COAST AND HINTERLAND:

THE ARCHAEOLOGICAL SITES OF EASTERN TASMANIA.

Submitted by HARRY LOURANDOS for the Degree of Master of Arts, Australian National University, May, 1970.

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CHAPTER 00

INTRODUCTION, THEORY AND METHOD

This thesis is concerned with cultural variation, with mainly its spatial-functional aspects, but also its diachronic, and the ways in which these can be detected archaeologically.

As a definition of culture, an interpretive or ecological one is preferred: "Culture is all those means whose forces are not under direct genetic control (i.e., extraneous) which serve to adjust individuals and groups within their ecological communities," (Binford L., 1968:32). Culture then could be expected to vary spatially in response to environmental variations, as it does chronologically. Separate cultural aspects could be expected to be found in different parts of the area. "This would have special implication for hunter-gatherer situations. Thus, without some control of this spatial variable, a diachronic cultural sequence, interpreted from evidence at one site, may lead to serious misinterpretation. Errors incurred in this way would be multiplied in cross-site comparisons of chronological sequences."

It is proposed here to study these spatial-functional aspects in view to relating them to the chronological cultural sequence in Tasmania.

As a study area, Tasmania had specific advantages, enabling a certain amount of control to be imposed on the evidence. (*)

(*. c.f. Binford S.R.; Binford L.R. 1968.)
CHAPTER ONE

INTRODUCTION, THEORY AND METHOD

This thesis is concerned with cultural variation, with mainly its spatial-functional aspects, but also its diachronic, and the ways in which these can be detected archaeologically.

As a definition of culture, an intergrative or ecological one is preferred: "Culture is all those means whose forms are not under direct genetic control (i.e. extrasomatic) which serve to adjust individuals and groups within their ecological communities." (Binford L. 1968:323). Culture then could be expected to vary spatially in response to environmental variations, as it does chronologically. Separate cultural aspects could be expected to be found at sites with separate functions.¹ This would have special implication for hunter-gatherer situations. Thus, without some control of this spatial variable, a diachronic cultural sequence, interpreted from evidence at one site, may lead to serious misinterpretation. Errors incurred in this way would be multiplied in cross site comparisons of chronological sequences. It is proposed here to study these spatial-functional aspects in view to relating them to the chronological cultural sequence in Tasmania.

As a study area, Tasmania had specific advantages, enabling a certain amount of control to be imposed on the evidence:

It is relatively small and physically isolated (and therefore to a large degree - if not totally-culturally isolated); from all existing evidence there appeared to be a general degree of cultural homogeneity, but by no means overruling the possibility of significant internal variation; the existence of a major internal environmental division.

It was proposed to carry out this study in two ways:

(i) by choosing two aspects of one defined ecological area; as a study area, a part of eastern Tasmania (a region undefined archaeologically and not professionally studied) was chosen and two sites were excavated. Eastern Tasmania forms a distinct ecological biome, and the aspect investigated was between a coastal and an inland site within close proximity to each other. I wished to look at their separate site functions and to see how these reflected the broader subsistence pattern within such a relatively small area.

(ii) to compare the above results with those obtained from a number of already excavated sites in the north-western corner of the island (Jones 1966) located in regions ecologically separate from the east.

Once in the field, I was forced to modify this original plan. The surface sites in the east showed distinct dissimilarities in composition and distribution to those I had observed in the north-west corner. I therefore proposed to construct a hypothetical interpretation based on my original observations, and to test these firstly in two ways - by an extensive surface survey in the east, followed by excavation of two eastern sites. Thirdly I had to widen the comparative material of the north-west and west also to include the surface evidence. I was able to carry out a certain amount of fieldwork in the latter area myself.

Both as a contrast and a check, the available ethnographic material was used alongside the archaeological evidence. The
final aspect was to integrate this spatial-functional evidence with the chronological. This was done by correlating the results with the chronological sequences interpreted from the north-west at Rocky Cape, and from my own excavations in the east.

2.1. THE ENVIRONMENT

As the archaeological discussion is set against the ecological divisions of the island, it is necessary here to outline the major ecological features of Tasmania, and man’s position within the ecology.

Eastern - Tasmania and its underlying islands are physically a part of the East Australian Highlands, and are now separated from the mainland by a shallow Bass Strait, 150 miles wide. In size, the island is 26,383 square miles, 300 miles from north to south, and 190 miles east to west. It is 0.3% the size of Australia, just under a third the size of Victoria.

"Australia, extending as it does well north of the Tropic of Capricorn and with much of its area in the zone of the sub-tropical anticyclones, is basically a warm, dry continent. By way of contrast, Tasmania is in the temperate zone and practically the whole island is well watered with no marked seasonal concentration; there are no desert or drought areas as found extensively on the adjacent continent." (Tas. Year Book 1969 : 34).

It lies between 42 1/2 degrees south of the equator and is equivalent in latitude to north-eastern Spain and extreme northern California, with which it shares similarities.

Unlike Australia, it is predominantly influenced by polar-marine air masses, and its inland position sheltered from the
2.1. THE ENVIRONMENT

As the archaeological discussion is set against the ecological divisions of the island, it is necessary here to outline the major ecological features of Tasmania, and man's position within the ecology.

a. General - Tasmania and its outlying islands are physically a part of the East Australian highlands, and are now separated from the mainland by a shallow Bass Strait, 150 miles wide. In size, the island is 26,383 square miles, 180 miles from north to south, and 190 miles east to west. It is 0.9% the size of Australia, just under a third the size of Victoria.

"Australia, extending as it does well north of the Tropic of Capricorn and with much of its area in the zone of the subtropical anti-cyclones, is basically a warm, dry continent. By way of contrast, Tasmania is in the temperate zone and practically the whole island is well watered with no marked seasonal concentration; there are no desert or drought areas as found extensively on the adjacent continent." (Tas. Year Book 1969 : 34).

It lies between 43½ degrees south of the equator and is equivalent in latitude to north-western Spain, and extreme northern California, with which it shares similarities.

Unlike Australia, it is predominantly influenced by polar-marine air masses, and its insular position sheltered from the extremes of heat and cold of more continental regions. Australia, excepting the Great Divide in the east, is a continent of low plateau and plain, with mountainous, Tasman is completely mountainous, with a larger proportion of high country in its total area than any other state. It has been described by the Hydrographic Department of the Admiralty as "probably the most uniform island in the world". (Tas. Year Book 1969 : 34).
extremes of heat and cold of more continental regions. Australia, excepting the Great Divide in the east, is a continent of low plateau and plains, with little relief; Tasmania is completely mountainous, with a larger proportion of high country in its total area than any other state. It has been described by the Hydrographic Department of the Admiralty as "probably the most thoroughly mountainous island in the world." (Tas. Year Book 1969:281).

b. **Ecology** - Tasmania, being an island, has its two major ecosystems (coastal and terrestrial) in close association. The island has a very extensive coastline of an estimated 900 miles with at least an added 500 if the offshore islands are included. Table 2.1 presents a comparison between the coastlines of the Australian states, indicating that Tasmania (excluding the offshore islands) has a larger coastline than either Victoria or N.S.W., with an area of 29 square miles to every mile of coastline. No point is more than 70 miles from the sea.

The terrestrial area can be divided into five major biomes corresponding to each of the major vegetational divisions of the island: rainforest, sclerophyll forest, sedgeland, coastal heath and moorland. These are discussed below.

c. **Climate**

(i) General - the climate is temperate marine, influenced by prevailing westerlies. A distinct continental effect exists,

1. Biomes on land are named after the predominant vegetation that has maintained itself in any given region. Knight (1965:337) defines a biome as "a climatically controlled area including a number of different communities in various stages of succession. The entire region is dominated by a typical climax type (climatic climax), but it will include a number of diverse climax types (disclimax, edaphic climax, and so on) in accordance with existing ecological conditions." This definition must be widened here to include ecological conditions maintained by extra climatic variables such as fire, and firing by man, basic to the ecology of Tasmania and Australia (Jackson 1965, 1968 (a), and especially 1968 (b)).

Fig. 2.1: Tasmanian Mean Annual Precipitation (after Davies 1967: Fig. 1.3).

Fig. 2.2: Precipitation Provinces (after Gentilli 1947; Davies 1967: Fig. 1.4).
Fig. 2.3: Structural Provinces (after Spry and Banks 1962; Davies 1967: Fig. 1.5).

Fig. 2.4: Relief Map of Tasmania (after Davies 1967: Fig. 1.1).
producing a small daily temperature range of 10°F at the coast, and double this inland. The mountainous topography, especially of the western half, produces a significant east-west variation.

(ii) Rainfall - the overall Tasmanian pattern is of precipitation from a general westerly circulation, modified by topography.

Figs. 2.1, 2.2 show a rainfall dichotomy between the superhumid and humid western and northern province, and the subhumid east. Average rainfall for the west ranges from 50 - 150 ins. annually (50-60 on the coast, 150 inland), with a heavy winter maximum including extreme 3-5 day rainfalls in late June. This is one of the wettest areas in Australia. Conversely a distinct rainshadow exists in the central, eastern and south-east areas. Lowest rainfalls occur inland where parts of the midlands receive 20 ins. or less annually. This area has only a one in two chance of receiving effective rainfall in midsummer. Everywhere else, effective rainfall (maintaining plant growth) occurs between May-October.

(iii) Snow - the heaviest snowfalls exist in late winter and spring. In June or July, unusual distributions of pressure systems can cause snow even at sea levels in the south.

(iv) Temperature - the highest annual temperatures occur in the east and south-east. The height of land in the west partly explains the lower mean temperature there. The Föhn effect is a further cause for higher mean temperatures in the east:

"Moist air from the west is cooled as it is forced to ascend over the western and central highlands; moisture is precipitated .... and the descending air mass is drier and therefore more susceptible to warming." (Tas. Year Book 1969:46).

d. Physical - An equivalent east-west dichotomy exists in Tasmania's physical structure (Fig. 2.3). The eastern fault structure province, with its tabular landforms, contrasts with
Fig. 2.5: Vegetation Map of Tasmania.

(After Davies 1964).

- Rain Forest
- Schlerophyll Forest
- Cleared Land
- Coastal Heath
- SedgeLand
- Moorland
the western and northern fold structure province of ridge and valley landscape. This structural division has been intensified by the precipitation. The only coastal plains are located in the north-west and the north-east, the only inland plain in the northern midlands. The land generally rises to its maximum on the Central Plateau (Fig. 2.4).

e. Vegetation

- Again a twofold division occurs. The wetter west shares floristic forms with New Zealand and South America - dominated by sub-antarctic rainforest; the dry east, predominantly Australian in character, is dominated by sclerophyll forest.

Great diversity in soil, local climates, and the rugged mountainous and hilly topography complicate this basic division. A basic simplified distribution of vegetation is shown in Fig. 2.5.

There are three main vegetation formations: austral-montane, temperate rainforest, and sclerophyll forest. However, these full climax conditions are not achieved because of the interaction of two intervening factors - fire frequency and soil fertility.

These produce a pattern of disclimaxes, grouped into the four categories of moorland, sedgeland, coastal heath and cleared land.

These formations are maintained and their area extended by the interacting process of length of time between effective firing and its effects on the original fertility of the soil (ie. increased leaching). The greatest effect occurs on already infertile soils.

The full effect has been to (i) extend the sclerophyll forms and sedgeland at the expense of the rainforest, shrinking the latter's climatic range; (ii) extend coastal heath and open grassland into areas where sclerophyll forest forms were climax types. A chief agent in the acceleration of this process (at least in the post-glacial period) has been man and his fire lighting activities (Jackson 1968; Jones 1968:205-210).

1. References: Curtis (1969:55-59); Davies (1964); Gilbert (1959); Gordon (1969:60-61); Jackson (1965, 1968(a), 1968 (b)).

2. Not differentiated is mixed forest and wet sclerophyll. These are included in the rainforest category. These areas are ecotonal between rainforest and sclerophyll in the humid and superhumid provinces.
Plate I

Plate II
Temperate Rainforest: it is dominated by Nothofagus, and has a range from sea level to 3,500 feet. It is the climax in regions where summer rainfall exceeds 2 ins. a month (55 ins. annually).

Sclerophyll Forest: it is dominated by eucalypts whose whole ecology, including regeneration, is based on frequent firing.¹ The division into dry and wet forest forms is based on structure rather than species distribution. (i) Dry Sclerophyll: (Plate 1). Found in areas of less than 30 ins. annually, where evaporation is high. It is relatively open forest becoming open savanna (Poa grassland) where rainfall is low (20 ins.) and fire frequency high. Such areas have been classed as open grassland. (ii) Wet Sclerophyll: Areas of 30-35 ins. and lower fire frequency. It has tall, dense understoreys. Areas with increased rainfall and decreased firing show a change to mixed forest (Plate 2).

Sedgeland: a widespread lowland community of hummock sedgeland, shrub moor and wet scrub. Its range is between sea level and 3,500 feet, and it occurs mainly in the west, in areas of high rainfall and poor soils. It occupies 47% of area climatically regarded as suitable for rainforest. Frequent firing has greatly extended its range beyond the edaphic limits.

Coastal Heath: found mainly in the north-west and north-east, with a general coastal distribution in narrow belts or infertile soils, limited by both salt and wind. Its range has been greatly extended by frequent firing, where poor forest would be climax.

Moorland: a non-forest, austral-montane vegetation, of low shrub and bog. It is distributed in areas 3,500 feet in the north, and 2,000 feet in the south.

¹ Jackson (1968(b):12) shows how the eucalypt has adapted to fire and poor soil conditions "by exploiting, accentuating and perpetuating the disclimax conditions."
Fig. 2.6: Distribution of Aboriginal Man. An extension on Jones 1968: Fig. 5, and including the surface collection of E. Rodway (pers. comm.).
f. **Fauna** - Comparatively little ecological information exists on the Tasmanian terrestrial fauna. The biome carrying the highest animal populations and distribution of species is the sclerophyll forest, with a wide variety of crustaceans, insects, birds, reptiles, monotremes and marsupials. However, both Poa grassland and coastal heath are very rich faunally; but unfortunately comparative population estimates between them and the sclerophyll forests are not available. Jackson (1968(b):15) shows how a rapid build up of marsupial populations reaching plague proportions (especially Brush Possum and Rufous Wallaby) is activated by the growth of fire weed, following forest burning. This effect would have provided a major incentive to Aboriginal burning. This aspect is best reflected in the Aboriginal extension of open grasslands capable of carrying perhaps larger marsupial populations than the surrounding forests. Moorland is not a rich habitat for terrestrial species, although sclerophyll communities extend here. The sedgeland biome, with its acid peaty soils providing unfavourable conditions for succulent herbaceous plants, is therefore the poorest terrestrial habitat.

Robinson often notes how in high rugged mountainous country, the macropods of the open forest and grasslands, are replaced mainly by wombat and possum. "In mountainous country I live on badger, porcupine, rats, grubs and possum; in clear country on kangaroo." (Robinson 1834, July 9). All this information indicates the attraction of the open forest and grasslands as areas of intensive terrestrial hunting.

2.2. **ABORIGINAL MAN**

a. **Distribution** - Fig. 2.6 shows an Aboriginal occupation

1. Main information comes from Guiler (1965)
of all terrestrial biomes excepting the rainforest. Both Hiatt and Jones have indicated how inhospitable a habitat the latter was for man, lacking available animal and vegetable foods, and being physically uncomfortable, if not impossible, to live in (Hiatt:199; Jones 1968:207). Ethnographic evidence exists for the penetration of the rainforest, but none for its inhabitation (Hiatt:193-4). The relative lack of evidence from the hinterland of the West Coast may in part be due to insufficient survey, but there is ethnographic evidence to show that occupation here did not extend far inland, being limited to the narrow belts of heath and sedgeland (Hiatt:193-4).

With climatic conditions similar to those of the present, the area of greatest terrestrial occupation would be the sclerophyll forest (including the cleared land) of the eastern half of the island. Apart from the central mountain moorland, the remainder of terrestrial occupation was limited to the narrow coastal biomes of coastal heath and sedgeland, in the west and north-west, and coastal heath in the north-east. This points to a significant division between the eastern and western distribution; between a terrestrial-coastal east, with a more or less balanced ratio of terrestrial area to coastline, and of a coastal west, with a low percentage of terrestrial area per mile of coastline. Because of the limitation of the rainforest, an ecological division for Aboriginal occupation can be drawn between a dry terrestrial sclerophyll east, and a wet coastal west.

b. Economy and Diet - From the ethnographic evidence Hiatt shows that the Tasmanian economy of terrestrial hunting and gathering, and coastal shellfishing and gathering, was carried out in all ecological regions (Hiatt:218). No ethnographic evidence exists for the existence of specialised inland or coastal economies. All Aboriginal groups seem to have had
access to the coast. One reference from the foothills of the Central Plateau (the Clyde River), mentions that the natives of this area must have gone to Swanport, on the east coast, a distance of at least 80 miles (Robinson 1831, Nov. 23). There is little conclusive evidence to suggest that some groups were more terrestrially, or coastaly oriented, for example:

(Robinson 1832, July 1) "The native women of the coast think themselves superior to the inland females because they can dive and get fish. The inland women on the contrary think themselves superior to the maritime tribes because they can climb trees for opossums."

Hiatt outlines the diet (Hiatt:109-127) as representative of all the occupied biomes, and including certain food taboos such as scale fish (island-wide), or regional taboos, such as penguin eggs, eaten by Bruny Island natives (south-east) but not eastern natives (Robinson 1830, Nov. 4).

c. **Seasonality** - Hiatt has shown that there was year round exploitation of both inland and coast (Hiatt:123). At least she could detect no seasonal variance. Aborigines were observed occupying highland country at all seasons, even during times of severe frosts and mid-winter: Mt. Claude - Mt. Vandyke, inland central north (Robinson 1834, July 12). This indicates the degree of climatic tolerance exerted by the Tasmanians. Also in certain areas some movement due to seasonal climate is evident. In the area of the upper Forth (inland north-west), Robinson observes that in August the country was deserted (seeing no fresh huts or fresh signs of natives) and he suspected migration at this time of year to the coast (Robinson 1830, Aug. 21). In the same area in the summer he notes: "From the number of uncouth hovels and the immense quantity of kangaroo which frequent the hills ... no doubt whatever exists in my mind that this country had been much resorted to during the summer months by numerous tribes of natives." (Feb. 1831, P. 237, Note 152).
Such movement could be expected in areas of high altitude such as the Central Plateau. On the edge of the latter (Patrick's Plains) in September during the snows, Jorgensen reports that the area is deserted (Jorgensen V.D.L. Co. 1828:70).

Three significant food sources can be singled out: (i) seal; (ii) mutton birds, lagoon birds and coastal birds; (iii) seasonal bird's eggs. (c.f. Hiatt:125-7). The sudden appearance of these sources would have exerted an important influence on Aboriginal economy and activity involving movement and concentration. Mutton birds occur all around the coast in September, and between November-March, both eggs and young birds being available (eg. Robinson 1830, June 21, north-west corner). Eggs of coastal birds (gulls, penguins etc.), and lagoon birds (ducks, swans etc.), are found in spring, between late August-October: "the natives towards the latter end of this month would traverse the coast in search of eggs." On this advice, Robinson proposed to go to Port Davey (West Coast) "as the natives in the interior will then flock upon the coast" (Robinson 1829, Aug. 3). Similar occurrences of the natives moving to the coastal lagoons at the egging season occur in the north (eg. Robinson 1830, Sept. 16, 18). Elephant seals, detected prehistorically in Tasmania (Jones 1966:7), possibly occurred on the coast three times a year, August-November, November-April, March-August.

Fur seals breed in late November - early December (Davies, Seals:4). The above evidence is incomplete but points to a definite seasonal optimum of these resources in spring-early summer.

Terrestrial animals also have a seasonal cycle of availability. The scarcity of terrestrial game is one reason mentioned by Robinson for Aboriginal movement to the coast to shellfish (Robinson 1829, Sept. 28; 1830, Oct. 18). There are several instances when Robinson and his natives had great difficulty in procuring game, (e.g. 1831, Nov. 23; 1832, May 10, June 22; 1834, July 4, 16).
2.3. **CONCLUSIONS**

Of the above information, certain main points can be extracted:

(i) There is a major ecological division within Tasmania, between the dry east and the wetter mountainous west.

(ii) Tasmania is a coastally oriented habitat, with a very large coastline in proportion to land. Significantly large, inhabitable terrestrial areas occur mainly in the east. These areas are large enough to have a certain continental effect on climate, yet no point is more than 70 miles from the sea.

(iii) Aboriginal firing of the vegetation has in effect extended the area of inhabitable land all around the island, at the expense of the rainforest, which is inhospitable to man, and distributed mainly in the west. It also had the effect of increasing animal population sizes in recently burnt off areas, rejuvenated by subsequent young regrowth.

(iv) The most productive terrestrial biome in food resources is the sclerophyll forest, and the least, excepting the rainforest, the sedgeland. Differences could then be expected in the Aboriginal inhabitation of these biomes.

(v) No specialised coastal, or terrestrial Aboriginal economies have been detected from either the ethnographic or archaeological evidence. A combination of exploitation of both coast and inland is apparent in all regions.

(vi) Although no marked seasonality occurs in the Tasmanian climate, three main seasonal food factors have been isolated. All would have exerted significant influence on Aboriginal activities. These factors are: seals, coastal migratory birds and lagoon birds, and the egging season. The latter two occur all over Tasmania, but the former appears to have had mainly a western and northern distribution. This too could be expected to have affected Aboriginal occupation and economy.
SECTION B

THE ARCHAEOLOGICAL EVIDENCE
SECTION B

INTRODUCTION : THE SURVEY

Method: An extensive survey was carried out along the east and south-east coasts, with less detailed extensions throughout the inland to the area of mountain moorland on the Central Plateau. Most of the observations in the west and north-west were carried out during participatory archaeological fieldwork in that area in 1965 and 1967. Finally, I managed to visit all major areas and habitats excepting the south-west.

Results: Significant differences were observed between the distribution and the internal composition of the sites in the east and south-east and those in the north-west and west. To demonstrate these differences more clearly, two chosen sites were excavated in the east, a coastal and an inland. From the surveys, it also became apparent that these regional differences appeared to correspond to the broad ecological divisions of the island. For example, there was a sudden division in site type between the area of the extreme north-east corner (Eddystone Point, north) and the remainder of the east coast. This division also coincided with an environmental change from sclerophyll forest to open coastal heathland. As this division was a meaningful one,

1. On both occasions, together with or under the supervision of Mr. Rhys Jones.
it was decided to integrate the archaeological material with these ecological divisions or biomes as outlined above (Chapter Two).

Henceforth the East has been interpreted here as the basically dry sclerophyll forest area with the exception of the coastal heath strip along the north-east coast and north-east corner. The latter area is referred to as the North-East. The West refers to the West Coast, the basically narrow coastal strip predominantly sedgeland, with some heath, backed by rainforest, and is subdivided into two sub-regions, northern West Coast and South-West. The North-West refers to the western half of the North Coast together with its hinterland extending back to the Central Plateau.

South-East, an area including greater Stora Bay, with an extension to include Great Oyster Bay, and the northern East Coast, the area north of the Freycinet peninsula.

The South-East is a complex of many protected and hilly bays, small estuaries and inlets. The only areas which front the open sea are the exposed coasts of Bruny Island, the Tasman Peninsula, and Maria and Gonipen islands. In contrast, the northern East Coast is mainly open to the sea with fewer protected bays and estuaries. There is no major change in coastal vegetation, the open forest often coming right to the water's edge.

The Eastern inland can be divided into two regions: the Midlands plateau of forest with open central Pietz grasslands; and the Lake Country of the Central Plateau consisting of thousands of lakes with patches of open forest. Two significant ecological features exist and can be linked with Aboriginal settlement: an elaborate series of waterways, lakes and swamps extending from behind coastal dunes to the Central Plateau; patches of open forest and grassland supporting large animal populations, especially Kangaroo. (Robinsam 1834: October - December).

The inland archaeological surface pattern extends, in less dense form, into the Mountain Moorland zone.
CHAPTER THREE

THE SITES IN THE EAST

3.1. ENVIRONMENT

The East refers to the sclerophyll biome. This habitat has no definite coastal plain, but consists of hills interspersed with small flats, and is immediately backed by the rugged ranges of the Midlands plateau. It can be divided further into the South-East, an area including greater Storm Bay, with an extension to include Great Oyster Bay, and the northern East Coast, the area north of the Freycinet peninsula.

The South-East is a complex of many protected and hilly bays, small estuaries and islets. The only areas which front the open sea are the exposed coasts of Bruny Island, the Tasman Peninsula, and Maria and Schouten islands. In contrast, the northern East Coast is mainly open to the sea with fewer protected bays and estuaries. There is no major change in coastal vegetation, the open forest often coming right to the water's edge.

The Eastern inland can be divided into two regions: the Midlands plateau of forest with open central Poa grasslands; the Lake Country of the Central Plain consisting of thousands of lakes with patches of open forest. Two significant ecological features exist and can be linked with Aboriginal settlement: an elaborate series of waterways, lakes and marshes extending from behind coastal dunes to the Central Plain; patches of open forest and grassland supporting large animal populations, especially macropod. (Robinson 1831: October - December).

The inland archaeological surface pattern extends, in less dense form, into the Mountain Moorland biome.
3.2. ARCHAEOLOGICAL SITES

a. Site Forms - Two basic forms can be defined.

(i) Concentrations - A build up of cultural material at a definite site-locus, clearly delineated in area, and of some depth. Coastal and estuarine shell middens and rock shelter deposits are examples.

(ii) Scatters - Extensive, undelineated cultural deposit extending over a very large area, fixed to no definite site-locus, and of little or no significant depth. Shell midden scatters (coastal or estuarine) and stone artefact scatters (inland and coastal) are the examples.

b. Site Types - Three types have been defined:

(i) Shell Middens - The remains of two types of shell middens: estuarine and rocky coastal, dependent on their constituent shell species, ultimately determined by the midden's ecological location.

