.68	14.83	13.21	5.75	1.72	Shuswap
1533	Secwempec	E-985-40-	767	44.21	22.27	9.69	22.27	8.36	5.68	3.94	Plateau
1534	Secwempec	E-985-40-	799	32.30	20.74	9.36	20.74	9.89	4.28	2.24	Shuswap
1535	Secwempec	E-985-40-	514	48.66	21.87	14.33	21.87	18.89	8.21	7.75	Shuswap
1536	Secwempec	E-985-40-	350	37.84	24.36	15.68	24.33	18.18	5.70	4.64	Shuswap
1537	Secwempec	E-985-40-	916	26.45	10.40	6.45	10.40	7.44	4.84	1.15	Shuswap
1538	Secwempec	E-985-40-	515	57.19	24.42	17.72	24.42	23.80	6.97	9.28	Plateau
1539	Secwempec	E-985-40-	687	22.94	14.68	10.81	13.26	14.68	2.46	0.71	Kamloops
1540	Secwempec	EeRb 10	333	52.07	20.79	12.21	19.65	12.44	8.92	9.03	Shuswap
1541	Secwempec	EeRb 10	66	34.70	19.36	12.03	19.37	13.47	6.41	4.09	Shuswap
1542	Secwempec	EeRb 10	363	43.35	19.95	12.40	19.95	14.72	3.54	2.80	Shuswap
1543	SFU Museum	DiPu-16	89	24.59	20.78	11.08	20.61	14.31	6.33	2.66	Plateau
1544	Secwempec	EeRb 3	1170	47.38	29.85	19.54	29.85	20.67	8.60	11.51	Shuswap
1545	Secwempec	EeRb 3	1175	34.90	23.32	15.83	23.32	17.98	5.34	4.03	Shuswap
1546	Secwempec	EeRb 3	1177	39.98	22.35	14.78	21.49	15.72	6.80	5.43	Lehman
1547	Secwempec	EeRa 4	1-29	38.50	25.12	15.85	25.12	18.95	7.17	5.77	Plateau
1548	Secwempec	EeRb 3	196	35.90	22.01	13.94	22.01	13.59	4.23	3.01	Plateau
1550	Secwempec	EeRb 3	179	74.51	28.71	12.73	28.71	14.85	6.41	9.41	Plateau
1552	Secwempec	988.8	103	52.14	29.10	16.06	29.10	19.87	8.23	11.57	Shuswap
1553	Secwempec	988.8	119	53.68	25.01	10.92	24.92	12.80	5.36	6.89	Shuswap

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1554	Secwempec	988.8	110	59.24	22.11	12.48	22.11	15.26	6.46	7.15	Plateau
1556	Secwempec	987.9	224	25.31	28.80	14.33	28.80	14.06	4.09	2.04	Plateau
1557	Secwempec	987.9	206	39.73	18.90	9.82	18.90	13.82	5.33	3.73	Shuswap
1558	Secwempec	987.9	125	27.61	28.15	12.23	28.15	15.21	4.28	2.66	Plateau
1559	Secwempec	987.9	121	38.38	24.15	13.70	24.15	16.50	4.80	3.71	Plateau
1560	Secwempec	987.9	200	36.69	20.36	11.41	20.36	13.64	3.70	2.57	Plateau
1561	Secwempec	987.9	102	39.61	25.38	11.06	25.38	15.75	6.08	3.95	Plateau
1562	Secwempec	987.9	145	47.00	23.48	13.11	23.48	15.12	8.32	7.86	Plateau
1563	SFU Museum	EeRb 140	1686	35.55	24.26	18.5	24.26	17.76	3.92	3.37	Nesikep
1564	Secwempec	987.9	213	27.26	20.34	13.40	20.34	16.36	6.73	3.03	Shuswap
1565	Secwempec	987.9	202	33.66	19.38	11.55	17.49	19.38	5.11	2.47	Kamloops
1566	Secwempec	987.9	150	37.40	21.01	9.19	21.01	8.33	4.79	3.24	Plateau
1567	Secwempec	987.9	118	37.17	15.76	7.41	13.64	15.76	4.16	1.99	Kamloops
1568	Secwempec	987.9	197	33.95	17.02	7.79	13.69	17.02	3.71	1.53	Kamloops
1569	Secwempec	987.9	236	23.35	19.23	6.63	19.53	6.53	4.12	1.47	Plateau
1570	Secwempec	987.9	333	24.39	14.29	9.15	12.97	14.29	3.91	0.98	Kamloops
1571	SFU Museum	EdRi 11	358	27.92	18.31	7.51	18.31	11.25	3.54	0.97	NO Photo
1572	Secwempec	987.9	243	23.08	15.07	7.75	11.45	15.07	2.71	0.67	Kamloops
1573	Secwempec	987.9	203	23.73	14.02	5.73	10.22	14.02	2.79	0.56	Kamloops
1574	SFU Museum	EeRb 144	1404	22.54	7.89	7.70	7.89	7.06	2.86	0.53	Lancolate
1575	Secwempec	987.9	230	19.90	14.95	7.84	12.80	14.95	3.24	0.73	Kamloops
1576	Secwempec	987.9	217	17.88	15.23	7.70	9.01	15.23	4.25	0.71	Kamloops
1577	Secwempec	987.9	212	17.37	10.65	6.34	9.36	10.65	2.53	0.41	Kamloops
1578	Secwempec	987.9	74	55.16	23.25	12.34	23.25	10.51	7.87	9.17	Shuswap
1579	Secwempec	987.9	324	28.37	20.22	9.11	19.70	20.22	3.36	1.70	Kamloops
1580	Secwempec	987.9	143	52.04	21.53	14.39	20.52	18.36	8.43	7.35	Shuswap
1581	Secwempec	987.9	323	33.22	16.12	7.35	14.83	16.12	2.87	1.02	Kamloops
1582	Secwempec	987.9	297	53.05	20.19	10.56	20.19	19.64	4.16	4.00	Kamloops
1583	Secwempec	987.9	62	14.07	22.61	10.28	22.61	14.04	5.13	4.70	Plateau
1584	Secwempec	987.9	144	45.59	26.09	10.60	26.09	10.66	8.94	7.23	Plateau
1585	Secwempec	987.9	152	51.28	21.50	13.36	21.50	13.80	8.80	8.61	Shuswap
1586	Secwempec	987.9	87	54.57	28.48	15.92	28.48	9.21	6.79	9.17	Shuswap
1589	SFU Museum	EfQt 1	192	44.59	17.23	11.04	17.03	8.00	8.29	7.71	Lancolate
1590	SFU Museum	DiPu-16	53	26.85	21.21	14.22	21.21	16.92	6.51	3.31	Plateau
1591	SFU Museum	DiPu-16	96	NA	22.80	12.85	22.75	14.53	7.34	4.16	Plateau
1592	SFU Museum	DiPu-16	62	15.92	11.15	9.14	10.25	11.15	1.85	0.32	Kamloops
1593	SFU Museum	DiPu-16	88	NA	27.14	16.68	27.14	20.24	4.47	2.47	Plateau
1594	Secwempec	EeRb 3	1159	24.59	30.73	15.09	30.73	17.39	5.24	3.41	Plateau
1595	SFU Museum	DiPu-16	38	NA	13.77	9.45	13.58	12.27	3.40	1.04	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1596	SFU Museum	DiPu-16	71	30.61	21.31	14.83	21.31	17.81	6.20	4.15	Plateau
1597	SFU Museum	DiPu-16	82	28.00	18.06	11.28	17.90	15.60*	4.66	2.05	Plateau
1598	SFU Museum	DiPu-16	101	11.99	11.31	7.65	10.92	10.95	1.96	0.30	Kamloops
1599	SFU Museum	DiPu-16	14	17.68	11.99	8.96	11.19	11.82	2.63	0.51	Kamloops
1600	SFU Museum	DiPu-16	3	32.54	24.10	14.66	23.78	17.58	5.46	4.12	Plateau
1601	SFU Museum	DiPu-16	24	15.45	9.65	6.59	8.67	9.81	2.18	0.26	Kamloops
1602	SFU Museum	DiPu-16	25	NA	18.10	11.46	18.09	16.52	5.63	2.74	Shuswap
1603	SFU Museum	DiPu-16	49	NA	14.68	8.99	14.53	13.38	4.06	1.33	Plateau
1604	Penticton Museum	DlQv 4	497	27.49	23.18	12.55	23.18	11.35	6.15	3.37	Plateau
1605	SFU Museum	DiPu-16	117	17.50	12.98	10.73	10.84	12.14	2.67	0.60	Kamloops
1606	SFU Museum	DiPu-16	113	15.87	11.72	9.30	11.39	12.30	2.72	0.43	Kamloops
1607	SFU Museum	DiPu-17	1	18.78	15.32	9.45	13.45	15.32	3.77	0.84	Kamloops
1608	Kelowna Museum	K1 - EaQl14	836	25.86	23.56	11.97	23.56	16.09	4.72	2.14	Plateau
1609	SFU Museum	DiPu-17	4	36.57	27.45	16.50	27.05	15.30	6.10	6.18	Plateau
1610	SFU Museum	DiPu-17	21	37.11	20.30	14.50	14.83	14.87	5.52	4.05	Shuswap
1611	SFU Museum	DiPu-17	28	19.46	18.36	12.74	18.36	14.22	5.70	2.17	Plateau
1612	SFU Museum	DiPu-17	27	11.01	20.18	13.31	20.26	16.03	5.50	1.11	Plateau
