A DESCRIPTIVE ANALYSIS OF ARTIFACTS
RECOVERED IN 1981 FROM THE ST. MUNGO
CANNERY SITE (DgRr2)

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ACKNOWLEDGEMENTS

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To the VCC field school, who did most of the excavation, a special thanks is due for their conscientious effort.
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INTRODUCTION

This paper describes the artifacts recovered in undisturbed deposits by the 1981 test excavations at the St Mungo Cannery Site (DgRr2) in North Delta, B.C. This large shell midden is located in the Fraser Delta "on the south bank of the South Arm of the Fraser River...opposite Annacis Island and the north-eastern tip of Lulu Island" (Boehm 1973:8) (Fig.1). The site has a complex history of surface collection and excavation dating back at least to the early 1950's. The most extensive excavations to date are those conducted by G. Calvert in 1968 and 1969 (Boehm 1973, Calvert 1970).

Location

The following brief review of the location of this site is derived from Calvert's much more complete description (Boehm 1973:8-18) which should be consulted for further details. A more recent account of the general area is also available in the reports of investigation for the nearby Glenrose Cannery Site (Matson 1976c:2-7).

The site is located about 21 km from the present mouth of the Fraser River on a low terrace located at the base of the west side of Panorama Ridge, a "steep glacial outwash" (Matson 1976c:2). Originally the site was at least 300m X 75m but is now heavily disturbed by the railway, River Road, cannery buildings, residences, and a lumber yard (see Fig.2). In places it reaches 2m in depth although it is unclear how extensive the deep deposits were prior to disturbance. The site is bisected by a small stream that runs off Panorama Ridge. This stream is now entirely in culverts, some of which are visible on the Cannery property near the main building. It would seem to discharge under the cannery building which is raised on pilings above the Fraser River bank.

The southwest end of the site would, at one time, have bordered on or near Gulf of Georgia beaches. Calvert suggests that sea level fluctuations, climatic changes and delta growth have resulted in significant local habitat changes during the periods of occupation at the site. During the main occupation the site may have overlooked mud flats and/or marshy areas (Boehm 1973:14-18). Matson (1976c:15) presents enticing evidence of a local marine
Figure 1: Location of the St. Mungo Cannery and Glenrose Cannery Sites.
Figure 2: South West 1/2 of DgRr2 Showing Location of Previous Investigations.
bay with rocky foreshore prior to ca. 4300BP, followed by marsh/mudflat development. Until dikes were built much of the area west of Panorama Ridge was bog or marsh.

Ethnographically the site is located within the Kwantlem territory, a Halkomelem speaking group of Coast Salish Indians. Some of the upper deposits may be the result of a Coast Salish occupation, but the main body of the deposits are old enough that a direct ethnographic connection probably cannot be made. The better descriptions and summaries of Coast Salish culture are listed by Calvert (Boehm 1973:18) and may be consulted for detailed information.

Site History

The St. Mungo Cannery site has a long history of disturbance and excavation. The cannery has been the prime disturbance, beginning operation in 1900. At the turn of the century the midden was used as a Chinese market garden. Residential use of the site is quite recent, but extensive. The part of the site investigated in 1981 has a 1940's house with full basement built on it. The midden was decapitated and pushed over the river bank onto a lower terrace to create a flat area for house and garden. In this area the midden is crosscut by pipe lines of different sizes and depths (Fig.3). In addition the site has been cut by River Road and a railway. The most recent disturbance has been at the hands of 'collectors' in search of 'good' artifacts. This disturbance was so severe that the Heritage Conservation Branch found it necessary to cover an area of the site adjacent to the 1981 study area with plastic and sand. The study area itself is heavily pockmarked by these illicit excavations (Fig.3).

Archaeological investigations began with surface collections and test excavations during the 1950's. In 1968 and 1969 a large scale excavation (see Fig.2) was conducted by S.G. Calvert resulting in oft-cited reports (Boehm 1973, Calvert 1970). In 1980 the study area was shovel tested (Howe 1980) and a burial was removed from a water line next to River Road (Fig.2). 1981 saw the excavations discussed here, and large scale excavations are planned for the near future.
Culture History of the Site

The work of G. Calvert at St. Mungo showed the site to have an important place in the regional culture history. Calvert divided her material into three major periods - Component I being the oldest, III the youngest.

The bottom of Component I was dated to 4310 ± 110BP and 4240 ± 105BP. The middle of Component I dates to 3970 ± 105BP (Boehm 1973:12). The artifacts from lower levels of Component I were found to resemble the Fraser Canyon Eayem Phase of approximately the same age. They are characterized by "large cores, beaver incisor carving tools, shell cutting blades, boulder spall tools, needles, simple bone pendants, tooth pendants, brow bands, bone rings, worked ribs, bone 'fleshers', bilaterally barbed harpoon, thick chipped and ground slate, spindle-shaped incised bone charms(?), stemmed or single-shouldered spear or lance points, and possibly antler carving"(Calvert 1970:73). The upper levels of Component I grade into Component II. From these levels are found "'dagger-like' tools, bird bone beads, disc beads, unilaterally barbed tanged harpoon with lateral line guard,... very thin basalt scrapers, (and) small points"(Calvert 1970:73).

Stratigraphically Component I is characterized by "thick, finely stratified deposit of typical shell midden type with heavily concentrated dump areas and intermediate areas of dark humus and finely crushed shell"(Ibid:58). These 'living floors' have some hearths and extensive ash deposits.

The vertebrate remains indicate a consistent "summer and fall and/or spring occupancy"(Boehm 1973:84-85) of the lower layers of Component I. The upper layers of I and II, may have been occupied during all seasons(Ibid:85). A wide range of fauna are represented in all components with a few important relative changes between components. Dog, hair seal and perhaps beaver and comorant become increasingly important through time. Swan, geese and loons are more important in the lower levels, and the gulls peak in the middle of Component I. The frequency of salmon increases with time, while other fish decrease. The technology for harvesting salmon is apparently different in Component I than later components - possibly hooks were of greater importance. Slate knives, probably for fish processing, also increase through time(Boehm 1973:93-95). The invertebrate fauna are not yet studied.
No burials were recovered from Component I, and little discussion of features is available.

The lower levels of Component I have since been named the St. Mungo Phase (Matson 1976b:286) and included in the regional Charles Phase (Borden 1975:97). The middle component of the Glenrose Cannery site, referred to as the St. Mungo component, has very similar stratigraphy, artifacts, fauna, and seasonality. There was probably also a winter use of the Glenrose site. Several hearths, post moulds and living floors were evident. Burials were found only in the upper levels of the component. (Gose 1976; Ham 1976; Immamoto 1976; Matson 1976b,c,1981; Styles 1976).

Matson suggests the St. Mungo Phase possibly includes the Eayem and Mayne Phases and occurred from 4300 - 3300BP. He finds two commonly occurring objects unique to the phase - "decorated slate and bone pendants". Also characteristic is the absence of microblades, ground slate disc beads and thin ground slate knives (Matson 1976b:286). This concurs with Borden's Charles Phase which lumps Eayem, Maurer, St. Mungo I, Crescent Beach I, Glenrose II, and Mayne Phase deposits into a 'regional phase' existing between 5500 and 3000+ BP (Borden 1975:96,97).

The Mayne Phase has similar dates and materials. In defining the phase Carlson finds small bilaterally barbed harpoons "particularly diagnostic" and a much greater frequency of stemmed and shouldered chipped stone points (Carlson 1970:115).

At DgRr2 the Component II and III deposits described by Calvert have been tentatively assigned to Early Marpole and Whalen II or Protohistoric Coast Salish occupations respectively. The upper layers of the first component may also be assignable to Marpole. (Calvert 1970:73,75).

Component II is a large pit excavated into Component I. The sandy fill of the pit ranges from black to orange and is from off site(Calvert 1970:58). It may have been an internment feature as several burials were probably associated with it (Ibid:59). The artifacts from the upper levels of Component I, and from Component II (see above) are indicative of Marpole Phase sites (Ibid:59,73). The date of 1120 ± 95 BP falls outside the range of Marpole dates(Burley 1980:Fig.7;Mitchell 1971a:17). Calvert noted the lack of "stone bowls and carvings,
the handmauls and large adzes so distinctively Marpole" (1970:73). The Marpole Phase has been described several times, most notably by Borden (cf 1968a:18-20;1970:99-107), Mitchell (1971a:52-56) and Burley (1980). Mitchell posits a direct and undramatic transition from the Marpole Culture Type to the Gulf of Georgia Culture Type (1971a:72). It may be that the Component II materials fall into this transitory era.

At Glenrose a Marpole component was recovered. It also lay directly on top of the St. Mungo deposits with a hiatus in occupation between. There, the Marpole Component is identified by the presence of ground slate knives, ground slate beads, celts and microblades (Matson 1976e:303,304). Statigraphically it is "a dark sandy loam layer with relatively little shell in it" (Matson 1976c:11). The mammal and shell fish remains are similar to earlier levels, but the avian fauna increases. Herring are found for the first time and eulachon and sticklebacks are suddenly not present. The indicated site seasonality changes to a fall-to-early spring pattern (Matson 1976e:304, 305; 1980:81,82).

Component III at St. Mungo seems to represent a short and quite recent occupation. Two dates are available - 490 ± 95BP and 800 ± 95BP. (Boehm 1973:12). Artifacts unique to this component at DgRr2 are "toggle harpoons, stone adze blades, and possibly pecked and ground stone implements other than hammerstones" (Calvert 1970:73). Artifacts shared with Marpole, but not lower deposits, are "large bone points, thin ground slate knives and blanket pins" (Ibid). In addition there is a thin disturbed layer of historic items. The stratigraphy is characterized as a "layer of ash...composed chiefly of multicoloured ash spreads, numerous fire-cracked rocks and a number of small, irregularly shaped hearths in a matrix of dark brown soil with finely crushed shell. Two large post moulds and a number of smaller stakes or post moulds are associated with these hearth areas" (Calvert1970:58).

At Glenrose there occurs a component considerably older than the St. Mungo component. This Old Cordilleran component has not been previously recovered from St. Mungo, but is discussed here as a point of comparison for the lower deposits recovered from the 1981 excavations at St. Mungo. The Old
Cordilleran from Glenrose has been placed in the 8500 to 5500BP time period. These early deposits fall within two stratigraphic units. The lowest is interpreted as a beach deposit, being composed of a "sandy deposit full of rounded cobbles and an occasional water-worn artifact" (Matson 1976c:9). On the profiles this is referred to as "bouldery grey sand with gravel" (Ibid: Fig. 1-4). The second stratigraphic unit of Old Cordilleran material is "a sandy matrix...sometimes oxidized to a red colour, sometimes charcoal stained" (Ibid:9) with fewer cobbles and the occasional patch of shell and small amounts of *Mytilus edulis* shell. These layers were capped by a few centimetres of tan ash-clay (Ibid). Subsistence activities are seen as oriented towards a land mammal hunting pattern, with additional exploitation of seals, bay mussels and fish (Matson 1976e:297). Occupation seems to have been restricted to the early summer. Cobble tools and coarse basalt utilized flakes are dominant artifacts, with other cutting and scraping implements well represented (Ibid: 298; 1976b: Table 17-1). Large bifaces occur regularly, along with a few bone awls, antler beam wedges, and a fixed antler unilaterally barbed point. Some abrasive stones also occur. Some large pits and a possible hearth are evident in the profiles (Matson 1976c: Figs. 1-4, 1-7).

In summary, the known culture history of DgRr2 starts about 4300 years ago and continues sporadically to historic times. If the site area was accessible it may have been used discontinuously for 8500 years because it is so close (ca 500m) to the Glenrose Cannery Site.

**METHODS**

**Excavation**

In May and June of 1981 excavations were conducted at DgRr2 under the direction of David Archer with the author as assistant, both then employed by the Heritage Conservation Branch. The main body of excavation was done by Vancouver City College Field School students, instructed by Diana French. Additional help came from another HCB employee Mike Rousseau, from a Simon Fraser University B.C. Studies course instructed by Robert Wilson and from assorted volunteers. Excavations were located at the very SW end of the site on the bridge right of way for the Annacis Island Crossing Highway Project (Fig. #3).
Figure 3: Location of 1981 Excavations at DgRr2.
"The principal aim of the field work was to assess the condition of cultural deposits" (Archer & Mackie 1981:2) within the right of way. Therefore, the first objective was to "identify the extent of disturbance in this area of the site" (Ibid). Since an attempt "to provide a basis for evaluating the worth of the cultural deposits" (Ibid) was only a secondary consideration, the nature of data recovery was necessarily limited, as thus was the scope of this report.

The study area was sampled using eleven 1X1m excavation units located on or near the intersects of a 10m grid. Originally the grid was located to ensure maximum and representative coverage of the right of way. Locations off the grid intersects were chosen to avoid obstacles or obviously disturbed areas. The excavation unit 'numbers' used in this paper are their grid coordinates.

Of the eleven excavation units, eight reached sterile basal deposits. The remaining three units had excavated depths of 2 to 3m, 1m of which were undisturbed, being located under a thick layer of bulldozed midden. These units were not finished due to the constraints of time and safety. Disturbance was heavy in the remaining excavation units. All have had substantial portions of the upper deposits removed to make way for house and garden. Two units fell almost directly over a sewer line rendering the contents of one (N24-25, E25-26) unusable in this study, and the contents of the other (N14-15, E24-25) only partially useful. One half of N24-25, E14-15 also cut through a pipe disturbance.

"Vertical control during excavation was maintained by reference to a main datum plane...assigned an arbitrary elevation of 10.00m above sea level.

"The units were excavated in arbitrary 10cm levels using trowels and shovels; soil removed was dry-screened through ½-inch mesh. All artifacts, detritus, and vertebrate faunal remains were saved - shellfish remains were not" (Archer & Mackie 1981:4). No radiocarbon samples were collected. All non-artifacts were bagged together by level. Major stratigraphic divisions were recorded, and excavated materials were usually separated stratigraphically within the levels.

"The field observations were recorded on standard forms provided by the B.C. Provincial Museum. For two of the excavation
units - N(24-25)E(25-26) and N(34-35)E(4-5) - normal controlled techniques were abandoned part way through the excavation. Since both showed signs of extensive disturbance, the deposits were simply shovelled down to an undisturbed level or to sterile subsoil."(Ibid). Excavated materials were washed and labelled (if necessary) during the course of the excavation.

**Analysis**

The purpose of this study is to describe the artifacts recovered in 1981 from undisturbed deposits with reference to the previous excavations at the St. Mungo Cannery Site. The Glenrose Cannery Site (DgRr6) is also extensively referred to because it is geographically and temporally very similar to DgRr2, and, as it is more completely reported, it serves as a better reference to the local prehistory.

The first step in analysis was to separate the disturbed from undisturbed deposits. Disturbance is defined as any deposit visibly altered by recent (ca80yrs) historical activity. The disturbed areas were designated with reference to the profiles and their stratigraphic descriptions and the excavation level notes. If historic artifacts were found in level bags this was also considered.

All level bags from undisturbed levels were then searched for missed artifacts. Artifacts were included in the analysis if their elevation, layer designation, and/or arbitrary level number indicated an in situ recovery.

The artifacts were laid out relative to their major stratigraphic breaks and elevation. This layout revealed some vertical and horizontal variation, which led to the re-examination of the profiles for associated variation. The observed stratigraphic variations are the diagnostic criteria for defining the assemblages.

Assemblages, as used here, are stratigraphic zones (and their contents) that share a number of sedimentological characteristics that may reflect differences in cultural activity and/or post depositional factors. The cultural differences may be attributed to use by different 'cultures', or to different uses by the same 'culture'. Each assemblage is defined below in the results section.

Artifacts were assigned to assemblages on the basis of their stratigraphic location determined through the artifact and level
records in conjunction with profile drawings. If classification by assemblage was very difficult and due to aboriginal disturbance of the strata the bottom of the assemblage was lowered to a level at which the separation was distinct enough to use. In one case (N24-25, E14-15)(Fig.6) the lowest assemblage was not distinct enough to separate the two in the field notes so all artifacts were assigned to the upper assemblage. Although these decisions occasionally result in arbitrary mixing the process does duplicate the aboriginal mixing which, in some units, is a very important fact. It also reduces the mixing of a higher assemblage with a lower one.

The artifacts are assigned to classes that follow the traditions set for the southern coast of B.C. These are combined functional and descriptive classes, categorized by raw material and manufacturing technology. The emphasis is towards non-functional descriptions. Calvert(1970;Boehm1973) was followed for some classes, Mitchell's publications were used extensively and Matson's (1976a) descriptions were followed wherever this was possible. Some artifacts are previously undescribed, these are assigned to new classes that conform to existing standards. It is felt that the most important comparisons are to be made with the Glenrose materials, so the general classification scheme and its order are used here. Some departures were made in order to facilitate comparisons with other work in the area. Perhaps the most important differences are that artifact classes are described separately for each assemblage, and that several variables are more explicitly defined (ie:steepness of edge angle). It should be obvious that these departures are, in part, a privilege associated with relatively small collections.

RESULTS

Introduction

Assemblages are described in this section. Included in each description is a brief discussion of assemblage stratigraphy, spatial location, features, burials, and faunal remains. Artifacts are fully described.

Measurement of length, width and thickness was made with dial calipers accurate to .01cm. Lengths greater than 13.3 were measured with a ruler. Artifacts were weighed on an electronic balance accurate to .01gm. Edge angle is determined with a goniometer useful only for angles greater than 20°, and probably ±5° accurate,
depending on the item. Description of artifact material is
general. The rock types fit into fairly broad classes. Some of
the few bone artifacts identifiable to species were identified.
All artifacts were examined, at various magnifications, under a
stereoscopic dissecting microscope.