(ii) Inland Scatters - Stratified deposit in rock shelters, or stratified or unstratified scatters in open camp. The open camp scatters are usually stratified. Shell midden deposits occur in (a) lunettes, (b) stream and rock alluvium, and (c) any form of sedimentary deposit, the most possible source being valley dunes (mentioned by Davies 1957:22-23).

(iii) Stone Quarries - These are located at the site of natural outcropping of suitable stone.

FIG. 3.1: Shell Midden Concentrations of Eastern Tasmania. (See Appendix 3.1)

6. Internal Structure (in terms of Excavation Evidence):

(i) Shell Middens (Fig. 3.1)

(a) Distribution - The protected bay estuarine type predominates in the South-East (Storm Bay, Great Oyster Bay), and the rocky coastal type on the coastal areas of the South-East, and especially along the open coastal areas of the East Coast. Location and morphology (as well as shell composition) of the middens appear to be...
3.2. ARCHAEOLOGICAL SITES

a. Site Forms - Two basic forms can be defined.

(i) Concentrations - A build up of cultural material at a definite site-locus, clearly delineated in area, and of some depth. Coastal and estuarine shell middens and rock shelter deposits are examples.

(ii) Scatters - Continuous and undelineated cultural deposit extending over a very large area, fixed to no definite site-locus, and of little or no significant depth. Shell midden scatters (coastal or estuarine) and stone artefact scatters (inland and coastal) are the examples.

b. Site Types - Three types have been defined.

(i) Shell Middens - These consist of two types, bay estuarine and rocky coastal, depending on their constituent shell species, ultimately determined by the midden's ecological location.

(ii) Inland Camps - Either stratified deposit in rock shelters, or stratified deposits or unstratified scatters in open camps. The open camp stratified deposits occur in (a) lunettes, (b) river and creek alluvium, and (c) any form of sedimentary deposit, a possible source being valley dunes (mentioned by Davies 1967:22-23).

(iii) Stone Quarries - These are located at the site of natural stone outcrops.

c. Internal Structure of the Sites (Surface Evidence):

(i) Shell Middens (Fig. 3.1)

(a) Distribution - The protected bay estuarine type predominates in the South-East (Storm Bay, Great Oyster Bay), and the rocky coastal type on the exposed areas of the South-East, and especially along the open northern East Coast. Location and morphology (as well as shell composition) of the middens appear to be
governed by those of the obtainable shell populations immediately associated. Large, concentrated shell beds are associated with similarly shaped middens; scattered rock populations along a beach front are associated with a continuous and shallow midden scatter. The middens have been accumulated directly on the coastline (or estuary), with few exceptions within a few feet of the shellfish habitats.¹

As yet no inland shell middens of riverine species have been investigated although such have been reported unofficially from the Midlands region.

(b) Composition - All shell midden types are composed of the following variables: 1. an almost total shellfish composition; 2. a high ash charcoal content; 3. extremely low frequencies of bone material, either of terrestrial or marine species; 4. low frequencies of flaked stone artefacts and of flaking floors; 5. few non-shell structural features, the one exception being small circular charcoal concentrations definable as hearths, and lacking in any stone superstructure.

Shellfish and Ecology - The bay estuarine type is composed of the mud feeding species oyster ("Ostrea angasi" Sowerby, 1871), and mussel ("Mytilus planulatus" Lamarck, 1819), and they occur together in differing ratios, or independently according to the structure of the associated shell populations. The rocky coastal type is composed of the exposed rock platform species; the dominant species in association here being the "Subninella undulata" Solander, 1786, and a species of Abalone ("Notahaliotis ruber" Leach, 1814).²

1. One aberrant example is of a rock shelter on the Tasman Peninsula, two or three miles inland, between Roaring Beach and Saltwater River, and a few hundred feet above sea level, where up to eight species of coastal shellfish were recognised. (Personal observation)

2. Isolated examples of middens predominantly composed of the Katelysia sp. have been noticed. e.g. Shelley Beach (North East Coast). (Personal observation)
Other shell species, less important economically to the Aborigines as a food source (such as lagoon forms), probably exist but have not been investigated. Some difference in shell collection can be expected between rocky coastal and bay estuarine middens because of the distinct energy expenditure ratio peculiar to either ecological zone. This ratio can be ascribed to diving into significant depths off an exposed rock platform as against collecting in a tidal estuary.

Location - Shellfish habitats seem richest at the mouths of small creeks and estuaries, probably because of the greater nutrient source in these locations. Also, rock species are more plentiful on larger exposed rock shelves, often coinciding with beach heads and promontories. Middens also seem densest at these locations which can be accounted for by these ecological reasons and not, as is often claimed, for reasons of cultural preference, for example, proximity to freshwater, or strategic reasons. (e.g. Crowther 1950:85; Legge 1928:327)

(c) Interpretation - These shell middens appear mainly associated with shell fishing, and reflect the immediate micro-environment. As a group they can be interpreted as specialised shell-dumps, with few other features associated.

By plotting the approximate volume, density and area of shell middens, the importance of certain coastal areas as foci of economic exploitation and activity can be noticed. The Tasmania-wide results (Fig. 3.4) show that the principal focus in the East was the Little Swanport estuary, and that major foci can be seen at the greater Storm Bay area (South-East), Great Oyster Bay, the North East corner, the northern West Coast. When the whole of the Tasmanian coastline is considered, Little Swanport emerges as possibly the principal shell fishery.

1. Personal communication with Alan Dartnall, Invertebrate Zoologist, Tasmanian Museum, Hobart.

2. A "focus" I have defined as a comparative convergence or concentration of activity at one site or locality.
Fig. 3.2: Eastern Tasmanian Inland Sites. Based on Davies 1967: Fig. 1.11 (lunettes) and Jones 1968: Fig. 6 (archaeological sites).
Fig. 3.3: Eastern Aboriginal Stone Quarries.
(See Appendix 3.2)
(ii) **Open Inland Camps** (Fig. 3.2)

(a) **Distribution** - These have a total blanket distribution across the entire sclerophyll forest biome (beginning from immediately behind the coastal shell middens) and have a high frequency around the lakes, marshes and waterways in the more open forested and grassed areas.

(b) **Composition** - The major constituent variables are:
1. relatively complex flaked stone assemblages; 2. extensive flaking floors, indicating both manufacture and use of the tools; 3. many water-worn pebbles and local stone lumps, with evidence of pounding; 4. pestles and mortars (in low numbers), a possible indication of vegetable foods (see below P.47); 5. a high frequency of red ochre; 6. charcoal scatters (in low frequency); 7. no surface evidence of any permanent structures.

(c) **Interpretation** - From the above description these site types are interpreted here as open, temporary camps, of indeterminable size, with an emphasis on flaked stone production and use. (For an explanation of these activities see the Crown Lagoon site below P.77f)

(iii) **Stone Quarries** (Fig. 3.3)

(a) **Distribution** - This conforms to the natural geological regions and the locations of natural stone outcrops. Almost the entire sclerophyll East (with the major exception of the Freycinet Peninsula and part of the northern East Coast), is located within one large outcrop area of chert-hornfels, the principal silicious stone material employed in Eastern Tasmania. Within this area natural outcrops are ubiquitous and plentiful, more so than in any other area of the island. So too are the native quarries. Often these natural outcrops are closely associated with the living sites, e.g. at Little Swanport.
3.3. CONCLUSION: TOWARDS A MODEL FOR THE EAST

The survey results were tested archaeologically by the excavation of two sites: an estuarine shell midden, Little Swanport, and an inland camp, Groote Lagoon, Shell midden sites reflect a very restricted use of flaked stone.

The following can be stated about the Eastern sites: shell middens reflect a closed estuarine coastal or estuarine exploitation system. They can be classed basically as shell-dumps. Inland camps produce a very different stone assemblage, closely associated with terrestrial hunting, and therefore can be associated with a larger environmental area. Stone quarries are abundant, and reflect only primary flaked stone implement manufacture; presumably the latter were employed elsewhere at sites such as the Groote Lagoon type, and in a more restricted way at sites like Little Swanport.
(b) **Composition** - These quarries consist of natural cores showing negative flake scars, a high frequency of primary flakes with bulbs, worked cores, and very low frequencies of retouched pieces.

(c) **Interpretation** - This site-type represents only the primary breakdown of raw materials into cores and flakes, with very little retouching carried out at the quarry. It can be assumed that retouch and use were carried out elsewhere, at sites such as the inland camp type. Shell midden sites reflect a very restricted use of flaked stone artefacts.

3.3. **CONCLUSIONS: TOWARDS A MODEL FOR THE EAST**

The survey results were tested archaeologically by the excavation of two sites; an estuarine shell midden, Little Swanport, and an inland camp, Crown Lagoon. A full excavation report of each of these sites is given in the following chapters, 4 and 5. The results from each excavation proved consistent with the survey results. This stands as verification of the predictions made from the surface evidence. On the strength of this it is valid to assume a certain reliability in both the archaeological evidence and its interpretation.

The following can be stated about the Eastern sites: shell middens reflect a restricted, predominantly coastal or estuarine exploitation, with terrestrial features very poorly represented. They can be classed basically as shell-dumps. Inland camps produce a very different stone assemblage, closely associated with terrestrial hunting, and therefore can be associated with a larger environmental area. Stone quarries are abundant, and reflect only primary flaked stone implement manufacture; presumably the latter were employed elsewhere at sites such as the Crown Lagoon type, and in a more restricted way at sites like Little Swanport.
All three sites are highly specialised, limited in function and interdependent. Both types of living site (inland camps and shell middens) are associated with the exploitation of a very limited range of micro-environments from those potentially available. In the main they are restricted to the exploitation of the immediate micro-environment. Both are of a temporary nature.

A model to fit these findings is the following: an Aboriginal exploitation of dual ecosystems - the coast and the sclerophyll inland - incorporating a number of temporary, dispersed, limited-activity sites. This can be seen as a nomadic and dispersed economic organisation depending on temporary and specialised camps located to independently exploit each micro-environment. This involves the two primary activities of almost exclusive shell fishing and other marine gathering activities on the coast and estuary, and the following and hunting of the game throughout the open and undulating forest.

There were no significant typological differences noticed in the flaked stone assemblages from the separate activity sites in the Eastern region. Stone typology did not appear cruder in the D'Entrecasteaux Channel area (South-East) as has been claimed by Crowther. (Crowther 1950:85)
CHAPTER FOUR

To test the validity of the observations from surface evidence in the East, two sites were chosen, each in a separate ecosystem: an estuarine shell midden and an open inland site. As a control, the sites were chosen on either side of one small river and were separated by 16 air miles distance from each other. The probability that the two sites were in the same cultural area and may have been used even by the same group of people was not unreasonable, because of their proximity and the common connection of the river which flowed through the only nearby connecting pass in the intervening mountain range. Supporting ethnographic evidence exists for the latter (see below).

In the excavation and analysis of the two sites, the objectives were basically functionalist and ecological. I wished to break down each site into a number of activity units so as to construct an overall site activity pattern. The main aspects looked for were: (i) the site's ecological role within its own area - whether it reflected a restricted environment (the immediate micro-environment) or a wider environment; (ii) the relationship of the site's activity pattern within that of the whole region; (iii) the possibility of change in this pattern over time.

* An investigation made of the pass, by us, found open midden of typical Eastern form on the river bank (e.g. at East's Dolly Creek) and utilized quarry sites, which demonstrate that this passage was well used by the Aboriginals.
4.1. **INTRODUCTION : OBJECTIVES AND METHODS**

To test the validity of the observations from surface evidence in the East, two sites were chosen, each in a separate ecosystem; an estuarine shell midden and an open inland site. As a control, the sites were chosen on either end of one small river system - the Little Swanport - the estuarine midden at its mouth and the inland camp on one of its tributaries (Crown Lagoon). Although the inland site was between 2-3000 feet above sea level and the shell midden right on the coast, they were only 16 air miles distance from each other. The probability that the two sites were in the same cultural area and may have been used even by the same group of people was not unreasonable, because of their proximity and the common connection of the river which flowed through the only nearby connecting pass in the intervening mountain range. Supporting ethnographic evidence exists for the latter (see below).¹

In the excavation and analysis of the two sites, the objectives were basically functionalist and ecological. I wished to break down each site into a number of activity units so as to construct an overall site activity pattern. The main aspects looked for were: (i) the site's ecological role within its own area - whether it reflected a restricted environment (the immediate micro-environment) or a wider environment; (ii) the relationship of the site's activity pattern within that of the whole region; (iii) the possibility of change in this pattern over time.

¹. An investigation made of the pass, by us, found open camps of typical Eastern form on the river bank (eg. at Goat's Gully Creek) and utilised quarry sites, which demonstrate that this passage was well used by the Aborigines.
Plate III

Plate IV
4.2. LOCATION

Little Swanport is a sheltered harbour, the largest on the Tasmanian East Coast, protected by surrounding wooded hills, and rugged mountain tiers in the west, from which the small Little Swanport River drains into Great Oyster Bay. The vegetation of the area is dry sclerophyll forest, some of which still remains thinly around the estuary, coming right down to the water's edge (Fig. 4.1). It is a situation typical of the Eastern habitat.

LS II is one of a series of many shell middens that line both sides of the estuary, including the central islets (Fig. 4.2). These conform to the bay estuarine type of midden and are distinguishable from those at the open heads of the estuary, and lining the exposed Great Oyster Bay which are of the rocky coastal type.

Since the intrusion of early European settlement, the marine ecology of the Little Swanport estuary has been seriously disrupted mainly due to two factors: (i) the extensive deforestation and pastoralism causing a silting up of the estuary and subsequent, almost total anihilation of the existing shell beds; (ii) overfishing of the shell beds in the latter half of the nineteenth century. By 1882 the beds of Little Swanport and Greater Swanport had been either commercially extinguished, or killed off. Before this, Swanport had been one of the chief five oyster fisheries listed in Tasmania, with recorded single hauls of 5,000 shellfish.

4.3. CHOICE OF SITE

Of all the areas in Eastern and South-Eastern Tasmania, the Little Swanport estuary appeared to have by far the largest density

1. Davies 1967:20
2. Report To The Fisheries Royal Commission of Tasmania, 1833 : 83
3. Ibid : x
Fig. 4.1: The Little Swanport Estuary. Drawn from an aerial photograph (Lands and Survey Dept., Hobart)

- area of Fig. 4.2
- shell midden concentration
- sand banks
and concentration of shell midden, a fact verified by the above Fisheries' statistics (above Fig. 3.4). This evidence allowed the estuary to be considered as potentially the most significant coastal focus of activity on the East Coast. In this way it appeared to represent the most likely comparison with the excavated sites of the North-West and especially the open site of West Point, located on the northern West Coast.

The site I chose for excavation, LS II, is an individually located, concentrated and high conical shaped midden, at the mouth of a creek, which runs from a north westerly direction into the estuary, and is situated immediately above a stony platform once probably a rich shellfish bed. Its solitary nature allowed for a size estimate to be made of the midden itself, and of the sample excavated, and its concentrated and high conical shape provided a clearer stratigraphy and cultural succession, than would the more extensive and undulating middens in other parts of the estuary. After observing the nature and content of all these middens, I hoped that this site would provide a typical sample of the estuary.

4.4. DESCRIPTION AND HISTORY OF THE LITTLE SWANPORT MIDDENS

a. Description and Distribution - Morphologically the Little Swanport middens are undulating and continuous, following the unbroken line of shell beds, lining both banks of the estuary. They are most extensive by far on the southern bank, where they cover many acres, with dense extensions up to 2-3000 yards inland. A very large quantity of midden has been destroyed, especially on this southern bank by commercial lime burners1 and many open sections are visible, some up to 8 feet deep, showing dense concentrations. The grassy twin conical islet immediately east of LS II was visited and observed to be wholly of human deposition,

1. Taylor 1891: 90
set on a shallow rocky knoll. Its composition was totally of shell with little charcoal or ash visible, and no stone artefacts. In contrast, the other middens of the estuary were associated, at all places observed, with a very light scatter of finished flaked stone artefacts, especially along the stony strand, where the artefacts seemed to be remnants of eroded middens. At no place was bone material detected except for one fish bone (leatherjacket) from the lower layers of a midden directly west of LS II.

In the Little Swanport estuary the archaeological remains do not cease near the shore with the shell middens but extend back into the one-time forest (now the open paddocks) as a scatter of flaked and abraded stone artefacts, conforming to the definition of open camps (above). Some light shell scatters are to be found up to many hundreds of yards inland, but are at no place concentrated nor extensive. In no way does Little Swanport seem to deviate from the general definition of a bay estuarine situation.

b. Recorded History - The first serious recognition of the Little Swanport shell middens was made by A.J. Taylor (Taylor 1896). While engaged in commercially exploiting the middens for lime he became interested in their anthropological implications, and actually carried out a small excavation on the southern bank, to verify that the middens were of human deposition. His is probably the first investigatory excavation of any Aboriginal site in Tasmania. In amongst the thick shell material he came across charcoal, one flaked stone implement, a bone spatula¹, and from the commercial excavations, some marsupial bones. From the size of the middens he made an attempt at reconstructing

¹. He was the first to identify this artefact type.
Fig. 4.2: Ground Plan of the Little Swanport Excavation (LS II)

H = high tide
L = low tide
\text{rock}
Plate VII

Test excavations were carried out at LB II in squares A, B, C and D. Square C (located on the slope of the hill behind the midden masonry) revealed about 6 inches of shell midden, and a couple of stone flakes, demonstrating that there was a significant

Plate VIII

Having favourably compared our finds from these excavations with those of the field survey, and the observations of Taylor et al., the above sample seemed reasonable, and is in fact by archaeological
their rate of accumulation, and finally deduced that "the spot must have been frequented by the natives for a very long period of time." (Taylor: 92).

Pulleine (1929:312) and Crowther (1950:84,86) mention the extraordinary size of these middens in comparison to any others in Tasmania, Pulleine calling them "the phenomenal deposit" and "the most outstanding monument of the Tasmanian of the past". All describe the dense, predominantly shell content, and from the southern bank, Pulleine and Crowther mention the finding of bone spatulae, and Crowther of human remains (Ibid: 86). All these observations were verified by my own excavations, except that of the human remains.

4.5. EXCAVATION METHOD

Test excavations were carried out at LS II in squares A, B, C and D. Square C (located on the slope of the hill behind the midden nucleus) revealed about 6 inches of shell midden, and a couple of stone flakes, demonstrating that there was a significant though minor extension of the midden pattern for a good distance around the nucleus. This has been observed in the surface evidence. The main excavation was carried out in January 1968.

A set of thirteen squares were laid out (Fig. 4.2), based on a grid (including A, B and D of the test excavation), in an attempt to sample as wide an area, and as large a volume, as possible. This was designed to test for possible spatial differences in activity areas across the site. Approximately 1,035 cu. feet were excavated, and an area of 325 sq. feet. This is 1% of an estimated area of approx. 30,000 sq. feet, of the whole of LS II.

Having favourably compared the results from these excavations with those of the field survey, and the observations of Taylor etc., the above sample seemed reasonable, and is in fact by archaeological
standards quite a large one.

Excavation was carried out basically in 6 inch spits, with concessions made to stratigraphical variations, and each spit was again divided into four quarters. All material was put through an 8 mm sieve, and at least every fifth bucket put through a fine 3 mm sieve, to detect for the presence of any finer material.

4.6. STRATIGRAPHY AND STRUCTURAL FEATURES

a. Stratigraphy - A cross section of the site is shown along the north-west section walls of seven squares, and encompassing a length of 52 feet (Fig. 4.3). The stratigraphy consists of an intricate complex of shell lenses. The one non-shell feature present is a marked increase in humus, associated together with a noticeable colour change from grey-brown to dark-brown, in the whole lower third of the site. This has been verified by the soil analysis (below), and may be due to a difference in climate during the early stage of the midden's accumulation. The one other stratigraphical feature of significance is a relatively narrow all mussel shell lense, which extends across most of the site, located about one third of the midden's height from the base. It can be seen in the deeper sections, L, A, N, K, and M. It is discussed below (P. 38), and it too appears possibly related to some climatic variants, most probably a part of that mentioned above.

The stratigraphy is more complex, and deeper in the area of the midden's apex, and least in the shallower deposits towards the midden's outer perimeter, away from the water. This indicates that the midden was being accumulated more rapidly in the area of the apex.

b. Structural Features - Two major lense compositions exist:
   (i) loosely compacted lenses, mainly of whole shell, obliquely (even vertically) positioned, with little ash, charcoal and humus intermixed; (ii) densely compacted lenses of whole and broken shells,
Fig. 4.3: Little Swanport Stratigraphy.
The West-North Section

I e-s H e-s M w-n K w-n N w-n A w-n L w-n

- disturbed
- very loose
- loose & gritty
- compact
- tightly compact
- gritty
- ashy
- mussel lens
- unexcavated clay base

shell in clay
stone

datum
high tide

0 5 ft.
horizontally positioned in a dense matrix of ash, charcoal, and humus. Because of the way these are interspersed throughout the midden, from top to bottom, it appears more feasible that they are the primary product of the accumulation and use of the midden as a living site, than due in the main to secondary factors such as slumping etc. In the latter case a more uniform midden-wide trend could be expected.

The loose lenses have the characteristics of loosely accumulated rubbish heaps, and the compacted lenses of downtrodden living floors on which presumably most of the activity took place. A close archaeological analogy to this situation was observed in the Rocky Cape V cave, where the central area of the cavern floor was downtrodden and ashy, encircled by loose piles of midden. If the structural composition of LS II is viewed this way, the whole site can be seen as a shifting series of living floors and dumps, together with intermediate forms of these (Fig. 4.3).

One general trend visible is that in the deeper squares around the apex the deposit appears to be looser in the upper layers, and more concentrated in the lower, though loose layers also occur here. The deposit is concentrated throughout the shallower outer squares. This infers that in the area of the apex there had been more living floors in the lower horizon, with the upper horizon used more often as a dump. Further inference suggests that the midden has steadily been shifting away from the water, with a looser more rapidly accumulating dump developing in the area of the present apex.

Apart from these shell structures, the only other structural features were small circular charcoal concentrations, (c. 6 inches diameter) interpretable as hearths, as well as charcoal scatters and ash lenses. The latter two were far more numerable than the former, suggesting that the preservation of hearths had been much

1. Jones and Lourandos 1967 (Unpublished)
Fig. 4.4: Ground Plan of Features (LS II Squares D and N).

- animal/bird bone
- fish bone
- sea urchin
- pounder
- red ochre
- bone spatula
- dolerite
- hearth
- charcoal patch

\_\_\_\_ - very loose shell
\_\_\_\_ - loose shell
\_\_\_\_\_\_ - compact shell
Fig. 4, 5: Distribution of Charcoal.

4.7. Distribution of the Holes

This has been analysed in two ways: (1) by a chemical analysis of three soil samples, stratigraphically positioned, and (2) by an analysis of 10 soil samples.
disrupted by subsequent human activity, while the midden was developing. This is further strengthened by the fact that all other major cultural variables - such as flaked stone and bone - were distributed rather evenly throughout the deposit, not concentrated enough to allow for a closer definition of more specific activity areas. Due to this basic uniformity and lack of definite structures, it became difficult to construct a plan of the features in each spit, and each square. As a sample these have been reconstructed for squares D and N (Fig. 4.4).

A graph of the charcoal collected from each spit representing the general distribution of hearths and fires throughout the site appears in Fig. 4.5. This indicates: (i) the fluctuating nature of hearth areas; (ii) the greater concentration of hearths in the deeper pits (around the apex); (iii) a marked tendency for greater concentrations in the lower layers of the deeper pits. These results correlate well with the results from the shell structures (above).

As evidence for shelters of some kind used on the midden there was only one post hole (diameter 1.2 ins., 6.5 ins. deep) found at the base of the shell midden in square E, extending into the clay below. The detection of other postholes may have been prohibited by the exclusive shell consistency of the midden. Terrell (1967: 47) found that post holes were readily noticeable in the sand beneath the shell midden layers in a site on Ponui Island (New Zealand), but could detect none within the shell midden layers themselves.

4.7. COMPOSITION OF THE MIDDEN

This has been analysed in two ways: (i) by a chemical analysis of three soil samples, stratigraphically positioned; (ii) by an analysis of 11 solid samples.

1. The analysis was carried out by D. Smith, Laboratory Assistant, Department of Anthropology (Temporary) University of Sydney.
a. **Soil Analysis** - The three samples were chosen from square L, spits 3, 7 and 11, corresponding to the top, middle and bottom layers.

(i) Method\(^1\) - the solid sample was sieved through a 2 mm sieve, and 10 grams of fine fraction was taken as the soil sample. The latter was treated with Hydrochloric Acid (HCl) to dissolve all shell (calcium carbonate CaCO\(_3\)). The amount dissolved equalled the amount of shell present. The residue was then burned in intense heat, the amount burned equalling the amount of organic/charcoal content, and the residue equaling the amount of soil (silica and negligible quantity of ash).

(ii) Results -

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>SHELL</th>
<th>CHARCOAL</th>
<th>SOIL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>L(3)</td>
<td>7.9gms (79%)</td>
<td>1.1 gms (11%)</td>
<td>1.0 gms (10%)</td>
<td>10.0 gms</td>
</tr>
<tr>
<td>L(7)</td>
<td>8.3gms (83%)</td>
<td>0.75gms (7.5%)</td>
<td>0.95gms (9.5%)</td>
<td>10.0 gms</td>
</tr>
<tr>
<td>L(11)</td>
<td>6.63gms (66.3%)</td>
<td>1.25gms (12.5%)</td>
<td>2.12gms (21.2%)</td>
<td>10.0 gms</td>
</tr>
</tbody>
</table>

There is close agreement between the samples from the upper and middle spits, 3 and 7; shell making up the bulk of the constituents (c. 80%) with rather equal amounts of charcoal and soil. The lower sample, spit 11, shows a 100% increase in soil content (21.2%), and an increase in charcoal (12.5%) with a consequent lower representation of shell (66.3%).

