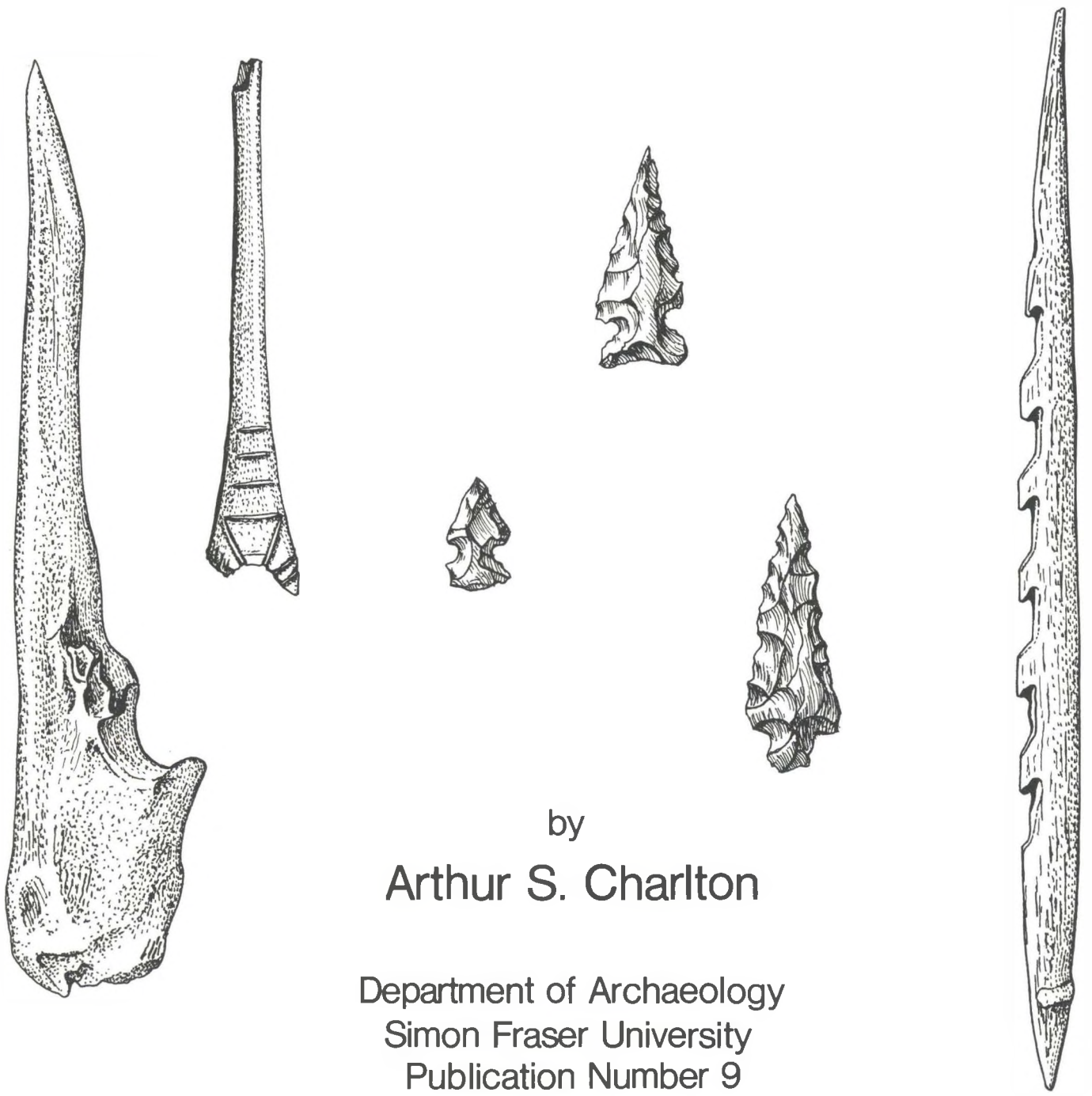
THE BELCARRA PARK SITE



by

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Department of Archaeology
Simon Fraser University
Publication Number 9

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INTRODUCTION

During the past three decades archaeological research in the Strait of Georgia region has concentrated upon the establishment and refinement of regional chronologies. The Fraser delta sequence, until quite recently at least, was considered to date to approximately 1000 B.C. at the earliest. The sequence consisted of five phases which are, earliest to latest: Locarno Beach, Marpole, Whalen II, Pre-Stselax and Stselax. Pre-Stselax was presented as a provisional term denoting a developmental stage between Whalen II and Stselax (Borden 1970:110). For a number of reasons the validity of the Whalen II phase has been questioned and it has been suggested that this phase be deleted (Mitchell 1971a:56, Fladmark 1974).

Since the presentation of the Fraser delta sequence two immediate problems, both temporal in nature, have become apparent. The first problem in the sequence related to the origins of the Locarno Beach phase (i.e. the pre-1000 B.C. time period). Archaeologists have long suspected that "early" culture-bearing deposits existed in the lower Fraser vicinity and the discovery of an early sequence in the Fraser Canyon (Borden 1957) heightened this suspicion. Lately, this problem has been addressed and a number of researchers (Carlson 1970; Calvert 1970; Mitchell 1971a; Loy 1972; Percy 1974) have made important contributions to the 5000–1000 B.C. period. Much of this material has been recently synthesized (Borden 1975). Matson (1976) has now added significant new data to the early end of this sequence.

The second problem involved the poorly understood A.D. 400–1200 time period and it is this time period on which the present study focuses. In 1971 examination of a number of surface collections from the Belcarra Park site convinced the author that the site contained a late prehistoric component. Included in all collections were artifact types considered characteristic of late components defined for the region (Borden 1970:96; Carlson 1970: 120; Mitchell 1971a:48). Noteworthy in the Belcarra Park collections was the presence of relatively large percentages of small triangular chipped stone projectile points of the side-notched and corner-notched variety and of small triangular ground slate projectile points of the side-notched variety. This presence suggested that the Belcarra Park site contained deposits belonging to the A.D. 400–1200 time period and that the potential for making a statement about the chronology and culture change for this time period seemed good. Hence the excavation strategy was directed toward recovery of a sample of closely associated artifacts to permit definition of valid cultural taxonomic units. This goal was accomplished and two superimposed assemblages were recovered: Belcarra Park I and Belcarra Park II.

The delineation of the two cultural units is based on the distributional analysis of an assemblage of 1,036 artifacts obtained from fifteen judgementally selected excavation units and an examination of the physical stratigraphy. A summary of the artifacts and their assignment to site components is presented in Table I. A unit by unit distribution of all artifacts is given in Appendix II. By plotting the distribution of key artifact classes on stratigraphic profiles, significant physical and cultural breaks were identified and isolated. Two stratigraphic zones were idenified: Zone B which contains the cultural unit Belcarra Park I, and Zone C which contains the cultural unit Belcarra Park II. Zone A consists of the underlying sterile subsoil. The Belcarra Park I assemblage correlates typologically with previously defined components of the Locarno Beach phase. The Belcarra Park II assemblage shares many characteristics with previously defined late prehistoric components of the region, most notably Whalen II and Stselax (Borden 1970) as well as San Juan (Carlson 1970) and Gulf of Georgia (Mitchell 1971a).

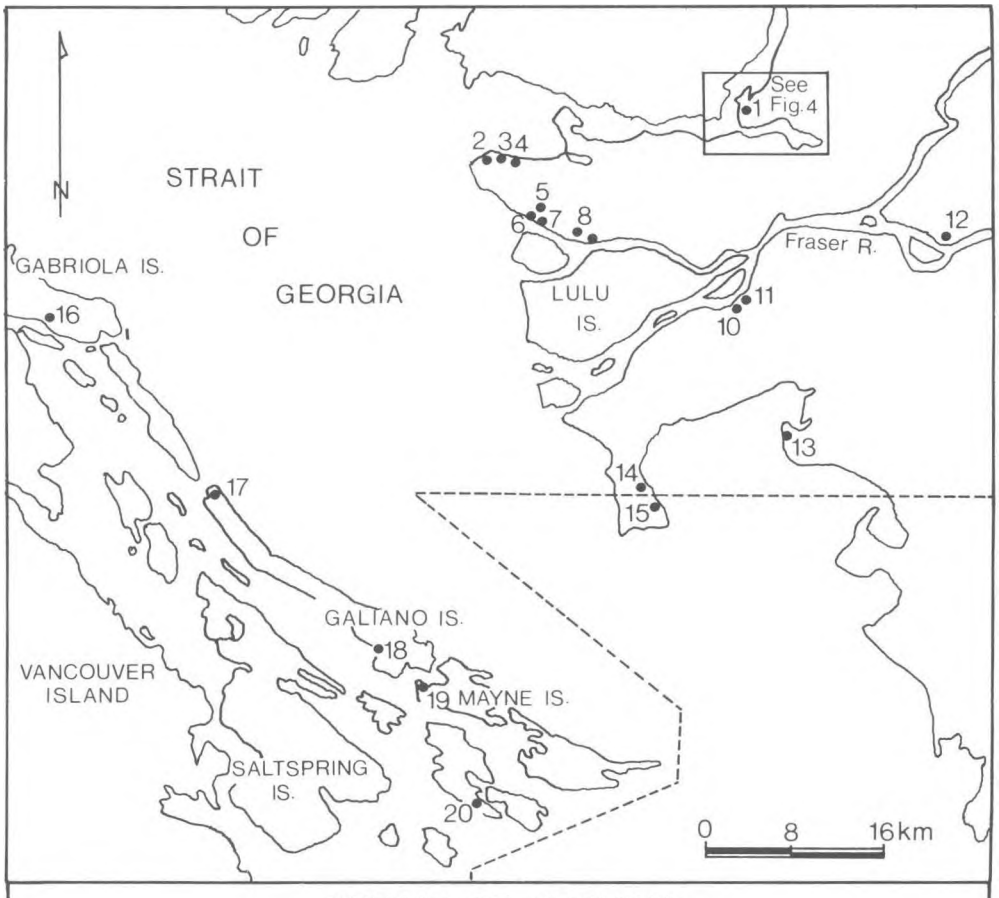
The artifact types most characteristic of each component are the following:

(a) Belcarra Park I
- Chipped contracting stem points
- Stemless ground slate points
- Ground slate knives (thick)

(b) Belcarra Park II
- Chipped triangular side and corner notched points
- Triangular ground slate points
- Triangular ground slate points (side-notched)
- Wedge based bone points
- Composite toggling harpoon valves

Reliance was placed upon these types as they have been utilized previously by a number of workers with apparent success. A further approach using presence and absence of artifact types was applied to the assemblage. The above methods of isolating components have recently been subjected to criticism (Abbott 1972, Fladmark 1974). However, as Mitchell has noted:

> ...The fact that their distributions (key artifact types) led to the formation of boundaries which are consistent with the distribution breaks for other



STRAIT OF GEORGIA
Selected Archaeological Sites

1. Belcarra Park DhRr 6
2. Point Grey DhRt 5
3. Locarno Beach DhRt 6
4. Jericho Beach DhRt 18
5. Old Musqueam DhRt 3
6. Male DhRt 1
7. Stselax DhRt 2
8. Liquid Air DhRs 19
9. Marpole DhRs 1
10. St. Mungo DgRr 2
11. Glenrose DgRr 6
12. Port Hammond DhRp 17
13. Crescent Beach DgRs 6
14. Beach Grove DgRs 1
15. Whalen Farm DfRs 3
16. False Narrows DgRw 4
17. Dionisio Point DgRv 3
18. Montague Harbour DfRu 13
19. Helen Point DfRu 8
20. Pender Canal DeRt 2

Fig. 1 Gulf of Georgia: Selected Archaeological Sites.

Table I Distribution of Artifacts by Component

Class	Component I	Component II	Site Total
STONE			
Chipped Stone			280
Leaf-shaped points	6	5	11
Contracting stem points	5		5
Stemmed points	3	16	19
Triangular points		12	12
Triangular side-notched points		55	55
Triangular corner-notched points		13	13
Miscellaneous chipped stone points		15	15
Core tools	3	8	11
Split cobble tools	3		3
Chipped slate knives		6	6
Chipped stone bifaces	8	24	32
Chipped stone unifaces		6	6
Cobble core tool		1	1
Graver		1	1
Drills		2	2
Unifacially retouched flakes	3	11	14
Bifacially retouched flakes		19	19
Utilized flakes	19	34	53
Miscellaneous chipped stone	2		2
Ground Stone			143
Stemless points (slate	14		14
Stemmed points (slate)	2		2
Triangular points (slate)		43	43
Triangular side-notched points (slate)		8	8
Ground slate knives (thick)	4		4
Ground slate knife fragments (thin)		61	61
Adze blades	6	15	21
Ground slate object		1	1
Miscellaneous ground stone fragments	1		1
Pecked and Ground Stone			135
Shaped abrasive stones	5	54	59
Unshaped abrasive stones		43	43
Abrasive slab		1	1
Hand mauls		2	2
Hammerstones	6	4	10
Notched sinker		1	1
Perforated stone preform		1	1
Saws		12	12
Pipes		5	5
Miscellaneous pecked and ground stone	1		1
BONE			550
Barbed bone points	1	31	32
Barbed bone harpoons		3	3
Barbed bone arrow/harpoons		2	2
Wedge based points		122	122
Medium bone points		41	41
Shouldered bone point		1	1
Bone bipoints		9	9
Ulna tools		14	14
Split bone awls		24	24
Shouldered awls		9	9
Straight awls		13	13
Metatarsal awls	1		1
Bird bone awls		10	10
Bird bone splinter awls		9	9
Bird bone points		3	3
Bird bone tube beads		3	3
Bird bone whistle		1	1
Chisels or wedges	2	5	7
Bone splinter drills		6	6
Bone needle		1	1
Bone splinters with worked tips		67	67
Bone blanket pins		24	24
Tooth pendants		4	4
Rodent incisor tools		23	23
Miscellaneous decorated bone items		3	3
Miscellaneous worked bone fragments	1	117	118
ANTLER			149
Barbed points		13	13
Barbed harpoon		1	1
Wedges	1	12	13
Antler tine tips		7	7
Antler sleeve hafts		4	4
Composite toggling harpoon valves	1	93	94
Antler foreshafts?		3	3
Worked Antler preforms		4	4
Miscellaneous worked antler	1	9	10
TOTAL	99	1,170	1,269
Per cent of Total	8	92	100

> classes of artifacts as well suggests they can be useful for sorting out components.
>
> (Mitchell 1971a:88)

The method of judgemental rather than random selection of units to excavate has been questioned also. A recent study utilized both random and non-random samples from a single site to test the hypothesis that the "differences between the sample obtained by judgemental and probability sampling strategies...should exist and be detectable by statistical procedures" (Spurling 1976:64). In this case the variations between the sampling strategies were found to be insignificant and that, "on the basis of the respective technic item frequencies recovered, the probabalistic technique displayed no obvious increase in representativeness over that recovered by the judgemental implicit strategy" (Spurling 1976:66).

The following three sections describe first the Belcarra Park site and then the two components from the site. Artifact classifications and descriptions are included in the sections describing the Belcarra Park I and II components.

In many cases, taxonomic categories developed by previous researchers have been retained for purposes of comparison. These include Borden (1950, 1951, 1962, 1968a, 1970, 1975), Calvert (1970), Carlson (1960, 1970), Crowe-Swords (1974), Drucker (1943), Duff (1952), Kidd (1969), McMurdo (1972) and Mitchell (1971a, 1971b). Ninety-nine artifacts based on 25 types are assigned to the Belcarra Park I component while 1,170 artifacts based on 64 types are assigned to the Belcarra Park II component. In addition, 29 artifacts are classified as historic.

The final section summarizes the findings, places the Belcarra Park site within the context of Strait of Georgia prehistory and presents some suggestions for future research. Discussion is focused upon chronology and culture change in the region. Three hypotheses to explain the cultural differences observed in the two Belcarra components are examined. It is argued that gradual cultural change based upon the introduction of new techniques to exploit the environment is the most likely explanation, as opposed to hypotheses that place emphasis on either migration or environmental factors.

Table II Historic Artifacts Intruded into the Upper Midden

Class	Component I	Component II
HISTORIC ITEMS		
Clamshell button		1
Bifacially flaked flint		1
Bone knife handle		1
Clay pipe stem		1
Glass bottle and cork		1
Glass button		1
Square head nails		15
Round head nails		2
Rifle shells		2
Fork handle		1
Cufflink		1
Hat pin		1
Wooden object		1
		29

THE BELCARRA PARK SITE

Introduction

Belcarra Bay is situated twelve miles to the south of the Coast Mountains. It is rough, mountainous land of granitic rock types which are exposed at or near the surface. In many places this bedrock is overlain by till, outwash, sand, gravel and silt of glacial and interglacial origins (Armstrong, 1957:Map 16). These deposits are in evidence at the southern extremity of the Belcarra Park site (DhRr 6), which is a large midden situated on the eastern shore of a

Fig. 2. Aerial photograph of the Belcarra Park site (DhRr 6).

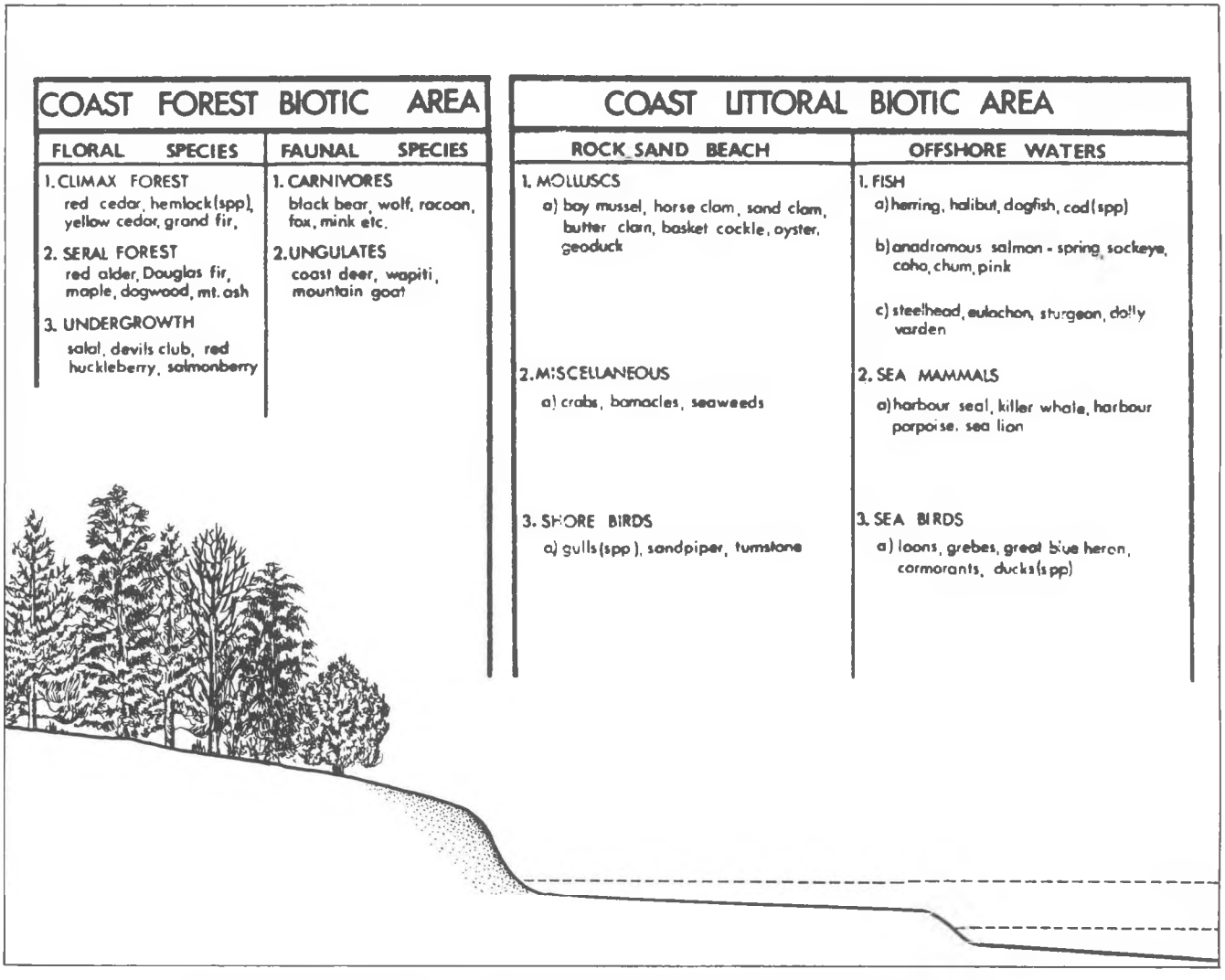


Fig. 3. The Belcarra Park site in relation to the Coast Forest and Coast Littoral Biotic Areas.

well protected body of water (Indian Arm) at longitude 122° 55'25" W and latitude 49° 18'48" N (Fig. 4). Indian Arm, a glacially deepened fiord, is the northern extension of Burrard Inlet. To date 22 archaeological sites have been recorded for the Burrard Inlet—Indian Arm locality. This includes 13 habitation sites as well as nine pictograph sites. While Belcarra Park is the only site in this locality which has been intensely excavated, six other sites have been briefly tested. These include Strathcona (DhRr 18), Pigeon Cove (DhRr 9), Noons Creek (DhRq 1), Caraholly (DhRr 17), Barnet Highway (DhRr 10) and Cates Park (DhRr 8).

The Belcarra Park site, like many other coastal middens is located on the border of two major biotic zones; in this case the Coast Forest Biotic Area and the Coast Littoral Biotic Area. The latter area includes an intertidal zone as well as the offshore waters. The significance of this location is summarized in Figure 3.

An outline of the physiography of the area is provided by Bostock (1948) and Holland (1964) while the climate of the area is detailed in Chapman and Turner (1956), Kendrew and Kerr (1955), Kerr (1951) and Stager and Wallis (1968).

Site Description

The Belcarra Park site presently measures 150 metres (north—south) by 40 metres (east—west). The site may have been slightly larger at one time as road construction has bisected the site at the northern boundary (Fig. 2 and 5), although close examination of the northern road exposure showed no cultural deposits. Other destruction at the site includes the construction of three buildings on

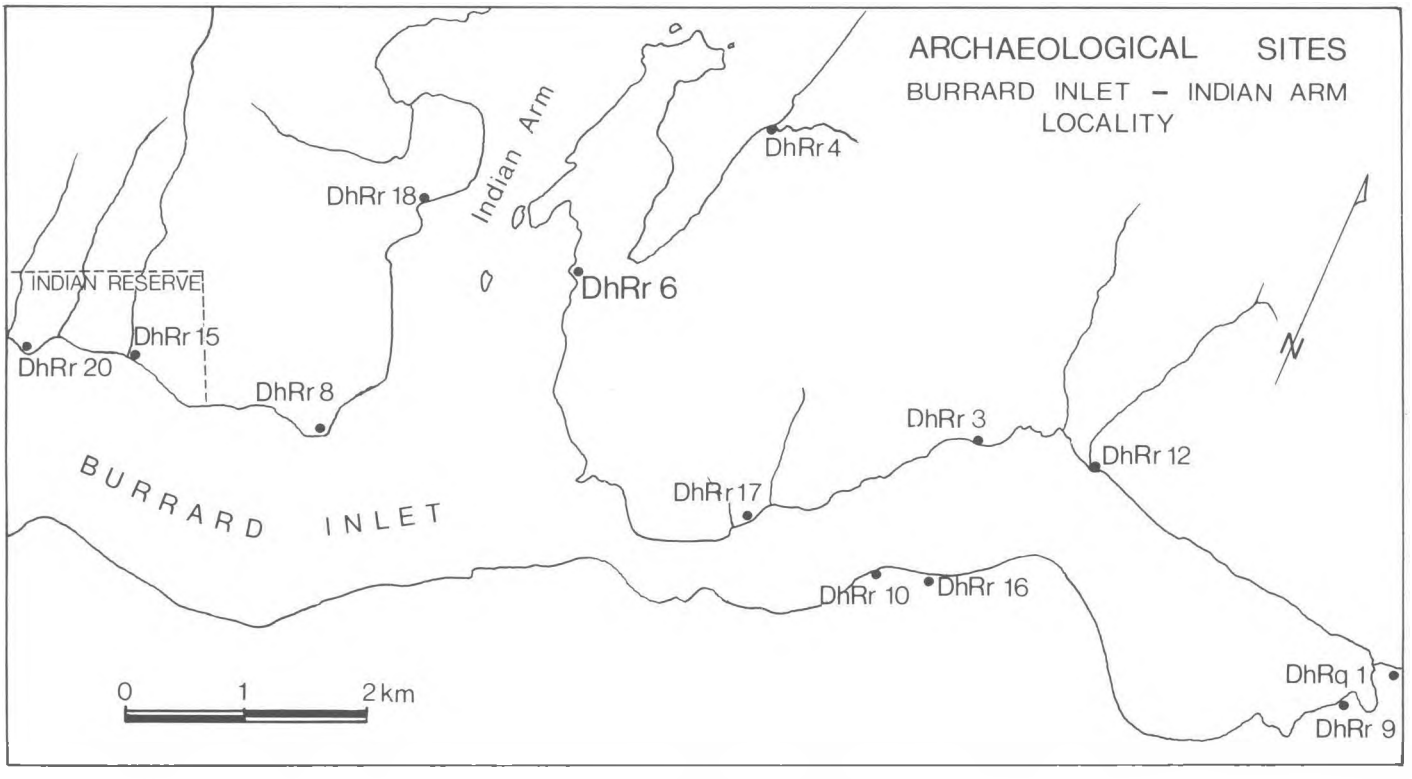


Fig. 4. Archaeological sites: Burrard Inlet—Indian Arm locality.

the western boundary of the midden and wave erosion along the western edge. Some residents claim that as much as half an acre has eroded from the western face of the midden within the last fifty years.

The existence of the Belcarra Park site has been known to professional archaeologists, local residents and relic collectors for a number of years. The park had always been in the hands of private owners and until 1971 proposals for excavations were always denied. In the spring of 1971 Belcarra Park was purchased by the Vancouver-Fraser Regional Parks Authority (now part of the Greater Vancouver Regional District). Application for controlled archaeological investigations was made to the Authority in May of 1971 and permission was granted shortly thereafter.

Excavation Units

Restrictions imposed by Park officials limited the excavations to the extreme northwest section of the Belcarra Park midden. A datum point was established at the northeast corner of the concrete sidewalk (Fig. 5), and an arbitrary north/south base line traversed the datum point. Primary horizontal excavation units were 2 metre by 2 metre squares. Vertical excavation units of 10 centimetres were used with the exception of Excavation Unit 1 which was excavated utilizing natural stratigraphic levels. Excavation Units 1 – 10 were excavated during June, July and August, of 1971 while Excavation Units 11 – 14 were excavated during October, 1971.

Approximately 108 cubic metres of midden was excavated from the 15 excavation units. Soil samples, carbon samples, one burial plus numerous features and 1,306 catalogued artifacts were recorded during the excavations. Typical profiles are shown in Figures 6, 7 and 8.

Physical Stratigraphy

The oldest geologic deposits at the site are granitic and associated rock types (hornblende–quartz diorite, biotite) formed in pre-Tertiary times. The bedrock is commonly mantled by thin layers of glacial, glaciomarine and raised marine shore deposits consisting of tills, outwash, sands, gravels and silts (Armstrong 1957:Map 16).

The surficial geologic deposits (Zone A) at the Belcarra Park site consist of:

a) Yellow and red/brown glaciomarine clays and brown sandy till of glacial origin which date to the Vashon Stade (ca. 19,000–13,000 B.P.) of the last major (Fraser) glaciation.

These deposits were observed in all excavation units and in Excavation Units 11–14, the cultural deposits lie directly on these clays and tills.

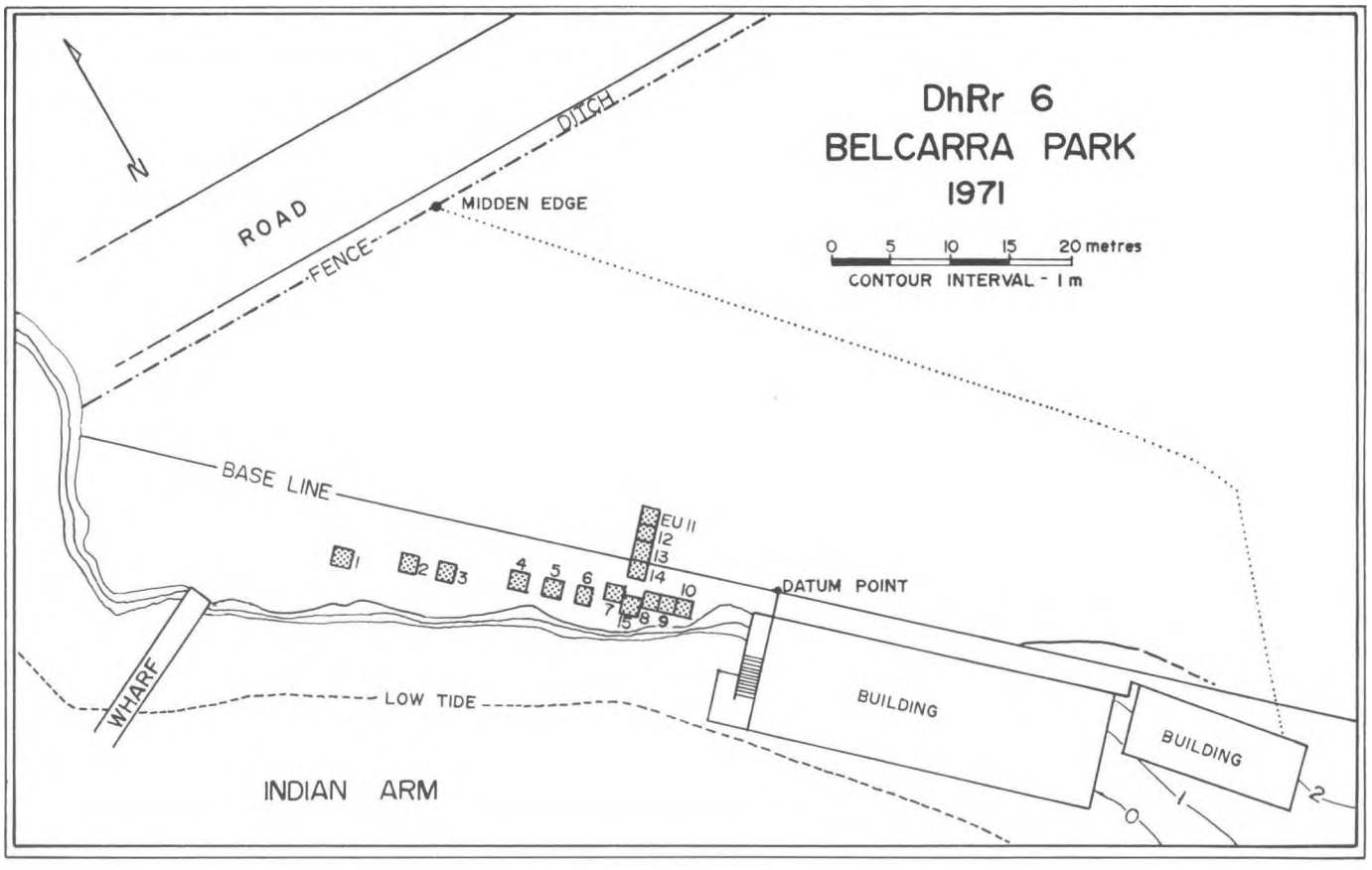


Fig. 5. The Belcarra Park site showing location of excavation units.

b) The above deposits were overlain by brown beach gravels in Excavation Units 1–10 and 15. These gravels (Bose) are raised marine shore deposits (wave washed lag gravels) which date to the Everson Interstade (ca. 13,000–11,000 B.P.).

From an examination of all excavation units, the midden can clearly be divided into two major stratigraphic units. Zone B (Fig. 6) consists of a black compact soil which contains highly fragmented charcoal and much fire-cracked rock. Minute amounts of shell and very little bone and antler were observed. When present the bone and antler was poorly preserved. The thickness of Zone B deposits varies between 16.8 and 82.0 centimetres with a mean thickness of 33.7 cm. Zone B deposits were noted only in Excavation Units 1–10, 14, 15 and the western half of Excavation Unit 13 (i.e. the western or beachward portion of the midden). Zone B deposits reach a maximum thickness (82.0 cm) in Excavation Unit 5. Zone C overlies Zone B and differs from Zone B in that it contains a great deal of faunal material (bird, land mammal, sea mammal and fish) which is generally well preserved. Great quantities of shellfish species (blue mussel, butter clam, cockle) are also characteristic of Zone C. Zone C is typical of many coastal British Columbia middens in that it contains a complex mixture of shell layers, lenses of multi-coloured ash and layers of humic soil, charcoal and fire-cracked rock. To further facilitate description, Zone C has been divided into the following categories (Fig. 8):

Zone C1 – a zone of black soil matrix containing sparse to moderate amounts of fragmented blue mussel, butter clam and basket cockle shell. This stratum appears consistently in all excavation units and varies in thickness from 12.0–59.0 cm with a mean thickness of 33.0 cm.

Zone C2 – a zone which consists primarily of crushed blue mussel shell. Moderate amounts of fragmented butter clam and basket cockle shell were also noted. This zone appeared consistently in all excavation units and was often interspersed with Zone C1. Zone C2 averaged 23.0 cm in thickness and ranged from 8.0 – 48.0 cm.

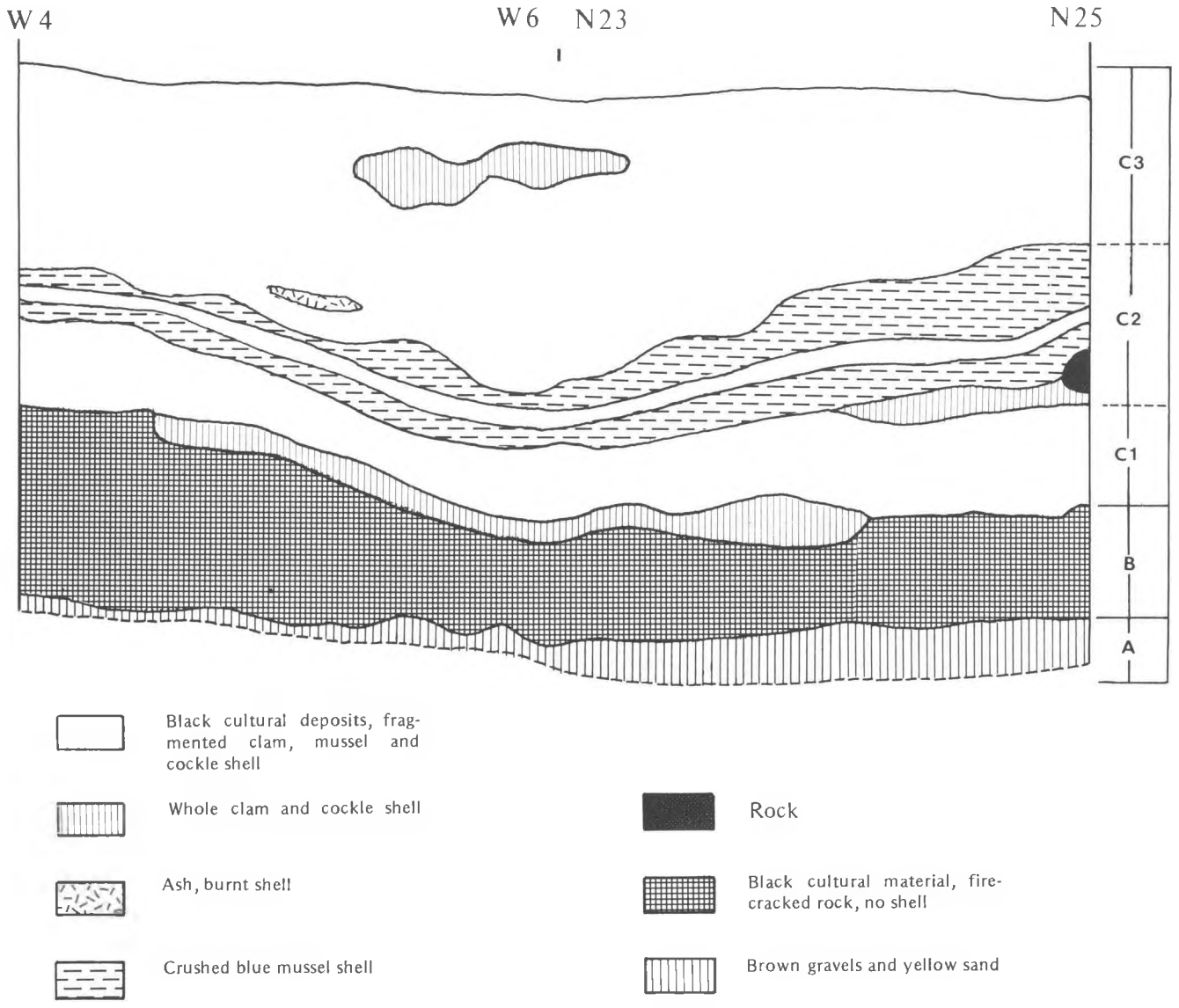


Fig. 6. Stratigraphic Profile: DhRr 6, Excavation Unit 4, north and east walls.

Zone C3 – this zone consists of whole and/or large pieces of butter clam and basket cockle shell. Excavation Units 1–4 contained deposits of Zone C3 which ranged between 8.0–22.0 cm in thickness and averaged 13.0 cm. All other excavation units yielded isolated lenses of loose shell rather than complete strata.

Zone C4 – this zone is a black humus layer which contains little or no shell. Lenses of charcoal, fire-cracked rock, ash and sand lenses, and historic disturbances are also common in this zone. This zone is the uppermost zone at the Belcarra Park site and averages 30.0 cm in thickness with a range of 21.0–48.0 cm in thickness.

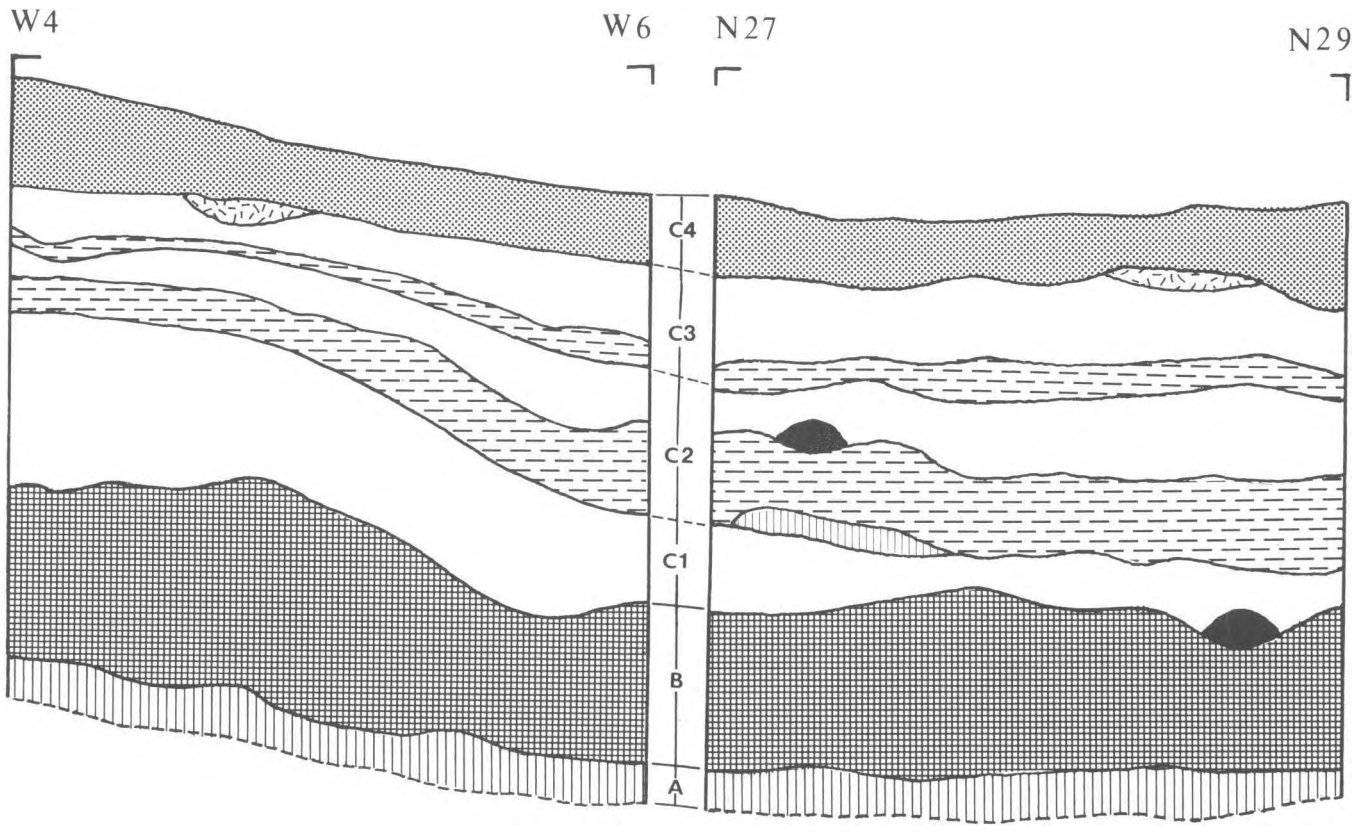


Fig. 7. Stratigraphic Profile: DhRr 6, Excavation Unit 5, north and east walls.