Unless otherwise stated, the following rules, modified from
Haggarty and Sendey (1976:19, 21), are used:

a - The term fragment refers to any object or class
of objects incomplete in any of the
measurement dimensions - length, width, or thickness.
b - length is the maximum dimension
c - width is the maximum dimension perpendicular to
the length.
d - thickness is the maximum dimension at right angles
to both the length and width measurements.
e - The mean, standard deviation and interquartile
ranges are computed only for those dimensions of
artifacts with a frequency of five or more.**
f - The use of parentheses () indicates an incomplete
dimension; the order of dimensions recorded is
length, width, thickness, weight, edge angle.
g - The above dimensions are recorded in centimeters,
weight in grams, edge angle in degrees.
h - Functional terminology was not used in either the
description of an object or an artifact class
unless a specific function could be inferred with
a high degree of confidence.

Features visible in the stratigraphy are discussed. Few
features were recognized during excavation and these received
minimal attention at that time. A conservative identification of
features was made on the profile drawings. These are classified
within assemblages by excavation unit. The amount (m²) of
stratigraphy examined is provided to allow for relative comparisons.
These 'definitions' apply to the feature discussions:

**interquartile range was calculated for frequencies of +5.
### TABLE I.

Features in Stratigraphic Drawings

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<th>Unit Number</th>
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**Assemblage Totals**
- I: 7.1, 3(1), (1), 13, 4, 20(2)
- II: 19.8, 16, 1, 71, 9, 97
- III: 2.6, -,-, 5(1), 1(1), 6(2)

**Site Total**
- 29.5, 19(1), 1(1), 89(1), 14(1), 123(4)

(1) - probable features
Assemblage I rests on sterile fine sands and silts that are mottled with stain – probably oxidation. These sterile deposits are generally light brownish grey (2.5Y 6/2) with the stained areas a strong brown (7.5YR5/8). In one square these basal sediments were shovelled out and partly screened down 75cm from the bottom of Assemblage I. This excavation revealed no further cultural materials, indeed almost no pebbles or small granules were noticed. These sediments did coarsen at the bottom to a well sorted medium sand laminated with finer sands.

Assemblage I is characterized by dark brown to yellowish sands mixed with pebbles, cobbles and some boulders. The main criterion for separating these deposits from Assemblage II was the absence of shell. The very bottom cultural deposits have no shell, relatively little organic staining – a few flecks of charcoal and some darkening of the sands – and poor preservation of bone. (see Fig. 4). If a similar deposit overlay this one that contained even a few scattered fragments of shell it would be included in Assemblage II. For many squares this decision seemed wrong and it is likely that a less arbitrary division might substantially increase the size of Assemblage I deposits and collections. There are some obvious parallels between these deposits and the Old Cordilleran deposits from Glenrose. This type of sediment is not reported by Calvert whose basal deposits appear to be at a higher elevation. Using Figure 2 contours we can assume a 20 foot surface elevation for Calvert's excavations, and roughly 14.5 feet for the 1981 "10.00m" datum. This would place Calvert's basal deposits at an elevation of circa 14 feet, and the 1981 basal deposits between 8 and 10 feet. This may help explain the difference.

Assemblage I deposits are found in eight units. Due to disturbance, six excavation units have artifacts included in the assemblage: N4-5, E4-5; N14-15, E17-18; N4-5, E14-15; N14-15, E24-25; N14-15, E3-4; N24-25, E30-31. Twenty features are noticeable in the profile drawings of this assemblage. They occur at a density of 2.8/m² and seem to include all types (Table I). The large pits sometimes have large cobbles and boulders in them. 15% are large pits, 65% are posts/small pits and 20% are stakes. There is one probable hearth. During excavation
Figure 4: Profile of West and North Walls, N4-5, E14-15
Figure 5: Profile of West Wall, N34-35, E4-5.
Figure 6: Profile of South and West Walls, N24-25, E14-15.
small post(?) features were quite common. These are highly visible where they protrude into the sterile sands.

No burials were recovered, and very few faunal remains. A general impression of the fauna, gained while searching the level bags for artifacts, is that there is almost no mammal, no large bones at all, and mostly fish vertebra.

**Artifact Descriptions**

**Unifacially Retouched Flakes**

There are six amorphous flakes with unifacial retouch on one or more edges in this assemblage. They are of variable size, material and edge angle. For the sake of comparison, these tools are described within the classes developed for unifacially retouched flakes in Assemblage II.

**Medium Unifacially Retouched Narrow Angle Flakes**

Flakes in this class have edge angles no greater than 45° and weigh between 25 and 60gms. The two specimens in this class are different in nearly every other way. The heavier flake is of a coarse grained black basalt without a patina and with cortex remaining. It has very few irregular flakes, one of which is deep and gives the impression of a notch. The flaking is on a concave edge and could be just as easily utilization as intention.

The smaller flake is made of a fine grained brown basalt or chert. It has a light patina and no cortex. The retouch occurs on the convex edges around 3/4 of the perimeter and is regular although widely spaced thus creating a ragged sharp edge. The edge may exhibit some use-wear rounding. It is heavily weathered as is demonstrated by the poor fit of the pieces of this artifact(Fig 7d). This artifact might be considered 'denticulate' by Matson (1976a:122) and fits within his medium size class(Ibid:118). The larger flake would fit Matson's large size class(Ibid:117). 7.01 x 5.47 x 1.64cm x 59.20gm x 30°; 5.94 x 4.90 x 1.34cm x 42.89gm x 40°.

**Small Unifacially Retouched Narrow Angle Flakes**

This class is defined as those flakes with unifacial retouch that are no heavier than 24.99 grams and have retouched edge angles of 45° or less. The one member of this class is made of a heavily patinated basalt flake with one face made of cortex. It has a convex edge with light regular retouch that is rounded and polished - probably from wear.
This flake would probably fall into Matso's 'small' class of retouched flakes (1976a:118). 4.47 x 2.66 x 1.33cm x 10.32gm x 36°.

**Large Unifacially Retouched Steep Angle Flakes**

This class has edge angles greater than 45° and weigh more than 60gm. The one member is rather enigmatic. It is made of a slate-like material and may perhaps be a core fragment or a piece of split pebble tool. Its edges are somewhat battered giving it a crude retouch on a convex edge. It has cortex on two faces and shows no signs of wear. There is a light patina on all surfaces. Matson might include this in his 'heavy duty' class (1976a:122). otherwise it falls into his 'large' classification (Ibid:117). 8.56 x 6.40 x 3.14cm x 144.89gm x 73°.

**Medium Unifacially Retouched Steep Angle Flakes**

These flakes have edge angles greater than 45° and weigh between 25 and 60 gm. The two items in this class are nearly equal in weight but have quite different forms. The lighter of the two is a shale-like material and quite thin. The other is of a coarse igneous rock that is a section out of a flat pebble - having cortex on both faces and one end. It may be a fragment of a pebble tool. Both these flakes are patinated, both have a few widely spaced retouch flakes creating an indented edge that might be termed 'denticulate' (Matson 1976a:122). The crude retouch perhaps makes the edge straightness irrelevant, however, the shale specimen could be considered straight, the other convex. Both these specimens are medium length as used at Glenrose (Ibid:117).

6.83 x 4.71 x 1.29cm x 38.37gm x 65°; 4.92 x 3.24 x 2.45cm x 38.82gm x 56°.

**Utilized Flakes**

Amorphous unmodified flakes that show use-wear microflaking on at least one edge. In this assemblage utilization occurs on concave, convex and straight edges - often more than one edge per item. All items are relatively large fine grained chert or basalt flakes. Two have a lot of cortex remaining. One flake apparently has an iron rich band in it that has oxidized into a crust in which are embedded some plant fibres. The largest flake has some cortex and is very thick - functionally it may be closer to the split pebble class.
The utilized flakes are discussed in more detail in Assemblage II. Pursuant to that discussion, two of these flakes are longer than 6cm and all are heavier than 10gm. Using the weight division these can all be classified as large utilized flakes. On the average they have a steeper edge angle than utilized flakes in other assemblages, they are larger and they are more consistently made of fine grained materials. All are patinated.

<table>
<thead>
<tr>
<th>All Utilized Flakes</th>
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<tbody>
<tr>
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</tr>
<tr>
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</tr>
<tr>
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<td>Width</td>
</tr>
<tr>
<td>Thickness</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Edge Angle</td>
</tr>
</tbody>
</table>

**Large Utilized Narrow Angle Flakes**

Three flakes with edge angles of 45° or less that weigh more than 10 grams. Two are very fine grained, one of medium grain (chert, basalt). All have microflaking variously occurring on a convex edge, an irregular edge and a concave edge. The shortest one is not patinated.

- 7.46 x 6.28 x 1.54cm x 71.13gm x 36°;
- 5.42 x 4.00 x 1.19cm x 23.80gm x 44°;
- 3.88 x 3.54 x 1.50cm x 18.37gm x 45°.

**Large Utilized Steep Angle Flakes**

Two flakes with edge angles greater than 45° that weigh more than 10gm. Both are fine grained, have some cortex remaining and microflaking. One utilized edge is convex, the other concave.

- 10.56 x 7.75 x 3.5cm x 325.31gm x 55°;
- 4.50 x 3.0 x 1.25cm x 17.77gm x 50°.

**Cortex Spall Tools**

These are large relatively thick flakes struck from the outside of cobbles with one cortical face. All have a convex, thin cutting edge and a thicker holding end. All are of granular igneous rock showing varying degrees of patination on the flaked surfaces. They all show possible utilization - both small flakes and rounding may occur on the thin edges. One has some battering along a thick edge - perhaps to dull the edge for holding. Cortex Spalls are also referred to as boulder spall tools at other sites. They are quite common at Glenrose in the Old Cordilleran Component, but less so in the St. Mungo Components at Glenrose (Matson 1976b: 290) and DgRr2 (Calvert 1970:66). Mitchell (1971a:104) finds these tools uncommon in Gulf of Georgia sites, although more have turned
Figure 7:  
a, b, c, e - Small Steep Angle Retouched Flakes;  
d - Medium Narrow Angle Retouched Flake;  
f - Medium Steep Angle Retouched Flake;  
g - Large Steep Angle Utilized Flake;  
h, l - Cortex Spall Tools;  
i, j - Pièces Esquillées;  
k - Unformed Core.  
d, h - Assemblage I;  
a, b, c, i, j, k, l - Assemblage II;  
e, f, g - Assemblage III.
up in later excavations (cf Haggarty & Sendey 1976:67; Murray 1980:148). Borden notes that these do not appear in the Canyon until the Eayem Phase (1975:81,82) although he recognizes "thick pebble spalls" first in the Mazama Phase (Ibid:70). Subsequent to Eayem they are quite numerous in the Canyon (cf Archer 1980: 244). Spall tools are illustrated in Fig. 7n.

<table>
<thead>
<tr>
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<th>S.D.</th>
<th>Range</th>
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<td>0.73</td>
<td>6.62</td>
</tr>
<tr>
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<td>5.76</td>
<td>0.83</td>
<td>4.93-7.16</td>
</tr>
<tr>
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<td>1.48</td>
<td>0.45</td>
<td>0.92-2.15</td>
</tr>
<tr>
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<td>48.45</td>
<td>35.10-159.70</td>
</tr>
<tr>
<td>Edge Angle</td>
<td>5</td>
<td>30</td>
<td>4.24</td>
<td>27-37</td>
</tr>
</tbody>
</table>

**Split Pebble Tool**

This cobble fragment has one split or flake face and one cortex face. It is split from a green coarse grained igneous cobble. The split face has coarse retouch along the cutting edge with localized secondary finer flaking towards one end. It is likely that the main working area is this pointed corner with fine retouch. The object has fairly heavy patination, and no obvious wear. This class is equivalent to Mitchell's class of the same (1971a:104). It is unclear how it would be classified at Glenrose - perhaps as a cortex-planed scraping plane (Matson 1976a:145). Although it seems more likely to be a cutting tool than a scraper. It is not evident whether such tools are previously known at St. Mungo. 11.0 x 10.22 x 4.46cm x 449.8gm x 30°.

**Unifacial Choppers**

Two pebbles with unifacial flaking on one side. These tools are so different from one another that they should be treated separately.

The small one is a quartzite pebble with two flakes, creating a short and fairly sharp cutting edge. The flaking occurs on a concave surface of the cortex. The opposite side is domed. There is one 'flaked' notch in a side perpendicular to the flaked edge which is probably natural and seems waterworn. 6.24 x 5.32 x 3.13cm x 144.9gm x 60°.

The large chopper is a heavily patinated basalt cobble with at least thirteen unifacial flake scars. On the cortex are glacial(?) striations. The flaked edge is quite narrow, especially so near the edge. Part of the angled face that leads to the cutting edge is cortex, suggesting a naturally angled face was taken advantage of in manufacture. There are no obvious signs of wear - the patina
Figure 8: a - Unifacial Chopper, Assemblage I; b, c - Bifacial Choppers, Assemblage II.
being too heavy to see microwear. There is some shovel retouch. This item would fall into Bordens (1968b:Fig31c) symmetrical converging class. It is similar to a Mayne Phase pebble from Helen Point (Carlson 1970:Fig.34k). Both these specimens fall within Mitchell's cobble-core tool class (1971a:106).

**Polished Pebbles**

Three small pebbles of varying shape with polish on one flattish face. The discreete nature of the polish would suggest they have been used. One specimen is nearly flat on one face and rounded on the other with rounded edges and a rounded square outline. The flat side has a high polish with some striations. The round surface is slightly polished with a few striations. The high polish does not extend up the sides. The polish may be additive as there seems to be foreign matter trapped within and below the polish surface. 4.35 x 4.20 x 2.25cm x 61.12gm.(Fig.9g).

The second example also has one flatter side with a higher grade of polish. This one is a subrounded pebble, roughly triangular in outline, with steep unifacial flaking onto the rounded side. The high points in the flake scar are highly polished (Fig.9a). These may have been finger grips. The flat side is highly polished on the high points of its somewhat pitted surface. This again could be a deposited polish. There is some polish on the rounded side. Both of these pebbles are of a very dense green stone and were found near each other. 3.76 x 3.56 x 1.40cm x 27.30gm.

The third pebble is split lengthways through the faces. It would have been the largest, probably oval in outline with one flattish side and one somewhat rounded. It has a small patch of polish and striations in the center of the flattish face. It has subsequently been split and flaked at one end. The worked edge is generally unifacial, but has a couple of small hinge fractures onto the opposite face suggestive of a battering type use. All the flaked edges are partially rounded. This flaking could be natural. The rock is chert-like. (5.20)x(3.37)x 2.64cm x 65.38gm.

A fourth elongated pebble has some deep striations on one side but no polish. Of a soft slate-like rock this item is probably naturally produced. 5.07 x 2.90 x 1.50cm x 31.42gm.

Similar objects are described from Montasue Harbour III and
Figure 9: a, g - Polished Pebbles; b - Incised & Ground Schist; c - Ground Slate Knife; d - Chipped & Ground Slate Object; e, f - Rodent Incisor Chisels; h - Incised & Shaped Sandstone; i - Chipped & Ground Celt; j - Mussel Shell Adze; k, l - Stone Disc Beads. a, g - Assemblage I; b, e, f, h, j, k, l - Assemblage II; c, d, i - Assemblage III.
are compared to some in the Cattle Point Maritime Phase (Mitchell 1971a:194). Ethnohistorically small pebbles were used by the Makah in basket making (D.Croes personal communication) which may be a possible use for these pebbles. These objects are difficult to see when dirty and when wet so they may often be missed during excavation.

ASSEMBLAGE II

Assemblage II has very diverse shell rich deposits. As mentioned there may be a fuzzy boundary between Assemblages I and II. However, some squares have a sharp boundary marked by a shell rich layer overlying the sands and pebbles of Assemblage I (cf Fig.4). Generally, Assemblage II is marked by alternating layers of shell(finely crushed); dark charcoal rich 'loam'; and ash rich layers. Often there are thick layers with shell, 'loam' and globs of yellowish clay and silts. In some cases these may be backdirt from aboriginal excavations into the lower deposits, in others they could be naturally deposited on the midden and then trampled in. This origin is suggested by a sterile horizon of olive clay (5Y5/3 - 2.5Y4/4) that occurs in seven of the eight units with Assemblage II in the profiles. (the exception is N14-15, E24-25). (see Figs.4,6). This clay sometimes occurs in association with a layer of silty fine sand. The clay is very sticky and is also found in a layer of balls coated with shell and other debris. These balls of clay probably result from the trampling of a clay layer into the midden. Given its wide spread distribution and texture, the most likely explanation for this clay is a flood deposit or perhaps slope wash. There may be only one or two brief events involved in the deposition of these layers. The arbitrary elevation ranges from 9.20m at N4-5,E14-15 to 8.55m at N24-25,E14-15. In four squares (N24-25,E30-31;N14-15,E17-18;N14-15,E3-4;N4-5,E4-5) it occurs at 9.00m. The importance of this layer is that it may mark a single point in the habitation of the site - a single surface of use. Unfortunately, the nature of this study precludes the examination of associations between this horizon and the cultural materials.
Assemblage II is located above Assemblage I deposits in all the same excavation units, with the addition of the highly disturbed N24-25, E14-15.

Features show a marked increase (Table I) to a density of 4.9/m² of stratigraphic drawing. Of the 97 features, 16.5% are large pits, 1% are hearths, 73.2% are posts/small pits and 9.3% are stakes. Deep features were also observed as shell rich concentrations within the Assemblage I deposits. These were difficult to see and thus record. The increase in feature density is probably related to a far greater intensity of activity at the site, as is also reflected in the increase of shell, fauna, artifacts, etc.