1614	SFU Museum	DiPu-17	93	20.05	18.79	14.65	18.97	17.08	4.79	1.77	Plateau
1617	SFU Museum	EfQt 1	8	41.74	29.54	16.80	28.77	18.34	5.58	6.23	Lehman
1618	SFU Museum	EfQt 1	204	44.43	17.94	10.81	17.94	13.04	7.63	5.55	Shuswap
1621	SFU Museum	EfQt 1	249	37.88	15.16	9.26	15.16	9.85	7.51	3.76	Lochnore
1622	SFU Museum	EfQt 1	10	54.66	22.64	15.19	22.62	12.28	8.55	8.77	Lochnore
1623	SFU Museum	EfQt 1	75	31.80	16.16	10.82	16.35	8.20	5.53	2.34	Shuswap
1624	SFU Museum	EfQw 2	92	26.72	12.40	5.74	12.36	8.71	3.71	0.92	Plateau
1625	SFU Museum	Keatly (SV)	photo 0287	46.65	28.39	13.94	25.96	10.01	7.34	8.97	Lancolate
1626	SFU Museum	EfQw 2	119	18.09	11.13	7.48	9.84	7.00	3.22	0.54	Kamloops
1627	SFU Museum	EbRj 92	12	24.40	14.42	7.09	12.72	8.18	3.88	0.94	Plateau
1628	SFU Museum	EbRj 92	10	19.67	11.85	7.80	10.35	9.00	3.22	0.59	Kamloops
1629	RBC Museum	EeQw 7	25	33.50	22.88	14.73	22.91	22.06	4.87	3.08	Plateau
1631	SFU Museum	EbRj 3	21	17.01	8.55	6.93	8.62	6.60	3.49	0.51	Kamloops
1632	SFU Museum	EbRj 3	16	19.44	21.00	9.75	20.82	10.55	3.19	1.04	Plateau
1633	SFU Museum	Keatly (SV)	photo 0269	29.79	17.86	12.71	17.52	17.32	5.95	3.23	Shuswap
1634	SFU Museum	Keatly (SV)	photo 0271	39.15	18.11	12.27	18.01	16.72	4.63	2.88	Plateau
1635	UBC Museum	EcPx 6	18	24.94	24.30	16.18	24.27	18.71	7.75	4.47	Plateau
1636	SFU Museum	Keatly (SV)	photo 0275	42.90	21.82	9.60	22.92	14.04	5.20	3.54	Plateau
1637	SFU Museum	Keatly (SV)	photo 0277	30.66	25.70	9.34	25.70	9.40	5.36	2.57	Plateau
1638	SFU Museum	Keatly (SV)	photo 0278	33.21	22.69	11.41	22.66	13.44	5.38	2.83	Plateau
1639	SFU Museum	Keatly (SV)	photo 0281	19.37	9.59	6.01	8.78	9.54	3.44	0.57	Kamloops
1640	SFU Museum	Keatly (SV)	photo 0282	26.86	9.33	6.58	8.42	7.92	2.54	0.66	Shuswap

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1641	SFU Museum	Keatly (SV)	photo 0284	25.90	15.23	12.19	15.19	14.22	5.46	1.80	Plateau
1643	SFU Museum	Keatly (SV)	photo 0288	32.00	22.01	14.69	22.01	16.87	7.00	4.35	Plateau
1645	SFU Museum	Keatly (SV)	photo 0292	22.80	11.52	7.37	11.50	9.46	4.58	1.13	Shuswap
1650	SFU Museum	DiRa 20	108	31.55	22.03	13.23	21.59	9.53	4.22	2.47	Shuswap
1652	SFU Museum	DiRa 20	99-02	15.57	11.13	8.38	10.82	11.13	4.14	0.69	Plateau
1653	SFU Museum	DiRa 20	99-01	19.04	15.36	7.03	15.36	7.20	3.68	0.79	Plateau
1654	SFU Museum	DiRa 20	99-05	38.27	17.96	12.41	17.92	14.23	5.56	2.86	Plateau
1655	UBC Museum	EfRl 3	3	32.11	22.40	14.66	22.40	18.87	5.14	3.11	Kamloops
1656	SFU Museum	DiRa 20	99-01	20.77	15.94	11.18	15.94	12.90	4.81	1.38	Plateau
1657	SFU Museum	DiRa 20	99-03	28.75	24.33	10.20	24.58	10.46	4.45	3.02	Plateau
1660	SFU Museum	DiRa 20	99-05	41.66	28.52	NA	NA	28.52	3.74	3.97	Triangular
1661	SFU Museum	DiRa 20	00-02 C	16.76	14.09	8.21	14.09	10.95	2.00	0.45	Plateau
1662	SFU Museum	DiRa 20	00-08 C	37.27	16.97	14.46	16.97	11.08	6.36	3.56	Lancolate
1663	SFU Museum	DiRa 20	00-01 C	33.68	27.70	12.85	27.70	18.92	5.76	4.33	Plateau
1664	SFU Museum	DiRa 20	00-05 K	34.10	22.73	7.98	22.73	9.18	4.98	2.88	Plateau
1665	SFU Museum	DiRa 20	00-05 E	36.94	16.92	7.70	16.92	6.66	4.04	2.19	Plateau
1675	RBC Museum	EeQw 7	355	32.07	16.47	11.84	16.56	14.02	6.96	3.42	Shuswap
1678	SFU Museum	EdRi 11	16	51.03	27.81	10.61	27.81	11.73	5.57	6.08	Plateau
1680	SFU Museum	EdRi 11	15	39.68	26.79	11.30	26.81	13.80	4.12	3.37	Plateau
1684	SFU Museum	Edri 11	1024	25.16	16.70	9.80	16.71	11.57	5.03	1.95	Plateau
1685	SFU Museum	Edri 11	1049	16.30	32.57	14.69	32.57	NA	6.45	4.04	Plateau
1686	SFU Museum	Edri 11	553	19.44	16.71	6.40	16.71	8.28	2.76	0.80	Plateau
1687	SFU Museum	Edri 11	1359	25.99	20.79	13.06	20.77	16.07	4.76	2.51	Plateau
1688	SFU Museum	Edri 11	563	34.44	24.01	11.30	24.01	15.25	4.94	3.26	Plateau
1689	SFU Museum	Edri 11	1234	44.80	25.02	13.70	25.02	14.52	6.51	6.71	Plateau
1690	SFU Museum	Edri 11	1244	38.67	27.34	11.61	27.34	13.33	4.41	3.23	Plateau
1691	SFU Museum	Edri 11	555	22.14	14.40	6.50	14.40	6.54	2.90	0.59	Plateau
1692	SFU Museum	Edri 11	1103	29.88	25.19	13.01	25.19	14.96	4.86	3.42	Plateau
1693	SFU Museum	Edri 11	563	34.23	24.00	11.26	24.00	15.26	4.92	3.27	Plateau
1694	SFU Museum	Edri 11	892	22.23	28.64	17.04	28.64	18.12	5.99	4.26	Plateau
1695	SFU Museum	Edri 11	899	21.00	23.00	12.37	23.00	12.90	5.09	2.46	Plateau
1696	SFU Museum	Edri 11	875	25.55	24.60	17.72	24.60	22.89	5.86	4.19	Shuswap
1697	SFU Museum	Edri 11	452	19.02	14.18	7.63	14.19	14.17	3.38	0.76	Kamloops
1698	SFU Museum	Edri 11	455	20.03	17.54	7.96	17.54	9.13	2.65	0.56	Plateau
1699	SFU Museum	Edri 11	734	31.21	13.38	6.42	13.38	8.52	2.69	0.70	Plateau
1700	SFU Museum	EeRb 77	3	42.67	22.27	16.69	22.27	20.98	6.02	5.13	Shuswap
1701	SFU Museum	EeRb 77	5	49.15	34.18	18.43	34.18	19.76	10.23	12.43	Lehman
1702	SFU Museum	EeRb 77	15	26.01	15.10	9.52	15.10	10.36	3.77	1.12	Shuswap
1703	SFU Museum	EeRb 77	10	17.29	15.49	6.76	15.49	15.61	2.54	0.63	Kamloops

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1704	SFU Museum	EeRb 77	66	25.27	15.85	7.81	15.85	13.64	3.66	1.07	Kamloops
1705	SFU Museum	EeRb 77	67	19.91	12.08	6.68	12.08	12.08	2.31	0.52	Kamloops
1706	SFU Museum	EeRb 77	68	17.99	10.45	7.15	10.45	10.45	2.00	0.37	Kamloops
1707	SFU Museum	EeRb 77	69	25.34	15.62	8.21	15.10	10.71	3.27	1.00	Plateau
1708	Kelowna Museum	K1 - EaQl14	900	36.23	18.97	9.78	18.97	13.94	6.69	3.87	Plateau
1709	SFU Museum	EeRb 77	152	38.98	26.02	14.16	26.02	20.37	6.65	6.87	Shuswap
1710	SFU Museum	EeRb 77	153	19.26	14.82	7.82	14.82	14.85	3.42	0.80	Kamloops
1711	SFU Museum	EeRb 77	165	20.60	10.97	5.40	10.97	5.22	3.04	0.63	Kamloops
1712	SFU Museum	EeRb 77	203	16.82	12.97	8.67	12.97	12.81	3.26	0.62	Kamloops
1713	SFU Museum	EeRb 77	206	17.74	11.44	8.16	11.44	8.45	3.82	0.80	Kamloops
1714	UBC Museum	EeRn 5	7	22.01	12.11	6.86	12.13	8.89	4.48	1.08	Kamloops
