

CHAPTER 13

Six Facets of Quartz Crystal Tools from the Stave River

Duncan McLaren

Cordillera Archaeology

Brendan Gray

Cordillera Archaeology

Introduction and Background

Quartz crystals are relatively common in archaeological sites of the lower Fraser River and Salish Sea regions. As of 2016 there are 93 recorded sites reported to contain quartz crystal objects in British Columbia (Figure 1). The majority of these sites are situated on the eastern side of Vancouver Island, the Fraser River drainage, the Peace River region, and southeastern BC. A lower frequency of these objects in northwestern BC may be due to less archaeological work in that region compared to southern BC. Different types of quartz crystal artifacts found at the Ruskin Dam Site in the lower Fraser River region (Gray et al. 2010) are related to a range of tasks and activities. Here we explore six ‘facets’ of quartz crystal use:

- (1) processes of quartz crystal tool manufacturing;
- (2) use of quartz crystals as carving tools;
- (3) quartz crystal microblade industry;
- (4) quartz crystals as objects of personal ornaments;
- (5) quartz crystals and metaphysics; and
- (6) quartz crystal as an exchange commodity.

These facets form an interpretive mosaic through which this valuable, hard, and aesthetically pleasing lithic raw material can be understood.

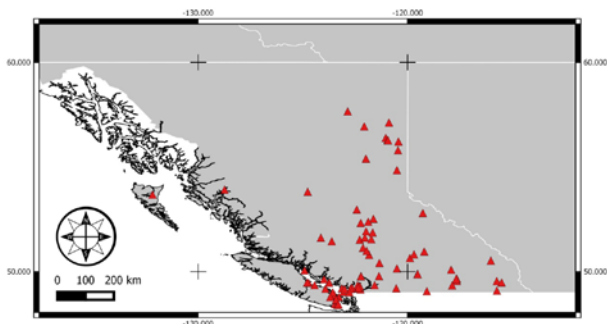


Figure 1. Locations of recorded archaeological sites containing quartz crystal artifacts in B.C.

In the Fraser Valley region, quartz crystal is most commonly associated with the Locarno Beach phase. Rankin’s (2010) analysis of quartz crystal debitage from the

Crescent Beach Site (DgRr-1) indicates a low frequency associated with Charles Phase strata dating between 5,500 and 3500 BP (6300 to 3800 Cal BP). The highest frequency is found in Locarno Beach Phase components dating between 3500 and 2500 BP (3800 to 2600 Cal BP), and a lesser amount in the subsequent Marpole Phase from 2500 to 1500 BP (2600 to 1400 Cal BP). Patenaude (1985:201) found a similar pattern at the mouth of the Pitt River.



Figure 2. A well-made quartz crystal biface from site DhRo 14, upstream of Stave Falls.

Quartz crystal is a very hard and dense lithic raw material that is available in the lower Fraser Valley at different locations in the Garibaldi and Cheam mountain ranges (e.g., Foley Peak). It has a hardness of 7 on the Mohs scale and is the hardest commonly available material known in the region. For this reason, quartz crystal was a valuable toolstone used to chisel, cut, groove and incise other objects (Stewart 1973).

Quartz crystal objects have been found during surface and subsurface inspections of archaeological sites in the Stave River drainage (Figure 2). Excavations at the Ruskin Dam Site (DhRo-59), on the lower Stave River, secured an assemblage containing 10% of all lithics from all strata bearing cultural deposits (Gray et al. 2010). A total of 485 quartz crystals were classified into different artifact types (Table 1). A remarkable 25% of the assemblage is made up of unmodified nodules of quartz crystal (Figure 3). Tool types include chisels (7%) and graters (6.6%). Chisels have

'bit' ends shaped by intentionally flaking, whereas graters are unmodified through flaking, but display use-wear. A quartz crystal microblade industry is indicated by the presence of microblades and microblade cores. In some instances it was difficult to differentiate between microblade cores and chisels as they often have the same form. Microblade cores were differentiated based on blade scars over twice as long as wide.

Table 1. Typology of quartz crystal tools from DhRo-59.