The number of faunal remains are hugely increased. The shell is mostly highly fragmented Mytilus edulis, with very few clams - all fragmented. Some barnacles were observed. In the level bags there seems to be an increase in the number of vertebrate remains through time, with a marked band containing a high density of bone - fish, birds and large mammals all well represented. This zone is about 10 - 30cm thick and occurs circa 30cm below the modern surface in those units East, West and South of the house. This correlates closely to a concentration of bone artifacts.

Human Remains are rare in these deposits with no in situ burials recovered. One burial was removed, probably from this assemblage, in 1980. The relevant notes have not been seen, but its location is plotted on Figure 2.

**Artifact Descriptions**

**Bifacial Knife**

This small symmetrical leaf shaped biface is made from a fine grained basalt blade-like flake. The margins are retouched with flake scars terminating near the edge, giving the edges a double bevelled form. Both faces are the flat smooth faces of the original flake. In longitudinal section this knife is curved and slightly twisted, reflecting the form of the original flake. The proximal end (of the original flake) is considerably thicker (0.40cm) than the distal end (0.12cm). The proximal end is plano-convex in cross section. At this end on the convex surface
the retouch scars from the two sides terminate into each other, thinning the very end somewhat. This is the only place where flake scars from opposite edges intersect. The distal end has lighter retouch with almost none on the very tip. In cross section the tip is thin lenticular, although in general this end is like the medial section which is lozenge shaped.

Use-wear patterns indicate this is probably a cutting implement. At the thick proximal end on the retouched tip and edges there is rounding of the high points such that the outline is very regular and the edge dull. It is unclear whether this is intentional dulling or use-wear. The thin distal end has similar rounding on both edges that meets asymmetrically at the tip. In outline one rounded portion is more highly convex and intersects the other rounded edge off-center of the midline. This highly rounded edge has a good deal of microflaking, much of which is polished. This suggests that the distal end was the (principal?) working edge. This in turn suggests the proximal end may have been intentionally dulled to facilitate holding or hafting. The shape of the edge suggests a cutting action parallel to the edge.

The general form of this artifact is the same as Matson's small leaf shaped bifaces although considerably thinner (1976a:111); Calvert's Chipped Point I (Boehm 1973:120); and the Mayne Phase leaf shaped points (Carlson 1970:117,Fig.34m). Although this specimen is more carefully worked, it shares many technological characteristics with a chipped and ground point from Montague Harbour I (Mitchell 1971a:95-96, Fig.32d). (Fig. 10b).

5.77 x 1.46 x 0.40cm x 4.52gm x 24° at the tip.

5.77 x 1.46 x 0.40cm x 4.52gm x 24° at the tip.

Contracting Stem Bifaces

Two small bifaces with a leaf shaped outline that contract at the proximal end. The larger of the two is made on a blade-like flake of fine basalt. The retouch is not extensive, with very few flake scars invading the faces of the original flake. In this respect it is very similar to the bifacial knife described above. It has a similar provenience too - coming from the same excavation unit about 40cm lower than the knife. This specimen has one convex edge with a barely discernable shoulder - the overall effect being a continuously convex edge from tip to stem. The other side is straight to the shoulder from the tip, and straight to the stem from the shoulder. It is this side that gives the general impression of a contracting stem. The base is
Figure 10: a - Small Leaf Shaped Biface; b - Bifacial Knife; c,d,e,f - Contracting Stem Bifaces; g,h - Biface Fragments. b,c,d,g,h - Assemblage II, a,e, f - Assemblage III.
straight. In cross section this object is lozenge shaped. There is no sign of utilization. (Fig.10c).

The shorter specimen is also a fine grained basalt and it too is asymmetrical in outline. Both edges are convex in outline, one being more so than the other. The more convex side of the object is a thinner side of the original flake with a sharp edge that has a little retouch, except at the shoulder and tip. The other side is quite thick with heavy retouch. The stem is probably contracting by default, seemingly due to a flake scar on the original flake. The base is pointed convex. A small part of the tip is missing, but probably no more than 2mm. When excavated, this biface had a lot of red ochre on both faces. This did not seem to be a post depositional occurance. This specimen was not washed thoroughly so ochre remains in some low points on both faces. As noted by Matson (1976a:111) this class is common at Glenrose and is found also at Montague Harbour and in the Lochnore-Nesikep sites. Calvert refers to these as Chipped Point IV, although there may be overlap with her Chipped Point III and VI classes too (Boehm 1973:120,121). A similar 'diamond shaped stone point' is illustrated for the Mayne Phase (Carlson 1970: Fig.340). Figure 10d is this biface.

3.73 x 1.93 x 0.62cm x 3.99gm; 4.79 x 1.78 x 0.62cm x 5.43gm.

Biface Fragments

These six items are all the tips, bases and medial fragments of bifaces that are too incomplete to classify. Measurements are given only for those that show signs of use subsequent to breaking. The one medial section is from a large thin biface with lenticular cross section. Stratigraphically it is from an area where the Assemblage I strata are rife with aboriginal disturbance. This fact, combined with its heavy patination, make it likely to be originally from Assemblage I.

A large fine grained basalt tip and medial section has the broken end retouched rather crudely. It is likely that this specimen was re-used, perhaps as a knife, although it shows no use-wear. It is 5.4 x 3.4 x 0.82cm x 13.46 gm. (Fig. 10h).

A smaller tip fragment of very similar shape and material to that above shows some possible use under high magnification. One corner adjacent to the break has some polish and rounding on the retouched edge. The polish invades the broken edge and also extends up the retouched edge for ca. 1.0cm. This too may
have been used as a cutting implement subsequent to breaking. It is 2.61 x 2.80 x 0.55cm x 3.24gm.

Two other fragments are nearly whole, missing only their bases. Their original form is unclear, although they could probably be placed in Matson's (1976a:111) 'square based biface' class. They are similar to each other in size, shape, material, quality of workmanship and edge wear. Both are on crude flakes of fairly granular basalt. They have convex sides, with one more heavily retouched than the other. On one the 'tip' is actually the squared percussion point of the original flake from which the tool was made. Both edges of this tool are heavily rounded, including portions of the percussion point and some high points on the faces. The cross section is plano-convex and it is patinated. The longer specimen has a roughly plano-convex cross section and no patina. One edge, (the straighter of the two), has heavy rounding on the whole length. The opposite edge has some rounding nearer the tip than the base. The tip and faces show no wear. This rounding is probably use-wear, the most likely cause would be a cutting or sawing motion. (Fig.10g). (3.68) x 1.70 x 0.62cm x 4.00gm; 4.16 x 1.68 x 0.59cm x 3.54gm.

The remaining fragment is a thick, rather crudely made tip of fairly granular basalt. It has a triangular cross section.

Unifacially Retouched Flakes

Unifacially retouched flakes constitute the largest single class of artifacts in this collection (N=62). They include all amorphous flakes with unifacial flaking on one or more edges. With few exceptions the edges only are deliberately shaped, resulting in a wide variety of shapes and sizes.

Retouched flakes are common in other St. Mungo Components (Boehm 1973:119,120; Matson 1976b:289) and have been treated differently. Calvert initially subdivided her "scrapers" on the basis of thickness (1970:67,68), but subsequently lumped them all together (Boehm 1973:119,120). The Glenrose examples are subdivided into ten classes according to judgementally derived variations in size, edge angle, quality and nature of the retouch (Matson 1976a:117-123). In this collection a split based on size and edge angle is made. Retouched flakes from Glenrose are divided into three arbitrary size classes based on length of artifact. Here weight is used as a more representative indication of mass. The size divisions are arrived at by examining the frequency
Figure 11: Frequency of Weight for All Unifacially Retouched flakes, Assemblage II.
distribution (Fig. 11) which suggests that a tripartite division is warranted - the first break occurring at 25 grams, the second at 60 grams. The divisions only roughly correspond to the Glenrose system. Table II should assist in comparisons between the collections.

**TABLE II**
Comparison of Size Classes of Unifacially Retouched Flakes as used at DgRr2 (Weight & Edge Angle) and at DgRr6 (Length)

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<th>Number</th>
<th>Mean</th>
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<th>Range</th>
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The Glenrose collections are also arbitrarily divided into steep and narrow edge angles. The same distinction is used here, again based on the distribution (Fig. 12). Although the distribution is roughly normal, there is a break around 45° which approximates a similar break for utilized flakes. Therefore, 45° is used as the dividing point, resulting in 32 narrow angled specimens and 30 with steep angle retouch.

Since edge angle is probably tied to function, as is discussed below for utilized flakes, it is interesting to compare size and edge angle. Figure 13 illustrates quite clearly that edge angle and size are not inter-dependent. However, it is obvious that there are some tasks that require a heavy duty tool and others, although similar, that require the finesse of a small implement. No doubt many of these objects had a wide variety of functions that overlap the size and edge angle boundaries used here. Never the less, using the criteria of edge angle and size for class definition should reflect differences in the functions of many of these objects.
Figure 12: Frequency of Edge Angles for All Unifacially Retouched Flakes, Assemblage II.
Large Unifacially Retouched Narrow Angle Flakes

Unifacially retouched flakes that weigh more than 60.0 grams and have a narrow edge angle. These three specimens are made of shale, basalt and an igneous rock. The shale specimen has fine retouch and heavy rounding on a straight edge. The basalt specimen has irregular retouch on a convex edge. The third specimen has crude and irregular retouch on a convex edge. It may be a utilized flake. All three specimens have remnants of cortex. One of these falls within Matson's large category, the others are medium by his definition (1976a:17). 10.83 x 6.18 x 1.24cm x 99.69gm x 35°; 6.82 x 6.58 x 2.42cm x 82.58gm x 30°; 6.79 x 6.46 x 2.06cm x 89.94gm x 44°.

Medium Unifacially Retouched Narrow Angle Flakes

Unifacially retouched flakes with a narrow edge angle that weigh between 25.0 and 60.01 grams. Generally the retouch is cruder than in the previous class. No one material predominates in this class. A range of basalts are used in addition to slate, shale, quartzite and unidentified granitic and metamorphic rocks. Three specimens have straight edges and the remainder(five) have convex edges. Some members of this class have fine retouch resembling use-wear and others have used edges in addition to the retouched edges. One retouched edge has some microflaking and three others have rounding on the retouched edges. The quartzite flake is also a hammerstone fragment. This class overlaps Matson's medium and large criteria (1976a:117).

<table>
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<td>36</td>
<td>5.68</td>
<td>30-45</td>
<td>30-40</td>
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</table>

Small Unifacially Retouched Narrow Angle Flakes

Unifacially retouched flakes less than 25gm in weight and with a narrow edge angle (45 degrees or less). These are made from a variety of materials including slate, shale and fine grained basalt. Three have some cortex remaining.
Twelve specimens have straight edges, seven have convex edges, two have concave edges. Three may correspond to Matson's (1976a:119) 'well made' criterion and one may have his 'denticulate' type of retouch (Ibid:122) Several of these specimens overlap the utilized flake category - either they have a fine retouch that is attributable to use-wear, or else they have, in addition to the retouched areas, unretouched edges that show use-wear. One resembles cortex spall tools but is very small and perhaps firecracked. Only three have visible wear on the retouched edges - in all cases this is rounding of the high points. This class overlaps Matson's small and medium sizes for Glenrose (1976a:117,118).

<table>
<thead>
<tr>
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<td>32.52</td>
<td>5.61</td>
<td>20-42</td>
<td>28-38</td>
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</table>

Large Unifacially Retouched Steep Angle Flakes

Unifacially retouched flakes that weigh more than 60.0 grams and have a steep edge angle (greater than 45°). Granular igneous rocks account for three of this class and two are metamorphic. Three have cortex remaining and all have crude irregular retouch except the shale specimen which has a light regular retouch that may be, in part, use wear. Other edges of this item are utilized. All retouched edges are convex, none show rounding or microflaking. This class is subsumed within Matson's large and medium categories and may well overlap with his heavy duty steep angle retouched flakes (1976a:117,118,122). One specimen borders on being a split pebble.

<table>
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<td>63</td>
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Medium Unifacially Retouched Steep Angle Flakes

Unifacially retouched flakes with steep edge angles that weigh between 25.00 and 60.01 gm. Coarse grained materials dominate (seven) - including basalt, igneous, metamorphic and quartzite. One fine grained chert (?) was also used - this example is patinated. Remnants of cortex remain on four specimens.
Seven specimens have convex edges, one has a straight edge. One or two might be included in the utilized flake category. The retouched edges of two show rounding and one other shows microflaking. This class overlaps Matson's (1976a:117) large and medium classes.

<table>
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<tr>
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<td>9.58</td>
<td>50-75</td>
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Small Unifacially Retouched Steep Angle Flakes

Unifacially retouched flakes less than 25gm in weight and with an edge angle greater than 45°. Fine basalt or chert is an important material (eight), as is fairly granular basalt, also represented eight times. There also is one example of schist that is a waterworn fragment of an artifact. Several others appear to be appear to be fragments too - although some are used subsequent to breaking. Eleven specimens have straight edges, six have convex, two have both convex and concave and one is notched. This notched specimen and two straight edged flakes with notches in them may correspond to the 'notched steep-angled retouched flakes' from Glenrose (Matson 1976a:123). Five of these specimens (Fig.7a,b,c) fit Matson's 'well made' category (Ibid:119). One might be considered 'denticulate' (Ibid:122). Another specimen has had use as pièce esquillée although it is unclear if this was before or after use. Four items show use-wear on the retouched edges - two have microflaking; one is rounded; and one is highly polished. Two specimens have cortex in places. This collection overlaps the small and medium size classes from Glenrose (Ibid:117,118).
Pièces Ésquillées

These are usually exhausted bipolar cores. They are produced by bipolar percussion which results in at least two parallel edges that are heavily battered, and from which originates the bifacial flaking. They are generally rectangular in outline with small flake scars predominating. Previous work in the St. Mungo time period refers to these as 'stone wedges' (Boehm 1973:119; Matson 1976a:128) for use in the groove and splinter technique of wood, bone and antler working. Recent ethnological observations (Archer 1980:282-284) and experimental data (Flenniken 1980:86) suggest not only are these bipolar cores, but that they are not particularly suitable for use as wedges.

In this assemblage, three are very fine basalt, the remainder (twelve) are of a fairly granular basalt. There seems to be a size split - larger ones (Fig.7j) all have cortex remaining and are not as square as the smaller ones. The smaller ones (Fig.7i) have no cortex and are often as wide (distance between battered edges) as finger tips - suggesting they are exhausted since they could not be struck without damage to the fingers. There are differences in the length/width ratios as noted by Calvert (Boehm 1973:119) but these are probably insignificant - partly depending on the degree of battering, partly on the internal structure of the rock. None of these specimens show secondary modification or use. Width is here defined as the greatest distance between parallel striking platforms.

<table>
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<tr>
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<td>7.70</td>
<td>1.09-26.09</td>
<td>2.42-14.11</td>
<td>4,12</td>
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Bifacially Retouched Flakes

Flakes with one or more edges regularly bifacially retouched. One is a large slate flake with a bifacially retouched corner that has some rounding on high points of the edge. The point of percussion is cortex and the ventral edge of this cortex is worn - perhaps an indication that this is also a resharpening flake. However, it is more likely this edge was used after it was struck off - probably for scraping. The bifacially retouched portion was probably for cutting. The other flake is basalt and is
very likely a pièce œquilléée. It has one bifacially flaked edge and some fine battering on the opposite thick edge. However, this battering may be use-wear if this flake were used as a wedge or chisel. The retouched edge is somewhat battered. There is also some localized bifacial retouching on one corner. Similar objects to these have been recovered in other St. Mungo components (Boehm 1973:122; Matson 1976a:129).

3.96 x 3.71 x 1.39cm x 20.72gm x 35°; 6.18 x 4.90 x 0.94cm x 25.73gm x 52°

**Unformed Cores**

A variety of flaked fragments which have unprepared platforms. One of these is a large battered cobble that may be a pebble tool. The remainder (five) are similar in size but of different grades of basalt. One maybe of another type of igneous material. All objects in this class have some cortex remaining. On one the 'cortex' is a quite heavily patinated flaked surface of an older tool - probably the edge of a screper or chopper. It is not a resharpening flake. The more recent flake scars are easily distinguished as they are not patinated. Matson (1976a:131) uses this classification at Glenrose. They are different in form from these ones, and Calvert's cortex-backed cores from St. Mungo (Boehm1973:118) are also different than these. They all have some cortex.

<table>
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<tr>
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<tr>
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<td>339.78</td>
<td>40.40-877.70</td>
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**Utilized Flakes**

Amorphous flakes that have been used without prior modification resulting in abrasion and/or microflaking of the used edges. This class very likely contains artifacts of trampling and other unintentional factors. It also overlaps with the retouched flakes since it is difficult to distinguish intentional retouch from use-retouch. Coarse basalt is the predominant material although shale, quartzite, chert, and obsidian were also used.

In a recent review of ethnological and experimental archaeology sources Archer (1980:225,241) concludes that edge angle is an important variable in determining flake-tool function with the narrower angles reflecting a cutting use, the steeper a variety of heavier tasks such as "scraping, planing, whittling, and shredding"
This distinction is used at Glenrose but steepness of edge angle was determined by eye and was only applied to retouched flakes (Matson 1976a:117,131).

Matson split utilized flakes into two size classes by length (Ibid:133), however, Assemblage II has only one specimen within his large category (longer than 6cm). Archer (1980:230) also makes a size split - using 10gm as the boundary. If this criterion were applied to Assemblage II, eleven specimens would be considered large. There may be some justification for this break if one considers the distribution by weight as two different sized classes that overlap (Fig.15). Besides that, intuitively there seems little that the two ends of the distribution have in common when one has the objects in hand.