1715	SFU Museum	EeRb 77	282	26.16	24.21	15.72	24.21	14.76	5.25	3.07	Shuswap
1716	SFU Museum	EeRb 77	306	25.15	18.57	8.96	18.57	8.83	3.35	1.76	Plateau
1718	SFU Museum	EeRb 77	458	51.66	26.29	9.38	26.29	NA	6.25	6.53	Plateau
1719	SFU Museum	EeRb 77	495	28.45	24.06	13.95	24.06	15.94	5.62	3.52	Plateau
1720	Secwempec	E-985-40-	544	34.72	16.65	10.41	16.65	12.63	6.74	2.58	Shuswap
1721	SFU Museum	EeRb 77	549	31.51	24.95	14.24	24.95	16.80	4.98	3.71	Plateau
1724	SFU Museum	EeRb 77	580	35.69	23.73	11.61	23.73	13.09	6.12	3.60	Plateau
1725	SFU Museum	EeRb 77	586	32.56	18.69	13.45	18.69	16.90	4.77	2.75	Plateau
1726	SFU Museum	EeRb 77	590	39.51	27.71	16.60	27.71	17.65	8.74	7.47	Shuswap
1727	SFU Museum	EeRb 77	594	44.07	21.97	16.64	21.97	18.70	6.40	4.67	Shuswap
1728	SFU Museum	EeRb 77	603	38.18	26.79	15.26	26.79	18.11	5.72	4.73	Plateau
1729	UBC Museum	ElSf 1	7	32.39	20.45	15.90	20.28	18.73	5.43	3.47	Plateau
1730	SFU Museum	EeRb 77	609	34.63	23.74	13.66	23.74	15.51	5.13	3.48	Nesikep
1731	SFU Museum	EeRb 77	626	29.65	22.63	10.14	22.63	10.56	4.30	2.31	Plateau
1732	SFU Museum	EeRb 77	649	25.32	22.22	14.18	22.22	14.35	5.59	2.78	Plateau
1733	SFU Museum	EeRb 77	655	34.86	21.69	13.78	21.69	18.64	5.25	3.97	Plateau
1736	SFU Museum	EeRb 77	1314	32.25	17.68	8.40	17.68	9.31	4.39	2.29	Plateau
1737	Penticton Museum	osoyoos lake	822 (88)	29.37	16.09	7.44	13.48	16.09	4.06	1.44	Kamloops
1739	SFU Museum	EeRb 75	29	35.51	22.27	12.75	22.71	13.50	6.47	3.99	Plateau
1740	SFU Museum	EdRi 11	356	36.85	29.72	14.65	29.72	19.75	3.89	3.20	NO Photo
1741	RBC Museum	EhRmn Y	45	36.30	18.74	10.32	18.74	14.57	5.39	5.26	Plateau
1742	RBC Museum	DiQm 13	14	35.39	17.77	11.86	17.77	13.04	5.81	3.22	Shuswap
1745	SFU Museum	EeRb 144	1364	37.25	22.74	12.45	22.74	19.83	5.53	3.72	Plateau
1747	SFU Museum	EeRb 77	1334	29.16	20.19	9.68	20.19	9.30	4.28	1.91	Plateau
1748	SFU Museum	EeRb 77	1360	30.41	24.07	16.63	24.07	12.67	4.03	2.53	Plateau
1749	SFU Museum	EeRb 77	1362	30.04	24.82	10.94	24.82	12.41	7.21	5.07	Plateau
1750	SFU Museum	EeRb 77	1464	33.00	20.77	16.67	20.77	16.15	3.15	2.44	Plateau
1753	SFU Museum	EeRb 144	69	41.88	31.14	15.62	31.14	16.93	6.18	5.14	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1755	SFU Museum	EeRb 144	356	28.83	18.47	11.27	18.47	10.14	5.10	3.19	Lochnore
1756	SFU Museum	EeRb 144	395	13.80	10.70	4.95	10.70	10.70	1.95	0.19	Kamloops
1757	SFU Museum	EeRb 144	415	29.42	23.59	8.85	23.59	10.19	3.81	1.70	Plateau
1758	SFU Museum	EeRb 144	414	34.01	21.66	8.12	21.66	9.23	4.41	2.35	Plateau
1759	SFU Museum	EeRb 144	1568	43.43	27.71	13.92	27.71	17.96	6.18	5.76	Plateau
1760	SFU Museum	EeRb 144	1595	20.58	14.16	8.45	14.16	14.16	3.06	0.76	Kamloops
1761	SFU Museum	EeRb 144	1597	31.11	32.78	20.46	32.78	32.78	5.80	5.17	Lehman
1762	SFU Museum	EeRb 144	1583	12.22	10.68	6.09	10.68	10.68	3.10	0.31	Kamloops
1763	SFU Museum	EeRb 144	1615	48.31	24.30	15.54	24.30	22.50	7.51	8.41	Lochnore
1764	SFU Museum	EeRb 144	1609	29.10	26.80	19.89	26.80	25.93	5.21	4.44	Lochnore
1766	SFU Museum	EeRb 144	493	39.87	26.56	17.29	26.56	17.99	6.80	7.97	Nesikep
1767	SFU Museum	EeRb 144	503	37.00	25.25	14.10	25.25	16.07	5.37	5.05	Plateau
1768	SFU Museum	EeRb 144	507	31.03	22.43	14.16	22.43	18.60	5.77	3.42	Plateau
1769	SFU Museum	EeRb 144	520	44.00	21.76	11.48	21.76	18.44	4.68	3.60	Plateau
1770	SFU Museum	EeRb 144	521	42.44	22.15	8.92	22.15	12.49	4.78	3.97	Nesikep
1773	SFU Museum	EeRb 140	279	20.66	15.41	11.71	15.41	15.46	4.62	1.40	Shuswap
1774	SFU Museum	EeRb 140	493	23.78	23.30	17.03	23.30	23.14	5.02	3.33	Lehman
1775	SFU Museum	EeRb 140	570	12.05	11.87	6.72	11.87	8.39	3.28	0.44	Kamloops
1776	UBC Museum	FlSa 1	63	30.14	17.67	13.19	16.61	14.73	6.97	3.14	Shuswap
1777	SFU Museum	EeRb 140	87	13.82	11.29	5.09	11.29	11.29	2.55	0.22	Kamloops
1778	SFU Museum	EeRb 140	168	16.14	12.77	6.40	12.77	12.77	2.58	0.38	Kamloops
1780	UBC Museum	EbRj 8	14	31.81	17.25	13.99	17.25	12.00	5.55	3.35	Lancolate
1781	UBC Museum	FlSa 1	64	21.59	27.89	19.32	26.55	21.19	6.69	4.52	Nesikep
1782	SFU Museum	EeRb 140	792	30.97	19.90	14.53	19.90	17.56	4.72	2.79	Shuswap
1784	SFU Museum	EeRb 130	7	15.48	13.50	5.32	13.50	13.50	2.58	0.45	Kamloops
1785	SFU Museum	EeRb 161	1	64.02	30.75	12.82	30.75	15.86	7.35	10.51	Plateau
1786	RBC Museum	EbQu 15	66	36.19	28.27	12.11	28.27	13.28	7.69	6.52	Plateau
1787	SFU Museum	EeRb 149	60	22.30	18.88	12.78	18.88	14.82	4.55	2.18	Shuswap
1788	SFU Museum	EeRb 149	54	24.32	13.58	6.76	13.58	6.52	2.52	0.63	Shuswap
1789	SFU Museum	EeRb 149	43	21.09	17.49	13.77	17.49	17.49	5.80	1.94	Shuswap
1791	SFU Museum	EeRb 140	471	42.04	21.35	11.56	21.35	12.76	6.67	5.32	Shuswap
1792	SFU Museum	EeRb 140	168	15.88	12.77	6.23	12.77	12.77	2.56	0.37	Kamloops
1793	SFU Museum	EeRb 140	279	20.25	15.23	11.48	15.23	15.23	4.62	1.40	Plateau
1794	SFU Museum	EeRb 130	39	24.43	22.68	14.09	22.68	22.68	4.66	2.51	Plateau
1796	SFU Museum	EeRb 172	1	49.35	19.86	14.65	19.86	16.84	8.83	8	Plateau
1797	SFU Museum	EeRb 162	2	19.55	15.61	8.71	15.61	12.86	3.74	0.97	Plateau
1798	SFU Museum	EeRb 130	45	16.06	17.07	6.99	17.07	7.17	3.13	0.78	Plateau
1800	SFU Museum	EeRb 177	2	29.86	22.13	13.44	22.13	15.24	4.46	2.36	Plateau
1801	SFU Museum	EeRb 192	1	41.77	23.5	15.68	23.5	16.48	6.74	7.2	Shuswap

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1802	SFU Museum	EeRb 178	1	39.18	24.03	9.96	24.03	12.42	4.95	4.46	Plateau
1804	SFU Museum	EeRf 57	2	19.51	11.26	7.8	11.26	8.54	3.28	0.81	Shuswap
1805	SFU Museum	EeRf 57	6	33.41	22.71	13.5	22.71	15.66	5.39	3.29	Plateau
1806	SFU Museum	EeRf 57	7	17.15	10.33	7.01	10.33	5.32	2.36	0.4	Kamloops
1807	SFU Museum	EeRf 57	2	36.13	24.57	16.1	24.57	17.09	5.9	4.78	Nesikep
1808	SFU Museum	EeRb 148	5	16.97	12.49	6.88	12.49	12.49	2.18	0.42	Kamloops