Disturbed black humus

Ash, burnt shell

Black cultural deposits, fragmented clam, mussel and cockle shell

Yellow and brown sand

Charcoal and humus, no shell

Crushed blue mussel shell

Whole clam and cockle shell

Black cultural material, fire-cracked rock, no shell

Brown gravels and yellow sand

Rock

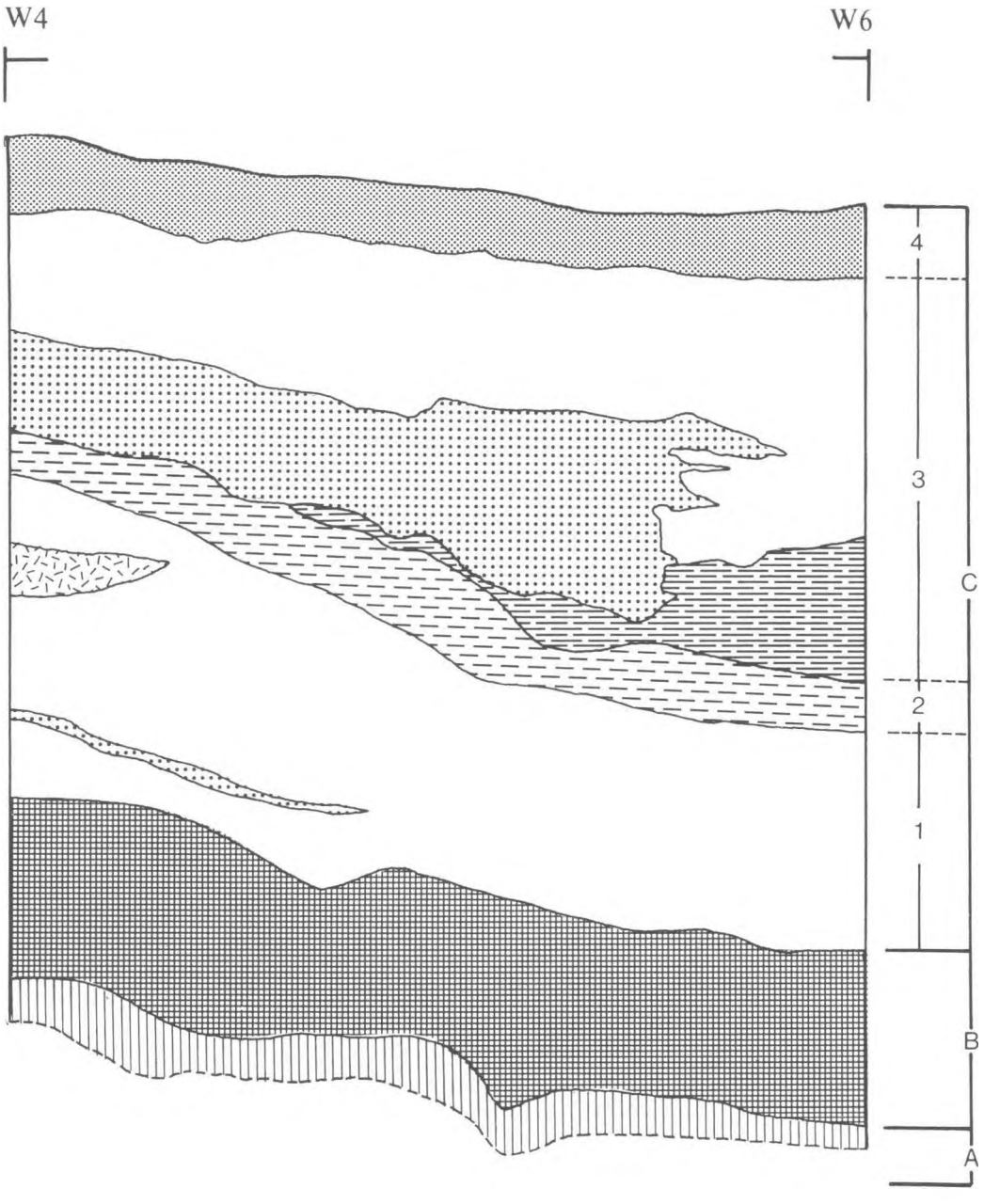


Fig. 8. Stratigraphic Profile: DhRr 6, Excavation Unit 6, north wall. See Figure 7 for key.

Introduction

The relatively small sample of artifacts (N=99) from the Belcarra Park I component represents 8% of the prehistoric assemblage. The component is dominated by lithic tools (92%), consisting of chipped stone (58%), ground stone (29%) and pecked and ground stone (13%). The paucity of bone and antler artifacts (N=8) is considered in part due to differential preservation.

Chipped Stone Artifacts

A total of 14 chipped stone points were recovered from Belcarra Park I deposits. Thirteen specimens are complete, and one is fragmentary but can still be classified. Twelve of the points are manufactured from basalt, two from green quartzite. For descriptive purposes the points have been classified in the following three categories: (1) Leaf-shaped points, (2) Stemmed points, and (3) Contracting stem points. Measurements enclosed in parentheses refer to incomplete dimensions.

Leaf-shaped Points

All six points in this category are complete. Two are manufactured from a fine grained basalt, three from a local granular basalt and one is manufactured from a green quartzite material. All exhibit convex edge form, with considerable variation in symmetry (Fig. 9a,b). All are biconvex in cross-section. Quality of flaking ranges from crude to excellent. Metric attributes for leaf-shaped points are summarized in Table III.

Table III Chipped Stone points, (leaf-shaped), Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	30.5–64.8 mm	48.25	24.94	6
width	16.8–28.8 mm	18.42	12.21	6
thickness	6.6–11.8 mm	8.50	5.28	6
weight	2.4–16.1 g	7.52	10.37	6

Contracting-stem Points

Five points, all complete and all manufactured from various grades of basalt, comprise this group (Table IV).

Table IV Chipped Stone Points (contracting stem), Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	49.2–83.8 mm	61.66	27.59	5
width	17.2–35.9 mm	23.8	15.39	5
thickness	6.7–10.7 mm	8.22	3.25	5
weight	5.7–25.1 g	11.98	16.03	5

Edge form ranges from straight to slightly convex, and three exhibit asymmetrically sloping shoulders. All are biconvex in cross-section.

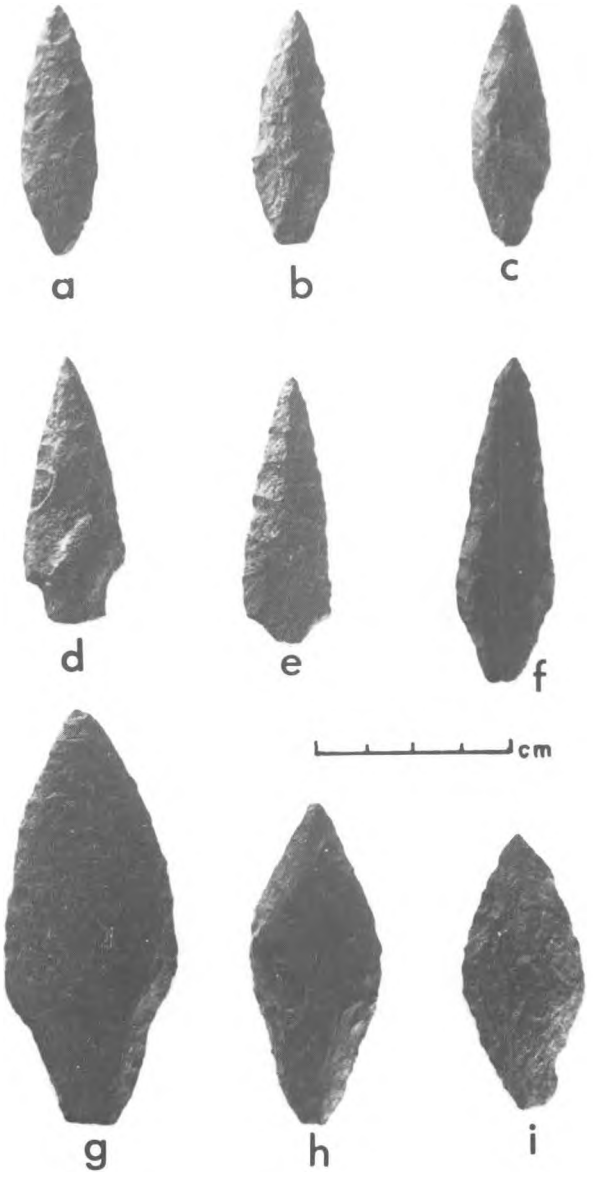


Fig. 9. Chipped stone points, Belcarra Park I. *a,b* leaf-shaped chipped stone points; *c,d* stemmed chipped stone points; *e–j* contracting-stem chipped stone points.

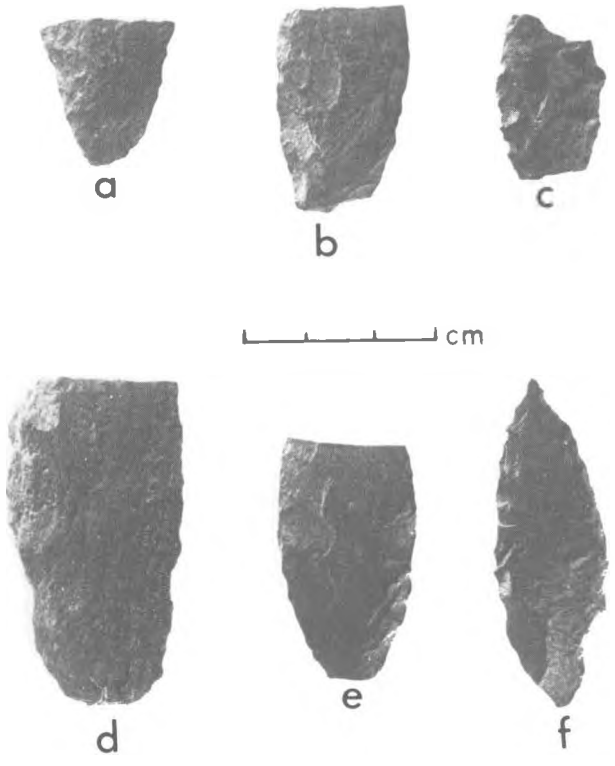


Fig. 10. Chipped stone bifaces, Belcarra Park I.

Stemmed Points

Three stemmed points (Table V) were excavated. Two of the points are complete (Fig. 9c,d) and one is a fragment. All three points are manufactured from local basalt. Shoulder form is asymmetrical and stems are straight rather than contracting. Edge form ranges from straight to excurvate, and all are bi-convex in cross-section.

Table V Chipped Stone Points (Stemmed), Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	32.5–54.5 mm	43.5	–	2
width	19.4–21.2 mm	20.1	–	3
thickness	6.0–9.1 mm	7.53	–	3
weight	4.8–8.8 g	6.8	–	2

Chipped Stone Bifaces

Eight artifacts are reported in this class, one is complete, seven are fragmentary (Fig. 10). Materials utilized include basalt (4), green quartzite (2), chalcedony (1) and slate (1). The Belcarra Park I bifaces probably served as cutting and scraping implements. Some, though, may be fragments of leaf-shaped projectile points.

Core Tools

Three core tools, two of basalt and one of unidentified stone material were recovered (Fig. 11). All three have had a number of flakes removed and very little cortex remains on any of the tools. The flakes have been struck at such a steep angle that no cutting edge has been produced. It is assumed that these nearly exhausted cores were utilized solely for the production of flakes.

Split-cobble Tools

The term is utilized by Mitchell to designate "a range of crude cutting and chopping implements, all of which show

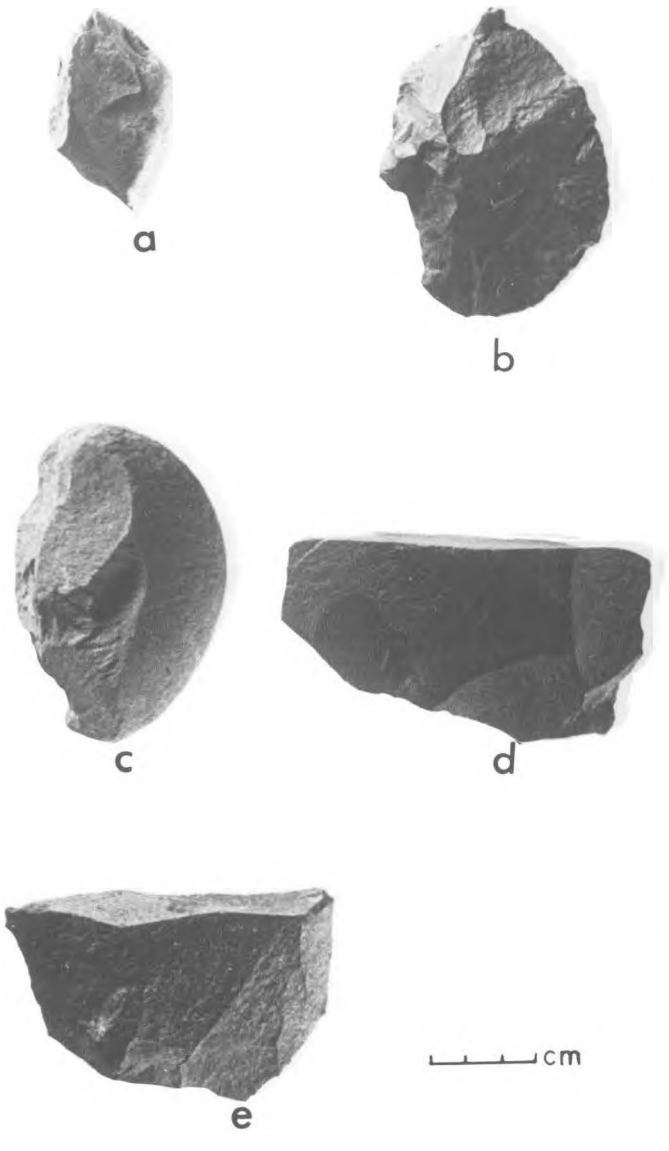


Fig. 11. Cobble core and split cobble tools, Belcarra Park I. *a–c* cobble core tools; *d–e* split cobble tools.

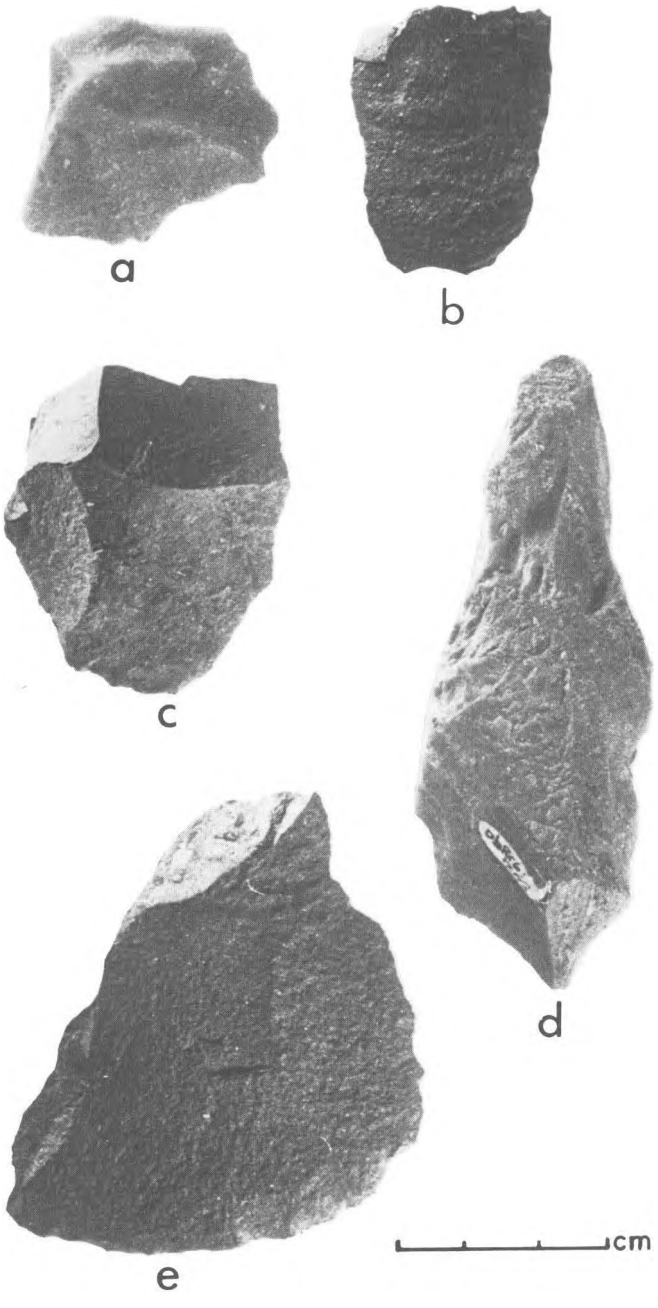


Fig. 12. Utilized and retouched flakes, Belcarra Park I. *a,d* utilized flakes (green quartzite); *b,c,e* unifacially retouched flakes.

coarse retouch on their cutting edges" (Mitchell 1971a:104). Three such implements although smaller for the most part than the Montague Harbour I specimens, are recorded for the Belcarra Park I component. All three of these tools are manufactured from basaltic material; two from a local, granular basalt and one from a more vitreous basalt. All exhibit rough retouch along the working edge, producing a sinuous cutting edge (Fig. 11).

Unifacially Retouched Flakes

Three irregularly shaped flakes of local basalt show signs of use and secondary retouch. In all three cases the retouch is both minimal (restricted to a section of one edge) and unifacial (Fig. 12).

Utilized Flakes

Nineteen flakes are irregularly shaped and exhibit signs of use, usually small striations or polish. Secondary retouch is absent. The most common material was local basalt (10). Green quartzite (6) and slate (3) flakes were also utilized (Fig. 12).

Miscellaneous Chipped Stone

Two implements are assigned to this category. A thin, bifacially flaked piece of slate (knife?) exhibits no secondary retouch or other modifications. It is roughly rectangular in outline, has a tapering cross-section and measures 97.5 x 53.0 x 11.0 mm. A thin schist tool roughly square in outline and rectangular in outline is from the Belcarra Park I component. This implement (knife?) measures 84.0 x 75.5 x 10.0 mm.

Ground Stone Artifacts

Ground Slate Points

Ground slate points from the Belcarra Park I component (16) were classified on the basis of presence or absence of stems.

Stemless Points

Fourteen ground slate points were grouped as stemless; six are complete, eight are fragmentary (6 distal tips, 2 proximal base fragments). Quantitative data are summarized in Table VI. All points are leaf shaped in outline with the exception of two unfinished points (Fig. 13d,m) which are triangular in outline. The points are hexagonal in cross-section resulting from three well defined facets being abraded on each face. Edges are convex with the maximum width occurring at the midline. The edges then taper gently to either a convex or straight base. An exception is Figure 13d which measures 110 x 31 x 6 mm. This point is triangular in outline, and has slightly asymmetrical straight edges. The maximum width occurs at the base rather than the midline. This point is very similar in size and outline to one illustrated by Borden (1962:13, Plate 3-c). Eight points have their basal portions intact. Six of these show a pronounced basal thinning on both faces of the points. Four of the eight show definite grinding facets on each edge near the base. These facets extend from the base along the edges for variable lengths (approx. 20–30 mm) giving a dulled edge. Mattson (1971:72) has reported two ground slate

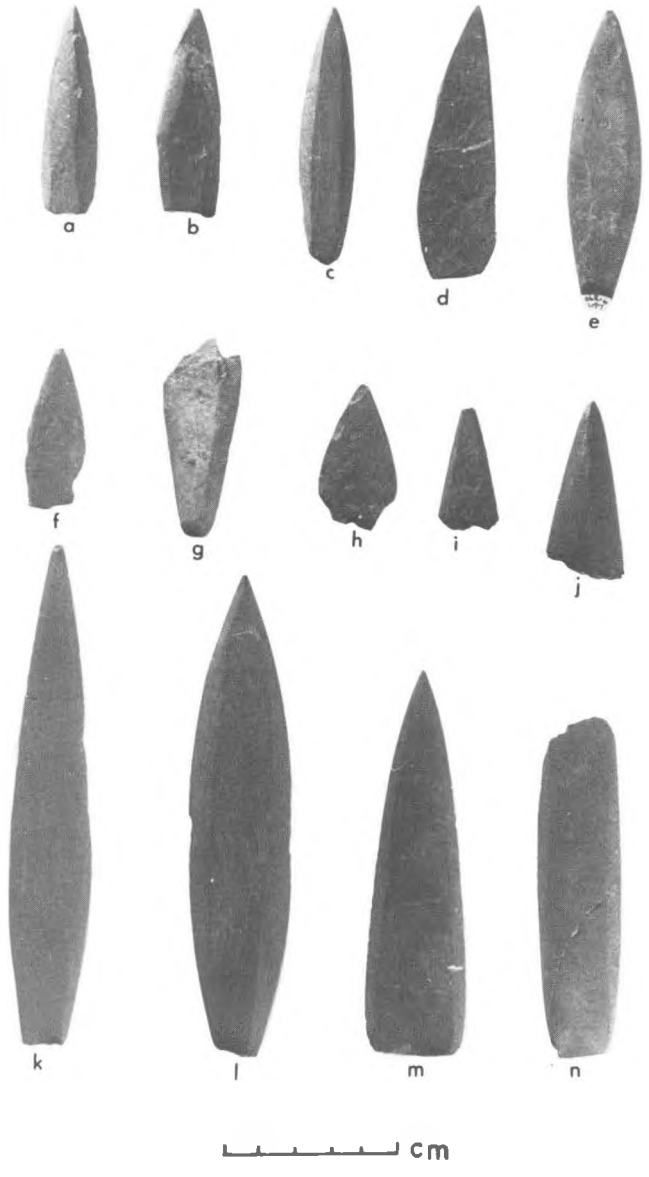


Fig. 13. Ground slate points, Belcarra Park I. *a–e, K–n* stemless ground slate points; *g,h* stemmed ground slate points.

points from his Skagit Delta I component with blunted lateral edges near their bases. This artifact type has been considered a diagnostic trait of early component sites in the Lower Fraser and Gulf Island regions.

Table VI Ground Slate Points (stemless), Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	74.4–163.0 mm	115.6	–	7
width	16.8– 30.2 mm	23.4	–	11
thickness	4.9– 7.1 mm	5.0	–	13
weight	10.08–44.83 g	23.57	–	6

Stemmed Ground Slate Points

Two stemmed ground slate points are reported from component I; both points are small and fragmentary. The points are poorly finished and do not exhibit the quality of workmanship seen in most of the stemless ground slate points.

Figure 13h shows a small point measuring (41.0) x 23.2 x 4.0 mm. The edges have been ground at the right angles to the faces of this point, giving it a rectangular cross-section. The edges are straight to slightly convex with sloping shoulders. A bevelled stem measuring 13.2 mm wide tapers to a broken base. The other stemmed point (Fig. 13g) measures (46.5) x 18.8 x 3.1 mm. This point exhibits convex edge form with markedly asymmetrical sloping shoulders, which taper to a broken base. Grinding facets (3) on each face give this point a hexagonal cross-section.

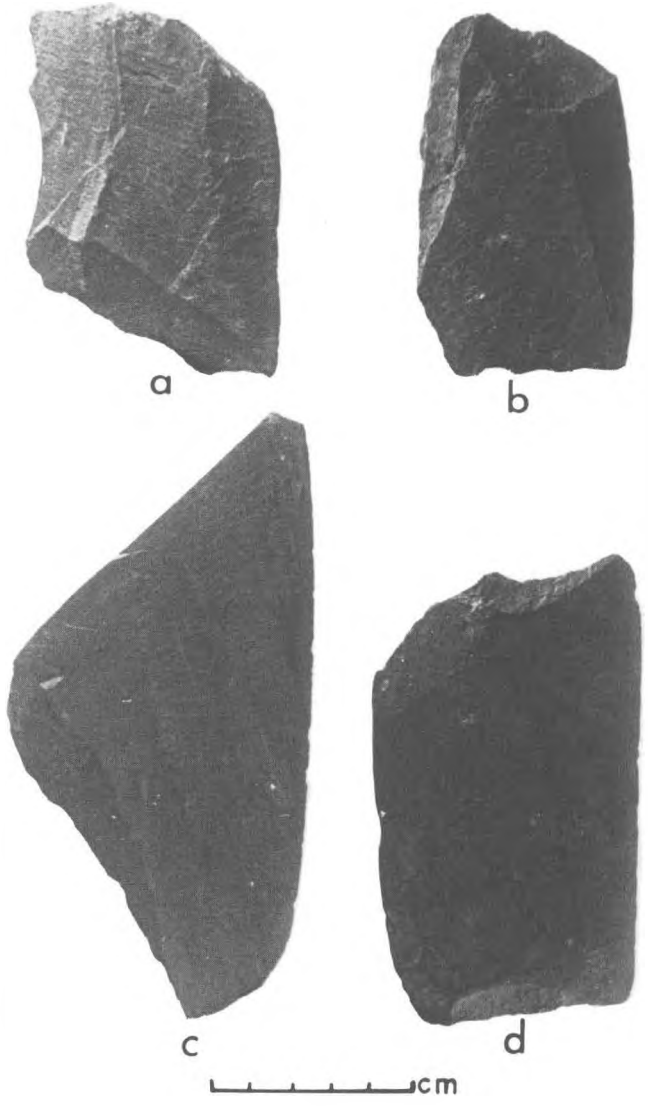


Fig. 14. Ground slate knives, Belcarra Park I.

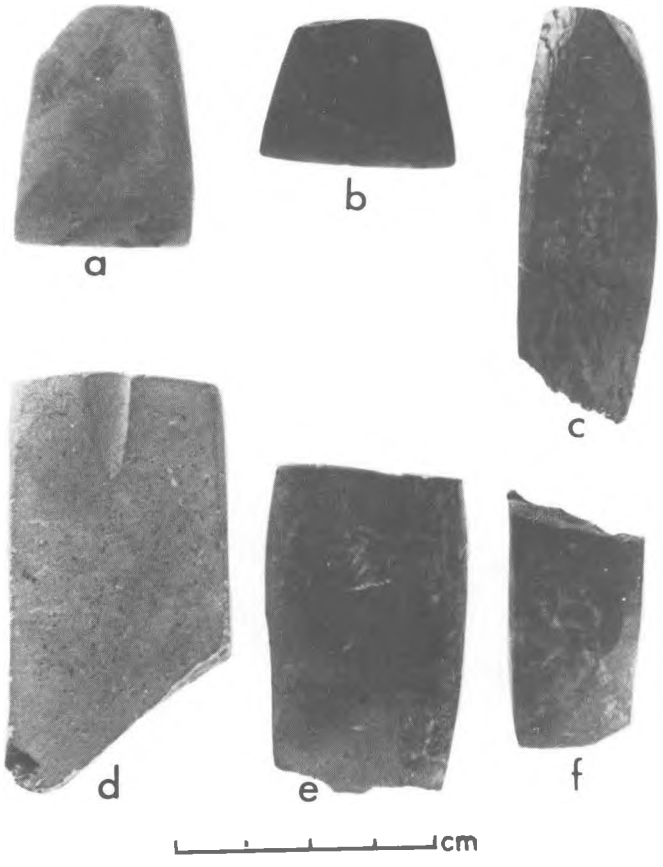


Fig. 15. Adze blades, Belcarra Park I.

Ground Slate Knives

Four knives of ground slate (Fig. 14, Table VII) are from the earliest component at the Belcarra Park site. These implements are manufactured from large slate flakes which have been preformed by bifacial percussion flaking. They were then bifacially abraded which produced a thin sharp cutting edge approximately one millimetre in thickness. The cutting edges are straight to slightly convex. The cross-sections taper from thick edges (maximum 18.8 mm) to thin cutting edges. This style of ground slate knife has been reported from a number of sites in the Lower Fraser area, and the Skagit delta.

Table VII Ground Slate Knives, Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	88.2–152.9 mm	111.27	–	4
width (max.)	55.0– 68.5	66.07	–	4
thickness (max.)	10.4– 18.8 mm	13.02	–	4
thickness (at cutting edge)	1.0– 1.4 mm	1.22	–	4
weight	59.5–132.0 g	93.6	–	4

This style of ground slate knife has been reported from a number of sites in the Lower Fraser area, and the Skagit delta.

Adze Blades

Six adze blades manufactured from jadeite were located (Fig. 15, Table VIII). All are small in size and show careful finish. Outlines are rectangular as are cross-sections. Four of the adze blades have their cutting edges (bits) intact. Bits have been bifacially ground with an emphasis on one face, producing a somewhat asymmetrical cutting edge. The edges of the bit are all slightly convex in form. Two of the adze blades have their maximum width at the bit. Three of the bits show a wear pattern in which small unifacial flakes have been removed from the side of the less bevelled edge. The same wear pattern has been observed in two celts from the Montague Harbour I component. Mitchell feels this pattern shows evidence for "adzing or some other single-direction chopping or chiselling activity" (Mitchell 1971a:113).

Table VIII Adze Blades, Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	23.8–64.4 mm	43.85	14.70	4
width	21.6–31.7 mm	26.98	4.45	5
thickness	5.1–18.4 mm	13.42	8.24	4
weight	6.28–40.87 g	26.42	14.99	4

Miscellaneous Ground Stone

A single piece of ground slate was too fragmentary to permit classification. The single specimen is thin (9.0 mm), has been bifacially ground and tapers toward edges which have been broken. The cross-section is biconvex.

Pecked and Ground Stone Artifacts

Shapes Abrasive Stones

Five abrasive stones were recovered from the Belcarra Park I component. This ubiquitous class of artifact has been variously described in the literature as abrader, whetstone or hone. They are not particularly diagnostic of any phase, yet they remain as a vitally important part of the Northwest Coast tool kit. Clearly, they were used for abrading, grinding and polishing of bone, stone and shell implements. Being made of various grades of sandstone they break easily. The majority of abrasive stones excavated were fragmentary, thus making classification difficult. Thus far, the most detailed typology is that of Mitchell(1971a) who classifies abrasive stones from the Montague Harbour midden as either shaped (round, tapering, bar and miscellaneous) or irregular.

All five Belcarra Park I abrasive stones show evidence

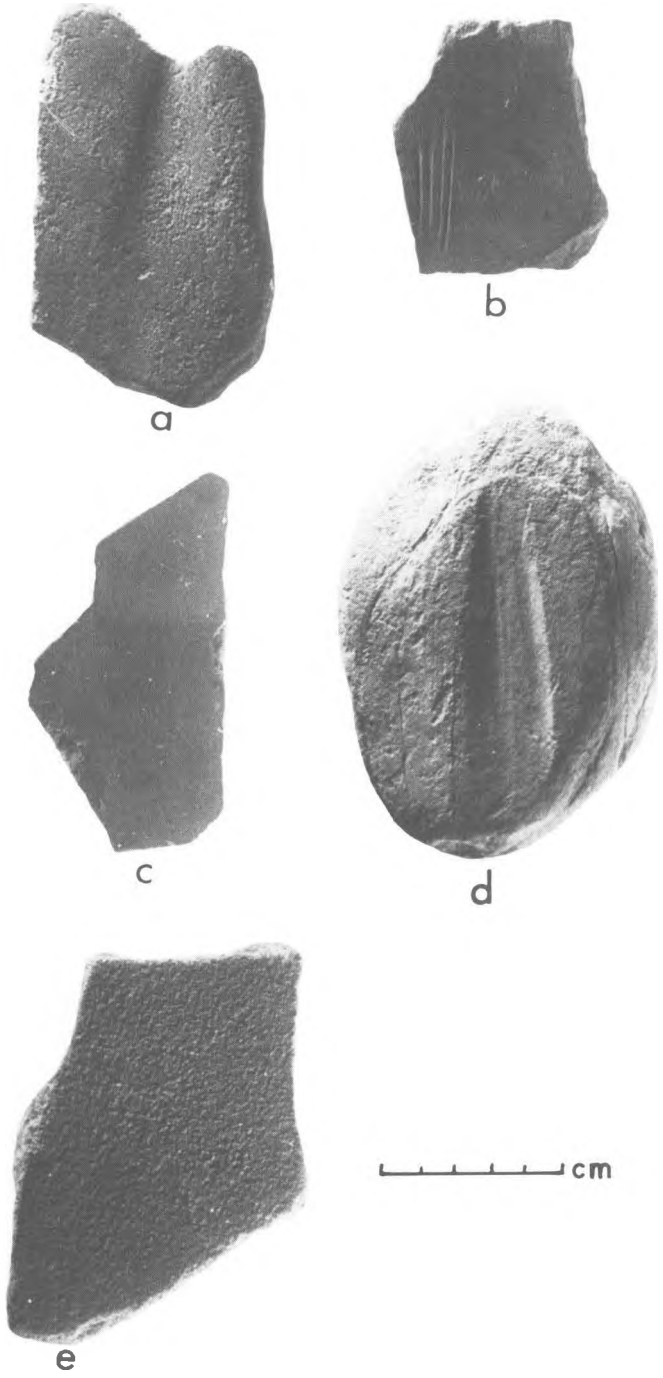


Fig. 16 Abrasive stones, Belcarra Park I.

of definite shaping. Figure 16b is a medial fragment and may be a fragment of a larger shaped abrasive stone. All five abrasive stones are of sandstone and range in texture from fine to coarse. All are rectangular in cross-section, while in outline they range from rectangular to hexagonal. The large abrasive stone measures 143 x 103 x 26 mm while the smallest is 53 x 43 x 18 mm. Three show evidence of being utilized bifacially, one had been utilized unifacially only, while the last one was a medial fragment (longitudinally broken) and utilization could not be determined. As well, one artifact, (Fig. 16e) showed extensive abrading on two edges.

Hammerstones

Hammerstones as defined by Mitchell are "naturally oval beach or river cobbles showing signs of use for pounding or pecking" (Mitchell 1971a:119). Wear use patterns are reflected by battered and/or pitted areas on one or more ends or sides of the implement. Six hammerstones (Fig. 17, Table IX) all complete, were excavated in the Belcarra Park I component. Three specimens exhibit pitting at one end while the other three show pitting at both ends. Hammerstones are a common artifact type and are widely reported from virtually all components in the Lower Fraser and Gulf of Georgia regions.

Table IX Hammerstones, Belcarra Park I

Attribute	Range	Mean	S.D.	Number
length	97.2–136.0 mm	115.0	–	6
width	61.0– 93.5 mm	79.0	–	6
thickness	43.8– 59.0 mm	53.0	–	6
weight	443.5–659.7 g	554.7	–	6

Miscellaneous Pecked and Ground Stone

A rather unusual pecked and ground stone implement was excavated. The tool measures (121.1) x 98.3 x 24.9 mm and is manufactured from schist (?). The object is triangular in cross-section and tapers from a thick (24.9 mm) edge to a thin (2.7 mm), ground working edge. The thin edge (unlike knife forms) has not been honed and polished to a fine cutting edge, but is convex and blunt.

Bone and Antler Artifacts

Five bone artifacts are from the first component. Four are manufactured from land mammal bone, while a single item is of bird bone. All the implements are fragmentary.

Barbed Bone Point

A medial fragment of a barbed bone point (Fig.18b) measuring (36)x 13.9 x 4.5 mm was recovered. Two barbs are present, they are low and isolated. The distance between the barbs is 8.0 mm. The barbs were formed by a simple sawing action on either side of the implement. The artifact is elliptical in cross-section.

Metatarsal Awl

One land mammal (deer?) metatarsal bone is from the Belcarra Park I deposits (Fig. 18c). The tool has been split

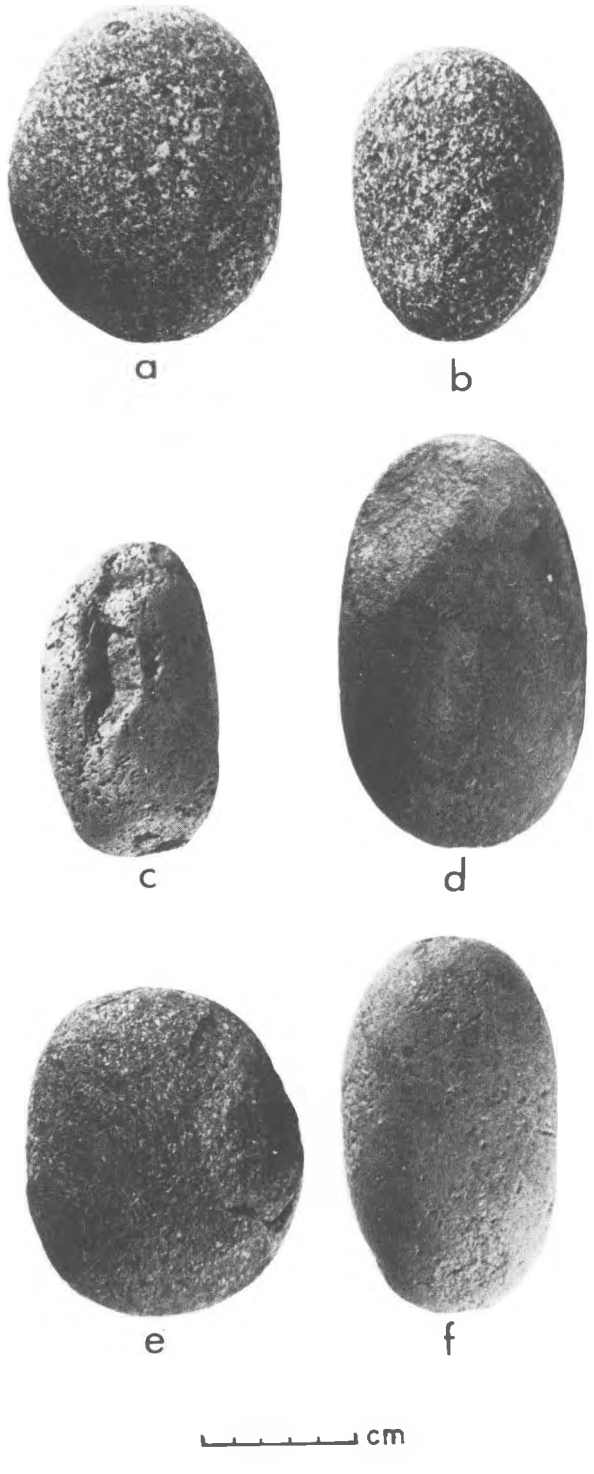


Fig. 17. Hammerstones, Belcarra Park I.

longitudinally and a transverse facet has been ground at the distal (broken) end. Ten metatarsal awls which have been split and ground to a point are reported by Mattson (1971: 103) for the Skagit delta; although phase designation for these implements is unclear.

Bone Chisels or Wedges

Two specimens, both fragmentary, fall into this category. A highly polished wedge tip (Fig. 18e) has a smooth well rounded bit which has been unifacially ground. This gives the tip its markedly asymmetrical form. Another fragment (Fig. 18a), like the previous one, has a highly polished wear pattern. Considerable care has been taken in the manufacture of this implement which measures (36.2) x 11.8 x 6.3 mm. This chisel-like tool has been manufactured on a land mammal long bone and exhibits straight sides and a biconvex cross-section. The bit is straight and has been asymmetrically, bifacially ground.

Miscellaneous Worked Bone Fragment

A bird bone fragment measuring (51.5) x 6.4 x 5.2 mm was located in the Belcarra Park I component. The fragment shows no obvious manufacturing marks but it appears to have been highly polished from use. It may have functioned as a bird bone whistle, awl or possibly a drinking tube. Bird bone whistles have been recorded from sites with early components in the Lower Fraser and Gulf of Georgia regions.

Composite Antler Toggling Harpoon Valve

A broken toggling harpoon valve (56.6) x 19.3 x 14.8 mm was recovered (Fig. 18f). The rounded lateral spur and basal socket portion is all that remains of this artifact, but the complete implement must have been at least 114.0 mm in total length. Composite toggling harpoon valves (and antler foreshafts) have been recovered from a number of sites in the coastal area of southwestern British Columbia. Three types of toggling harpoons have been recognized from the Locarno Beach phase; a small, one-piece toggle head, a one-piece toggle head which has a slot for a cutting blade and a composite toggle head, again slotted for a cutting blade (Borden 1970:97). The first two types were not found in the Belcarra Site.

Antler Wedge

One fire-hardened antler tine wedge was recovered from Belcarra Park I deposits (Fig. 18d). This wedge measuring 101.1 x 27.0 x 18.1 mm has been sawn longitudinally and snapped. Carving marks showing where the tine was cut from the beam are still in evidence. There is no evidence of battering on the poll, however. The wedge is curved following the natural shape of the tine. The bit is convex in form.