A more obvious break is evident in the distribution of edge angles (Fig.14). Narrow edge angle in this collection would seem to be 45° or less (N=28), and steep greater than 45° (N=7). A scatterplot of edge angle to weight (Fig.16) suggests that although the bigger tools tend to have steeper edge angles than the smaller ones, there is considerable overlap. Thus, on this collection, size may be a less critical variable than edge angle. There was little difference in edge damage between sizes. All showed microflaking, and the few examples with rounded edges fell in both classes. So, perhaps there is support for Matson's size classes. Most of the material is coarse grained, precluding an accurate determination of edge wear so the paucity of rounded edges may not necessarily affect one's interpretation of edge function.

Previous St. Mungo collections have few utilized flakes (Boehm 1973:51,118), but this can probably be largely attributed to differences in excavation and analysis procedure.

**Large Utilized Narrow Angle Flakes**

Those flakes weighing more than 10 grams with edge angles of 45° or less. These seven flakes are made from medium grained basalt (four), slate or shale, chert and quartzite (one of each). Six have microflaking, two have rounding of the edge. One has microflaking on a projecting end.

<table>
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<td>28.63</td>
<td>10.17</td>
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<tr>
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<td>34.29</td>
<td>8.84</td>
<td>25-45</td>
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</table>
Figure 14: Frequency of Edge Angles for All Utilized Flakes, Assemblage II.

Figure 15: Frequency of Weight for All Utilized Flakes, Assemblage II.
Small Utilized Narrow Angle Flakes

Included here are all flakes weighing 10.0gms or less with edge angles of 45° or less. There are twenty one flakes in this class, of which five are made of coarse grained material (basalt or quartzite); nine are fairly granular basalt, and seven are fine grained (basalt, chert, obsidian, chalcedony). Only one shows rounding, the remainder have microflaking. All are utilized on sides rather than corners or points.

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<td>3.00</td>
<td>0.12-8.43</td>
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<td>25.76*</td>
<td>7.54*</td>
<td>&lt;20-40</td>
<td>&lt;20-33</td>
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* six edge angles of less than 20° were arbitrarily called 18° for the sake of these calculations.
Large Utilized Steep Angle Flakes

Four flakes that weigh more than 10.0gm and have an angle greater than 45° on their used edges. Three are coarse grained materials (basalt, quartzite, granitic) and one is chert. All have microflaking, one also has some rounding. The chert specimen has two corners and one edge used.

5.72 x 3.97 x 1.36cm x 32.06gm x 68°;
4.39 x 3.15 x 0.79cm x 10.44gm x 60°;
3.20 x 2.89 x 1.40cm x 16.66gm x 80°;
5.79 x 4.48 x 1.38cm x 36.94gm x 70°.

Small Utilized Steep Angle Flakes

Three utilized flakes with edge angles greater than 45° that weigh 10 grams or less. All are of fairly coarse basalt with microflaking - two have a point utilized only.

2.92 x 1.91 x 1.05cm x 4.85gm x 68°;
3.51 x 1.36 x 0.47cm x 1.80gm x 70°;
3.32 x 3.20 x 0.58cm x 5.38gm x 68°.

Cortex Spall Tools

In the second assemblage there are two sub-classes of cortex spalls, both of which are different from those in Assemblage I.

Fire Cracked Spall Tools

Four fire cracked spalls have retouch or signs of use. All have one cortex face and are of granular material - both igneous and metamorphic.

9.67 x 6.25 x 2.15cm x 146.10gm x 35°;
9.34 x 4.15 x 1.37cm x 66.30gm x 31°;
8.34 x 4.45 x 1.00cm x 49.10gm x 55°;
5.17 x 4.18 x 1.45cm x 32.45gm x 50°.

Small Cortex Spall Tools

These are flaked cortex spalls made from smaller pebbles. They are all retouched or utilized and are less granular than fire cracked spall tools. These fall well within the size range of Matson's (1976a:135) 'steep angle retouch cortex spalls', and Calvert's (Boehm 1973:118) 'tool flakes'. The edge of one specimen would fit Matson's description, but the other has a narrow edge angle and is utilized - not retouched. (Fig.71).

5.63 x 4.78 x 1.35cm x 42.70gm x 54°;
4.22 x 3.52 x 1.28cm x 21.54gm x 26°.

Hammerstones

These all are cobbles and pebbles (mostly with flat faces) that show signs of battering on one or more of the ends, edges, or faces near the ends. They show varying degrees of wear, from
Figure 17: a, b - Hammerstones; c - Anvil Stone. b - Assemblage II; a, c - Assemblage III
very slight pitting to extensive flaking and crushing. There are two fragments, one of which has been subsequently utilized and is included with the utilized flakes. One of the bifacial choppers in this assemblage has been used as a hammerstone, as has one of the unifacial choppers. Two of the larger specimens seem to be roughly formed. Each have one broken or flaked end on which the resulting sharp edges are battered smooth (Fig.17b). However, one of these may be water worn. Both are quartzite and rounder in cross section than the others. The remaining hammerstones fall within Calvert's Types I and II (1970:71,72; Boehm 1973: 124,125) and Matson's small, medium and large classes (1976a:137,138). These criteria were not used due to the small sample.

Anvil Stones

These are fairly large stones that show pitting in the center of a flattish face. This pitting occurs in a circular pattern and often the individual 'pits' are linear. These result from use as an anvil for bipolar flaking. Their presence is not surprising in light of the number of pièces esquillées in this assemblage. Flenniken's description (1980:56,51) is used here as a guide. The two examples in this assemblage are included in other classes - one is an incised and shaped sandstone fragment (Fig.9a) that was subsequently used as an anvil. The other is a large granitic bifacial chopper that may have been used first as an anvil (Fig.8b), 6.57 x 4.95 x 2.18cm x 99.83gm; 11.67 x 10.75 x 4.54cm x 810.8gm.

Bifacial Choppers

These are pebbles and cobbles that have large and usually irregular flakes removed bifacially to form a cutting edge. The cutting edge can be on either the side or end of the pebble. Of fairly coarse grained materials, no two are of the same rock, (including sandstone, quartzite, a greenish granitic rock and a black metamorphic variety). All have a fairly large area of cortex remaining with at least 25% of the perimeter unflaked. This portion is always opposite the center of the cutting edge and can be interpreted as a hand grip. All of these, with the possible exception of the coarse granitic and sanstone specimens, could have served a dual purpose as cores.
A quartzite chopper is split near one end, perhaps intentionally. Where this split meets the cortex it is battered or 'backed', probably for comfort of grip. It has no obvious wear. (Fig. 8c).

The granitic chopper has about 70% of its cortex remaining. The handgrip is a naturally squared-off end. The resulting corners are heavily pitted as if from use as a hammerstone. The two flat faces have deep pitting in the center as if from use as an anvil. On one side this pitting is intercepted by a flake scar - suggesting it was used first as an anvil. Concurrent use should not be ruled out in this case.

Only one chopper shows wear - this is in the form of irregular flaking of the edge and in some places a little battering.

Although of varying size, there is a remarkable similarity of thickness. (Thickness is measured from cortex to cortex in some cases, and cortex to flake scar in others). Thickness is very similar to the Glenrose collection (Matson 1976a:142). Bifacial choppers are previously described in the St. Mungo components (Boehm 1973:117; Matson 1976b:290). Mitchell includes them in the cobble-core tool class (1971a:106).

<table>
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<td>11.10</td>
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**Unifacial Choppers**

These pebbles and cobbles have unifacial flaking that forms a fairly steep cutting edge. As Matson (1976a:142) suggests, many of these may be failed cores. Two of these specimens are waterworn after flaking, and another three are fire cracked. A variety of materials is used - basalt, granite and assorted other igneous rocks. They come in a wide range of sizes and shapes.

The basalt chopper is thick, with one flat face that has served as a striking platform to numerous fine grained flakes. The cortex has deep glacial(?) striations and some battering has occasionally overlapped the flake scars. The flaked edge is battered and rounded, and some ridges on the flaked face are rounded. This may have been used as a rasp too. This tool, and another that is flaked from a split surface platform, are probably within Matton's cobble scraping plane class (1976a:145).

Two specimens have a single flaked indentation in the edge
opposite the flaked edge. These could be line or net sinkers. The indentations in both are very steeply flaked in a form that suggest a natural origin. On one the 'flaked edge' may also be natural. This specimen is heavily waterworn granite, thus the insecurity of classification. The other specimen shows some wear on the flaked edge.

One item is a fire split cobble with a couple of subsequent flakes removed.

Mitchell has previously described tool such as these as cobble-core tools (1971a:106).

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Split Pebble Tools

Pebbles with one cortex face and one flaked or split face. They tend to be thicker and larger than spall tools and in this collection, retouch when present is on the split face. They are all made of coarse materials - granitic, basaltic, and quartzite pebbles. One of them may be a core fragment aboriginally picked up on the beach as it shows a spotty white encrustation that looks like those from certain marine organisms. A small flat quartzite pebble may have been split bifacially. Opposite the cutting edge is a flake scar into the cortex with a little crushing. This may in fact be a cortex spall tool core.

Some of these implements show a little rounding - perhaps use-wear. They probably are both cutting and scraping tools, and as such would fall into the Glenrose classes of cobble scraping planes and cortex spalls (Matson 1976a:145,133).

The largest specimen is a split granitic pebble that shows deep pitting at its percussion point, possibly suggesting use as a hammerstone. It has flaking secondary to the split so probably it was used as a pebble tool.

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Chipped and Ground Slate Fragments

Both of these fragments have a combination of chipping and grinding but are too incomplete to determine if this is from backing of an edge, breakage or intentional shaping of the object. Both are black with one and two ground faces respectively. The first has one edge ground slightly off 90°. The other has one battered edge that would appear to be backed - possibly a knife fragment. Previous excavations at this site have found little ground slate in this assemblage (Boehm 1973:52,123). These may be fragments of Borden's ambiguous 'chipped and ground slate points' characteristic of his Charles Phase(1975:95). The larger one may be part of a 'chipped and ground slate object' as described for Assemblage III. (3.15) x (1.90) x 0.24cm x 2.10gm; (1.39) x (1.18) x 0.15cm a 0.44gm.

Abrasive Stone Fragments

These flat sandstone pebbles show faint signs of abrasion - a few striations and some smoothing. Both are questionable artifacts. One is a small, fine grained fragment with one rounded edge that may be shaped. The broken edges are worn (probably naturally), as is one flake scar that also is probably natural. The few striations tend to angle away from the rounded edge.

The second item is a large medium grained roughly rectangular flat pebble with faint traces of abrasion. Three edges are rounded (water worn?), the fourth is flaked. These rough, irregular flakes may have been from intentional shaping - perhaps to modify for use as a sinker. This artifact may have been burnt. The width is not complete, but probably close to the original. See also the incised and shaped sandstone fragment description for another possible abrasive stone.

The abrasive stones from previous excavations at this site are similar (Boehm 1973:124; Calvert 1970:70). Those from Glenrose are not shaped (Watson 1976a:155). One would expect a lot more abrasive stones at this site given the amount of worked bone there is. 10.00 x (9.78) x 2.67cm x 368.08gm; (4.00) x (3.02) x 1.46cm x 29.10gm.

Stone Disc Beads

These two beads are ground of fine grained sandstone with biconical holes centrally located. One is facetted and roughly square of blackish stone, the other is nearly round with remnants of facets and is of a yellow-brown stone. These are equivalent
to Calvert's 'slate disc beads' (1970:70) later referred to as 'siltstone and sandstone' (Boehm:1973:123), and probably to Matson's 'slate beads' (1976a:159). These two beads where found together and may be intrusive from Assemblage III. In the measurements below, length is maximum diameter, width minimum diameter. 0.73 x 0.68 x 0.34cm x 0.30gm; 0.74 x 0.68 x 0.32cm x 0.26gm. (Fig.9k, l). 

**Incised and Shaped Sandstone Fragment**

This fragment is a thick flat piece of sandstone with two (pecked and ground?) notches on adjacent sides. The object is broken through the sides of both these notches. Between the notches is a rounded 'corner' with a rounded edge. Coming off both faces and around the edge until they nearly meet are a series of shallow, parallel incisions (Fig.9h). One side has five clear incisions, the other four, plus one partial incision (worn away?). These incisions are matched on both sides and may well have met on the edge prior to wear or weathering of this area. Both faces are ground into very shallow depressions — perhaps intentionally, or through use. One face has some pitting and grooving that appears to be from use as an anvil. These would have been subsequent to shaping and fragmentation of the artifact. This item's initial function is unclear — perhaps an abrasive stone, net sinker or purely decorative item. It is unlikely the decoration or notching would be noticed if this were picked up out of the dirt — thus possibly explaining its use as an anvil. To my knowledge, this is unlike other incised artifacts from this time period. 6.57 x 4.95 x 2.18cm x 99.83gm.

**Incised and Ground Schist Fragment**

A small fragment of schist that has one edge rounded by grinding and both faces ground. The incised face is ground the smoothest. The incisions, which are fairly even in depth and width (ca.0.02 x 0.05cm), are two sets of parallel, roughly evenly spaced lines that intersect at about 45° to one another. The object may be burnt. Similar items are known from St. Mungo I (Boehm 1973:123; Calvert 1970:71); Glenrose —St. Mungo Component (Matson 1976a:129,153,154); Esilao —Bayem Phase (Borden 1975:75). Borden considers this artifact an innovation of the Charles Phase in which all the above components fall (Borden 1975:95,97). Hall (1968) also describes similar artifacts
Fired Clay Object

A small sphere of clay with an impressed flat groove that has created a flatter side to the object. It seems only slightly fired as the clay is still friable. The groove retains the impression of a flat edged thin object, perhaps a thin piece of wood. This object is probably incidentally fired - stuck on a piece of firewood, etc. However, it seems deliberately shaped as it is so evenly spherical and was pushed evenly and gently against some other object. Stratigraphically it occurs from a zone with patches of very sticky clay that are probably deposited naturally. Fired clay is not unknown in sites of the area, however, it is most often within clay lined pits (cf Mitchell 1971a:147). Groove:
length 0.98; depth 0.19; width 0.22cm. Overall: 1.13 x 1.10 x 0.92cm x 0.96gm. (Fig. 18a).

Sectioned Bone Awl

This is a well finished and highly polished section of long bone - possibly a canon bone. Its proximal end is the split epiphys s. One side near the base still has evidence of the graving done to section the bone. In cross section this awl is flat lenticular - the edges are rounded. The tip is unifacially bevelled on opposite faces to make an asymmetrical point. This bevelling could be use-wear if the tool were rotated or scraped in one direction only. In outline the sides gradually converge to the point with a long nearly parallel section in the middle. It is fairly uniform in thickness; thinning only near the tip. The whole object is highly polished but shows little other wear. Calvert (1970:61, Fig.15a) suggests tools similar to this might be for fibre working. The tip is somewhat different from Matson's (1976a:160) 'flat pointed awls' which he suggests are basketry awls. Similar tools are found in other sites too (cf Capes 1977:77, Fig. 12h; Dewhirst 1980:138-139; Mitchell 1979:92; Monks 1977:126-127, Fig.18w). 12.97 x 1.17 x 0.50cm x 8.67gm. (Fig. 20e).

Possible Sectioned Bone Awls

Two long flat sectioned and ground fragments missing their tips. Both are fragmented and reconstructed, both are heavily worked and polished.
Figure 18: a - Fired Clay Object, Assemblage II; b,c - Rodent Incisor Chisels, Assemblage III
Figure 19: a – Bone 'Flesher'; b, c, d – Bone 'Wedges'; e – Possible Net Gauge; f – Wide Point with Square Base; g – Bone Blade. a to g – Assemblage II.
Figure 20: a - Bird Bone Tube; b,c,d - Bird Bone Awls; e - Sectioned Bone Awl; f - Split Bone Awl; g,h - Possible Sectioned Bone Awls; i,j - Bevelled Skull Fragments. a,b,c,e,g,h,i,j - Assemblage II; d,f - Assemblage III.
The shorter object is darkly coloured, probably from fire. It is a large mammal (deer?) long bone split through the epiphysis. The epiphysis is ground flat to form the butt, and the faces are also ground flat to create a flat plano-convex cross section at the butt. One side is excursive, the other slightly incurvate, both converging to the tip. The ventral surface has some of the marrow cavity intact, giving it a concavo-convex cross section, but functionally a plano-convex section. The sides are rounded at the break, gradually squaring off to the butt. The dorsal surface is lightly worked cortex. At the break this object is 1.12cm wide and 0.49cm thick. This object is reconstructed from seven pieces. The butt resembles those described here as bone 'flesher' fragments. It shows no battering - only a high polish. This may have been a flesher with a narrow tip. (13.01) x 2.20 x 0.71cm x 16.78gm. (Fig.20h).

The longer specimen has a rounded, nearly pointed base and is basically leaf shaped with both sides contracting-excursive. It also is made from a sectioned piece of bone, but probably a rib. It is slightly concavo-convex in section but could be considered flat. All surfaces are worked, with a high polish on the sides of the tip end where it is broken. At the break this item is 0.69cm wide and 0.15cm thick. (14.35) x 1.51 x 0.44cm x 7.84gm. (Fig.20g).