1809	SFU Museum	EeRb 140	1814	16.55	11.56	8.14	11.56	11.56	2.29	0.45	Kamloops
1810	SFU Museum	EeRb 140	921	26.65	10.41	5.9	10.41	10.1	3.21	0.77	Kamloops
1811	SFU Museum	EeRb 140	999	11.45	10.47	5.72	10.47	10.47	2.14	0.23	Kamloops
1812	SFU Museum	EeRb 140	1004	17.7	14.86	6.46	14.86	12.13	3.56	1.02	Shuswap
1813	SFU Museum	EeRb 140	1005	25.8	12.55	6.55	12.55	12.55	3.05	0.84	Kamloops
1814	SFU Museum	EeRb 140	1417	39.08	24.15	14.21	24.15	14.74	6.05	5.4	Shuswap
1815	Kelowna Museum	K1 - EaQl14	42-106	26.09	20.92	13.77	20.92	17.37	5.01	2.45	Plateau
1816	SFU Museum	EeRb 140	1649	25.49	10.29	7.67	10.29	10.29	3.49	0.89	Kamloops
1817	Kelowna Museum	K1 - EaQl14	42-27	31.20	12.37	5.97	12.37	5.38	4.95	1.48	Shuswap
1818	SFU Museum	EeRb 140	57	29.4	21.03	15.25	21.03	17.78	6.8	3.73	Shuswap
1819	SFU Museum	EeRb 140	789	21.83	16	8.74	16	16	3.4	1.04	Kamloops
1820	SFU Museum	EeRb 140	619	41.17	17.29	13.1	17.29	9.17	8.07	5.48	Lochnore
1821	SFU Museum	EeRb 140	597	22.96	15.94	10.47	15.94	11.81	5.09	1.72	Shuswap
1822	SFU Museum	EeRb 140	595	19.39	12.26	6.62	12.26	12.26	3.03	0.47	Kamloops
1823	SFU Museum	EeRb 140	583	13.21	11.26	5.92	11.26	6.41	2.9	0.38	Kamloops
1824	SFU Museum	EeRb 140	580	17.75	14.85	9.33	14.85	14.85	3.91	1	Kamloops
1825	SFU Museum	EeRb 140	508	9.32	8.61	4.14	8.61	8.61	1.89	0.12	Kamloops
1826	SFU Museum	EeRb 140	1778	24.41	16.01	9.69	16.01	16.01	4.13	1.29	Kamloops
1827	SFU Museum	EeRb 130	8	51.71	20.79	16.07	20.79	19.58	8.2	8.86	Shuswap
1828	Secwempec	987.9	225	35.55	19.13	8.56	19.13	17.00	3.90	2.37	Kamloops
1830	SFU Museum	EfQv 12	03-0697a	27.65	25.94	14.60	25.94	16.18	5.49	3.16	Plateau
1831	UBC Museum	EeRl 7	369	36.07	23.10	13.31	23.10	9.03	6.93	5.12	Plateau
1832	SFU Museum	EfQv 12	03-1274a	20.86	11.78	7.90	11.10	11.71	5.11	1.19	Kamloops
1833	SFU Museum	EfQv 12	03-0959a	17.42	15.99	12.05	15.99	11.56	4.92	1.21	Shuswap
1834	SFU Museum	EfQv 12	03-0246a	22.27	21.69	15.13	21.77	17.63	4.30	2.12	Plateau
1835	SFU Museum	EfQv 12	03-0082a	35.79	16.87	9.91	16.59	15.12	3.91	2.12	Plateau
1836	SFU Museum	EfQv 12	03-096a	66.52	25.57	11.17	23.11	16.64	5.97	8.41	Shuswap
1837	SFU Museum	EfQv 12	03-0316	28.91	20.07	10.11	20.07	11.53	3.51	1.79	Plateau
1838	SFU Museum	EfQv 12	03-1082a	33.59	27.78	11.76	27.78	11.56	7.38	5.62	Plateau
1839	SFU Museum	EeRi 7	3834	38.86	23.69	8.02	23.69	4.12	2.30	1.51	Plateau
1841	Secwempec	E-985-40-	701	16.13	12.13	8.38	11.39	12.13	2.66	0.48	Kamloops
1842	SFU Museum	EeRi 7	3787	30.63	14.59	9.55	14.57	13.48	3.58	1.42	Kamloops
1843	SFU Museum	EeRi 7	3118	19.48	13.91	7.48	9.94	13.91	2.47	0.47	Kamloops

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1844	SFU Museum	EeRi 7	3494	13.71	9.16	5.80	9.16	6.83	1.91	0.23	Kamloops
1845	Secwempec	E-985-40-	832	22.64	20.89	10.10	20.89	13.32	3.80	1.35	Plateau
1846	SFU Museum	EeRi 7	3460	25.34	9.76	6.47	9.70	9.71	2.91	0.67	Kamloops
1847	Secwempec	E-985-40-	495	18.69	9.45	4.33	7.38	9.45	2.93	0.42	Kamloops
1848	RBC Museum	DjQy 5	275	22.51	11.23	6.31	8.92	11.23	3.60	0.61	Kamloops
1849	SFU Museum	EeRi 7	3612	27.72	12.68	6.86	12.68	8.19	2.88	0.83	Shuswap
1850	SFU Museum	EeRi 7	3220	24.23	10.15	5.61	9.09	10.17	2.57	0.48	Kamloops
1851	SFU Museum	EeRi 7	3304	27.53	10.91	5.93	10.91	6.20	3.62	0.80	Plateau
1852	SFU Museum	EeRi 7	3180	14.86	9.23	6.59	8.23	9.21	2.10	0.27	Shuswap
1853	SFU Museum	EeRi 7	3182	17.04	14.04	5.91	9.27	14.06	2.34	0.35	Kamloops
1854	SFU Museum	EeRi 7	3195	14.33	11.22	6.75	8.31	11.22	2.21	0.24	Kamloops
1855	SFU Museum	EeRi 7	3572	17.84	10.90	7.54	10.69	10.68	3.05	0.66	Shuswap
1856	SFU Museum	EeRi 7	3708	25.41	12.84	6.61	12.09	8.19	3.06	0.77	Shuswap
1857	SFU Museum	EeRi 7	3711	20.65	16.80	6.52	16.80	8.50	2.77	0.67	Plateau
1858	SFU Museum	EeRi 7	3722	16.41	10.81	6.09	8.79	10.62	2.23	0.33	Kamloops
1859	SFU Museum	EeRi 7	3742	34.42	26.14	7.71	26.14	9.14	3.37	2.08	Plateau
1860	SFU Museum	DjQg 9	surface A	28.34	14.83	8.42	14.19	11.77	5.16	2.07	Shuswap
1861	SFU Museum	DjQg 9	Surface B	24.15	14.86	8.23	12.09	14.85	4.15	1.48	Shuswap
1862	UBC Museum	FuRa X:1	1	38.21	28.85	14.42	28.85	NA	6.00	5.95	Plateau
1863	UBC Museum	FiRx 2	8	46.96	22.18	18.27	20.37	19.37	6.72	6.59	Shuswap
1864	UBC Museum	FiRx 1	18	34.52	19.85	7.69	19.85	9.02	5.50	3.14	Plateau
1865	UBC Museum	FiRx 1	19	37.67	20.80	10.41	20.80	12.74	6.43	4.72	Shuswap
1866	UBC Museum	FiRx 1	17	30.21	20.35	15.08	19.55	20.36	4.65	3.52	Shuswap
1867	UBC Museum	FiRv 1	43	28.69	20.65	15.32	20.65	16.62	5.75	3.07	Plateau
1868	UBC Museum	FiRv 1	45	18.28	10.06	6.99	9.16	10.06	2.65	0.45	Kamloops
1869	UBC Museum	FiRv 1	49	24.40	14.68	9.90	13.10	14.67	5.58	1.67	Kamloops
1870	UBC Museum	FiRv 1	40	26.33	18.86	13.62	18.84	16.70	6.51	3.74	Shuswap
1871	Penticton Museum	unknown	522	29.98	22.35	16.46	21.08	22.35	6.40	3.86	Kamloops
1872	UBC Museum	FiRv 1	51	24.40	11.44	6.77	11.41	NA	4.14	0.90	Plateau
1878	UBC Museum	EbRj 1	131	38.72	26.13	14.31	26.18	15.62	7.72	5.76	Plateau
1880	UBC Museum	EbRj 1	40	27.93	16.27	9.08	14.85	16.25	3.20	1.39	Kamloops
1881	RBC Museum	EeRk 4	11.23	22.60	12.40	6.79	9.88	12.40	2.71	0.60	Kamloops
1882	UBC Museum	EeQs 1	3	62.66	45.11	32.51	44.06	34.37	5.70	23.06	Shuswap
1885	UBC Museum	EcRi X	1	39.27	27.68	16.91	27.68	15.44	5.93	5.56	Shuswap
1886	UBC Museum	EcRi X	3	45.83	23.93	15.82	23.91	17.53	8.56	9.06	Shuswap
1887	RBC Museum	EeQw 7	1209	21.82	15.85	9.23	11.13	15.85	3.88	0.92	Kamloops
1888	UBC Museum	FeRk 1	199	45.75	32.11	20.69	31.41	27.92	6.48	10.63	Lehman
1889	UBC Museum	FeRk 1	176	51.46	24.56	13.74	24.28	20.76	6.48	10.63	Lehman
1890	UBC Museum	EeRk 1	41	50.28	29.31	12.55	26.01	14.50	6.03	6.23	Plateau

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
1891	UBC Museum	EeRk 1	1	37.23	22.39	13.48	21.86	12.18	4.98	3.72	Plateau
1892	UBC Museum	EeRk 1	44	25.46	18.65	11.64	18.41	14.56	6.80	3.38	Plateau