Artifact Type	General Descriptions	n	% of Assemblage
Blank	A six sided crystal unmodified by use or percussion. Raw material or decorative.	122	25
Biface	Projectile point which has been manufactured through bifacial knapping.	1	0.2
Biface preform	Fragment of quartz crystal exhibiting flake reduction on two sides.	2	0.4
Chisel	Distal end chipped into a single or double bevel bit. Often associated use-wear.	38	7
Graver	Often unmodified with pointed distal bit, exhibiting use wear. For incising or drilling.	32	6.6
Microblade core	Exhibiting one or more microblade scars.	16	5.9
Microblade	Over twice as long as wide, with longitudinal dorsal flake scars or crystal facets.	27	5.5
Core	Microolith core with non-blade like flakes scars.	1	0.2
Flake	Platform bearing flake.	35	7.1
Shatter	Flake fragment with no platform, bipolar reduction remnant, or shattered faceted crystal fragment.	208	42.4
Pendant	Generally with worked or natural groove for suspension	3	0.6
Total Classified:		485	100

The average frequency of quartz crystal tools per cubic meter of each layer excavated at the Ruskin Dam site demonstrates that these objects were deposited throughout its occupational history (Figure 4). Higher frequencies of graters, chisels, and microblade cores are associated with Locarno Beach component (3500 to 2500 BP; 3800 to 2600 Cal BP). Curiously, there is an increase in the density of quartz crystal microblades in the Strait of Georgia Phase (1500 to 200 BP; 1400 to 180 Cal BP). The persistence of this technology at the Ruskin Dam site into the Strait of Georgia Phase is fairly unique in the Fraser Valley and may be a more upriver variant.

Quartz crystal objects are known from several other sites with radiocarbon dated contexts in the Stave Watershed. The earliest occurrence of quartz crystal debitage is from DhRo-53 found between two radiocarbon samples dating: 7748+/-43 BP (Wk19460) 8595 - 8429 Cal BP) and 7222+/-41 BP (Wk 19461) (8159 - 7964 Cal BP) (McLaren et al. 2008). Significant quantities of quartz crystal objects including pendants, chisels, graters, and microblades have been found in excavations at DhRo-10, the Blind Slough Site (McLaren et al. 2008) and at DhRo-26 (Stave Falls Site) (McLaren and Maxwell 1998; McLaren and Owens 2000). Four radiocarbon age place the occupation of DhRo-10 between 3230 and 2950 BP (3590 - 2980 Cal BP), and 27% of the assemblage comprises of quartz crystal. Four radiocarbon dates place the occupation of DhRo-26 as occurring between 4000 BP and 358 BP (4580 - 280 Cal BP) (most of these deposits date to the Locarno Beach phase), and 20% of the assemblage from excavated contexts is quartz crystal (McLaren et al. 2008).

Many quartz crystal artifacts from these sites are unmodified nodules or core tools as opposed to reduction waste. In this way, they retain much of their natural aesthetic as transparent, six-sided, prismatic crystals. Most of the artifacts from the Stave watershed are manufactured from very clear quartz crystals. A few are white, grey or red suggesting impurities such as aluminum or iron. Significantly, the aesthetic properties of quartz crystals led to the use as objects of adornment as well as objects vested with spiritual powers on the Northwest Coast (Boas and Hunt 1906). The following sections explore six facets of quartz crystal artifact use drawing primarily from the collections made during excavation at the Ruskin Dam Site (DhRo-59) which is situated at the mouth of the lower Stave River canyon.

Processes of Quartz Crystal Tool Manufacture

Flakes, shatter, and nodules of quartz crystal at DhRo-59 attest to its use as a quartz crystal tool manufacturing site. Some of the unmodified nodules were likely stockpiled for later tool production. Shattered crystals (42%), platform bearing flakes (7.1%) and microblades (5.5) reveal that these objects were being manufactured both by bipolar reduction and direct freehand percussion (Table 1). It is possible that indirect percussion (mallet and punch method) was also being used to produce microblades.

Quartz Crystals as Tools

Quartz crystals tools are depicted by Stewart (1973:87) as being hafted in handles and used for incising, carving and cutting. Artifacts from DhRo-59 reveal that crystals were shaped in a variety of different ways to be used as tools.

Chisels from DhRo-59 display both single and double beveled bits (Figure 3), and percussion flaking of the distal end of the quartz crystal is either unifacial (single bevel) or bifacial (double bevel). Most often it is the naturally pointed end of the crystal that is modified. It is likely that these chisel would have been hafted in slotted handles.