These results correspond with the stratigraphical analysis (above). This increase in soil and charcoal in the lower third is apparent across the whole site, and could be a product either of (i) a greater soil (and charcoal) activity due to environmental factors during the earlier period of the midden's formation, or (ii) secondary effects of deposition such as percolation of material downwards. As there is strong evidence for more arid climatic conditions than those of the present coinciding with this early phase (see below P. 120), the former explanation seems to agree with the evidence.

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1. The analysis was carried out by D. Smith, Laboratory Assistant Department of Anthropology (Prehistory) University of Sydney.
b. Solid Sample Analysis -

(i) Method - the method followed was the same as that used at Rocky Cape V (Jones and Lourandos 1967), and basically corresponds to that used by Terrell (1967:47f.). The following conclusions of Terrell's study were employed in this analysis:

- (i) that the factor of dehydration had no effect on the results if it were constant throughout all the samples (P.51);
- (ii) that the use of 500 gms was a reliable sample (P.51);
- (iii) that his overall error due to sampling was less than 2% (P.51);
- (iv) that the ½ in. size sample provided a reliable estimate (P.53).

Samples were taken from a volume of 1 ft. x 1 ft. x 3-4 ins. from each spit of the excavation, and of these 11 were chosen for analysis from two squares, L and N (L : Spits 1,3,5,7,9,11,13; N : Spits 5,6,7,8), as representative of those squares. All 11 were dried, and those in the basal levels which contained much clay were washed and dried, and the residue kept. Each was then passed through a series of sieves of 8 mm, 5 mm and 3 mm fractions, resulting in 4 samples (which included the 3 mm residue). Only the 8 mm fraction was used for the analysis of the percentage of each variable. The results including those of each main variable, and the three smaller fractions is represented in Figs. 4.6, 4.7.

(ii) Results - the mean average results (Table 4.1) show a total of 95.8% shell, 3.9% dolerite, with a remainder of 0.2% (including imported flaked stone, red ochre, charcoal, land snail, barnacle, marine worm cast, and wood (?)). Significantly no bone was found in any of the samples.

There seems to be some fluctuation in the total 8 mm fraction (Fig. 4.7) with a higher representation in the middle layers. This appears to correspond to the structural differences within the shell lenses - between concentrated and loosely compacted lenses - which can be explained more satisfactorily as a product of human deposition rather than some other variable. Of the three
smaller fractions, there seems to be a general uniformity, with an overall tendency towards slightly higher representation in the lower layers. This corresponds to the soil analysis of greater soil and charcoal quantities in this horizon.

4.8. **FAUNAL REMAINS**

The faunal remains of LS II are analysed here as a reflection of the food procuring activities immediately associated with the site. No attempt is made at assessing their dietary significance.

a. **Preservation of Evidence** - Samples from three different layers, top, middle and bottom, of the site (Spits L3, L7, and L11), all showed a pH of 8, indicating extremely favourable conditions for the preservation of bone. In spite of this the frequency of bone material in the site was extremely low. The contention here is that the low frequency of bone is due to cultural factors and not to preservation. This is based on the following:

(i) the pH of the soil supports this claim; (ii) bone was found in all levels of the midden, top to bottom; (iii) delicate fish bone was well preserved in the lower third of the midden; (iv) the low frequency, distribution and composition of the flaked stone assemblage correlate closely with the bone material; (v) shell was well preserved in all layers, though better in the top half.

b. **Shellfish** - The analysis of the shellfish evidence was carried out from the 11 samples used in the analysis of the midden's composition (above). All the results come from the large 8 mm fraction. The mean average results of these is shown in Fig. These show the overwhelming representation of oyster (79.2%).

1. This pH value is equivalent to that from West Point which was between 8-9 (Coleman:27). In contrast to LS II the calculation of meat from the bone material present indicated a high percentage coming from marine and terrestrial mammals (below P.83).
Fig. 4.8: Size of the Archaeological Oyster Shell Population

- top two thirds of deposit (L1-7,N5)
- bottom third (L9-13,N6-8)

Fig. 4.6: Total Midden Composition
Fig. 4.7: Total Shell Composition

The archaeological Oyster population and initial analysis of the samples (17) revealed individuals of oyster were selected for assessment and each was divided into two chronological samples for more accurate measurement of length. The graphs show the populations participating respectively from top to bottom. From this it can be seen that these values are representative of the population. Analysis of the assemblage of the residue indicates that the oyster population was predominantly composed of the larger sized shells, averaging 80 mm. However, convincing this sight appear in suggesting cultural preference with the living shell population, there is no way of verifying whether the archaeological results represent cultural selection or the living population.
as opposed to the significant representation of mussel (21.0%),
and the very low 2.2% for the remaining species. Of the latter
only the whelk (1.0%) can be considered significant in proportion
and as a source of food. Whelk sometimes occurred in clusters
within the midden probably biasing one of the samples used
(L2 in Fig. 4.7). All the remaining shell species, apart from
subninella, could be expected to have been collected indiscriminately
along with the oyster and the mussel. Both the dominant species
are mud-feeders, and would have lived in an estuarine habitat,
similar to that immediately associated with the midden. The
minor proportions of rocky coastal species, such as the subninella,
may have been imported from the coast (c. one third of a mile away),
or more likely have been extraneous inhabitants of the estuary, and
in low numbers. Scallops live in habitats too deep for profitable
human exploitation, and infrequent examples represented in the
midden probably are of aberrant cases.

(i) The Archaeological Oyster Population and Cultural Selection -
of the 11 samples the 173 unbroken individuals of oyster were
selected for measurement and divided into two chronological
groups : the top and the bottom halves of the midden. The lower
valve was chosen for more accurate measurement of length.
Fig. 4.8 shows the populations reconstructed respectively from
both samples. There is significant agreement between the two
populations. From this it can be stated that there was no apparent
change in the oyster shell collecting activity of the site over time.
Further the graphs are unimodal, and negatively skewed. This
indicates that the oyster population was predominantly composed
of the larger sized shells, averaging around 8 cm. However,
convincing this might appear in suggesting cultural preference
of the larger shells, without comparisons with the living shell
population, there is no way of verifying whether the archaeological
results represent cultural selection or the living population.
Terrell (1967: 55-60) demonstrates by sampling both the living and archaeological pippi shell populations how a similar negatively skewed graph of the archaeological population apparently was a natural one. He warns against the dangers of ignoring the natural evidence (P. 55). However a difference could be expected between the scooping up of large numbers of sandy shell species (as in Terrell's example) and the hand picking of rock fast estuarine mud oysters and mussels, as at Little Swanport. Some sort of selection might be expected in the latter situation, but without verification this remains a supposition.

(ii) The Shell Population Over Time - although there appears to be no apparent change in the oyster collecting activities over time, there does appear to be a change in the differing ratios of oyster and mussel collected. Fig. 4.7 shows the separate frequencies of oyster and mussel over time in 2 squares, L and N. In both squares there is a marked tendency for oyster to drop from 80-90% representation in the top spits to c. 50% and lower in the lower third of the midden, (rising again at the base of the midden). Conversely there is an equivalent rise in the representation of mussel, which surpasses oyster in sample 10. This observation is verified by the stratigraphy where at this point in the midden appears an extensive mussel lense (above). Thus it appears that at one time either there was a change brought about in the composition of the shell bed reversing the ratio of the dominant species or that this was due to some cultural factor, such as the decline in the preference of oyster over mussel. The former explanation seems more plausible for two reasons: (i) mussels are a far less economically profitable food source than the very large mud oyster; (ii) the evidence for a mid-Recent climatic high of more arid conditions than the present with intermittent stream aggradation in Eastern Tasmania (below P. 120). This climatic variation has already tentatively
been recognised as possibly responsible for certain variance in the midden's composition (above P. 31). The latter seems to be the more likely explanation for the following reasons: (i) increased aggradation would cover the shell beds with amounts of sand and silt. Such a situation would disrupt the oyster populations (as it has the present day populations) with mussel possibly being less affected; (ii) a warmer climate may also have affected successful oyster breeding, the mud oyster being a southern Australian animal.

It cannot be inferred from such a short analysis how serious the disruption of the shell beds was. A comparison with the present day oyster population in the estuary (above), indicates that it could have been very serious, even producing a major threat to the marine food supply.

It is interesting to ask if this climatic phase had any connection, direct or indirect, with the cessation of scale fishing, which occurs approximately synchronously with the mussel lens.

(iii) The Collecting and Eating of the Shellfish - there is much detailed ethnographic evidence to show that shellfish was collected by the women and that the shellfish were broiled in their shells on the coals (see below P. 57). The archaeological evidence at LS II with its dense distribution of charcoal lenses and hearths is a verification of this, unchanged for the entire duration of the site. As well, this is verified by the shellfish evidence. A check was made of all the whole oyster shells from the 11 samples. Of these only 11 (6.4%) had positive or dubious fractures at the lip, indicating that they might have been prised open. There is ethnographic evidence of wooden spatulae being used for shell fishing, at least in rocky coastal situations.

Labillardiere provides evidence on their manufacture: "We observed some of the savages employed in cutting little bits of wood in the form of spatula, and smoothing them with a shell, for the purpose of separating the rock limpets and sea-ears" (P.306). It is quite possible that such spatulae were used in the collection of estuarine species. No positive shell implements were identified in the field, and an inspection of the 11 samples produced only 1 (2.9%) identifiable as showing possible use signs, and 4 less possible examples. Many of the mussel shells have fractures but it was impossible to distinguish these from breakage.

(iv) Dolerite - a further factor represented in very large quantity at Little Swanport, which seem to be directly connected with the collecting of shellfish is lumps of local dolerite. These today make up the stony shore and bed of the estuary, and are scattered widely overland. In the site their distribution is widespread, dense and relatively constant. Recorded from the site were 3,909 pieces, comprising an estimated approximate weight of 1.25 tons. No macroscopic signs of use wear were apparent but on a number of examples that were looked at under a microscope, a few very minor signs of wear were observed. This did not indicate any significant use of the stone. In contrast many of the stones were found in the deposit with oyster shells still adhering to them. Their great frequency allows them to be associated with the one variable of equal frequency, the shellfish. Thus the stone is interpreted as derived mainly from the estuary floor, collected along with the shellfish, clusters of which were probably attached. Of the few remaining living shellfish near the site, most can be seen growing on stones in such a way. This is clear evidence for the shell collecting methods employed.

1. At no time within the deposit were these stones noticed to form a hearth or any defineable structure. The total weight has been calculated from 11 of the 15 excavated squares.
by the Aboriginal women.

c. Terrestrial Fauna (And Avifauna) - All the excavated terrestrial fauna consisted of mammals. Of an estimated 69 individuals, 60 were of land mammals, 8 of birds with 1 unidentifiable. Apart from these 69 individuals there were other unidentifiable fragments of bone found (Fig. 4.9), but not in quantities significant enough to alter the overall impression of a very low frequency of mammals and birds. The list of individuals appears below (Table 4.3) with the terrestrial mammals listed in two ways: (i) those identifiable into species and families; (ii) those unspecified but divisible into size classes from very small (i.e. small bandicoot size) to large (Forester Kangaroo size). Table 4.4 groups all the land animals into size classes to demonstrate the range of animals hunted.

(i) Results - the animal species identifiable represent a general range of sclerophyll forest forms, including Forester Kangaroo, wallaby, bettong, possum (including Brush Possum), rodents (including the water rat), bandicoots, and rat kangaroo. There appeared to be no marked representation of any one species to infer any marked cultural selection. The range of animal sizes shows that most individuals present were either of medium size (33%) or medium-small to very small (48.3%), with only 18.3% medium-large, or large. Whether this size range reflects that of the living animal population, or again some form of cultural selection cannot be verified without comparative evidence of the structure of the living animal population. There were no significant differences detected in the animal population excavated, over time.

(ii) Distribution - there appears to be a minor discrepancy in the frequency of this faunal evidence between the top, middle and bottom zones of this deposit. There are 26 (37.6%) individuals
from the bottom. This could be explained by the difference in the physical disposition of the animal being lower and closer to the lower half, and more compressed, broken up and wet in the lower. The preservation of the laboratory, in the lower half, was in part by removal, but here some fish retrieved from the shellfish bed layer (area L). However, the condition that shellfish were found in these two areas are significant food sources. Graphic censuses are not significant in the area habitat and were probably imported to the area. The graphic casings of shellfish were carried from the coast (Sullis 1953: 3). All shellfish forms are the same, and therefore may have been fished in the area. There is a firm consistency in the fishing methods used. The only other species of shellfish was the sea-urchin which could have been caught either in the estuary or on the coast.

Fig. 4.9: Distribution of Land Fauna (and Bird).

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</table>

Fig. 4.9: Distribution of Land Fauna (and Bird).

vs - very small  bp - brush possum
s - small        w - wallaby
md - medium size bt - bettong
l - large
b - bird
rk - rat kangaroo
f - forester kangaroo
bc - bandicoot
m - macropod
wr - water rat
r - rodent
p - possum
from the bottom. This could be explained by the difference in the physical composition of the midden being looser and drier in the top half, and more compressed, broken up and wet in the lower. The preservation of the material in the lower half could in part be responsible, but here even fish bones are retrieved from the basal layer (square D). However, these discrepancies between top and bottom do not appear so very significant.

d. Marine Fauna (Non Shellfish) - Marine fauna (other than shellfish) at LS II occurs in low frequency. In this way, it seems parallel to all the other bone remains in the site, restrengthening the conclusion that shellfishing was the main activity present. Of these marine species the scale fish, and the crayfish, are the significant food sources. Crayfish come from a rocky coastal habitat and were probably imported to the site. There are ethnographic examples of crayfish being carried up to 20 miles inland from the coast (Hellyer 1828: 34). All scale fish were of the leather jacket family, individuals being identified by a prominent serrated dorsal spine. They are an estuarine species and therefore may have been fished at the site depending on the fishing methods used. The only other species of importance was the sea urchin which could have been caught either in the estuary or on the coast.

The full list of non shellfish marine fauna is the following:

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>NO. OF INDIVIDUALS</th>
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</thead>
<tbody>
<tr>
<td>Leatherjacket (Aluteridae fam.)</td>
<td>13 - 14</td>
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<tr>
<td>Crayfish (Jasus lalandi)</td>
<td>11</td>
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<tr>
<td>Sea Urchin (Heliocidaris erythrogramma)</td>
<td>10</td>
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<tr>
<td>Cuttle Fish</td>
<td>1</td>
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<tr>
<td>Chiton</td>
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</table>
Of interest is not their frequency but their distribution. All species were somewhat evenly distributed in all but the uppermost levels (excepting the leatherjackets). Of the latter, 12 identifiable individuals out of 13 were found either within or close to the uppermost limit (Fig. 4.10).

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<th>Spits Squares</th>
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Fig. 4.10: Distribution of Marine Fauna

- f - fish (leatherjacket)
- c - crayfish
- u - sea urchin
- ch - chiton
- cf - cuttle fish

The faunal assemblage was divided temporally into three units which correspond with present day and late Quaternary deposits, respectively. The occurrence of the (cf. Plate 8) was apparently not restricted to the site. The sea determined mainly by a combination of significant low tides or spring. All samples were in size fall into the category of small.

The faunal assemblage - the frequency of flaked stone was relatively low; only 176 pieces. This results in a density of less than one piece per sq. ft. So far, no flaking was associated, there were no small secondary units. Fossils, the products of weather and comminution (See Tables 4.5, 4.6).

Individual Score: (number: 6, 1.3G) All these are signs.

1. The technology of the industry is discussed below by not compared with the faunal assemblage from lower levels.
Of interest is not their frequency but their distribution. All species seem somewhat evenly distributed in all but the uppermost levels (excepting the leatherjackets). Of the latter, 12 identifiable individuals out of 13 are found either within the lower third of the midden or on its uppermost limit (Fig. 4.10). One individual occurs in the middle level (spit G2) and a dubious example from the upper (spit N1). Although the total sample is very small there is strong indication that the catching of scale fish belongs to the earliest phase at Little Swanport.

4.9. FLAKED STONE

a. Method of Analysis - The assemblage was divided technologically into eight categories and again functionally into three categories: retouched, used, and products of use (eg. flakes apparently broken or discarded on the site). Use was determined mainly by macroscopic analysis of significant edge damage or wear. All material above 1 in. size fell into the category of small broken flakes.1

b. The Assemblage - The frequency of flaked stone was extraordinarily low, only 176 pieces. This results in a density of less than one piece per 6 cu. feet. Secondly no flaking floors were associated, there were no small secondary waste flakes, the products of trimming and retrimming. (See Tables 4.5, 4.6).

(i) Above ½ in. Size -

Retouched Flakes: (number: 67, 40.9%) All show use signs and all appear imported as there are no signs of secondary waste flakes and chippings in the deposit.

Retouched Cores: (number: 8, 4.9%) All show use signs.

1. The technology of the industry is discussed below Pp. and compared with the assemblage from Crown Lagoon.
Natural Cores: (number: 5, 3.0%). These are chunky stone cores or blocks, whose shape does not appear to have been humanly produced. One shows retouch, and all show use signs.

Flakes: (number: 63, 38.4%) About 85% have bulbs of percussion, 4 show retouch, all show use signs with 34 (53.9%) showing extensive use signs.

Rejuvenation Flakes: (number: 15, 9.1%) Most are edge-forms (see below P. 67) and some side forms (Clark 1952: 100). All show subsequent use signs or extensive use signs, and of these 2 show possible retouch. Only 2 very small ones can be classed as waste products of the site.

Broken Retouched Flakes: (number: 4, 2.4%) These are significantly sized, parts of broken retouched flakes. Three show subsequent use signs.

Miscellaneous: (number: 2, 1.2%) These are amorphous, natural chunky lumps. Both show use signs, and one possible retouch.

(ii) Below ½ in. Size -

Small Broken Flakes: (number: 12, 6.8% of total assemblage of 176 pieces) None are secondary waste flakes, and 6 show obvious signs of having been broken during use, with secondary signs apparent.

c. Results - The characteristics of the assemblage are the following:

(i) A small assemblage of extremely low frequency and density.

(ii) A very large percentage of finished retouched pieces (86, 52.4%).
Fig. 4.11: Distribution of Stone Tools (Flaked and Pounding).

- flaked stone (176)

- pounders (8)
(iii) The total use of all usable pieces (excluding the broken flakes) (163, 99.3%). All but 2 of the fifteen rejuvenation flakes had subsequent use signs.

(iv) Of the 176 pieces only 15 (8.5%) proved to be waste, and of these, only 2 - the two small rejuvenation flakes - possibly due to trimming of retouched pieces.

(v) Of those tools used, there seemed to be three types:
- retouched flakes (67, 40.9%)
- used flakes (63, 38.4%)
- retouched cores (8, 4.9%)

d. Distribution and Possible Use - The distribution of flaked stone (Fig. 4.11) generally shows these evenly scattered across the site and seldom clustered. There appears to be a slightly higher frequency in the lower third of the deposit (see p. 52 below). However, these are minor differences, and negligible in affecting the consistency in the overall pattern present. In both its low frequency and general distribution, the flaked stone can be strongly correlated with that of the land fauna (above).

Given the almost total shellfish orientation of the remainder of the deposit, this correlation appears to be causally related. There is a frequency ratio of approximately 2.5 flaked stone artefacts to each individual land animal. This conclusion is based on the assumption already mentioned above that imported flaked stone tools are not specifically associated with shellfishing. If this had been the case, their frequency and density could plausibly be expected to have been far greater in accordance with that of the shell faunal remains.

1. Most probably a reference to the raised short-joelina material most commonly used in the area.
There is much ethnographic information to link the flaked stone artefacts with the hunt, and they were often observed associated with inland hunting camps. Robinson (1831, Nov. 11) records: "At one of these huts they had been eating emu, and at another, I found a piece of petrified wood 1 ... They had made of this fossil instruments for the purpose of manufacturing their deadly weapons and to cut up their game." (South of Brady's Lake, Central Plateau)

e. Conclusions - From this data an activity model can be built:
(i) That of the few flaked tools brought to the site there is almost negligible evidence of trimming on the spot, let alone any major production of worked pieces. The retouched pieces must have been imported already trimmed to the site.
(ii) This fact, together with the almost negligible numbers of rejuvenation flakes and the overall low frequency in density of the flaked tools, suggest that little use for them was necessary at the site.
(iii) The explanation presented for this is that hunting of terrestrial game, with which these tools appear associated, was not a major activity of the site.
(iv) There is an indication that over time there may even have been a slight decrease in the use of flaked stone at LS II, but this may also be explained otherwise (below p. 52).

4.10. PESTLES, MORTARS, WATER-WORN PEBBLES

Only eight examples of these forms of stone tool were found in the sample excavated. These consisted of 2 mortars, 1 pestle, 4 large broken water-worn pebbles, and 1 small broken water-worn pebble.

1. Most probably a reference to the veined chert-hornfels material most commonly used in the area.
Fig. 4.12: The Two Mortars and Pestle.

Mortars:  
- a. B2 
- b. L12, SW.

Pestle:  
- c. K3, NE. (Actual Size)
a. Description -

Mortars: Both examples are water rolled stones and approximately of equal size (Fig. 4.12).¹ Heavy signs of pounding occur all around their perimeter, especially on the long ends. Small pitted depressions occur in the centre of both flat sizes, together with less prominent use signs. There is no evidence for grinding. This type is characteristic for the whole of Tasmania, present in surface collections from most regions. Archaeological proof exists of their association with the pestle which justifies their being called by these terms. This evidence comes from Rocky Cape (Jones and Lourandos 1967) where an example of the two, one sitting atop the other, was found in situ. The only ethnographic reference to artefacts resembling either pestle or mortar is in reference to the grinding of red ochre (see below P. 51). Red ochre was found throughout the site and possibly was ground on this sort of mortar. However, the excessively heavy wear present may indicate another use. Australian examples are usually associated with the pounding of vegetables and bone (Peterson 1968:567).

Pestle ²: (Fig. 4.12) One example only was found - a frequency comparable to the mortars. Robinson states: "They prepared the red ochre by mixing it with the fat of the penguin or mutton bird, and bruise it together and grind it between two stones in the same manner as a painter would use a muller." (1830, Nov. 20).

Broken Water-Worn Pebbles ³: Four examples were excavated. All of these are broken and all show only minor signs of use on their ends and flats. These may have been broken by design and/or have been used as ochre grinding palletes. Water-worn stones are commonly associated in surface sites all over Tasmania, coast and inland, but from the few use signs apparent these possibly served

1. (a) Size 8.7 x 7.7 x 4.6 cms.
   (b) 8.5 x 8.0 x 3.4 cms.

2. Size 4.4 x 4.2 x 2.0 cms. The most usual type of pestle is a small water-worn pebble (c.f. Legge 1930)

3. Sizes (a) 14.6 x 7.8 x 4.2 cms. (b) 13.0 x 8.5 x 4.4 cms.
   (c) 8.6 x 7.6 x 3.6 cms. (d) 14.0 x 5.5 x 2.5 cms.
a separate function to the mortars.

**Small Broken Water-Worn Pebble**: One example was found. It had been broken in half and showed certain signs of wear along its sharp edges.

b. **Results** - The small size of this group of artefacts is indicative of the minor frequency of the activities they may reflect, reiterating the restricted range of activities present at the site. The presence of the mortars and pestle may indicate evidence for vegetables being pounded. Their low frequency can certainly be correlated with the amount of bone present, to indicate their possible association. There is evidence for land and sea vegetables being collected and eaten on coastal and estuarine sites (see below P. 57), but there are no observations of these being tenderised or pounded with stone tools. If Peterson's suggestion (Peterson 1968:569) can be accepted archaeologically and for the Tasmanian situation, i.e. that the number of mortars and pestles present at any campsite reflect the number of individual family units present, then it may be possible to infer that at Little Swanport there does not seem to have been a very large population present at any one time.

4.11. **RAW MATERIALS**

There seems to have been only negligible importation of raw stone materials onto the site from outside the environs of the estuary. Of the weight of raw silicious stone material employed at LS II, the great majority was of chert-hornfels (96.7%) with only a very minor amount (3.2%) from other sources (quartzite, petrified wood and quartz). Almost all the variety of chert-hornfels excavated (and petrified wood) can today be located at Aboriginal quarries and stone outcrops within a distance of 1. Size 4.2 x 2.4 x 1.8 cms.
Plate IX

Plate X
of a few miles from the site (Fig. 3.3 above). Outcrops occur around the estuary and plentifully in the paddocks behind.¹

All the heavier pounding tools are of local dolerite pebbles except one of granite whose nearest source is the Freycinet Peninsula on the opposite side of Great Oyster Bay. The ratio of silicious stone to coarse stone used at Little Swanport (silicious, 59.1%; coarse, 40.8%) was similar to that from Crown Lagoon (below).

4.12. BONE TOOLS

Only 2 examples² of worked bone tool were found in situ, both in the same layer (N6) in the lower third of the midden's deposit. They were associated with fish bone, animal bone and shellfish.

a. Description -

(i) (Fig. 4.13 (a)): Length 20.3 cms, made from a L. fibula, and in a poor condition of preservation. It has a rounded off and flattened end which shows signs of having been burnt.