1894	UBC Museum	EfRl 3	159	33.58	20.84	10.56	19.59	8.90	6.62	3.93	Shuswap
1896	UBC Museum	EdRk 3	15	63.19	34.99	18.63	34.99	22.87	7.91	16.84	Plateau
1897	UBC Museum	EdRk 3	12	38.10	26.53	15.13	26.53	21.58	4.16	3.63	Plateau
1899	UBC Museum	EdRk 3	25	38.54	14.57	5.87	11.96	14.57	4.25	2.03	Kamloops
1900	Kelowna Museum	D4 - DlQm14	87	26.87	23.33	12.02	23.33	16.14	4.47	2.15	Plateau
1901	UBC Museum	EdRk 4	90	31.75	35.29	15.11	35.29	19.92	6.43	4.96	Plateau
1902	UBC Museum	EdRd 1	88	38.45	24.10	21.18	24.10	22.36	7.93	6.94	Lochnore
1903	UBC Museum	EdRd 1	87	22.73	14.94	11.01	14.94	14.30	3.86	1.21	Kamloops
1904	RBC Museum	EeQw 7	349	32.16	16.76	10.69	16.76	14.14	4.30	2.09	Shuswap
1905	UBC Museum	EhRf 15	8	36.61	22.62	13.88	22.50	19.01	5.47	3.74	Plateau
1906	UBC Museum	EhRf 9	3	27.55	17.11	12.79	17.11	13.29	5.05	2.24	Plateau
1907	UBC Museum	EfRl 5	141	27.95	22.32	15.08	22.32	16.28	3.91	2.67	Plateau
1909	UBC Museum	EfRl 5	10	30.24	19.67	14.03	19.67	11.60	6.47	3.47	Nesikep
1910	UBC Museum	EfRl 5	3	36.44	27.17	13.50	27.17	11.54	6.61	5.65	Nesikep
1911	UBC Museum	EfRl 5	5	33.67	21.35	14.57	20.17	19.77	8.15	6.64	Shuswap
1912	UBC Museum	EfRl 5	4	43.03	19.47	13.11	19.41	14.74	6.88	5.70	Shuswap
1913	UBC Museum	EfRl 5	9	42.89	21.59	14.78	16.65	21.59	6.36	5.49	Plateau
1914	UBC Museum	EfRl 5	16	40.31	26.48	18.00	27.44	19.37	5.68	5.60	Plateau
1915	UBC Museum	EfRl 5	6	39.63	13.82	8.78	13.82	10.86	4.81	2.17	Plateau
1916	UBC Museum	EfRl 5	8	37.23	19.84	9.27	19.75	NA	3.84	2.86	Plateau
1918	UBC Museum	EdQx 5	209	35.99	20.20	11.58	20.20	9.91	7.03	3.72	Plateau
1919	UBC Museum	EdQx 5	206	33.40	20.49	7.36	20.49	11.28	5.65	2.82	Plateau
1920	UBC Museum	EdQx 5	228	23.79	20.86	6.00	20.81	6.23	5.27	2.51	Plateau
1922	UBC Museum	EdQx 5	381	57.55	22.30	13.10	22.15	11.07	5.96	6.90	Shuswap
1923	UBC Museum	EdQx 5	329	27.02	15.00	8.81	15.00	12.96	6.58	2.13	Shuswap
1925	UBC Museum	EbRj X	46	36.89	16.21	7.88	14.13	15.96	3.16	1.39	Kamloops
1926	UBC Museum	EbRj 14	4	28.36	16.76	8.16	14.55	16.76	3.44	1.49	Kamloops
1927	UBC Museum	EbRj 14	2	28.05	15.99	8.85	14.05	15.99	4.20	1.52	Kamloops
1928	UBC Museum	EbRj 14	3	43.67	17.10	8.46	14.59	9.18	4.50	3.13	Kamloops
1929	UBC Museum	EiRh 6	10	28.82	21.84	11.12	21.04	11.15	5.91	3.60	Plateau
1930	RBC Museum	EeQw 7	1731	19.20	11.48	8.57	11.47	11.49	2.87	0.61	Kamloops
1931	UBC Museum	EiRh 7	34	36.97	26.83	12.21	26.83	13.37	7.14	6.16	Plateau
1933	UBC Museum	EiRe 1	1	63.61	34.83	29.21	34.83	24.04	8.55	20.49	Lochnore
1934	UBC Museum	EiRh 4	3	41.31	25.14	13.34	25.14	14.77	5.09	4.19	Plateau
1935	UBC Museum	EiRh 4	4	32.72	22.14	16.51	22.23	20.48	4.46	3.13	Plateau
1936	UBC Museum	EfRl 3	13	39.46	31.31	18.85	31.28	27.97	5.95	7.84	Lehman
1937	UBC Museum	EfRl 3	2	41.13	19.98	16.76	18.91	20.37	8.90	6.67	Lochnore

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1938	SFU Museum	DiRa 20	99-06	32.11	17.64	10.36	17.64	8.54	4.16	2.10	Plateau
1940	UBC Museum	EfRl 3	147	37.48	23.06	12.15	22.93	12.17	7.18	5.02	Shuswap
1941	RBC Museum	EeQw 7	1823	37.07	17.02	9.46	13.85	17.02	3.42	1.70	Kamloops
1942	UBC Museum	EfRl 3	150	26.55	29.31	11.87	29.23	15.05	5.67	4.56	Plateau
1943	UBC Museum	EfRl 3	183	24.06	27.78	13.77	28.59	NA	5.05	3.77	Plateau
1944	RBC Museum	E R y	992	33.58	19.05	9.87	18.29	15.07	4.14	2.07	Plateau
1945	UBC Museum	EeRl 7	372	13.31	5.32	0.64	5.04	1.53	2.87	0.73	Shuswap
1946	SFU Museum	EfQv 12	03-1037a	36.07	24.54	12.21	24.34	13.65	4.06	3.16	Plateau
1947	UBC Museum	GaSa 1	7	74.74	28.59	21.99	27.78	23.61	7.22	15.53	Nesikep
1948	UBC Museum	Ma 3783	3783	63.23	31.02	21.11	29.58	19.19	11.99	23.93	Lochnore
1949	UBC Museum	E B	311	62.87	32.80	20.05	32.70	12.52	8.40	17.13	Lochnore
1950	UBC Museum	E B	407	83.45	46.79	19.09	45.10	11.92	2.84	15.72	Lochnore
1951	UBC Museum	EeRb X	2	18.86	13.88	8.06	9.51	13.87	4.42	0.83	Kamloops
1952	UBC Museum	EeRb X	3	18.44	14.04	7.24	11.49	13.71	3.25	0.77	Kamloops
1953	UBC Museum	EeRb X	5	17.98	15.72	8.37	15.72	NA	4.08	1.25	Kamloops
1954	UBC Museum	EeRb X	4	21.71	15.55	9.05	13.85	?13.28	2.87	0.84	Kamloops
1955	UBC Museum	EeRb X	6	11.01	19.77	9.65	NA	19.77	2.96	0.75	Kamloops
1956	UBC Museum	EeRb X	1	44.90	28.30	12.41	27.84	12.63	6.24	6.73	Plateau
1957	UBC Museum	EfRl 5	265	24.83	20.97	14.66	21.90	16.93	7.09	33.35	Shuswap
1958	UBC Museum	EfRl 5	235	56.73	25.92	NA	25.46	13.80	6.80	9.92	Plateau
1959	Kelowna Museum	K1 - EaQl14	845	30.26	14.35	5.81	14.35	7.18	5.66	1.73	Shuswap
1960	UBC Museum	EfRl 3	301	25.18	14.67	6.97	9.74	14.67	3.25	0.98	Kamloops
1961	UBC Museum	EeQw 3	5	53.64	23.27	17.23	22.33	18.42	5.59	7.18	Nesikep
1962	UBC Museum	EeQw 2	2	51.21	21.77	20.02	21.75	20.20	5.24	7.06	Nesikep
1963	UBC Museum	FlRv 2	1	72.85	27.68	20.63	27.21	24.59	8.20	17.44	Nesikep
1964	UBC Museum	FlSa 1	18	27.98	20.47	13.43	20.49	15.98	6.36	3.64	Shuswap
1966	UBC Museum	FiSi 1	229	43.21	21.14	14.90	19.85	16.25	6.57	5.95	Nesikep
1967	Secwempec	E-985-40-	496	26.38	12.80	6.78	11.70	12.80	3.25	0.83	Kamloops
1968	UBC Museum	FiSa 3	35	68.56	29.25	18.29	29.25	24.11	6.38	11.86	Plateau
1969	UBC Museum	EiRh 9	3	38.85	21.80	9.58	21.80	12.03	3.49	2.78	Plateau
1970	RBC Museum	EeQw 7	1229	16.41	14.23	7.58	14.23	9.00	2.33	0.57	Plateau
1971	UBC Museum	EiRm 4	5	20.20	26.15	13.33	26.15	14.57	4.77	2.37	Plateau
1972	UBC Museum	EfRl 3	288	43.27	29.12	13.39	29.12	NA	5.72	5.76	Plateau
1973	UBC Museum	EfRl 3	292	36.18	23.76	14.15	23.76	19.22	7.01	5.10	Plateau
1974	UBC Museum	EfRl 3	299	37.36	18.98	14.79	18.98	17.42	4.36	2.85	Plateau
1975	UBC Museum	EfRl 3	294	47.20	32.20	15.83	31.22	26.72	5.52	8.41	Lehman
1976	Secwempec	E-985-40-	394	28.34	14.62	7.67	14.62	10.65	3.47	1.20	Plateau
1977	UBC Museum	EfRl 3	293	35.82	21.68	11.85	21.68	13.85	5.09	3.79	Plateau