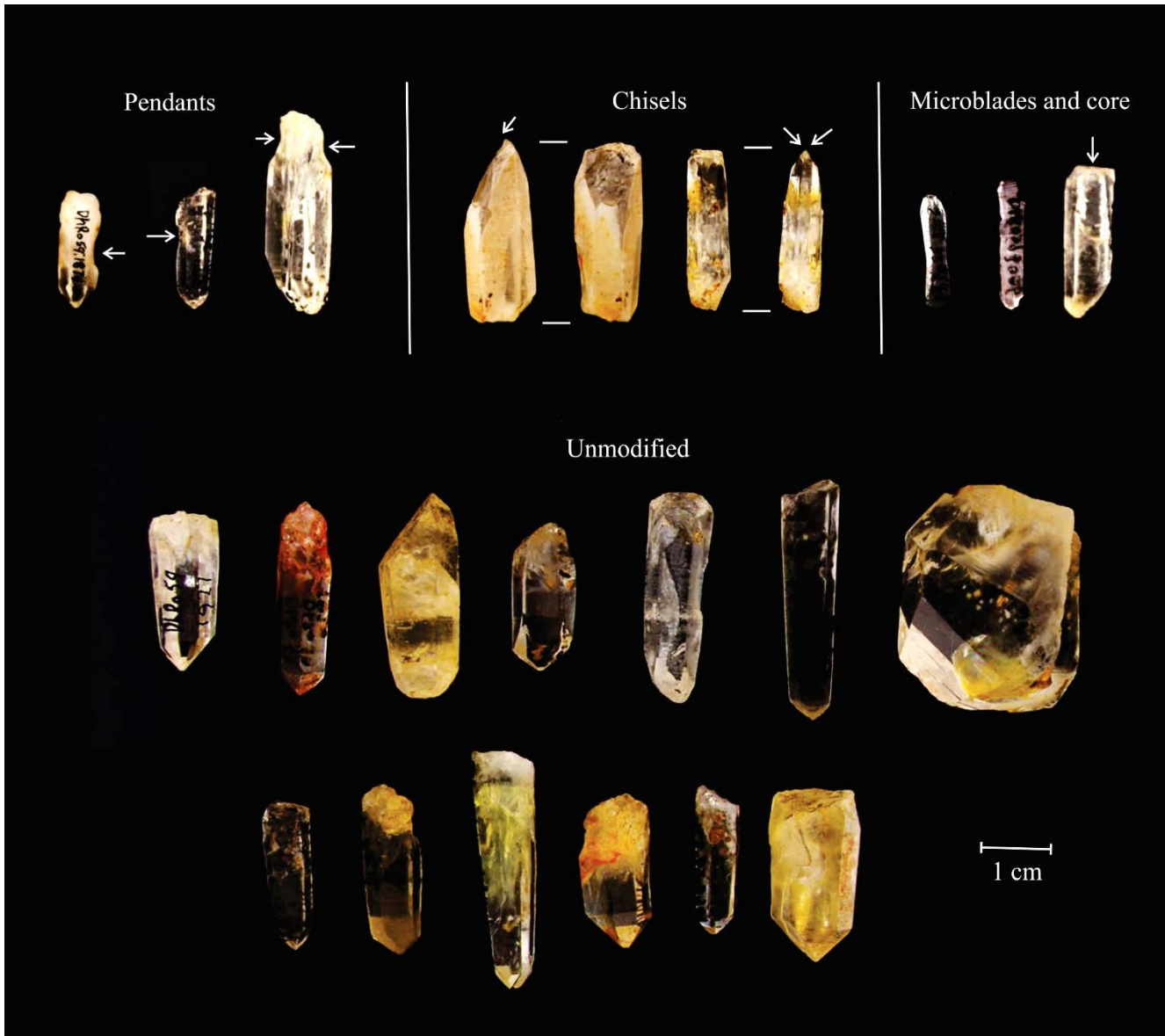


Figure 3. Examples of quartz crystal artifact types recovered from DhRo-59

Similar to ornaments and blanks, quartz crystal selected for use as graters do not display evidence for intentional reduction. Graters can be differentiated from ornamental crystals, however, as they exhibit rounding and striations on their pointed, distal ends. It is likely that graters were hafted in slotted handles prior to use. Quartz crystal is known to have been used on the Northwest Coast to produce grooving bits for working jade (Emmons 1923). Quartz crystal graters used experimentally by Grant Keddie, to groove and incise nephrite and slate have readily visible signs of heavy use wear, primarily rounding and crushing (Figure 5). Some of the graters from DhRo-59 show similar wear patterns supporting that these activities were performed there. Other show less pronounced use wear and may have been used on softer materials such as bone and wood.