**Bird Bone Awls**

Three bird bone awls with split portions forming a long narrow point. The highly polished tips of these specimens are sharp with a flat piercing end that curves and expands. One awl still has the end of the bone as a grip. A second awl is a broken off tube, its proximal end has a blunt tip that shows a little wear (Fig.20c). The third awl is a longitudinally split fragment of bird bone with a flat tip that is polished. It may be incomplete. The specimen with the end of the bone intact has had the point sectioned out of the bone, including the angled portion of the tip (Fig.20b). The two larger specimens were abraded during manufacture, the smallest one is unmodified. Calvert found bird bone awls at St. Mungo (Boehm 1973:111-112). It is not clear if any came from Glenrose but they are quite common throughout the coast (cf Borden 1970:Figs30-32;Carlson 1970:Fig.36;Dewhirst 1980:140;Drucker 1953:52;Mitchell 1971a:133,172,202;Simonsen 1970:147).
Bone 'Wedge'

Bone objects with a wedge shaped bit and battered poll are included in this class. Only one complete specimen was recovered from undisturbed deposits and it has little resemblance to the finely finished wedge fragments described below. This specimen is a large, long wedge shaped piece of spirally fractured bone. Beyond the initial fracturing of this bone there is no intentional modification. The wedge of the tip is aligned perpendicular to the faces - 90° different than all the tip fragments recovered. The tip shows some wear in the form of compression fractures and polish. The polish continues on all four ridges or corners of the fracture up to the poll. The poll is fractured and compressed. The changes to this object are subtle so this type of artifact may often go unnoticed. It fits into the class 'utilized bone' but as the function is identifiable it is included here. (Fig.19b).

9.72 x 2.62 x 1.21(Poll) x 0.91cm(Bit) x 24.14gm.

Bone 'Wedge' Fragments.

These are poll and bit fragments of bone wedges or chisels. All the poll fragments show signs of compression and battering, all the bits are battered and wedge shaped. They have greater thickness to width ratios than the poll fragments. These fragments fall into both Matson's size classes(1976a:164).

Poll Fragments - Included here are two snapped off polls, one of which is split in half. The specimen with a whole width measures 1.5cm across and is 0.68cm thick. One medial fragment from very near the poll is included because it shows fractures at both ends which seem to characterize wedge breaks. Two bone flakes driven off the exteriors of large wedge polls are present. They both have a highly polished cortex with battering at the proximal end. An interesting feature of both these flakes is a medial thinning in cross section which subsequently thickens again into a second flat bulb near the distal end. The largest bit fragment has a nearly complete flake scar with these characteristics at its proximal end. All the larger wedge fragments are obviously made on split sections of long bone. Three fragments are from artifacts originally
considerably smaller than those from which the bits were part of.

Bit Fragments - All four bits are snapped cross wise and split longitudinally from use as wedges. One fragment, measuring 4.78 x 1.22 x 0.72cm x 4.67gm, has some polish on the broken edges and may have been used after breaking. Another fragment, measuring 4.98 x 1.85 x 1.01cm x 5.55gm, was left with a sharp proximal tip which has extensive rounding and polish. This point probably served as an awl (Fig.19d). The largest piece is 9.55cm long and probably was about 10cm long when in use. It is 1.27cm thick near the poll (Fig.19c). The remaining fragment is a splinter from the middle of a heavily battered tip.

Bone 'Flesher'

A very well made 'wedge' distinguished by the lack of battering on the proximal end. The canon bone of a deer has been sectioned longitudinally through on epiphysis and transversly across the diaphysis. The epiphysis is flattened and rounded to form the poll. The bit is broad, bifacially ground and asymmetrically worn. The bevelling of the tip is long from the ventral face and short on the dorsal face. On the ventral bevel there is a steep, tiny bevel at the very tip. This was probably a resharpening bevel. In cross section the bit is plano-convex. The edges are both slightly incurvate - flaring gently at the poll and bit. The whole tool is highly polished except the end of the poll which is cancellous tissue. Under the polish there are some coarse striations from manufacture - especially near the tip. The bit seems even more highly-polished than the rest. This specimen was found during well cleaning in a post hole intrusion into the lowest deposits.

Bone fleshers were first described at St. Mungo (Boehm 1973:111; Calvert 1970:61), and have subsequently been recognized at Glenrose (Matson 1976a:164-165). A similar tool is described from the Fraser Delta by Smith (1903:170). (Fig. 19a).

9.11 x 1.75(Poll) x 1.45(Bit) x 1.28(Poll) x 0.56(Bit)cm x 10.20gm.

Bone 'Flesher' Fragments

Two flat fragments sectioned from epiphyses of large mammal bones. These are distinguishable from 'wedge' fragments by the absence of battering or compaction. Both are broken near the poll, one is also split longitudinally nearly to the poll. They are well made but show relatively little polish except on the edges. The polls are slightly convex with square corners. It looks like they were straight sided. These items could be parts of fleshers, little
used wedges, large points, or awls. (2.90) x 1.88 x 0.61cm x 3.24gm; (3.13) x 1.78 x 0.72cm x 2.70gm.

**Bone Blade**

This is a symmetrical leaf shape made on a flat piece of bone. It has a distinct working end characterized by bifacial bevelling on both edges that culminates at a flat fairly sharp tip. The tip is lenticular in cross section. One edge, at 4.62cm back from the tip, is squared off with coarse grinding. The same occurs on the other side at 5.56cm from the tip. These two flat edges meet at a pointed convex base. This section of the blade is rectangular in cross section. With the exception of two deep flake scars in one face the whole object is extensively worked. Use-wear in the form of polish is confined to the bevelled edges and faces. The very edges, starting at the squared off basal area, are highly polished to the tip. The very tip is less highly polished. In outline the sides are contracting excurvate except for straight areas on the bevelled edges. These straight edges are more heavily rounded and polished than the others, seeming to result from use. This object was probably used as a knife. The squared off edges at the base were probably hafted since one would expect them to be polished if hand held. Bone blades from Glenrose are very similar in size and shape with the exception of their flat bases (Matson 1976a:165,167). Facetted bone projectile points from Locarno Beach deposits also have a similar form with the exception of the bases which seem to mimic ground slate and shell points (Borden 1970:Fig. 30s,t). A blade with similar form is illustrated from the Fraser Delta (Smith 1903:Fig. 13d). It, however, has a hole in the base and may have been part of a harpoon. 8.78 x 2.38 x 0.66cm x 13.48gm. (Fig. 19g).

**Large Pointed Bone Objects**

Three pointed tips of mammal bone artifacts occur in this assemblage. Two are calcined with quite dull tips and oval cross sections. One of these is broken lengthways as well as transversly. Both are well finished with some deep striations away from the tips. The third and largest specimen has a long narrow taper leading from a sharp tip with round cross section to a basal area triangular in section. It shows signs of tapering at the break - which may be quite near the end. This specimen is heavily weathered but does show signs of being made from a piece of sectioned bone (Fig. 21c). The others were probably
Figure 21: a - Bone Pendant; b - Tooth Pendant; c, i - Large Pointed Bone Objects; d, e, h - Bone Bipoints; f, g - Small Pointed Bone Objects; j, k, l, m - Worked Bone Fragments. a, b, c, f, g, h, l, m - Assemblage II; d, e, i, k - Assemblage III.
sectioned too. All three have part of the marrow cavity intact. These could be perforators, the largest may have been a part of a projectile point or other hunting implement. Large bone points are previously known in St. Mungo components (Boehm 1973:113; Calvert 1970:63,66; Matson 1976a:167).

(6.39) x 1.10 x 0.66cm x 3.37gm;
(3.30) x (0.62) x 0.34cm x 0.92gm;
(3.59) x 0.81 x 0.61cm x 1.63gm.

**Small Pointed Bone Objects**

The four objects in this category are broken at one end. They are relatively slender with a sharp worked tip. Two are of bird bone. Three are flat in cross section, one is square. The square sectioned specimen is very eroded and may in fact be a piece of detritus.

The longest fragment has a tip that is rounded square in cross section with the very tip missing. It is made on a sectioned splinter of bird bone that has the edges ground and polished (Fig.21f).

The next longest specimen has a flat rectangular cross section. The tip is of a flat spatulate variety with convex tip. In longitudinal section this has a steep wedge shape. The whole object is worked, with diagonal manufacturing striations on all surfaces. It is highly polished. (Fig. 21g).

The third item is a shattered fragment of bird bone that has the very tip slightly ground and extensive rounding and polish on the high points of the edges. There seem to be some encircling striations on these high points which may indicate use as an awl or drill. The very tip is triangular in cross section.

These items may be fish hook barbs, herring rake teeth, awl tips, needle tips, and so on. It is unlikely that they all had the same function. Other small points have come from St. Mungo components (Boehm 1973:112-113; Calvert 1970:66; Matson 1976a:168).

(3.79) x 0.38 x 0.16cm x 0.27gm;
(3.15) x 0.37 x 0.20cm x 0.32gm;
(3.08) x 0.63 x 0.21cm x 0.38gm;
(2.68) x 0.37 x 0.30cm x 0.29gm.

**Wide Point with Square Base**

A symmetrical wide, thin point with square base. For 3.5cm away from the base the sides are straight and parallel. At this juncture there is a subtle shoulder from which the sides converge to the tip, again the sides are straight. The very tip is asymmetrical
with one side slightly rounded—perhaps from use. The tip is
ground from the faces to a sharp point while the sides are
flat. In cross section this object is rectangular, in lon-
gitudinal section it curves slightly. The tip is the thickest
area (0.30 cm) and has no cancellous tissue on the faces. The rest
of the tool has cancellous tissue on one face and thins towards
the base where it is 0.24 cm thick. The base is roughly finished
clearly showing that it was incised and snapped. The corners
of the base are rounded. All parts of this object are worked.
The only sign of wear is polish on the tip with some microscopic
partially encircling striations and the above mentioned rounding.
This object is probably made from a section of rib. A similar
object with a sharp point was found in Georgeson Bay II deposits
(Haggarty and Sendey 1976:53). They may fall within Calvert's
'worked rib' class (Boehm 1973:111; Calvert 1970:61, Fig. 15g).
This was probably a piercing tool—perhaps an awl.
8.79 x 1.46 x 0.30 cm x 4.95 gm. (Fig. 19f).

Bone Bipoint

This small nearly complete double-pointed piece of bone is
partly worked on the edges and at the broken tip. It is highly
polished all over. The outline is asymmetric, with one long taper
and one short. The long taper has the tip broken but it is evident
that the tip was ground round. The short taper has a wedge shaped
base at right angles to the faces with little working. The object
is made on a small fragment of shattered bone—one flat face being
the cortex, the other the marrow cavity. It has burnt to a dark
brown. In outline it is very similar to some from Montague Harbour
III (Mitchell 1971a:Fig. 118b, g), and one from St. Mungo (Calvert
1970:Fig. 15k). (2.67) x 0.56 x 0.21 cm x 0.38 gm. (Fig. 21h).

Bevelled Skull Fragments

Two large fragments of skull have been shaped on one convex
edge. The largest fragment is nearly flat in longitudinal section
with only a slight bow. This specimen has a unifacially bevelled
edge that is rounded and polished. The bevel is on the interior
surface with an edge angle of 30°. This surface has some deep
striations back from the edge. These tend to be parallel to the
worked edge but are probably manufacturing scars. Both faces are
polished, the interior face more so. This is probably a hand grip
polish. The function of this tool is not obvious—it may have
been a cutting or scraping implement. Both breaks follow sutures,
one corner of a break may have some use polish so it could have broken during use. (7.04) x (4.03) x 0.65cm x 10.09gm. (Fig. 20i).

The smaller specimen is reconstructed from six fragments recovered from the level bag. It too has an irregular convex edge with a straight portion. However, the ground edge is only slightly bevelled (75°) and the bevel is mostly on the exterior surface. This edge was probably incised and then ground. In longitudinal section this implement is considerably more dished than the other. Both faces are worked. The exterior face has some deep striations, the interior surface is covered with them, especially so on one end. On the interior surface these striations are nearly all parallel and are oriented ca. 45° to the straight portion of the edge. They probably represent manufacturing scars too. Both faces and the worked edge are polished. There is some rounding of the worked edge that implies use as a scraper. Most rounding occurs on a short section of the edge that is bevelled from the interior surface. Microscopically there are numerous traces of a red substance in the low places of both faces. This may be ochre and perhaps post depositional since ochre is very common in the deposits. This object is broken along a suture also. (5.72) x (3.05) x 0.40cm x 3.70gm. (Fig. 20j).

Functionally these objects may be akin to sea mussel shell knives, ground slate knives or stone scrapers. Bone knives of a much different form are reported from Bowker Creek (Mitchell 1979:92) and the central coast (Simonsen 1970:166). The bone blades described here and in Matson (1976a:165,167) may have served in a similar capacity too.

Perforated Bone Pendant Fragment

A broken biconically drilled hole indicates this fragment was probably suspended. It is a flattish piece of bone, slightly concavo-convex in cross section. The sides diverge from the perforation - one is excursive, the other straight. The distal end is broken off so the final shape is unclear. Both faces have some grinding and polish. On the convex face is a wide (0.20cm) incision that is parallel to the excursive edge, originating on the opposite side of the perforation. The straight edge seems to be worked, the excursive edge was definitely sectioned (probably bifacially) and subsequently ground and polished. It could be that the incised line was intended to be another edge to the pendant. The perforation was probably oval with the long dimension oriented lengthways -
perhaps it was worn from use. The perforation width was about 0.18cm. Flat bone pendants are common in St. Mungo deposits, but all those of this general form are considerably smaller than this fragment (Calvert 1970:61, Fig. 16d; Matson 1976a:169). Matson does illustrate one pendant fragment with an off center hole that is of a larger type (1976a: Fig. 8-27h). Calvert mentions larger pendants from St. Mungo but no dimensions are available (Boehm 1973:115).

Perforated bone pendants are considered to be an important innovation of the Charles Phase (Borden 1975:95). (4.37) x (2.12) x 0.27cm x 2.33gm. (Fig. 21a).

**Bird Bone Tube**

The diaphysis of a bird long bone has been partly cut and partly snapped at one end and is broken at the other. The worked end has extensive rounding and polish on all high points. The long shaft is entirely covered with polished longitudinal striations that probably result from scraping with a sharp stone tool. On the shaft about 3.5cm from the worked end is a patch of transverse grooves that appear to be an aborted attempt to section or perforate the bone. The broken end is spirally fractured and may exhibit some wear. This tip is polished and one flat portion of the break is highly polished. This flat portion may be part of a longitudinal slit cut in the tube before it broke. A bird bone tube was found in the St. Mungo component at Glenrose (Matson 1976a:173). Usually these are considered to be drinking tubes (Dewhirst 1980:326; Drucker 1943:58; Simonsen 1970:167-168). It may be a whistle fragment if there was a perforation at the break. Bird bone whistles usually have transverse holes, but some tubes with longitudinal holes have been classified as whistles (Capes 1977:79; Dewhirst 1980:331-332). It is also possible that the broken tip was used later as a perforator. 10.43 x 1.30 x 0.64cm x 5.58gms. (Fig. 20a).

**Possible Net Gauge**

A polished rectangular fragment of transversely sectioned rib that is broken longitudinally along the flat plane. The ends have been sectioned and then broken with no further modification or polish of the resulting frayed edges. What is left of the side edges is rounded and polished. In outline and size this object is similar to Borden's 'net gauges' (1970: Fig. 30r; 1976: Fig. 9), but it is less well manufactured. In cross section it is concavo-
convex. This could be a blank for some other object, although this would not explain the polished cortical surface. 5.64 x 2.05 x (0.35)cm x 3.63gm. (Fig. 19e).

**Miscellaneous Worked Bone**

Fifty four pieces of miscellaneous bone with worked portions. Some are probably detritus, most are broken unidentifiable fragments of artifacts. Some have been used subsequent to their breaking.

Several are of interest: No.3108 is the spherical end of an artifact. The very tip is flattened and quite polished. It could be a peg or perhaps a flaker tip. Its diameter is 0.80cm. No. 2970 and No. 2946 are split deer phalanges, one is split right through the epiphysis, the other up to the base of the epiphysis. Both have a jagged concavo-convex end where they are broken across the diaphysis. The high points on these ends are slightly polished. These may have been used as scrapers. 3.66 x 1.72 x 1.20cm x 2.98gm; 2.20 x 2.08 x 1.15cm x 2.10gm. (Figs. 21 l,m).

There are five well finished fragments with a rectangular cross section. These are all likely to be 'wedge' or 'flesher' fragments. All are small.

Three pieces of split or sectioned bird bone diaphyses have ground and polished ends. They may be bird bone awl tips, tube fragments, or whistle fragments. (Nos. 3168, 2946, 2923).

Three other pieces of bird bone are the ends of long bones. All have abrasion on the flatter surfaces near the ends.

No. 2558 is a small semi-circular piece of totally worked and highly polished bone. This bone is very hard and tooth-like, perhaps a piece of ear bone or phalange. It has a square cross section, a circular exterior edge and a right angled interior edge. At one break is a groove cut into the interior side. It may have been a decorative item such as a pendant, knob on a pin or nose ring. (2.26) x 0.67 x 0.55cm x 1.20gm. (Fig. 21j).

No. 2727 is a highly fragmented (nine pieces are glued into four pieces) scapula fragment. This object is sectioned and ground on one edge. It may have been a knife-like implement as one edge is quite sharp. It is from a very large land mammal (minimum length ca.) 18.0cm x 2.88 x 2.62cm x 33.54gm.

**Miscellaneous Utilized Bone**

Sixteen amorphous fragments of bone that show wear, but are not purposefully shaped and are unclear as to their functions. This wear takes the form of rounding or polish, and is usually
on a sharp edge or corner. Some of these were probably fleshers, wedges or awls, others scrapers. In this collection most are thick spiral fractures, probably of deer and elk bones. There is one skull fragment that is utilized on one edge - it probably is similar in purpose to the bevelled skull fragments described above. A long splinter of rib may have been a fiber working implement. There are also four pieces of used bird bone - three are used on the tips, probably as perforators. This class overlaps the worked bone class which includes pieces of worked bone that have been used for a purpose other than that which the original modification suggests.