1978	UBC Museum	EfRl 3	290	35.49	31.87	20.19	31.14	23.01	4.56	5.84	Lehman

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1979	UBC Museum	EfRk 1	113	42.37	31.30	14.67	31.30	14.70	8.39	10.76	Plateau
1981	UBC Museum	EqRi 10	3	17.54	18.68	9.31	18.68	13.43	3.17	0.87	Kamloops
1982	RBC Museum	DkQj 3	11	24.99	13.66	6.93	12.45	12.47	4.03	0.96	Kamloops
1983	UBC Museum	DhRt 7	1	69.18	37.40	19.68	35.89	NA	7.56	17.13	Shuswap
1984	UBC Museum	DhPt 9	110	16.75	20.11	14.35	19.68	17.43	5.61	2.30	Shuswap
1985	UBC Museum	DhPt 9	109	20.22	20.67	15.86	20.69	18.17	4.81	1.95	Plateau
1987	UBC Museum	DhPt 9	102	32.18	20.32	13.29	19.65	20.30	5.15	3.32	Plateau
1988	UBC Museum	DhPt 9	113	29.26	17.30	11.20	16.59	17.27	4.91	2.34	Plateau
1989	UBC Museum	DhPt 9	107	42.68	24.24	14.04	24.24	15.91	4.72	4.80	Plateau
1990	UBC Museum	EcPx 6	26	36.00	17.77	14.29	17.77	15.02	5.34	3.58	Shuswap
1991	UBC Museum	EcPx 6	11	25.53	12.64	8.20	12.60	12.64	2.77	0.83	Kamloops
1992	UBC Museum	EcPx 6	12	22.06	14.93	8.61	14.64	13.89	3.13	0.99	Kamloops
1993	UBC Museum	EcPx 6	15	13.73	15.23	12.64	14.52	15.19	2.57	0.57	Plateau
1994	SFU Museum	Keatly (SV)	photo 0273	24.94	12.01	6.01	9.03	12.02	2.30	0.45	Kamloops
1995	UBC Museum	EcRx 4	22	18.17	13.98	10.75	12.88	13.87	4.84	1.17	Plateau
1996	UBC Museum	EcRx 4	40	48.52	21.61	11.37	21.60	15.68	5.22	5.17	Plateau
1999	UBC Museum	EeRl 4	7	36.37	24.65	15.61	24.53	18.04	6.87	6.22	Plateau
2000	UBC Museum	EeRl 4	199	16.38	15.90	6.85	16.04	8.12	2.51	0.56	Plateau
2001	UBC Museum	EeRh 1	6	34.09	15.58	6.78	14.50	15.58	3.21	1.42	Kamloops
2002	UBC Museum	EeRh 1	5	30.03	15.79	8.97	15.17	15.79	4.42	1.85	Kamloops
2004	UBC Museum	DhQu X	61	52.76	29.66	14.24	29.66	14.32	6.88	7.86	Plateau
2005	UBC Museum	EbPw 1	17	48.27	22.55	14.79	22.55	16.33	6.91	7.34	Nesikep
2006	UBC Museum	EbPx 12	10	32.18	21.08	10.42	21.04	15.19	5.67	3.29	Plateau
2007	UBC Museum	EgRj 1	4	42.28	19.44	14.50	19.41	15.86	5.50	4.60	Plateau
2008	UBC Museum	EgRj 1	12	65.97	22.92	12.40	22.43	15.75	6.84	8.72	Plateau
2009	UBC Museum	EfQn 2	1	37.22	26.20	14.29	26.20	15.45	4.99	5.58	Plateau
2010	UBC Museum	EfQu 2	1	34.97	22.73	12.80	22.73	13.10	5.21	3.66	Plateau
2011	UBC Museum	EfQu 1	2	39.62	19.71	11.53	19.71	13.56	6.31	3.98	Plateau
2012	UBC Museum	EfQu X	3	30.35	19.51	15.96	19.51	19.50	4.70	3.00	Plateau
2013	UBC Museum	GaSc 1	1	54.51	20.35	12.65	20.35	14.39	7.18	6.69	Shuswap
2014	UBC Museum	Gasa 8	2	59.92	22.16	21.06	22.16	19.38	5.52	8.62	Nesikep
2015	UBC Museum	FlRv 1	47	42.98	22.55	16.89	22.90	19.36	8.42	6.94	Shuswap
2021	UBC Museum	FlSa 1	45	43.27	19.07	13.03	19.28	13.69	6.02	4.88	Shuswap
2023	UBC Museum	FlSa 1	89	52.15	24.34	12.99	24.34	16.43	6.33	7.77	Plateau
2027	UBC Museum	FlSa 1	47	49.25	20.01	12.65	19.46	13.17	6.33	5.31	Nesikep
2029	UBC Museum	FlSa 1	98	24.58	24.62	13.45	23.32	15.92	5.38	3.02	Plateau
2030	SFU Museum	EeRb 140	57	30.14	20.97	15.50	20.97	17.69	6.87	3.74	Shuswap
2031	SFU Museum	EeRb 140	1720	21.59	13.76	7.69	13.76	13.85	3.47	0.90	Kamloops
2032	UBC Museum	FlSa 1	1117	31.98	19.34	9.36	19.34	9.21	4.58	2.05	Lehman

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2033	UBC Museum	FlSa 1	66	42.25	17.15	9.97	14.43	12.01	4.17	3.00	Shuswap
2034	Kelowna Museum	Manhattan Beach	7-39	30.70	14.65	6.36	14.65	6.92	2.72	0.94	Plateau
2035	UBC Museum	EkRo 16	61	16.62	11.88	5.88	11.60	11.76	2.86	0.61	Kamloops
2036	UBC Museum	EkRo 16	176	23.44	13.30	8.08	13.33	10.63	2.91	0.77	Kamloops
2037	UBC Museum	EkRo 25	2	29.01	15.93	9.64	12.16	15.93	3.14	0.94	Kamloops
2038	UBC Museum	EkRo 25	7	26.17	13.38	8.67	12.27	13.38	2.79	0.63	Kamloops
2039	UBC Museum	EkRo 25	4	18.66	13.11	7.06	10.62	13.11	2.92	0.47	Kamloops
2040	UBC Museum	EkRo 48	288	22.70	14.59	8.50	14.06	14.40	3.75	0.96	Kamloops
2041	UBC Museum	EjRe 13	213	40.15	30.49	18.96	31.05	23.84	5.96	6.87	Lehman
2042	UBC Museum	EjRe 13	208	44.75	18.45	13.91	18.45	16.40	6.38	4.60	Shuswap
2043	UBC Museum	EjRe 13	220	25.44	18.66	12.09	18.64	14.81	4.98	2.00	Nesikep
2044	UBC Museum	EjRe 13	201	36.01	25.31	16.44	22.75	11.59	5.90	5.15	Shuswap
2045	UBC Museum	EjRe 13	217	28.61	27.83	12.70	27.53	13.20	4.92	4.34	Nesikep
2047	UBC Museum	EbRc 2	7	35.59	22.69	13.34	19.45	18.68	5.46	4.45	Lehman
2048	RBC Museum	EeQw 7	1207	23.01	11.04	7.26	8.93	10.92	2.80	0.58	Kamloops
2049	UBC Museum	EbRg X	1	43.69	22.54	15.29	22.49	17.75	9.56	7.78	Plateau
2051	SFU Museum	EeRb 77	272	22.01	12.96	7.54	12.96	12.86	2.44	0.69	Kamloops
2052	RBC Museum	EeRk 4	11.24	20.64	13.89	8.62	12.16	13.89	2.75	0.63	Kamloops
2053	UBC Museum	EkSa X	18	15.74	14.18	9.00	12.81	14.13	2.97	0.58	Kamloops
2054	UBC Museum	EkSa X	8	14.12	13.53	7.78	12.43	13.46	2.85	0.55	Kamloops
2055	UBC Museum	EkSa X	5	22.11	10.49	6.94	9.30	9.25	3.67	79.00	Kamloops
2056	UBC Museum	EkSa X	9	14.20	11.82	6.63	9.22	11.82	2.63	0.34	Kamloops
2057	RBC Museum	E R y	1022	30.23	18.94	8.63	14.26	18.94	3.83	1.45	Kamloops
2058	UBC Museum	ElSf 1	3	36.67	20.73	15.85	20.70	20.63	7.03	4.65	Plateau
2059	Penticton Museum	unknown	A593	43.50	20.02	13.02	20.02	14.45	6.06	4.47	Plateau
2060	UBC Museum	ElSf 1	2	27.70	17.37	15.25	17.07	17.30	4.95	2.20	Plateau
2061	UBC Museum	ElSf 1	8	34.06	18.29	12.28	18.28	14.76	7.02	4.22	Plateau
2062	SFU Museum	EeRb 77	606	32.39	16.31	9.42	16.31	13.28	5.10	2.51	Plateau
2064	UBC Museum	EhRi 1	1	18.91	16.37	8.67	14.33	16.37	3.27	0.83	Kamloops
Not Used	Chase Museum	Carryl Coles	d	58.82	27.31	19.44	27.31	9.50	7.52	11.37	Lancolate
Not Used	Kelowna Museum	EaQl 13	361	63.79	23.37	19..08	23.37	15.44	9.08	12.38	Lancolate
Not Used	Penticton Museum	DlQv 4	435	28.52	12.02	10.47	12.02	8.28	4.83	1.42	Lancolate
Not Used	Penticton Museum	DlQv 4	413	33.92	17.85	14.30	17.85	10.67	5.68	3.23	Lancolate
Not Used	Penticton Museum	DlQv 4	411	46.01	17.39	13.59	17.39	9.07	5.03	4.06	Lancolate