Four quartz crystal bifaces have been collected from archaeological sites in the Stave River watershed: DhRn39, DhRo14 (Figure 1) (DhRo26, and DhRo59). These objects are rare in comparison to the large number of bifacial artifacts manufactured from other materials that have been collected from the area to date. The blank crystals from which these objects were manufactured were much larger than those typically found in assemblages at most sites.

Quartz Crystal Microblade Industry

The presence of microblades and prepared microblade cores in the archaeological sequence of the Fraser River region has long been known to span many millennia (Mitchell 1968; Patenaude 1985). The quartz crystal microblade tradition is unique in some respects as the faceted shape of the crystals provides a ready-made microblade core. In some instances, these cores exhibit some platform preparation. In

other instances, blades could have been produced through bipolar percussion, although likely with less accuracy and more risk. Some microblade cores have only one or two microblade scars, while a few have evidence of multiple and repeated microblade production. The small size of most quartz crystals limits the size and amount of blades that can be efficiently produced. Complete microblades from the Ruskin Dam site are sharp and hard, and would likely have been hafted for use as knives or for arming slotted antler spear points (e.g., Flenniken 1980; Christensen and Stafford 2005).

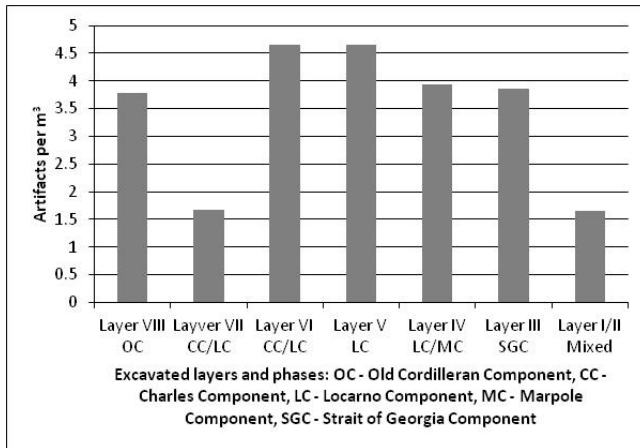


Figure 4. Graph showing the density of quartz crystal artifacts per cubic meter excavated at DhRo59. Density equals the number of artifacts per stratigraphic layer divided by the volume of excavated sediment in a given layer (Gray et al. 2010).

Quartz Crystal Ornaments

Due to the aesthetic quality of quartz crystals in their unmodified form, they were sometimes used for ornamental purposes. Quartz crystals are unusual stones in that they have a six-sided shape, are clear and shiny, and catch light in an intriguing way. Ethnographic accounts for Northwest Coast groups mention instances where quartz crystals were used as adornments. Boas and Hunt (1906:77) note in their oral history of the *Kwakwaka'wakw* that some Chiefs' ceremonial regalia included the use of a head-dress decorated with quartz crystals. In their raw form, high quality quartz crystals were more likely selected and used as objects of ornament. On three crystals from the Ruskin Dam site at least one transverse groove is present presumably to suspend the artifact as a pendant or regalia dangler (Figure 3). In some instances, these grooves appear to be a natural part of crystal form, however, they have evidence of being smoothed and enhanced through grinding.

Metaphysics and Quartz Crystal

On the Northwest Coast many groups regarded quartz crystals to be objects of metaphysical significance, playing

roles in stories of creation, the practice of shamanism, and in ceremonialism.

Wilson et al. (2003:71) report on a shaman burial that was excavated in Deep Bay on Vancouver Island. The funerary objects include quartz crystals and obsidian objects. Quartz crystals were known amongst the *Kwakwaka'wakw* to have been used by supernatural helpers as gifts of shamanistic power (Boas 1966:135) and as magical weapons (Boas and Hunt 1906:241). They also play roles in *Kwakwaka'wakw* creation stories (Boas and Hunt 1906:29). Very similar metaphysical qualities are attributed to quartz crystals amongst the Coast Tsimshian (Barbeau 1958).

MacDonald et al. (1989) discuss the use of quartz crystals by shamans as portalling devices throughout North America including the Northwest Coast. Portalling is a shamanistic practice that refers to a shaman's ability to shift from one reality to another using a magical medium such as a crystal (MacDonald et al. 1989:39).

Of particular interest, a quartz crystal was collected during Captain Cook's third voyage to *Nuu-chah-nulth* Territory and is stored at the British Museum (Figure 6). *Nuu-chah-nulth* ascribed magical properties to quartz crystals and they were sent as potlatch invitations to neighbouring groups (Mackie 2010).