Miscellaneous Worked Antler

A poorly preserved antler fragment measuring (29.2) x (11.8) x (6.2) mm was recovered. The artifact was so

Fig. 18. Artifacts of bone and antler, Belcarra Park I. *a* chisel (bone); *b* barbed fixed point (bone); *c* metatarsal awl (deer?); *d,e* wedges (antler); *f* composite toggling harpoon valve (antler).

badly deteriorated that most attributes could not be ascertained.

Burials

A single burial was encountered in the lowermost portion of Zone B deposits, (Belcarra Park I component) in Excavation Units 9 and 10 (Fig. 19–20). It lay on its left side, was oriented to the southwest and appeared to be in a flexed position although this was difficult to ascertain as the burial was badly fragmented, scattered and poorly preserved. Fragments of the proximal portion of both the right and left femur and fragments of ribs and the left ulna were burnt. Four cranial fragments and a fragment of the right half of the mandible remained. The complete deterioration of the pelvic region made identification of sex impossible. A single adze blade (Fig. 15d) was located in close proximity to the burial and may be associated.

Cultural Reconstruction

The small sample size of the Belcarra Park I component allows few generalizations in terms of cultural reconstruction. Clearly though, a specialized manufacturing technology based upon bifacial stone chipping, the pecking and grinding of stone and the grinding of bone, antler and presumably wood was in operation. Stone was worked by chipping, pecking, grinding, incising and sawing. Granular rock was shaped by pecking. Direct percussion techniques are in evidence in cobble tools, split-cobble tools and in the preforming of ground slate knives. Fine pressure flaking was observed on chipped stone points and bifaces of granular basalt, green quartzite and on relatively rare vitreous basalt items. Slate and nephrite tools were formed primarily by abrasion although adze blades were first sawn to shape and then finished by abrasion.

There was no evidence of stone drilling or carving from the Belcarra Park I component although other Locarno Beach components, especially ones that contain Gulf Island complex artifacts reflect the existence of well developed drilling techniques.

Bone tools were generally sectioned by splitting, incising or sawing and snapping and then finished by abrading. A similar technology was applied to antler tools, although evidence for adzing was also observed. No shell artifacts were located but other Locarno Beach components have yielded shell adze blades and chisels.

Judging by the size of the chipped stone and ground stone projectile points, spears and lances appear to have been in use. Large ground and faceted bone points have also been recovered from the Locarno Beach components at the Whalen Farm and Locarno Beach sites. It is highly probable that darts and throwing boards were being utilized; a single anthropomorphic atlatl hook made from an antler tine has been recovered by Borden (1970:98).

Ground slate knives and split-cobble tools probably functioned as butchering tools and the abundance of fire-broken rock suggests that stone boiling and steaming were important activities. Well made adze blades, chisels and wedges attest to a highly developed woodworking technology.

Fishing equipment is poorly represented in the Belcarra

Fig. 19. Burial no. 1, excavation units 9 and 10, Belcarra Park I.

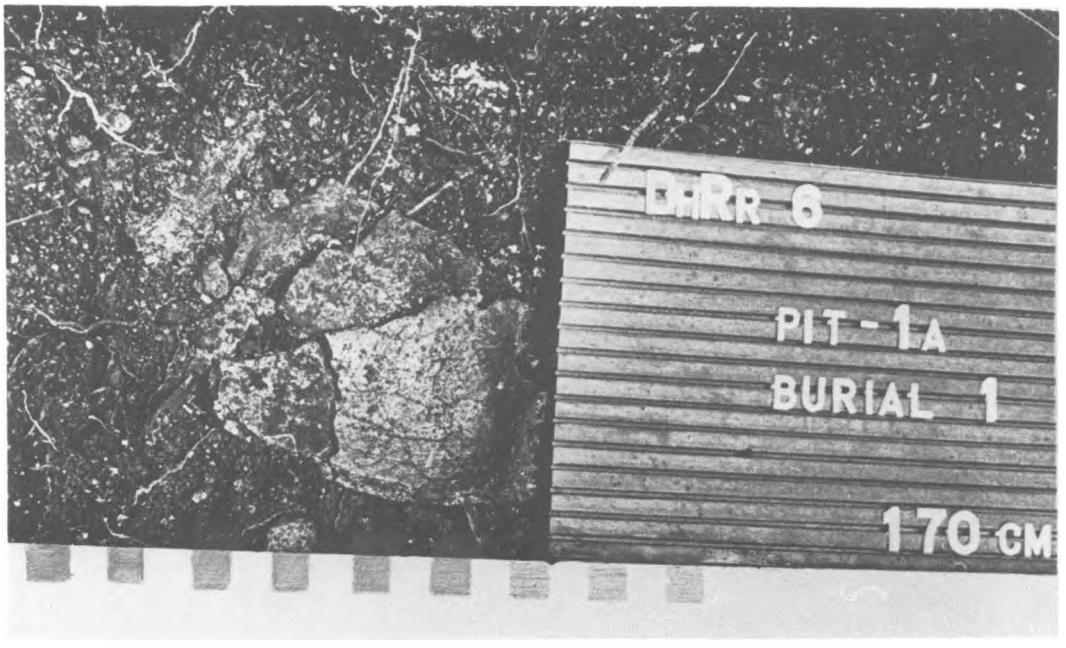


Fig. 20. Burial no. 1, excavation units 9 and 10, Belcarra Park I.

Park I component, although the single barbed bone point may have functioned as a fish spear. Other components have also yielded grooved and notched stones suitable for net or fishline sinkers, fish gorges and bone bipoints and single pointed bone artifacts which may have functioned as parts of leister spears or composite fish hooks. Mitchell (1971a:150) considers the composite toggling harpoon from Montague Harbour I as being too light for the taking of large sea mammals but suggests that small sea mammals or porpoises may have been taken. A spur fragment of a large toggling harpoon valve was recovered (Fig. 18f). A well developed toggling harpoon technology appears to have been in existence as many valves and antler foreshafts have been recovered from other Locarno Beach components.

Personal ornaments were not recovered from Belcarra Park I although other Locarno Beach components have labrets, earspools and Gulf Island complex artifacts which may have been ornamental. No direct evidence of structures was obtained from this component. Borden (1970:99) has suggested that large plank houses were not in existence during Locarno Beach times, as heavy woodworking implements were absent.

Flexed burials appear to be characteristic of Locarno Beach components. Burial cairns have also been reported from the Montague Harbour I component (Mitchell 1971a: 147) and one individual from this component was burned. As in the Belcarra burial it did not appear to be an intentional cremation.

Introduction

In comparison with the previously described component, the Belcarra Park II assemblage is large (N=1,170) and dominates the site. The Belcarra Park II artifacts comprise 92% of the prehistoric assemblage. The bone and antler industries comprise the majority of the collection (58.7%) while the chipped stone (19.2%), ground stone (11.6%) and pecked and ground stone (10.5%) industries form 41.3% of the Belcarra Park II assemblage. The bone industry is especially dominant (46.3% of Belcarra Park II assemblage) in this component with the class of unbarbed bone points alone comprising almost half of the bone industry (242 of 545 artifacts).

Chipped Stone Artifacts

Chipped Stone Points

In all, 116 chipped stone projectile points either complete or fragmentary were excavated in the Belcarra Park II component. Fifteen are too fragmented for classification and are grouped as chipped point fragments. Complete points are grouped into the following categories: leaf-shaped points, triangular points, stemmed points, triangular side-notched points, and triangular corner-notched points. Basalt (ranging from granular to vitreous) was the dominant material selected (109) for projectile point manufacture. Slate (1), chert (1), green quartzite (2) and chalcedony (1) are also represented.

Stemmed Points

Sixteen projectile points (14 complete, 2 fragmentary) are classified as stemmed points (Fig. 21). The preferred raw material is basalt with 14 specimens manufactured from this material. One point has been manufactured from chert and one from slate. All points are bifacially flaked although on three the flaking is primarily on one face with minimal secondary retouch only along the edges of the other face. Edges are straight to convex while stems are short (mean 6.5 mm), narrow and straight to slightly expanding. Table X summarizes the quantitative attributes of stemmed points. Small stemmed projectile points are widely reported from Gulf of Georgia sites with late components.

Table X Chipped Stone Points (stemmed) Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	25.0–53.0 mm	37.7	9.81	14
width	12.0–24.0 mm	16.73	3.27	16
thickness	3.0– 7.0 mm	4.66	1.19	16
neck width	5.0–10.0 mm	7.93	1.57	16
weight	0.8– 7.4 g	2.62	1.88	14

Leaf-shaped Points

Five leaf-shaped points, all manufactured from basalt were recorded as being from Belcarra Park II (Fig. 22f–k, Table XI). Edges are straight to slightly convex, bases are convex; all are biconvex in cross-section. Maximum width occurs in the lower one-third of the artifact. These points are bifacially flaked with secondary retouch along the edges. All points have been thinned toward the base. Workmanship varies from crude to excellent.

Table XI Chipped Stone Points (leaf-shaped), Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	27.0–51.9 mm	39.5	8.5	4
width	4.0–20.0 mm	15.6	5.95	5
thickness	4.0– 8.0 mm	6.0	1.67	5
weight	4.9– 5.0	4.95	.05	2

Triangular Points

These points (12 in number) are small and all are manufactured from basalt (Fig. 22a–e, Table XII). Base form is generally straight although two exhibit convex bases (one is asymmetrical) and one has a concave base. All are bifacially flaked and have bases which are thinned. Some exhibit shallow, well-controlled flaking technique while others manufactured on thick flakes show steep, crude flaking.

Table XII Chipped Stone Points (triangular) Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	26.0–51.0 mm	35.5	6.98	10
width	18.0–24.0 mm	20.62	1.93	10
thickness	4.0– 8.0 mm	6.0	1.33	11
weight	1.5– 5.8 g	3.66	1.95	7

Triangular Side-notched Points

This is the largest category of chipped stone projectile points from the Belcarra Park site (Table XIII). The 55 points represent 48% of all chipped stone projectile points from the Belcarra Park II component. Once more basalt is

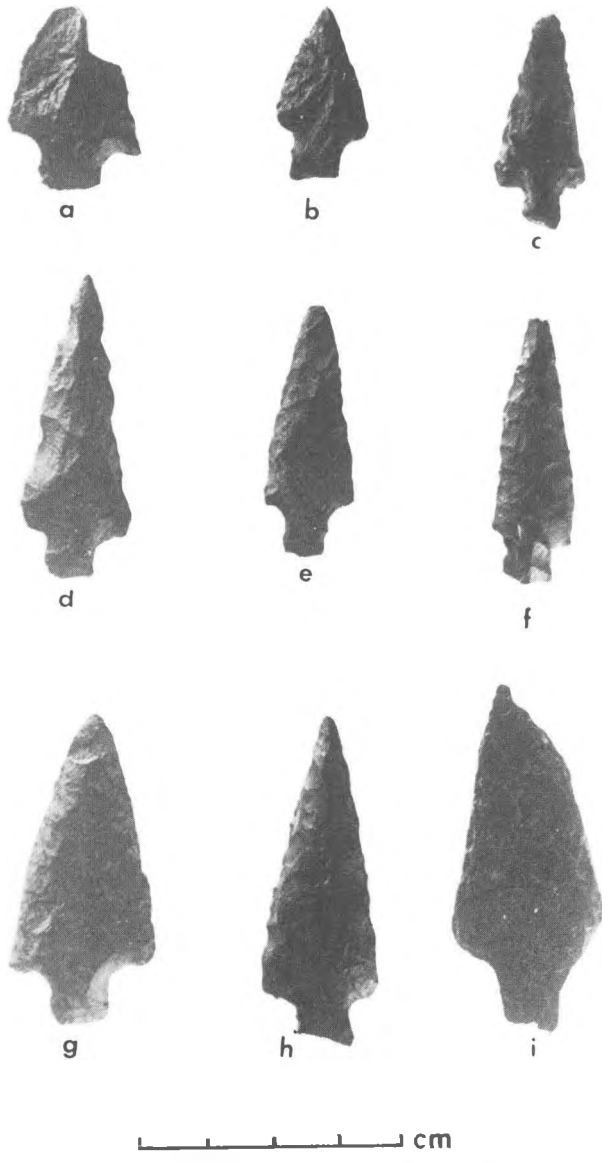


Fig. 21. Chipped stone points (stemmed), Belcarra Park II.

the preferred material; 36 points are manufactured from granular basalt while 16 have been manufactured from a more vitreous grade of basalt. One point (Fig. 23n) is made of chalcedony while two are of a green quartzite material.

These are small points (mean length 30.8 mm) with triangular outlines and narrow (under 4.0 mm) side notches. Edges are straight although one anomolous specimen (Fig. 23aa) exhibits incurvate (concave), serrated edges. Stems are expanding and the maximum width of the artifact is at the base. Bases range from straight (23), to convex (13), to concave (6). Base form could not be ascertained for 13 of the artifacts. These points have been bifacially flaked and thinned towards the bases. Workmanship is good, often with skillfully controlled retouched edges. Small, side-notched points have been reported, but not in abundance, in the late components in the Lower Fraser area.

Table XIII Chipped Stone Points (side-notched) Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	18.0–61.0 mm	30.8	9.07	33
width	10.0–20.0 mm	15.5	2.32	52
thickness	3.9– 7.0 mm	4.4	.95	51
neck width	5.0–12.0 mm	8.5	1.72	50
weight	0.6– 5.8 g	1.7	1.05	33

Triangular Corner-notched Points

Thirteen chipped stone points have been classified in this category. Twelve are manufactured from black basalt and one is of green quartzite. They are small (under 30 mm in length) and triangular in outline with straight or slightly convex edges (Fig. 24, Table XIV). All are characterized by being barbed although one is best described as being shouldered. Base form where observable is either straight or convex.

Table XIV Chipped Stone Points (corner-notched) Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	28.0–34.0 mm	30.9	2.29	7
width	15.0–20.0 mm	17.4	1.36	10
thickness	3.0– 4.0 mm	3.7	.46	10
neck width	6.0–12.0 mm	8.3	1.62	10
weight	.9– 2.1 g	1.59	.41	7

Fragmentary Chipped Stone Points

These 15 basalt specimens are tip fragments. Lacking the basal aspect they are impossible to classify. Several appear to have straight or slightly convex edges and are triangular in outline. They may fit into any of the previously three described classifications.

Chipped Slate Knives

Six chipped slate knives were recovered from the Belcarra Park II component (Fig. 25, Table XV). These are roughly rectangular in outline with straight to excurvate edges. Manufactured from large flakes, they all exhibit broad percussion flake scars which have produced rough, sinuous cutting edges. These tools are bifacially flaked and show no secondary flaking.

Table XV Chipped Slate Knives, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	64.0–82.0 mm	75.6	–	6
width	45.0–78.0 mm	62.0	–	6
thickness	.8–18.0 mm	11.3	–	6
weight	31.6–119.5 g	56.4	–	6

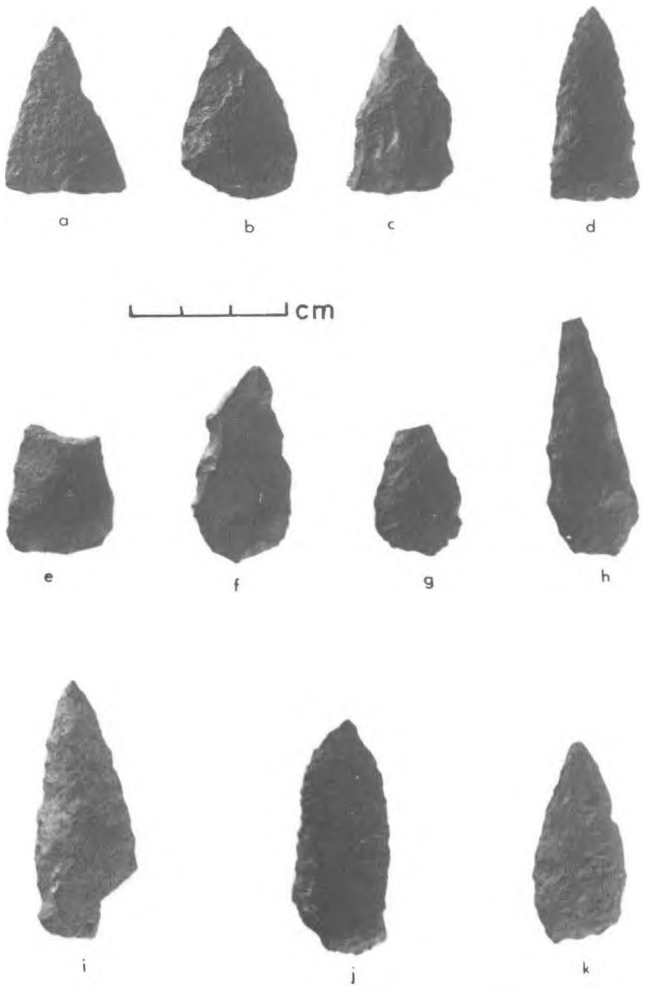


Fig. 22. Chipped stone points (triangular, leaf-shaped), Belcarra Park II. *a–e* triangular chipped stone points; *f–k* leaf-shaped chipped stone points.

Chipped Stone Bifaces

Twenty-four artifacts from the second component have been classified as chipped stone bifaces (Fig. 26, Table XVI). Nine are complete while 15 are incomplete (10 tip fragments, 2 medial fragments, 3 basal fragments). These implements exhibit a wide range in shape, size and material. Leaf-shaped bifaces were the most common; however there was only one each of the rectangular, triangular and bipoint configuration. Materials utilized include granular basalt (11), vitreous basalt (6), green quartzite (3), chalcedony (1), chert (1), petrified wood (1) and an unknown material (1). A unique artifact in this category is a bilaterally notched biface (Fig. 26a). Triangular in outline, it is manufactured on a broad curved flake of basalt and measures 60.0 x 31.0 x 8.1 mm. The notches are deep and have grinding facets on the upper edges of the notches. This implement shares many of the attributes of the hafted scraper category defined by Sanger as "carefully flaked, thin discoids with narrow side notches" (Sanger 1966:10).

Chipped stone bifaces reflect what is considered to be a deliberate attempt on the part of the tool manufacturer to achieve a preconceived form. Some of the smaller tip fragments may be fragments of projectile points. In the literature this class of artifact is often given the inferred function of knife (hafted or non-hafted), spear point or dart point. Table XVI summarizes the metric data for chipped stone bifaces.

Table XVI Chipped Stone Bifaces, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	33.0–75.0 mm	59.0	–	9
width	19.0–59.0 mm	30.7	–	17
thickness	6.0–18.0 mm	9.1	–	23
weight	4.7–49.8 g	20.3	–	9

Chipped Stone Unifaces

Six implements from Belcarra Park II are classified in the uniface category (Fig. 27g, Table XVII). Three are of granular basalt, two are of vitreous basalt, while one is manufactured from green quartzite. Cross-sections are plano convex (5) while one is biconvex. Outlines are extremely irregular. Flakes are struck predominently from one face, as is the secondary flaking.

Table XVII Chipped Stone Unifaces, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	38.0–66.0 mm	51.6	–	6
width	23.0–46.0 mm	38.0	–	6
thickness	7.0–17.0 mm	12.6	–	6
weight	16.5–53.5 g	30.7	–	6

Cobble Core Tool

One complete cobble core tool was excavated in Belcarra Park II deposits (Fig. 27j). The implement measures 114 mm x 93 mm x 47 mm and weighs 488.0 g. A number of broad flakes have been struck (5 from one face, 7 from the other) producing a sinuous cutting edge on this heavily water-rolled tool. The material is unknown.

Cores

Eight cores were recovered (Fig. 27h,i). Materials selected include vitreous basalt (5), granular basalt (2) and green quartzite (1). A series of irregular flakes have been removed from each artifact. Striking platforms where observable were manufactured as a result of the removal of a single broad flake. Judging by the steep edges produced by the removal of flakes there is little doubt that these implements were utilized as cores rather than choppers or scrapers.

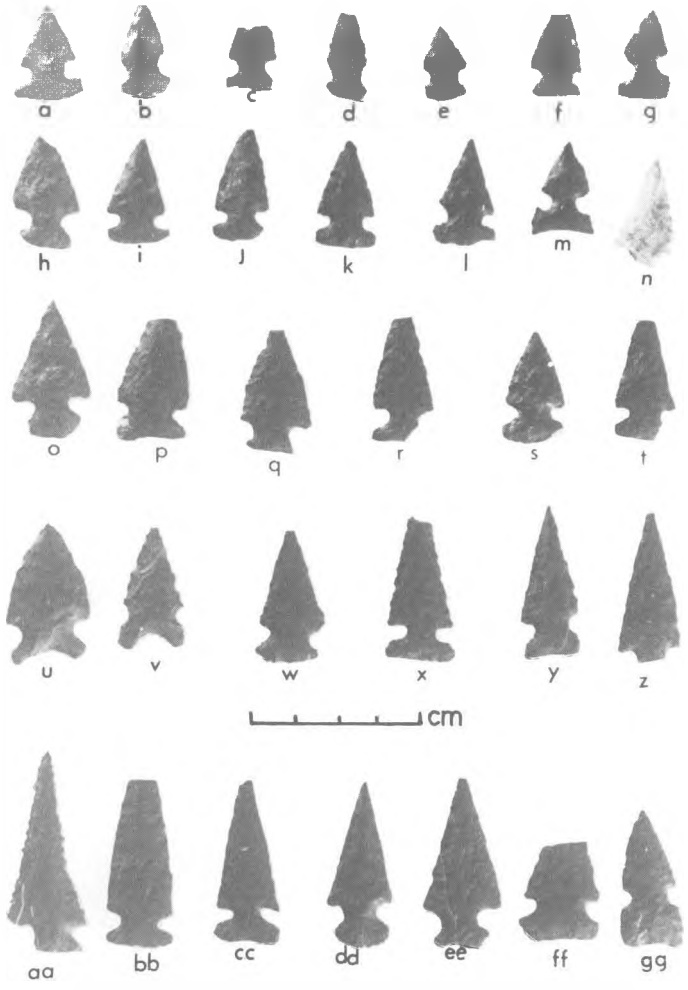


Fig. 23. Chipped stone points (side-notched), Belcarra Park II.

Graver

A single graver made of vitreous basalt was excavated from the late component (Fig. 27a). The finely made tool measures 55 mm x 24 mm x 10 mm and weighs 11.4 g. The well defined graver spur is unifacially retouched and the opposite face of the spur tip exhibits wear polish. The implement is very similar in dimension and form to Sanger's Group 2 gravers from the Lochnore-Nesikep locality (Sanger 1970:83–84). Gravers are thought to be tools which were utilized for cutting and sectioning hard to work material such as bone and antler. To my knowledge no gravers have been reported from sites in the Lower Fraser or Gulf of Georgia regions.

Drills

Two artifacts, both fragmented, both of vitreous basalt and both bifacially flaked have been classified as drills (Fig. 27b,c). One artifact (Fig. 27b), is lenticular in cross-section, while Figure 27c is plano-convex in cross-section and resembles the T butt drills described by Stryd (1972: 200). Drills are also reported by Sanger (1970:84) for the Lochnore-Nesikep locality. Drills, like gravers are not common in Lower Fraser sites although Crowe-Swords (1974) lists four drills from the Carruthers site.

Bifacially Retouched Flakes

Nineteen flakes were excavated which exhibit retouch. Eight of the flakes are irregular forms which show secondary retouch on both faces and on one or more edges. There is considerable variation in the quality of flaking, ranging from poor to excellent. Materials selected include granular basalt (4), vitreous basalt (1), chalcedony (1), green quartzite (1) plus one flake of unknown material.

Unifacially Retouched Flakes

Eleven flakes of amorphous form but exhibiting unifacial retouch were recovered. Retouch along one edge only ranges from marginal to extensive. Materials include granular basalt (3), vitreous basalt (7), chalcedony (1) and green quartzite (1). McMurdo (1974:45) reports 50 unifacially modified flakes from the Helen Point site.

Utilized Flakes

Utilized (or use-retouched) flakes are defined as triangular shaped flakes which exhibit small scars or polish which can be attributed to use and do not exhibit purposeful retouch. Thirty-four such flakes were recovered from Belcarra Park II deposits. Materials include granular basalt (13), vitreous basalt (10), green quartzite (7), pitchstone (3) and chert (1).

Ground Stone Artifacts

Triangular Ground Slate Points

Forty-three triangular slate points (10 complete, 33 fragments) were excavated in Belcarra Park II deposits (Fig. 28, Table XVIII). These points share the following non-metric attributes. All points are triangular in outline and have straight to slightly convex edges. Base form is variable and ranges from straight (often asymmetrical) to slightly convex to concave. One artifact (Fig. 28o) exhibits a well defined basal notch. Edges are bifacially bevelled resulting in a lenticular cross-section. A number of specimens exhibit a number of grinding facets on both faces of the implement. Most reach their maximum thickness one-third of the distance from the proximal end and then taper gradually to a thinned base. Quantitative data are given in Table XVIII. Triangular ground slate points according to Barnett (1955:101) are arming points for composite toggling harpoons. These points are common in coastal sites in southwestern British Columbia which contain post-Marpole components, and are often considered characteristic of such components.

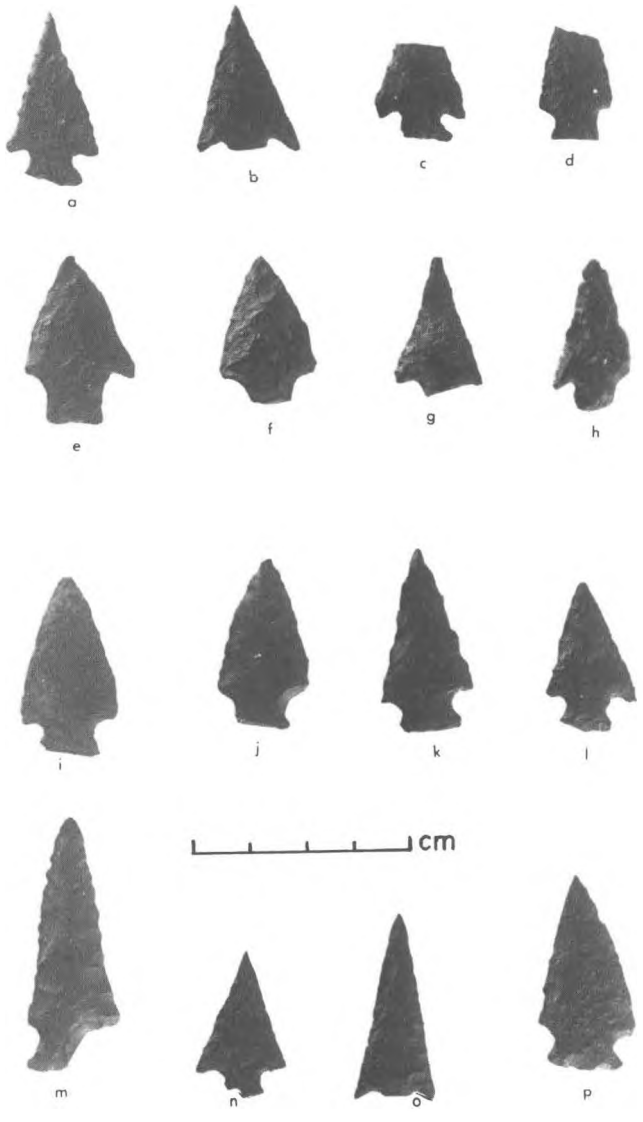


Fig. 24. Chipped stone points (corner-notched), Belcarra Park II.

Table XVIII Triangular Ground Slate Points, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	27.0–89.0 mm	53.0	16.18	17
width	12.1–27.0 mm	20.9	4.33	26
thickness	1.5– 5.0 mm	2.7	.91	37
weight	.92– 3.2 g	2.3	1.21	6

Triangular Ground Slate Points (Side-notched)

Eight small triangular ground slate points manufactured from various grades of slate were excavated in Belcarra Park II deposits (Fig. 29, Table XIX). They differ from the previous category in that these points exhibit small side-notches. They are also much smaller (under 36.0 mm in length) and lighter (mean .72 g), plus they do not share the attribute of basal thinning. All points are triangular in outline and have straight sides although one specimen (unfinished) has convex sides and a single side-notch. Edges have been bevelled bifacially which has resulted in a sharp edge and a lenticular cross-section. Base form is straight, although some are slightly convex. Side-notched ground slate points are not commonly reported for Gulf of Georgia sites. One is illustrated by Carlson (1970:121) from the San Juan component at the Helen Point site. It appears to be similar in size and form to the Belcarra Park points. Crow-Swords (1974: Fig. 19a–d) excavated ten ground slate side-notched points at the Carruthers site.

Table XIX Triangular Ground-slate Points (side-notched) Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	21.0–36.0 mm	29.0	5.62	5
width	13.0–17.0 mm	14.4	1.25	6
thickness	1.5– 2.5 mm	1.94	.30	8
neck width	7.0– 9.0 mm	7.81	.66	8
weight	.56– .87 g	.72	—	2

Ground Slate Knives

A considerable number of ground slate knife fragments were excavated. Eight of the fragments are large enough to discuss some of their shared attributes although no complete knives were found (Fig. 30). All of these tools have been manufactured from thin slabs of slate of various grades. Initial modification consisted of coarse abrasion followed by fine honing, producing an implement with a mean thickness of four millimetres. Edges are bifacially ground in a symmetrical fashion producing a strong, sharp and often polished cutting edge. Indications are that these tools were rectangular to plano-convex in outline. Sixty-one smaller ground slate fragments were also recorded. The possibility that these smaller fragments may actually represent portions of other tool classes (e.g. ground slate points) has been considered. However, two factors mitigate against this possibility. Firstly, a number of the fragments exhibit portions of a well-defined bevelled cutting edge and, secondly, the attribute of thickness is identical (mean 4 mm) to the eight larger ground slate knives. A number of these smaller fragments could easily be pieces of the same tool. This class of artifact is well represented in late component sites in the Lower Fraser and Gulf of Georgia regions and is often considered a characteristic trait of these components.

Adze Blades

Five complete adze blades (celts) and ten fragments

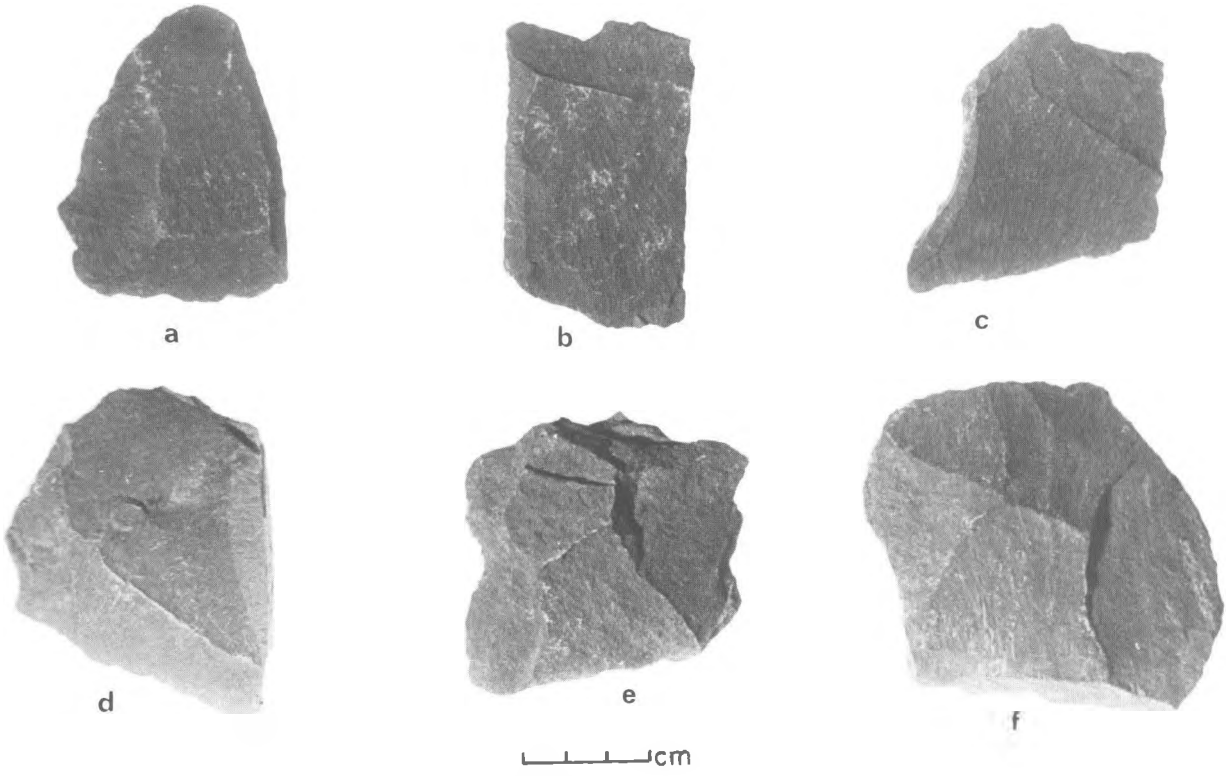


Fig. 25. Chipped slate knives, Belcarra Park II.

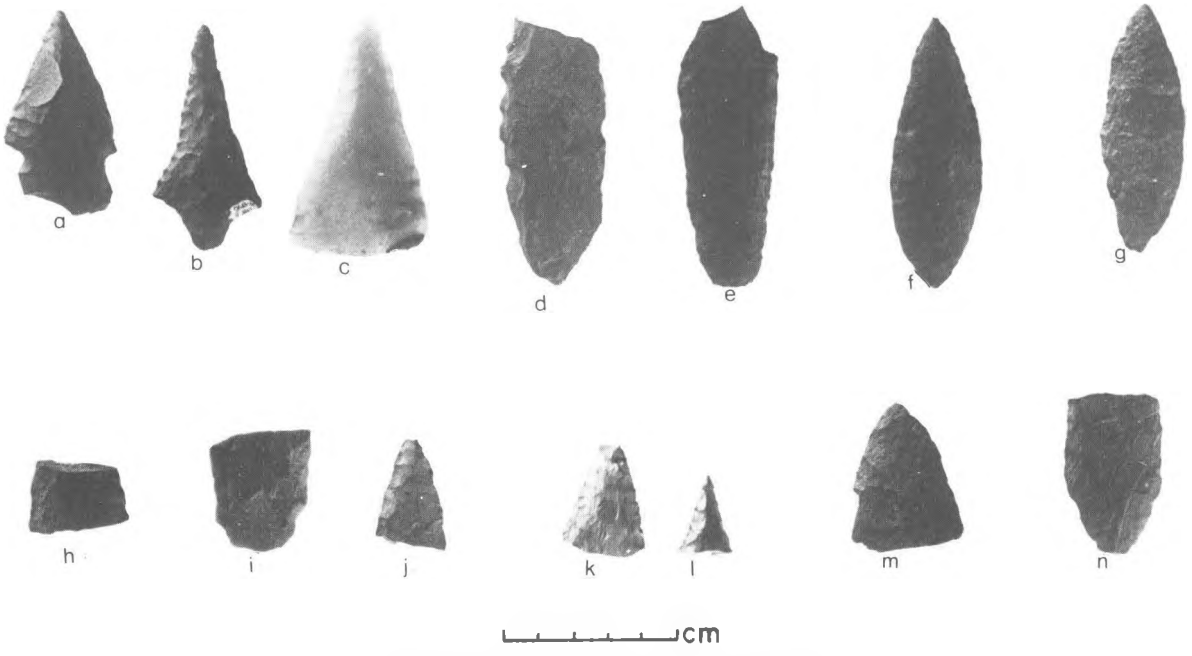


Fig. 26. Chipped stone bifaces, Belcarra Park II.

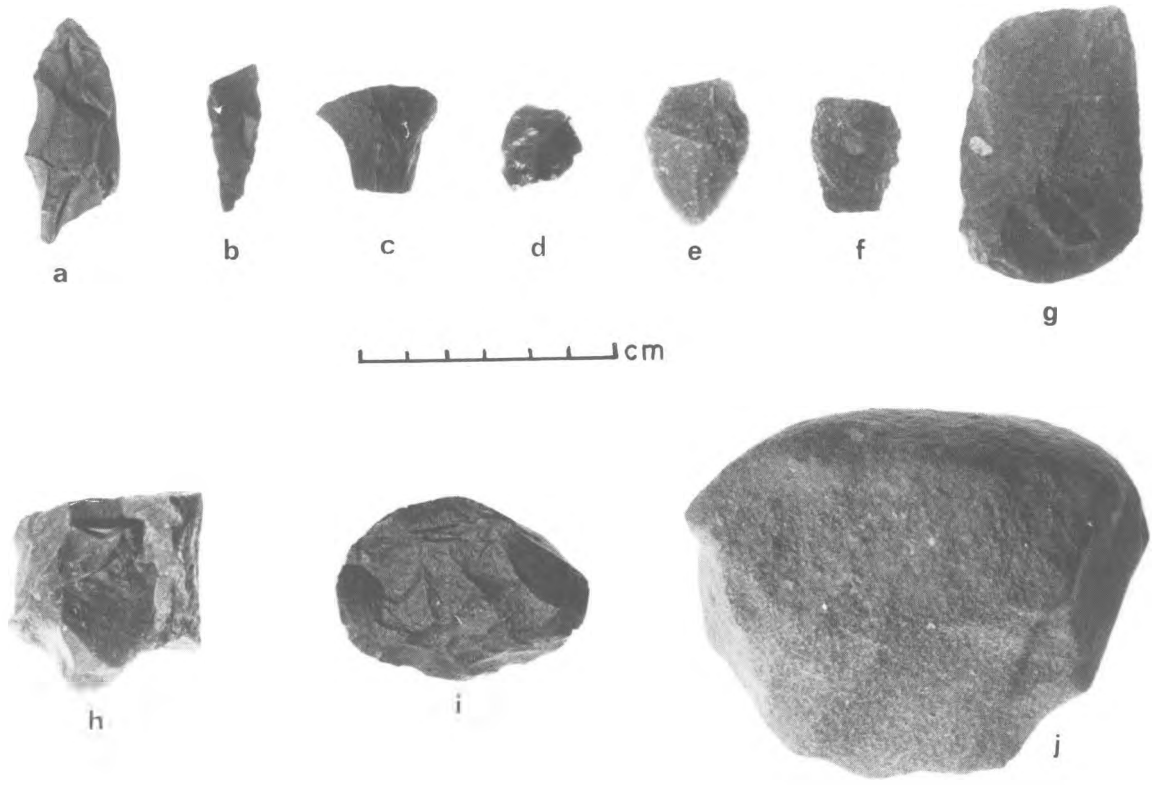


Fig. 27. Miscellaneous chipped stone, Belcarra Park II. *a* graver; *b,c* drills; *d ?; e ?; f ?; g* chipped stone uniface; *h,i* cores; *j* cobble core tool.

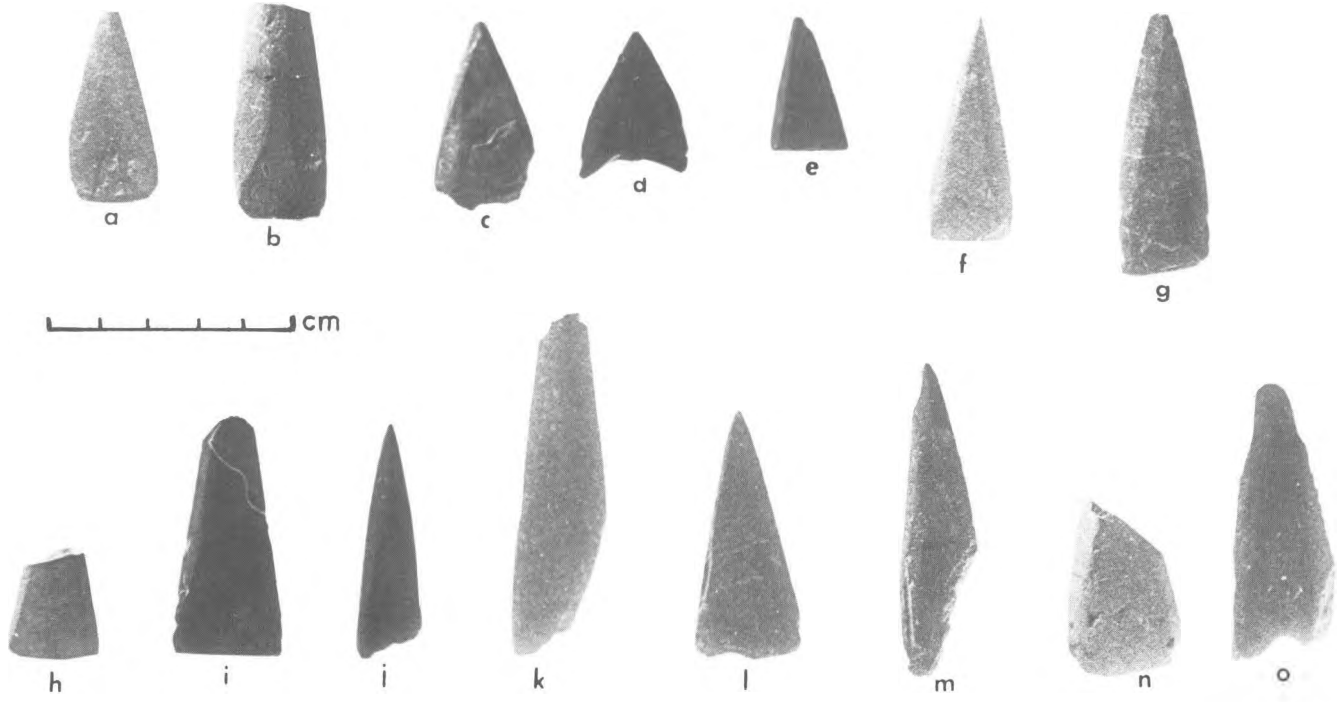


Fig. 28. Triangular ground slate points, Belcarra Park II.