Not Used	Penticton Museum	unknown	398	57.38	22.25	14.82	22.25	9.08	7.85	8.47	Lancolate
Not Used	Penticton Museum	DlQv 4	551	57.41	24.47	18.34	24.47	12.52	7.12	10.18	Lancolate
Not Used	Penticton Museum	U	JH 534	77.53	31.53	24.29	31.33	13.66	6.38	16.10	Lancolate
Not Used	Penticton Museum	DlQv 8	A17	80.89	35.77	22.99	35.77	25.52	7.59	23.63	Lancolate
Not Used	Penticton Museum	DlQv 8	9	91.13	31.96	27.76	31.96	14.76	11.56	35.51	Lancolate

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Not Used	Penticton Museum	DlQv 4	516	94.01	30.59	19.08	27.03	18.16	7.88	24.43	Lancolate
Not Used	Penticton Museum	DlQv 5	72	95.91	41.00	35.53	41.00	24.60	8.48	30.99	Lancolate
Not Used	RBC Museum	E R y	1021	24.85	18.78	10.94	16.18	18.78	3.13	1.13	Kamloops
Not Used	RBC Museum	EeQw 7	1738	25.97	12.67	6.71	12.21	12.67	3.43	0.86	Kamloops
Not Used	RBC Museum	EeQw 7	1716	33.08	10.98	7.37	10.98	4.51	4.38	1.39	Lancolate
Not Used	RBC Museum	DiQm 8	1	34.83	31.45	13.65	31.45	12.01	4.09	3.52	Plateau
Not Used	RBC Museum	EeQw 7	234	36.25	19.83	14.96	19.83	11.16	6.72	5.08	Lancolate
Not Used	RBC Museum	EcQt y	4	38.51	22.92	17.66	22.92	13.08	6.49	5.56	Lancolate
Not Used	RBC Museum	EeRk 4	6.52	40.22	18.48	14.07	18.48	15.20	5.65	3.74	Shuswap
Not Used	RBC Museum	DiQy 5	254	42.01	21.29	17.28	21.29	12.62	5.29	4.49	Lancolate
Not Used	RBC Museum	E R y	1083	42.88	14.97	11.69	14.97	8.49	5.22	3.69	Lancolate
Not Used	RBC Museum	EbQu 15	64	43.96	24.04	18.11	24.04	8.61	7.90	7.81	Lancolate
Not Used	RBC Museum	EeQw 7	1832	46.65	20.80	12.74	20.80	10.70	7.49	6.32	Shuswap
Not Used	RBC Museum	EbQu 15	61	47.96	19.51	13.27	19.51	6.75	8.39	7.01	Lancolate
Not Used	RBC Museum	EeRj 15	177	47.98	20.93	14.24	20.93	10.26	8.80	9.17	Lancolate
Not Used	RBC Museum	DlRj 9	51	51.01	19.63	17.15	19.63	9.66	8.69	7.90	Lancolate
Not Used	RBC Museum	EdRh 89	6	53.17	20.39	12.07	20.39	5.75	7.07	6.44	Lancolate
Not Used	RBC Museum	EeRk 4	2.136	55.06	25.22	20.05	23.85	16.70	8.83	12.57	Lancolate
Not Used	RBC Museum	EcQv 2	1	55.48	21.62	17.16	21.62	9.54	6.92	8.57	Lancolate
Not Used	RBC Museum	DiQm 13	2	56.39	29.33	NA	29.33	NA	4.94	6.42	Triangular
Not Used	RBC Museum	EbQu 15	48	57.04	26.13	16.35	26.13	15.66	5.69	8.86	Lancolate
Not Used	RBC Museum	EcQv 2	63	57.91	24.90	21.94	24.90	16.20	5.28	7.22	Lancolate
Not Used	RBC Museum	EbQu 15	96	58.69	28.20	22.44	28.20	18.25	11.19	18.33	Lancolate
Not Used	RBC Museum	Egh Rm-Y	18	62.48	15.63	12.21	15.63	6.33	6.23	6.00	Lancolate
Not Used	RBC Museum	EeRk 4	6.123	63.10	30.01	22.73	30.01	17.83	9.49	18.72	Lancolate
Not Used	RBC Museum	EcRi y	3	63.56	30.07	25.09	30.07	25.09	8.35	15.26	Lancolate
Not Used	RBC Museum	EeRp 47	9	64.52	30.73	24.05	30.73	12.02	9.91	16.33	Lancolate
Not Used	RBC Museum	EfRh 64	1	67.32	33.07	24.56	33.07	9.88	7.73	14.81	Lancolate
Not Used	RBC Museum	EeRk 4	11.45	67.32	32.28	24.21	32.28	24.21	9.45	19.98	Lancolate
Not Used	RBC Museum	EcQt 12	8	70.88	25.71	19.44	25.71	10.22	6.27	12.56	Lancolate
Not Used	RBC Museum	EbQu 15	87	73.68	28.52	24.40	28.52	8.94	10.44	20.01	Lancolate
Not Used	RBC Museum	EbQu 15	69	74.17	27.56	20.44	20.44	9.63	9.97	18.71	Lancolate
Not Used	RBC Museum	EbQu 15	96	79.03	34.74	30.21	34.74	18.54	12.50	34.09	Lancolate
Not Used	RBC Museum	EeRk 4	23.56	89.47	36.10	32.04	36.10	24.70	8.20	27.98	Lancolate
Not Used	RBC Museum	DiQy 5	356	95.82	26.66	22.55	26.66	12.08	7.31	17.40	Lancolate
Not Used	Secwempec	987.9	241	22.54	12.18	7.67	10.86	12.18	3.03	0.78	Kamloops
Not Used	Secwempec	987.9	207	27.92	12.09	6.64	11.35	12.09	3.20	0.90	Kamloops
Not Used	Secwempec	E-985-40-	804	41.96	20.24	20.19	20.19	9.81	6.68	4.09	Plateau
Not Used	Secwempec	EeRb 3	180	42.44	17.02	12.91	17.02	10.70	5.88	4.02	Lancolate

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
Not Used	Secwempec	987.9	302	44.59	19.40	14.58	19.40	12.12	6.20	5.30	Shuswap
Not Used	Secwempec	987.9	146	46.54	21.33	16.88	21.33	14.44	6.94	5.88	Lancolate
Not Used	Secwempec	987.9	157	47.40	24.10	15.76	24.10	10.56	4.03	4.72	Lancolate
Not Used	Secwempec	E-985-40-	448	56.13	17.51	14.15	17.51	9.50	7.65	7.48	Lancolate
Not Used	Secwempec	988.12	86	69.22	27.27	15.51	25.74	8.19	8.29	16.17	Lancolate
Not Used	Secwempec	988.8	112	69.31	28.14	17.84	28.14	9.65	6.42	10.94	Lancolate
Not Used	Secwempec	E-985-40-	446	69.35	19.91	15.96	19.91	9.20	8.01	10.72	Lancolate
Not Used	Secwempec	E-985-40-	228	72.46	21.31	15.44	21.31	9.95	8.42	11.60	Lancolate
Not Used	SFU Museum	EeRb 144	1457	13.04	7.55	7.19	7.55	6.50	3.28	0.34	Lancolate
Not Used	SFU Museum	EdRi 11	360	20.41	16.55	7.80	16.55	8.91	3.37	0.66	NO Photo
Not Used	SFU Museum	EdRi 11	1436	20.80	16.60	6.03	16.60	NA	3.50	0.75	NO Photo
Not Used	SFU Museum	EeRb 144	206	28.96	10.49	8.62	10.49	6.76	3.84	1.08	Lancolate
Not Used	SFU Museum	DiRa 20	00-05 J	29.54	21.45	9.73	21.45	10.57	4.00	2.25	Plateau
Not Used	SFU Museum	EeRb 140	395	31.39	15.90	14.76	15.90	15.90	2.45	1.08	Triangular
Not Used	SFU Museum	EeRb 140	501	31.47	15.94	13.66	15.94	15.94	2.49	1.09	Triangular
Not Used	SFU Museum	EeRb 130	40	31.51	16.22	12.64	16.22	9.73	6.42	3.16	Lancolate
Not Used	SFU Museum	EeRb 130	4	31.81	18.99	8.01	18.99	8.66	4.24	2.19	Plateau
Not Used	SFU Museum	DiRa 20	00-08 A	33.42	19.75	9.40	19.91	10.24	4.71	2.34	Plateau
Not Used	SFU Museum	EdRi 11	1435	33.75	12.99	6.01	12.99	8.78	4.68	3.30	NO Photo
Not Used	SFU Museum	EdRi 11	476	34.81	30.95	26.51	30.97	30.95	8.17	7.86	Lancolate
Not Used	SFU Museum	EbRj 3	4	35.22	13.85	NA	11.72	13.85	5.56	2.16	Lancolate
Not Used	SFU Museum	EeRb 144	1697	35.91	16.74	14.30	16.74	6.50	6.88	4.01	Lancolate
Not Used	SFU Museum	EeRb 75	1	35.99	13.11	10.37	13.11	8.76	5.49	2.49	Lancolate
Not Used	SFU Museum	EeRb 77	87	36.85	26.68	11.72	26.68	10.79	4.45	3.71	Plateau