**Tooth Pendant**

A tooth that is biconically drilled through the root. This perforation, now broken, was most likely for suspension. It was about 0.30 cm in diameter. This is the only worked area of the tooth. This style of pendant is common at St. Mungo (Boehm 1973:117). Tooth pendants are also common at Glenrose (Matson 1976a:171-172), and numerous other sites on the coast. (Capes 1964:Fig 21-9,10; 1977: 80; Dewhirst 1980:309-315; Mitchell 1971:137,175). (2.89) x 0.72 x 0.60 cm x 1.20 gm. (Fig. 21b).

**Rodent Incisor Chisel Fragments**

Two rodent incisors have their distal ends modified through use and/or manufacture. The longer of the two is complete in width and thickness with the natural tooth curve evident. The bit is unifacially bevelled on top of the natural bevel. The enamel working edge is asymmetric with tiny chips missing from the whole edge. These chips extend into the bevelled surface only. The broken end has a sharp point that is rounded and polished. This end may have been a graver (Fig. 9f).

The second specimen is split through the width and the thickness as well as transversely but seems to have been used after the width was split. It is not curved. The bit edge has not been ground but takes advantage of the natural bevel. This edge is heavily worn with moderate sized chips missing, again off the bevelled face only (Fig. 9e). Both of these may be whole tools as they are similar in size to those recovered from Assemblage III. These tools are common in DgRr2 deposits (Calvert 1970:71), although quite rare at Glenrose (Matson 1976a:173). (2.54) x 0.67 x 0.46 cm x 0.81 gm x 60°; (1.41) x 0.73 x (0.23) cm x 0.36 gm x 48°.
Antler Beam Wedges

Three nearly whole wedges made of beam portions of antler were recovered. All have unifacial bevelling that forms a convex bit end. Two have some smoothing of the concave face. The poll ends of two retain evidence of a groove cut around the antler by which the antler was weakened and then broken. All three have evidence of battering on the poll ends, including fragments driven off length ways that are large enough to seriously weaken the entire object. These large fractures may have been responsible for the discard of these specimens. One wedge (the widest) is badly eroded but still has signs, at the poll end, of the dimpled surface characteristic of the base of an antler. In one specimen the width is measured quite near the bit due to shattering on the poll end. Shattering and erosion are too severe to measure the thickness of another specimen. On the average this collection is the same size as those found at Glenrose although much thicker (Matson 1976a:178). They are similar in all dimensions to Georgeson Bay II wedges (Haggarty and Sendey 1976:57). Antler wedges were the largest single class in the St. Mungo component of earlier excavations at this site (Boehm 1973: Table XIV).

9.00 x 3.21 x 3.16cm x 42.45gm, (Fig. 22b);
6.83 x (3.31) x 2.84cm x 36.56gm;
7.92 x 3.82 x 2.15cm x 33.13gm.

Split Antler Wedge

This is a long thin cortical splinter of antler that has some unifacial working of the bit and quite heavy use indicated by shattering and crushing of the poll end and some damage to the bit. The bit end seems to be the tine end of the antler and the poll end may be the base, or the fork of a small prong. The unworked diameter would probably have been about 2.5cm at the poll end. The cortex face is highly polished, the opposite face is mostly spongy tissue and is ground flat. Thus the cross section is plano-convex. The longitudinal section is concavo-convex. In outline one side is straight for the entire length, the other is irregular but generally narrows from poll to bit. The middle of this object is constricted suggesting the original splinter may have been removed sideways with a wedge. The flat surface is painted with red ochre from bit to poll which may imply a special function for this tool. In all measurements this object falls outside the interquartile range of antler wedges from Glenrose (Matson 1976a:178). It may be equivalent to a bone object from
Figure 22: a - Antler Chisel Haft; b - Antler Beam 'Wedge';
c - Split Antler 'Wedge'; d - Bilaterally Barbed
Antler 'Harpoon'; e - Antler Ring. b, c, d -
Assemblage II; a, e - Assemblage III.
Montague Harbour I (Mitchell 1971a:Fig.61k). However, the Montague Harbour specimen, as with the bone fleshers from Glenrose (Matson 1976a:Fig.8-25a), shows no battering on the poll end. A sea mammal wedge of similar form was recovered from the middle levels of Yuquot (Dewhirst 1980:130). Probably the closest example reported in this area comes from Dionisio Point IIa (Mitchell 1971b:161, Fig.111). 10.96 x 1.58 x 0.62cm x 8.14gm. (Fig. 22c).

**Antler Wedge Fragments**

There are numerous pieces of antler wedges in this site. Two subdivisions are described here: poll fragments and bit fragments.

**Poll Fragments**

The six poll fragments are all pieces shattered from the side of the poll with heavy compaction on one end. Five are definitely fragments of beam wedges. The sixth is indeterminate.

**Bit Fragments**

The five bit fragments have varying proportions of the bit and shaft remaining. The larger fragments are all pieces of antler beam wedges, the two smaller fragments probably are as well. Two pieces are heavily weathered. One tip is quite narrow (1.0cm) but flares steeply towards the poll end. It is bifacially bevelled—perhaps a chisel bit.

**Small Bilaterally Barbed Antler Harpoon**

A well made small symmetrical bilaterally barbed antler point with poorly developed bilaterally line guards. The line guard involves two shallow lateral hollows at the distal end of the tang. These give a slightly knobbed appearance to the outline of the tang. The end of the tang is pointed excurvate. In cross section the tang is a rounded rectangle. The remaining part of the harpoon is slightly excurvate with five barbs per side. The barbs next to the tang are high isolated and get increasingly smaller towards the tip changing from high enclosed to low enclosed types (Drucker 1943:37). The barbs end 2/3 of the distance to the tip. The barb adjacent to the tang are large and angle at about 45° outwards towards the base. The notches between these barbs and the more distal ones are angled and a lot deeper than the others and may also have acted as line guards. The remaining notches are cut perpendicular to the long axis of the harpoon. The tip is sharp and entirely made of the non-spongy part of the antler suggesting it may be a tine. In longitudinal section the artifact curves,
reflecting the curve of the antler. In cross section it is lenticular, the cortex face being more convex. None of the original antler surface remains - the whole object is covered with longitudinal striations from manufacture. The only possible sign of wear is a hint of extra polish on the line guards.

Small bilaterally barbed harpoons have been described as "particularly diagnostic" of Mayne Phase assemblages (Carlson 1970:115). Carlson goes on to implicate them in a "wide spread coastal culture" existing between 5000 and 3000 years BP (Ibid:117). Carlson compares his specimens with others in the area including a fragment from St. Mungo which has a different barb style to the one described here (Calvert 1970:Fig.17d). Subsequently a fragment was recovered from the St. Mungo Component at Glenrose that is similar to this one (Matson 1976a:Fig.8-30e). One of the Helen Point examples has the same size and form as the one described here with exception of a prominent line guard and tang. It is not nearly so carefully made (Carlson 1970:Fig.34b). This find perhaps further strengthens the notion of cultural association between Mayne Phase and St. Mungo components (Ibid:117).

Overall: 8.76 x 1.97 x 0.86cm x 10.21gm;
Tang: 1.78 x 1.06 x 0.67cm; Length of barbed section: 3.80cm. (Fig.22d

**Worked Antler Fragments**

Eleven miscellaneous fragments of antler that have been worked (detritus) and unidentifiable pieces of artifacts.

The detritus includes five beam fragments. Two of these have been sectioned and split out. Four have adze cuts on the cortex surface. Some of the 'adze marks' might be akin to the scars found on the 'antler flakers' from the previous St. Mungo excavation (Boehm 1973:114). There is one antler chip which appears to be adzeing detritus. It is 1.02cm wide. An antler tine tip is also included in this class. It has some battering on the cut and chopped proximal end so perhaps it is a 'peg' as described by Matson (1976a:165), or one of his punches (Ibid:179).

There are four artifact fragments, two of which are likely to be wedge fragments. One of these two could be the tip of a small narrow wedge.

**Mussel Shell Adze Fragment**

A thick piece of *Mytilus californianus* with the corner of a bevelled edge. The bevel and most other grinding is on the concave
surface and across the ventral end of the valve. On the convex surface a natural ridge is ground flat, otherwise there are still pieces of the periostracum intact. The lateral side of this object seems to be a modified margin of the shell. The cutting edge has some polished chip scars - probably from use. This is most likely an adze blade fragment. Calvert found shell adze blades in her St. Mungo Component I (Boehm 1973:52,125), as did Matson in the Glenrose St. Mungo Component (1976a:177). Shell adze blades are also fairly common in Locarno Beach sites (Borden 1970:99; Mitchell 1971a:57). (2.0) x (1.7) x 0.42cm x 1.72gm. (Fig. 9j).

ASSEMBLAGE III

The third assemblage is characterized by dark, loose deposits with little fragmented shell, sometimes interspersed with compact, fine, multicoloured layers of ash. (Fig. 5). All three excavation units with Assemblage III are located on the river side of the house under deep layers of bulldozed midden, (N24-25, E4-5; N32-33, E14-15; N34-35, E4-5). It appears that there was once a bank between these units and the house. The lower terrace on which this assemblage occurs was covered over, probably with the upper layers from the rest of the study area, in order to make a platform for lawn and garage. There is a layer of in-situ historic debris above the Assemblage III deposits, but the prehistoric deposits are intact and probably represent a later-occupation than Assemblages I and II. There was no stratigraphic connection between the assemblages recovered because we were unable to complete excavation of any of the three units. One unit (N24-25, E4-5) seems to be located on the bank slope. The most northwesterly unit hit the water table with no sign of sterile deposits (Fig. 5).

Features are relatively scarce in these deposits - 2.3 features per m² of stratigraphy. Of these six features, five are posts/small pits and one is a stake (Table I). The paucity of features may partly be due to the incomplete sample of Assemblage III available.

Some human remains were recovered, but again no in situ burials. Faunal remains are common, although the mollusc quantities are down. Vertebrate remains occur less frequently than in the peak of Assemblage II.
Artifact Descriptions

Small Leaf Shaped Biface

One small symmetrical leaf-shaped biface of fairly granular basalt was recovered from this assemblage. In outline the edges are slightly convex, tapering to the point and to the nearly round base. It is plano-convex in cross section. Both faces have little flaking beyond the margins thus consisting largely of the original faces of the flake from which the biface is made. The medial sections of both edges show some rounding and there is light rounding near the tip. Some of the high points on both faces in the medial section are rounded, and perhaps a bit near the tip. If this is use-wear, then the rounding may result from hafting or cutting through thick objects nearer the base, and cutting with the tip. Similar objects come from nearby excavations (cf Burley 1980:Table IV). (Fig. 10a). 5.01 x 2.15 x 0.78cm x 8.47gm.

Contracting Stem Bifaces

The shorter of these two bifaces is a thick, fine grained basalt, leaf shaped point with a slightly contracting stem and square base. The sides are symmetrically convex from tip to base on one side with a shoulder on the other. From the shoulder to the base on this side it is slightly concave - thus creating the contracting stem. The shoulder is rounded. The edges of the stem are battered with considerable hinge flaking. This battering is what shaped the stem. The base may have been broken during manufacture. The flake scars from opposite edges intersect in the middle of the faces giving a fat lenticular cross section. One edge and one face show very heavy wear. The high points on both are ground down and on the edge have as many as three wear facets leading onto the worn face. The wear on the face covers a fairly large area. This wear is confined largely to the medial section. The opposite edge is battered - perhaps 'backed' with light polish on the high points. The second face has some polish of the high parts. There is little wear on the stem suggesting it may have been hafted. The tip has virtually no wear. The location of the wear and the direction of the few striations suggest this may have been used in a scraping action with a low angle of attack or more of a whittling or planing action as illustrated by Keeley (1980:Fig.3). At times it may have had other uses too. 5.56 x 2.04 x 0.90cm x 12.58gm x 62°. (Fig. 10e).

The second specimen is a longer thin leaf shaped point with symmetrical blades but asymmetrical stem. One side of the stem
contracts much more deeply than the other. Both shoulders are rectangular. The base is narrow and straight. In cross section this biface is flat lenticular. The edges are well flaked with most flake scars intersecting along the mid line. The 'tip' of this biface appears to be the squared off flat percussion point of the flake on which this tool is made. This dull tip probably precludes use as a piercing instrument. In addition there seems to have been little effort made to thin the tip suggesting that a sharp tip was never required on this tool. Both edges at and near the shoulders exhibit some rounding of the high points, more so on the edge with a shallow shoulder. There is no evidence for hafting at either end although if it were hafted it would probably be the 'tip' end. This object was quite likely a knife. Calvert also suggests that these "Chipped Point VII... (with) one shoulder or with one shoulder considerably more pronounced than the other... might be knives" (Boehm 1973:121).

6.61 x 2.10 x 0.64cm x 9.58gm x 50°. (Fig. 10f).

Biface Fragments

One base and one tip of bifaces were recovered. The tip is well made with convex sides, a sharp point and a fat lenticular cross section. The base fragment is irregular, poorly made and perhaps a pièce esquillée. However, it shows extensive rounding and polish on the high points of both edges and both faces. The base is convex.

Unifacially Retouched Flakes

These amorphous flakes with unifacial retouch are treated in the same manner as those in Assemblage II. Figure 23 shows a different distribution of edge angles. There is still a bimodal curve, but the whole distribution is shifted towards steeper angles. This calls into question the validity of splitting steep from narrow edge angles at 45° since this split would fall in the middle of a mode. However, to change the definitions of steep vs narrow edge angles would render the data incompatible with Assemblage II. As a result the definition arrived at for other retouched flakes and utilized flakes is used here too. Since the modes are different between assemblages it may be assumed that some other variable is also different - perhaps function, raw material or depositional processes. Other differences are also readily apparent such as the great number of the smallest flakes, and the lack of large flakes (Fig. 24). Again there is no obvious
Figure 23: Frequency of Edge Angle for All Unifacially Retouched Flakes, Assemblage III.

Figure 24: Frequency of Weight for All Unifacially Retouched Flakes, Assemblage III.
correlation between edge angle and size (Fig. 25), although there may be a clear division of edge angle in the larger flakes.

As with Assemblage II, there is an overlap between Matson's (1976a:117-118) size categories and those used here. Table III is to aid in comparison between the two sites.

**TABLE III**

Comparison of Size Classes of Unifacially Retouched Flakes as used at DgRr2 (Weight & Edge Angle) and at DgRr6 (Length)

<table>
<thead>
<tr>
<th>Length(cm)</th>
<th>Weight</th>
<th>Edge Angle</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
<th>Interquartile Range</th>
<th>Ranks Used</th>
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<tr>
<td>0-4</td>
<td>Weight</td>
<td>23</td>
<td>3.68</td>
<td>2.54</td>
<td>0.93-12.36</td>
<td>1.87-5.35</td>
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<tr>
<td></td>
<td>Edge Angle</td>
<td>23</td>
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<td>14.44</td>
<td>28-40</td>
<td>42-68</td>
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<td></td>
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<tr>
<td>4-7</td>
<td>Weight</td>
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<td>19.96</td>
<td>11.62</td>
<td>4.75-36.84</td>
<td>9.88-32.93</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Edge Angle</td>
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<td>65.54</td>
<td>16.02</td>
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<td>48-75</td>
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<td></td>
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<td>+7</td>
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<td>-</td>
<td>-</td>
<td>48.49</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Edge Angle</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>32.04</td>
<td>-</td>
<td></td>
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</tr>
</tbody>
</table>
Medium Unifacially Retouched Narrow Angle Flakes

Unifacially retouched flakes with a narrow edge angle that weigh between 25.00 and 60.01 grams. These three specimens are of coarse grained materials - one is flawed chert, the other two are unidentified igneous rocks. Two have a convex edge, one straight. None show wear subsequent to retouch, although the retouch of one borders on the utilized flake class. Two still have cortex. This class overlaps the large and medium classes at Glenrose (Matson 1976a:117-118). 6.50 x 5.00 x 1.02 cm x 33.85 gm x 34°; 7.60 x 5.36 x 1.48 cm x 48.49 gm x 32°; 8.02 x 4.09 x 2.08 cm x 52.04 gm x 30°.

Small Unifacially Retouched Narrow Angle Flakes

Unifacially retouched flakes less than 25 grams in weight and with a narrow edge angle (45 degrees or less). All these flakes are made of fairly granular basalt and are all within Matson's (1976a:118) "small" class. Four have straight edges, the rest (four) have convex edges. One shows some polish subsequent to retouching. The nature of the retouch leaves three as borderline utilized flakes. Three have some cortex.

<table>
<thead>
<tr>
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<th>N</th>
<th>X</th>
<th>S.D.</th>
<th>Range</th>
<th>I.Q. Range</th>
<th>Ranks</th>
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<td>2.93</td>
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<td>2.09-3.72</td>
<td>2.28-3.49</td>
<td>2,7</td>
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<td>1.94-3.06</td>
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<tr>
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<td>0.28</td>
<td>0.33-1.13</td>
<td>0.44-0.88</td>
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<tr>
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<td>8</td>
<td>4.83</td>
<td>3.50</td>
<td>1.39-12.36</td>
<td>1.87-6.48</td>
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<tr>
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<td>6.78</td>
<td>28-45</td>
<td>30-45</td>
<td>2,7</td>
</tr>
</tbody>
</table>

Medium Unifacially Retouched Steep Angle Flakes

Unifacially retouched flakes with steep edge angles that weigh between 25.00 and 60.01 grams. The largest of this class is possibly a shale core. It has fairly straight battered edges. The smallest is made of a granular faulted chert. It has two denticulate edges with heavy rounding on the 'teeth'. The edges are both convex (Fig.7f). The third specimen is of fairly granular basalt with remnants of cortex. Its concave edge has an even retouch. 4.45 x 4.13 x 1.60 cm x 32.93 gm x 75°; 4.95 x 3.57 x 1.52 cm x 36.84 gm x 75°; 5.18 x 3.62 x 1.40 cm x 27.71 gm x 85°.
Small Unifacially Retouched Steep Angle Flakes

Unifacially retouched flakes less than 25 grams in weight and with an edge angle greater than 45 degrees. Coarse grained materials (general igneous, basalt and shale) account for three specimens, fine grained basalt for three, and fairly granular materials for the rest (shale - 1, basalt - 14). Six flakes have remnants of cortex. One of the fine grained basalt specimens would fit Matson's "well made" criteria (1976a:119). It has both concave and convex retouched edges with a shaped point on one end. Another fine grained basalt item fits Matson's (1976a:122) "denticulate" category - it has a series of small deep flakes creating a saw-like edge (Fig 7e). One other specimen may also fit his denticulate class. Four members of this class have some crushing on one edge that suggests they may be pièce esquillé fragments. Three have some rounding of the retouched edge, two have utilized edges in addition to the retouched edges, and three are borderline utilized flakes. Apart from the "well made" flake, twelve flakes have convex retouched edges and one has a concave edge. Eight have edges that are straight. The sizes of these objects fall into Matson's small and medium categories (1976a:117,118).