(ii) (Fig. 4.13 (b)): Length 19.8 cms, made from a R. fibula, and of similar condition and form to the above. Both have been made either on the fibula of a large wallaby or Forester Kangaroo (Macropus giganteus tasmaniensis) which has been broken in half with the broken edge ground for use in the form of a spatula. In this way they compare closely with all other such spatulae from the South-East (eg. Crowther 1935: Plates XX, XXI; and Fig. 4.13 (c)³). They also compare favourably with examples from the North-West and the northern West Coast (Meston 1956:192-195, Plate G; Jones 1966: 3). In the main those in the West and

1. An outcrop of petrified wood exists a few hundred yards upstream from the site.

2. A possible third was found together with the other two. It was an R. fibula, but it had been broken near the usual worked end, showing no signs of working.

3. This is an unpublished specimen from the Maning Collection, (Donated to the Tasmanian Museum in 1967).
Fig. 4.13: The Bone Fibulae.
a: N6, W; b: N6, S; c: from the Maning Collection, Tasmanian Museum.
North-West have been made on wallaby fibulae (eg. all were at Rocky Cape). This probably reflects the animal populations of the area. However, the size difference (wallaby fibulae being smaller) may also reflect some difference in function.

Meston has defined two main forms of bone tool from the North-West; points and spatulae. Both forms were found in excavated contexts at Rocky Cape (Jones 1966). Only the spatulae have so far been recognised in the East, but this may be due to the smaller sample of bone tools from this region.

b. Distribution and Functional Significance. (Fig. 4.14) Bone tools are distributed at least in two widely spaced regions of Tasmania, the North-West corner and North-West coast, and the South-East. Such a distribution implies that they were probably used all over the island. Examples of bone tools have also been found inland (Jones 1965; Gill 1966). In the excavated deposits from which bone have been detected (the Rocky Cape caves, and now Little Discovery), they were only to be found in the lower deposits in asynchronous contexts. This strongly implies, Gill suggests (1966: 9), that they belong to an earlier phase of Tasmanian prehistory. This corresponds to the zoostratigraphic evidence which makes no mention of such tools.

c. Use - No direct conclusive evidence exists for their use.

Meston (1965: 196) suggests that they may have been used in shell fishing. They may have been used with a line or string, as both sickle and hook. Meston believes that they were used in the three ways, and he suggests that they were used out of the assemblages at approximately the same time. In Australia bone tools have a wide range of functions which is perhaps also true of the Tasmanian examples. The latter may have had both coastal and inland functions.

1. Discussed below p. 32
North-West have been made on wallaby fibulae (eg. all were at Rocky Cape). This probably reflects the animal populations of the area. However, the size difference (wallaby fibulae being smaller) may also reflect some difference in function. Meston has defined two main forms of bone tool from the North-West, points and spatulae. Both forms were found in excavated contexts at Rocky Cape (Jones 1966). Only the spatulae have so far been recognised in the East, but this may be due to the smaller sample of bone tools from this region.

b. Distribution and Cultural Significance - Fig. 4.14 shows that worked bone tools are distributed at least in two widely spaced regions of Tasmania, the North-West corner and North-West coast, and the South-East. Such a distribution implies that they were probably used all over the island. Examples of bone tools have also been found inland (Jones 1965: 195; Gill 1968). In the two excavated deposits from which these have been detected (the Rocky Cape caves, and now Little Swanport), they were only to be found in the lower deposit and from synchronous contexts. This strongly implies, as Jones suggests (1966: 9), that they belong to an earlier phase of Tasmanian prehistory. This corresponds to the ethnographic evidence which makes no mention of such tools.

c. Use - No direct conclusive evidence exists for their use. Meston (1965: 195) suggests that they may have been used in shell collecting. Hiatt (P. 209) implies the same on the analogy with wooden ethnographic spatulae. In the excavated sites they are associated with scale fish, both variables apparently dropping out of the assemblage at approximately the same time. In Australia bone tools have a wide range of functions which is perhaps also true of the Tasmanian examples. The latter may have had both coastal and inland functions.

1. Discussed below P. 52
Spits

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1. Only very limited amounts of red ochre were found, generally through the deposit (Fig. 4.15). Twelve pieces in all were retrieved, having a total weight of 35.6 g. All showed signs of having been extensively used. Many worn flat faces, showing parallel scratch signs exist all over each example (Fig. 4.15). This distribution corresponds exactly with that of the red ochre from the diggings (below).

2. Ethnographic evidence exists to explain the presence and use of the ochre and its probable relationship to certain artefacts present within the deposit: “If the woman is married she carries her own, her husband’s burden. Part of their baggage consists of a mill, a flat stone which the men use for the purpose of preparing the substance, and when the woman also wishes to grind with her for this purpose a large quantity of red ochre.” (Robinson 1834, Nov. 26).1 Such stone artefacts are described above (P. 46); their low frequency corresponding with that of the ochre present.

3. **Evidence for Cultural Change**

In order to examine the evidence for culture change in the deposit, and as the lower third of the deposit already seemed to form a separate stratum, it was decided to divide the site up into the three main strata, which were rearranged stratigraphically above (Fig. 4.17). The percentage frequency of each type artefact in each zone was then calculated (Table 4.7).

4. **Fig. 4.16**: A Piece of Red Ochre. (L10, NE)

(a) A twofold cultural division is noticeable in the site between zones I - II (the upper two-thirds of the deposit) and zone III.

1. Red ochre was highly prized by the ethnographic Aboriginals who often travelled far to acquire it. (e.g. Robinson 1821, Dec. 14; 1834, July 14)
4.13. **RED OCHRE**

Only very limited amounts of red ochre were found, generally throughout the deposit (Fig. 4.15). Twelve pieces in all were retrieved having a total weight of 148.9 gms. All showed signs of having been extensively used. Many worn flat faces, showing parallel scratch signs exist all over each example (Fig. 4.16). This description corresponds exactly with that of the red ochre from Crown Lagoon (below).

Ethnographic evidence exists to explain the presence and use of this ochre and its probable relationship to certain artefacts present within the deposit: "If the woman is married she carries her own and her husband’s burden. Part of their luggage consists of a mull, a flat stone which the men use for the purpose of preparing the pomatum to dress their hair with. The woman also carries with her for this purpose a large quantity of red ochre."

(Robinson 1831, Nov. 26). Such stone artefacts are described above (P. 46), their low frequency corresponding with that of the ochre present.

4.14. **EVIDENCE FOR CULTURE CHANGE**

In order to examine the evidence for culture change in the deposit, and as the lower third of the deposit already seemed to form a separate stratigraphic horizon, I decided to divide the site up into three equal zones. All spits were rearranged stratigraphically in accordance (Fig. 4.17). The percentage frequency of each major variable in each zone was then calculated (Table 4.7).

a. **Results**

(i) A twofold cultural division is noticeable in the site between zones I - II (the upper two thirds of the deposit) and zone III

---

1. Red ochre was highly prized by the ethnographic Aborigines who often travelled far to acquire it. (e.g. Robinson 1831, Dec. 15; 1834, July 16)
Fig. 4.17a: Division of the Site into Spits.

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Fig. 4.17a: Division of the Site into Three Horizons.
(the lower third), which shows significant cultural and ecological differences.

(ii) From this evidence, two corresponding phases can be interpreted - phase I (the lower third) and phase II (the upper two thirds).

b. Conclusions - There is evidence to propose a two phase sequence at Little Swanport affecting both the culture and ecology of the site. However, it is important to view these phases only as superimposed upon a conservative basic pattern of predominantly shell fishing activities, associated with the minor activities of hunting and the use of flaked stone tools. This basic pattern shows no variation over time. The major differences between phases I and II are: (i) the evidence for fishing and the use (and possible manufacture) of worked bone tools in the first phase; (ii) the total absence of these, and the almost total absence of scale fish (except for one doubtful occurrence) in the succeeding phase.

The evidence for a higher frequency of flaked stone in phase I (50%) may be due to a slightly higher use of these in the earlier phase, or to a slight contraction in the midden's lowest layer. From the bottom third of the midden, 45% of the flaked stone present came from the basal shell-clay layer. The C-14 sample was taken from the shell above this basal shell-clay layer, thus possibly post dating the basal age of the deposit. The lower incidence of bone in the lower third has been best explained as due to poorer preservation.

c. Chronology - (Fig. 4.3). The site has a basal C-14 date of between 4450 – 4750 BP.¹ This indicates that the present deposit is dated approximately to the establishment of the present day

1. The C-14 dates quoted here were officially received from the A.N.U. Radiocarbon Laboratory (H.A. Polach) and are at the moment being finalised. Final dates will lie within the above ranges.
sea level after the post glacial higher sea rise (Milford level),
dated approximately by Davies to c. 7000 - 6000 BP (1959: 95).
The discrepancy between the latter and the above LS II date
may be due to: (i) the possibility of slightly post dating the
earliest deposit at LS II; (ii) the possibility of a later date
for the present coastline's establishment in this estuary.¹ This
basal date corresponds well with the basal date from Crown Lagoon
establishing that the two sites were contemporary during Little
Swanport, phase I.

The C-14 dating of the approximate top of the lower third of
the deposit is between 3550 - 3850 BP, coinciding with (i) the end
of the fish and bone tool phase; (ii) the mussel layer; (iii) the
approximate top of the lower humic horizon. Thus this archaeological
evidence, including that which indicates some climatic difference
in phase I, corresponds to about the time of the mid-Recent
climatic dry period, c.6000 - 3500 BP². An upper C-14 date was
secured from between 1 ft. - 1.3 ft. below the top of the midden,
of between 1550 - 1850 BP. The very top of the deposit shows
marked recent disruption and possible truncation. This indicates
that the midden was probably used up until the historic period.

The above interpretation of a cultural sequence agrees in
part with the findings from North-West Tasmania (Rocky Cape). Here
scale fish was found only in the lower half of the deposit
(Jones 1966: 2-6, 9), and the time of its cessation dated to
between 3795 ± 100 BP (V83) and 3430 ± 95 BP (V88)³. These
dates correspond to those of Little Swanport. Both Jones (Ibid)
and Hiatt (Pp. 113-114) have emphasised the significance of this
cessation of a one time major occupation and food source at

¹. Davies has estimated from geomorphological evidence that the
Milford level indicates a rise of 6 feet in the vicinity of the
Little Swanport estuary (1961: 39, Fig. 8)

². See below P. 120

³. Personal communication with Rhys Jones.
Rocky Cape. Hiatt has shown that the eating of scale fish was taboo to the Tasmanians of the ethnographic period. The further significance of LS II in Tasmanian prehistory is discussed below (Pp. 119f).

4.15. CONCLUSIONS

a. Results - The midden's composition consisted almost completely of estuarine shellfish throughout. There were consistently very low frequencies of both imported flaked stone and land fauna (including bird), and there seemed to be a significant correlation between the two. There was no evidence for any permanent structures. Two phases can be seen in the midden's deposition which dates from at least 4450-4750 BP. These basically show the same constituent pattern except that in the lower third of the midden (phase I) a very low frequency of scale fish and worked bone tools are present, and absent in the upper two thirds (phase II). There is evidence to link the development of the lower third to a period climatically slightly different to the present, a more arid period. This can be seen to have had at least a significant effect on the shellfish populations with which the site was primarily associated.

b. Interpretation - Activities at the site were concentrated mainly around the exploitation of one micro-environment - the immediately adjacent shellfish beds - the probable reason for the midden's location. This staple diet was augmented by small numbers of fish, conceivably from the estuary (at least in the first phase of the midden's occupation). The diet was only lightly added to from surrounding micro-environments in very small quantities:

(i) the Coast - rocky coastal crayfish and possibly sea urchin, and certain coastal shell species such as subninella, though these too conceivably may have been procured from the estuary, being very scantily represented.
(ii) The Forest - land animals (mainly of medium to small size), and probably some birds which also would have been procurable in the estuary itself.

(iii) The Estuary and Forest - immediately procurable land and sea vegetables (see below).

The land fauna present suggests that hunting, and especially that of the larger sized animals, was not an important activity at the site. This is supported by the flaked stone evidence - few in number, low in density, all imported in their present state - though the purpose for which they were used at the site did not necessitate on the spot renewal by the flaking of fresh edges or new tools. No flaking floors existed and only negligible implement by-product waste.

The hearth structures are so small and numerous they seem more appropriately associated with the broiling of shellfish, rather than anything approaching a camp site settled for anything but a brief space of time (i.e., a few days). Apart from the shell formations and the one possible post hole there were no indications of structures of any permanence. However, the post hole suggests the possible existence of temporary shelters in keeping with the above interpretation.

The final interpretation must be of a temporary camp located primarily for the collecting and eating of the immediately procurable shellfish; whose activities seemed mainly to concentrate on this task, augmented from the surrounding micro-environments of estuary, open coast and sclerophyll forest, by small scale collecting of marine fauna, hunting mainly medium-small land animals, and the probable collection of vegetables. There was little significant change in this pattern through time.

c. LS II As a Reflection Of The Whole Estuary - The excavated evidence together with its interpretation appears entirely in accordance with the surface and test excavation of other middens
in the estuary. However, some slight qualification in interpretation must be made here. LS II - a relatively independent and compact site, may reflect but one aspect of the general activity pattern in the estuary. Two other forms of this pattern appear to be evident:

(i) The extensive and deep midden concentrations of the southern shore indicate the greater size of the shell beds in that area and may have allowed for much larger concentrations of population even at the same time in this area though from the known evidence these appear to have been occupied in similar activities to those at LS II.

(ii) The evidence from the islet middens just east of LS II appears a more extreme example of the LS II model, with sole shellfishing and eating activities represented, apparently unassociated with any other. LS II then seems to fall in between these two examples.

Although the archaeological evidence does not indicate that this estuary served a role as a permanent base for Aboriginal activities in the area (as will be shown for certain northern West Coast sites), its huge volume does point to its unrivalled ecological importance as a shell fishery, and as a most significant focus of activities on the East Coast.

d. Conclusions - LS II fulfills the description of an Eastern Tasmanian estuarine shell midden as identified by the field survey, and seems to be in no way an aberrant example.

4.16. ETHNOGRAPHIC ANALOGIES

A detailed discussion of the ethnographic evidence is presented in Chapter Seven. Here reference is made to three separate ethnographic observations of living shell midden situations from South-East Tasmania. These help to clarify the interpretation made from the above archaeological evidence. The three are typical
SAUVAGES DU CAP DE DIEMEN PRÉPARANT LEUR REPAS.
of the many observations from this region.

The first two are by Labillardiere (1772), the third by Peron (1802). The three plates presented here can be considered as composite scenes, but their reference to specific incidents is verified by the accompanying texts of both observers. The first observations appear to refer to a bay estuarine situation, the other two to rocky coastal situations.

(i) (Plate 11): D'Entrecasteaux Channel, probably on Bruny Island (Labillardiere: 303-4).

"There were nineteen of them, round three small fires, making their meal of bernacles, which they coasted on the coals, and ate as fast as they were ready. Every now and then some of the women went to pick these shell-fish from under the neighbouring rocks, and did not return till they had filled their baskets with them. On the same fires we observed them broil their species of sea-wrack, which is called 'fucus palmatus', and when it was softened to a certain point, they tore it to pieces to eat it ... Some of them sat on kangaroo skins, and some others had a little pillow, which they call roéré, near a quarter of a yard long and covered with skin, on which they rested one of their elbows."

Labillardiere notes that the artist was present and recorded this scene.

(ii) (Plate 12): D'Entrecasteaux Channel (Labillardiere: 309-312). This observation is quoted in length by Hiatt (Pp.127-28). The chief differences with the above description are: (i) the women dive deep off the rocks for "very large sea ears" - Abalone, and in between dives they have to warm themselves by the fire; (ii) to collect these rock platform species they use "a little bit of wood, cut into the form of a spatula";}
TERRE DE DIÉMEN.
HABITATIONS.
(iii) as well as shellfish "They also caught large lobsters which they killed as soon as they had caught." They roasted these, "Lobster claws were given to the men and children; the women ate the bodies"; (iv) They also ate "broiled fucus or fern roots."

(iii) (Plate 13): Mouth of the Huon estuary (Peron: 174-181). The details of the observation occur exactly as appear in the illustration except that in the evening the full family returns to eat, and share the hut 1 making up a group of nine. 2 "The family were returning from fishing, in which they had been fortunate, for each was loaded with shell-fish, of that kind belonging to the large species of marine ear (ie. Abalones) peculiar to these shores ... The cooking was neither tedious nor difficult; these large shells were placed in the fire, where, as in a dish, the fish was baked, and afterwards eaten without any other preparation or seasoning." He also describes the artefacts used by the family: a water bag made from "fucus palmatus", "the two ends bent together with a small pin of wood", a stone implement - "a split fragment of granite was used as a knife" to bark trees and sharpen spears, a wooden spatula for rock shellfishing, and "a bag made of rushes".

These observations concur well with the evidence from Little Swanport. The main points to note are: (i) the location - directly on the shore; (ii) the diet, mainly of shellfish, augmented by crayfish and vegetables; (iii) the temporary nature of the situations; (iv) the existence, or absence of temporary shelters; (v) the incidence of vegetables in the diet - a fact only inferable from the mortars and pestles in the archaeological evidence.

1. Peron's description of this is given below P. 107
2. Below P. 112
3. Inserted, not in the original quotation.
There is little ethnographic evidence on the Great Oyster.

Plate XIV
There is little ethnographic evidence on the Great Oyster Bay area. Robinson who passed through it in 1831 states that the area south of the Buxton River as far as Prosser's River (which includes Little Swanport), was the country of the "LARE.MAIR.RE.ME.NER nation" (1831, Jan. 11). In reference, he often confuses the area referring to it as that of the "LOON.TITE.ER.MAIR.RE.LOIN.NER nation" (1830, Oct. 11), which he later locates in the region of Greater Swanport (present Swansea) which is immediately adjacent to the Buxton River boundary (1831, Jan. 11). He refers to these groups as part of the Great Oyster Bay tribe.

There is evidence indicating that Aborigines hunted in the Midlands and then moved down to Great Oyster Bay to shellfish. One specific reference located about twenty miles north of Crown Lagoon states: "the native woman ... said that when she was with them (the natives), they said they should go to Oyster Bay to get shells". (Robinson 1831, Oct. 20). One other reference, from the Shannon River (in the foothills of the Central Plateau) adds: "now we had arrived here he (the chief) said they were gone to Swanport." (Robinson 1831, Nov. 23).

Plate 14 is included as evidence of the existing ethnographic situation in the general area of Great Oyster Bay. Schouten Island lies directly opposite Little Swanport and is prominently featured in this composite illustration.

5.7. CHOICE OF SITE

1. Robinson spells the Aboriginal words phonetically as he heard them. His spelling is not consistent.
CHAPTER FIVE

SITE TWO: CROWN LAGOON (CODE NAME CL)

5.1 LOCATION

(Fig. 5.1) The site of Crown Lagoon was stratified within the upper horizon of a lunette (fossil dune), which fringes the eastern side of the now-drained basin of Crown Lagoon. The archaeological deposit extended across the entire dune, observable in eroded sections and by testing. The dune is now well grassed over and about a quarter of a mile in length. Before being drained for grazing purposes at the end of last century, the lagoon, or marsh, formed part of the upper drainage system of the Little Swanport River. Ecologically, the area today is in poor and stony land, with dry and open sclerophyll vegetation, surrounded by densely forested hills. The area is situated between 2-3000 feet above sea level, and is flanked by a densely forested and rugged mountain range, immediately to the east, and further to the west by the open Poa grasslands of the Midlands valley.

In 1831 Robinson passed by Crown Lagoon and stated: "After travelling over some wooded and stony hills came to a marsh which ... was part of the Eastern Marshes .... The kangaroo bounded before us...... Tom (a native informant) said the natives hunted in those parts." (1831, Oct. 22).

5.2 CHOICE OF SITE

I was shown the site by Mr. Rhys Jones2 in August, 1967, who

1. For Objectives and Methods, see above P.
2. The Australian National University, Department of Anthropology (Prehistory).
Fig. 5.1: General Crown Lagoon area, showing the lunette and the location of the excavation. Drawn from an aerial photograph (Lands and Survey Dept., Hobart)

--- eroded area

△ datum

drained lake bed

location of Fig. 5.2
Fig. 5.2: Ground Plan of the Crown Lagoon Excavation (CL)

--- eroded area
Plate XV
in turn had been directed to it earlier that year by the owner of the property on which it was located, "Lemont", Mr. McShane. Jones noticed the archaeological importance of the lunette (Jones 1967:362). Such lunettes have been referred to before as containing Aboriginal deposits (eg. Crowther 1950:88).

Inspection of a large eroded area of the site clearly showed the importance and complexity of its artefact deposit (which was scattered all over the eroded area), as well as its restricted depth of occupation. This, and the awareness from the geomorphological evidence of the site's restricted time span, led me to consider the site as an interesting example of an inland camp, representing only one relatively short time phase in Tasmanian prehistory. It thus provided the required contrast to Little Swanport. The site was excavated in February 1968.

5.3 GEOGRAPHICAL BACKGROUND AND CHRONOLOGY

The Crown Lagoon lunette is one of a number distributed mainly in the subhumid eastern province of Tasmania. Their origin had been hypothesised as linked with the seasonal drying up of the lakes, with which they are associated (Stephens and Crocker 1946), the dune being accumulated on the leeward side by wind action, transporting material from the dry lake floor. They have generally been considered as the result of drier conditions (Davies 1967:22). The dunes show no evidence of recent accretion, thus requiring more arid climatic conditions.

Geode (1965) has produced strong evidence for a mid-Recent period of greater aridity with intermittent stream aggradation in Eastern Tasmania. He has supporting evidence of a radiocarbon date of 4435 ± 110 BP from a younger fill in which he found a flaked stone implement. It is at this time and in this area that the Aborigines' greatest possible effect on the environment was felt. Their firing activities seem causal in
producing the intensity of aggradation (Davies 1967: 20). Conditions following are seen as wetter and possibly cooler, with one minor return to drier conditions, possibly about 2000 BP (personal communication with Dr. Goede).

This evidence agrees with the radiocarbon dates from the excavations at Crown Lagoon. These date the limit of the densest part of the deposit; they are 4170 ± 80 BP (ANU 279) and 4860 ± 95 BP (ANU 278). The cultural deposit then can be considered to be slightly greater in range. These date the upper horizon of the lunette and secure its mid-Recent origin. Thus, while the site was occupied, climatic conditions were drier than the present, indicating a probable difference in vegetation, from that of the present. Together with the faunal evidence from the excavation, this could plausibly be hypothetically reconstructed as open forested grassland.

5.4. EXCAVATION METHODS

This was the first time in Australian archaeology that such an open non-shell midden site had been excavated. Its excavation produced a number of problems. Unlike in a rockshelter or cave the cultural deposit was not concentrated but shallow and very extensive.

Nine excavation squares were placed in two groups on the grassed dune on either side of the already exposed erosion area. Excavation was in three inch spits, divided into quarters. All material was passed through a fine 3 mm sieve. The reason was:

(i) to encompass as wide an area within the sample as possible using the information available from the eroded area as a control;
(ii) to provide two separate samples from two widely spaced locations as a check against possible spatial differences occurring across such a large site; (iii) a large controlled
Fig. 5.3: Schematised section through the Crown Lagoon site showing the basic stratigraphy.

T - turf
I - grey banded
II - dark brown
III - red
IV - yellow
2.5. Cultural Deposit

The section shows a cultural deposit which has been divided into four major layers, based mainly on colour distinction. 1. The bottom deposit is characterized by a dark grey layer which was developed under water surface wind erosion. There were many signs of recent compaction, including many stone flakes. 2. The base was barren and had bones of introduced animals - sheep, cattle, rabbit - and balls of lead shot. At the base of this layer is the distinct junction between the cultural deposit and the natural profiles. Layer II - a dark brown horizon at the top of the old profile, and possibly the limit of decay of vegetation at this level. It is within this layer that the uncontaminated deposit is found.

Fig. 5.4: Stratigraphy of Crown Lagoon - the North-West Section Walls.

- charcoal

1. Some drift sampled in the erosion area - and care was taken in excavating to determine the boundary between the contaminated material and the cultural deposit.

2. This stratigraphy was verified by Dr. A. G. G. Sexual, Department of Geography, University of Tasmania, Hobart.

3. Old carbonised tree trunks and branches were found within this layer in support of this interpretation.
Surface collection of the eroded area was made by grid as part of a project to collect a large sample for a study of the stone technology of the site. This could not have been obtained practically by excavation and the surface sample would be secured to the stratigraphy and chronology of the excavated sample. Unfortunately, the entire project proved too great for the time permitting, and this aspect had to be indefinitely postponed.

The two samples were labelled CL I and CL II, each square was correlated separately with the others, and the total combined as sample CL.¹

5.5. STRATIGRAPHY AND THE CULTURAL DEPOSIT

Fig. 5.3 represents a schematised stratigraphical section which is typical of the whole site. It is based on CL II, square B. The section shows a soil profile which has been divided into four major layers, based mainly on colour distinction.² The top of the deposit is covered by a turf layer which was not to be found in all squares, especially not in those where surface wind erosion was occurring. Layer I is a grey banded humic and sand lense, of obvious recent origin. Towards its base were many signs of recent occupation, along with a few small stone flakes. These signs were, the bones of introduced animals - sheep, cattle, rabbit - and balls of lead buckshot. At the base of I is the distinct junction between the recent dune layers and the mature soil profile. Layer II - a dark-brown humic layer - forms the top of the old profile, and possibly is the product of organic decay of vegetation at this level.³ It is within this layer that the uncontaminated

¹. Some of the deposit had been penetrated by recent rabbit burrows - one probable reason for the erosion area - and care was taken in excavating to distinguish between the contaminated material and the cultural deposit.

². This stratigraphy was verified by Dr. A. Goede, Department of Geography, University of Tasmania, Hobart.

³. Old carbonised tree stumps and branches were found within this layer in support of this interpretation.
Aboriginal cultural activity begins. Below, is a red ochre layer (layer IV) and there is a lower half, the deposits of debris and artifacts and some natural material, well stratified. Layer IV is a yellow sand layer of much greater depth. The cultural deposit fades out at the top of the latter layer.