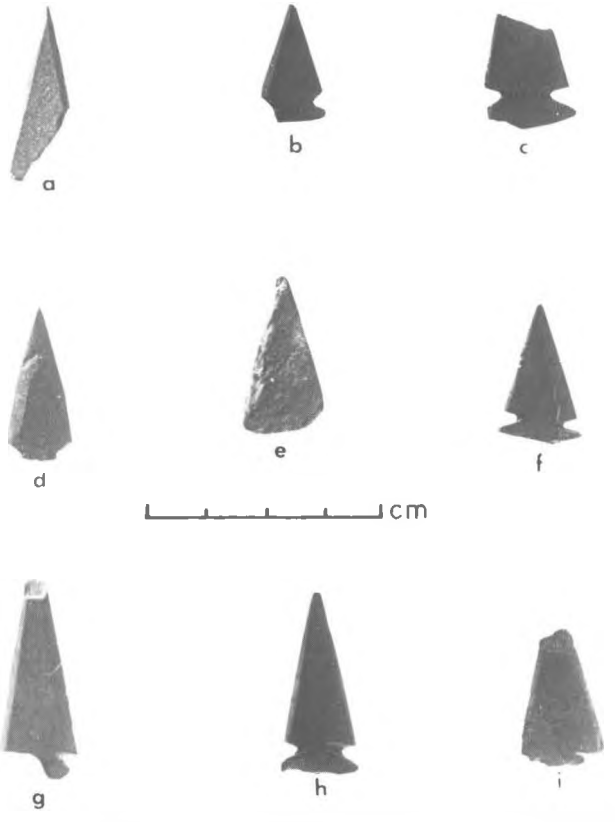


Fig. 29. Triangular ground slate points (side-notched), Belcarra Park II.

were found (Fig. 31, Table XX). Five of the fragments are relatively large pieces (three poll fragments, two bit fragments), which could be classified. Five of the ten fragments were small shattered pieces. Those which could be analyzed had their maximum width at the bit, the sides then gently taper to convex polls. All bits were bevelled (asymmetrically) on both faces. Of those with bits intact (7), three have small chips removed from the bit edge, similar to the Belcarra Park I specimens. Three of the eight which have polls intact show signs of extensive battering. While most of the specimens are highly polished, six of the adze blades still exhibit saw facets on a single side. Figure 31j shows clearly the manufacturing technique of sawing and snapping. Saw cuts have been made from the dorsal (5.5 mm) and ventral (7.0 mm) faces leaving a central area (5.0 mm) which was then snapped. Small, well-made celts or adze blades are commonly reported in coastal sites with post-Marpole components. The Belcarra Park II specimens are similar in size and form to ones (Type III) illustrated from the Carruthers site (Crowe-Swords 1974:Fig 25).

Table XX Adze Blades, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	33.5–63.2 mm	44.54	10.40	5
width	17.9–31.5 mm	26.38	4.13	10
thickness	6.9–15.2 mm	12.36	5.55	9
weight	7.63–51.49 g	24.03	16.00	5

Ground Slate Object

A finely made ground slate object measuring 14.2 x 10.0 x 2.1 mm and weighing 0.6 g was located in the second component. The outline is that of a rounded triangle with a rectangular cross-section. The implement is well finished and exhibits highly polished surfaces. Two holes have been biconically drilled; the hole nearest the proximal end is the smallest (2.2 mm diameter) while the other hole measures 3.5 mm in diameter. Three small incisions (1.0 mm) are noted on one face only. A single incision has been inscribed at the proximal end while two (3.5 mm apart) have been inscribed at the distal end.

Pecked and Ground Stone Artifacts

Hand Mauls

Two hand mauls manufactured from fine grained igneous rock (greenstone?) were excavated from the late component (Fig. 32). Neither artifact is complete; both are distal (poll) fragments, and both are of the nipple topped type. Figure 32a is the larger of the two, and is broken at the point where the shaft joins the flanged striking head. The tool is cylindrical in cross-section. Thickness at the flared poll measures 45.0 mm while the shaft tapers from 38.5 mm to 56.0 mm in thickness. Two flakes have been removed from the poll indicating that light battering has taken place. Figure 32b is a much smaller poll fragment which measures 96.0 mm from the poll to where the tool had broken. Evidence of battering was observed at both the proximal and distal ends. The poll aspect (with 11 flakes removed) was extensively battered. Both hand mauls were finely finished and exhibit polished surfaces. These mauls with their cylindrical cross-sections, flanged striking heads and nipple tops correspond to the Type 1 B1 classification of Drucker (1943, Fig. 13d). Hand mauls of this style are widely reported from middens with late components in southwestern British Columbia.

Hammerstones

Hammerstones can be described as unmodified cobbles which generally show battering and/or pitting at one or more sides or ends of the implements. Four such tools (three complete) are from the Belcarra Park II component (Fig. 33, Table XXI). The largest of these tools (Fig. 33c) shows pitting at one end and a large flake removed from the circumference. The other three exhibit pitting at both ends. One (Fig. 33d) is heavily battered on the circumference as well. Hammerstones are widely reported for all

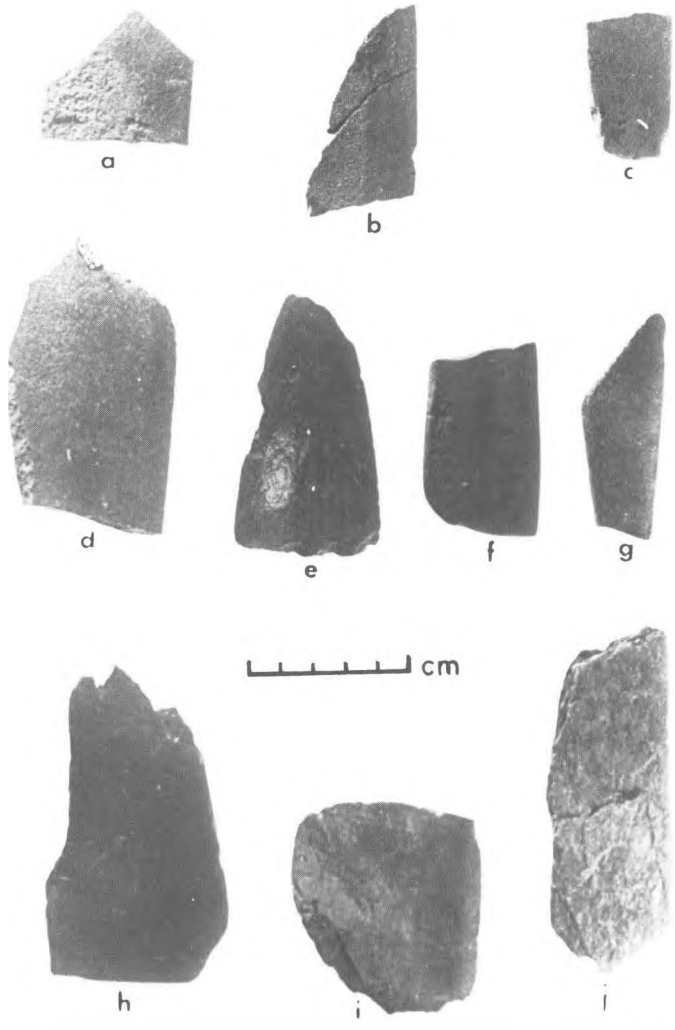


Fig. 30. Ground slate knives and sandstone abrasive saws, Belcarra Park II.

components in southwestern British Columbia.

Table XXI Hammerstones, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	103.0–128.8 mm	119.1	–	3
width	54.0– 77.8 mm	68.5	–	3
thickness	30.0– 68.5 mm	49.6	–	4
weight	432.5–610.0 g	535.7	–	3

Notched Sinker

A large flattened cobble (Fig. 34b) manufactured from an abrasive material was excavated in the Belcarra Park II component. The tool is oval in cross-section, measures 154.0 mm x 109.0 mm x 38.0 mm, and weighs 688.8 g. A well defined notch measuring 39.0 mm in length has been pecked into the edge.

Perforated Stone Preform

A single, small sandstone implement had been carefully pecked to a circular shape (Fig. 34a). The tool, plano-convex in cross-section measures 77.5 x 71.0 x 29.0 mm and weighs 230.8 g. No signs of abrasion were noted which might have suggested a grinding function for this tool. A small depression had been pecked into the central areas of each face of the implement which suggests that the tool was intended to be a perforated stone.

Saws

Twelve tools (all fragments) were classified as saws (Fig. 30). All twelve were manufactured from sandstone which grades from coarse to fine grit. Outlines vary from rectangular to trapezoidal while cross-sections are either triangular, plano-convex or biconvex. All of the tools taper to a well defined bifacially bevelled working edge. Nine have symmetrically bevelled edges while three have markedly asymmetrical edges. Working edges and both faces exhibit extensive wear patterns.

Abrasive Slab

A large abrasive tool of coarse sandstone measuring 223 x 146 x 190 mm and weighing 478.8 g is from Belcarra Park II deposits. The tool, while broken, has been definitely shaped. Its function as an abrader is clear as evidenced by the signs of abrasion on both faces. Mitchell has suggested the term abrasive slab rather than abrader stone "...in the belief that they [abrader slabs] are too heavy for comfortable use in the hand." (Mitchell 1971a:125).

Shaped Abrasive Stones

Abrasive stones have been differentiated by determining whether or not purposeful shaping has taken place during the manufacturing process. Fifty-four (10 complete, 44 fragments) tools were defined as shaped abrasive stones and they share the attribute of being carefully manufactured and shaped (Fig. 35, Table XXII). Various grades of sandstone were utilized and four were manufactured from siltstone. Outlines of the ten complete artifacts range from oval (5), elliptical (2), to rectangular (3). Cross-sections are either biconcave (3), plano-concave (3) or rectangular (4). All ten exhibit abrasion marks on both faces although in six of these one face predominates in being heavily abraded. Two of the tools (Fig. 35a,c) exhibit a series of parallel grooves, one unifacially, the other bifacially. As mentioned, 44 shaped abrasive stone fragments were also recovered. They share the attribute of having one edge (or a portion

Table XXII Shaped Abrasive Stones, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	58.0–159.0 mm	109.0	–	10
width	53.0–131.0 mm	78.5	–	10
thickness	18.0– 49.0 mm	23.9	–	10
weight	60.0–628.3 g	476.8	–	10

of one edge) definitely shaped. Where observable cross-sections were as follows: bi-concave (11), plano-concave (12), rectangular (13), biconvex (1), concave-convex (1) and plano-convex (1).

Unshaped Abrasive Stones

Some 43 pieces of sandstone or siltstone were classified as unshaped abrasive stones as they show no evidence of purposeful shaping (Fig. 36). Bifacial abrading was observed in 24 of the fragments, unifacial abrading in seven. Twelve could not be determined as they were split longitudinally.

Abrader stones, be they shaped, unshaped, large or small are widely reported from all components in southwestern British Columbia and it is not unusual for this artifact class to be the largest class in an assemblage. While they may not be diagnostic of any one component, their wide distribution and large numbers reflect the importance of this ubiquitous tool whose function was the grinding and abrading of stone, bone and antler implements.

Pipes

Five fragments of finely finished stone pipes manufactured from steatite (4) and argillite (1) were recovered (Fig. 37). They are all bowl fragments which indicate they are pieces of straight, cylindrical pipes with flaring, expanding bowls (trumpet pipes) rather than elbow pipes. The bowl fragments are all very thin (thickness 2.0–4.0 mm) and are highly polished. One bowl fragment (Fig. 37b) exhibits a series of three parallel incisions around the circumference of the bowl.

Bone Artifacts

Barbed Bone Points

Thirty-one barbed points, of which two are complete were recovered. The 29 fragments are as follows: tip fragments (7), medial fragments (11), base fragments (11). These points which were probably fixed, exhibit considerable range in size and form (Table XXIII), and are unilaterally barbed (Fig. 38), with one exception which is bilaterally barbed. The 12 specimens which could be classified as to base shape were either conical (7) or pointed (5). Barb arrangement ranges from low, enclosed, dense barbs (7), and low, enclosed, isolated barbs (8), to low, extended, isolated barbs (3). As all the points are unilateral with low barbs, they correspond with Drucker's (1943:41) A1 category.

Table XXIII Barbed Bone Points, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	80.0–180.0 mm	130.77	35.87	4
width	7.0– 19.0 mm	11.24	3.82	7
thickness	3.8– 8.0 mm	5.86	1.27	7
weight	6.39– 8.94 g	7.83	1.07	3

Fifteen of the fixed bone points appear to correlate with A. McMurdo's Class II, Type I point which has the following attributes: square enclosed barbs, conical bases and long slender, straight profiles. McMurdo (1972:72) notes that these are most often associated with late Coast Salish components but have also been reported for both Marpole and Mayne phases.

The bilaterally barbed point is a small basal fragment which measures (36.0) x 6.5 x 3.5 mm. Along one edge are ten barbs which are low, straight, enclosed and dense. On the opposite edge is a single broken barb and posterior to this barb are a series of seven shallow serrations which may have served a hafting function.

Barbed Bone Harpoons

Three specimens, all basal fragments are from the second component at the Belcarra Park site. Figure 39d has a flat-

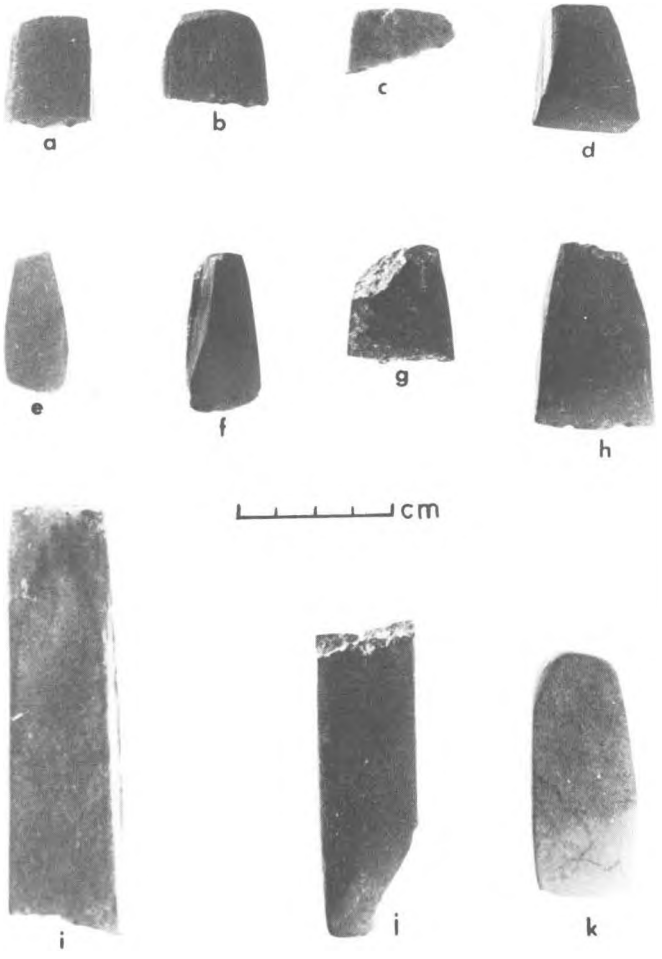


Fig. 31. Adze blades, Belcarra Park II.

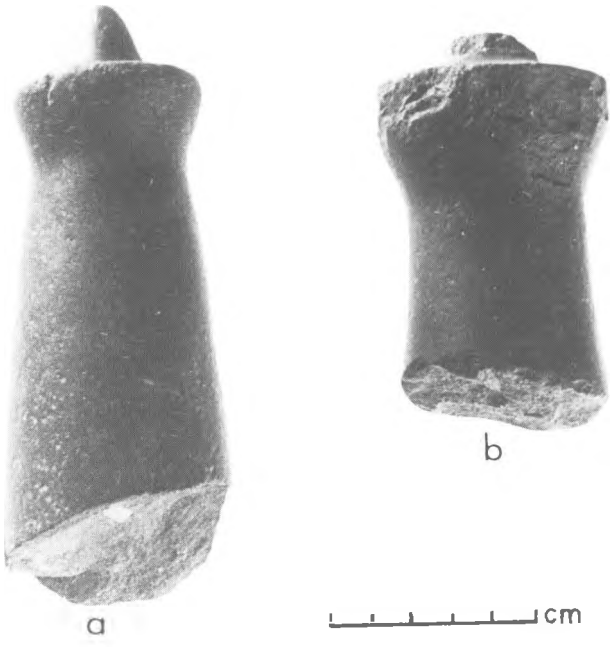


Fig. 32. Hand mauls, Belcarra Park II.

tened oval cross-section with a squared base. Barb arrangement is low and enclosed while barb shape is straight. Line attachment is by a unilateral reverse barb which is 28.0 mm from the posterior end of the implement. The barb measures 8.0 mm in length, 4.0 mm in depth and has been sawn into the shaft at a 30 degree angle. Figure 39e is similar to the preceding in that it also exhibits low, enclosed barbs and a squared base. Cross-section is plano-convex while barb shape could not be ascertained. This artifact also has the reverse barb form of line attachment. The barb is 18.0 mm from the posterior end of the implement and measures 9.0 mm in length, 4.0 mm in depth and has been sawn into the shaft at a 30 degree angle. Figure 39f exhibits a concave-convex cross-section, a conical base, and a unilateral shouldered line attachment. Barb arrangement or shape could not be determined.

According to McMurdo's (1972) typology of harpoons (based on barb arrangement and line attachment attributes) only Figure 39f can be classified. Because of their anomolous line attachment form, the other two artifacts do not fit into McMurdo's typology. Of the 121 harpoons from the Northwest Coast analyzed by McMurdo, none exhibited the reverse barb method of line attachment. A unilateral barbed harpoon with a reverse line notch was excavated at the nearby Caraholly site (DhRr17) by Struthers (1973, Fig. 6b).

Barbed Arrow/Harpoons

Two artifacts (Fig. 39b,c) from the Belcarra Park II component share many of the attributes of unilaterally barbed harpoons reported from various components in southwestern British Columbia. Due to the fact that they both have the attribute of the line attachment they can be classified as harpoons. Yet, their size and weight set them apart from any classification used on the southwest coast of British Columbia. Both artifacts are complete, small and extremely well made. Artifact no.1581 (Fig. 39b) measures 44 x 9 x 4 mm and weighs 1.17 g. The two unilateral barbs are low, enclosed and isolated and the barbs are straight. The base shape is conical while line attachment is by a unilateral line guard. Figure 39c, the larger of the two arrow/harpoons, measures 62 x 8 x 2 mm and weighs 1.47 g. The arrangement of the four barbs is low, enclosed and isolated with a straight barb shape. The base is thinned and the line attachment is by unilateral shoulder.

Wedge Based Points

There are numerous examples of this artifact type from south coast middens where they are generally interpreted as being arming points for composite toggling harpoon

Fig. 33. Hammerstones, Belcarra Park II.

heads (Carlson 1960:579). In one instance (Mitchell 1968: Fig. 7) a single point was located in association with two valves. McMillan and St. Claire (1975:48) also report two wedge based points located with their companion valves. The wedge based points (122) from the Belcarra Park II component exhibit little variation and are very uniform in size and shape (Fig. 40a–h). They are small points (mean length 37.84 mm) and extremely sturdy (155 complete, 7 fragmentary). The points are typically well finished being ground flat and worked on all faces. The tips are broad and well made and are often circular in cross-section. Invariably, the points reach their maximum width immediately behind the tip, then gently taper to a thinned (1.0 mm) well defined base. The posterior aspect of these points is usually either rectangular or biconvex in cross-section. Two wedge based points were found in association with composite toggling harpoon valves in Belcarra Park II deposits.

Table XXIV Wedge Based Points, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	22.0–52.9 mm	37.84	6.18	109
width	4.6–12.2 mm	8.89	1.40	120
thickness	3.0– 6.9 mm	4.75	.78	120
weight	.3– 2.3 g	1.31	.42	107

Medium Bone Points

In general form (well finished points with tapered bases) these points appear quite similar to the above described wedge based bone points. Upon close examination however, the two classes differ in a number of major attributes. For example in overall dimensions the medium bone points are invariably longer, wider, thicker and heavier and the ranges seldom overlap (Fig. 40 i–o). Like the wedge based points, they taper to a well-defined convex or squared base, but differ in that the base is much thicker (mean thickness 2.0 mm). The points have been finely finished by abrasion. Forty-one bone points, (37 complete, 4 fragments) have been classified as medium bone points.

Table XXV Medium Bone Points, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	43.0–76.0 mm	55.0	–	39
width	7.0–11.5 mm	8.5	–	41
thickness	3.0– 8.0 mm	4.7	–	41
weight	1.2– 3.4 g	2.1	–	37

Metric attributes are summarized in Table XXV. Their well-finished tapered base suggests a hafting function. Similar points have been classified as medium unbarbed points by McMillan and St. Claire (1975:48) who suggest that they functioned as barbs on composite fish hooks.

Fig. 34. Perforated stone preform *(a)*; notched sinker *(b)*; Belcarra Park II.

Shouldered Bone Point

This point is a finely finished bone point with asymmetrical shoulders (Fig. 40w). It measures (46.0) x 15.5 x 9.5 mm and weighs 2.1 g, was manufactured from dense land mammal bone, and exhibits a number of well-defined facet planes. Most abrading was performed unifacially giving the tool a plano-convex cross-section medially, although the tip is circular in cross-section. From the

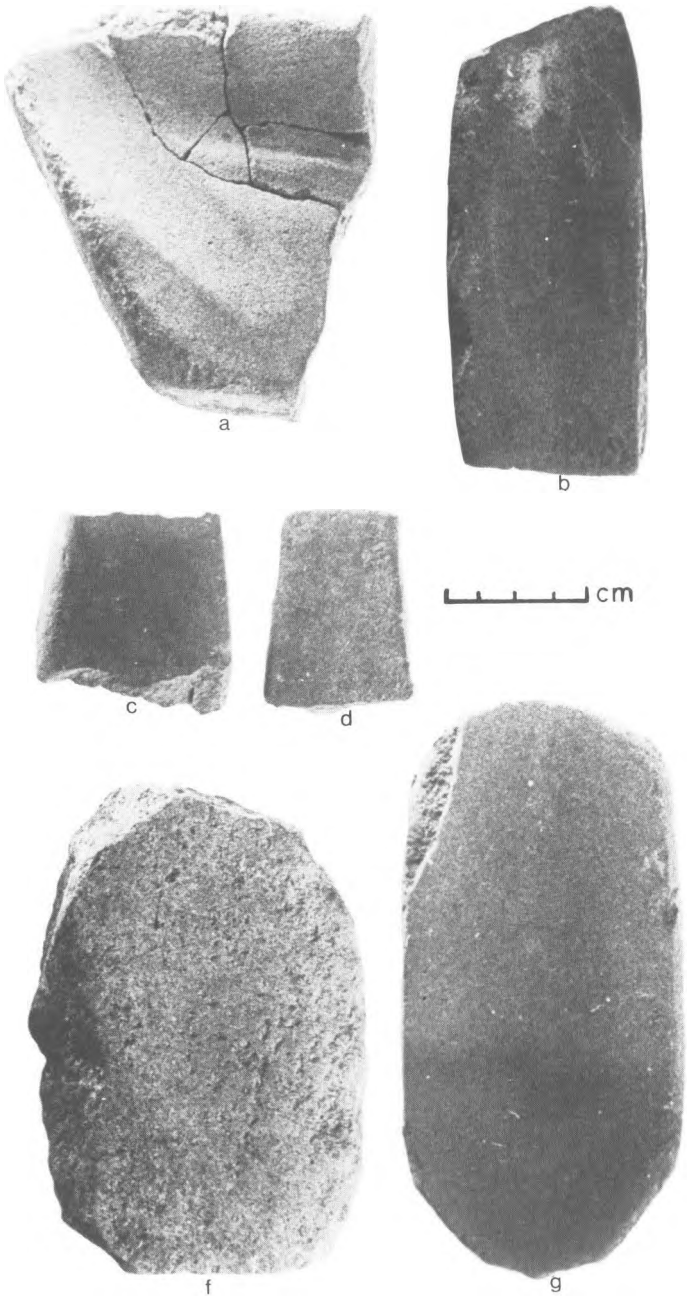


Fig. 35. Shaped abrasive stones, Belcarra Park II.

maximum width which occurs at the shoulders, the point tapers to an undefined broken butt.

Bone Bipoints

Nine implements made on land mammal splinters have been classified as bone bipoints (Fig. 40p–u). Eight correspond to Mitchell's (1971a:202) bone bipoint classification. The ninth specimen corresponds to Mitchell's (1971a:202) fish gorge classification. The artifact measures (55.5) x 6.5 x 4.5 mm and tapers sharply to a constriction (4.0 mm wide) where it has been broken. The gorge, subrectangular in cross-section is well made and had been finely abraded on all faces (Fig. 40v). The other eight bipoints vary considerably in dimension and form. Four of the eight are minimally worked exhibiting abrasion only at the tips. The other four exhibit greater care and workmanship as all surfaces are abraded.

Similar implements have been reported ethnographically for the Gulf of Georgia Salish who used them for taking flounders (Barnett 1955, Fig. 27).

Table XXVI Bone Bipoints, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	43.0–102.0 mm	60.3	–	8
width	5.0– 12.0 mm	8.7	–	6
thickness	4.0– 7.0 mm	5.3	–	8
weight	1.0– 4.0 g	2.3	–	7

Ulna Awls

Fourteen tools manufactured from ulnae of land mammals were classified as ulna awls (Fig. 41f,g). Eleven are complete and three are fragments. In all cases the unmodified ulna have had their blades abraded which has produced a highly effective cutting or piercing instrument. Like split bone awls the tool maker has concentrated upon the distal portion of each implement and has produced either a pointed or a rounded tip. Like split bone awls, ulna awls are widely reported from sites with late components in the Lower Fraser and Gulf of Georgia areas.

Table XXVII Ulna Awls, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	62.0–157.0 mm	102.0	–	12
width	14.0– 62.0 mm	29.2	–	14
thickness	8.0– 39.0 mm	21.0	–	14
weight	3.5– 48.9 g	13.3	–	11

Split Bone Awls

This type of artifact is very common in late prehistoric components in the Lower Fraser-Gulf of Georgia area and is widely reported. Twenty-four artifacts from the Belcarra Park II component have been classified as split bone awls (Fig. 41a,b). The tools which are manufactured from splinters of long bones of land mammals are simple and quickly made implements. The long bones were first longitudinally cut and snapped or more commonly simply broken or smashed. The larger fragments were then selected and the distal portions *only* were ground to a sharp tip providing a simple but efficient tool.

Table XXVIII Split Bone Awls, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	53.5–126.0 mm	66.0	–	24
width	6.5– 17.0 mm	11.3	–	24
thickness	3.0– 13.5 mm	6.0	–	24
weight	1.8– 11.1 g	4.3	–	24

Shouldered Awls

These nine specimens are manufactured on pieces of split land mammal bone, and all are fragments (Fig. 41c–e). Work has been concentrated at the distal end where a well-developed point (circular cross-section) has been formed. In all cases except one, a single shoulder is the norm. The points appear to have been roughly shaped then carefully abraded producing a well-defined thick point. Two of the points exhibit a high degree of wear polish on the tips.

Straight Awls

These well finished implements are manufactured from the long bones of land mammals. All have been carefully abraded to shape and exhibit a high degree of wear polish (Fig. 41h–k). Two are decorated with geometric designs and two have been sectioned longitudinally. Metric attributes of straight awls are contained in Table XXIX. Included in the straight awl classification is a single, well made awl from a deer metapodial (Fig. 41j).

Table XXIX Straight Awls, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
Length	78.0–155.0 mm	114.8	–	11
width	7.5– 21.0 mm	11.2	–	13
thickness	4.0– 9.0 mm	6.6	–	13
weight	3.4– 25.2 g	11.3	–	11

Bird Bone Awls

A total of ten (4 complete, 6 fragments) bird bone awls was excavated from the second component at Belcarra Park (Fig. 42g–i). All are manufactured from the long bones of various bird species. The four complete specimens have the articulating ephyesis (proximal end) intact. Modification of these tools is confined to the distal end although three specimens exhibit a high degree of wear polish on their shafts. A sharp working tip at the distal end has been produced by abrading a single bevel at a sharp angle.

Table XXX Bird Bone Awls, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	56.0–89.5 mm	74.0	–	4
width	2.5– 5.0 mm	3.3	–	9
thickness	2.5– 4.0 mm	2.9	–	9
weight	0.7– 1.3 g	0.9	–	4

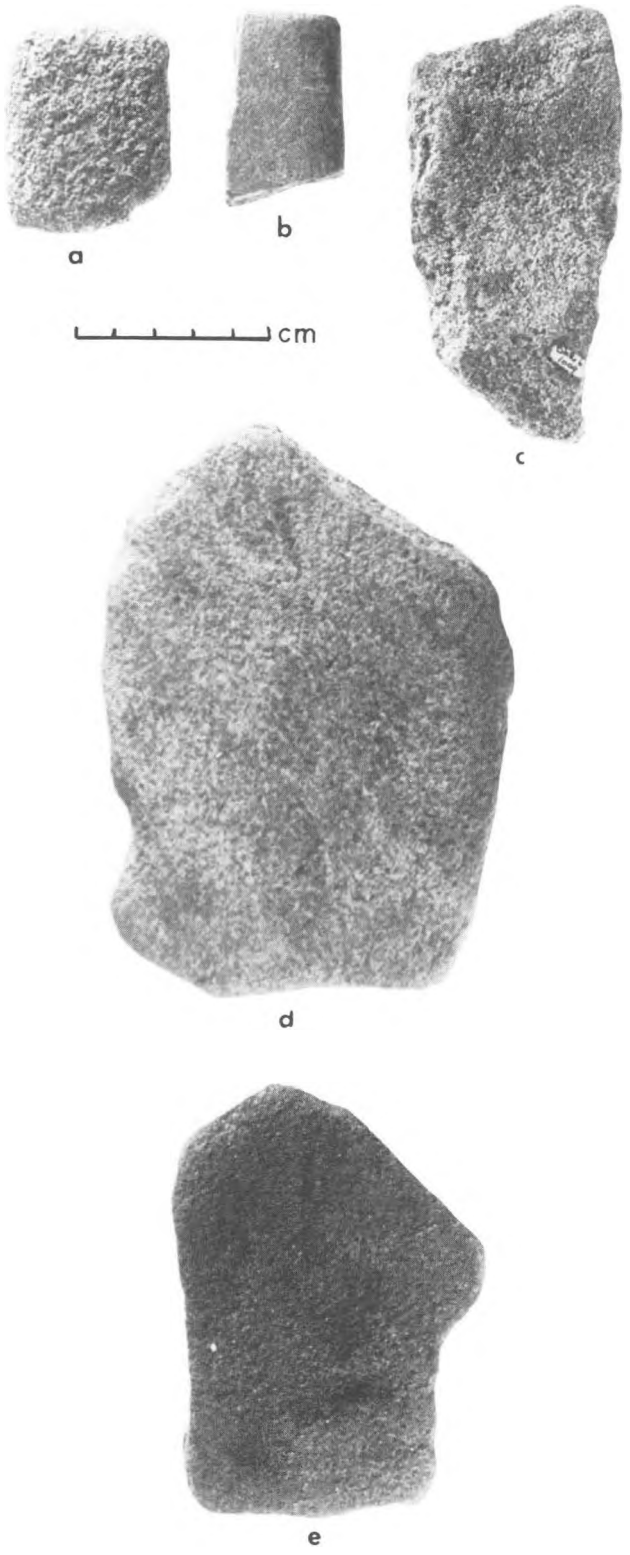


Fig. 36. Unshaped abrasive stones, Belcarra Park II.

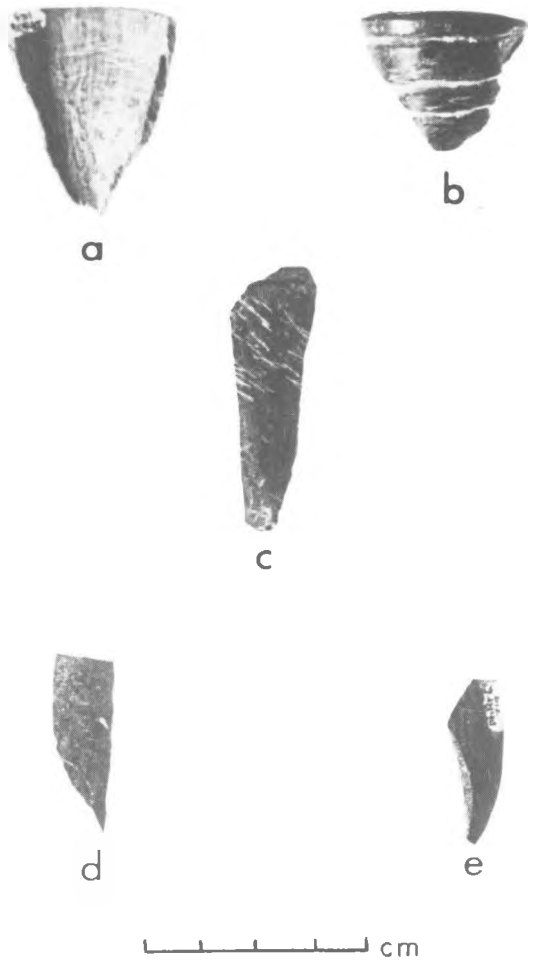


Fig. 37. Pipe fragments, Belcarra Park II.

Bird Bone Splinter Awls

These implements are similar to split bone awls manufactured from land mammal bone. For example the manufacturing process (i.e. distal tip abrasion of bone splinters) appears identical. There are, however, significant differences in both size and weight (Table XXXI). A total of nine (5 complete, 4 tip fragments) were recovered. They have all been manufactured from large long bone splinters of large bird species and are plano-convex in cross-section (Fig. 42d–f).

Table XXXI Bird Bone Splinter Awls, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	48.0–74.0 mm	57.4	–	5
width	5.5– 9.0 mm	7.2	–	5
thickness	2.0– 4.0 mm	2.6	–	5
weight	0.9– 1.2 g	1.0	–	5

Bird Bone Points

Three finely made points manufactured from bird bone splinters were from Belcarra Park II (Fig. 42a–c). Two are complete and measure 25 x 3 x 1 mm and 39 x 5 x 2 mm, respectively. The former weighs 0.1 g and the latter, 0.5 g. Both of these points have finely abraded tips and shafts and taper to well-defined squared wedge bases. The broken specimen which measures (22) x 3 x 1 mm differs from the other two in that the tip has been abraded on a number of planes producing a rounded shouldered tip similar to the bone drills also of the Belcarra Park II component.

Bird Bone Tube Beads

Three bird bone beads (2 complete, 1 fragment) are from the Belcarra Park II component (Fig. 42). The long bones of large bird species provided the raw material for the beads. Measurements for the two complete beads are 15 x 14 x 12 mm (Fig. 42k), and 12 x 9 x 7 mm (Fig. 42l). The latter weighs 0.5 g and the former 1.5 g. The manufacturing process involved cutting around the circumference to a depth of 0.5 mm then snapping to detach the head from the long bone. In one specimen, the rough edges of the snapped area have been smoothly abraded. Two of the three specimens show a high wear polish. Included in this classification are a number of broken bird long bones, which vary in circumference from 5.0 to 15.0 mm. They all have the attribute of having a cut end (as described above) and/or having parallel incisions around the circumference. Three specimens clearly show these parallel incisions (Fig. 42m,n). Thus, these are interpreted as bird bone tube beads, preform or blanks and not bird bone drinking tubes as is often suggested. Calvert (1970:61) reports three complete and several fragments of bird bone tube beads from the upper layers of the main deposit at the St. Mungo Cannery site.

Bird Bone Whistle

A broken bird bone from the Belcarra Park II component has been classified as a bird bone whistle. The broken implement measures (59.0) x 9.0 x 9.0 mm (Fig. 42j). Two holes have been sawn transversely into the tube to a depth of approximately 3 mm. The artifact is broken at both ends where the holes were sawn. Carlson (1970:121) has illustrated a single bird bone whistle from the San Juan phase at the Helen Point site.

Bone Chisels

Five implements (2 complete, 3 bit fragments) manufactured from land mammal long bones were recovered (Fig. 43i,j). The two complete specimens measure 129 x 26 x 9 mm and 58 x 18 x 8 mm respectively. The former weighs 22.2 g and the latter 4.9 g. All the implements are well finished and abraded on all faces. The bits have been ground to a spatulate rounded form. All bits with the

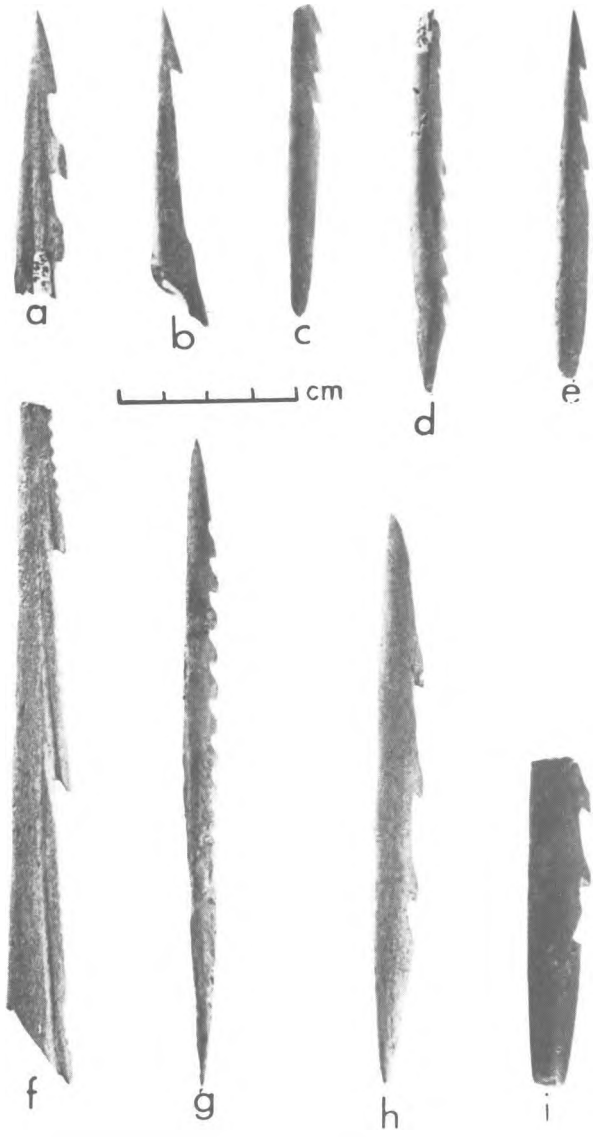


Fig. 38. Barbed bone points, Belcarra Park II.

exception of one are bifacially ground. A considerable amount of wear polish was observed on all five implements.

Bone Splinter Drills

Six artifacts from the Belcarra Park II component have been classified as bone drills. Only one (Fig. 43e) is complete and measures 100 x 13 x 7 mm and weighs 4 g. It is circular in cross-section and is made from the long bone of an unidentified bird species. Four of the six have been manufactured on splinters of land mammal bones. All of the specimens in this classification share the attribute of having a carefully worked distal tip which is circular in cross-section. In all cases the shafts taper sharply to the well-defined tip. Wear pattern on the circumference of the tip suggests a drilling function. Bone drills are not widely reported for prehistoric components in the area. Mitchell (1971a:201) has described three bone splinter drills from the Montague Harbour III component.

Bone Needle

A finely crafted specimen manufactured from land mammal bone has been classified as a bone needle (Fig. 43g). The broken implement measures (56.0) x 10.5 x 3.0 mm and has been finely abraded on all surfaces. The shaft is symmetrical, has a flattened oval cross-section and exhibits use-wear polish. The implement is broken at its proximal and where the needle eye has been incised biconically. The eye measures 2.0 mm in width; its length could not be measured.

Bone Splinters with Worked Tips

This is a loosely defined category that includes all fragments of land mammal bone with worked tips. These carefully crafted implements (67 in number) show a great deal of wear polish. Cross-sections are variable, being either plano-convex, round or elliptical. Due to their fragmentary nature, original form and function could not be determined. Conceivably, they could have functioned as awls, fish gorges or other fish hooks, or as arming points for composite toggling harpoons (Fig. 43a–d).