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>X</th>
<th>S.D.</th>
<th>Range</th>
<th>I.Q.</th>
<th>Range</th>
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<td>54-70</td>
<td>6,17</td>
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Pièces Esquilléées

These small cores are similar in form to those in Assemblage II, although they tend to be smaller and to more often have some cortex remaining (nine have cortex). The difference in presence of cortex may relate to a different technological sequence - perhaps using cortex spalls or small flat pebbles since several of them have cortex on one face. There is one possible specimen made of quartzite (the only coarse grained specimen), two of chert and one fine grained basalt. The remainder are fairly granular basalt. Only one specimen has a length greater than the width (width is the maximum distance between parallel striking platforms). One shows some signs of use (polish) - but this is at a break and may be the remains of a broken tool edge subsequently reduced with bipolar flaking.
Bifacially Retouched Flakes

Flakes with at least one bifacially retouched edge. The retouch is quite regular and even on both faces. Some of these objects may be cutting implements, others might be fragments of pièces esquillées although the edges do not have much crushing. Most edges are quite sharp. One implement has some cortex on one edge. Two are basalt, the largest is a thick piece of schist that is burnt on one face. Matson (1976a:129) describes similar objects from Glenrose where they are rare and only occur in the St. Mungo Component. Calvert also describes similar artifacts from the St. Mungo site (Boehm 1973:122).

Unformed Cores

Two flaked fragments with unprepared platforms. Both have cortex remaining, one is quartzite, the other chert. These are similar to those found in Assemblage II. 5.06 x 4.75 x 3.35 cm x 85.46 gm; 5.94 x 3.55 x 1.79 cm x 39.69 gm.

Utilized Flakes

These amorphous flakes that have been used without modification are treated much the same as those in Assemblage II.

Of the fifty-six specimens only one is longer than 6.0 cm, and four are heavier than 10 grams (Fig. 27). Forty-five utilized flakes have an edge angle of 45° or less and eleven have edge angles greater than 45°. The division of flakes into steep and narrow edge angle is less obvious than in Assemblage II (Fig. 26), perhaps the larger sample is filling the gaps, or maybe there is less polarization of edge functions. Certainly the smallest flakes have a wide and quite even distribution of edge angles (Fig. 28) which would suggest they had a wide set of uses. It may reflect other factors such as difference in quality of material - there seems to be a trend towards fine edge angles for fine grained materials such as chert and steeper edge angles for the coarser basalts. The coarser basalt flakes may have more edge damage caused during detachment of the flakes. All flakes except one show microflaking, five of these also have some rounding or polish.
Figure 26: Frequency of Edge Angle for All Utilized Flakes, Assemblage III.

Figure 27: Frequency of Weight for All Utilized Flakes, Assemblage III.
Figure 28: Scatterplot of Size and Edge Angle for All Utilized Flakes, Assemblage III.

Large Utilized Narrow Angle Flakes

Two specimens that weigh over 10 grams and have edge angles $45^\circ$ or less. One is basalt, one granitic. Both are fairly granular, with microflaking. One also has some rounding of the edge. Both have an edge angle of $45^\circ$ but are greatly different in size. $3.38 \times 3.28 \times 1.33\text{cm} \times 15.77\text{gm} \times 45^\circ$; $6.56 \times 4.95 \times 1.49\text{cm} \times 55.31\text{gm} \times 45^\circ$.

Small Utilized Narrow Angle Flakes

These utilized flakes weigh no more than 10 grams and have an edge angle no greater than $45^\circ$. Fine grained materials are relatively common (twelve) and are mostly chert with some basalt and obsidian. Twenty six specimens are of a fairly granular basalt, four are unidentified igneous rocks and one is a granular granitic rock. All have microflaking, five also are polished. Seven are used on corners.

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<td>6.89</td>
<td>20-45</td>
<td>25-35</td>
<td>11,33</td>
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</table>
Large Utilized Steep Angle Flakes

These two flakes are both heavier than 10 grams with an edge angle greater than 45°. One is granitic with rounding on one edge and some microflaking. The larger flake (Fig 7g) is very heavily rounded and polished on the high points of two edges. The wear would arise from a motion perpendicular to the plane of the edges suggesting it may have been a scraper. It is made of a greenish rock - perhaps serpentine. One of the worn edges is concave, the other is convex. The dorsal surface has a lot of cortex left. Although the wear pattern is different, it may fit into Matson's class of "edge ground flakes" (1976a:137). 4.65 x 3.22 x 1.30cm x 17.90gm x 50°; 5.72 x 4.95 x 1.12cm x 32.94gm x 72°.

Small Utilized Steep Angle Flakes

These are utilized flakes that weigh 10 grams or less with edge angles greater than 45°. Of these nine flakes all have microflaking, two have been used on a pointed edge. One is highly polished. Three are probably fragments of larger objects. Eight are fairly granular basalt, one is possibly serpentine.

<table>
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<td>58</td>
<td>9.35</td>
<td>48-70</td>
<td>48-70</td>
<td>2,8</td>
</tr>
</tbody>
</table>

Hammerstones

These are two oval quartzite cobbles with evidence of battering. The smaller one has light pitting in the center of one face, the larger has deep pitting on one end, on all broad faces near the ends and on the opposite sides near one end. There is also light pitting down the center of one face (Fig 17a). The second tool may have had light use as an anvil stone. The first is most likely a hammerstone because the pecked areas occur on an undulating surface that does not seem as appropriate for use as an anvil as the opposing face would be. As with Assemblage II these crosscut previous classes of hammerstone described in the immediate area. 12.15 x 8.74 x 4.98cm x 756.9gm; 10.54 x 6.69 x 4.02cm x 398.1gm.
Anvil Stone

A large, slightly flat, granitic cobble with deep localized pitting and crushing on one face. There may be some pecking of the margin but this is also attributable to weathering. The unworked face has been burnt. This anvil stone is very similar to those from Glenrose (Matson 1976a:141). Anvil stones occur in previous collections from St. Mungo but are also used as hammerstones (Boehm 1973:124, Calvert 1970:Fig.20b). 13.4 x 11.7 x 6.7cm x 1570.7gm. (Fig. 17c).

Ground Slate Knife Fragment

This thin incomplete fragment has one double bevelled edge with some knicks and polish. The opposite edge is ground flat. The cutting edge is not parallel to the back, the width changing in the 1.67cm left of the edge from 3.08 to 3.28cm. One face is flaked along the flat edge, the other face has a little grinding wear near the flat edge - otherwise the faces are unground. Both ends are missing. Mitchell describes a knife with unground faces from Montague Harbour I and compares it to others from the Fossil Bay and Locarno Beach sites (1971a:113). These, however, are thicker with tapering cross sections. It is probably more comparable to those described from the Eayam, St. Mungo, Marpole, Gulf of Georgia and Stselax Phases or Culture Types (Boehm 1973: 52,123; Borden 1968a:19,21;1970:96;Calvert 1970:70;Haggarty and Sendey 1976;48;Matson 1976a:147,148;Mitchell 1971:48,52,191). (4.07)-x 3.28 x 0.32cm x 6.64gm. (Fig. 9c).

Chipped and Ground Slate Object

This is an evenly thin, multi-edged piece of green slate with one ground face and all edges bifacially bevelled by careful flaking. All six edges are straight. It shows some microscopic polish and microflaking on the edges suggesting it is a finished cutting implement. Chipped slate knives are elsewhere found (cf Mitchell 1971a:99,156) but these are not ground and tend to be thicker. Perhaps the best comparison is with the smaller of the Montague Harbour III chipped slate knives (Mitchell 1971a:187), and the smaller Georgeson Bay I "bifacially chipped slate objects" (Haggarty and Sendey 1976:32), and also the "chipped slate scrapers or knives" from DfRu8 (Hall 1968). Schist artifacts similar to this are common at the Hoko River (45CA213). 6.90 x 4.40 x 0.19cm x 2.17gm. (Fig. 9d).
Ground Slate Fragments

These two fragments have one double bevelled edge. The larger one is of a green and evenly thin slate with two ground faces and fairly heavy knicking and polishing on the edge. One bevel of the cutting edge has two distinct bevels along it - perhaps the result of resharpening. The smaller fragment is of black slate with one face missing and the other ground. Its edge is heavily knicked and polished and was perhaps resharpened with steeper bevelling very near the edge. The nature of the wear suggests these are knife fragments, but it is conceivable that they were other types of ground slate artifacts. (3.68) x (2.27) x 0.21cm x 1.73gm; (2.15) x (0.74) x (0.14)cm x 0.24gm.

Chipped and Ground Celt

This is a small, coarsely flaked and partially ground nephrite celt. It is generally rectangular in outline with convex poll and bit, one straight side and one convex side. In cross section the bit is plano-convex, the poll is concavo-convex with the ventral surface a flake scar, and the middle is roughly plano-convex. The width is fairly regular. The sides have extensive bifacial flaking, probably bipolar, some of which may be subsequent to grinding the dorsal surface of the bit. The bit is relatively well finished with bifacial grinding, the edges are not ground and the faces are only ground on high points. The poll is thin with a well finished dorsal surface - this may be an old bit that had the ventral surface shatter off. The bit shows evidence of use in some irregular unifacial microflaking on the dorsal surface. This celt has a different form and manufacturing sequence, (possibly interdependent variables) than others recovered from the Fraser Delta or Gulf of Georgia (cf Calvert 1970; Haggarty and Sendey 1976; Hall 1968; Matson 1976a; Mitchell 1971a). It is somewhat similar in form to a Component III ground celt from DgRx5 (Murray 1980:251-252). However, there are two examples of chipped and ground celts from Silverhope Creek (DiRi39) near Hope. One is smaller and better finished (Archer 1980:290,292,293). A second celt, which Archer terms a "celt preform" (1980:296), is nearly identical in size, shape and manufacture (Ibid:Fig.31g). The edges of this celt show wear suggesting it is a finished item (personal examination). Silverhope Creek deposits fall within
the canyon Skamel Phase, which is contemporaneous with Marpole (Archer 1980:75; Borden 1970:96). 5.59 x 2.00 x 1.89 cm x 13.40 gm. (Fig. 9i).

Abrasive Stone Fragments

Four small fragments with widely varying coarseness of sandstone, two with one abraded face and two with both faces abraded. One of each have slight rounding of the remaining margin, and three are heavily abraded. One of these fragments is heavily dished in the center, probably from use-wear. Its thickness varies from 0.8 cm in the center to 1.32 cm at the margin. These abrasive stones show more obvious abrasion than those in Assemblage II. They are similar to those previously recovered in St. Mungo components. (Boehm 1973:124; Calvert 1970:70; Matson 1976a:155).

(4.98) x (4.57) x 1.32 cm x 41.26 gm;
(4.97) x (3.09) x 0.67 cm x 18.20 gm;
(4.77) x (2.44) x 0.45 cm x 8.58 gm;
(5.90) x (5.01) x 0.66 cm x 27.80 gm.

Stone Disc Beads

These are siltsone (two) and fine sandstone (one) biconically drilled disc shaped beads. One is round, two have rounded facets. The round one is also blackish, the other two yellow-brown. Length and width measure maximum and minimum diameter respectively.

0.69 x 0.67 x 0.36 cm x 0.24 gm;
0.72 x 0.71 x 0.34 cm x 0.31 gm;
0.63 x 0.56 x 0.20 cm x 0.12 gm.

Handmaul Fragment

A fragment of a well finished handmaul made of fine grained sedimentary rock. It includes part of the flat striking (?) face, part of a 1.7 cm high, slightly bevelled, convex side to the striking head and part of the shank. The curve is smooth, suggesting a striking head diameter of about 9.5 cm and shank diameter of about 5.5 cm if the specimen were round. The exterior is polished smooth. There are no signs of wear. It may be fire cracked. Handmauls are previously known from St. Mungo (Boehm 1973:124; Calvert 1970:70). No handmauls were recovered at Glenrose (Matson 1976b:290, 291). Borden identifies handmauls as diagnostic of Marpole and later Phases in the Fraser Delta (1970), Mitchell finds them distinctive of Marpole and later Culture Types.
Figure 29: a - Pipe fragment; b - Handmaul Fragment. a,b - Assemblage II.
Pipe Fragment

A broken conically drilled cylinder of reddish vesicular igneous rock. All surfaces are ground quite smooth, the lip is squared off to an average width of 1cm. It is 4.4cm in diameter, with the hole tapering from 2.7cm diameter to 1.52cm diameter at the broken end. This object weighs 74.58gm and is probably from Assemblage III. It was donated by a man who could point out the spot in undisturbed deposits from which he found it about 5m from the nearest excavation unit. This is very similar to one from the Marpole Component at Glenrose (Matson 1976a:151). Originally it was probably biconically drilled. Classifying this item as a pipe is for convenient comparison with Glenrose, not because there is strong evidence as to its function. (Fig. 29a).

Split Bone Awls

These two awls are spirally fractured bone fragments with sharp points that have been used for perforating. One is a piece of utilized bone, the other is heavily modified.

The large specimen is a spirally fractured mammal long bone with a sharp tip that has been utilized for perforation. The tip is triangular in cross section, with the very tip and edges rounded and polished from use. This wear is evident on the higher points of the broken surface all the way to the proximal end. It may be that the proximal end was used in a scraping action. There is some evidence in the form of striations that the length of this tool was used as a scraper too. The deep marrow cavity gives this tool a concavo-convex cross section. The broken edges are nearly parallel to each other and the long axis of the bone. Split bone awls are previously described from St. Mungo deposits but generally are worked before use (Boehm 1973:112; Calvert 1970:61; Matson 1976a:159). 13.00 x 2.09 x 1.35cm x 26.37gm.

The second specimen is a ground, spirally fractured pointed bone. The cortex and marrow canal are little worked except at the tip. In outline the sides are straight with a consistent taper to the tip. The sides are rounded which produces a round cross section at the tip. The base is polished and worn but not worked heavily. The sides are polished, as is the tip. The tip has microscopic encircling striations on the higher points. These striations extend 2.0cm from the tip at which point the
maximum diameter is 0.94cm. These striations are very likely from use - probably as a piercing tool that was twisted into a firm material such as soft wood or a thick dry hide. Split bone awls are quite common - at St. Mungo they are previously named "splinter awls" (Calvert 1970:59-60); at Glenrose this would be called a "needle pointed awl" (Matson 1976a:159-160). Simonsen calls this type of artifact drills (1970:149-150). At these sites and others this object might also be referred to as a large bone point if not for the striations. 9.17 x 1.37 x 0.68cm x 5.29gm. (Fig. 20f).

**Bird Bone Awl**

A bird bone has been broken through the diaphysis resulting in a short fragment with sharp point and a hand grip at the epiphysis. The point has not been modified after breaking, other than through use. The very tip is polished and rounded with some polish on high spots towards the base. This item would also fall in the utilized bone class. (Fig. 20d).  

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**Bird Bone Awl Fragment**

The tip of a bird bone awl, this specimen does not seem to have been sectioned but has been shaped by grinding before use. It has a sharp point which is based on a bone fragment that has been split in half longitudinally. The edges of the split are all highly polished except one portion near the very tip that has chipped off with use and subsequently been polished only slightly. The very tip is highly polished; rounded and rectangular in cross section. (2.32) x 0.62 x 0.32cm x 0.21gm.

**Bone 'Wedge' Fragments**

These are two bit fragments from wedges or chisels made of mammal bone. Both are fragments of the very tip with remains of the marrow canal. Originally both were very small objects. One is a highly polished, heavily battered piece with a tip that was nearly round in outline. Its original width would have been circa 1.7cm. It has a unifacially bevelled tip, on which is superimposed another small bevel at the very tip - probably from use. It is likely this was a chisel. The other fragment is broken in two directions, but the original width can be estimated at circa 1.35cm. This fragment is weathered with little polish evident. There is some knicking of the unifacially bevelled tip. The bit would have been convex in outline. This may have
been a wedge, chisel, or base of a point. Both these fragments would fall into Matson's small class of wedges (1976a:164).

**Large Pointed Bone Object**

This is a thick short pointed object, rectangular in cross section with an asymmetrical tip and a transversely sectioned butt end. It is heavily ground but still shows signs of longitudinal sectioning. The tip is broken to one side, resulting in a bevelled, fairly sharp point. This area is chipped, worn and polished. This was probably a heavy-duty hafted awl or punch. The butt end shows some polish, otherwise I would suggest it is an awl tip that was sectioned off in order to resharpen the point. 2.58 x 0.56 x 0.44cm x 0.76gm. (Fig. 21i).