Trial trenches were dug in two squares (CL II B and CL III B) to test if the cultural deposit continued below this level. I was found that it is a new deposit of a different color, has a depth of 2 ft., and seems to show marked concentration in the lower red layer. This could be explained either by inferring greater Aboriginal activity at this point or some change in the rate of deposition of the dune material. Above the above square, there is no significant layer. The graphs for CL II (A-D) represent the flaked stone concentration in all nine squares above 3/4 in. In the latter, the deposit can be seen to be truncated, layer I, and possibly part of layer II, being truncated. Fig. 5.5 shows the frequency of flaked stone in each square. The graphs for CL II (A-D), with slight variance in B, show a unimodal curve, negatively skewed. The same curve is apparent for CL I (A-D) except that it is shorter, with part of the area of curve on the left missing. This is to be expected if layers I and part of II are missing.

5.5. COMPOSITION

This has been analysed in Appendix 5.4.

5.7. SPATIAL VARIATION AND THE IDENTIFICATION OF ACTIVITY AREAS

To determine if there were any chronological or spatial differences in the site's function, two variables were analysed:
(i) the distribution of stone artefacts; (ii) definable structural features.
Aboriginal cultural deposit begins. Below is a red sand layer (layer III), and towards its lower half, the densest part of the cultural deposit (both in artefacts and structural features), is stratified. Layer IV is a yellow sand layer of much greater depth. The cultural deposit fades out at the top of the latter layer.

Trial trenches were dug in two squares CL IIB, and CL IID, to test if the cultural deposit continued below this level. It was found that it did not.

The cultural deposit then has a depth of approximately 1.5 ft. to 2 ft., and seems to show marked concentration in the lower red layer (III). This could be explained either by inferring greater Aboriginal activity at this point or some change in the rate of deposition of the dune material.

These stratigraphic layers are well represented in the stratigraphy of all nine squares, except for some variation in the four squares of sample CL I (A-D). In the latter, the deposit can be seen to be truncated, layer I, and possibly part of layer II, being totally absent. This seems due to recent erosion. The same can be seen in Fig. 5.5 which shows the frequency of flaked stone in each square. The graphs for CL II (A-E), with slight variance in B, show a unimodal curve, negatively skewed. The same curve is apparent for CL I (A-D) except that it is shorter, with part of the area of curve on the left missing. This is to be expected if layers I and part of II are missing.

5.6. COMPOSITION

This has been analysed in Appendix 5.1.

5.7. SPATIAL VARIATION AND THE DETECTION OF ACTIVITY AREAS

To determine if there were any chronological or spatial differences in the site's function, two variables were analysed: (i) the distribution of stone artefacts; (ii) definable structural features.
Fig. 5.6: Frequency of Edge-Rejuvenation Flakes (CL)

(i) Overall significant degree of variation within and between squares (a-e). These data were placed against a background of frequencies (g-h). This showed: (i) overall positive skewed distribution (a-e) - a reversal of the CL I result; (ii) significant variation between squares.

(ii) Conclusions - variation within individual squares, and between the two samples, CL I and CL II, proved to be due to spatial, not temporary, factors across the site, with the existence of separate activity areas, but that the site's overall function showed no variation over time. Such a situation could lead to archaeological misinterpretation, if only small areas were sampled.

b. Structural Features - The detectable structural features are plotted onto separate spit floors in Figs. 5.7 a, b, c.

They clearly demonstrate the separation of activity areas as the above graphs indicate. Hearth and charcoal patches are clustered in the area of the middle spit of squares, CL II A, B and C. (Figs. 5.7 a, b), and are either absent or in low frequency elsewhere. In the latter areas, the hearths are replaced mainly by flaked stone artefact matters. Fig. 5.7 c presents a sequence of three
a. The Distribution of Stone Artefacts -

(i) Method and Results - instead of analysing the distribution of the entire assemblage, the artefact type with the highest overall frequency was selected - the edge-rejuvenation flake (mean frequency 51.8%). This artefact has distinct functional implications. Its frequency in each spit was graphed for the two separate excavated samples, CL I, and CL II, and for each square (Fig. 5.6).

For sample CL II (Fig. 5.6 a-f) two points can be observed:

(i) a general tendency for a negatively skewed distribution indicating a higher representation in the lower levels (Fig. 5.6 f);
(ii) a significant degree of variation within squares and between squares (Fig. 5.6 a-c). These results were placed against those from sample CL I (Fig. 5.6 g-k). This showed: (i) an overall positively skewed distribution (Fig. 5.6 k) - a reversal of the CL II result; (ii) significant variation between squares.

(ii) Conclusions - variation within individual squares, and between the two samples, CL I and CL II, proved to be due to spatial, not temporal factors. This indicates that function varied spatially across the site, with the existence of separate activity areas, but that the site's overall function showed no variation over time. Such a situation could lead to archaeological misinterpretation, if only a small area were sampled.

b. Structural Features - The detectable structural features are plotted onto separate spit floors in Figs. 5.7 a, b, c. They clearly demonstrate the separation of activity areas as the above graphs indicate. Hearth and charcoal patches are clustered in the area of the middle spits of squares, CL II A, B and C. (Figs. 5.7 a, b), and are either absent or in low frequency elsewhere. In the latter areas, the hearths are replaced mainly by flaked stone artefact scatters. Fig. 5.7 c presents a sequence of three
Fig. 5.7(a): Ground Plan of Features (CL II)

- hearth
- charcoal smear
- lump of carbonised wood
- humus stain
- flaked stone artefact
- large stone core
- coarse stone lump
- disturbance
Fig. 5.7(b): Ground Plan of Features (CL I)

The pH of the deposit was 6, which together with the site's open nature does not provide ideal conditions for bone preservation. Nonetheless, bone fragments were found in all spits and in every quarter spit excavated (Table 4.1), indicating the original high density of bone associated with the rest of the cultural deposit.

Identifiable bone fragments were all of similar size and shape, separate from one another. Most were teeth, all of the one species - the Forester Kangaroo (Macropus giganteus tasmadensis). Identifiable fragments were all of molars or maxillary parts, apart from one upper incisor. Their distribution is fairly even throughout the deposit. This implies that the presence or only one species is the product of preservation and not current faunal selection.

b. Results - The consistent presence of bone throughout the deposit suggests that the Forester Kangaroo was a main activity throughout, with this species associated with the lower cultural levels, and the Forester Kangaroo presence indicates the existence of open savannah floristic environments.

Fig. 5.7(c): Three Phases at CL II A, B and C - I, II, III
main phases in the development of the cultural deposit in the adjacent squares, CL II, A, B, C. This demonstrates the shifting nature of the separate activity areas at one location over time.

Thus the existence of two separate activity areas showing temporal shift has been demonstrated archaeologically. These are: (i) hearth areas interpretable as probable cooking areas; (ii) flaked implement scatters interpretable as flaking floors (their composition is discussed below).

5.8. **FAUNAL REMAINS**

a. **Description** - The bone material in the deposit was in a very poor state of preservation, and very few pieces were identifiable. The pH of the deposit was 6, which together with the site’s open nature does not provide ideal conditions for bone preservation. Despite this bone fragments were found in all spits and in every quarter spit excavated (Table 5.1), indicating the original high density of bone associated with the rest of the cultural deposit.

The only recognisable bone remnant was of unworn macropod teeth, all of the one species – the Forester Kangaroo (*Macropus giganteus tasmaniensis*). Identifiable pieces were all of molars or molar fragments, apart from one upper incisor. Their distribution is fairly constant throughout the deposit. This implies that the presence of only one species is the product of preservation and not of cultural selection.

b. **Results** - The constant representation of bone throughout the deposit suggests that terrestrial hunting was a main activity throughout the site. At least one species can be associated – the largest land animal, the Forester Kangaroo. His presence indicates the existence of open sclerophyll forest or grassland.

1. This faunal material was analysed by Peter Thompson (Australian Institute of Aboriginal Studies, Canberra).
in this area should also reasonably correspond to the ethnomethodological model 
above P. 88).

5.9. PLATE XVIII

a. Method of Analysis of Crown Lagoon assemblage. The total of nine categories of flakes struck off any other worked area of a flake or core. Into the second category also fall all of what could be generally termed larger secondary flakes. This category is termed rejuvenation while the first category is termed advance rejuvenation. The difference between: (i) flakes used or blunted with secondary flaking or in the retouched state; (ii) flakes of any size, which are still flake.; The first being the largest in size, which is generally 2. Intraspecies (sheep), were associated with careful discrimination into species (rat, possum).
in this area at the time of the site's occupation. It is also reasonable to connect this major activity with the corresponding major variable - stone tool manufacture. There is ethnographic evidence to strengthen this connection (above P. 58).

5.9. FLAKED STONE

a. Method of Analysis - The same basic method was applied to the Crown Lagoon assemblage as was applied to the Little Swanport assemblage. This time the above ½ in. size was classified into a total of nine categories. There was a clear distinction made between (i) rejuvenation flakes which clearly showed that a significant area of the heavily and steeply retouched working edge of the implement, or core, had been removed, and (ii) rejuvenation flakes struck off any other worked area of a flake or core. Into the second category also fell all of what could be generally termed larger secondary flakes. This category is termed rejuvenation (b) while the first category is termed edge-rejuvenation. This classification sets up a functional division between: (i) flakes showing signs of a deliberate removal of the used or blunted working edge (edge-rejuvenation); (ii) flakes with secondary working signs struck off in the initial manufacture or in the retouching of an implement (rejuvenation (b)); (iii) flakes with no obvious secondary signs, generally large in size, which are often termed "primary", and are here classed as flakes. The intention behind this classification was to order the largest constituent of the Crown Lagoon assemblage - that which is generally referred to as "waste" - so as to be able to

1. Intrusive bone, mainly of modern species (rabbit, cattle, sheep), were found in the upper banded layer 1 and were also associated with areas of modern burrow intrusion. These were carefully distinguished from the Aboriginal deposit. With this intrusive modern fauna were associated recent indigenous species (rat, possum) clearly identifiable from their fresher appearance.
make an approximate statement on the primary production, use and resharpening of implements. This is evidence highly significant in interpreting the overall function of the site, as well as the implements' form.

The samples (CL I and II) were treated individually for each category, and then combined into one total sample CL. Table 5.2 shows the consistency in frequencies in both samples.

b. Preservation of Material - As noted, the soil had an acidic nature, with the result that much of the chert-hornfels tended to be covered by a thick patina, which in some cases had caused a certain amount of edge damage. This tended to cause some error in the calculation of used pieces, but not a considerable error as no microscopic analysis was attempted.

c. The Assemblage - The size of the assemblage was 743 pieces over 1 in. size, and 7,059 below 1 in. size.

(i) Above 1 in. Size -
Retouched flakes: (number: 32, 4.3%) All show use signs and from similarities with the rock types in the "waste-material", most would plausibly have been manufactured on the site.
Retouched cores: (number: 12, 1.6%) All show use signs and some indicate a derivation from large flakes.
Cores: (number: 3, 0.4%) Flake scars present suggest that these serve the purpose of nuclei, for the production of flakes.
Natural cores: (number: 5, 0.7%) Two have retouch and use signs, and a third use signs.
Flakes: (number: 137, 18.4%) Nine showed signs of retouch, and in all 41 had use signs (29%).

Edge-Rejuvenation Flakes: (number: 385, 51.8%) These showed a distinct bulb of percussion on the ventral side, immediately opposite the rather blunted working edge of the dorsal side, indicating that rejuvenation of the working edge was intended. (Fig. 5.15d). Fourteen of these had retouch, and in all 82 (21%) signs of use.
Rejuvenation (b) Flakes: (number: 142, 19.1%) Most of these showed secondary working signs, indicating they had been removed either in the initial, or retrimming stages. A small percentage came off the side, and other locations on the core. Eleven (7.7%) showed use signs.

Broken Retouched Flakes: (number: 16, 2.1%) Seven showed use signs, including 5 with extensive use signs.

Miscellaneous: (number: 11, 1.5%) Four showed use signs, including 2 with possible retouch.

(ii) Below ½ in. Size - the great majority of these were flakes with bulbs of percussion and signs of secondary retouch, indicating they were the by-products of implement manufacture and retrimming.

d. Results - There is marked dissimilarity between the two assemblages, Crown Lagoon and Little Swanport (Table 5.4 a,b). A low 11.4% show retouch at CL, compared with 52.4% at LS II; only 26.2% was used at CL, while 99.3% - almost the whole assemblage was used at LS II; and of the entire assemblage above ½ in. size, 73.7% were by-products of use at CL, while only a very insignificant 1.8% was waste at LS II. The functional difference between the two assemblages is clearly that of workshop conditions at CL, where stone tools were manufactured, used and rejuvenated, compared with the importation, and only slight use of completed tools at LS II. This again would indicate a clear division between the function of the two sites.

At CL, 51.8% of the assemblage, was of edge-rejuvenation flakes, strongly indicating that the predominant tool activity of the site was the resharpening of used stone tools. Also indicated is that steep retouch and edge blunting of implements was a product of the way these were employed at the site. A further 19.1% were rejuvenation (b) flakes, and 18.4% primary flakes, of which only 29% show use, and 6.3% signs of retouch,
which is a great contrast to LS II where all showed use signs. A low 0.4% were nuclei cores, which are totally absent at LS II. This corroborates the interpretation of the site being associated with the trimming of stone tools, and indicates that primary manufacture was by no means the main activity. This could be because flakes were primarily produced at the natural quarries.

Of the retouched implements at CL there was a much higher ratio of cores to flakes (12 : 32), than at LS II (8 : 67) - an indication that heavier tools were needed at the site.

e. Conclusions - In contrast to Little Swanport, Crown Lagoon appears to have been a site where flaked stone tool activities were primarily concerned with the rejuvenation of tools, and only secondarily with their primary manufacture. A greater use appears here of retouched cores, than at Little Swanport, indicating a need for heavier tools of this form; only 5.4% were of used flakes, which was a class of tools making up 38.4% of the Little Swanport assemblage. In support of this, the edge-rejuvenation flakes indicate that steep retouch and edge blunting were products of the tool's function and use, at Crown Lagoon. No such evidence was found at Little Swanport.

So high an energy expenditure connected with stone tools must be also connected with another major activity. From the accompanying faunal evidence, and ethnographic evidence, which associate flaked stone tools with the manufacture of wooden implements and the dispatching of hunted animals (above P. 67), I interpret this major activity as the hunt. This activity played a very minor role at Little Swanport.

5.10. COMPARISON BETWEEN THE STONE INDUSTRIES FROM LITTLE SWANPORT AND CROWN LAGOON

a. The Two Industries - As has been noted, the stone industries from both sites included two retouched forms, flakes and cores.
As well a range of unretouched or lightly retouched flakes and cores had been used. It is proposed to look at both these aspects of each industry, and to draw a comparison between them. No attempt is made at defining a typological classification of the industry. Weight is used for measurement as representative of general mass.

(i) Little Swanport (LS II) -

Retouched Flakes: These are slightly lighter and smaller in the lower third of the deposit (Figs. 5.8a, 5.9a). This is also true of the flakes, but may be the overall product of the small sample. There appears to be a selection for weights around 20 gms. together with a small number of heavier examples.

Cores: except for one example, the cores all fall within the heavier end of the retouched flake range (Fig. 5.8b). There does not seem to be an exclusive distinction in weight between cores and flakes, generally cores tend to be larger and heavier than most flakes. It is characteristic that many cores show signs of originally having been large flakes.

Flakes: (Fig. 5.8c) except for two very large examples, their overall distribution appears to be slightly lighter than that of the retouched flakes.

Rejuvenation Flakes: (Fig. 5.8d) their range corresponds to that of the flakes.

(ii) Crown Lagoon (CL) -

Retouched Flakes: (Fig. 5.10a) these have an identical range to those from Little Swanport.

Cores: (Fig. 5.10b) these too have a comparable range, except for 2 very large examples - both core nuclei.

Flakes: (Fig. 5.10c) these are predominantly small, indicative of waste products; all the used examples (mainly the larger ones) have a comparable range to those of Little Swanport.
Edge-Rejuvenation: (Fig. 5.10d) like the latter, they too are mainly small (i.e. waste), with the used ones (mainly the larger) comparable to those from LS II.

Rejuvenation (b): (Fig. 5.10e) these are exceptionally light, indicative of their origin as by-products of retouch; used examples compare in size with used edge-rejuvenation flakes, and used flakes from both industries.

(iii) Results - there is a close overall similarity between both industries. There is an overlap in the size range of retouch flakes and cores, though most cores are heavier than the majority of retouched flakes. Most used flakes (whatever their derivation) have a slightly lighter range than the retouched flakes.

b. Morphology -

(i) Cores - as a group, these appear to serve a dual purpose as, nuclei (from which large flakes have been removed), and tools. Retouch is mainly steep and often stepped. One characteristic of a significant percentage is the choice of one main striking platform, around which large flakes have been steeply removed, producing a final high-domed form (Figs. 5.13a, 5.12a). This has some of the characteristics of a horse-hoof scraper, but has none of the latter's consistent regularity of form. Other characteristics are: (i) steep "scraper" edges (Fig. 5.13b); (ii) more than one striking platform - with a number of retouched edges per piece; (iii) steep concavities along two parallel sides, producing waisted forms (Figs. 5.12b, 5.13c), though these appear to have been originally thick flakes; (iv) alternate retouch on a few examples (Fig. 5.12c).

(ii) Retouched Flakes - these form a broad group of basically "scraper" forms. In size, they are mainly chunky (with equal length-breadth ratios), though longer and narrower, more "blade-like" flakes also occur (Fig. 5.9a, c). In this aspect there was
no detectable difference between the three horizons at LS II, nor between the LS II assemblage and the CL.

All are composite forms consisting of a number of scraper edges which produce a large range of variations in form. Most have at least two or more retouched edges, plus three or more positions showing use signs (Fig. 5.11 a, b). This is true of both industries, but more extreme in both cases at LS II, as the above graphs show. All are unifacial tools, with the smooth, flat, ventral side chosen as the striking platform, retouch appearing on the dorsal side. More than one striking platform is usually selected per piece. There are two main types of flaking: (i) careful shallow angle (c. 45°); (ii) steep, often step-flaking, sometimes producing concave edges (Fig. 5.14a).

The main characteristics in form are: (i) flat, straight or convex edge forms; (ii) high-domed discoidal forms, flaked around the bulb of percussion in a series of concave and convex edges (Fig. 5.14b); (iii) very small, flat, discoidal or convex edged flakes (the finest examples are found at Crown Lagoon) (Fig. 5.15a, b, c); (iv) long, straight, retouched edges on long flakes (Fig. 5.14c); (v) the general occurrence of shallow retouch on the thinner ends, and steep retouch on the thicker ends of flakes (Fig. 5.14d); (vi) notches showing heavy signs of wear (Fig. 5.14e); (vii) the use of any available sharp edges or protrusions, such as points formed between two concavities.

(iii) Results - there appears to be a morphological distinction between the two classes of retouched implement, core and retouched flake, but also a degree of overlap in size, form, and apparent signs of use. All are composite forms, with a large degree of morphological variation. Further evidence to strengthen the latter is the large percentage of edge-rejuvenation flakes from Crown Lagoon showing that the removal of blunted, steeply retouched edges, was a feature in the production and rejuvenation of used, implement forms. This helps to explain the large number, and
variation of steeply retouched, waisted and concave forms (both core and flake) found at both sites. This further indicates that the Little Swanport forms had been rejuvenated in this way elsewhere, before being carried on to that site (because of the total lack of waste evidence present).

c. **Use** - Two main functional forms can be subjectively abstracted: (i) steep, often step-flaked, straight and concave edges (together with notches), usually associated with heavier pieces; (ii) finer, shallower retouched edges associated with the lighter and smaller pieces. With the latter group, the large range of used flake forms could possibly be generally associated. Given the archaeological association of both industries with hunting, and the ethnographic support of this, it seems reasonable to allocate the following functions to the two above groups: (a) the production of wooden tools used in the hunt - spears and waddies - with group (i), involving generalised planing and whittling (the edge-rejuvenation flakes are supporting evidence\(^1\)); (b) generalised cutting and scraping activities (ie. cutting up and skinning game, treating skins - worn as cloaks and used as matting - etc.) with group (ii).

A more objective statistical analysis is needed to clarify the above observation.

d. **Discussion** - The two stone industries from Crown Lagoon and Little Swanport compare favourably with the descriptions of those excavated at Rocky Cape and West Point (Jones 1966: 3, 5-6, Fig. II). Verification of this rests on the completed analysis of the latter. All four industries have been dated to within the last 4-5000 years. Jones\(^2\) (1968:200) has recently broadly connected the Tasmanian

1. Compare the edge-wear on these to that in White P. (1967: Plate iv (a))

2. Mulvaney (Mulvaney and Joyce 1966:186, 208 Table 6) has also drawn a general comparison. Jones has recently defined the earlier Australian industry more clearly (personal communication).
Fig. 5.8: LS II Assemblage (Weight)

- **a** Retouched Flakes
  - I - top
  - II - middle
  - III - bottom (of deposit)

- **b** Cores and Natural Cores

- **c** Flakes

- **d** Rejuvenation flakes

Fig. 5.9: Length and Breadth of Retouched Flakes

- **a** LS II

- **b** Total LS II (64)

- **c** Total CL (31)
Fig. 5.10: CL Assemblage (Weight)

Fig. 5.11: Retouched and Used Positions On Retouched Flakes (LS II and CL)

Fig. 5.16: Frequency of Dolerite/Sandstone (CL)
Fig. 5.12 : L3 II Corse.

a : N8, N-E  b : N7, S-W  c : I5, S-E

d : F1
Fig. 5.13: CL Corea.

a: CL I B3, E  b: CL II B9, E  c: CL II C3, W
Fig. 5,15: CL Retouched Flakes.

a: CL I D2, W  
b: CL II E7, E  
c: CL II E1, N  
d: edge-rejuvenation flake  
e: CL I D1, W  
f: CL II E7, N  
g: CL II D3, W  
h: CL I A5, W  
i: CL I C2,
flaked stone tradition to that existing on the mainland before c. 5000 BP. The latter corresponds to the industry described from the first (lowest) phase at Kenniff Cave (Mulvaney and Joyce 1965: 172, 177f.). Generally the industries from Crown Lagoon and Little Swanport compare favourably with the latter in support of the above comparison. It is now expedient to ask:

(i) how closely paralleled are these later Tasmanian industries with the earliest Tasmanian industries (assuming that the earlier Rocky Cape industry is the product of coarse local material);

(ii) are certain types (e.g. the high-domed cores) a degenerate form of the earlier Australian horse-hoof core, (indicating local isolated evolution of the Tasmanian industry), as is noticeable in certain other artefact forms (e.g. bone tools).

5.11. DOLERITE AND SANDSTONE ARTEFACTS

a. Description - Thirty two significantly large pieces of dolerite and sandstone were excavated. No typical examples of the mortar or pestle types were included, nor have any been noticed on the surface, though this could be due to insufficient sampling. Thirty of the pieces were of dolerite, and 2 of sandstone. They fall into two main groups (Fig. 5.16), small ones between 20-60 gms. and larger, around 300 gms. (with the heaviest 614.5 gms.). They are mainly chunky and block-like but included are water rolled pebbles, and thin, flat pieces. All except two show positive and extensive use signs, on more than one face and edge. The heavier group all show extensive signs of pounding. Some are fractured, and sharp edges often show abrasions. Sixteen (50%) show signs of chipping or flaking, which on a few is indistinguishable from minor retouch. One piece has been notched. Both sandstone pieces have been extensively used, and show signs of heavy abrasion, or grinding, with resultant smooth and concave sides. The larger sandstone piece has a groove along one side.
b. Results - This group of artefacts serves as a contrast to the flaked stone. The lighter pieces can be paralleled with the latter, but the heavier obviously served a separate function, of pounding. Most of the tools show signs of multi-purpose use, but a number of functions can be deduced - pounding, scraping, and/or cutting, and possibly abrasion or smoothing (i.e. of wooden artefacts) with the sandstone tools.

At Little Swanport, there was neither the range nor frequency of such tools, compared to that of the flaked stone. There is ethnographic evidence for the eating of vegetables at inland sites (see below), and this is possibly one explanation for the presence of the pounding tools.

5.12. RAW MATERIALS

All the stone material present in the excavated sample must have been humanly carried onto the dune. The percentage of raw materials on the site is shown for both samples (CL I, CL II), and for the combined sample (CL I-II) in Table 5.5a. There is a general consistency in results except for the over-representation of quartzite in CL I, which subsequently biases the combined results. This over-representation is due to the presence of two large weighty quartzite cores within a small overall sample. The combined results indicate the predominance of chert-hornfels (65.5%) and the minor significance of quartzite (32.1%), though the results for CL II (chert-hornfels, 84.1%; quartzite, 12.2%) is probably a more accurate assessment. All other materials (including quartz, chalcedony, a very fine grained chert, petrified wood, opal, agate, shale and ironstone) make up only 2.4% of the total.

All the chert-hornfels can be acquired today at quarries within
a few miles of the site (Fig. 3.3 above). The origin of the chert is unknown at the moment but its frequency possibly suggests a local source.

Of the coarse grained stone material used, the great majority was of local dolerite (94.3%), with the remainder of sandstone (5.7%), which is also procurable locally. The ratio of coarse grained stone to fine grained is 56.4% (coarse), and 43.6% (fine) (Table 5.5b) - a ratio comparable to that from Little Swanport.

5.13. RED OCHRE

Red ochre has a significant distribution, being present in 41.5% of the spits excavated. However, it was mainly found as small broken, discarded chips. The larger pieces all showed use signs and were of similar description to those of Little Swanport. It has a total weight representation of 82.4 gms and with its distribution, this indicates its greater representation at Crown Lagoon than at the latter site.