Bone Blanket Pins

A series of finely finished bone points was excavated from the Belcarra Park II component. Twenty-four in number, all but one are fragmentary. These implements are characterized by the following attributes: (1) finely finished with high wear polish on all specimens, (2) round cross-sections and (3) uniformity in the dimension of thickness. These long tapering points had a mean of 5.1 mm in thickness. The variation in thickness ranged from 4.5 to 6.0 mm, a difference of only 1.5 mm. Three of the points which had proximal ends intact (Fig. 44) exhibited some form of decoration. Two (Fig. 44c,d) exhibited distinct whale fluke designs. Another medial fragment is characterized by an incised cross-hatched design.

Tooth Pendants

Four teeth which have been modified to allow suspension as a pendant were located in Belcarra Park II deposits (Fig. 45) and are described here.

Figure 45b shows a complete land mammal canine bearing a series of five narrow, parallel incisions cut into the proximal end by a sharp tool. In Figure 45c a calcined canine that has been cut and squared off by abrading the distal and proximal ends, is displayed. The hollow tooth may have functioned as a necklace. Figure 45d shows a large canine (bear?) that has been incised around its circumference at the proximal end. It is in a deteriorated

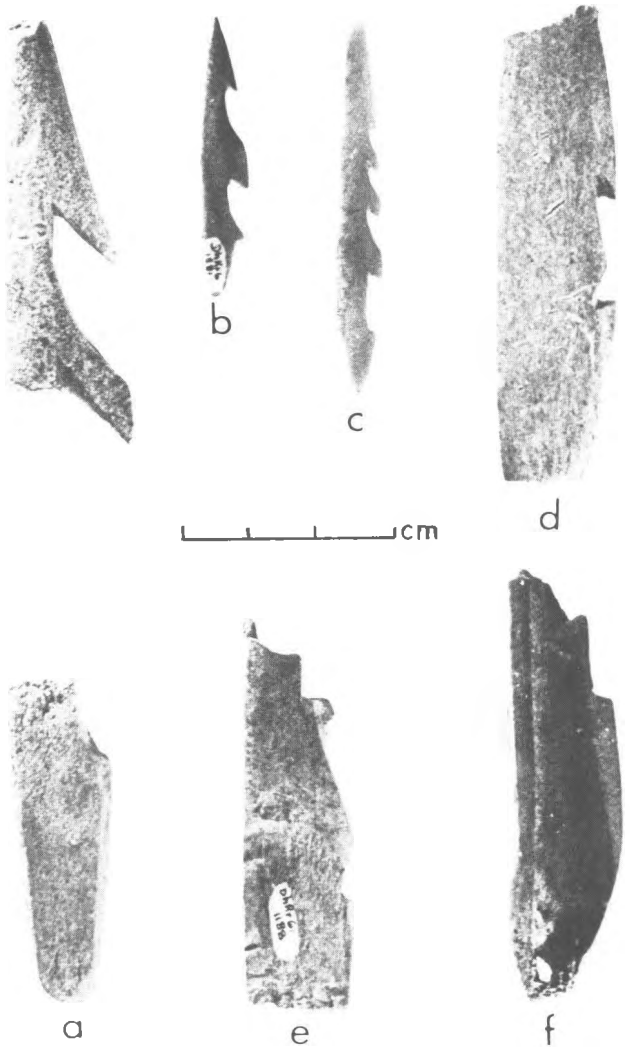


Fig. 39. Barbed harpoons, Belcarra Park II. *a* unilaterally barbed harpoon of antler; *b,c* unilaterally barbed arrow/harpoons of bone; *e–g* unilaterally barbed harpoons of bone.

condition. An incisor (Fig. 45e) has been cut and incised circumferentially to a depth of 1.0 mm at its proximal end. The pendant has a longitudinal break distally.

	Length(mm)	Width(mm)	Thickness(mm)	Weight(g)
Fig. 45b	36.0	9.0	5.5	1.9
45c	26.0	9.0	7.0	1.3
45d	35.5	10.0	8.0	2.3
45e	28.0	9.0	4.5	–

Rodent Incisor Tools

From the Belcarra Park II component a total of 23 (8 complete, 15 fragmentary) rodent incisor tools were excavated (Fig. 45f–j). These teeth are generally regarded as woodworking tools which had been set in hafts and utilized for delicate carving tasks. Ethnographically, Barnett (1955: 109) reports the use of such tools for engraving. Fifteen of the incisors have been split longitudinally then abraded laterally on the new face. A bevelled surface was then abraded at the distal working end producing a sharp cutting edge. Eight of the specimens had not been split longitudinally. In three cases the natural cutting edge of the tooth was utilized while five others had modified cutting edges. The tools are either rectangular (8) or plano-convex in cross-section. Metric attributes are summarized in Table XXXII.

Table XXXII Rodent Incisor Tools, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	34.0–61.0 mm	48.4	–	8
width	5.0– 8.5 mm	7.4	–	8
thickness	3.5– 6.0 mm	4.7	–	8
weight	1.0– 2.4 g.	2.3	–	8

Miscellaneous Decorated Bone Items

Three items manufactured from land mammal bone (rib–1, long bone–2) have been grouped together as they share the attribute of decoration as well as the material utilized. One specimen (Fig. 46b) appears to be a ring preform. It is sub-triangular in outline, is 7.0 mm thick and has been finely abraded and polished on all exterior surfaces. The interior marrow region remains unfinished. A fragment of a thin rib measures (33) x 11 x 2 mm (Fig. 46c). This implement (brow band?) is highly polished and has been unifacially decorated with a series of rectangular and triangular motifs.

The third decorated item is made of dense land mammal bone and its function is unknown (Fig. 46a). It is triangular in outline and measures (92.0) x (30.0) x 6.5 mm. It is broken at both the distal and proximal ends and must have been at least 116.0 mm in length when complete. Two spurs (one broken) form the proximal end. One spur is convex at its proximal end. The tool is highly polished and is characterized by a series of parallel horizontal incisions which have been carved into the implement unifacially.

Miscellaneous Worked Bone Fragments

A large number (117) of mammal bone fragments which are generally too small to ascribe to any other functional classification, were recovered from Belcarra Park II deposits. All primary modifications techniques (cutting, adzing, abrading, splitting, sawing, incising and polishing) are represented. Most specimens (103) exhibit abrading and/or incising. Nine show the distinctive marks of saw cuts. Most are obviously waste debitage discarded in the manufacturing process. Some may have been fragments of artifacts such as bone points, split bone awls or bone wedges.

Fig. 40. Bone points, Belcarra Park II. *a–h* wedge-based points; *i–o* medium bone points; *p–u* bone bipoints; *v* fish gorge; *w* shouldered bone point.

Antler Artifacts

Barbed Antler Points

A total of 13 unilaterally barbed points (3 complete, 2 tip fragments, 6 basal fragments, 2 medial fragments) were excavated in the Belcarra Park II deposits. The quantitative attributes for the three complete points are:

	Length(mm)	Width(mm)	Thickness(mm)	Weight(g)
Artifact 540 (Fig. 47e)	180.0	10.0	5.0	8.5
Artifact 228 (Fig. 47d)	139.0	8.0	5.0	6.6
Artifact 671	61.0	11.0	4.0	2.3

Profiles for the 13 points are either straight (8) or curved (5), while base shape is either pointed (6) or conical (3). Eight of the artifacts can be classified as to barb shape and barb application. Barb shape ranges from straight (3) to squared (3) to convex (2). Three of the fixed antler points exhibit a series of parallel notches or incision all less than 1.0 mm in depth and all on the barbed edges.

Barbed Harpoon

A single harpoon consisting of the proximal and distal portions (with the medial portion missing) was recovered from the earliest levels of the Belcarra Park II component (Fig. 39a). The implement was manufactured from antler and was well finished. Barb arrangement is high, extended and isolated. One of the two intact unilateral barbs is squared while the other is straight. The base of the harpoon is conical and the line attachment is by a unilateral shoulder. Mitchell (1971a:175) has observed that considerable variation in attributes is a trait, characteristic of this artifact class. The Belcarra Park specimen is a case in point. The harpoon shares many attributes with the "classic" Marpole style harpoon. It differs markedly though in the attribute of line attachment in that it exhibits a unilateral shoulder (Fig. 39a), rather than the more characteristic lateral line guard or unilateral line hole.

Antler Wedges

Twenty tools which have been classified as wedges were recovered (Fig. 48c–g). These implements which played a major role in the Northwest Coast woodworking tool kit

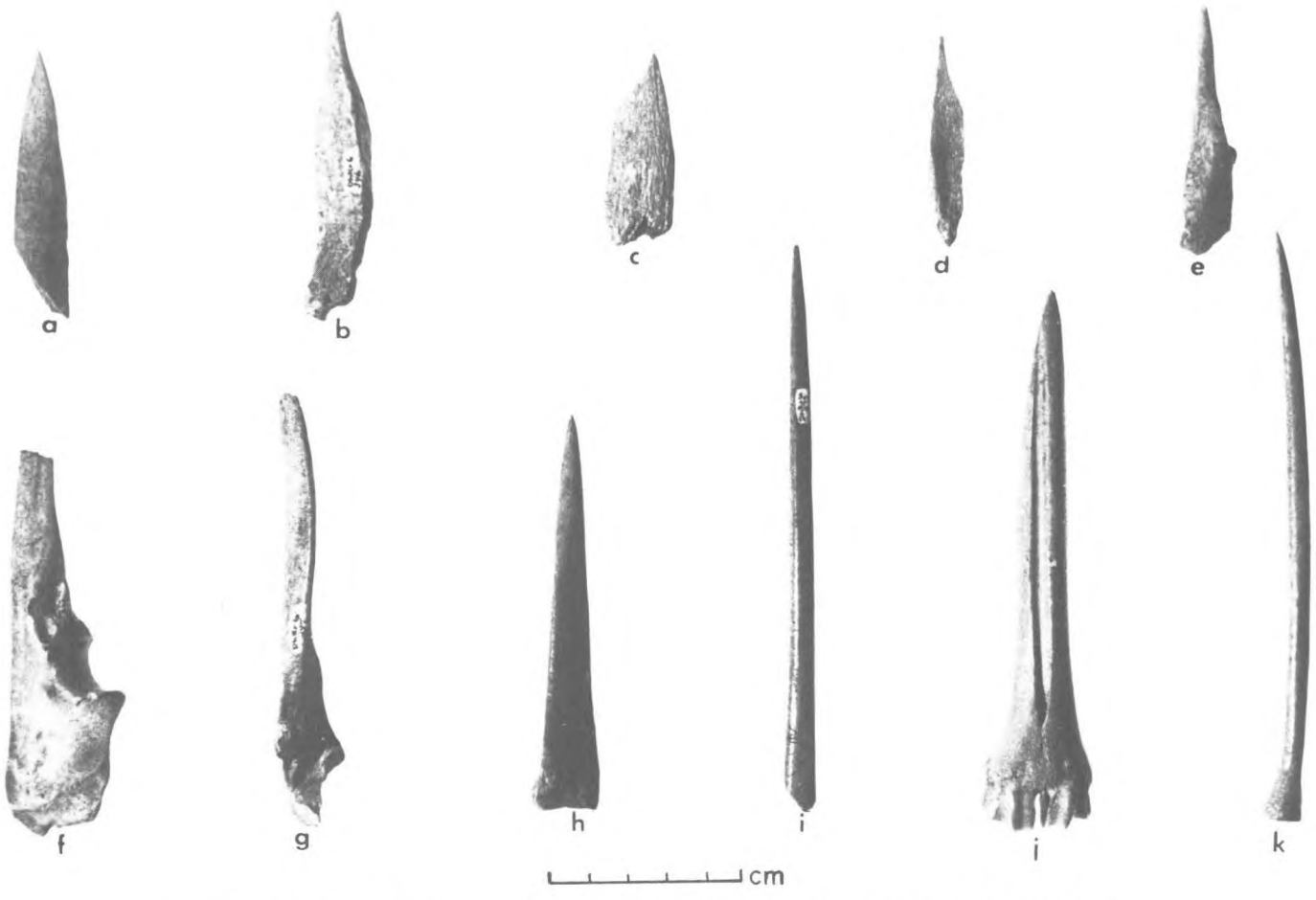


Fig. 41. Awls, Belcarra Park II. *a,b* split bone awls; *c—e* shouldered awls; *f—g* ulna awls; *h—k* straight awls.

were manufactured from either the beam or tine portion of the antler (invariably wapiti). Six of 20 are complete while the remainder consists of broken tips (12) or large fragments which had broken longitudinally (2).

The manufacture of these tools consisted of detaching (by cutting, adzing or sawing) the selected portion from the antlers. The artisan then simply ground the distal end (usually unifacially) which produced a highly efficient wedge-shaped tool for the splitting of cedar. Polls, when present, exhibited considerable battering. One anomolous wedge (Fig. 48d) had been sawn longitudinally along both edges of a beam section to a depth of 7.0 mm until the soft, spongy tissue was encountered. The section was then snapped and the distal portion bifacially ground providing a symmetrical bit. Cross-section of the wedges ranged from circular to plano-convex. Quantitative data for antler wedges are summarized in Table XXXIII.

Table XXXIII Antler Wedges, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	49.0—158.0 mm	98.7	—	6
width	31.0— 51.0 mm	36.7	—	6
thickness	12.7— 33.5 mm	23.1	—	6
weight	9.5— 58.6 g	35.1	—	6

Antler wedges are reported as common for all components in the Lower Fraser and Gulf of Georgia regions. A good example is the St. Mungo Cannery site where it is noted that . . ."Wapiti antler wedges of a variety of shapes and sizes are abundant through all levels. . .there is no pattern of increase in size or meaningful distribution of width, curve, or bit type" (Calvert 1970:63). Ethnographically, the use of elk antler wedges has been reported (Barnett 1955:108).

Antler Tine Tips

Seven antler tine tips (Fig. 48a,b) which did not function as wedges, were excavated in Belcarra Park II deposits. All of these tools have been detached from the main portion of the antlers by sawing, cutting or adzing the circumference proximally then snapping.

Table XXXIV Antler Tines, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	25.0–79.0 mm	50.9	—	7
width	12.0–45.0 mm	20.9	—	7
thickness	8.0–20.0 mm	13.7	—	7
weight	1.4–16.6 g	8.1	—	7

Antler Sleeve Hafts

Four sleeve hafts of wapiti antler represent this class of artifact (Fig. 49). The implements had initially been detached from large wapiti antler beams. The distal and proximal ends are squared either by adzing or abrading. The cortex of all four have been smoothly abraded as well. The soft inner matrix of the antler has been hollowed out by carving both shaft and bit sockets. Antler sleeve hafts are considered to be a distinctive trait of the Gulf of Georgia region (Smith 1907:437). They have been reported for the Gulf and San Juan Islands (Carlson 1960, Kidd 1969, Mitchell 1971a) but to the author's knowledge have not been reported for sites in the Lower Fraser drainage.

Table XXXV Antler Sleeve Hafts, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	46.6–74.1 mm	69.32	13.79	4
width	44.0–65.1 mm	55.06	8.64	3
thickness	30.1–33.8 mm	31.97	2.62	3

Composite Toggling Harpoon Valves

A total of 93 composite toggling harpoon valves are from Belcarra Park II deposits (Fig. 50). Forty-one are complete valves and include eight matching pairs. All pairs were found *in situ* and within a few millimetres of each other. At least one pair was found complete with a bone arming point (Fig. 50k). By examining the preforms (Fig. 50g–j) and the completed valves, a reconstruction of the steps in manufacture can be obtained. The initial step in the manufacturing process consisted of blocking out the rough shape by carving or adzing. This is followed by coarse and fine abrasion, further refining the shape. The socket areas are then gouged out and the point bed (either channelled or flat) is prepared. The exterior surfaces are invariably smoothly finished and only 11 valves show definite evidence that lashing grooves were utilized. Four of the valves had flattened point beds (Fig. 50e,f) designed for using a flat ground slate point. The majority of the valves (71) though, had channelled point beds designed for round or wedge based bone points (Fig. 50a–d). Eighteen were spur fragment and point bed attributes could not be determined.

This class of artifact (Drucker 1941:39-Type II) is extensively reported from post-Marpole phase components in the southwestern coastal areas of British Columbia. Composite toggling harpoons are reported ethnographically for the Gulf of Georgia Salish where they were used to take salmon, seal and sea lion (Barnett 1955:83,98,99).

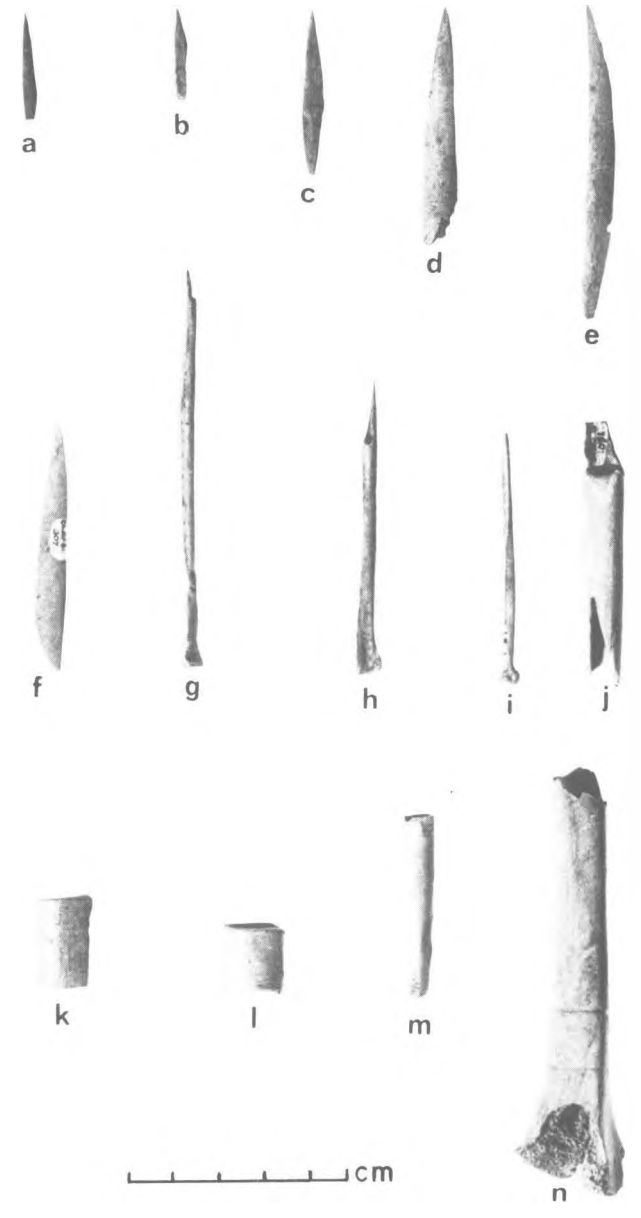


Fig. 42. Bird bone tools, Belcarra Park II. *a–c* bird bone points; *d–f* bird bone splinter awls; *g–i* bird bone awls; *j* bird bone whistle; *k,l* bird bone beads; *m,n* bird bone bead blanks.

Table XXXVI Composite Toggling Harpoon Valves, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	27.2–73.2 mm	45.44	9.96	51
width	3.5–13.2 mm	9.65	1.57	85
thickness	3.5–10.9 mm	5.77	1.32	84
weight	.6– 3.2 g	1.43	.58	39

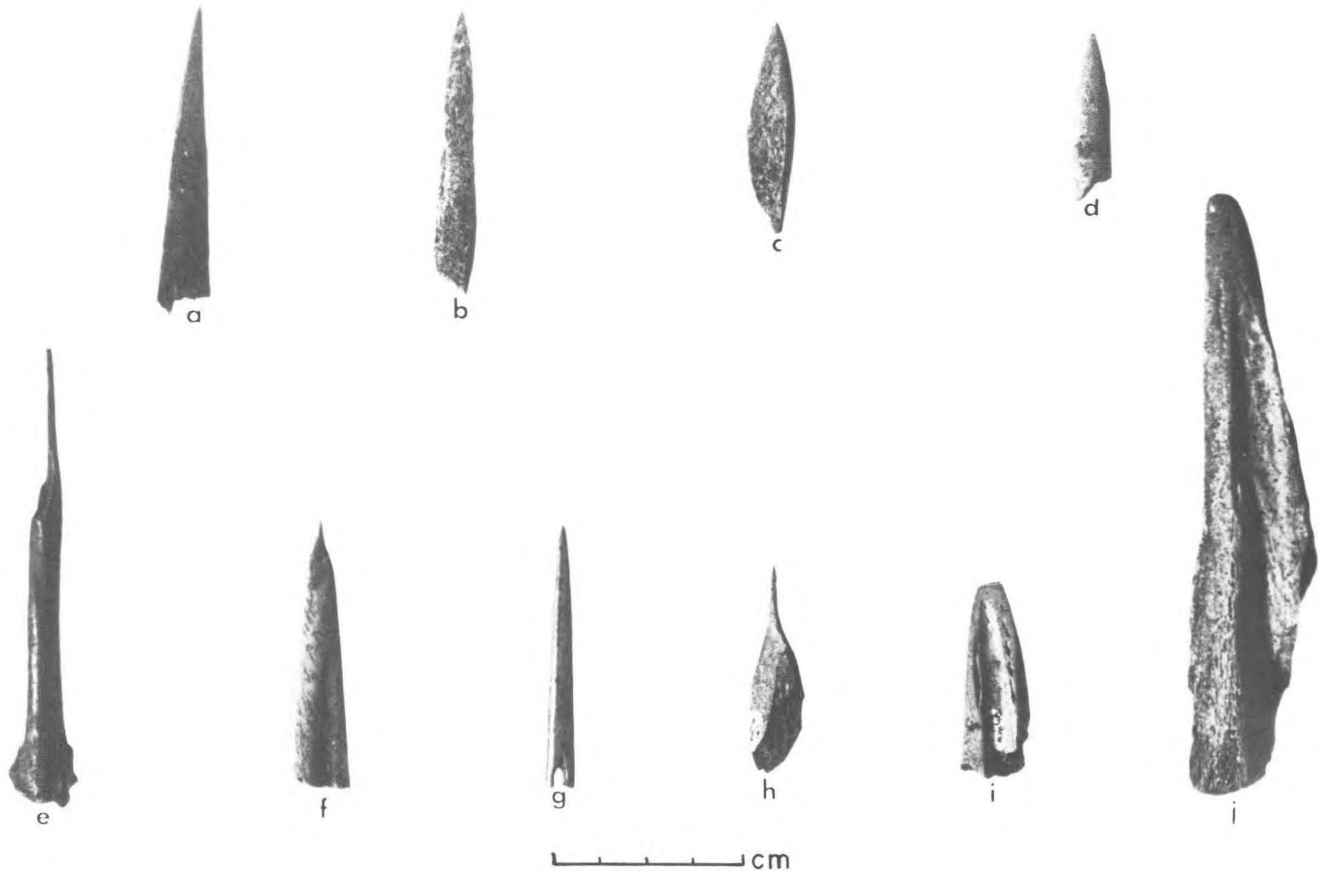


Fig. 43. Miscellaneous bone tools, Belcarra Park II. *a–d* bone splinters with worked tips; *e,f,h* bone drills; *g* bone needle; *i,j* bone chisels.

Antler Foreshafts

Three objects from Belcarra Park II deposits are tentatively classified as harpoon foreshafts (Fig. 51a–c). One is complete and all are circular in cross-section. They appear to be similar in shape to those described by Mitchell (1971a) and McMurdo (1974). Their size is somewhat smaller but then so are the Belcarra Park II toggling valves. It may be noted that when these specimens were compared with a number of the matching valves from the Belcarra Park assemblage, the foreshafts formed a good "fit" with the foreshaft sockets. Foreshaft measurements are: Figure 51a: (53.0) x 11.0 x 7.0 mm; Figure 51B: 60.0 x 9.0 x 8.0 mm; Figure 51c: (29.0) x 9.5 x 7.0 mm.

Worked Antler Preforms

Four well made antler specimens were located in Belcarra Park II deposits (Fig. 51e–g). Two are rectangular in outline and all are concave-convex in cross-section. These specimens have been manufactured from the beam portion of wapiti antler and are characterized by longitudinal lateral sawing on each edge. Adze marks are clearly defined on the distal portion of one specimen, while the other three have abraded distal ends. While the interior cell structure has somewhat disintegrated, clearly defined areas have been carved out at the distal ends of all four specimens, leading to the suspicion that a hafting function was involved.

Table XXXVII Worked Antler Preforms, Belcarra Park II

Attribute	Range	Mean	S.D.	Number
length	52.0–85.0 mm	73.7	–	4
width	17.0–20.5 mm	18.3	–	4
thickness	8.0–10.0 mm	9.1	–	4
weight	5.5–18.0 g	9.8	–	4

Miscellaneous Worked Antler

Nine antler fragments which could not be otherwise classified were excavated in Belcarra Park II deposits. These specimens exhibit various types of working such as carving, adzing, sawing and abrading (Fig. 51d,h).

Historic Artifacts

Twenty-nine historic artifacts manufactured from metal, glass, shell, wood, clay and stone were recovered from the plow zone (upper 30 cm) of the Belcarra Park site. It is common to find historic debris, such as rusty nails, broken glass, china and gun shells in the disturbed upper portions of most Northwest Coast middens. Most of the historic items from the Belcarra site fall into this category. Six items, however, are noteworthy and deserve brief elaboration.

Clay Pipe Stem Fragment (Fig. 52g)

The pipe stem fragment is circular in cross-section and is 7.5 mm at its widest point (distal end) and tapers to 6.0 mm. A small portion of the bowl remains at the distal end. The bowl measures 2.0 mm in diameter. On the lateral side of the stem an inscription reads *McDougall Glas...*and on the opposite side an inscription...*RNS Cutty Pipe.* Clay pipes were manufactured by the McDougall Company of Glasgow, Scotland between 1888 and 1892 and also in 1896 (Wilson 1971).

Glass Button (Fig. 52b)

This complete artifact is round in outline, manufactured from a dense black glass and exhibits a bevelled star design on its dorsal surface. Measurements are 20 x 20 x 4 mm and it weighs 25 g. The button is rectangular in cross-section and has no eyes but was attached by a loop on the ventral side.

Clam Shell Button (Fig. 52c)

The button is manufactured from clam shell and is of European design with four eyes. Rectangular in cross-section it measures 16.0 x 16.0 x 1.5 mm and weighs 0.4 g.

Bone Knife Handle (Fig. 52f)

This tool, broken at its proximal end measures (57) x 22 x 3 mm and is plano-convex in cross-section. The implement appears to have been the handle portion of a metal bladed knife. It has been carved and carefully abraded to shape. A whale fluke design forms the distal portion and geometric designs are incised on the dorsal face. Two metal rivets which hafted the handle to the blade are still intact.

Flint Biface Fragment (Fig. 52d)

This bifacially worked piece of flint is biconvex in cross-section, and exhibits careful pressure flaking on both surfaces and a well-defined notch. The flake which has a blue/gray patination over all surfaces had been truncated to show fine grained homogenous brown flint. Because the pressure flaking is entirely patinated the implement is thought to have considerable antiquity. Also flint is not found in the New World. It was quite common, however, for European ships of the 18th and 19th century to use flint as ballast.

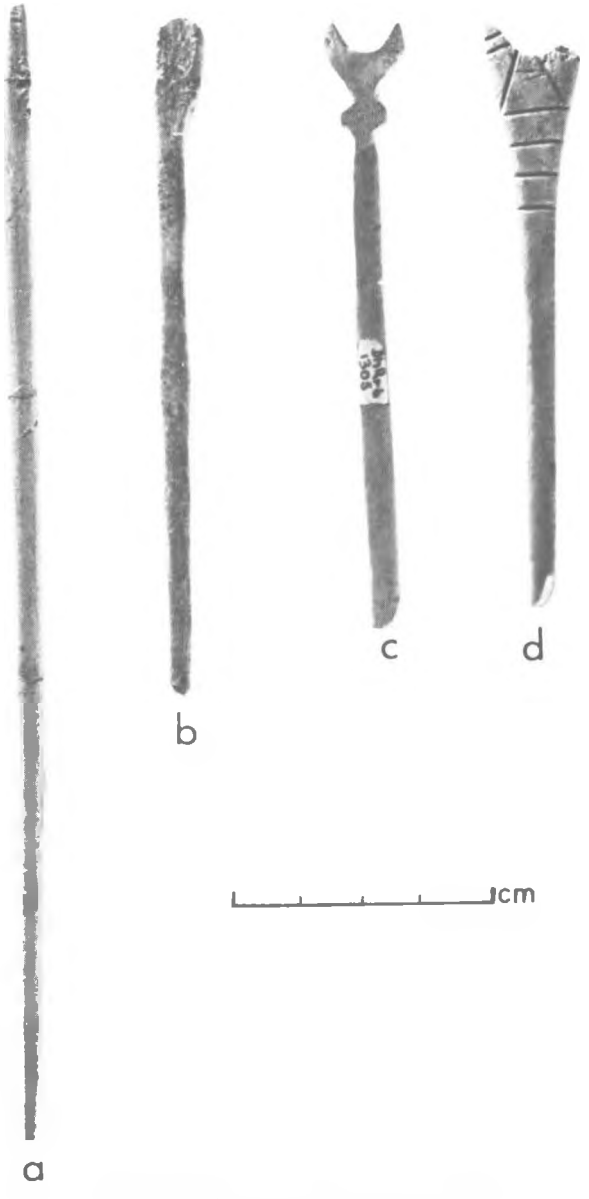


Fig. 44. Bone blanket pins, Belcarra Park II.

Wooden Implement (Fig. 52a)

This implement of unknown function measures 48 x 27 x 5 mm and weighs 15.6 g. It is in two pieces which screw together with wooden threads located on the interior of the proximal portion of the superior section and on the exterior of the distal portion of the inferior section. The inferior section also has a set of threads which are located on the interior of the distal portion which accept another part.

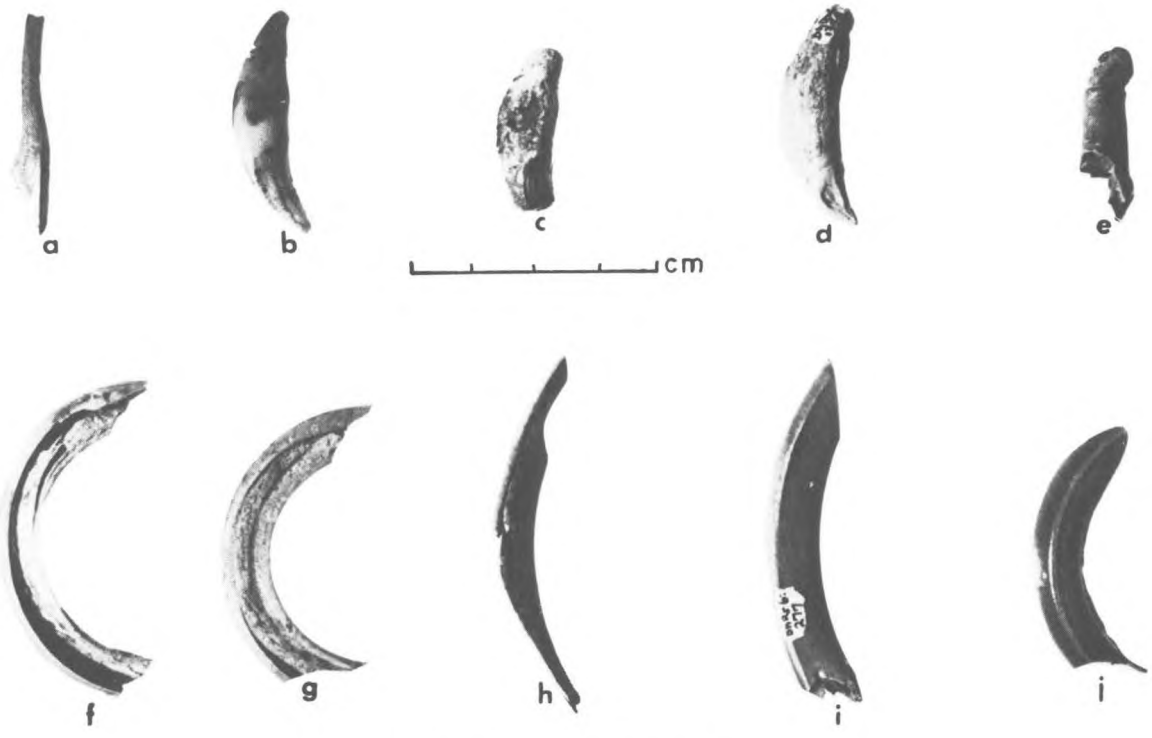


Fig. 45. Tooth artifacts, Belcarra Park II.

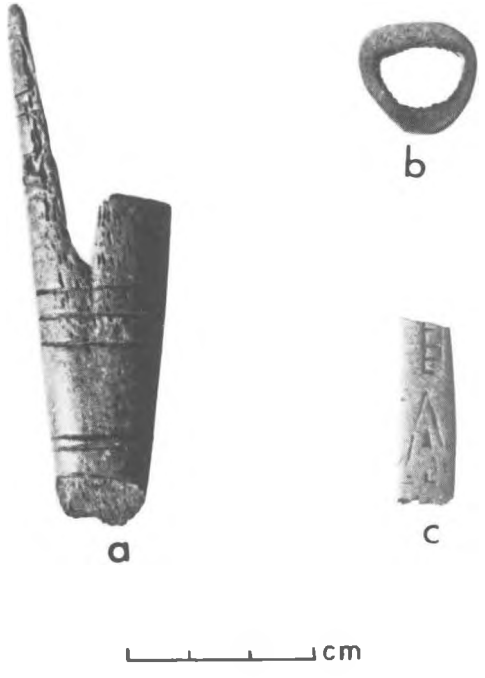


Fig. 46. Miscellaneous decorated bone items, Belcarra Park II.

Features

Twenty features were recorded during the 1971 field season. These consist of seven hearths and thirteen post moulds and all are associated with Belcarra Park II (Zone C) deposits. Hearths are typically concentrations of fire-cracked rocks with associated ash and charcoal (Fig. 53). Post moulds range from small (six are under 10 cm in diameter) to quite large (six are over 20 cm in diameter). The largest post mould was Feature 14 with a 30 cm diameter. The post moulds were widely dispersed and no pattern could be discerned. Noted and mapped were 60 amorphous, multi-coloured ash concentrations which were associated with Zone C deposits.

Post Moulds

Feature 1 – This feature was located on the west face of Excavation Unit 9. It extended from 40 cm below surface to a depth of 73 cm below surface. The diameter of the feature was 20 cm at the top and tapered to a diameter of 9 cm at the bottom. The matrix of the feature consisted of black soil from Zone C4. The feature truncated a stratum which consisted of black soil with a mixture of blue mussel and clam shell (C1).

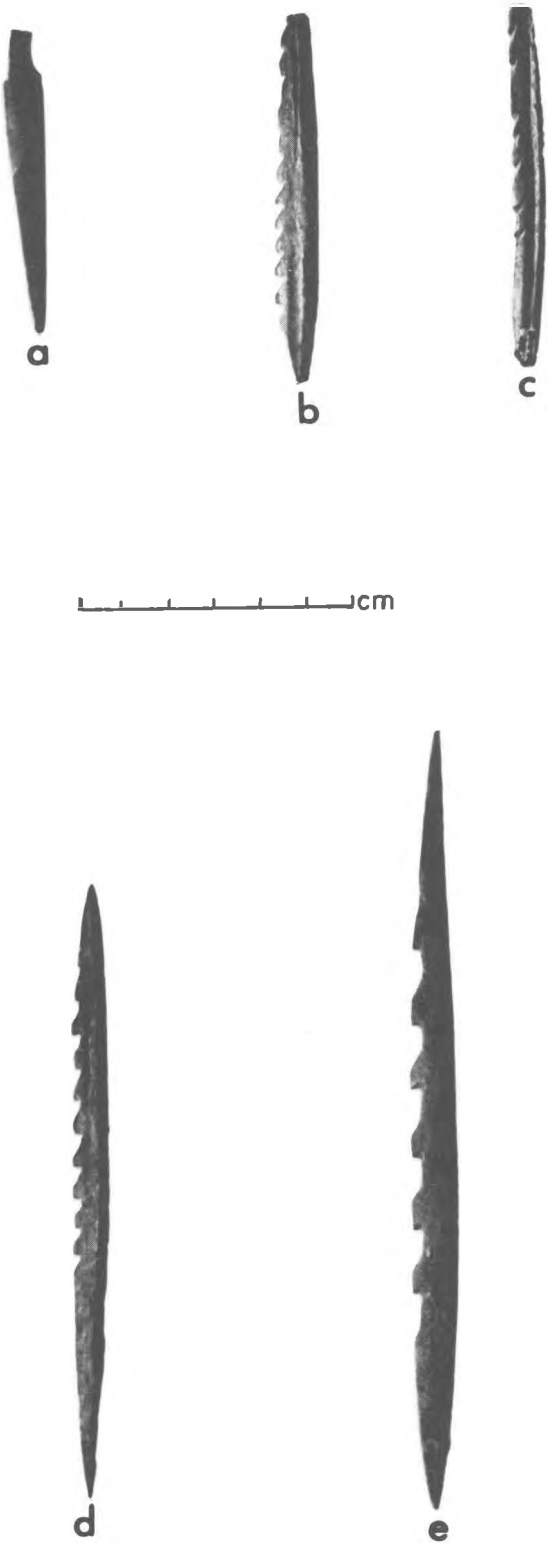


Fig. 47. Barbed antler points, Belcarra Park II.

Feature 2 – This small feature was excavated in the northwest corner of Excavation Unit 7. It was circular in cross-section with a diameter of 4 cm. The top of the post mould began at 40 cm below surface and continued to 70 cm below surface and cut through brown and yellow sand lenses. The post mould appeared to be decomposed wood, possibly red cedar.

Feature 3 – This circular post mould was observed in Excavation Unit 7 and had a diameter of 8 cm. The top of this feature began at 40 cm below surface and extended vertically to 90 cm below surface, and truncated yellow sand deposits.

Feature 4 – Excavated in Excavation Unit 6, this feature was circular in cross-section with a diameter of 3–4 cm. It extended vertically from 50 cm below surface to 70 cm below surface and cut through a white ash layer.

Feature 5 – This small post mould was also from Excavation Unit 6. The post mould was of a brown coloured matrix and extended vertically from 50 cm below surface to 90 cm below surface. This feature truncated a lense of white ash and brown soil and a strata of black soil mixed with clam and mussel (C1).

Feature 6 – This feature was circular in cross-section with a diameter of 6–7 cm. This large circular post mould (maximum diameter 25 cm) was located at 70 cm below surface in Excavation Unit 7. The post mould itself consisted of C4 strata (black humus layer) and was surrounded by an extensive yellow sand lens. The feature also cut through a stratum of black soil with fragmented clam and blue mussel shell (C1). The feature extended from 70 cm below surface to 105 cm below surface at which point its diameter had tapered to 12 cm.

Feature 8 – A circular post mould with a diameter of 16 cm was found in Excavation Unit 9. This feature extended vertically from 55 cm below surface to 90 cm below surface. The matrix of the feature consisted of black humus, (C4) which cut deeply into a thick layer of black soil mixed with clam and blue mussel shell.

Feature 11 – This post mould was from Excavation Unit 10 and measured 20 cm in diameter at 25 cm below surface. It extended to 50 cm below surface where it measured 10 cm in diameter. Like Feature 8, it consisted of black humus and was likely of historic origin. This feature cut deeply into a layer of whole clam and fragmented blue mussel shell.

Feature 12 – This feature was very similar to Feature 11 and was located 40 cm to the north of it. Maximum

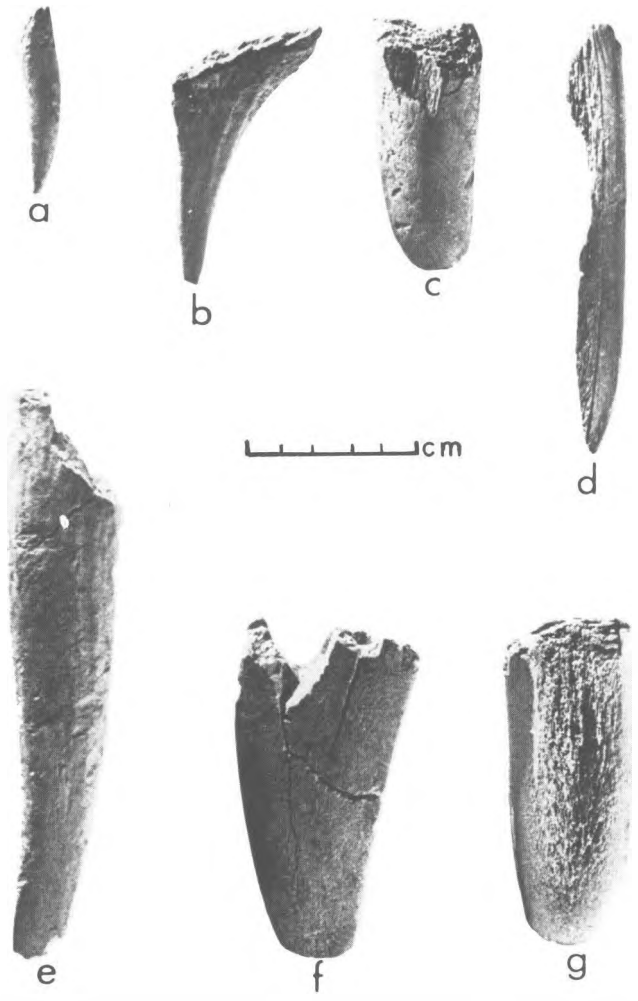


Fig. 48. Antler wedges and tine tips, Belcarra Park II. *a,b* antler tine tips; *c–g* antler wedges.

diameter measured 25 cm tapering to 4 cm. The feature extended from 25 cm below surface to 45 cm below surface.