**Bone Bipoints**

Two small double pointed bone objects that are ground at both ends. One is a sliver of bird bone which in outline has one tapered end and in longitudinal section two pointed ends. The long narrow taper culminates in a sharp point with a rectangular cross section. The opposite point is a very thin wedge ground flat on both faces but quite wide at the very tip (Fig. 21e). The other point is longer and made of a splinter of mammal bone. It is triangular in cross section at the middle - with a long narrow taper to one point which is sharp and roughly round in cross section. The other end has a wide taper and roughly worked blunt point more or less square in cross section. The medial portion is hardly worked. (Fig. 21d). This second example was probably hafted - perhaps into a fish hook. The first specimen shows a slight constriction in the middle and may have been a gorge. The second example is similar to Calvert's "mammal bone points" (1970:Fig.151,m). Both would fall between her medium and small size categories (Ibid:66), and within her "unbarbed bone points II" size class (Boehm 1973:113). 3.81 x 0.32 x 0.18cm x 0.19gm; 4.42 x 0.44 x 0.31cm x 0.44gm.

**Miscellaneous Worked Bone**

Included here are twelve bits of artifacts that are not large enough to classify. One is a utilized piece of sectioning detritus. It has a polished point and edges and may be a perforator. 9.05 x 1.20 x 0.41cm x 2.47gm.

A heavily worked fragment that is long and thin with expanding ends, one of which is slightly knobbed, maybe the proximal end of a pin. It has a round cross section and is made on a sectioned
sliver of bone from the end of a long bone. The surface has a dull even polish to it. (7.11) x 0.82 x 0.39cm x 1.63gm. (Fig.21k).

Of the three bird bones two are probably awl fragments. The third is broken longitudinally, with transverse cuts at both ends. This may have been a bone bead - 1.64 x 1.09 x (0.42)cm x 0.47gm.

Miscellaneous Utilized Bone

Six amorphous fragments of unworked bone that have been used enough to wear. This wear takes the form of rounding and polish. In some cases these signs may be related to post-depositional factors but, as they cannot be distinguished, all fragments fitting the above criteria are included. The first is a broken rib with highly polished edges as if used for scraping. Its faces are not polished. (5.04) x 1.50 x 0.36cm x 1.80gm. Another item is a small bit of bird bone that may be the butt end of a split bone awl. (3.22) x 1.0 x 0.35cm x 0.67gm. Two pieces of split mammal show some wear on their tips and split edges and are probably perforators.

Rodent Incisor Chisels

Two rodent incisors that are split and ground longitudinally and transversly. Both have irregular polls that have the higher points ground flat. These polls are roughly convex. Longitudinally the ventral faces have been ground flat after splitting. The larger specimen has a slight bevel to the ventral face resulting from an uneven split. Both have some of the root cavity remaining on the ventral face. In outline both bit edges are convex, in cross section they are plano-convex. The sides are parallel, the faces flat. The smaller specimen has the bit bevel extensively ground and is lightly knicked along the working edge. All the knicks are in the bevelled face. The larger specimen has the same wear pattern on the bit. In this case the bevel is natural as indicated by the concave surface of the bevel. This would seem to indicate that this specimen (and possibly the other) was intended to be this size and is not a bit worn beyond rejuvenation. This might imply a fairly specific type of haft. The specimen from the Marpole Component at Glenrose is heavily ground but three times as long. (Matson 1976a:173). It is unclear if other rodent incisors ("beaver teeth") from the south coast are this heavily worked - most illustrated examples do not seem to be, or are
split lengthwise in the plane perpendicular to these. 1.51 x 0.68 x 0.27 cm x 0.37 gm x 48°; 1.64 x 0.79 x 0.35 cm x 0.53 gm x 56°. (Fig. 18b,c).

Antler Ring

This fragment of a ring shaped object is made from a piece of an antler taken longitudinally from the side of the beam, it is not a transverse section of an antler. One flat side of the ring is cortex, the other is the spongy interior. Slightly less than half the ring remains with the break occurring along the grain. The exterior curve of the ring is ground to a convex shape. The interior curve is less regular, having been bifacially whittled to shape. The overall cross section is a rounded rectangle. Both sides of the ring are ground flat. The original exterior diameter would have been circa 3.5 cm, the hole would have been about 1.7 cm diameter. The ring width varies from 0.59 to 0.67 cm.

Other rings have been found at this site and in the region in general, but most are made of bone (Boehm 1973:115; Calvert 1970:61; Haggarty and Sendey 1976:40; Matson 1976a:169,171; Monks 1980:123; Trace 1981:147). A shale ring fragment from Montague Harbour I is very similar in size and shape (Mitchell 1971:119). The bone examples referred to above are of similar size and seem to have been manufactured in much the same manner. Ethnographically, antler rings are reported as "part of the composite toggling sea mammal harpoon apparatus" (Monks 1977:141). Antler rings were recovered in Deep Bay III deposits (Ibid:140,223). This artifact seems to have been chewed - probably by a dog. This may account for the break. (3.42) x (1.51) x 0.67 cm x 1.52 gm. (Fig. 22e).

Large Antler Chisel Haft

A large beam section of antler with a hollowed out slot at one end and a battered compacted poll. This specimen flares outwards at the slot end where it is chopped into a rough bevel on the sides and is bevelled by grinding on the faces. The faces are ground flat up their middles, more so at the distal end. As a result the cross section is a flat oval at the slot end and nearly round at the poll end. The sides are only partly ground with much of the original dimpled cortex remaining. The poll end has several long chunks driven off. Some longitudinal cracks arise from the poll end. The slot is a flat oval 5.13 cm wide by 2.1 cm thick.
It extends into the haft 4.37cm although the last 1.17cm constricts irregularly and was probably beyond the poll end of the chisel. The slot is somewhat eroded so could have held a blade rectangular in cross section. There is no sign of use in the slot nor at the slot end. This object probably held a ground stone chisel ('adze') blade. In terms of the slot and the battered end it is like the much smaller "antler tine chisel hafts" from Montague Harbour II and III (Mitchell 1971a:177,211) although in overall dimensions it is more similar to some of the double-socketed sleeve hafts found on the south coast (cf Haggarty and Sendey 1976:58; Hall 1968; Mitchell 1971:177; 1972:40). A narrower haft made from a broad antler tine that is similar in length but shows no battering was recovered from DcRt1 (Mitchell 1980b:48) and probably was a straight-adze haft. The specimen here described may have served a dual function as chisel and straight adze. 16.5 x 7.49 x 4.77cm x 250.75gm. (Fig.22a).

Mussel Shell Knife Fragment

Fragments of the dorsal half of the right valve of a Mytilus californianus individual. The posterior edge is ground flat and the hinge area is ground off to a flat surface. A small section of the anterior edge remains near the dorsal end of the valve - it too is ground flat. It is most probable that this is the held end of a mussel shell knife. Many complete examples have been recovered from Ozette which show grinding on all margins of the shell. This grinding is on a single plane and is best replicated by grinding the whole shell, concave surface down, on a large abrasive slab (G. Wessen, personal communication). This serves to sharpen the cutting edge at the ventral side of the valve. The hinge area on this fragment may have been ground at a different angle to the edges. Some examples are wrapped in bark on the holding end (cf Stewart 1973:161). Mitchell (1971a:215) cites several ethnographically known uses for such tools. Fragments of similar tools may have been recovered from Glenrose and St. Mungo before (Boehm 1973:125; Matson 1976a:177).

The length measurement is a combined one from two fragments for which an intervening piece is missing. The shell is thickest at the hinge (0.6cm) and thinnest at the opposite end (0.18cm). The shell is broken down the middle so the knife was probably at least 5cm wide. (8.3) x (3.0) x (0.6)cm x 8.58gm.
DISCUSSION

Three assemblages, distinct stratigraphically and in terms of their cultural contents, are easily recognized.

Assemblage I may be characterized by the lack of shell, the coarse nature of the sediments and the generally large size of stone tools found in it (Tables IV, V, VI). Artifacts are made only of chipped stone, with the exception of polished pebbles. This may partly be due to the criteria used for splitting artifacts by assemblage. However, there still would be a great majority of chipped stone artifacts.

There is no parallel to Assemblage I at the St. Mungo Cannery site. Calvert's excavations revealed a sterile layer immediately below shell rich deposits. The 1981 deposits were on a lower terrace and thus Assemblage I may be confined to lower elevations at the site.

Interpretation of Assemblage I deposits is difficult. It may represent a different activity area of early St. Mungo Phase, perhaps a beach that was used for some heavier tasks such as processing fish, large animals and/or wood. The tools in this assemblage (Table VI) might all be classified as processing tools with functions such as scraper, knife, axe, wood fibre creaser, and so on. There are no tools associated with manufacturing stone tools, heavy woodworking, procuring food or personal adornment. The features could result from processing activities too - for instance drying racks, stretching frames, and processing pits. However, they could also be the result of habitations or other structures.

Whether these patterns represent a different activity by the same group involved in Assemblage II or a different, earlier group cannot be answered without dates and a larger sample. However, it is tempting to draw parallels with the Old Cordilleran Component at Glenrose. The stratigraphy is very similar and the relative frequency of small stone tools are low, as are the frequencies for items associated with food procurement, the manufacture of stone tools and heavy woodworking (Matson 1976b: Table 17-1).

The sterile deposits of St. Mungo are probably riverine and potentially are more recent than 5500 BP. If this part of the site existed during the Old Cordilleran then it would not be surprising to find it was used. The St. Mungo Site would have been
## TABLE IV

### Distribution of Artifacts by Assemblage

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<tr>
<th>Artifact Class</th>
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<th>II</th>
<th>III</th>
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* Artifacts included in other classes - not counted twice.

* Discrepancies due to rounding
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<td>1</td>
<td>0.6</td>
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<tr>
<td>TOTAL</td>
<td>22</td>
<td>100</td>
<td>305</td>
<td>99.9</td>
<td>167</td>
<td>100</td>
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* includes chipped 'modified cobbles'
** includes pecked stone only (anvils and hammers)
<table>
<thead>
<tr>
<th>Artifacts found in Assemblage:</th>
<th>I only</th>
<th>II only</th>
<th>I &amp; II only</th>
<th>II &amp; III only</th>
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<tbody>
<tr>
<td>I only</td>
<td>Polished Pebbles</td>
<td></td>
<td>Large Unifacially Retouched Narrow Angle Flakes</td>
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<tr>
<td>II only</td>
<td>Bifacial Choppers</td>
<td>Chipped &amp; Ground Slate Fragment</td>
<td>Cortex Spall Tools</td>
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<tr>
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<td>Chipped &amp; Ground Slate Fragment</td>
<td>Incised and Shaped Sandstone</td>
<td>Unifacial Choppers</td>
<td>Contracting Stem Bifaces</td>
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<tr>
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<td>Incised and Ground Schist</td>
<td>Fired Clay Object</td>
<td>Split Pebble Tools</td>
<td>Large Unifacially Retouched Narrow Angle Flakes</td>
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<tr>
<td></td>
<td>Sectioned Bone Awls</td>
<td>Bone 'Wedges'</td>
<td>Small Unifacially Retouched Steep Angle Flakes</td>
<td>Small Unifacially Retouched Steep Angle Flakes</td>
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<tr>
<td></td>
<td>Bone 'Flesher'</td>
<td>Chipped &amp; Ground Slate Object</td>
<td>Pièces Esquillées</td>
<td>Bifacially Retouched Flakes</td>
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<td>Bone Blade</td>
<td>Ground Slate Fragments</td>
<td>Unformed Cores</td>
<td>Unifacial Choppers</td>
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<tr>
<td></td>
<td>Small Pointed Bone Objects</td>
<td>Chipped and Ground Celt</td>
<td>Small Utilized Narrow Angle Flakes</td>
<td>Split Pebble Tools</td>
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<td>Wide Point With Square Base</td>
<td>Pipe Fragment</td>
<td>Large Utilized Steep Angle Flakes</td>
<td>Large Leaf Shaped Bifaces</td>
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<td>Bevelled Skull Fragments</td>
<td>Hand Maul Fragment</td>
<td>Hammerstones</td>
<td>Contracting Stem Bifaces</td>
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<td>Bird Bone Tube</td>
<td>Split Bone Awls</td>
<td>Antler Stones</td>
<td>Large Unifacially Retouched Narrow Angle Flakes</td>
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<td>Possible Net Guage</td>
<td>Rodent Incisor Chisels</td>
<td>Abrasive Stone Fragments</td>
<td>Small Unifacially Retouched Steep Angle Flakes</td>
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<td>Tooth Pendant</td>
<td>Antler Ring</td>
<td>Stone Disc Beads</td>
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<td>Rodent Incisor Chisel Frags.</td>
<td>Large Antler Chisel Haft</td>
<td>Bird Bone Awls</td>
<td>Small Utilized Narrow Angle Flakes</td>
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<td>Antler Beam Wedges</td>
<td>Mussel Shell Knife</td>
<td>Bone 'Wedge' Fragments</td>
<td>Large Pointed Bone Objects</td>
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<td>Split-Antler Wedge</td>
<td>Ground Slate Knife</td>
<td>Bone Bipoints</td>
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<td>Antler Wedge Fragments</td>
<td>Ground Slate Fragments</td>
<td>Misc. Worked and Utilized Bone</td>
<td>Misc. Worked Antler</td>
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<td>Small Bilaterally Barbed Antler 'Harpoon'</td>
<td>Chipped and Ground Celt</td>
<td>I, II &amp; III</td>
<td>Mussel Shell Adze</td>
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<td>Misc. Worked Antler</td>
<td>Pipe Fragment</td>
<td>Medium and Small Unifacially Retouched Narrow Angle Flakes</td>
<td>Medium and Small Unifacially Retouched Narrow Angle Flakes</td>
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<td>Hand Maul Fragment</td>
<td>Large Utilized Narrow Angle Flakes</td>
<td>Large Utilized Narrow Angle Flakes</td>
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<tr>
<td></td>
<td></td>
<td>Split Bone Awls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rodent Incisor Chisels</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Antler Ring</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large Antler Chisel Haft</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mussel Shell Knife</td>
<td></td>
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</table>
more exposed, and might have bordered marine beaches. If so, it would have been the nearest beach to the Glenrose camp, and as such on the path to intertidal and littoral resource areas. Until completion of future studies this assemblage can only be included in the intriguing and ever growing list of small, undated lower assemblages.

Assemblage II can be summarized as a diverse mixture of artifacts, features and fauna contained in finely stratified layers of crushed bay mussel, black organic rich 'loam' with less shell and small ash lenses. Features may be more frequent near the bottom of the assemblage, but artifacts and mammal remains are more common nearer the top of what is left of the assemblage. This may reflect changing use of the site through time, or just shifting foci for the same activities. Whatever the case, use was far more intense than Assemblage I. Intertidal fauna are far more abundant, as are mammals and birds.

The artifacts reflect a diversity of activities at the site. There was probably heavy woodworking, processing of food, and manufacture of stone and wood fibre items.

The numerous features and diversity of artifacts suggests a wide range of activities on the site, as would be associated with a village or long term camp.

This assemblage agrees well with Calvert's Component I and the St. Mungo Component at Glenrose. There are a few differences, such as the quantity of utilized and retouched flakes, that are probably due to different sampling strategies. The low frequencies of ground slate and pecked and ground stone are in accord with previous definitions of the St. Mungo Phase, as is the presence of decorated incised stone, bone and tooth pendants, small bilaterally barbed antler harpoons, bone 'fleshers', bone and antler wedges.

There seems every reason to include Assemblage II with the St. Mungo Phase. The lower elevation of this material could imply slight differences for this area - perhaps an early (or later) occupation if the river levels changed enough, or different uses at the same time. However, there are no indications yet that any significant differences exist.

Assemblage III deposits are the upper (?) deposits on a low terrace next to the river. In at least one place they extend below the river level. The artifacts are notable for the substantial increase in ground stone - especially ground slate, and
pecked and ground stone. Several classes are unique to this deposit, many of which are associated with heavy duty wood working (Table VI). Celts, hand mauls and the large chisel haft are the prime examples. Also indicated is very fine carving - the rodent incisor chisels are purposefully small. The ground slate and mussel shell knife may be related to changing fish processing techniques.

The large amount of small crude chipped stone tools are mostly from one square (N24-25, E4-5), and are associated with a marked increase in lithic detritus. Many of these 'artifacts' may be the result of trampling or other non-deliberate factors, or they may be used for a specific task.

In general this assemblage agrees with Calvert's two upper components. It is difficult to associate it with Marpole or later phases. There are a few items that stand out, but the sample is too small to draw conclusions. The stone disc beads are usually associated with Marpole deposits. These are rare, but informants do mention large quantities eroding out of the bank. These beads are also found in Assemblage II, but there they may well be mixed from upper levels. Hand mauls and large celts (implied by the large haft) are associated with Marpole and later eras. Antler rings are ethnographically known. The pipe fragment resembles closely the Marpole Component pipe from Glenrose. Pipes like these do not seem to be known from anywhere else. The bifaces are inconclusive as well. At this stage we are only able to say that Assemblage III is probably much more recent than the other assemblages, falling either into the Marpole Phase or a later development.

SUMMARY

The 1981 excavations at St. Mungo confirm existing knowledge of the site and suggest a greater antiquity than previously suspected. There are tantalizing hints at a pre-St. Mungo occupation that may be associated with the older Glenrose deposits. The 'middle' deposits can be classified as St. Mungo or Charles Phase. They witnessed the most intense use of the site resulting in a high density and diversity of artifacts, features, layers and probably fauna. The St. Mungo phase is followed by much more recent appearing materials, but the incomplete record does not allow an assessment of the relationship between them. There could be an intermediate occupation lying under Assemblage III, or there may have been a hiatus in occupation between St. Mungo.
and these Marpole/Gulf of Georgia deposits.

As is often the case, more work at the site is badly needed. Fortunately, (and contrary to the usual pattern), a large scale investigation of this part of the site is on the drawing board. The near future should pull many answers from the holes in the ground and put them into the holes in our knowledge of this site.
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