Additional information on the *Nuu-chah-nulth* use of crystals was recorded by Drucker (1951:153) who notes that they were found in caves high up in the mountains and that most noble families had crystals as part of their heirlooms.

Closer to the Stave study area, Webber (1899:310) presents a story concerning the rise and fall of a Kwantlen Village on the lower Fraser River. The story refers to the use of "fire rocks" or quartz crystals for shamanistic practices as a shaman could call light with them. Further afield, but in a similar vein, the Ute of central Colorado employed ceremonial rattles made of buffalo rawhide in which were placed quartz crystals (Johnsen 2012:70). When shaken the mechanics of the colliding crystals would produce flashes of light (through the physical process of triboluminescence), effectively making the rattle glow through the hide.

Clearly, the cultures of the Northwestern North America considered quartz crystals to be significant objects endowed with metaphysical qualities. It is not difficult to assume that at least some of the crystals found at the Ruskin Dam site were thought to be instilled with similar properties. Indeed, many of the unmodified quartz crystals from the site have high esthetic qualities including high clarity, large size, and yellow or red discoloration (Figure 3).

Quartz Crystal as an Exchange Commodity

While there is considerable ethnographic mention on the Northwest Coast for quartz crystal use, most is from regions to the north and west of Coast Salish territory. This is in striking contrast to the archaeological evidence, which