Feature 13 – This feature was located in Excavation Unit 10, and is very similar to Features 11 and 12. Feature 13 consisted of Zone C4 material which truncated an area of burnt shell and ash and also a Zone C2 layer.

Feature 14 – This post mould located in Excavation Unit 2 had a maximum diameter of 30 cm and was the largest post mould excavated. The top of the feature was located at 55 cm below surface and it extended to a depth of 95 cm below surface where it measured 10 cm in diameter. Like many of the other post moulds this feature consisted of a C4 stratum and cut through a C1 stratum and a small ash lens.

Feature 15 – This feature also located in Excavation Unit 2 was very similar to Feature 14 and was located at 48 cm to the north of it. Its maximum diameter was 20 cm at 55 cm below surface and it tapered to a diameter of 10 cm at 90 cm below surface.

Feature 16 – This was a small feature from Excavation Unit 2. It extended from 75 cm below surface to 100 cm below surface and was 10 cm in diameter. The feature was rectangular in outline and consisted of a Zone C4 matrix and cut through a Zone C1 layer.

Hearths

Seven features which consisted of clusters of fire-broken rock associated with charcoal, ash and burnt shell were recorded as hearths. All are from Belcarra Park II (Zone C) deposits.

Feature 7 – This feature consisted of a concentration of fire-broken rocks which were associated with ash. The feature was located in the southeast quadrant of Excavation Unit 7 at a depth of 110 cm below surface. The feature measured 50 cm north/south by 60 cm east/west and was 15 to 20 cm in depth. The matrix surrounding this feature consisted of black soil with large lenses of crushed blue mussel and clam shell.

Feature 9 – This circular formation of rocks was approximately 60 cm^2 and was located at 100 cm below surface in Excavation Unit 5. It was associated with an ash layer located at the base of the feature. The feature, 20 cm in depth, was located in a matrix of black soil mixed with fragmented blue mussel and clam shell as well as lenses of whole clam and cockle.

Feature 10 – This well defined hearth feature measured 66 cm north/south and 75 cm east/west (Fig. 53). The feature was located in Excavation Unit 2 at 30 cm below surface and was 25 cm thick. Characteristic of this feature were two layers of fire-broken rock which were interspersed with charcoal, ash, shell and burnt wood. The feature was surrounded for the most part by Zone C1 matrix and was also associated with a 60 cm^2 ash spread to the west of the hearth.

Features 17 and 18 – These two associated rock concentrations were observed in Excavation Unit 1 at a depth of 90 cm below surface. Feature 17 measured 44 cm east/west and was 14 cm thick. The surrounding matrix was a C4 stratum plus charcoal. Besides having ash within the feature, it was associated with a large ash spread. Feature 18 consisted of a cluster of fire-cracked rocks in the northwest corner of the excavation unit. This feature was surrounded by the ash spread mentioned above.

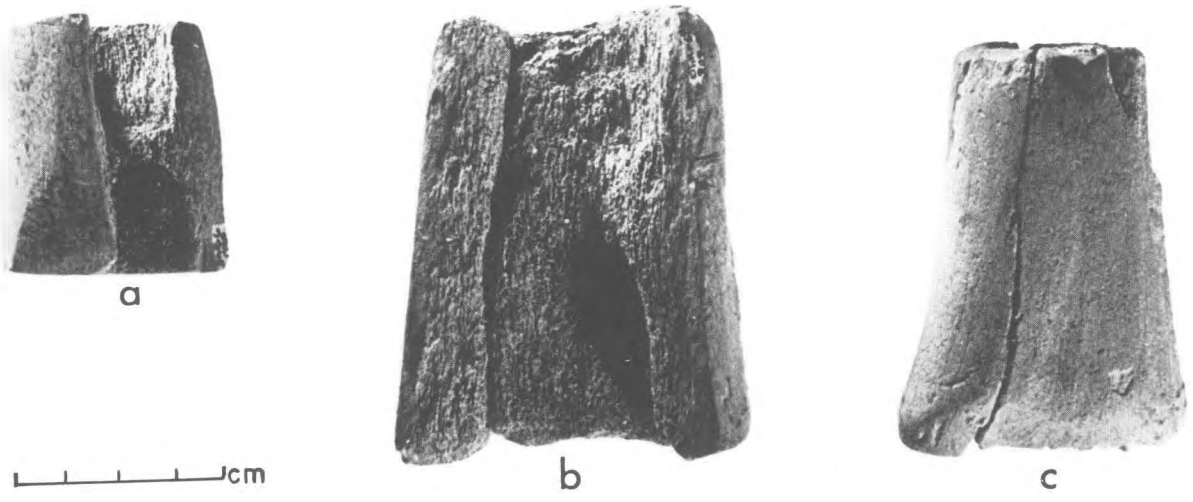


Fig. 49. Antler sleeve hafts, Belcarra Park II.

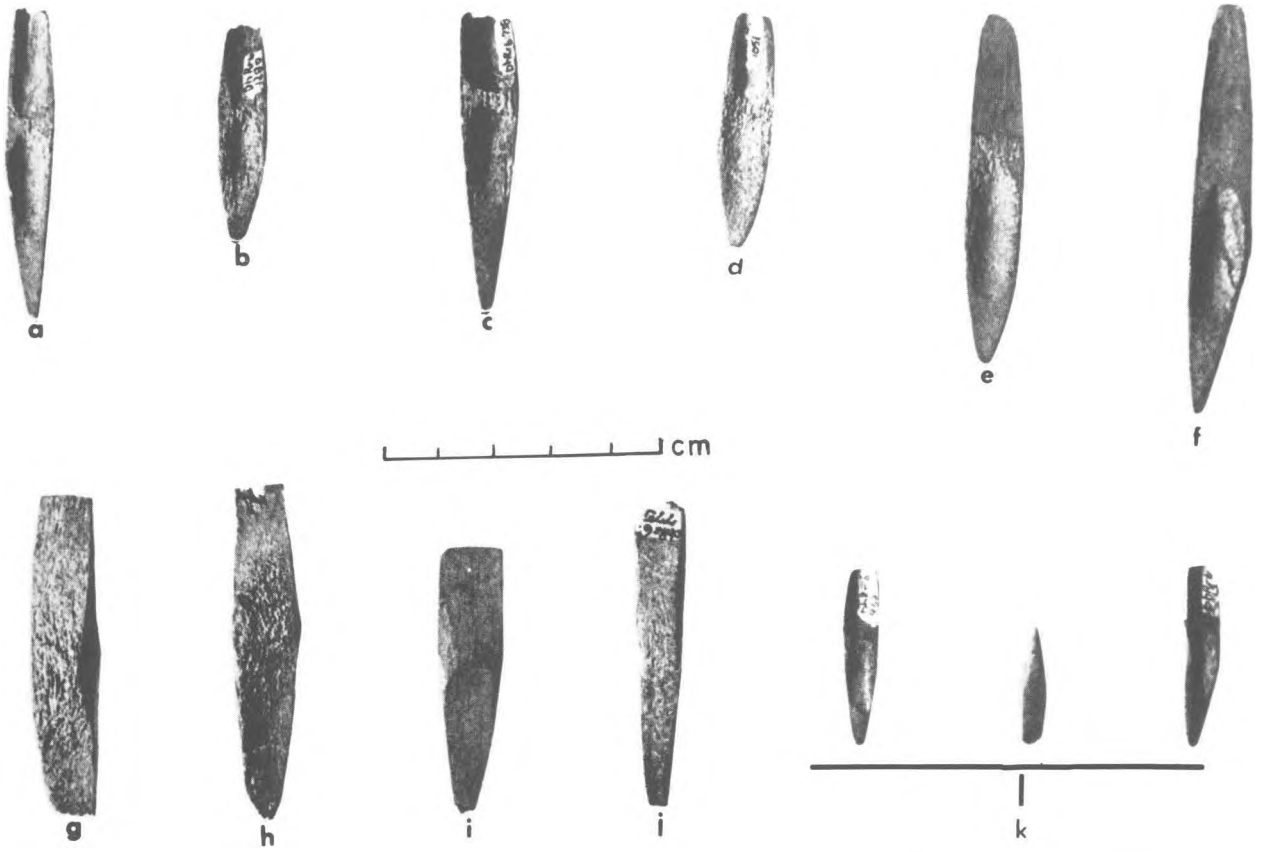


Fig. 50. Composite toggling harpoon valves, Belcarra Park II. *a–d* valves (channeled); *e,f* valves (slotted; *g–j* valves (preforms); *k* complete composite toggling harpoon.

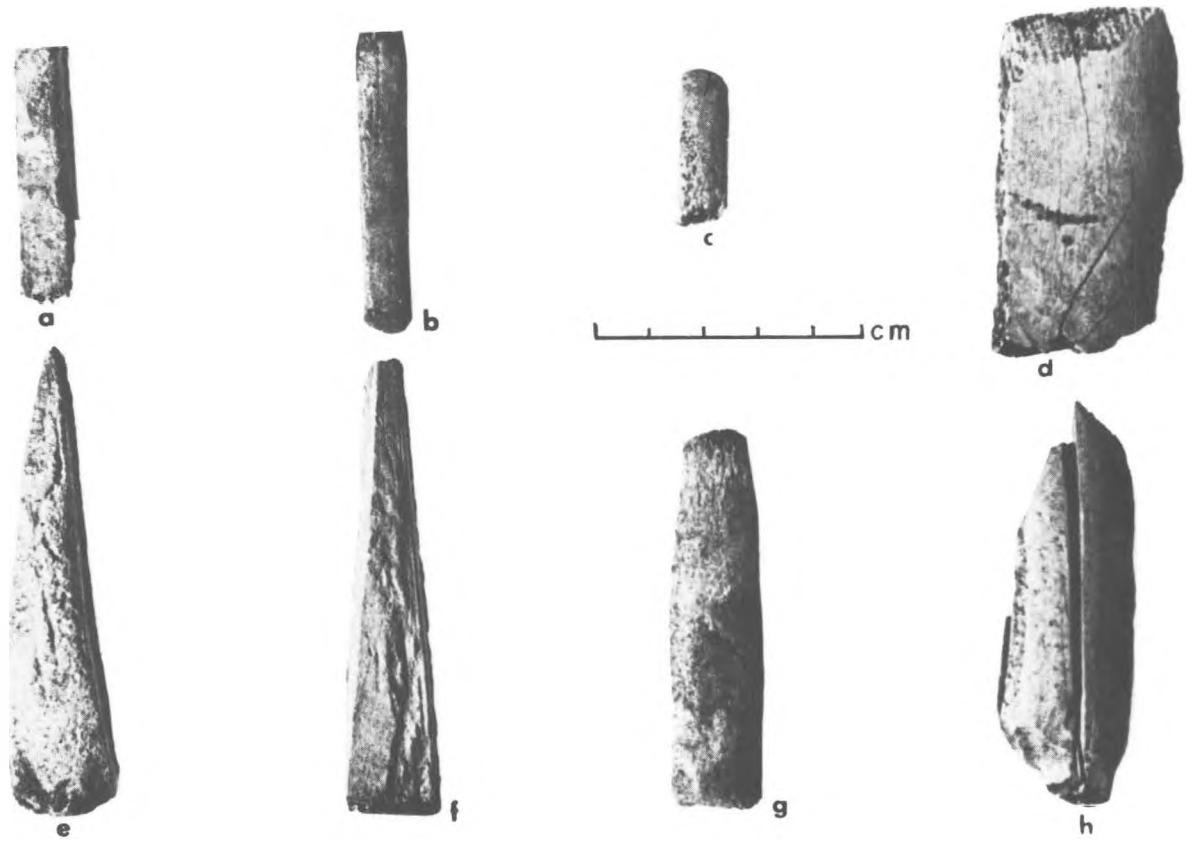


Fig. 51. Miscellaneous antler tools, Belcarra Park II. *a–c* harpoon foreshafts? *d,h* miscellaneous worked antler; *e–g* worked antler preforms.

Feature 19 – This hearth feature was observed in Excavation Unit 2 at a depth of 100 cm below surface. The feature measured 150 cm north/south by 100 cm east/west and was 20 cm deep. Fire-cracked rocks 10–20 cm in diameter, charcoal, decomposed wood and shell were observed within the feature, which was surrounded by C1 matrix as well as large lenses of whole and fragmented clam and cockle shell.

Feature 20 – This feature was confined to the southwest corner of Excavation Unit 1 at a depth of 110 cm below surface. Ash and charcoal were within the feature which was surrounded by a matrix of whole clam and fragmented blue mussel shell.

Cultural Reconstruction

An examination of the local ethnographies and the artifactual and non-artifactual materials recovered from the Belcarra Park II component, shows clearly that we are dealing with a fishing, hunting and gathering culture. In this regard, the Belcarra Park II assemblage is equated with what we might expect would remain from the Coast Salish way of life as depicted by Barnett (1955), Duff (1952) and Suttles (1958, 1960b).

Similar to most other late prehistoric components in the area, shellfish remains are numerous in the Belcarra Park II component. The great reliance on shellfish resources provides the most striking difference between the two components at the Belcarra Park site. Shellfish remains occur as isolated lenses (Fig. 6) or as solid deep strata of highly fragmented shell (Fig. 8). Thick strata of whole and broken shells representing shell dump areas were also present in Excavation Units 4, 5 and 6. Hearths and amorphous ash concentrations generally included quantities of burnt shell. Shellfish species included those easily collected from rocks at low tide (bay mussel) as well as burrowing species such as butter clam and cockle. The use of the digging stick, a traditional method of shellfish collecting, is inferred.

A wide variety of land mammals (Table XLI) are repre-

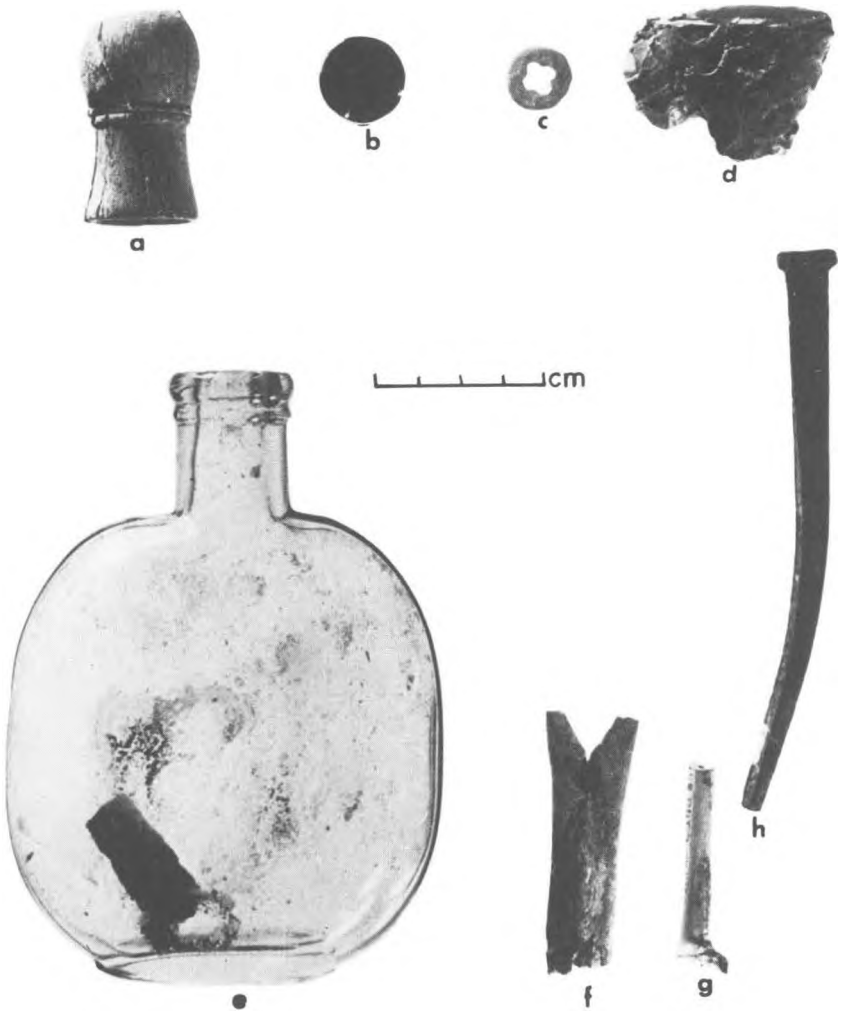


Fig. 52. Historic artifacts, Belcarra Park site. *a* wooden implement; *b* glass button; *c* clam shell button; *d* flint biface fragment; *e* glass bottle; *f* bone knife handle; *g* clay pipe stem fragment.

sented; the dominant species appear to be blacktail deer, domestic dog and elk. Fish species, while not analyzed, appear to be extremely abundant. Sea mammals are represented by northern fur seal, northern sea lion, harbour seal, and porpoise, but seem to have been of minor importance in the diet of Belcarra residents. Large numbers of bird bones are present and most of them are winter residents.

The wide variety of small chipped basalt projectile points and possibly the detachable arrow/harpoons, attest to the use of the bow and arrow during Belcarra Park II times. Barbed bone points too may have functioned as arrow points although they might also have been utilized as leisters or multi-pronged bird darts.

Toggling harpoon valves are small and were likely used for the taking of fish rather than sea mammals. Small toggling harpoons for salmon are noted in both the Whalen II and Stselax phases (Borden 1970:109–110). The toggling harpoon valves from the Montague Harbour III component are also small and it was suggested that they functioned as fishing implements (Mitchell 1971a:220). A wide variety of bone objects which likely functioned as fishing implements (e.g. fish gorges, herring rakes, composite fish hooks, trolling hooks) further emphasizes the importance of fishing pursuits in this component.

The well made ground slate knives were used for the butchering of fish and possibly game. Ground shell knives have also been reported for the Montague Harbour III component (Mitchell 1971a:215). The large amounts of fire-broken rock suggests that stone boiling and steaming methods were in use as well as open fire cooking. The wide variety and number of awl type implements strongly suggests that coiled basketry was being utilized during Belcarra

Fig. 53. Hearth (Feature 10), excavation unit 2, Belcarra Park II. (Formerly Feature 5, Pit 9).

Park II times.

Techniques of manufacture are essentially the same as in the earlier component. Stone tools were formed by chipping, pecking, grinding and sawing. Bone and antler tools were formed primarily by abrasion although sawing, drilling, graving, carving and adzing are also present. The dominant technique for toolmaking during Belcarra Park II times was clearly abrasion. Abraded tools show a wide range of finish from carefully crafted, often highly polished implements (adze blades, ground slate knives, hand mauls, barbed bone points, toggling harpoon valves, antler sleeve hafts, bone blanket pins), to implements that exhibit a minimal amount of abrasion that were clearly manufactured in an expedient manner, without embellishment, to complete the task at hand.

The complete range of woodworking tools is represented in the second component and includes hand mauls, hammerstones, antler wedges, bone chisels, adze blades, and antler sleeve hafts. Tools capable of performing fine carving tasks are represented by beaver and other rodent incisor tools.

A number of large post moulds (Features 1,6,11,12,13, 14) associated with the Belcarra Park II component may indicate the presence of large plank covered dwellings similar to those noted in the ethnographies.

A number of materials including jadeite, vitreous basalt, steatite, chalcedony and pitchstone, may have been received through trade. Jade and nephrite are generally obtained from sources on the Fraser River in the Yale vicinity, as is steatite. Vitreous basalt and chalcedony commonly occur in outwash gravels in many stream beds in the southern interior plateau of British Columbia. The flakes of pitchstone were from a source in the Garibaldi vicinity (E. Nelson 1976, personal communication). While artifacts of dentalium and sea mussel were not recorded at the Belcarra Park

site, these items are frequently recorded in late components in the region (e.g. Mitchell 1971a:221), suggesting trade with west coast groups.

Like other late components in the region, decorated items are rare. This, of course, is not surprising when one considers that perishable wood products such as boxes, baskets, paddles, house fronts, spoons, masks and many other items were the major medium for decoration. Decorated artifacts from the Belcarra Park II component include hand mauls, (Fig. 32), bone pins (Fig. 44), tooth pendants (Fig. 45) and miscellaneous bone objects (Fig. 46). No burials were excavated in the Belcarra Park II component.

There is every reason to suggest that the regular pattern of seasonal movement as noted during the contact period and recorded in the ethnographies for the Coast Salish, was in effect during Belcarra Park II times. The preliminary faunal analysis for the Belcarra Park II component strongly suggests a late fall/winter occupation for the residents. From the amount of deposit attributed to the Belcarra Park II component, we are dealing with either a larger population, longer occupancy or more frequent annual visits than was indicated for Belcarra Park I.

CONCLUSIONS: THE BELCARRA PARK SITE AND LOCAL PREHISTORY

Chronological Considerations

The earliest dates for cultural manifestations in the region are from the St. Mungo Cannery and the Glenrose site on the lower Fraser River (Fig. 1). A series of seven dates ranging between 6200 and 1330 B.C. have been reported for the Glenrose site (Matson 1976). Boehm (1973) reports dates of 2360 B.C. ± 110(I–4053) and 2290 B.C. ± 105 (I–4688) from cultural deposits lying immediately over sterile clay and a date of 2020 B.C. ± 105 (I–4685) from a hearth about 90 cm above these clays, at the St. Mungo Cannery site.

The Mayne phase (3000–1000 B.C.) defined by Carlson (1970) is based upon excavations at the Helen Point site, and is supported by radiometric assays of 3470 B.C. ± 230 (GaK 4938), 2030 B.C. ± 130 (GaK 3201) and 2000 B.C. ± 260 (W.S.U. 1191). The phase is delineated by the following distinctive cultural traits (Carlson 1970:115):

- Flaked basalt points (leaf-shaped, diamond, stemmed and shouldered)
- Flaked basalt scrapers, knives and debitage
- Pebble choppers
- microblades and other artifacts of obsidian and quartz crystal
- Ground slate points and knives are present but rare
- Chipped slate points
- Bilaterally barbed harpoon heads of antler
- Unilaterally barbed harpoon heads of antler
- Antler wedges
- Sandstone abrading slabs and whetstones
- Labrets and other polished stone items
- Bone pendants and long, unbarbed points of bone
- Red ochre and extended burials
- Circular hearths and rock slab features

The Locarno Beach phase (Borden 1968b,1970; Mitchell 1971a) follows the Mayne phase and dates between 1200-200 B.C. The phase is widely acknowledged among researchers and is supported by nine radiocarbon dates from sites on the lower Fraser, the Gulf Islands and the southern tip of Vancouver Island. To date, eight Locarno Beach components (including Belcarra Park I) have been reported (Mitchell 1971a:60). Distinctive archaeological features for the Locarno Beach phase include:

- Large to medium sized chipped basalt points (contracting stem, stemmed, leaf-shaped)
- Microblades and cores
- Chipped slate or sandstone knives
- Cobble and split cobble tools
- A well-developed ground stone industry characterized by faceted ground slate points and thick ground slate knives
- Small, well-made adzes
- Gulf Island complex of artifacts, labrets
- Large faceted ground bone points and heavy wedges
- Toggling harpoons (one-piece or slotted) and antler foreshafts
- Mussel shell adzes and points

The Marpole phase (Borden 1968b,1970; Carlson 1960, 1970) or the Marpole culture type (Mitchell 1971a) dates from ca. 400 B.C. to 400 A.D. To date, twelve Marpole components have been identified in the Strait of Georgia region and are supported by twelve radiometric assays. The distinctive archaeological features for the Marpole phase include:

- "Medium" and "large" chipped basalt points (leaf-shaped, stemmed, unstemmed), and small asymmetrically triangular points of basalt
- Microblades
- Large ground slate points and thin ground slate knives
- Large and small adze blades
- Stone sculpture (decorated bowls, seated human figures, fish effigies, decorated pipe bowls) found at some sites.
- Perforated stones and decorated hand mauls
- Labrets and disc beads of shale or clamshell
- A varied bone industry (large needles, split bone awls)
- Unilaterally barbed harpoons of antler and unilaterally barbed fixed points of antler and sculpture of antler
- Ornaments of native copper
- Flexed midden burials, skull deformation and frequent inclusion of grave goods
- Large post moulds and house outlines

The last phase in the sequence is the Stselax phase (Borden 1970) or its variant the San Juan phase (Carlson 1960, 1970) and the Gulf of Georgia culture type (Mitchell 1971a). The phase dates from ca. A.D. 1250 to 1808. Components of the phase have been documented at 11 sites (Mitchell 1971a:51) in the region. To this total can be added components from the Belcarra Park site and the

Carruthers site (Crowe-Swords 1974). Five radiocarbon dates fall within the above-mentioned time period. The Gulf of Georgia components are often equated with the ethnographically known Coast Salish culture which has been described by Barnett (1939, 1955), Duff (1952), Jenness (1955), and Suttles (1951, 1958, 1960a, 1960b, 1963, 1968). Mitchell (1971a:48) summarizes:

> . . .cultural reconstruction is based primarily on ethnographic information as it is felt (although admittedly not demonstrated) Gulf of Georgia culture and Coast Salish culture are essentially the same.

Distinctive archaeological traits for the latest phase include:

- Small, triangular chipped stone points of basalt, with a reduction in the amount of stone chipping
- Triangular ground slate points with thinned bases
- Thin ground slate knives
- Well-made adze blades, flat-topped hand mauls
- A well-developed bone tool industry, specifically unilaterally barbed bone points, and a wide variety of awl types, and also a wide variety of single and double-pointed bone items
- Small composite toggling harpoon valves of antler either slotted or channelled to accept arming points
- Spindle whorls and decorated blanket pins
- Flexed midden burials, skull deformation
- Large post moulds and house outlines

Using the criterion of stratigraphy, the Belcarra Park I component is clearly older relative to the Belcarra Park II component (Fig. 6, 7, 8). The great difference in the presence of organic material between the two components is suggestive that the two components are divergent in age. Only a single C^{14} sample was collected from the Belcarra Park I component. This composite sample yielded a date of A.D. 240±90 (GaK 3903) and is considered to be too young.

In terms of the established regional chronology, the Belcarra Park I assemblage bears the most resemblance to previously described Locarno Beach components. In the chipped stone industry we are dealing with a sample of 30 items (deleting the categories of unifacially retouched flakes, utilized flakes and miscellaneous chipped stone). Sixteen "medium" chipped stone points account for 50% of this total. These classes (leaf-shaped, contracting stem, stemmed) are generally considered distinctive for Locarno Beach components (Borden 1970:101; Mitchell 1971a:47). The remainder of the chipped stone assemblage from Belcarra Park I while not especially characteristic, would not be out of place in a Locarno Beach assemblage.

Ignoring for a moment the single unclassifiable fragment of ground slate from Belcarra Park I, we are left with a total of 26 ground stone tools. The stemmed (7.7%) and stemless (53.8%) ground slate points, the thick ground slate knives (15.4%) and the small rectangular adze blades (23.1%) are all distinctive features of previously described Locarno Beach components(Borden 1968b, 1970; Mitchell 1971a).

Table XXXVIII Distribution of Artifact Classes by Component

Class	COMPONENT: Belcarra Park I	COMPONENT: Belcarra Park II	% of Assemblage	Artifact totals
Chipped Stone	53.5% (N=52)	19.2% (N=226)	21.9%	280
Ground Stone	26.7% (N=27)	11.6% (N=136)	12.8%	163
Pecked and Ground Stone	11.9% (N=12)	10.5% (N=123)	10.6%	135
Bone	5.0% (N=5)	46.3% (N=545)	43.1%	550
Antler	2.9% (N=3)	12.4% (N=146)	11.6%	149
TOTALS	100.0% (99)	100.0% (1170)	100.0%	1,269

None of the pecked and ground stone items (shaped abrasive stones, hammerstones) are considered to be characteristic of the component, although Borden (1970:96) lists abrasive stones as being abundant for the Locarno Beach phase.

Bone and antler items form only 7.9% of the Belcarra Park I assemblage; and this scarcity unfortunately severely limits both intra-site and inter-site comparisons. None of the six classifiable items however, would be out of place in a Locarno Beach assemblage. The barbed bone point, the well made chisel and the harpoon valve (Fig. 18b,a,f) bear strong resemblance in size and form to ones illustrated by Borden (1970: Fig. 30a,d,v).

Of the Belcarra Park I tools that could be classified, 49.5% are associated with subsistence activities while 45.5% reflect manufacturing activities. A total of 19.6% of the manufacturing items appear to have been primarily related to woodworking endeavours.

The description and analysis of the prehistoric Belcarra Park assemblage has revealed two discrete components. The earliest component, Belcarra Park I is dominated by a well-developed chipped stone and ground stone industry. While bone and antler items were few in number (due to preservation factors), it is suggested that the site inhabitants were highly skilled in the manufacture of bone and antler tools. Clearly, the basic Northwest Coast technological adaptations were fully operative during Belcarra Park I times.

The technology described, with some variations and stylistic changes, continues during Belcarra Park II times. The chipped stone industry decreases quite sharply in the Belcarra Park II component as does the ground stone

industry, (Table XXXVIII). A large increase in bone and antler tools is observed. Bone tools (especially awls and unbarbed points) are represented by a complex array of ground and/or polished whole or fragmentary tools. Six types of unbarbed bone points comprise 56.7% of the classifiable bone items from this component. Wedge based points (arming points for toggling harpoons) alone, form 50.2% of all bone points. Needless to say harpoon technology is well developed by this time. Small channelled valves which accept the wedge based points are dominant but larger slotted varieties are represented as well. Woodworking implements are represented by adzes, antler wedges, hand mauls, antler sleeve hafts and rodent incisor tools. Unilaterally barbed fixed points of antler and bone are present as are a wide variety of bone pins, tooth pendants, bird bone tube beads and antler tine tips. A single bone needle and a bird bone whistle are also from this component.

Two C^{14} samples date the Belcarra Park II component. The dates of 330 A.D. ± 90 (GaK 3905) and 880 A.D. ± 90 place the component in the poorly documented time period between the Marpole and Stselax phases. Including the two Belcarra Park dates, there are now ten radiometric dates for the problematic A.D. 400–1200 gap (Fig. 54). Mitchell tentatively considers the single Whalen II date of 370 A.D. ± 100 as a late Marpole component. Six of the ten dates appear to date components of the Stselax/San Juan/Gulf of Georgia type. We might also add the Alberni Canal date of 500 A.D. ± 80 (GaK 5108) from a component closely resembling the Gulf of Georgia culture type (McMillan and St. Claire 1975:72). A recently excavated site in the northern Gulf of Georgia has yielded a date of 1160 A.D. ± 80 (GaK 6035) which apparently dates a Gulf of Georgia component (Monks 1975). Three dates from the Helen Point site on Mayne Island are within the A.D. 400–1200 time range. Component association for these dates is still unclear as Carlson (1970:120) initially reported no evidence of human occupation for that particular time period.

The first date submitted for the A.D. 400–1200 time period was from the late component at the Fossil Bay site (UW–24) 436 A.D. ± 40 (Kidd 1969). As it did date a late component, Kidd (1969:57) considered the date to be "surprisingly early" and of "doubtful validity". Even recent articles (Spurling 1976:59) refer to the Fossil Bay and Dionisio Point dates as "controversial".

However, with ten dates now clustered in the time period the picture, at least in terms of culture history, is becoming clearer. The evidence from the Belcarra Park site, plus evidence from at least five other sites, concurs with Mitchell's suggestion that the gap between the Marpole phase and cultures of the Gulf's historic inhabitants "may be closed by cultures of essentially the recent Salish form" (Mitchell 1971b:167).

Culture Change

Carlson (1970:120), referring to the A.D. 400–1200 period on the southern coast, states that "a significant degree of culture change took place during this 800 year interval". The major change involved the near disappearance of chipped stone technology and its replacement with ground and polished bone tools (1970). He suggests three possible hypotheses which may help to explain the change. The first hypothesis is based upon a migration model not dissimilar to Smith and Boas' suggestion some 68 years previously. This model suggests that "the bearers of the Marpole phase culture were replaced by another human population with a different technology" (Carlson 1970: 122). It was precisely this position that Borden utilized in an attempt to explain a "sudden break" in the cultural development as represented by his Whalen II phase ... "perhaps these sudden breaks in cultural development are somehow linked with the movement of new ethnic groups into the lower Fraser region" (1970:109). Yet paradoxically, virtually every major researcher, including Borden (1970: 101), has made a statement to the effect that:

> . . .a pattern is beginning to suggest itself of the whole southern Gulf of Georgia being already occupied two to three thousand years ago by a relatively homogeneous culture which had already achieved the fundamental ecological adaptations necessary for the maximum human utilization of the area at a pre-industrial level. These are the adaptations basic to the development of Northwest Coast culture as known ethnographically (Abbott 1962:111).

While the migration hypothesis has not been conclusively disproven, the accumulated evidence presented to date argues against such a possibility.

An alternate suggestion for explaining culture change in this 800 year period relates to a technology adapting to a shift in environmental conditions. As Carlson (1970:122) states. . ."a second possible hypothesis for the changes which took place. . .is that the changes in technology were a response to changing conditions of the natural habitat". However, no detailed paleoecological sequence has been presented for the region which would allow for the reconstruction of past environments. Heusser (1960) reports cooler and more humid conditions than at present, with western hemlock and sitka spruce dominating in south coastal British Columbia during his late Postglacial stage which began at about 3000 B.P. Fladmark (1974) places sea-level stabilization on the Northwest Coast at approximately 5000 B.P. and postulates that ensuing environmental stability correlates with large dependable salmon runs resulting from gradient maturation of the river systems. These factors are associated at this time with massive shell middens resulting from heavily populated winter aggregates that "reflect a settlement type characteristic of the ethno-

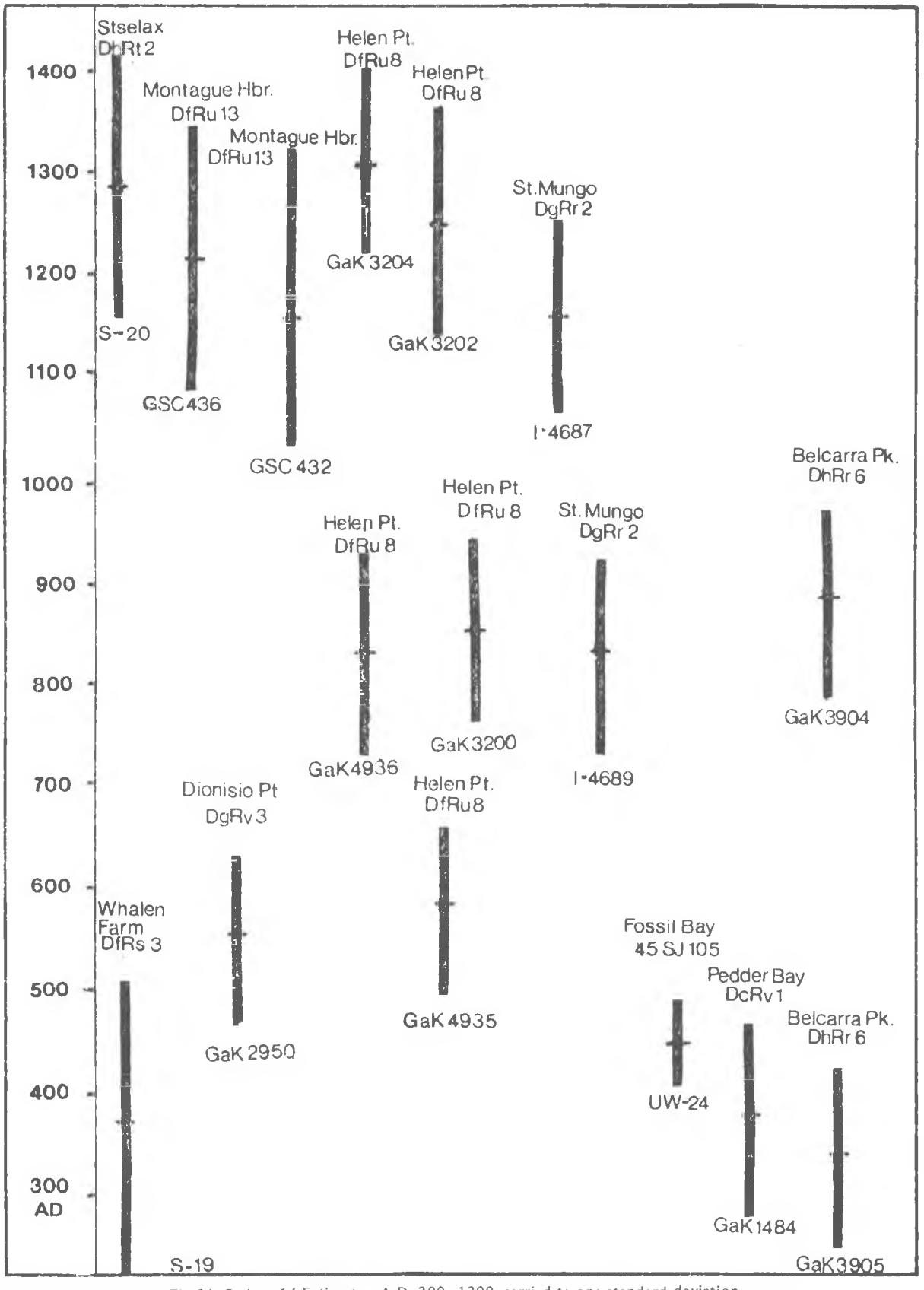


Fig 54. Carbon 14 Estimates, A.D. 300–1300, carried to one standard deviation.

S-20, 1290±130; GSC 436, 1220±130; Gak 3202, 1250±110; GSC 432, 1160±130; Gak 3204, 1310±90; I-4687, 1160±95; Gak 4936, 830±100; Gak 3200, 850±90; I-4689, 830±95; Gak 3904, 880±90; S-19, 370±140; Gak 2950, 550±90; Gak 4935, 580±85; UW-24, 436±40; Gak 1484, 370±100; Gak 3905, 330±90. (AD 1950).

graphic Northwest Coast cultural pattern" (1974:262).

A recent study by Mathewes (1970:2085) attempted to outline the post-glacial vegetation changes for two sites near Haney, British Columbia which is located approximately 26 kilometres east of the Belcarra Park site. Mathewes noted a hemlock/cedar dominance above the Mazama ash layer which indicated wet climatic conditions not dissimilar to those of the present. Mathewes concluded that "the palynological evidence, supported by well-preserved bryophyte subfossils, suggests that humid coastal conditions have prevailed in the study area since about 10,500 B.C". While the paleoecological evidence is still tentative in nature, what is available strongly suggests that environmental shifts are a rather unlikely explanation for any culture change which may have taken place during the last 2000 to 3000 years.

Carlson (1970:122) presents a third alternative one of... "a gradual change of the culture of the Marpole phase into that of the San Juan phase as the result of the introduction of new techniques for exploiting the environment". This position appears to be the most likely alternative and evidence from the Belcarra Park II assemblage supports this hypothesis, at least in part.

What then are the technological changes characteristic of the time period under discussion? As noted previously Carlson cites the reduction and near disappearance of chipped stone tools and replacement with a wide variety of ground and polished bone tools. This phenomenon has been reported from virtually every site in the region that has a late prehistoric component dating A.D. 1200 or later. All three sites in the lower Fraser drainage that date or appear to date to the A.D. 400—1200 time period, however, contain *significant* percentages of small, light, chipped stone projectile points.

For the Whalen II component, Borden (1970:106) reports chipped stone tools in abundance and illustrates a series of chipped stone projectile points that he considers diagnostic. Those points and in particular, side-notched and corner-notched varieties, he notes as being unknown on the Fraser delta before this time. Crowe-Swords (1974) has also reported a series of similar projectile points from the nearby Carruthers site. At this single component site, chipped stone projectile points of the small triangular variety form 71.2% of the chipped stone projectile point class (triangular 32.9%, side-notched 13.4%, stemmed 12.1%, corner-notched 12.8%). At the Belcarra Park site chipped stone projectile points of the small triangular form make up 82.4% of all chipped stone projectile points from the late component (triangular 8.8%, side-notched 48.2%, stemmed 14.0%, corner-notched 11.4%).