Further evidence as to its use was found in 3 small dolerite pebbles (between 20-20 gms each), whose one flat face was smeared in red ochre. This agrees well both with the evidence from Little Swanport, and from the ethnographic evidence (above P. 46), thus extending the latter far back into the prehistoric period.

5.14. CONCLUSIONS

The site Crown Lagoon, was occupied for several hundreds of years during the fifth millenium BP, while the upper layers of the lunette were forming during climatic conditions, supposedly drier than the present. The dating of the deposit has secured the age of this lunette landform to the mid-Recent dry period.

1. During the period of excavation, we located one local quarry of chert-hornfels, about a mile south-west of the site.
The majority activity represented at the site was concerned with the use and re-use of flaked stone tools, and less with their initial production. This can be seen as affecting the form of the tools themselves. The above activity appeared to be connected with the hunting of land animals and therefore supposedly with the manufacture of wooden tools for this purpose. Although bone remains were very poorly preserved, there was at least evidence enough to be able to associate these activities with the largest of the macropods. Pounding tools, indicating the probable presence of vegetable foods, possibly also reflect, in their low numbers, the low density of population concentration of the dune, though this is hypothetical. The size and frequency of the only definable living structure - the hearths - can be used in support of the latter. Together with the absence of post holes or any signs of wooden structures, this indicates a pattern of very temporary camps. Ecologically the site probably reflects a wider area than does Little Swanport; possibly wider than the confines of the marsh and its supported animal population, extending deep into the surrounding open forested grasslands. There is a far higher representation of male oriented activities at this site in comparison to Little Swanport - manufacturing and use of flaked stone tools, large scale hunting. This is verified by the greater density of red ochre than at Little Swanport, ochre being principally used by males, at least in the ethnographic period. There seemed to be a greater use of heavier core tools than at Little Swanport, possibly because of the heavier functional requirements. There was also a significant use of dolerite and sandstone pieces, in comparison to retouched stone tools.

A final interpretation would be of a temporary, shifting, hunting camp, principally organised for the exploitation of the game resources of the surrounding open forest or grassland, and
perhaps not located at any site locus more specific than the general area of the dune and the marsh. In this way, it appears to share many of the characteristics of the surface inland camps (as defined above), and indicates that this pattern was well established in Eastern Tasmania by the fifth millenium BP.

The case theoretical scheme and method of analysis as used for the East will now be applied to the archaeological evidence from the West, North-West and the North-East, in an attempt to integrate the surface evidence with the excavated.

6.1. THE WEST COAST

a. Environment - This region can be divided into two sub-regions, the northern, south to Macquarie Harbour, and the southern, south from Macquarie Harbour, incorporating the South-West corner. Basically the coast consists of a narrow coastal plain, backed by mountains, widest in the northern corner becoming increasingly narrow in the southern half, and with no coastal plain in the South-West. The environment consists of generally poor sedgelands in the southern half, with variations between sedgeland and rich coastal heath in the northern half. The northern corner is of coastal heath. The open areas are backed by dense rainforest and more wet sclerophyll, especially in the north. The rainforest in the southern half often meets the coast sitting over the coastal plain. (See Fig. 2.5 above, and Robinson 1930, April 11-13).

1. I have incorporated the surveys and notes made by Pulleine (1929), Legge (1928), Looman (1929), Guidero (1930), and Jones (1926). I have not carried out extensive surveys in these areas but have inspected and carried out brief surveys in all the areas excepting the South-West. I have also participated in excavations on the North-West coast and the North-East. (These include the excavated sites at East Point and the Rocky Cape sites. (Jones 1926))
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1. I have incorporated the surveys and notes made by Pulleine (1929), Legge (1928), Luckman (1949), Crowther (1950), and Jones (1965). I have not carried out extensive surveys in these areas but have inspected and carried out minor surveys in all the areas excepting the South-West. I have also participated in excavations on the North-West coast and the North-West, (these include the excavated sites at West Point and the Rocky Cape sites. (Jones 1966))
A description of the South-West corner between Lenina Bay (near Cox's Right) and Fort Dewey is given by Robinson:

"principally of mountains with extensive barren between them; the hills were covered with moss making them very difficult to climb." (Robinson 1829, March 2).

This area further south, between Recherche Bay and Cox's Right, as "very mountainous and covered with impenetrable forest" making travelling very difficult. (Ibid)

b. Site Types and Forms - (Fig. 6.1 and Appendices 6.1, 6.2)

Only living sites are discussed here. Types of living sites are divided into three types A, B and C. All are shell middens, no having yet been detected on the West Coast.

- type A site
- type B site
- type C site

wp = West Point

\^ = pit-depressions

with the shell beds, and could be classed as shell dumps.

E. (i) Extensive and comparably dense, continuous middens along open beach fronts and dunes.

(ii) Eroded midden concentrations in immediate or alone proximity to shell beds.

C. Concentrated and dense middens, well grassed, and most often associated with shellfish beds or close by, often on beach heads near the choicest shellfish habitats.

It is often difficult to distinguish between types B (ii), and C, as B (ii) may be an eroded form of C.

c. Composition of B and C Types (Surface Evidence) - Compared to the Eastern midden dumps most of these include a wider range of internal variables. These variables are: 1. a large percentage of shell; 2, significant proportions of bone material, with both coastal and terrestrial species (including bird)

1. Stone quarries are not as abundant here as in the East. Rock art sites appear to be peculiar to the West Coast, the North-West Coast, and possibly the off-lying Hanter Islands.

Fig. 6.1 : West Coast Archaeological Sites. (See Appendices 6.1, 6.2)
A description of the South-West corner between Louisa Bay (near Cox's Bight) and Port Davey is given by Robinson: "principally of mountains with extensive marshes between them"; the hills were covered with moss making them very difficult to climb. (Robinson 1830, March 7). He describes the area further south, between Recherche Bay and Cox's Bight, as "very mountainous and covered with impenetrable forest", making travelling very difficult. (Ibid)

b. Site Types and Forms - (Fig. 6.1 and Appendices 6.1, 6.2)

Only living sites are discussed here. Three living site types have been defined, types A, B and C. All are shell middens, no inland camp types having yet been detected on the West Coast.

A. Small shell middens of almost exclusive shell consistency, with few other variables represented. These are almost immediately associated with the shell beds, and could be classed as shell dumps.

B. (i) Extensive and comparably dense, continuous line scatters along open beach fronts and dunes.

(ii) Eroded midden concentrations in immediate or close proximity to shell beds.

C. Concentrated and dense middens, well grassed, and most often showing surface structural signs of house-pit depressions. These too are generally associated with shellfish beds or close by, often on beach heads near the choicest shellfish habitats.

It is often difficult to distinguish between types B (ii), and C, as B (ii) may be an eroded form of C.

c. Composition of B and C Types (Surface Evidence) - Compared to the Eastern midden dumps most of these include a wider range of internal variables. These variables are: 1. a large percentage of shell; 2. significant proportions of bone material, with both coastal and terrestrial species (including bird)

1. Stone quarries are not as abundant here as in the East. Rock art sites appear to be peculiar to the West Coast, the North-West Coast, and possibly the off-lying Hunter Islands.
represented; 3. large proportions of marine mammal species, predominantly of seal, mainly fur seal (Arctocephalus sp.), and some whale (e.g. Legge 1928:324); 4. extensive flaking floors and high frequencies of used and retouched stone artefacts; 5. large proportions of water-worn pebbles and local stones, many showing use signs, and a significant percentage of mortar and pestle types; 6. large proportions of red ochre; 7. heavy ash content and identifiable charcoal concentrations.

House-Pit Depressions - (associated with type C) (Fig. 6.1)

These have been described by Pulleine (1929:311) and Legge (1928:325) and their descriptions were verified by my own personal observations. The description is of circular depressions about ten to twelve feet in diameter (though larger ones of up to twenty feet have been reported at Temma (Pulleine 1929:311), and about one and a half feet deep. They appear to have been dug into the midden and around their perimeter is a heap of midden material about a foot in height. Often they are located in groups and on terraces around a central conical of the midden where depressions also occur. This may be an indication of social division within a group of huts. The circular structures conform exactly in size, form and location, to ethnographic descriptions of large circular huts situated in circular depressions and peculiar to the West Coast. (See below P. 105) The largest group recorded is between fifteen and twenty at Bluff Point, (Pulleine 1929:311), though Legge (1928:325) records only seven to eight for the same site. Generally they seem to be found in groups from three to four, a number of group clusters being found at each site. The size of the huts and their frequency could indicate sizeable populations at individual sites, if it can be assumed that all huts were synchronous, and all used at the same time.

1. This is especially noticeable at the sites of (i) south of the West Point Lighthouse and (ii) Green's Point.

2. See Appendix 6.2 for a list of house pit sites and numbers at each site.
d. Distribution - The surface evidence demonstrates an almost exclusively coastal distribution, with very few sites reported inland (Fig. 6.1). This is so even though the inland is far from unexplored, and is partially settled. Similar site types and forms are found the length of the coast (excepting the little investigated South-West corner), from Studland Bay to Port Davey. House-pit depressions so far have only been detected on the northern half of the coast, as far south as the north side of Granville Harbour. When considering the ethnoeraphic description of huts (see below P.100) their archaeological distribution might be expected to extend at least as far south as Port Davey. The ecology and topography of the South-West might be expected to impose certain restrictions on settlement and site patterns in this area.¹

e. Internal Composition (Excavated Material) -

Site: West Point.² (Fig. 6.1). The site's description fits that of a class C type, though it has certain peculiarities. A full report of this site has not been published, prohibiting a fuller interpretation.

Constituents -

1. There appeared to be no major internal cultural variance in the deposit.

2. The faunal evidence shows the exploitation of dual ecosystems, coast and heath. Over 90% of the calculated meat represented was of seal and shell fish, land animals contributing about 6% (Coleman 1966:81). Of the non shellfish meat (calculated from 10% of the excavated sample) the results are 75% seal, 20% macropod, and 3% bird. (Jones 1966:7). Of the frequency of individual animals present 45% were of bird, 23% seal, 17% macropod, 7% lizard and 4% rat kangaroo, possum, bandicoot, rat, native cat, Tasmanian Devil and

1. Since European settlement of the area grazing has caused extensive dune damage, bursting open and scattering many stratified archaeological deposits, at least on the northern half of the coast.

2. Information here comes from the preliminary reports (Jones 1966/1967), and my own observations as a member of the excavating team. E. Coleman (1966) has worked on the shell fauna and some of her conclusions are mentioned here. This material is being presented with the full permission of Mr. Jones.
whale. This indicates that the majority of activities were concerned with marine foods (shellfish and seals). There is significant representation of activities concerned with birds and macropods, and a lesser concern with the smaller animals, reptiles etc. How representative either of cultural selection or a reflection of the living animal populations of the heath, remains to be tested. The wide faunal range indicates the exploitation of a wide range of micro-environments (including the swamps and the mutton bird rookeries). No evidence for fishing (i.e. scale fish) was found.

3. The flaked stone assemblage was large - about 30,000 artefacts (Jones 1966:6). It consisted of flaking floors of waste material, including rejuvenation flakes, and retouched and used implements. The density of flaked stone was around a maximum of 50 flakes per cu. ft. in places. This assemblage is functionally comparable to that of Crown Lagoon and similar Eastern sites, and a direct contrast to that from Little Swanport. The stone material used was from a local source.

4. Large quantities of water worn pebbles showing use signs some having the characteristics of pestles and mortars. (Jones 1967:363).

5. Well constructed hearths (at least two complete examples being found) within a stone superstructure. Many less differentiated hearths were also found.

6. Clusters of pit depressions about 8-12 in all.

7. Dating of the site shows that it had a relatively short life of less than 1000 years, ranging between the dates of 1,850 ± 80 (bottom) to 1,330 - 80 (top). (Jones 1967:363).

Interpretation of the Site.- Jones interprets the site as a high density concentration based primarily for the "specialised exploitation of young seals, probably seasonally" (Jones 1966:9), together with terrestrial hunting and gathering, birding and the manufacture of flaked stone artefacts. He gives evidence of Southern Elephant Seal colonies generally being shore-based for three periods annually - for breeding, moulting, and winter
"haul out" purposes. As all seal remains were of immature individuals, he has made the assumption that the site was at least occupied in early summer (Jones 1966:7; Jones 1967:363).¹

The site's function can be discussed further within the analytical scheme presented within this thesis. It has characteristics of a seasonally sedentary camp, based for the exploitation of a nearby seal colony. Its composition includes the representation of a wide range of activities. These reflect both male and female tasks and participation. In a comparison with the site types of the East, West Point incorporates the full range of activities represented in both coastal middens and inland camps. The size and frequency of the house-pit depressions and the rapid accumulation of the large deposit during such a short life span, indicates significantly large population densities, possibly for significant periods of time, at the site.

A function interpretation would be of a base camp of semi-permanent (seasonal) nature, located for sealing, from which a large range of micro-environments could be exploited by both men and women, reflecting a range of activities far in excess of the limited boundaries of the site and its immediate micro-environment.

How typical is West Point of West Coast sites? It has already been classed superficially as a type C site, and shown to share many characteristics with type B sites. Two points are at issue here. Firstly, its large volume and short life indicate the existence of a stable economic factor which is interpreted here by Jones as a permanently based, seasonal seal colony, located nearby. Both type C and B sites have seal bone evidence associated, but whether this is an indication of seal colonies permanently based, or of isolated instances of individual

¹. Jones links the site's apparent prehistoric abandonment with the possible Aboriginal extermination of the seal colony. (Jones 1967:7; 1968:211, Table 1).
Fig. 6.2: Seal Colonies On or Close To the Tasmanian Coast. (See Appendix 6.3)

- Known present day seal colonies
- Ethnographically recorded seal colonies/seals
- Ethnographic record of seals caught by Aborigines
- Archaeological middens with seal bone
- Known archaeological shell midden concentration
- Shell scatter
- Cave

There is strong evidence to suggest that similar examples may exist ethnographically in South, and probably the whole northern half of the Tasmanian coast, mainly as off-shore islets, and with their greatest known distribution within the Bass Strait Basin. 1 There is ethnographic evidence for seals and their hunting by Aborigines from these areas the North-East, Northwest and North-East. The archaeological evidence of middens containing seal bone shows an extended version of the case - a western/northern/north-eastern distribution (Fig. 6.3). In contrast in the East and South-East there is both ethnographic evidence for seals and seal colonies, but no ethnographic records of Aboriginal sealing, nor any archaeological evidence of seals from middens. As a result, the results can be considered highly significant as the East and South-East coasts are well-known for lack of evidence for seal colonies.

1. A possibly exaggerated but effective reference comes from Robinsen: "All the islands (Mellesa Group) swarmed with seals and Pariah said at the time he saw thirteen hundred knocked down." (1839, Rev. 9, Preservation Island, North-East.)
beaching seals (Davies, Seals: 6) awaits systematic sampling of the individual middens. Secondly, West Point is located on the edge of a rich open heath plain, whose exploitation is indicated by the site's faunal evidence. In this way it shares another ecological feature with middens in similar biomes, especially those of the northern corner. Differences can be expected between these and the middens associated with inferior sedgelands.

There is strong evidence here to suggest that West Point is not wholly exceptional within the West Coast site pattern, and that similar examples may exist, especially in the north, and probably the whole northern half of the coast.

f. Seals and Sealing - (Fig. 6.2 and Appendix 6.3)

At the time of European contact seal colonies were found all around the Tasmanian coast, mainly on off-shore islets, and with their greatest known distribution within the Bass Strait Basin. ¹ There is ethnographic evidence for seals and their hunting by Aborigines from three areas, the South-West, North-West and North-East. The archaeological evidence of middens containing seal bone shows an extended version of the same - a western/northern/north-eastern distribution. (Fig. 6.2). In contrast in the East and South East there is both ethnographic evidence for seals and seal colonies and for established present day colonies, but no ethnographic accounts of Aboriginal sealing, nor any archaeological evidence of sealing from middens exists. These results can be considered highly significant as the East and South-East coasts are well explored in comparison to the other coasts.

The evidence for the presence of seals and colonies in the East and South-East all comes from isolated islets and exposed open sea sides of islands. As Aboriginal sealing parties (on canoes) were reported to have sealed off the South-West

1. A possibly exaggerated but effective reference comes from Robinson: "All the islands (Flinders Group) swarmed with seals and Parish said at one time he saw thirteen hundred knocked down." (1830, Nov. 9, Preservation Island, North-East.)
De Witt and Eddystone Islands (Robinson 1831, July 15), it is feasible that the above areas were also exploited by Eastern Aborigines. It remains for their associated middens to be detected.¹

There was no evidence for sealing found at Little Swanport, though the area lies opposite the Isle Des Phocques, site of an ethnographically recorded seal colony. However, it is quite possible that sealing, perhaps in a restricted way, was a part of the activities of the people of this general area.

g. Towards a Model for the West - The distribution of sites indicates a chiefly dense coastal concentration. Three site types were identified, A, B, and C. C types (and possibly B (ii) types) were classed as coastal bases, which facilitated the exploitation of (1) the dual ecosystems - coast and coastal plain, and (2) a number of micro-environments. Base conditions were emphasised by evidence for numerous large, and durable huts. An optimum situation was seen at a site such as West Point where apparent seasonally settled and populous conditions at the one base camp were provided by a dependable food source - seal, stabilising B and C type conditions. Less complicated sites, those associated with a limited number of activities, and a limited immediately procurable food source (type A, and possibly type B (i)), may have served during less favourable times and conditions, when key food sources (seals, macropods etc.) were not available or unpredictable. Such sites could be expected inland as shifting hunting camps.

A very general hypothetical year-round model might suggest population concentration and sedentism under optimum conditions (such as the seal cycle, or the availability of terrestrial game

¹. Ethnographically recorded seal/seal colony sightings near the Tasmanian coast are: (i) Bruny Island (Bligh 1792, Feb. 13); (ii) Maria Island (Peron:234); (iii) Isle Des Phocques (Peron:227); (iv) Waterhouse Island (Flinders 1798, Nov. 3, P.779). Ethnographic reports of Aboriginal sealing are: (i) Cox's Bight (Robinson 1830, Feb. 10); (ii) De Witt and Eddystone Islands (Robinson 1831, July 15); (iii) Hunter Island (Robinson's natives) (Robinson 1832, Oct. 18); (iv) George's Rocks (Kelly 1816, Jan. 14-18, ref. Caulder:174 f.)
-type C sites), balanced by a dispersal of population and activities (both coastal and inland) when these conditions were not prevalent (Types A and B (1) ?).

The South-West: the ecological differences of this region suggest the operation of a more restricted version of the West Coast pattern here, possibly with an even greater coastal orientation, the inland of sedgeland being extremely poor.

6.2. THE NORTH-WEST

a. Environment - This area has no distinct coastal plain. Because of its relatively high rainfall, and constant Aboriginal firing, disclimax vegetation conditions prevail (Jackson 1968(b)). Much of the area today is classified as "cleared land" (Fig. P. 2.5 above), but a reasonable reconstruction would suggest a mosaic of wet sclerophyll forest checked by rainforest, and interspersed with open Poa grassland. Robinson describes the area near the Surry Hills as huge, thick forest, interspersed with clear plains (Robinson 1830, Aug. 6). He also describes dense forest meeting the coast - to the water's edge - at Table Cape (1830, July 26). Open forest and plain, even today, can be seen following the river valleys towards the base of the Central Plateau. Heath fringes the coast in some areas, for example between Rocky Cape and Sister's Beach.

b. Sites - (Excavated evidence). Little systematic surveyance of sites has been carried out in this area. Three sites have been excavated on the coast by Jones - three coastal caves (Rocky Cape North, South and Sister's Creek) all within the one environment, today of coastal heath. Only preliminary reports exist of these sites, prohibiting close comparison with the excavated Eastern sites. (Jones 1966:2-6, 8-9; 1967:362-363; 1968:198-201). Basically the compositions of these sites fit a modified version of the West Coast model. They generally correspond to B type sites, type C - the optimum stage, not being represented.

1. A fourth excavation has been carried out on a prehistoric living floor within the south cave, Rocky Cape, by Jones and Lourandos, 1967.
Fig. 6.4: Rocky Cape South Faunal Distribution.

Presented with the full permission of Mr. Rhys Jones.
Jones' interpretation is of a sequence showing a transitional change between two major phases (Figs. 6.4). (i) An early phase of predominantly marine exploitation, with minor terrestrial exploitation associated. Fish, seal and shellfish made up the greater part of the diet, shellfish making up at least 50% of the meat source. (Jones 1967:362). (ii) A later shift to a joint marine-terrestrial exploitation, showing a marked lessening of the marine factor. Scale-fish ceases to be represented, sealing declines, and terrestrial mammal, and bird, increases. Jones links this phase with West Point.

Associated in both phases is evidence of stone manufacture and use. Generally these figures correspond with the Crown Lagoon assemblage (see above P. 69), and are in total contrast to that of Little Swanport (see above P. 45).

The archaeological evidence indicates an ecological similarity between the North-West and West coasts, and a marked dissimilarity with the East. As in the West, for the North-West it indicates the use of a coastal site as a base for the dual exploitation of coast and inland. The stone assemblage is supporting evidence, demonstrating the dissimilarities in function between North-West and Eastern coastal sites. Until more details are known, little more can be said of these sites' temporary, or seasonal nature.

At Rocky Cape, near the excavated caves, exist shell dumps of West Coast type A form, associated with all present-day shellfish

1. For further discussion, and the chronological significance of this sequence, see below P.119f

2. Rocky Cape south: Phase I - a density of c.10 flakes per cu.ft., with 70% retouch and cores; Phase II - density of 60 per cu. ft. (though most were tiny), with 2.5% retouch. Rocky Cape north: Density of 5 per cu. ft.

Sister's Creek: Density of less than 10 per cu. ft., and few retouched pieces. The differences between Phases I and II at Rocky Cape South, Jones explains as spatial-functional, rather than cultural. (Jones 1966:3, 5-6)
habitats (personal observation). The significance of the caves in the area lies in their prestige value, of offering protection against adverse climatic conditions prevalent on this exposed promontory. This may explain certain of their specialised features, such as the selection in seal carcass evidence present (Jones 1967:362), which is not represented at West Point. This prestige factor serves to distinguish them from the average coastal site located primarily for marine exploitation.

The hinterland of the far North-West, including the Rocky Cape area, is predominantly rainforest, and few areas with evidence for inland occupation might be expected. Inland penetration in the nature of open and rockshelter sites has been found further east, along the river valleys of the Forth and Mersey, and might be expected further west along the Blythe and Leven. (c.f. Fig. 2.6, above).

6.3. THE NORTH-EAST

a. Environment - This area consists of a long open and flat coastal plain, of rich heathland, backed by, and often intermixed with dry sclerophyll. It stretches from the Tamar River almost to Eddystone Point, and is virtually cut off from the East by a large mountainous area of rainforest and wet sclerophyll - the Eastern Tiers. Robinson has described the faunal richness of the area (Robinson 1830, Oct. observations)

b. The Sites (Surface Evidence) - Middens on the North-East corner (eastern side) have features similar to the North-Western sites mentioned, and are situated in a region ecologically similar in certain ways to that area. Shell middens at Eddystone Point, and further north at Cobler Rocks, and Cape Naturaliste\(^1\) are associated

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1. These were first brought to my attention by Mr. D. Walter of Launceston, in 1967. I later inspected the area with Mr. Jack Thwaites of Hobart and later with Mr. Jacques Bierling, Sydney University.
with significant quantities of marsupial and seal bone in dense deposits, some visibly up to five feet in thickness. This evidence for seals in the area corresponds with an ethnographic description by Kelly (1920:174) in January 1816, of a seal colony at George's Rocks, which lie immediately off the coast between Eddystone Point and Cobler Rocks. Large numbers of Aborigines are associated with the seals and with kangaroo in this description, though the incident had been induced by Europeans (c.f. Hiatt:199, 201). Excavation is needed here to determine how reliant these sites were on seal, or seal colonies; whether they in fact were temporary bases of a generalised West Coast B site type, as they appear to be from surface evidence. Further detailed surface studies are needed along the northern coast and inland.

West Coast. In the East there is a sharp distinction between coastal sites, located primarily for marine exploitation, and inland sites, located for limited terrestrial exploitation. All sites seem of a temporary or ephemeral nature. This has been interpreted as a dispersal of economic activities; each site located for the short-term exploitation of a limited micro-environment. The West Coast sites show an imbalance between coastal and inland occupation. Site distribution is heavily coastal with few sites detected inland. There is supporting ecological evidence for this. The results showed strong evidence for seasonality, with seasonal sedentary coastal bases, less sedentary (temporary) coastal bases, and dispersed coastal and inland limited activity sites. Coastal bases appear located for the exploitation of dual ecosystems - coast and hinterland, and for a wide range of micro-environments.

This West Coast pattern refers mainly to the northern half of that coast, with variations due to ecological variance in the little-explored South-West, and North-West. The North-East, with its intermediate ecology, shows certain dissimilarities with the East, and features more common with the related North-West. This area is also little-explored.
CONCLUSIONS:

Significant differences have been noticed in the distribution and composition of the archaeological sites in Tasmania. These regional differences appear to correspond closely to the separate biomes of the island. As there is no evidence to suppose separate cultural origins for each area these differences can validly be interpreted as the product of cultural adaptation to separate environmental situations.