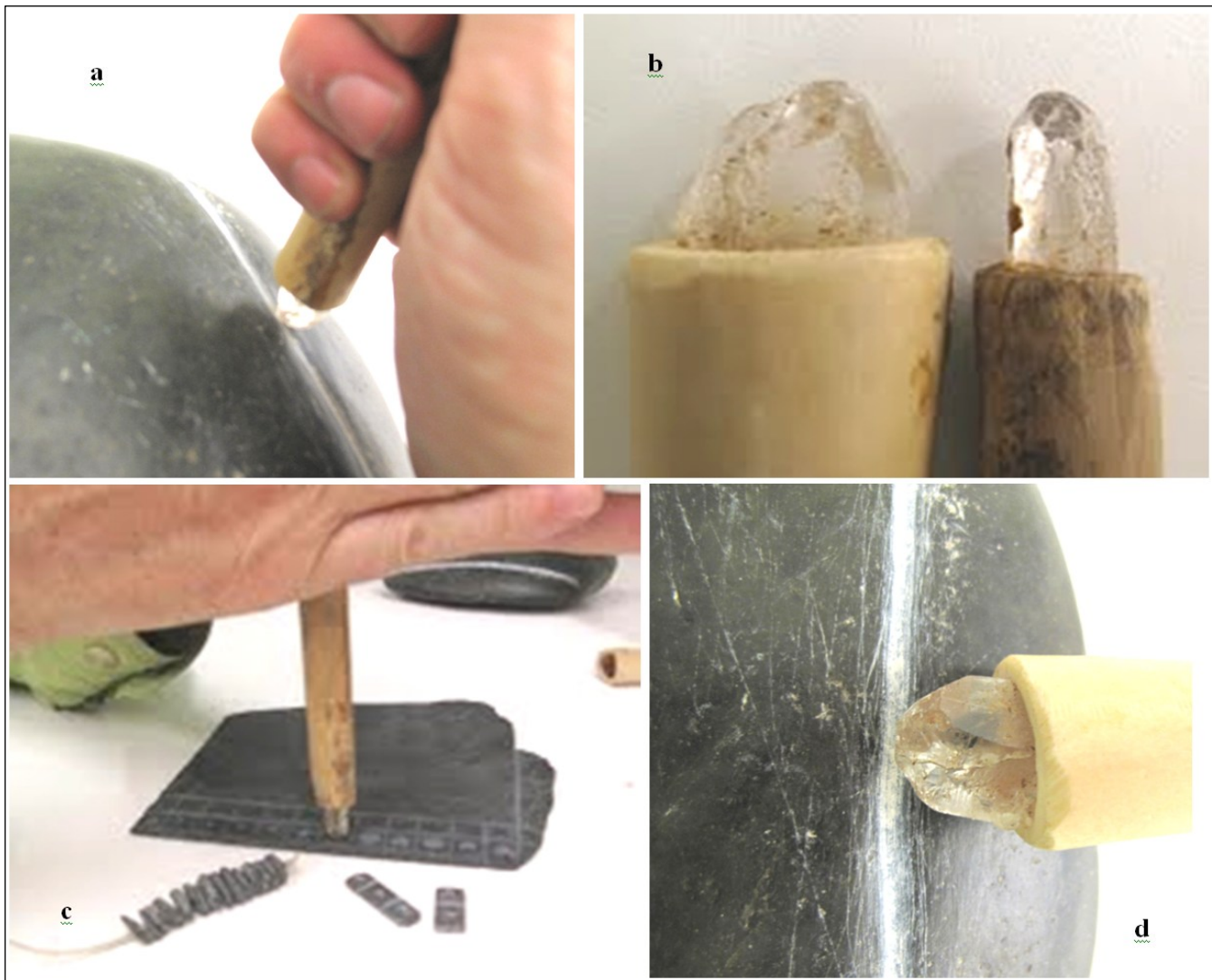


Figure 5. Images of Grant Keddie's (Royal British Columbia Museum) experimental use of quartz crystals gravers as stone carving tools. Image (a): incising a groove in a nephrite cobbler with a hafted quartz crystal; (b): quartz crystal bits showing rounded distal ends resulting from use; (c): using a quartz crystal to bi-conically drill and incise slate beads; (d): detail of groove and rounded quartz crystal tool bit.

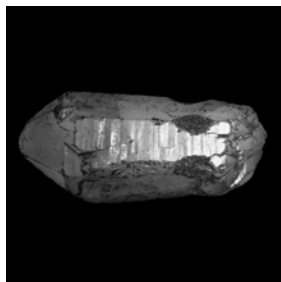


Figure 6. Quartz crystal collected by Captain James Dixon on Captain Cook's third voyage and housed at the British Museum. Note the transverse groove on the crystal's top facet which could have aided in lashing the pendant for use as a dangler or pendant.

demonstrates that most sites in coastal British Columbia with quartz crystal objects are in Coast Salish territory. This suggests that quartz crystals, which appear to be readily available in Coast Salish territory, may have been a valuable exchange commodity, in particular with *Nuu-chah-nulth* groups on the west side of Vancouver Island and possibly *Kwakwaka'wakw* groups to the north. On northern Vancouver Island, Boas (1910:103) records that quartz crystals were traded from east to west for sea otter, slaves, and coppers. A similar pattern may have existed in the lower Fraser Valley/southern Vancouver Island regions. Indeed, Carlson and Hobler (1993:48) note that the Pender Canal site is central to a trade complex involving quartz crystal (presumably from the east, such as the Stave watershed),

dentalium (from the west coast of Vancouver Island), and soap stone (presumably from the Interior Plateau).

Conclusions and Directions for Future Research

This chapter has examined the archaeology of quartz crystal use in the Lower Fraser River region, with particular attention to findings from the Ruskin Dam site and other sites in the Stave watershed. These sites have a high percentage of quartz crystal objects pointing to the importance of this material to past populations. The evidence presented here reveals that quartz crystals were being manufactured into chisels, microblades, and bifaces. They were used unmodified as graters. Many of the unmodified crystals were likely employed for metaphysical, shamanistic, or adornment purposes. The high frequency of sites in the lower Fraser River region containing quartz crystal implements suggests that they may have been a valuable exchange commodity. In general, the use of quartz crystal objects peaked during the Locarno Beach phase.

Future directions in research concerning quartz crystal use in the archaeology of the lower Fraser River region should include determination of the source locations for

these unique objects, and experimentation to see if technology such as XRF analysis could be employed to discriminate between quarries. Experimental replication of quartz crystal artifacts could help in determining if microblades were detached more effectively using bipolar, indirect or freehand percussion. Further experimental use of quartz crystal tools could help in determining use wear and the utility for cutting, whittling and grooving different objects.

Overall the information presented here demonstrates that quartz crystals were prized for their durability in manufacturing activities and their aesthetic qualities in the social and ideological realms. The high frequencies of these artifacts in the archaeological assemblages of the Stave River valley attest to this.

Acknowledgements

The authors wish to acknowledge the following people who were essential in aspects of this research: Wes Antone, Joey Antone, Katherine Antone, Les Antone Jr., Josh Antone, Tracy Dandurand, Scott Gabriel, Quint Stubbington, Shane Stubbington, Charlie Savino, Chris Thomas, Kevin Neary, Jenny Cohen, and Marianne Berkey.