The side-notched points from the Belcarra Park component (N=55) were compared with side-notched points from sites with late components in the Lillooet area. Stryd (1972:37) analyzed the attribute of projectile point neck width from a sample of 142 in order to determine function, the assumption being that "small light points with narrow necks function as arrow points whereas larger and heavier points served as atlatl or spear points". Two well-defined clusters of neck widths became apparent. The Belcarra Park side-notched points fall within the range for projectile points defined by Stryd as arrow points. We can then, on the basis of the combined evidence, document the introduction of the bow and arrow in the lower Fraser drainage in late prehistoric times, A.D. 100—400. Stryd (1972:37) has the bow and arrow being introduced in the southern interior of the province ca. 200 B.C. and the total disappearance of the atlatl by A.D. 1250.

Table XXXIX Local vs. Imported Lithics for Chipped Stone Industry: Belcarra Park Site

Lithic Material Utilized		COMPONENT Belcarra Park I	Belcarra Park II	Site Total
Local	) Granular Basalt	66.6%(34)	56.4%(114)	148
	) Green Quartzite	17.6% (9)	8.4%(17)	26
	) Slate	7.8% (4)	0.5% (1)	5
Imported	) Vitreous Basalt	5.9% (3)	30.2% (61)	64
	) Chalcedony	2.0% (1)	2.0% (4)	5
	) Chert	0.0 (0)	1.0% (2)	2
	) Pitchstone	0.0 (0)	1.0% (2)	2
	) Petrified Wood	0.0 (0)	0.5% (1)	1
		100.0%(51)	100.0%(202)	253

By the beginning of Belcarra II there is indirect evidence for increased contact (trade and/or diffusion) with populations of the Southern Interior. In the Belcarra Park II component a number of artifact classes could "fit" comfortably in late prehistoric sequences from the Southern Interior (i.e. side-notched and corner-notched projectile points, two drills and a single graver). Decorated items (bone blanket pins, decorated bone fragment, straight awls) exhibit "Interior" geometric designs. The increase in the amount of stone tools manufactured from lithics not available locally is noted (Table XXXIX). The large increase (fivefold) in tools made from fine grained vitreous basalt may be especially significant as it is this material which is utilized for the vast majority of arrow points in assemblages from the Southern Interior. At this point then it is feasible to hypothesize the introduction of the bow and arrow on the Southern Coast from the Southern Interior Plateau.

The precise ramifications on a society's techno-economic system resulting from the introduction of such a major technological innovation is unknown at present. We do know, however, that "large" to "medium" chipped stone

points (atlatl or dart points?) disappear on the southern coast after A.D.400 and I would suggest that this form of technology was rapidly replaced by a bow and arrow technology. That the bow and arrow persisted until Euro-American times is abundantly evident from both historic and ethnographic information. The reduction and virtual disappearance of chipped stone projectile points in components dating after A.D.1200 is well documented; I would suggest that many of the variety of bone points reported from these same components functioned as arrow points, replacing the chipped stone arrow points. The confirmation or rejection of such a hypothesis must wait until more refined typological studies can be undertaken. In this regard, though, the preliminary data from the Ozette site may provide a key. To date the late prehistoric component from this unique site has yielded an impressive array of complete and fragmentary bows, complete and fragmentary arrow shafts as well as a large number of wood and bone arrow points (Daugherty:1975).

Conclusions

This report has presented a detailed description and analysis of materials excavated from a large prehistoric site located on Indian Arm, a few miles northeast of Vancouver, British Columbia. The poorly understood time period of A.D.400–1250 has been the focus of the study. By utilizing the cultural materials excavated from the Belcarra Park site and by making inter-site comparisons, the above time period was discussed in terms of chronology and culture change. Previous theories which related to the time period and which relied heavily upon models of migration and cultural diffusion to explain observed changes in the frequencies of artifact types, were reviewed. The concept that culture change during late prehistoric times in the Strait of Georgia can best be explained as a response to environmental shifts was also examined. Finally, explanations for an observed change in some technological items from the Belcarra Park site were offered.

The analysis of the Belcarra Park assemblage and of the stratigraphic data has shown that two discrete cultural components are represented at the site. Zone B deposits contain the Belcarra Park I component. This, the earlier of the two components present, is represented by a small assemblage (N=99) that is culturally related to previously defined Locarno Beach components. The later component (Belcarra Park II) was dated between the 4th and 9th Century A.D. and is culturally related to previously described components of the Gulf of Georgia culture type. Also noted was a small assemblage (N=29) of historic materials from the disturbed plow zone of the site. The majority of the historic artifacts are late historic items, but a few may have been trade goods and these were fully described.

Prehistoric site occupation was not continuous in the areas examined and the two components are separated temporarily by approximately 500 years. To date, less than 1% of the Belcarra Park site has been excavated. If future excavations were conducted and if a probabilistic sampling design were utilized, it would not be at all surprising if cultural materials from the 400 B.C. – A.D. 400 time period were represented in the assemblage.

Continuities and discontinuities were observed between the two components at the Belcarra Park site. The most obvious difference is the stratigraphic break between the nearly shell free deposits of Zone B and the complex admixture of various molluscs in Zone C. Chipped and ground stone artifacts dominate in Zone B, while in Zone C chipped stone and ground stone items decrease relatively and bone and antler tools increase. As well, some artifact types have exclusive distributions in either zone. Some discontinuities may be explained by differential preservation, differential site utilization and by the sampling design used.

Considerable continuity between the two components is suggested by shared technologies and inferred subsistence activities. The basic manufacturing processes such as the chipping, pecking, grinding, and sawing of stone; and the grinding, sawing, snapping, cutting and adzing of bone and antler are all shared. The drilling of stone, bone and antler and decorative incising was observed only in the late component although sampling and differential preservation factors may have biased the results.

Basic subsistence activities such as the hunting of land and sea mammals and fishing are implied for both components, although the relative reliance on each pursuit has yet to be examined. Evidence of shellfish collecting is limited to the late component.

Certain artifact types such as "large" and "medium" chipped stone projectile points and "large" stemless ground slate points are present only in the early component. They appear to be replaced by smaller, more numerous chipped stone and ground stone triangular projectile points. Considerable discussion concerning this phenomenon was presented and arguments for the introduction of a new technology (bow and arrow) were offered.

Future Research

Historically, archaeological research in the Strait of Georgia region has been concerned with the establishment of local chronologies. I would expect that a considerable number of researchers will continue to work within this cultural historic framework, and that refinements to the chronologies will be suggested. While it can be argued that chronology building is an essential step in archaeological research, that does not necessarily mean that this should be viewed as an end result of research, but rather as an introductory step to broader problems. It appears that researchers in the Strait of Georgia are now ready to address some of the broader problems, as witnessed by recent attempts to examine the subsistence base and settlement patterns of prehistoric populations (Imamoto 1974, Ham and Irvine 1975, Boucher 1976). As well, other obvious problems need to be solved. The establishment of a detailed paleoecological sequence is badly needed. Work in establishing typologies of tool types is required. Detailed typologies of the plethora of bone and antler tools in sites with late components would be an obvious starting place. In this regard, research on "wet sites" in the region will aid in determining function. The lack of detailed published reports with comparative data is a perennial problem, and new series begun by Simon Fraser University and the Heritage Conservation Branch should help to alleviate the situation.

The whole problem of sampling needs to be addressed and our assumptions in this regard need to be questioned. In the majority of cases thus far, sites selected for excavation have been arbitrary and often biased in favour of large, deeply stratified sites. Generally, hypotheses are not explicitly stated and excavation units are arbitrarily selected. In some cases, the above approaches can be rationalized in that they were responses to salvage needs. However, sampling procedures at both the regional and site specific levels, until recently, have not been addressed. Yet, if our goal is "to derive results that reliably represent the populations being investigated" (Binford 1963), then the application of probability sampling designs to the data collecting process becomes essential. Boehm (1973:100) comments on sampling at the site specific level:

> . . .It is clear, however, that attempts to identify and describe processual change should be based on samples that are both large and representative of a wide area of the site. Sampling a wide area of the site will help to offset the biases introduced by differential use occupancy of site areas at one time. It is not enough that total artifact count from the site be high. A large sample must be recovered from each horizontal stratigraphic division of the site, as the factors producing sampling biases operate at each level of occupation.

On a regional level, ethnographic research (Duff 1964, Suttles 1960a, 1963) has exposed us to the cultural dynamics of Coast Salish culture and has made us aware of the complexities of the culture as it is known ethnographically. The ethnographic record of late prehistoric aboriginal groups in the Strait of Georgia region suggests that specific locations were not occupied throughout the year, but rather were occupied on a seasonal basis depending upon the resources to be exploited. These facts have important implications for archaeological research not only in terms of attempting to reconstruct the prehistoric lifeways of the Coast Salish (Abbott:1971, 1972) but also in the sampling strategies to be employed. Only by establishing research problems and utilizing a probabilistic sampling approach can we begin to accomplish the goals suggested by Binford. This is not to say that judgemental sampling designs have no place in future research in the region, or that probability sampling should be utilized rigidly in a "cookbook" fashion. Often the archaeologist is faced with external factors (e.g. site destruction, private property) which dictate that judgemental sampling is the only alternative. Moreover, judgemental sampling techniques such as crosstrenching may be essential in maintaining strict temporal control in highly complex midden situations. Rather, I would view probabilistic and judgemental sampling designs as complements to one another, as methodological tools dependent upon the explicitly stated research problems being investigated.

An over-riding factor which further complicates the attainment of research objectives is the present condition of the archaeological resources. In light of the degradation of the data base in the region it is becoming increasingly apparent that archaeologists will have to very quickly establish overall research priorities for the area. That the attrition rate of archaeological sites is high in the Strait of Georgia is witnessed by the results of the first *systematic* inventory of the Gulf Islands region. The project, begun in January, 1974, had by September of the same year recorded and assessed 590 sites. This figure represented a 100% sample of the Gulf Islands shoreline surveyed to that date. Initial figures revealed that only 35 sites (5.9%) were considered to be three-quarters or more intact while 269 sites (45.6%) were either badly damaged or totally destroyed (Charlton, et al. 1975). There are no detailed figures available for the lower Fraser River although I suspect that site attrition in this area, due to urban expansion and other surface altering activities, is probably higher than in the Gulf Islands.

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APPENDIX I

BOTANICAL SPECIES PRESENT IN THE BELCARRA PARK LOCALITY

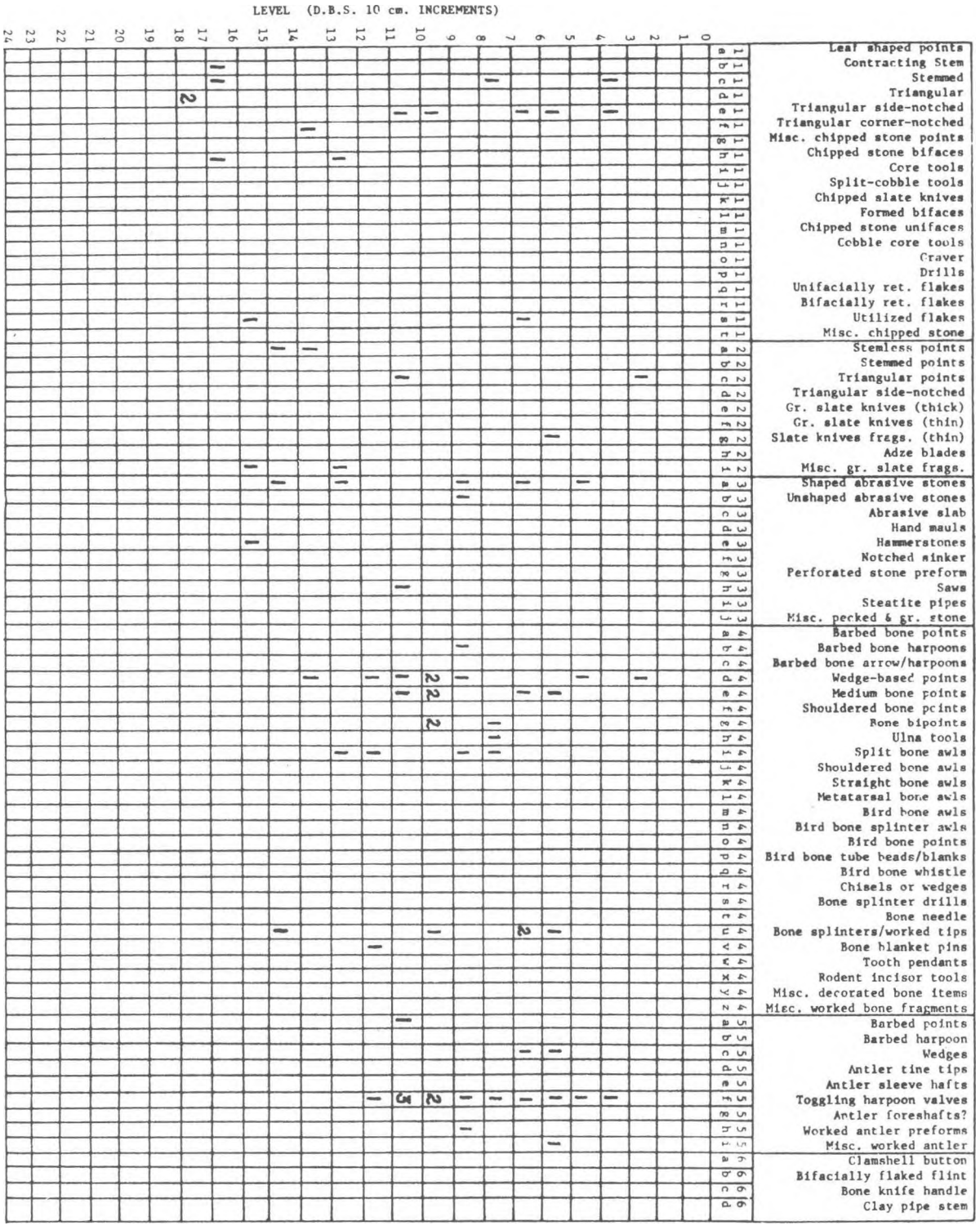
Trees

Western Hemlock	*Tsuga heterophylla*
Lodgepole Pine	*Pinus contorta*
Larch (planted)	*Larix sp.*
Sitka Spruce	*Picea sitchensis*
Douglas Fir	*Pseudotsuga menziesii*
Balsam Fir	*Abies amabilis*
Western Red Cedar	*Thuja plicata*
Northern Black Cottonwood	*Populus trichcocarpa*
Pacific Willow	*Salix lasiandra*
Birch	*Betula sp.*
Red Alder	*Alnus rubra*
Bitter Cherry	*Prunus emargainata*
Broadleaf Maple	*Acer macrophyllum*
Vine Maple	*Acer circinatum*
Cascara	*Rhamnus purshiana*
Pacific Dogwood	*Cornus nuttallii*
Oak (planted)	*Quercus spp.*
Sitka Mountain Ash	*Sorbus sitchensis*

Shrub and Understory

Hazelnut	*Corylus cornuta*
Scotch Broom	*Cytisus scoparius*
Hardhack	*Spiraea douglasii*
Salal	*Gaultheria shallon*
Saskatoon Berry	*Amelanchier alnifolia*
Salmon Berry	*Rubus spectabilis*
Red Huckleberry	*Vaccinium parviofolium*
Blue Huckleberry	*Vaccinium ovalifolium*
Oregon Grape	*Berberis aquifolia*
Thimbleberry	*Rubus parviflorus*
Trailing Blackberry	*Rubus ursinus*
Pacific Red Berry Elder	*Sambucas racemosa var. arborescens*
Wild Gooseberry	*Ribes divaricatum*
Sword Fern	*Polystichum munitum*
Spiny Wood Fern	*Dryopteris austriaca*
Braken Fern	*Pteridium aquilinum*
Northern Maidenhair Fern	*Adiantum pedatum*
Lady Fern	*Athyrium felix-femina*
Deer Fern	*Blechnum spicant*
Common Horsetail	*Equisetum arvense*
Common Wild Rose	*Rosa nutkana*
Devil's Club	*Oplopanax horidum*
Fireweed	*Epilobium angustifolium*
Skunk Cabbage	*Lysichiton americanum*
Plantain	*Plantago major*
False Azalea	*Menziesia ferruginea*
Wild Lily of the Valley	*Maianthenum dilatatum*
Cow Parsnip	*Heracleum lanatum*
Siberian Miner's Lettuce	*Montia sibirica*
Wild Mint	*Mentha canadensis*
Field Chickweed	*Stellaria media*
Foxglove	*Digitalis purpurea*
Bleeding Heart	*Dicentra formosa*
Baneberry	*Actaea rubra*
Bunchberry	*Cornus canadensis*
Wild Carrot	*Daucus pusillus*
Fleabane	*Erigeron sp.*
Wild Lettuce	*Lactuca canadensis*
Plantain	*Plantago maritima*
Twisted Stalk	*Streptopus amplexifolius*
False Solomon Seal	*Smilacina racemosa*
Indian Pipe	*Monotropa uniflora*
Edible Thistle	*Cirsium edule*

APPENDIX II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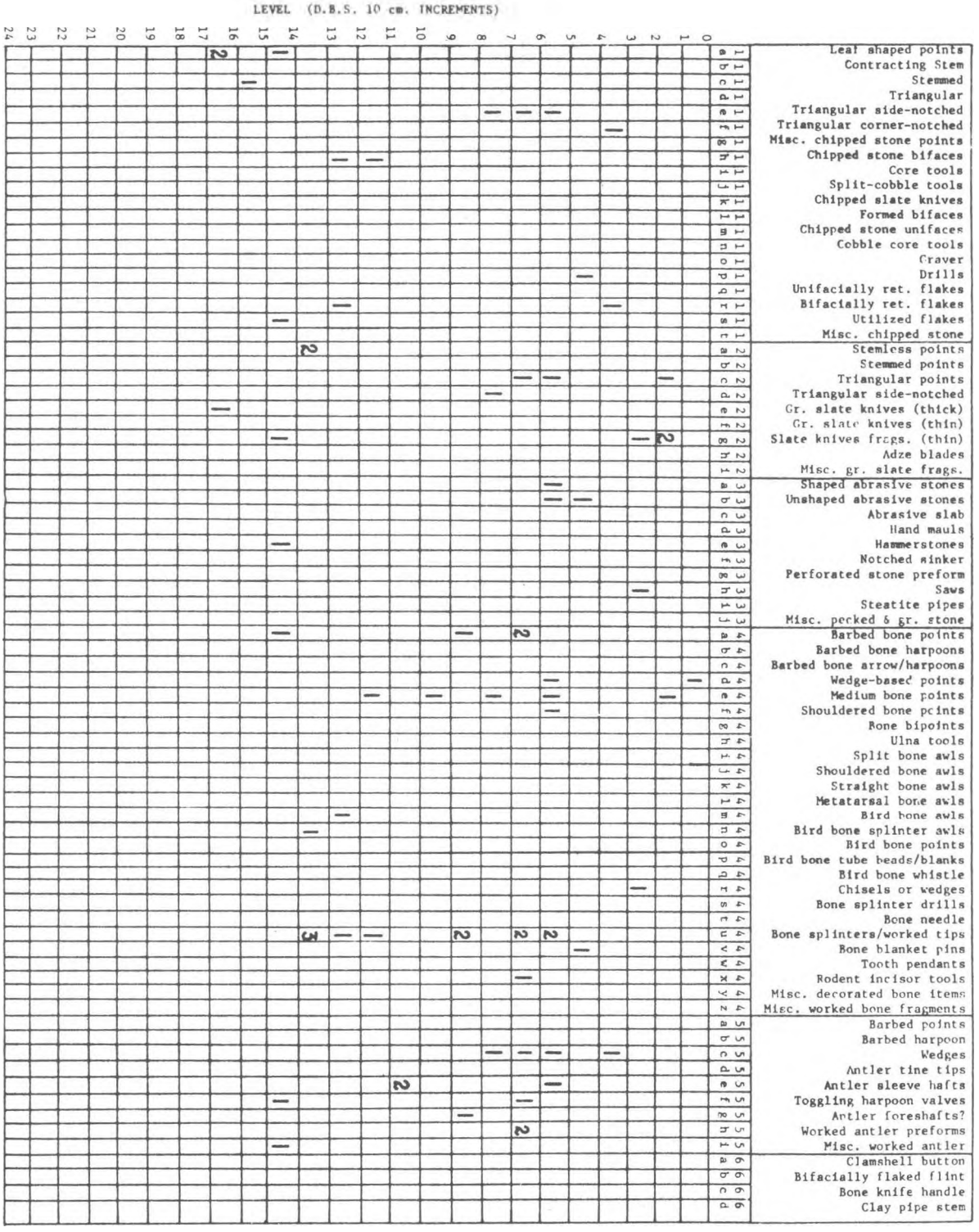
CHIPPED STONE INDUSTRY
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
1a Leaf shaped points
1b Contracting Stem
1c Stemmed
1d Triangular
1e Triangular side-notched
1f Triangular corner-notched
1g Misc. chipped stone points
1h Chipped stone bifaces
1i Core tools
1j Split-cobble tools
1k Chipped slate knives
1l Formed bifaces
1m Chipped stone unifaces
1n Cobble core tools
1o Graver
1p Drills
1q Unifacially ret. flakes
1r Bifacially ret. flakes
1s Utilized flakes
1t Misc. chipped stone
2a Stemless points
2b Stemmed points
2c Triangular points
2d Triangular side-notched
2e Gr. slate knives (thick)
2f Gr. slate knives (thin)
2g Slate knives frags. (thin)
2h Adze blades
2i Misc. gr. slate frags.
3a Shaped abrasive stones
3b Unshaped abrasive stones
3c Abrasive slab
3d Hand mauls
3e Hammerstones
3f Notched sinker
3g Perforated stone preform
3h Saws
3i Steatite pipes
3j Misc. pecked & gr. stone
4a Barbed bone points
4b Barbed bone harpoons
4c Barbed bone arrow/harpoons
4d Wedge-based points
4e Medium bone points
4f Shouldered bone points
4g Bone bipoints
4h Ulna tools
4i Split bone awls
4j Shouldered bone awls
4k Straight bone awls
4l Metatarsal bone awls
4m Bird bone awls
4n Bird bone splinter awls
4o Bird bone points
4p Bird bone tube beads/blanks
4q Bird bone whistle
4r Chisels or wedges
4s Bone splinter drills
4t Bone needle
4u Bone splinters/worked tips
4v Bone blanket pins
4w Tooth pendants
4x Rodent incisor tools
4y Misc. decorated bone items
4z Misc. worked bone fragments
5a Barbed points
5b Barbed harpoon
5c Wedges
5d Antler tine tips
5e Antler sleeve hafts
5f Toggling harpoon valves
5g Antler foreshafts?
5h Worked antler preforms
5i Misc. worked antler
6a Clamshell button
6b Bifacially flaked flint
6c Bone knife handle
6d Clay pipe stem



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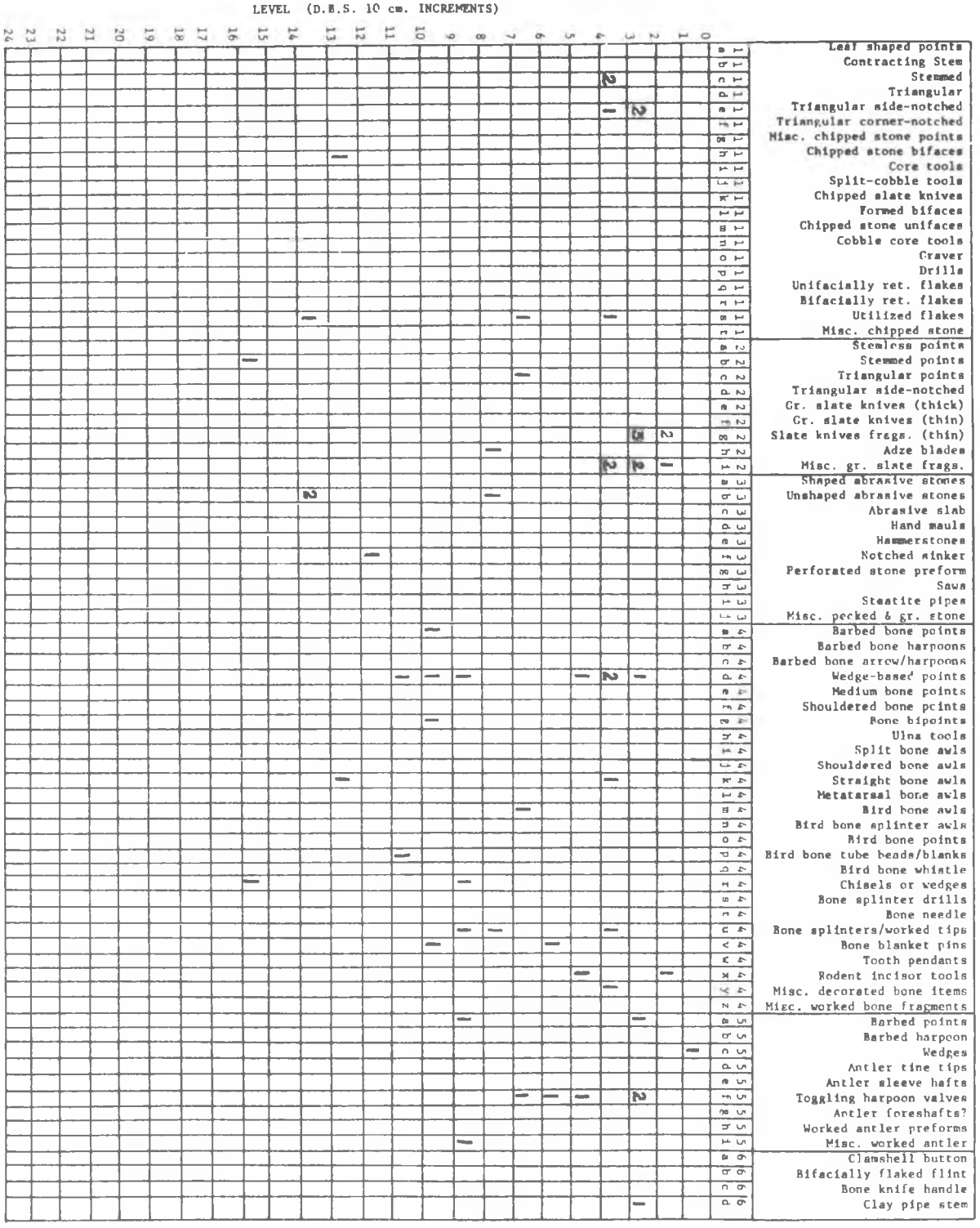
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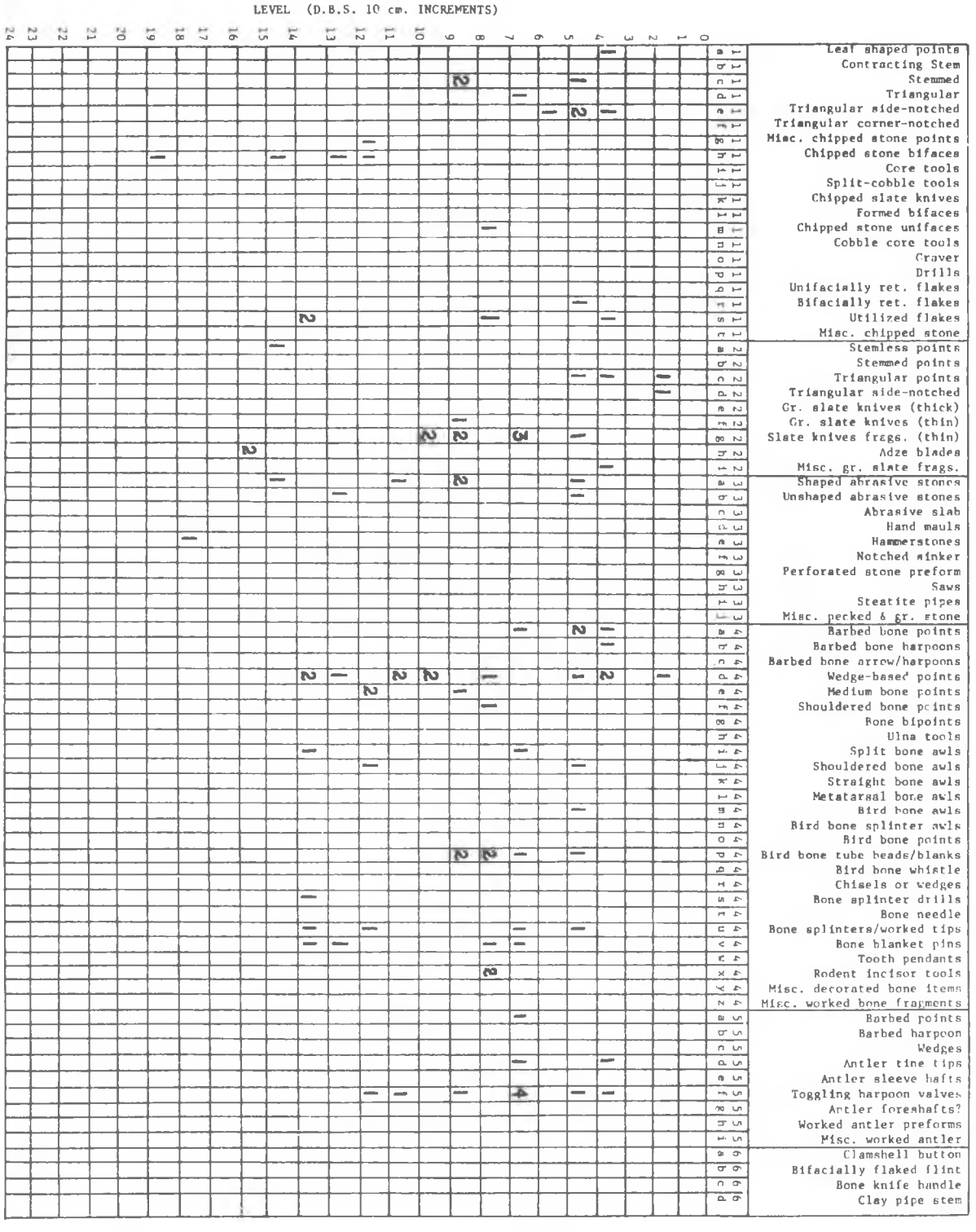
1a Leaf shaped points
1b Contracting Stem
1c Stemmed
1d Triangular
1e Triangular side-notched
1f Triangular corner-notched
1g Misc. chipped stone points
1h Chipped stone bifaces
1i Core tools
1j Split-cobble tools
1k Chipped slate knives
1l Formed bifaces
1m Chipped stone unifaces
1n Cobble core tools
1o Graver
1p Drills
1q Unifacially ret. flakes
1r Bifacially ret. flakes
1s Utilized flakes
1t Misc. chipped stone
CHIPPED STONE INDUSTRY
2a Stemless points
2b Stemmed points
2c Triangular points
2d Triangular side-notched
2e Gr. slate knives (thick)
2f Gr. slate knives (thin)
2g Slate knives frags. (thin)
2h Adze blades
2i Misc. gr. slate frags.
GROUND STONE INDUSTRY
3a Shaped abrasive stones
3b Unshaped abrasive stones
3c Abrasive slab
3d Hand mauls
3e Hammerstones
3f Notched sinker
3g Perforated stone preform
3h Saws
3i Steatite pipes
3j Misc. pecked & gr. stone
PECKED & GROUND STONE INDUSTRY
4a Barbed bone points
4b Barbed bone harpoons
4c Barbed bone arrow/harpoons
4d Wedge-based points
4e Medium bone points
4f Shouldered bone points
4g Bone bipoints
4h Ulna tools
4i Split bone awls
4j Shouldered bone awls
4k Straight bone awls
4l Metatarsal bone awls
4m Bird bone awls
4n Bird bone splinter awls
4o Bird bone points
4p Bird bone tube beads/blanks
4q Bird bone whistle
4r Chisels or wedges
4s Bone splinter drills
4t Bone needle
4u Bone splinters/worked tips
4v Bone blanket pins
4w Tooth pendants
4x Rodent incisor tools
4y Misc. decorated bone items
4z Misc. worked bone fragments
BONE INDUSTRY
5a Barbed points
5b Barbed harpoon
5c Wedges
5d Antler tine tips
5e Antler sleeve hafts
5f Toggling harpoon valves
5g Antler foreshafts?
5h Worked antler preforms
5i Misc. worked antler
ANTLER INDUSTRY
6a Clamshell button
6b Bifacially flaked flint
6c Bone knife handle
6d Clay pipe stem
TRADE GOODS
EXCAVATION UNIT 8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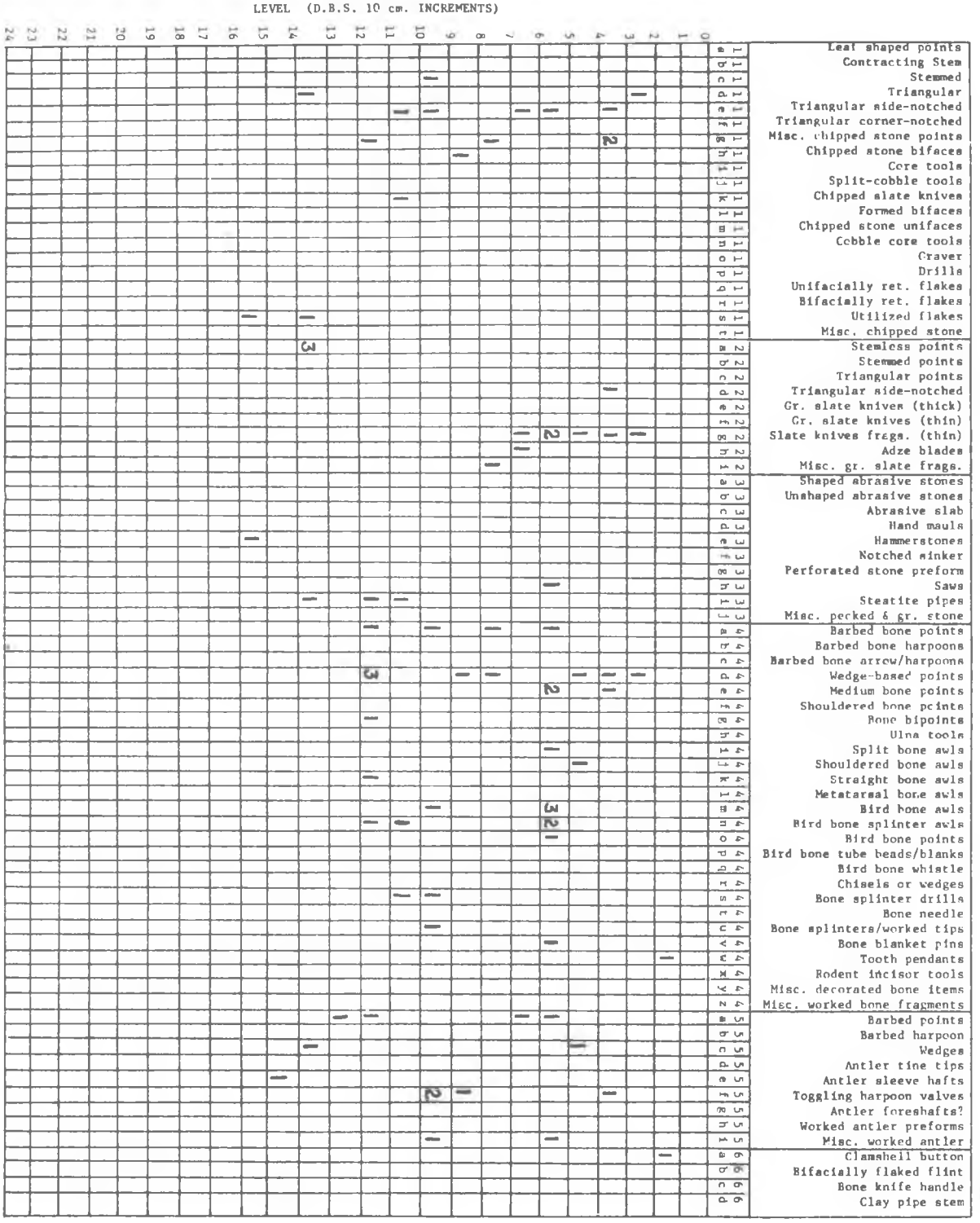
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem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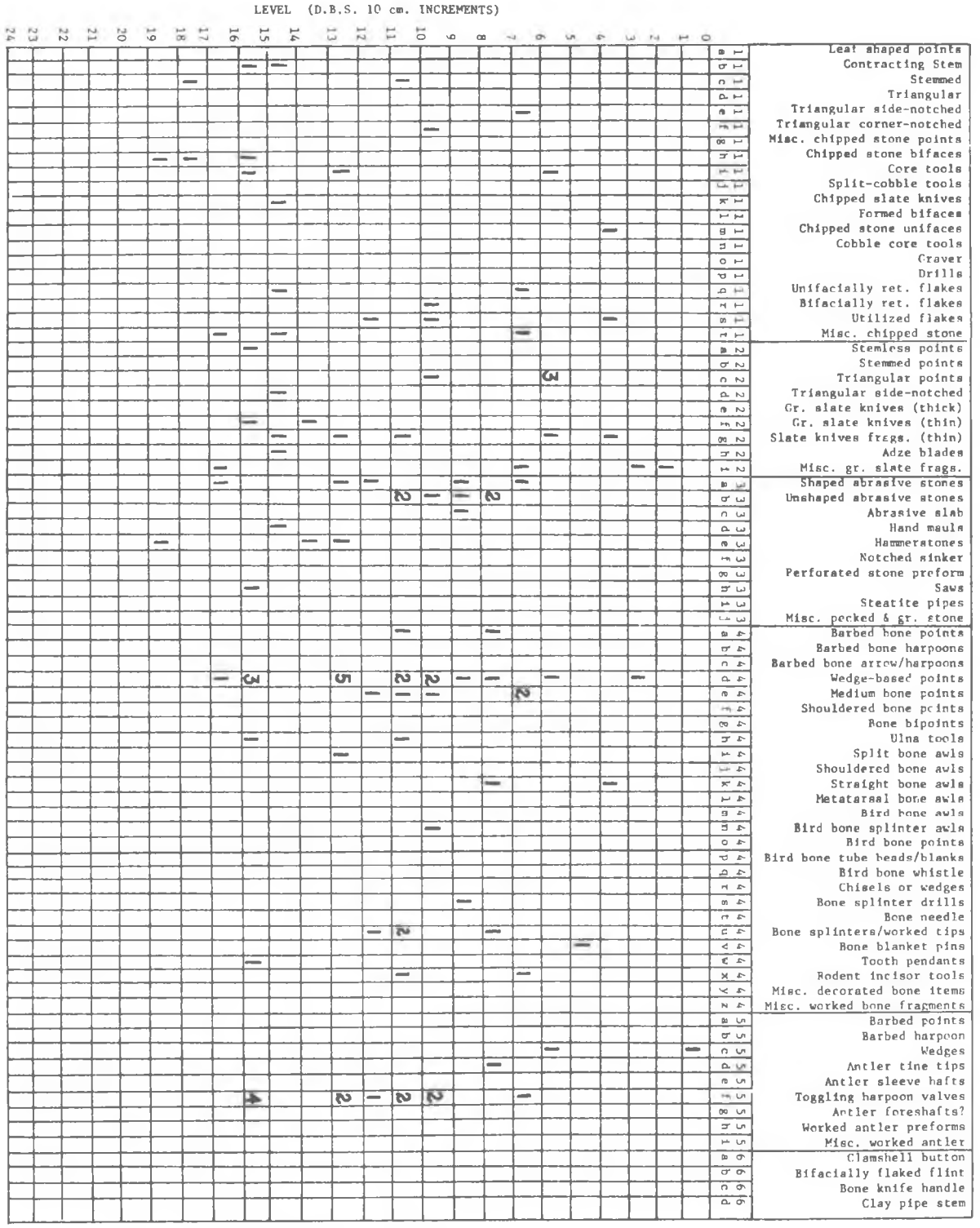
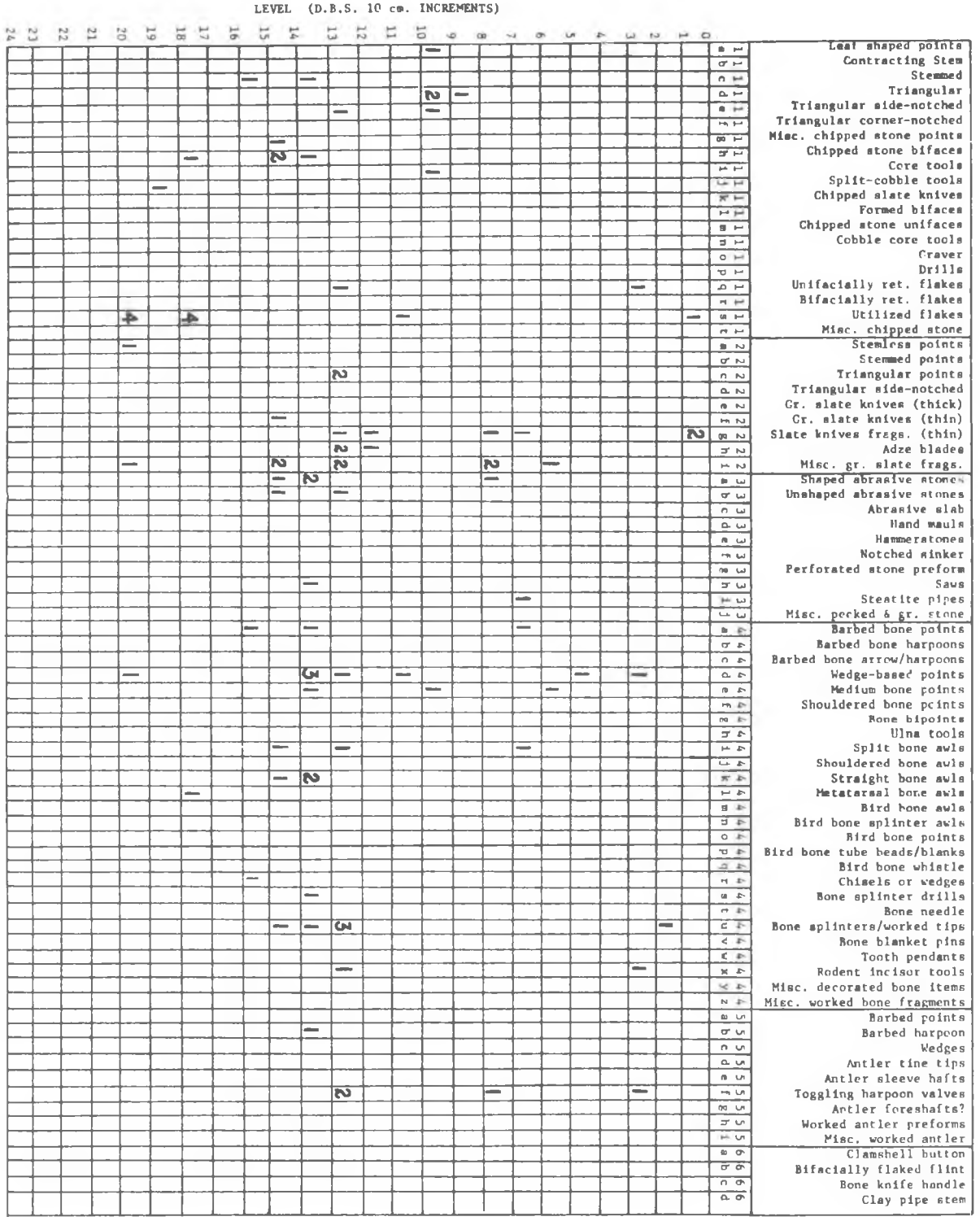
EXCAVATION UNIT 5
CHIPPED STONE INDUSTRY
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem


LEVEL (D.B.S. 10 cm. INCREMENTS)
EXCAVATION UNIT
CHIPPED STONE INDUSTRY
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem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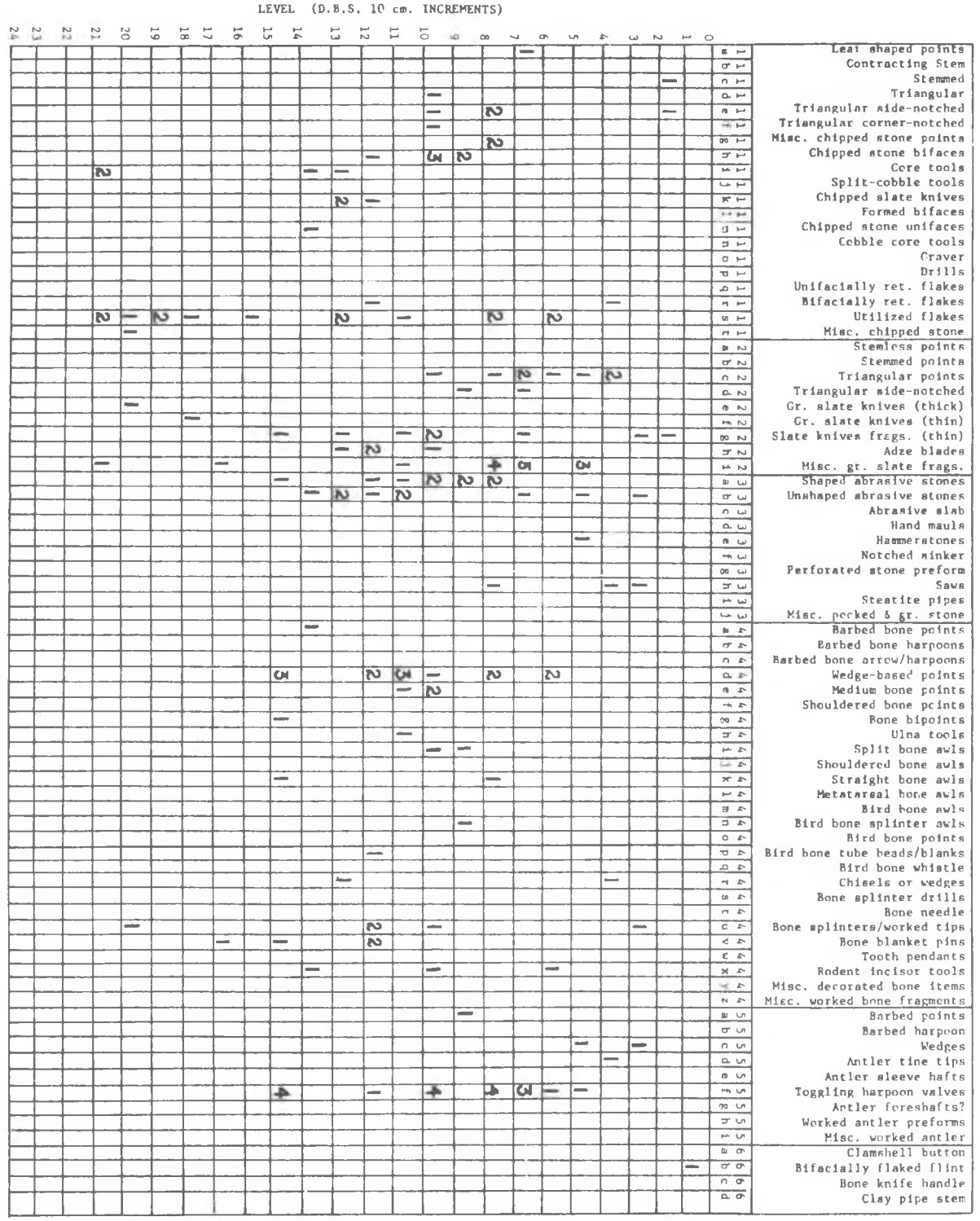
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem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EXCAVATION UNIT
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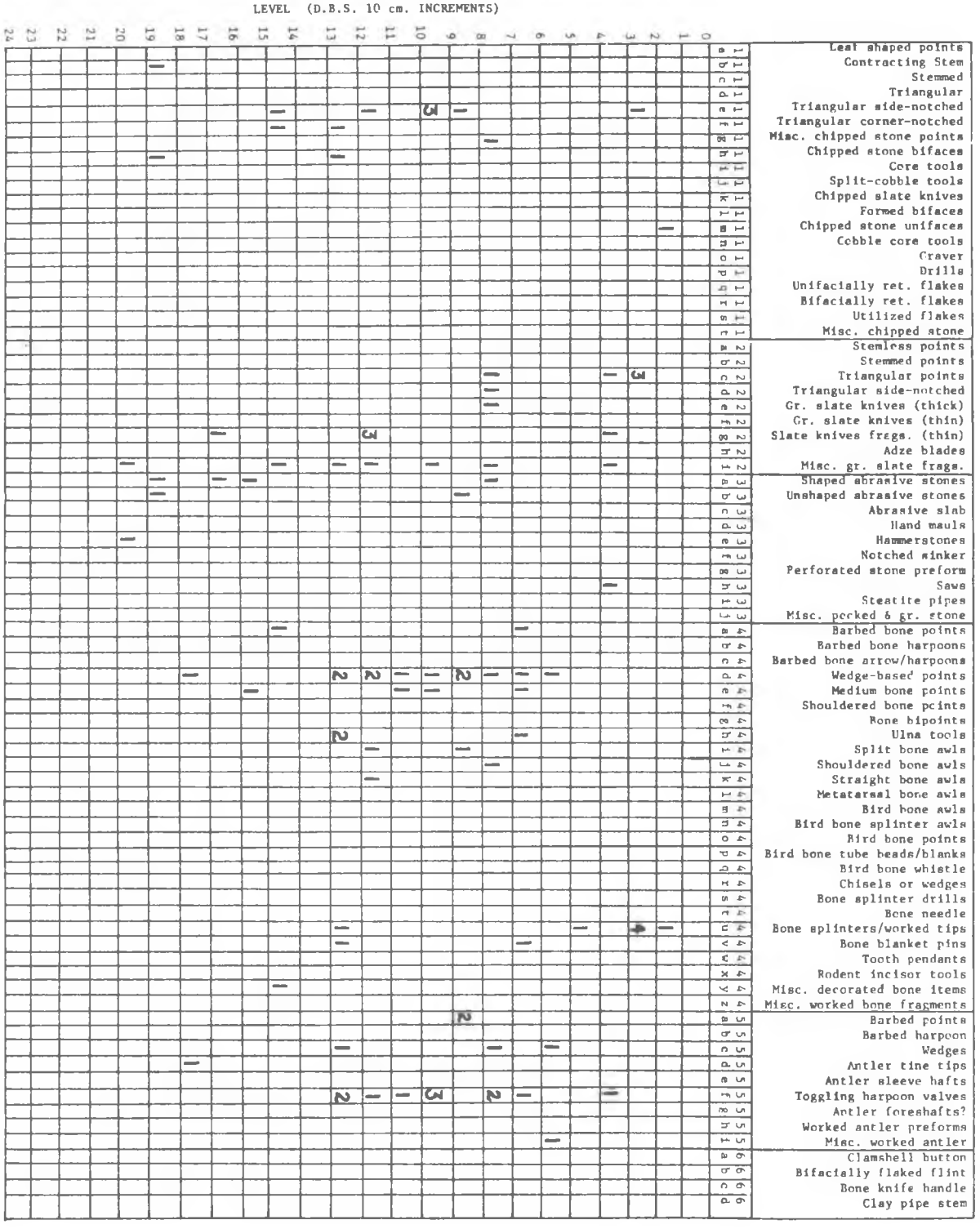
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
GROUND STONE INDUSTRY
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
PECKED & GROUND STONE INDUSTRY
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
BONE INDUSTRY
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
ANTLER INDUSTRY
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
TRADE GOODS
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem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EXCAVATION UNIT 6
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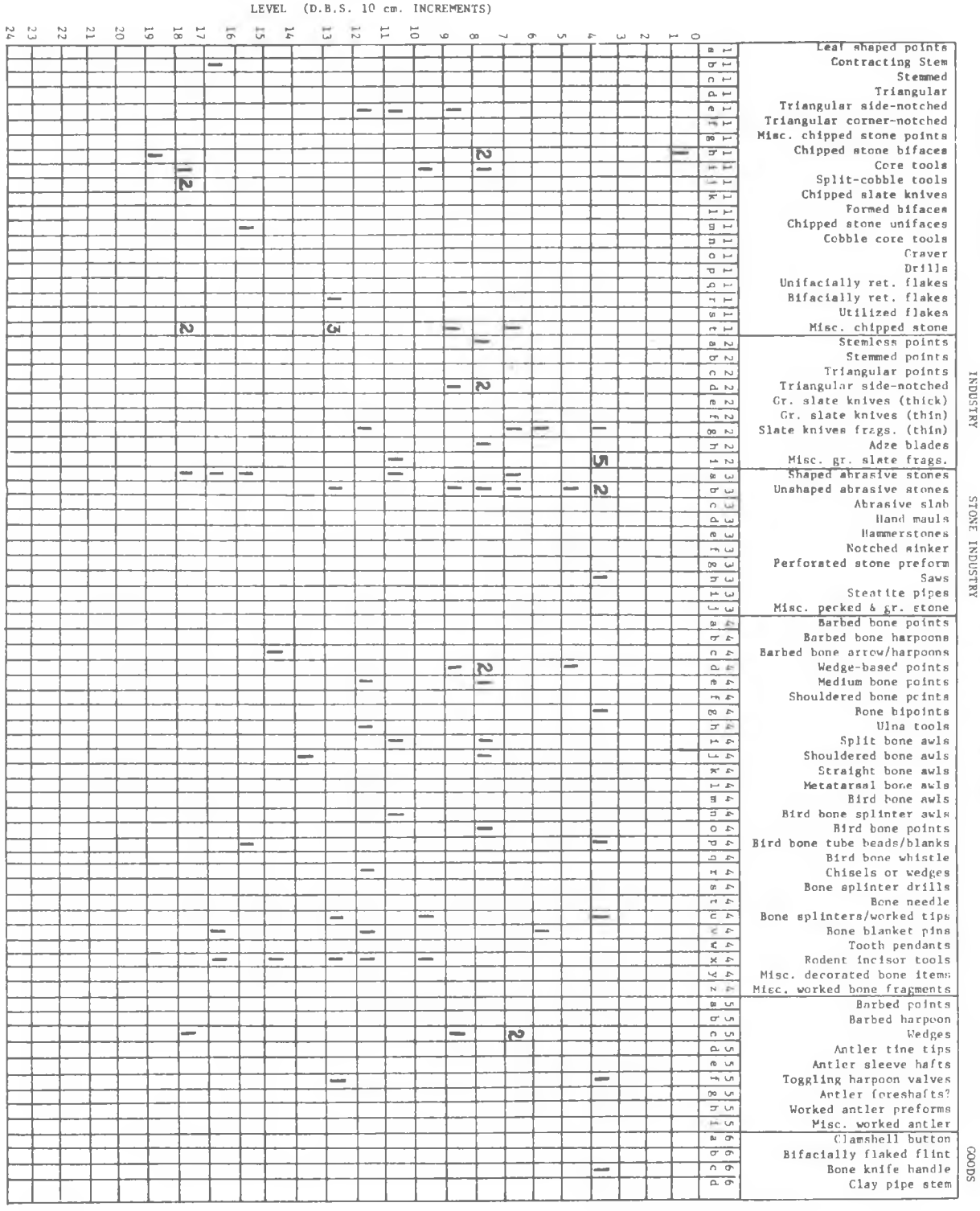
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem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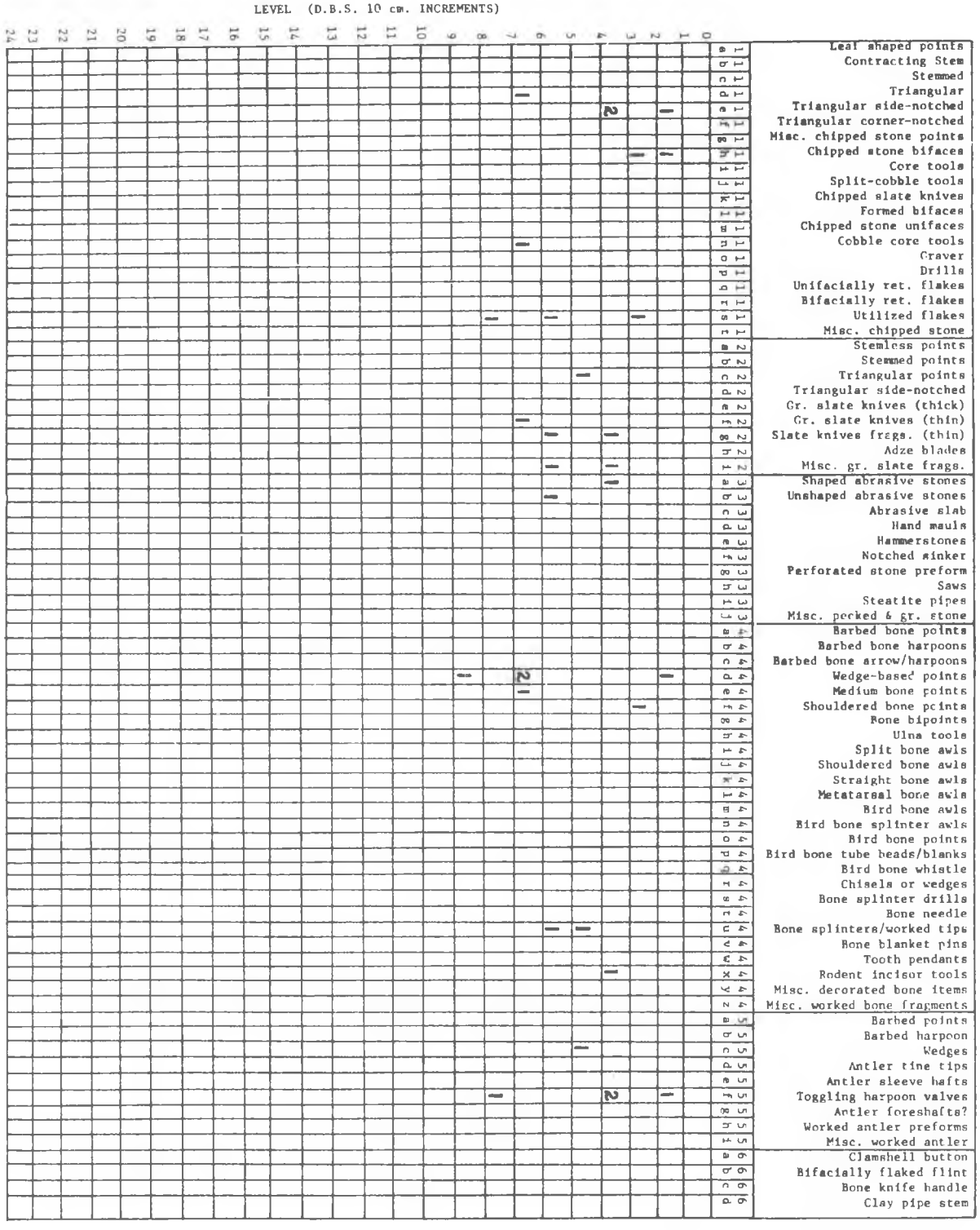
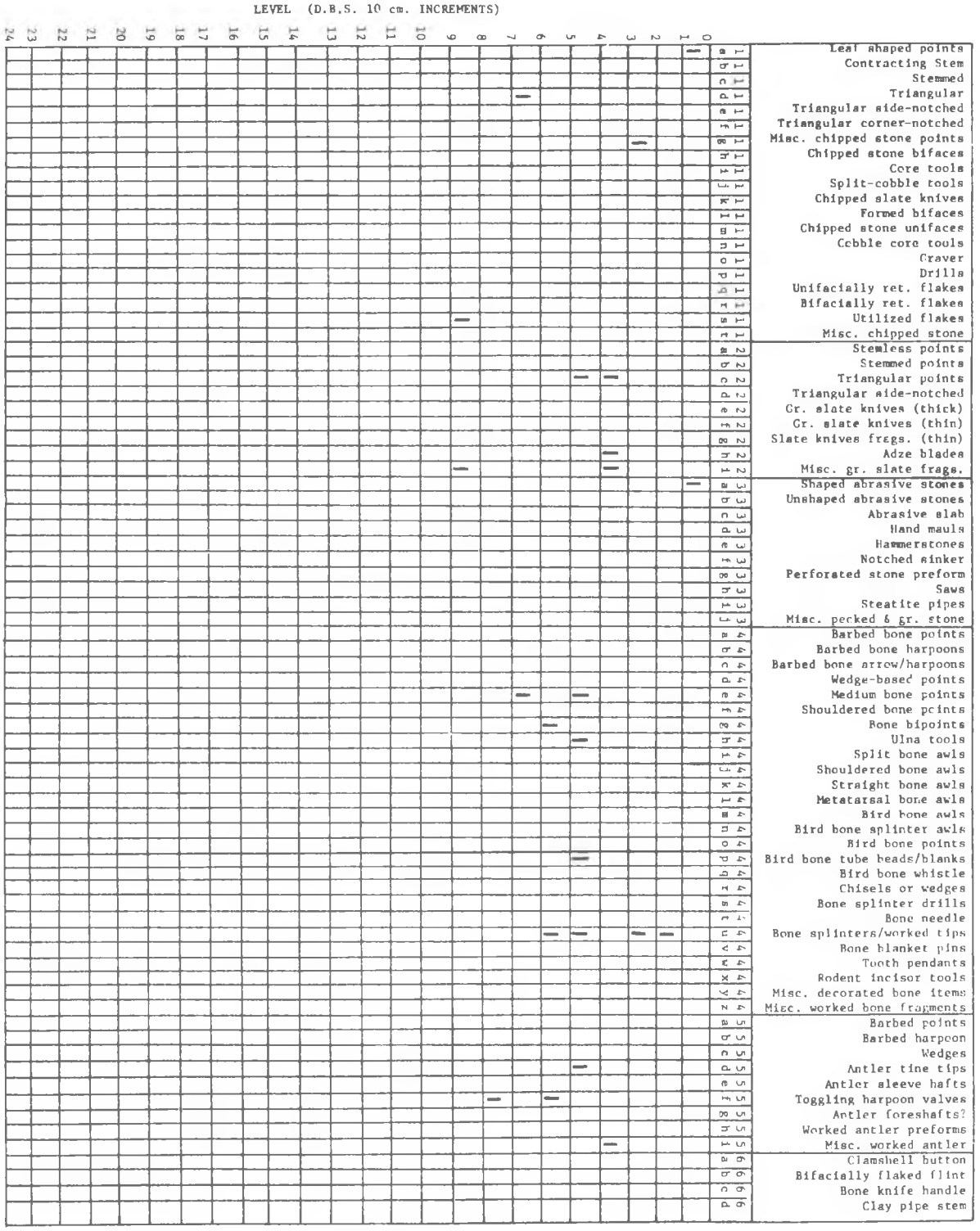
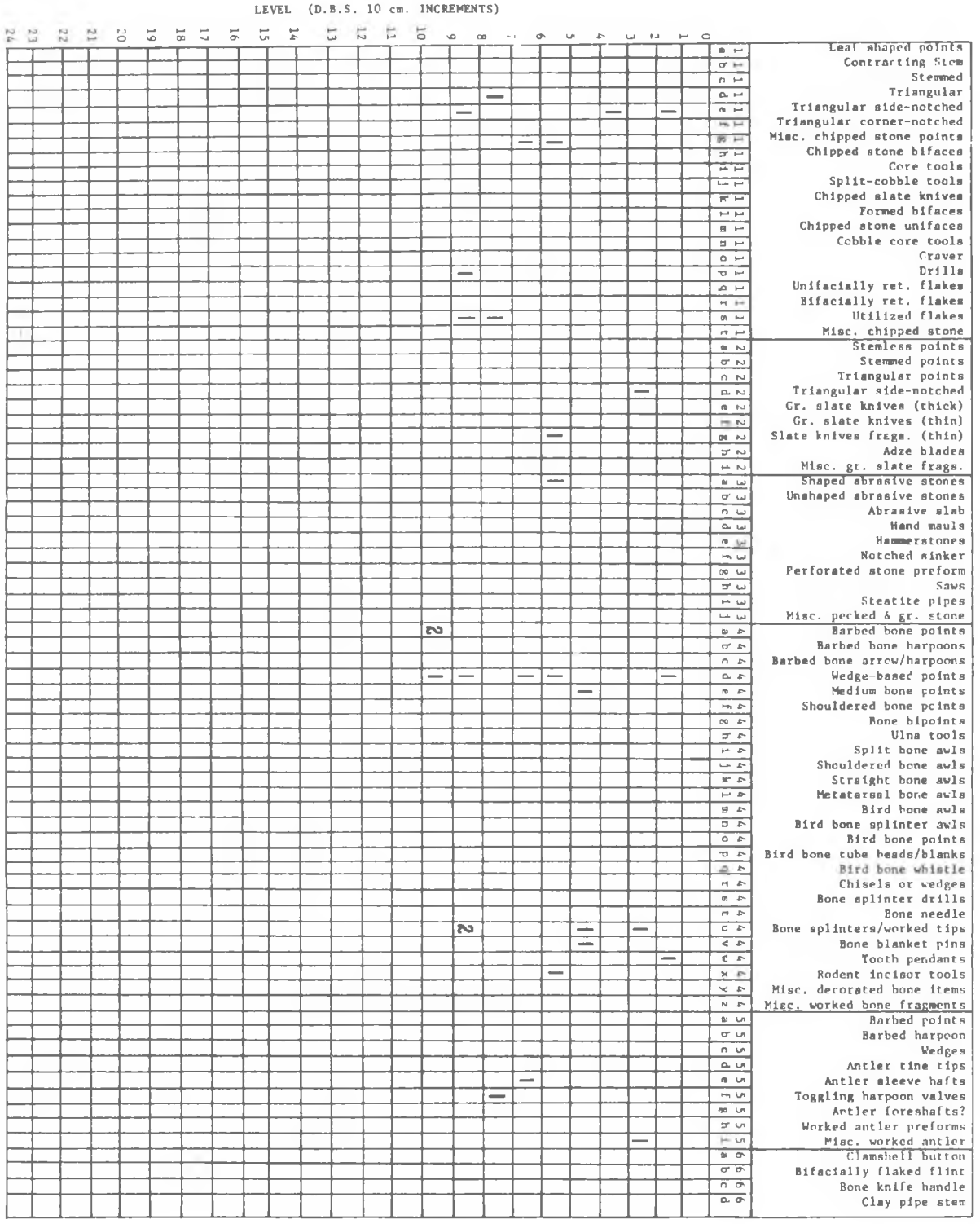
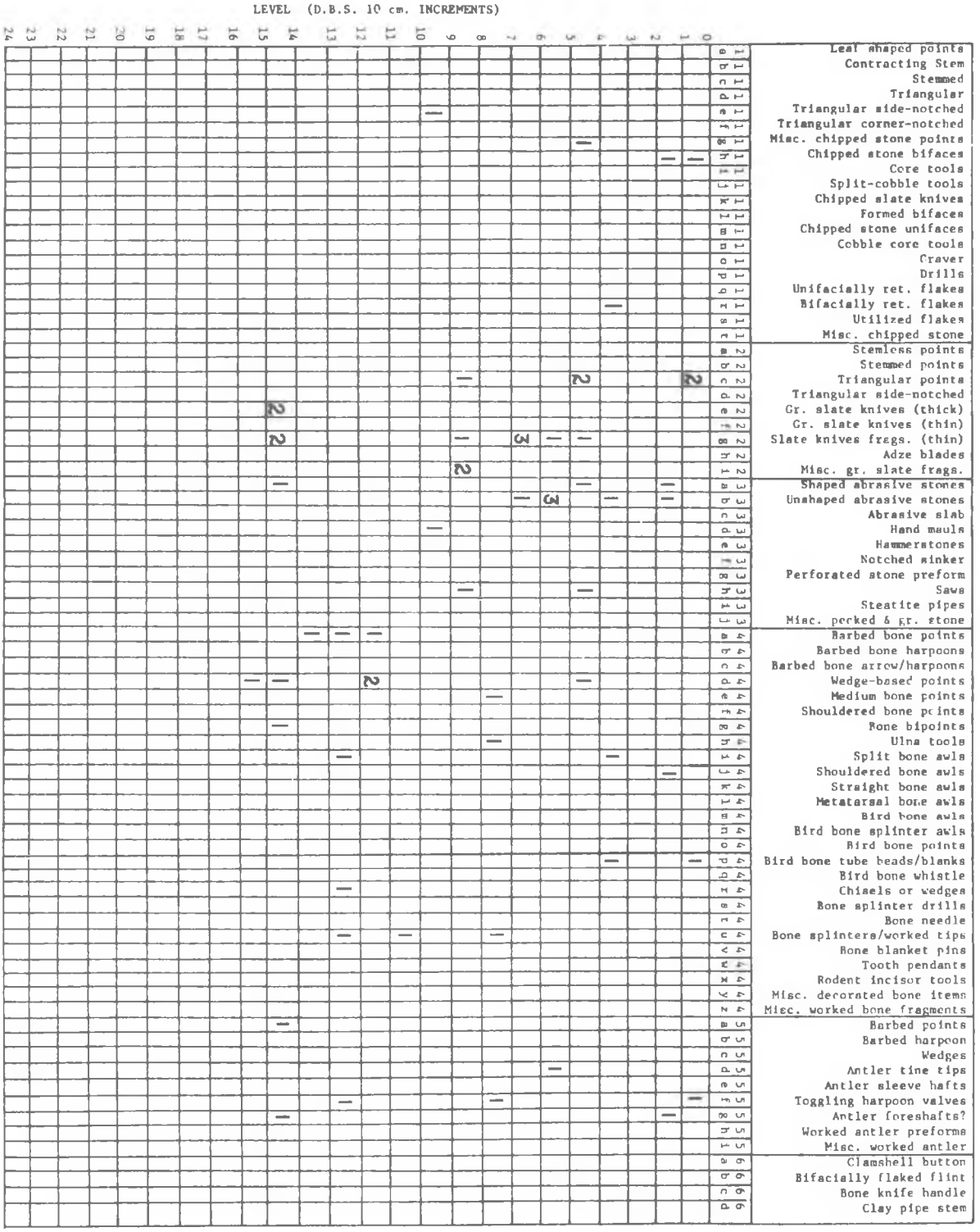
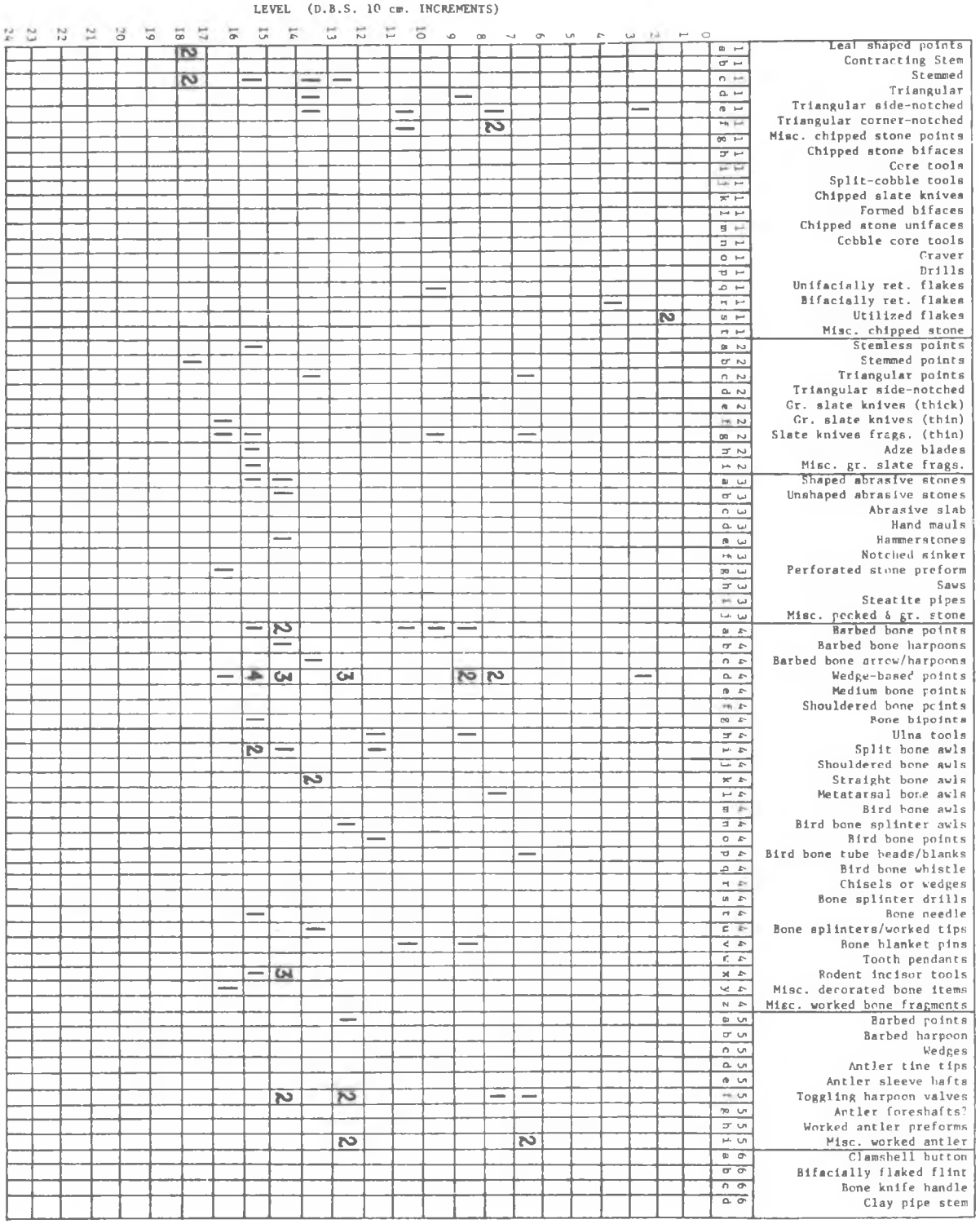
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
CHIPPED STONE INDUSTRY
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Craver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
GROUND STONE INDUSTRY
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
PECKED & GROUND STONE INDUSTRY
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
BONE INDUSTRY
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
ANTLER INDUSTRY
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
TRADE GOODS
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem
EXCAVATION UNIT 10


LEVEL (D.B.S. 10 cm. INCREMENTS)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
CHIPPED STONE INDUSTRY
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
GROUND STONE INDUSTRY
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
PECKED & GROUND STONE INDUSTRY
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
BONE INDUSTRY
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
ANTLER INDUSTRY
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
TRADE GOODS
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem
EXCAVATION UNIT "


LEVEL (D.B.S. 10 cm. INCREMENTS)
24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
1 a Leaf shaped points
1 b Contracting Stem
1 c Stemmed
1 d Triangular
1 e Triangular side-notched
1 f Triangular corner-notched
1 g Misc. chipped stone points
1 h Chipped stone bifaces
1 i Core tools
1 j Split-cobble tools
1 k Chipped slate knives
1 l Formed bifaces
1 m Chipped stone unifaces
1 n Cobble core tools
1 o Craver
1 p Drills
1 q Unifacially ret. flakes
1 r Bifacially ret. flakes
1 s Utilized flakes
1 t Misc. chipped stone
2 a Stemless points
2 b Stemmed points
2 c Triangular points
2 d Triangular side-notched
2 e Gr. slate knives (thick)
2 f Gr. slate knives (thin)
2 g Slate knives frags. (thin)
2 h Adze blades
2 i Misc. gr. slate frags.
3 a Shaped abrasive stones
3 b Unshaped abrasive stones
3 c Abrasive slab
3 d Hand mauls
3 e Hammerstones
3 f Notched sinker
3 g Perforated stone preform
3 h Saws
3 i Steatite pipes
3 j Misc. pecked & gr. stone
4 a Barbed bone points
4 b Barbed bone harpoons
4 c Barbed bone arrow/harpoons
4 d Wedge-based points
4 e Medium bone points
4 f Shouldered bone points
4 g Bone bipoints
4 h Ulna tools
4 i Split bone awls
4 j Shouldered bone awls
4 k Straight bone awls
4 l Metatarsal bone awls
4 m Bird bone awls
4 n Bird bone splinter awls
4 o Bird bone points
4 p Bird bone tube beads/blanks
4 q Bird bone whistle
4 r Chisels or wedges
4 s Bone splinter drills
4 t Bone needle
4 u Bone splinters/worked tips
4 v Bone blanket pins
4 w Tooth pendants
4 x Rodent incisor tools
4 y Misc. decorated bone items
4 z Misc. worked bone fragments
5 a Barbed points
5 b Barbed harpoon
5 c Wedges
5 d Antler tine tips
5 e Antler sleeve hafts
5 f Toggling harpoon valves
5 g Antler foreshafts?
5 h Worked antler preforms
5 i Misc. worked antler
6 a Clamshell button
6 b Bifacially flaked flint
6 c Bone knife handle
6 d Clay pipe stem
CHIPPED STONE INDUSTRY
GROUND STONE INDUSTRY
PECKED & GROUND STONE INDUSTRY
BONE INDUSTRY
ANTLER INDUSTRY
TRADE GOODS
EXCAVATION UNIT 12


LEVEL (D.B.S. 10 cm. INCREMENTS)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
1a Leaf shaped points
1b Contracting Stem
1c Stemmed
1d Triangular
1e Triangular side-notched
1f Triangular corner-notched
1g Misc. chipped stone points
1h Chipped stone bifaces
1i Core tools
1j Split-cobble tools
1k Chipped slate knives
1l Formed bifaces
1m Chipped stone unifaces
1n Cobble core tools
1o Graver
1p Drills
1q Unifacially ret. flakes
1r Bifacially ret. flakes
1s Utilized flakes
1t Misc. chipped stone
CHIPPED STONE INDUSTRY
2a Stemless points
2b Stemmed points
2c Triangular points
2d Triangular side-notched
2e Gr. slate knives (thick)
2f Gr. slate knives (thin)
2g Slate knives frags. (thin)
2h Adze blades
2i Misc. gr. slate frags.
GROUND STONE INDUSTRY
3a Shaped abrasive stones
3b Unshaped abrasive stones
3c Abrasive slab
3d Hand mauls
3e Hammerstones
3f Notched sinker
3g Perforated stone preform
3h Saws
3i Steatite pipes
3j Misc. pecked & gr. stone
PECKED & GROUND STONE INDUSTRY
4a Barbed bone points
4b Barbed bone harpoons
4c Barbed bone arrow/harpoons
4d Wedge-based points
4e Medium bone points
4f Shouldered bone points
4g Bone bipoints
4h Ulna tools
4i Split bone awls
4j Shouldered bone awls
4k Straight bone awls
4l Metatarsal bone awls
4m Bird bone awls
4n Bird bone splinter awls
4o Bird bone points
4p Bird bone tube heads/blanks
4q Bird bone whistle
4r Chisels or wedges
4s Bone splinter drills
4t Bone needle
4u Bone splinters/worked tips
4v Bone blanket pins
4w Tooth pendants
4x Rodent incisor tools
4y Misc. decorated bone items
4z Misc. worked bone fragments
BONE INDUSTRY
5a Barbed points
5b Barbed harpoon
5c Wedges
5d Antler tine tips
5e Antler sleeve hafts
5f Toggling harpoon valves
5g Antler foreshafts?
5h Worked antler preforms
5i Misc. worked antler
ANTLER INDUSTRY
6a Clamshell button
6b Bifacially flaked flint
6c Bone knife handle
6d Clay pipe stem
TRADE GOODS
EXCAVATION UNIT 15


LEVEL (D.B.S. 10 cm. INCREMENTS)
EXCAVATION UNIT 14
CHIPPED STONE INDUSTRY
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Craver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
GROUND STONE INDUSTRY
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
PECKED & GROUND STONE INDUSTRY
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
BONE INDUSTRY
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
ANTLER INDUSTRY
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
TRADE GOODS
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem


LEVEL (D.B.S. 10 cm. INCREMENTS)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
CHIPPED STONE INDUSTRY
Leaf shaped points
Contracting Stem
Stemmed
Triangular
Triangular side-notched
Triangular corner-notched
Misc. chipped stone points
Chipped stone bifaces
Core tools
Split-cobble tools
Chipped slate knives
Formed bifaces
Chipped stone unifaces
Cobble core tools
Graver
Drills
Unifacially ret. flakes
Bifacially ret. flakes
Utilized flakes
Misc. chipped stone
GROUND STONE INDUSTRY
Stemless points
Stemmed points
Triangular points
Triangular side-notched
Gr. slate knives (thick)
Gr. slate knives (thin)
Slate knives frags. (thin)
Adze blades
Misc. gr. slate frags.
PECKED & GROUND STONE INDUSTRY
Shaped abrasive stones
Unshaped abrasive stones
Abrasive slab
Hand mauls
Hammerstones
Notched sinker
Perforated stone preform
Saws
Steatite pipes
Misc. pecked & gr. stone
BONE INDUSTRY
Barbed bone points
Barbed bone harpoons
Barbed bone arrow/harpoons
Wedge-based points
Medium bone points
Shouldered bone points
Bone bipoints
Ulna tools
Split bone awls
Shouldered bone awls
Straight bone awls
Metatarsal bone awls
Bird bone awls
Bird bone splinter awls
Bird bone points
Bird bone tube beads/blanks
Bird bone whistle
Chisels or wedges
Bone splinter drills
Bone needle
Bone splinters/worked tips
Bone blanket pins
Tooth pendants
Rodent incisor tools
Misc. decorated bone items
Misc. worked bone fragments
ANTLER INDUSTRY
Barbed points
Barbed harpoon
Wedges
Antler tine tips
Antler sleeve hafts
Toggling harpoon valves
Antler foreshafts?
Worked antler preforms
Misc. worked antler
TRADE GOODS
Clamshell button
Bifacially flaked flint
Bone knife handle
Clay pipe stem
EXCAVATION UNIT 15

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