The sharpest contrast can be seen to occur between the two most dissimilar habitats - the dry sclerophyll East and the wetter West Coast. In the East there is a sharp distinction between coastal sites, located primarily for marine exploitation, and inland sites, located for limited terrestrial exploitation. All sites seem of a temporary or ephemeral nature. This has been interpreted as a dispersal of economic activities; each site located for the short-term exploitation of a limited micro-environment. The West Coast sites show an imbalance between coastal and inland occupation. Site distribution is heavily coastal with few sites detected inland. There is supporting ecological evidence for this. The results showed strong evidence for seasonality, with seasonal sedentary coastal bases, less sedentary (temporary) coastal bases, and dispersed coastal and inland limited activity sites. Coastal bases appear located for the exploitation of dual ecosystems - coast and hinterland, and for a wide range of micro-environments.

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CHAPTER SEVEN

THE ETHNOGRAPHIC EVIDENCE

7.1. INTRODUCTION

This chapter is aimed to analyze an independent body of data – the ethnographic literature on the Tasmanian Aborigines – and to place it as a form of check against the findings from the archaeological evidence. Of this literature the following questions were asked: (i) whether a dichotomy between the organisation of economic activities on the East Coast and that on the East and South-East coasts, was apparent; (ii) if this was so, whether it appeared to be linked in any way, to the major overall separate pattern of activities appeared to exist between the East and West Coast habitat; (iv) the ways in which those of the North-West and North-East were related to them. As well, any evidence to explain the existence of such possible differences, was collected and has been used throughout this thesis.

This is not the first review of the literature, but a thorough reappraisal of it was justified mainly because of the distinct nature of the questions being asked. Other reviews have been attempted (e.g. Ling Roth 1899, and more recently Miatt 1967), but each for individual reasons which provided data unsuitable for the questions asked here. Miatt dealt with a similar problem, which she called “the food-guest and economy” of the Aborigines, and came to definite conclusions on the “economy”
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This is not the first review of the literature, but a thorough reappraisal of it was justified mainly because of the distinct nature of the questions being asked. Other reviews have been attempted (e.g. Ling Roth 1899, and more recently Hiatt 1967), but each for individual reasons which provided data unusable for the questions asked here. Hiatt dealt with a similar problem, which she called "the food-quest and economy" of the Aborigines, and came to definite conclusions on the "economy"
of separate "sides" of the island. However, her data and certain of her conclusions proved unsuitable for the following reasons. Firstly, considering the method used, her selection of diet observations contained many significant biases and inaccuracies. She fails to distinguish between those observations of Aborigines in indigenous (pre-European contact) situations from those of Aborigines operating in a Europeanised situation. This occurs frequently in observations used from the Journals of G.A. Robinson (1829-1834), which make up a high percentage of her data. These journals in the main deal with Aborigines under Robinson's and the State's care, as well as containing references to Aborigines still employed in a relatively indigenous way of life. Although much information can be gained concerning dietary selection and related customs, from the former information, this is no valid observation of Aboriginal food-procuring activities, nor of diet, especially as the whole basis of the Aboriginal activity pattern had disappeared with the introduction of, settled camps (restricting activities), the dog as a hunting aid, and the staple food rations provided. Hiatt makes no allowance for the introduction of the dog as a hunting aid to those Aborigines still pursuing a relatively un-Europeanised way of life. The dog's introduction seems to have had a profound effect on hunting capacity and efficiency. Use of the dog may have itself introduced a new form of selection into Aboriginal hunting, for example a preference for the larger animals (e.g. macropods) which are listed in high frequency in Hiatt's figures. Such changes can be corrected through archaeological sampling of the faunal remains. Also as observations she includes very general references based on no direct observations.  

1. eg. "They live chiefly on kangaroo, opossum, and the smaller animals, down to the kangaroo rat, migrating at times to the coast for fish." (Asiatic Journal 1820 : 219)
application of an objective quantitative method can be unqualifyingly applied to such ethnographic data. On these grounds it is hard to accept many of the very broad range of cultural and economic conclusions reached (Hiatt 1967: 215-219), without more rigid qualification and testing. Hiatt in fact has only indirectly studied diet, she has actually studied activity concerned with the procuring of food.

Hiatt's conclusion that no economic difference existed between East and West coasts (P.218) must be qualified. If "economy" is interpreted as a broadly similar range of hunting-gathering activities associated with a similar broad range of foods, her conclusions are in part tenable. But if "economy" is also interpreted as the operation of these activities in the procuring of this range of foods, she is not justified in coming to those conclusions, even on the findings from her own evidence. She makes two main errors. Her first is to divide Tasmania up vertically into east and west without regard to the ecological biomes, thus cutting across them. For the East she includes the dry sclerophyll and the North-East heath and wet sclerophyll biomes. She concludes, "Hence I can find no major differences between the diet content of the east and west areas of Tasmania from the information available in the ethnographic record" (P.120), basing this on the fact that proportions of land and sea foods were to be found in both areas. Her second error is to fail to notice that her Map 1 (P.190) - the distribution of observations - distinctly shows the areas of the South-East and East coasts associated with the sclerophyll biome, as devoid of terrestrial mammal hunting (with one exception of small marsupials) consisting overwhelmingly of marine resources.

She makes one further error (with slight qualification on P.121), in failing to take into serious consideration the varying yield of food resources from each separate ecological area, although she presents such information as an introduction to her analysis (P.108).
For these reasons a complete reappraisal of the literature had to be made. I proposed to go through at least all of Hiatt's references, and as many others as I came across, and select from these only those observations of indigenous (non-Europeanised) Aboriginal food-procuring activities. As well, as a further check, I propose to examine two other forms of information - Aboriginal group-size estimates, and hut-group densities as an indication of group sizes - to see whether these produced any further qualifying evidence on Aboriginal settlement of the separate biomes.

7.2. THE ETHNOGRAPHIC LITERATURE

The literature surveyed fell chronologically into two groups: between 1771 to 1804 (including one early reference in 1642); between 1815 to 1834.

**Group 1**: (1642 - 1804) Tasman, 1642; Crozet (Marion Du Fresne), 1771; Labillardiere (D'Entrecasteaux), 1772; Furneaux, 1773; Cook, Anderson, 1777; Bligh, 1788, 1792; Cox, 1789; Flinders, 1798; Bass, 1799; Peron (Baudin), 1802; Knopwood, 1804.

**Group 2**: (1815 - 1834) Kelly, 1815-16; King, 1819; Ross, 1822; Hobbs, 1824; Hellyer, Jorgensen, Fossey, 1827-28; Robinson, 1829-34; Betts, 1830; Backhouse, 1932-33.

Tasmanian Aboriginal society and economy first came under serious European contact and disruption after 1798 (Plomley 1966: 1006). The areas mainly affected were the North-West and North-East coastal areas and islands, exploited commercially by European whalers and sealers. The significance of the two chronological group of references is that the earlier group is of observations almost all located in the South-East quarter of the island - an area not yet affected by intensive European influence (the first colony being established in Hobart in 1803). The second period covers the...
remainder of the island representing all major areas except the central East Coast and hinterland.

This means that of all the island only the South-East coastal area is well documented for the period of primary and light European contact. For the Central East inland, the North-West and North-East coasts and hinterlands, there is some early documentation, though scant. But for the West Coast observations do not begin before 1815, and are predominantly from the post-1830 period (eg. Robinson's Journals). As it is known how disruptive an effect sealers would have had on the seal colonies of the area (see below Section 7.3.d.), serious discrepancies between the earlier ethnographic situation along this West Coast, the North-West and North-East, and the later situation could be expected.

7.3. ABORIGINAL FOOD-PROCURING ACTIVITIES

Collection was made of all observations of eye-witness reports of Aborigines in an indigenous food-procuring situation, reliable reports of such, and reports of recent material remains of such activities. These are compiled in Appendix 7.1, and plotted onto Figures 7.1 and 7.2. Sixty-nine observations in all were collected.¹

The object was to isolate a pattern of food-procuring activities in each biome. As mentioned above, frequency of observation in a particular area is a result purely of European documentation, and does not reflect the frequency of Aboriginal activity.²

Figure 7.1 distinguishes between observations of activities associated with non-mammal marine foods and with terrestrial mammal foods. It shows that terrestrial mammals were hunted inland, and in all coastal areas at coastal camps, except those associated with the sclerophyll forest, that is, the South-East and

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¹ This is far less than Hiatt's 191 "direct" and 96 "gossip" observations (Hiatt: 109)
² Aboriginal distribution has been indicated above, Fig.
Fig. 7.1: Distinction Between Fishing & Terrestrial Hunting. Ethnographic observations used are the same as for Fig. 7.2.

+ - fishing (shellfish, crayfish)

x - terrestrial hunting
Fig. 7.2: Observations of Food-Procuring Activities (From Ethnographic Evidence). (See Appendix 7.1)

m - macropod
s - shellfish
v - vegetables
c - crayfish (marine)
z - small marsupials
w - wombat
r - rocky sea coast birds
b - land birds
e - emu
p - possum

l - lagoon birds
g - eggs
sl. - seal

Unspecific References:
x - terrestrial hunting
+ - fishing (shellfish, crayfish)
• - hut or shelter associated
^ - cave associated
East coasts. Here, out of nineteen observations, none are recorded of terrestrial hunting. These results show the same distribution of terrestrial hunting as is shown from the archaeological evidence (above Fig. 3.3). In place of terrestrial hunting on the South-East and East coasts are activities associated with marine foods - shell-fish, crayfish, augmented by vegetables (Figure 7.2). This is a conclusion also reached from the archaeological evidence (above Fig. 3.1).

In the South-East a junction between the two activity patterns seems to be the Derwent estuary, where on the upper estuary, associated with open forest, terrestrial hunting activities are recorded. Observations of coastal activities along the North-West and North-East coasts are few, but mixed marine-terrestrial activities are observable. The West Coast is better documented, and here all along the coast (excepting the extreme South-West) mixed terrestrial-marine activities occur associated together. Also recorded are separate hunting activities behind the coast, separate fishing (shell and crayfish) and birding, on the coast.

Conclusions and Interpretation - The archaeological observations of (i) specialised shell fishing and restricted marine exploitation for the South-East and East coastal middens associated with the sclerophyll forest biome, and (ii) of mixed marine-terrestrial exploitation on coastal middens on all other coastal areas associated with other biomes, are verified by the ethnographic data.

Figure 7.2 also shows that there is a high incidence of these coastal activities being associated with huts and hut clusters (at least on the West and East coasts), indicating that inhabitation as well as exploitation, took place on the coasts. However, the size and durability of these huts differed between the West Coast and all other areas (see below P. 104). This also satisfies conclusions drawn from hut depressions found in the archaeological evidence of the West Coast (above Fig. 6.1) and the suggestion of ephemeral camps.
being associated with the East and South-East coast middens (above P. 24). Further, from the above evidence three separate activity patterns can be isolated, for the South-East and East coasts and hinterland, the West Coast, and the North-West and North-East coasts and hinterlands.

a. The East - There appears a clear division between the activities performed on the coast and those inland. All the food procuring activities observed were of family groups of mixed sexes, together with children in most cases (though not all observations are full enough in detail). On the coast the women always did the shell, crayfish, and vegetable collecting, either in the presence of the men (above P. 57), or returned with the catch to a coastal point of rendezvous with the men (eg. Peron : 198). Invariably the meals took place directly on the shore, where large shell heaps were noticed by many of the observers (eg. Cook : Jan 29; Bligh 1788: 31). Sometimes the food remains were seen inside their empty huts and windbreaks (Labillardiere : 109), but shelters were not always associated. At no time during these seafood meals are the men described with spears or as performing any specific activity, although observations of men with spears in all-male groups, moving from behind the coast onto the shore, were seen (eg. Labillardiere (D'Entrecasteaux Channel) : 319-320; Peron (Maria Island) : 216f.). There is one observation of a family group including armed men on the coast (Maria Island), but there is no mention whether they are fishing or hunting, (Mortimer (Cox) : 18-20); and an obscure reference by Bligh to wood shavings near a hut (Bligh : 1792, Feb. 9), could have been the waste products of wooden tool sharpening, though this is speculation. Stone implements were also found in the baskets left behind on coastal camps (eg. Labillardiere : 127). All this evidence when taken together with the sea foods eaten, indicates
the predominant use of the littoral for the exploitation of its marine resources at very temporary camps. Hunting, even if it also occurred along the forested fringe of the coast, seems to have been a separate activity, divorced from fishing. It is both interesting and significant that when traditional activities were disrupted and a settlement established by Robinson on Bruny Island (1829), that these two activities, fishing and hunting, became centralised at the settlement, where rations were also provided (Robinson: 1829, May 17, 18). This also occurred wherever temporary or permanent European bases for the Aborigines were established by Robinson, whether he was on the move or settled, for example on Hunter Island, Swan Island, and Flinders Island.

In contrast to this situation, immediately behind the coast, and extending inland over the whole Eastern biome are observations of camps of family groups associated specifically with terrestrial game and vegetables. The greatest contrast between these two activity patterns can be seen on the Derwent River and estuary, where on the upper estuary, camps associated with mixed marine-terrestrial hunting activities occur, and close by, up the river, exclusively terrestrial-hunting camps are to be found. Wherever these inland hunting camps were located was also observed the debris of wooden implement manufacture and sharpening (Paton: 189–190; Robinson: 1831, Oct. 17).

b. The West Coast – Here the observations also are of family groups but the activities of hunting terrestrial game and fishing, (shell-fish, crayfish) occur both separately (six times) and together (six times)

1. A full ethnographic description of two East Coast meals is given above in Chapter Four, P. 56, and also occurs in Plates 11, 12, 13.

2. The size of these and the coastal groups are described in the following section.
along the coast. Five times out of the six they were associated together, they were associated as well with large, well constructed huts, but only one out of six separate fishing activities was associated with a hut. This may point to the more ephemeral nature of the latter. Family groups are recorded hunting inland behind the coast in the North-West, or along the coast, and as being camped once inland (North-West); but none of these observations are associated with huts, and a hut was only recorded once inland (below P. 106). The pattern seems to be of fishing and hunting, localised at coastal bases of a more than temporary nature (see below Section 7.4. a,(i)), with a dispersal either as ephemeral fishing parties along the coast or shifting hunting expeditions inland. The latter could be expected to be larger and more extensive in the rich and wide North-West heath, and less so along the narrow sedge land corridor of the more southern West Coast.

Elaborate coastal, or near coastal traps, designed for catching coastal birds (Robinson: 1833, May 18, July 12), and others for macropod (Robinson: 1832, July 3), were unused elsewhere on the island (Robinson: 1833, May 18). These could be either products of the peculiar ecology of the area, or, like the huts here, also indicate a restriction in area of activity.

A further activity present, common to coastal Tasmania, and especially to areas of extensive lagoon and marsh, as is present on the West Coast, was the hunting and collecting of seasonal coastal and lagoon birds and bird's eggs (see above Section 2.2d).

This above evidence agrees with the archaeological, except in one major factor - the existence of off-shore seal colonies, and their association with the Aborigines. Ethnographic descriptions of sealing occur only in two areas of the West Coast (above Fig. 6.2). Robinson adds that the natives of Cox's Bight "subsisted in a great measure on the seal of which they were very fond."
This may indicate a remnant of the more traditional West Coast pattern as indicated by the archaeological evidence. Only on the South-West islands was there evidence for actually established seal colonies, as distinct from isolated beaching seals. This area is reported to have been visited for sealing by the South-West natives, including those from Bruny Island (South-East) (Robinson: 1831, July 15). Jones (1966:7) has offered two explanations for this discrepancy between the archaeological and ethnographic evidence concerning sealing:

1. that either the European sealers were responsible for the decimation of seals, or
2. the Aborigines themselves had been in part responsible, such as in the prehistoric example of West Point.

Of the overall West Coast pattern, the evidence here and in the following section, suggests that even during the period of culture contact (post-1798) serious break-down was occurring. The late ethnographic information here mainly records the last stages of this disintegration.

c. The North-West and North-East - Far too little information remains of these areas, but the elements of a distinct pattern exist. This shows terrestrial hunting occurring at coastal camps, all over, east to west, and extending all the way inland. Unfortunately there are no observations of meals being eaten in this area, as there was for the other areas. Only one reference is made of shell-fish, together with terrestrial game, in a short statement about the area (and in particular to Port Dalrymple) of food remains associated with huts, made by Bass who compares this situation to that of the Upper Derwent (1799: 168,188). From this we can presume that dual activities of fishing and hunting were sometimes combined on the coast, but also there is evidence for shelters no more permanent than those from the rest of Eastern Tasmania (below Sec. 7.4.b.). Coastal
camps of a less permanent nature than those of the West Coast could be expected. As on the West Coast there are no direct observations of Aborigines traditionally involved in sealing, though there is the one important Europeanised situation on the coast opposite George's Rocks, in the North-East corner (above Sec. 6.3.b.). The reason for these omissions could be explained by the same reasons as for the West Coast (above P. 97).

7.4. HUT FORMS, HUT DENSITIES, AND SIZE OF GROUPS

Analyses of huts from ethnographic data have appeared before (e.g., Ling Roth: 107-111; Hiatt: 201-202), but as none of these are exhaustive enough, nor distinguish the observations chronologically nor by region, the following analysis was necessary. It's objective was to see if regional differences such as those apparent in the food-procuring activities, existed in hut forms, hut densities, and the size of groups of people.

a. Hut Forms - Figure 7.3 shows the distribution of hut forms from the 100 observations of huts found in the literature (Appendix 7.2). The main features visible are (i) that along the West Coast (excepting the extreme South-West) a separate hut form existed, not found elsewhere on the island. This is an observation often repeated since the first recorded European sighting by Jørgen Jørgensen (1827 March 31), and Robinson (1830, April 5); and (ii) that the rest of the island shared in a common series of hut and shelter forms.

(i) West Coast Hut Form - Robinson's description of the "West Coast hut" form, its construction and location follows. It tallies well with that of Jørgensen (Ibid).

Form: "Their tents are differently constructed from that of the Brune people. They are in the form of a semi-circular dome and are very commodius and quite water-proof ...."
Some of these huts are from ten to twelve feet in diameter and eight feet in height. The door or entrance is a small hole fourteen inches wide by two feet high, and this aperture is made to answer the threefold purpose of door, window and chimney. I entered several and found them to be very comfortable dwellings. Their huts or cottages are constructed by first placing a long stick in the ground and bending it over and forcing the other end into the ground at the distance required for the width of the hut. Other sticks are then stuck in the ground and bent over as the first, intersecting each other, and this is continued until they have a sufficient quantity to support the weight of thatch to be put on. After this frame or skeleton of a hut is completed they put on the thatch, which consists of long grass ...... The whole when completed has a very neat appearance. Some of these huts are lined with the bark of the tea-tree and are remarkably warm." (Robinson : 1830, April 5)

Robinson adds that they "are mostly covered with feathers on the inside, of magpies, cockatoos, crows and feathers of different feathered animals which they catch or kill with waddies." (Robinson : 1833, May 18).

These huts were built into circular excavated depressions, and in form and diameter correspond exactly with the archaeological hut depressions (above P. 81 ). "Saw several native habitations on the declivity of a hill dug out of the sand and towards the top, thus ...... (Fig. 7.4 (a))." (Robinson : 1833, Sept. 4, Sundown Creek.) "The holes made in the ground for habitations are remarkable. These holes are concave, about ten, twelve and twenty feet wide, and three or four and five feet deep, and a large heap of shells beside them. Some holes are small and of a
Fig. 7.3: Distribution of Huts From Ethnographic Evidence. (See Appendix 7.2)

- large domed wattle hut
- unspecified temporary shelter
- bark lean to
- wind break
- temporary bark/branch hut

Density: s = "several"; 3 = "some" and "huts"; 17 = specific number; 0 = many in area.
a. After Robinson 1833, Sept. 4, Sundown Creek.

b. After Robinson (Plomley 1966: Plate 7 (a)).

c. After Robinson 1834, July 11.

Fig. 7.4: Ethnographic Sketches of Huts and Shelters.
different shape, like a coal scuttle." (Robinson: 1834, March 9, Ordnance Point). Mention of large depressions, up to twenty feet in diameter, could indicate the existence of even larger hut sizes than those observed.

Hut sizes range from quite small versions (Robinson: 1830, March 19, coast near Port Davey), to the maximum size mentioned above. Of their capacity, Jorgensen says, "it was made to contain twelve to fourteen people with ease." (Op. cit. near "Venables Boat Harbour" - northern West Coast).

Their detailed construction and size are indicative of their durability and relative permanence, allowing them to be classed as well made huts, distinct from all other Tasmanian shelter types, which are ephemeral in nature.

Location: "These villages are always near to freshwater and close to some fishing rocks, and at them are in general to be found the native fig." (Robinson: 1830, March 26, Nye Bay). Their distribution (Fig. 7.3) shows that they are always located directly on the coast or immediately behind it in a situation like the above close to dependable marine sources. If their form and construction were only influenced by weather (as Hiatt suggests: 201), their distribution could be expected to be also found further inland across the open coastal plain. But not one example, either ethnographic or archaeological, exists from this area, though the region was penetrated a number of times by Robinson, and groups of natives were seen both occupying and hunting across these zones. There is only one observation of a hut inland on the West Coast, located behind Sandy Cape in a patch of wet sclerophyll of usual Tasmanian bark construction, and therefore of a temporary nature. (Robinson: 1834, March 29).

1. References, to Aboriginal open inland camps, made by Robinson are:
(i) 1830, March 29, Little Rocky River.
(ii) 1832, June 23, Welcome River, behind Mount Cameron West.
(iii) 1832, Sept. 3, Arthur River.
(iv) 1832, Sept. 7, South Studland Bay.
Exceptional precipitation occurs on the West Coast with extreme 3-5 day rainfalls in late June. (Langford: 9).

Observations of natives using these hut forms occur from March to June, indicating at least that their occupation was more than just a winter one (as indicated by Flomley (1966: 229, Note 62)).

(ii) Tasmanian (Non West Coast) Forms - Of the many observations of shelters in eastern and northern Tasmania, three main types can be abstracted.

1. Bark hut of semi-circular framework: "They (the huts) consisted of branches fixed by both ends into the ground, and supported the one upon the other, so as to form a framework of an hemispherical form, about four feet and an half in height. The branches were fastened together with the leaves of a species of grass; and the buildings seemed to require nothing more in order to be completed, than to receive their covering of bark, which renders them impenetrable to rain." (Labillardiere: 102).

Only one very elaborate form of this type was found - from Recherche Bay (South-West) (Labillardiere: 282), perhaps a product of the wetter climate of that area.

2. Barklean-to: "it was simply a shelter of bark disposed in a half circle, and supported against some dry branches: so light a shelter could have no other object than that of protecting the inhabitants from the action of a cold wind." (Peron: 176) (Figs. 7.4 (b) and (c)).

3. The wind break: This is generally of lattice construction of differing lengths; a "fence constructed by the natives against the wind from the bay. It consisted of strips of the bark ...... interwoven between stakes fixed perpendicularly into the ground, forming an arch, of about a third of the circumference of a circle, nine feet in length and three in height, with its convex side turned towards the bay." (Labillardiere: 101). (Plate 13 above).
The most usual construction material appears to have been bark but other materials were also used, such as green leaves (Robinson: 1834, July 11), drift wood (Robinson: 1830, Sept. 15), and of bush (Robinson: 1834, July 11). Variations between these forms were common in size and quality of construction. Robinson who accounts for most of the observations does not distinguish between forms (i) and (ii), categorising all non West Coast forms as "Southern" or "Brune Island" types, distinguishing only between huts and wind breaks. The most unusual shelter Robinson observed was very large, "sufficiently large as to contain from thirty to forty persons." In size it was "twelve yards in length", and of lean-to form (Robinson: 1834, Aug. 22). Huts were usually constructed only during inclement weather; for example a statement made by Robinson from the North-East as rain began to set in, "I was therefore convinced that the natives was gone to make a hut for the night." (Robinson: 1830, Oct. 31). Bass (1799: 188) notes the similarity between shelters from Port Dalrymple (North) and the Derwent (South-East).

Generally all three variations are hastily built and frail constructions of a temporary nature, whose size and form depended on weather conditions, time of duration and number of people to be housed.

Location: Huts were recorded from all localities on the coast and inland. There often seems to be a high correlation between their location and the proximity of waterways, creeks, rivers, and lakes and marshes.

(iii) Conclusions - A division occurs in the hut forms of Tasmania, between large well constructed and durable huts, on the direct littoral of the West Coast, and the temporary and ephemeral bark huts, lean-tos and wind breaks of the remainder of the island, including the hinterland of the West Coast. The
factors involved in the two basic forms seem to be three, durability, size and location; and influencing these would be weather, size of population and length of use.

A pattern emerges for the West Coast indicating a dense concentration of large, well-constructed, and durable huts, located on the coastline, imbalanced by a probable light concentration of temporary shelters inland. This pattern fits both the archaeological evidence of coastal bases, and that of the food procuring activities which indicated a concentration of activities on the coast. The South-West area (Port Davey - Recherche Bay) also appears to have had a large coastal distribution. Robinson (1830, March 7) states that he came upon up to one hundred huts in this area.

In the remainder of the island the same range of basic makeshift and temporary forms is distributed across the entire region, despite locality or altitude. This too agrees with both archaeological conclusions and those of the food procuring activities. There is no indication that these shelters vary in accordance with the varying climates of these regions, nor that the least elaborate shelters were to be found in the area of mildest climate, the East Coast, as Plomley suggests. (Plomley 1966: 229, Note 62).

b. Hut Densities - (Fig. 7.3 and Table 7.1)

(i) The density of the huts was calculated from ninety three observations according to geographical area, and to the time when they were recorded. Chronologically the observations fell into two groups - 1771-1804, and c. 1820 and after. In this way some control was maintained over distortions caused by culture contact (European-Aboriginal), at least for some areas. The South-East Coast: of 24 observations 10 (42%) recorded 1 hut, and 14 (58%) between 2-4 huts, with an overall estimated average of 2 and a maximum of 4. All these observations were made before European settlement of the area.
The Central and South-East Inland: Of 15 observations, 3 (20%) were of one hut, and 12 (80%) of between 4-7 huts, with an overall average of 4.5 huts and a maximum of 7. These observations come from the period 1830 and after, and appear to reflect some distortion, for two early observations also exist in this general region, one recording a group of 14 huts on the Upper Derwent, the other of a group of 17 huts on the Shannon River. It would appear that at the time of initial European contact, hut densities in this region were possibly greater than the later 4.5 average, with the maximum reaching to at least groups of 17.