Not Used	SFU Museum	EdRi 11	230	39.90	31.18	30.21	31.19	25.32	5.72	6.60	Triangular
Not Used	SFU Museum	Keatly (SV)	photo 0295	40.20	27.26	22.75	21.79	27.26	6.45	5.39	Triangular
Not Used	SFU Museum	EeRb 184	1	41.6	17.33	12.65	17.33	10.5	4.91	3.4	Lancolate
Not Used	SFU Museum	EdRi 11	376	42.00	20.77	9.50	20.77	NA	4.40	3.23	NO Photo
Not Used	SFU Museum	EeRb 140	201	42.24	16.63	14.31	16.63	8.30	5.23	3.65	Lancolate
Not Used	SFU Museum	DiRa 20	109	42.37	20.42	12.54	20.31	6.45	7.59	5.44	Lancolate
Not Used	SFU Museum	EeRb 77	1200	43.19	17.38	15.44	17.38	8.24	8.10	5.82	Lancolate
Not Used	SFU Museum	EeRb 77	1236	43.51	28.52	26.21	28.52	28.52	4.03	4.33	Triangular
Not Used	SFU Museum	EeRb 77	331	44.65	24.83	20.85	24.83	12.59	6.21	6.70	Lancolate
Not Used	SFU Museum	Keatly (SV)	photo 300	44.94	28.32	24.01	20.75	28.32	5.92	5.20	Triangular
Not Used	SFU Museum	Keatly (SV)	photo 0291	45.25	31.71	24.24	31.71	16.75	8.25	10.45	Triangular
Not Used	SFU Museum	EfQt 1	222	47.70	19.88	13.55	19.66	10.84	7.04	6.38	Lancolate
Not Used	SFU Museum	Keatly (SV)	photo 0299	49.37	32.95	25.32	21.92	32.95	5.06	5.73	Triangular
Not Used	SFU Museum	EdRi 25	3	49.44	25.00	19.42	25.00	10.30	6.42	7.55	Lancolate
Not Used	SFU Museum	EdRi 25	3	49.48	25.99	18.65	25.99	9.84	6.41	7.55	NO Photo

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
Not Used	SFU Museum	EeRb 144	68	49.82	16.45	11.80	16.45	8.65	4.58	3.50	Lancolate
Not Used	SFU Museum	EeRb 77	562	50.56	17.65	13.92	17.65	10.17	6.80	5.67	Lancolate
Not Used	SFU Museum	Edri 25	5	51.91	26.87	21.06	26.88	18.99	7.64	9.59	Lancolate
Not Used	SFU Museum	EdRi 25	2	52.28	25.06	22.50	25.08	15.47	7.57	10.70	Lancolate
Not Used	SFU Museum	Keatly (SV)	photo 0296	53.55	34.97	28.56	26.90	34.97	5.77	7.51	Triangular
Not Used	SFU Museum	EdRi 11	302	56.56	29.18	24.62	29.19	12.82	10.36	13.75	Lancolate
Not Used	SFU Museum	EeRb 144	67	56.97	16.53	14.46	16.53	7.88	8.59	6.99	Lancolate
Not Used	SFU Museum	EdRi 25	1	58.68	26.38	21.79	26.38	13.34	7.31	10.62	NO Photo
Not Used	SFU Museum	EeRb 144	702	61.54	19.14	14.91	19.14	6.78	9.68	11.03	Lancolate
Not Used	SFU Museum	EdRi 25	4	62.15	22.51	18.36	22.51	5.65	6.46	9.45	Lancolate
Not Used	SFU Museum	EeRb 77	551	67.36	29.12	28.12	29.12	16.23	9.02	19.15	Lancolate
Not Used	SFU Museum	EeRb 190	1	67.81	20.65	14	20.65	10.14	9.27	11.48	Lancolate
Not Used	SFU Museum	EeRi 7	3814	69.99	26.96	22.48	26.99	15.60	10.84	17.07	Lancolate
Not Used	SFU Museum	EeRb 144	1339	70.20	25.92	23.57	25.92	25.92	4.90	6.68	Triangular
Not Used	SFU Museum	EfQt 1	212	70.55	35.73	21.45	35.45	10.60	11.61	25.20	Lancolate
Not Used	SFU Museum	EfQt 1	183	94.61	30.93	21.72	30.53	11.15	11.12	31.36	Lancolate
Not Used	SFU Museum	EeRb 191	6	115.25	37.5	34.21	37.5	27.83	13.53	50.26	Lancolate
Not Used	UBC Museum	EiRh 7	10	17.47	20.86	17.80	20.86	13.11	6.63	2.82	Lancolate
Not Used	UBC Museum	DhPt 9	115	28.81	18.01	17.52	16.51	16.51	3.17	1.72	Triangular
Not Used	UBC Museum	EbRj 1	295	30.95	32.16	26.63	32.16	14.36	10.18	10.88	Lancolate
Not Used	UBC Museum	EbRj 1	296	31.39	33.45	25.58	38.45	13.90	8.87	9.53	Lancolate
Not Used	UBC Museum	EfRk X	6	36.68	17.61	14.49	17.61	10.39	7.55	4.53	Lancolate
Not Used	UBC Museum	EfRl 3	16	38.45	28.15	22.13	28.15	12.81	5.21	5.89	Lancolate
Not Used	UBC Museum	EdQx 5	248	45.46	19.05	16.05	19.01	8.24	7.25	5.37	Lancolate
Not Used	UBC Museum	EeRn 2	1	45.48	16.63	14.94	18.65	12.13	7.68	6.80	Lancolate
Not Used	UBC Museum	FlSa 1	100	48.64	18.84	15.02	18.39	14.93	7.82	6.71	Lancolate
Not Used	UBC Museum	FlSa 7	8	51.16	18.27	16.16	18.23	12.70	6.28	5.55	Lancolate
Not Used	UBC Museum	EfRl 5	2	52.00	21.22	16.93	21.22	13.23	6.73	7.86	Lancolate
Not Used	UBC Museum	EdQx 5	133	53.56	18.93	14.60	18.89	8.29	3.44	5.07	Lancolate
Not Used	UBC Museum	EdRk 3	26	54.84	28.19	23.07	28.02	13.74	5.04	7.31	Lancolate
Not Used	UBC Museum	EeRk 1	40	57.00	20.36	13.30	19.11	12.86	7.35	8.60	Lancolate
Not Used	UBC Museum	FiRv 1	21	57.48	25.97	20.03	25.97	12.92	7.10	10.34	Lancolate
Not Used	UBC Museum	FlSa 1	24	59.80	23.51	16.81	23.01	10.17	6.54	9.34	Lancolate
Not Used	UBC Museum	EbRj 7	13	61.12	26.33	23.44	26.33	22.79	8.00	12.77	Lancolate
Not Used	UBC Museum	EcRi X	2	62.82	29.06	21.95	28.99	14.19	8.62	13.73	Lancolate
Not Used	UBC Museum	FlSa 1	5	67.82	21.27	16.28	21.26	10.16	8.49	11.81	Lancolate
Not Used	UBC Museum	EcRx 4	41	70.87	30.14	24.10	30.14	20.01	6.71	16.22	Lancolate
Not Used	UBC Museum	EbRj 7	11	72.95	16.66	NA	16.66	NA	6.41	8.31	Lancolate
Not Used	UBC Museum	EjRe 12	2	74.62	23.45	17.17	23.45	12.40	12.65	17.94	Lancolate

working number	collection location	Borden Number / Geographical information	Artifact Number	Total Length	Max Width	Neck Width	Shoulder Width	Base Width	Max Thickness	Total Weight	Point Type
Not Used	UBC Museum	EfRk 1	15	76.04	39.12	NA	39.12	31.27	12.97	40.92	Lancolate
Not Used	UBC Museum	FlSa 1	15	78.39	30.54	21.33	24.73	12.72	7.29	19.41	Lancolate
Not Used	UBC Museum	FlSa 1	23	80.85	25.71	19.11	25.70	13.16	10.78	20.35	Lancolate
Not Used	UBC Museum	EcRi X	4	82.08	36.20	20.51	34.17	7.74	9.41	33.43	Lancolate
Not Used	UBC Museum	EeRh 1	19	82.41	36.10	33.63	35.94	27.72	6.77	21.73	Lancolate
Not Used	UBC Museum	ExRx 5	1	85.10	32.99	29.03	32.99	24.06	13.64	36.97	Lancolate
Not Used	UBC Museum	FlSa 1	14	86.48	34.04	24.61	31.62	13.37	8.06	22.87	Lancolate
Not Used	UBC Museum	EfQv X	2	87.97	31.90	24.92	31.90	7.87	11.03	31.75	Lancolate
Not Used	UBC Museum	EdRk 3	8	90.89	29.04	21.20	29.00	12.47	12.51	26.72	Lancolate
Not Used	UBC Museum	FlSa 1	13	94.06	32.82	26.84	32.82	11.71	9.75	29.08	Lancolate
Not Used	UBC Museum	FlSa 7	7	105.83	33.47	27.40	33.40	16.16	12.52	34.32	Lancolate
Not Used	UBC Museum	FlSa 1	1108	111.89	38.96	35.56	30.96	21.89	10.29	49.59	Lancolate

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