North-West, North-East, Inland and Coast: Of 28 observations, 13 (46%) were of single huts, and 15 (54%) of between 2-4 huts, with an overall estimated average of 2, with a maximum of 4. Again this area too displays distortion. All the observations are of the later period, but there exists an early statement by Bass (1799: 168) which includes this area, where he says "seven or eight were regularly found together like a little encampment." Higher densities with a maximum of 7-8 might be expected of this region in a period of early contact. There appeared no differences between coast and inland.

The West Coast: Of 21 observations, 6 (29%) are of single huts, and 15 (71%) of between 2-5 huts, with an overall estimated average of 3, and a maximum of 5. All these observations are late (1827 and after). There are no early observations to compare with the above, but there is archaeological evidence (Ch.6 Sec.6.1) of hut depressions of up to between 15-20 reported at Bluff Point on the North-West coast (above P.82). This points to a far greater density and maximum grouping than is shown for the later period. The extreme South-West coast between Cox's Bight and Pretty's Point (near Recherche Bay) has the lowest densities on this coast, and from descriptions probably less elaborate and permanent huts (Fig. 7.3).
(ii) Conclusion - Hut densities appear lowest in the South-East coastal region with a maximum hut grouping of 4, and densest in the South-Eastern Inland with a maximum grouping of 17. This draws a clear distinction between the South-East coast and inland. The best example of this is the Derwent estuary where numerous huts were recorded (Fig. 7.3; and Bass 1799: 188) with a low maximum of about 3 at the mouth, and a group of 14, about 16 miles upstream, within easy distance of the river.

Distortions due to culture contact proved apparent in all areas except the South-East coast. It was possible to correct these in part with the inclusion of some early observations for all except the West Coast. Here archaeological evidence pointed to the discrepancy between the situation at and before the time of contact, and in the period 1827 and after. On the northern quarter of the coast hut densities appear to have been at least as great if not greater than those of the South-East Inland.

c. Hut Densities as Indicators of Aboriginal Group Sizes - Attempted here is the calculation of the size of groups in each area from the hut densities already discussed. These estimates will then be correlated with actual numerical observations of group sizes in the following section.

Estimation is made difficult here as few observations of specific numbers of people to a hut or huts, exist. Of these the following can be deduced. From the North-East there are two specific observations, (i) a group of 7 individuals, (ii) a group of 8 individuals. Each group is associated with a single hut (Robinson: 1830, Nov. 1; 1831 July 8). Another less specific observation comes from the north (Fort Sorell) recording a group of approximately 20 men, women and children, associated with 2 huts (Robinson: 1830, Sept. 20). A fourth observation from the Huon estuary (South-East) records a family of 9 sharing one hut (Feron: 176-7).
Although few, these four observations show certain consistencies. All are of mixed-sex groups, consisting of single families in at least two cases, with between 7-9 individuals sharing temporary shelters. It could be assumed, as an approximation, that 1 hut/shelter equalled a single family of about 8-9 individuals. This is dependant on some valid approximation of the average size of a single family.

Only one of the above four observations is pre 1804. It describes a family group of 8 (Huon River), an old man, a woman (c. 48 years) (probably his wife), a younger man and woman (c. 28 years), and 4 children, a girl (c.16-17 years), a boy (c.4-5 years), a small girl (c.3-4 years), and a baby. (Peron, Ibid). This group appears consistent, with all other observations of family groups around the island. (Below P. 113).

For the West Coast there is only one specific reference, to an apparent segment of a family of 4 - a man, an old woman, and two young women, sharing one hut. As well there are more less specific observations of single families and groups of families, generally associated with huts, from this area (eg. Robinson: 1830, March 18). But whether about 7-9 individuals occupied 1 hut, as in the rest of the island, is uncertain. The size and range of sizes of West Coast huts, and their estimated number of inhabitants (c.f. Jorgensen, above P. 106) might indicate a larger number of individuals per hut, at least for the larger huts in this area.

Though only approximations, the assumption of about 8-9 individuals per family, per hut, will be used in the estimation of the size of groups from each area calculated from the hut observations already tabulated.

1. Peron states 9, though he only seems to describe 8 individuals.
Comparison Between Hut Densities and Numerically Stated Population Observations - (1) Population table 7.2 draws together the data on hut densities, the estimated population from these hut densities, and the numerically stated group size observations; for each of the four regional divisions. Despite the low frequency of observations (93 for huts, and 58 for population), for all areas except the North-East and North-West, where there is an inadequacy in both numbers and reliability of observation, there appears an overall significant agreement between the estimated population and the observed population.

Of the 58 group size observations, 48 were usable numerical observations, which were divisible into two categories, those recording family groups, and those of all-male groups. The latter are often indistinguishable as either hunting parties, or groups of aggression. Because of this confusion in the male groups, it is assumed that the family group would be a more accurate indicator of the size of the economic group, using the male group as an extra check on group size capacity in an area. Groups are divided into, "Minimum", "average", and "maximum". The "Observed" category, refers to the ethnographically stated group size observations, and the "Estimated" to the estimated population deduced from hut densities.

The South-East Coast: Of 22 population observations for this region, 13 were of family groups. There seems to be a slightly higher group size for the "average" and "maximum" in the Observed category than in the Estimated (Observed: ave. 23, max. 48; Estimated: ave. 12-18, max. 24-36). This could suggest either that the sample used was too small or that there were more individuals per hut than estimated. Male group observations show a maximum of about 30 and an average of 13, thus falling within the limits of group sizes for the region. From this evidence it could be stated generally that on the South-East Coast group sizes had a
range of between 6-48, with an average of slightly less than 20. All the observations from this area are pre 1804, and they appear representative of conditions prevailing immediately prior to European contact.

The South-East Inland: Here too there appears to be an agreement between the Estimated and Observed figures; group sizes again appearing higher in the Observed (Observed: min. 26, ave. c.70, max. c.120-180; Estimated: min. 6-9, ave. 27-40, max. c.100-150). This is probably due both to the small number of observations in the Observed category, and to the distortion in hut averages - all coming from the post 1830 period. Two male group observations exist of 5 and 72 individuals, thus falling within the overall range. For this region then group sizes appear to fall within the range of between 6-9 to 120-180, with an average at least as high as between 27-40 and possibly much higher.

North-West, North-East, Inland and Coast: It is difficult to construct estimates from either category, as the hut densities are all, except one, post 1820 observations, and the population observations few (5 family groups, 1 male group). The maximum of 200 is dubious, coming from an unreliable source, Kelly (1816, Jan. 18), and occurs during a Europeanised situation, (c.f. Hiatt: 199f.). I include this observation with reservation for it does give some estimate of the potential maximum of group sizes in the area, not apparent from the rest of the Observed category, which all come from the post 1830 period. The one male group observation is again by Kelly who describes a group of about 50. This falls within the range of the Estimated population. With qualification as to its tentative nature, the range of group sizes for this area appears to fall between 6-9 to 48-72+, with an average (based on hut densities) of 12-18.

The West Coast: As with the first two regions, Estimated figures agree with the Observed, showing a slightly lower minimum and
average. All the observations for both categories are post 1820, and the extremely low ratio of individuals per hut (see above P. 112) together with the overall conservative hut and population figures of the region (in light of the archaeological evidence—above P. 81) indicate these may be due to a rapid decline in population during this late period. However, for the post 1820 period groups sizes for the West Coast fall within the range of 4 to 40-50, with an average of around 20.

(ii) Conclusions—Where the data was available and reliable there proved significant agreement between the Estimated and Observed results. The data was fullest for the South-East coast and least for the North-West and North-East Inland. Only one region, the South-East coast provided the clearest information on the pre-1804 period, with the West Coast providing the least, having no observations recorded before the mid 1820's. The results gained from this correlation proved strikingly similar to those provided by the hut densities. The highest group sizes and group size averages existed for the South-East Inland (max. 120-180, ave. 27-40+) and the lowest on the South-East coast (max. 48, ave. less than 20). As well, one result not so clearly brought out by the hut density results was that the West Coast shared in ratios as low as those for the South-East coast. However, this was indicated as being mainly caused by the lateness of the observations recorded, as population densities and the pattern of activities appears to have been disrupted in this region (and especially in the North-Western corner) since the 1790's.

1. One reference exists from the late 1820's recording a female/child group of c. 30—indicating a family group of c. 40+—which is a group size non-existent in the later post 1830 observations. Children are significantly few in these later references.

2. Male groups all come from Kelly (1815-16), the largest appearing in the North-West corner opposite Hunter Island. If in any way accurate they may again point to the decline in population between this and the later observations.
Although many of these conclusions are tentative, this investigation of group sizes has brought out a number of significant results. (i) There is a clear division in the range of Aboriginal population densities and group sizes from each of the major Tasmanian biomes. (ii) The clearest division occurs between the South-East coastal region and its hinterland, the highest group sizes occurring in the inland, and the lowest on the coast. (iii) A discrepancy exists between the findings here for the northern West Coast, and those implied by some of the archaeological evidence, which indicates a serious decline in population and activity by the recorded ethnographic period in that area. (iv) The Tasmanian group sizes seemed largest in the inland of the sclerophyll biome, with family group concentration past 100, but these concentrations were of a non permanent nature similar to all the Tasmanian habitations and camps, except those along the West Coast.

Because of the significant correlation between the hut densities and group sizes, a certain confidence can be placed in the estimates arrived at.

7.5. COMPARISON BETWEEN THE ETHNOGRAPHIC AND ARCHAEOLOGICAL FINDINGS

Results and interpretations obtained from the separate groups of data, ethnographic and archaeological, are in the main remarkably consistent. The archaeological observation of a separation of activity patterns between the two environmental extremes - east and west - was closely verified by the ethnographic evidence. So too was that of differences in the activity patterns between coast and inland in the East. These variations were supported and clarified by the inclusion of hut density and group size data.

Utilisation of both forms of data enabled certain clarification to be made of both prehistoric and ethnographic interpretations of the Aborigines. The major points are:
(i) There was a significantly large discrepancy between the West Coast ethnographic situation, and that interpreted from the archaeological evidence. The ethnographic data itself revealed certain internal discrepancies, indicating that the major influential factor was cultural contact with Europeans, and that the lateness of the ethnographic observations was the cause of the magnitude of these discrepancies.

(ii) An even more extreme division between coastal and inland Eastern settlement was brought out by the ethnographic data. The indication of dense inland concentrations in contrast to generally lighter coastal groupings, was a factor difficult to determine alone from the archaeological evidence.
8.1. DISCUSSION

a. An Environmental Interpretation - Two basically dissimilar subsistence patterns have been defined from the archaeological evidence (and verified and modified by the ethnographic evidence) from two distinct and dissimilar environments, East and West Tasmania. More intermediate patterns less dramatic in contrast can be defined from two intermediate environments, the North-West and North-East.

Lacking any supporting cultural evidence for this major dichotomy, it appears best interpreted as due to the environmental east-west division. The factors influencing this appeared to be the following. The wetter West consists of an environmental imbalance between two ecosystems - a rich coast with significant seasonal food factors (e.g. seals), and a relatively faunally poor, and spatially restricted, hinterland. There is an overall higher incidence of dependable food resources on the coast. In contrast, the dry East consists of a more terrestrially oriented environment with a far greater ratio of land area per foot of coastland. There seems to be a greater balance between the food resources of inland and coast, the latter being less attractive than the West Coast, lacking the significance of the seasonal seal factor.

This interpretation agrees with the archaeological and ethnographic settlement patterns - of a coastal concentration in the
West and a total distribution in the East.

b. The Eastern Sites and Tasmanian Prehistory - The Eastern sequence demonstrates that: (i) a dispersed coastal-terrestrial pattern was operating in the East, and was well established by 4500 BP and earlier - its various aspects detected both inland and on the coast; (ii) this pattern was quite dissimilar from that existing synchronously at 4500 BP at Rocky Cape, and from any other operating subsequently in either the North-West or northern West Coast (West Point); (iii) fossil aspects such as scale fishing and worked bone tools existed on the coast and ceased to be represented synchronously in both the East (Little Swanport) and the North-West (Rocky Cape). However, their use was minimal during the 1000 years of their detection at Little Swanport, compared to their apparently more significant synchronous representation at Rocky Cape. Thus, while Rocky Cape still maintained a heavy coastal orientation, activities in the East indicate at least a dual coastal-terrestrial balance. Jones (1966:200) interprets the Rocky Cape sequence as cultural adaptation to a changing environment, and applies it generally to all areas of similar environment (i.e. backed by rainforest). In contrast, the Eastern sequence in its basic lack of apparent major change over time can be seen to indicate the stabilisation of a distinct cultural pattern, both coastally and inland, inferring a certain stabilisation of environmental conditions. The latter I interpret as the successful penetration of the hinterland along with the full establishment of its present vegetation - the sclerophyll forest.

The latter statement needs qualification. The question to be asked is, what was the Eastern Tasmanian environment like before c.5000 BP. Davies and Goede (stated above) both have evidence to support the existence of a climatic arid period between 6000-3500 BP;
they link the strong supporting evidence of intermittent stream aggradation with the intensification of arid conditions by the fire-lighting activities of the Aborigines. Thus it appears as if the inland penetration had at least occurred by about 1000 years before the beginning of the Eastern sequence, validating its interpretation. Davies (1967:20) notes that from charcoal near the top of an older aggradational phase (Clarence Hills) a date of 7900 ± 460 was obtained. This may indicate the existence of already favourable conditions for some inland occupation, much earlier than the above limit. The latter date concurs with coastal dates from shell middens from the South-East, North-West and Northern inland (Jones 1966:199, Fig. 4).

It appears then that the Eastern cultural pattern had been well established by 4500 BP, at that time reflecting the last phase of aspects belonging to an earlier cultural period (i.e. fishing and bone tools), and perhaps different environmental conditions.

It is expedient to make a hypothetical assessment of the archaeological situation before the beginning of the now established Eastern pattern. This assessment is of value if only because it presents testable propositions. If the Eastern cultural pattern were connected with the open forest, then its existence would depend upon the length of time that open forest conditions had prevailed in eastern Tasmania. There is evidence to suggest (Davies 1967:7-9, 24; Jones 1968:194-5) that within the tree line, the vegetation of eastern Tasmania may not have been radically different to that of the present - precipitation in the area being similar to that of today. Jones (1968:193, Fig. 2) presents a reconstruction of Tasmania and south-eastern Australia, during the last glaciation. In the area of the present island of Tasmania, the tree line is close to the coast, indicating that any
hypothetical Aboriginal occupation at that time would have been predominantly coastal. The latter does not infer the complete avoidance of the interior. At that time, the area of greatest terrestrial occupation appears to have been in Bass Strait across the now drowned land bridge with its extension to King Island. It is plausible that total peripheral occupation existed even on the West and South-West coasts; spatulae from the northern West Coast attest to its occupation pre-dating that of West Point by at least a couple of thousand years.

However, if the Eastern vegetation already displayed characteristics similar to today’s, then it can be expected that the Eastern cultural pattern was significantly different to that in the West and North-West. Further, it can be supposed on these grounds, that at no time between the drowning of the land bridge and the beginning of the present Eastern sequence, did that sequence show the full characteristics of the Rocky Cape sequence. This is dependent on the fact that the East Coast also remained similar to the later coast - that is, that seal colonies were not as prevalent here as in the western and northern areas. However, the eastern distribution of present day colonies perhaps suggests that these are a remnant of a larger past population. As to the extent scale fishing was practised on the Eastern and South-Eastern coasts, pre c.4500-5000 BP, this too needs further archaeological testing. 1

To conclude, the post-Pleistocene prehistory of Tasmania suggests a gradual intrusion of the island’s hinterland, from a mainly peripheral coastal occupation (excepting the Bass Strait area), reaching a peak with the full establishment of present-day vegetation conditions occurring probably around the time of the mid-Recent arid period. Consequently, a terrestrial-coastal Aboriginal organisation was established in the terrestrial East, the West and North-West retaining (in comparison) a more coastally oriented organisation.

1. The cessation of scale-fishing can be expected to have placed a limit on the potential maximum size of subsequent Aboriginal population.
8.2. CONCLUSION

Significant cultural variation was detected archaeologically from both surface and excavated sites in the defined Eastern Tasmania. Inland sites reflected separate aspects from coastal sites. A cultural subsistence pattern was interpreted for the Eastern sites, and demonstrated as distinct from that interpreted for the Western and North-Western areas. This interpretation was, for the East, a dispersed, nomadic, non-sedentary pattern, incorporating a number of limited-activity sites, with a more coastally oriented Western pattern indicating seasonal optimum periods maintaining seasonally sedentary coastal bases. More intermediate regions (such as the North-West and North-East) were shown to lie in between these two extremes.

The ethnographic data was studied and was shown basically to support the archaeological interpretation. As well, it added further evidence - that the largest population concentrations (at least in the East) occurred inland. In turn, the archaeological evidence provided clarification and correction to existing interpretations made solely from ethnographic sources.

Finally, these separate subsistence patterns were placed in a chronological context. The Eastern sequence compared favourably with that from the North-West. It demonstrated that the Eastern pattern had been well established by c. 4500-5000 BP, and that it also reflected fossil aspects from an earlier period. The evidence from the North-West (together with the geographical evidence) indicates an earlier period of greater coastal orientation - but one expressed individually in the separate Tasmanian environmental zones. The ecological basis of both East and West subsistence patterns suggest that this may have been a controlling factor for the whole of Tasmanian prehistory, implying individual cultural adaptation to separate environments.
While in Tasmania I was assisted and encouraged by a great many people, both professionally and in the field. Of these I would particularly like to express my gratitude to: Mr. Jacques Bierling, Mr. Phil Dart, Mr. A. Dartnall, Dr. J.L. Davies, Dr. A. Goede, Mr. J. Hood (Lisdillon), Mr. McShane (Lemont), Dr. G. Reber, Mr. F.L. Sutherland, Mr. Charles Turner, and my supervisor, Mr. D.J. Mulvaney, and especial thanks to Mr. Rhys Jones, under whose guidance and encouragement I took up this project.

I would like to extend warm thanks to everyone who came excavating: Anne Barrell, Barry Brimfield, Vaughan Edwards, Liz Parkes, Michael Potter, Peter Thompson, Jack Thwaites, Cosha Tillema, Murray Woods, Andrew Young.

Finally, I wish to express my gratitude to the Tasmanian Museum and to its Director, Dr. W. Bryden, for sponsoring the whole project.

ACKNOWLEDGEMENTS

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This bibliography has been subdivided into two sections:

1. archaeological and 2. ethnographic.

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2. ETHNOGRAPHIC BIBLIOGRAPHY

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Land Annual for 1834 and 1836. James Ross, Hobart Town.

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Comprising an Account of its Agricultural Capabilities...... 
Robinson, London.
<table>
<thead>
<tr>
<th>State or Territory</th>
<th>Area</th>
<th>Proportion of Total Area</th>
<th>Coastline</th>
<th>Area per Mile of Coastline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasmania</td>
<td>26,383</td>
<td>0.89 (a) 900</td>
<td>0.89</td>
<td>29</td>
</tr>
<tr>
<td>New South Wales</td>
<td>309,433</td>
<td>10.43 (b) 700</td>
<td>10.43</td>
<td>443</td>
</tr>
<tr>
<td>Victoria</td>
<td>87,884</td>
<td>2.96 680</td>
<td>2.96</td>
<td>129</td>
</tr>
<tr>
<td>Queensland</td>
<td>667,000</td>
<td>22.47 3,000</td>
<td>22.47</td>
<td>222</td>
</tr>
<tr>
<td>South Australia</td>
<td>380,070</td>
<td>12.81 1,540</td>
<td>12.81</td>
<td>247</td>
</tr>
<tr>
<td>Western Australia</td>
<td>975,920</td>
<td>32.88 4,350</td>
<td>32.88</td>
<td>224</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>520,280</td>
<td>17.53 1,040</td>
<td>17.53</td>
<td>500</td>
</tr>
<tr>
<td>A.C.T.</td>
<td>939</td>
<td>0.03</td>
<td>0.03</td>
<td>-</td>
</tr>
<tr>
<td>Mainland</td>
<td>2,941,526</td>
<td>99.11 11,310</td>
<td>99.11</td>
<td>260</td>
</tr>
<tr>
<td>Australia</td>
<td>2,967,909</td>
<td>100.00 12,210</td>
<td>100.00</td>
<td>243</td>
</tr>
</tbody>
</table>

Table 2.1: Comparison of the Coastline of the Australian States. (After Tas. Year Book 1969: 44)
<table>
<thead>
<tr>
<th>CONSTITUENTS</th>
<th>WEIGHT</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oyster</td>
<td>17,727.4</td>
<td>73.7</td>
</tr>
<tr>
<td>Mussel</td>
<td>4,835.6</td>
<td>20.1</td>
</tr>
<tr>
<td>All other shell</td>
<td>498.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Shell</td>
<td>23,061.4</td>
<td>95.8</td>
</tr>
<tr>
<td>Dolerite</td>
<td>958.7</td>
<td>3.9</td>
</tr>
<tr>
<td>All other variables</td>
<td>30.1</td>
<td>0.2</td>
</tr>
<tr>
<td>- Flaked Stone</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>- Red Ochre</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>- Charcoal</td>
<td>15.9</td>
<td></td>
</tr>
<tr>
<td>- Wood</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>- Land Snail</td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>- Barnacle</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>- Marine Worm Cast</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>- Bone</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>- All other species</td>
<td>36.7</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>24,050.2</td>
<td>100.0</td>
</tr>
</tbody>
</table>
**Table 4.2: Total Shell Composition**

<table>
<thead>
<tr>
<th>SHELL</th>
<th>WIGHT</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oyster (Ostrea angasi)</td>
<td>17,727.4</td>
<td>76.9</td>
</tr>
<tr>
<td>Mussel (Mytilus planulatus)</td>
<td>4,835.6</td>
<td>21.0</td>
</tr>
<tr>
<td>All other shell</td>
<td>498.4</td>
<td>2.2</td>
</tr>
<tr>
<td>- Whelk (fam. Buccinidae)</td>
<td>236.1</td>
<td>1.0</td>
</tr>
<tr>
<td>- Katelysia sp. and Venerupis crenata</td>
<td>106.7</td>
<td>0.5</td>
</tr>
<tr>
<td>- Austrocochlea constricta and Austrocochlea odontis</td>
<td>85.4</td>
<td>0.4</td>
</tr>
<tr>
<td>- Cominella lineolata and Lepsiella vinosa</td>
<td>33.5</td>
<td>0.1</td>
</tr>
<tr>
<td>- All other species</td>
<td>36.7</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>23,061.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>
### TABLE 4.3: TERRESTRIAL ANIMALS (AND BIRDS)

<table>
<thead>
<tr>
<th>Identifiable Species</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forester Kangaroo (Macropus giganteus tasmaniensis)</td>
<td>3</td>
</tr>
<tr>
<td>Wallabia</td>
<td>4</td>
</tr>
<tr>
<td>Macropod</td>
<td>2</td>
</tr>
<tr>
<td>Bettong (Bettongia cuniculus)</td>
<td>1</td>
</tr>
<tr>
<td>Potoroo (Potorous tridactylus)</td>
<td>1</td>
</tr>
<tr>
<td>Bandicoot</td>
<td>6</td>
</tr>
<tr>
<td>Brush Possum (Trichosurus vulpecula)</td>
<td>2</td>
</tr>
<tr>
<td>Possum</td>
<td>1</td>
</tr>
<tr>
<td>Water Rat (Hydromys chrysogaster)</td>
<td>1</td>
</tr>
<tr>
<td>Rodent</td>
<td>3</td>
</tr>
</tbody>
</table>

**TOTAL: 24**

<table>
<thead>
<tr>
<th>Unsolicited Terrestrial Animals</th>
<th>Size-Classes: Large</th>
<th>Medium-Large</th>
<th>Medium</th>
<th>Medium-Small</th>
<th>Small</th>
<th>Very Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>60</td>
<td>7</td>
<td>13</td>
<td>3</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL: 36**

<table>
<thead>
<tr>
<th>Birds (Unspecified)</th>
<th>Size-Classes: Large</th>
<th>Medium</th>
<th>Small</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

**TOTAL (Terrestrial Animals and Birds): 69**
<table>
<thead>
<tr>
<th>SIZE-CLASSES</th>
<th>No. %</th>
<th>FREQUENCY</th>
<th>No. %</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retouched Flake Large</td>
<td>67</td>
<td>48.9</td>
<td>67</td>
<td>41.0</td>
</tr>
<tr>
<td>Retouched Core Medium-Large</td>
<td>8</td>
<td>4.9</td>
<td>8</td>
<td>4.9</td>
</tr>
<tr>
<td>Flake Medium</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Core Medium Small</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rejuvenation Flake Small</td>
<td>15</td>
<td>9.1</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>Broken Retouched VERY SMALL</td>
<td>4</td>
<td>2.4</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: 164 100.0 86 100.0 163 100.0 3

(Below 1/2 in. Size)

Small Broken Pieces 12 6.0(of total of 176) 12

(Total product of use of 176) 19 8.5
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>FREQUENCY</th>
<th>RETouched</th>
<th>USED</th>
<th>PRODUCTS OF USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Above ½in. Size)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retouched Flake</td>
<td>67</td>
<td>40.9</td>
<td>67</td>
<td>41.0</td>
</tr>
<tr>
<td>Retouched Core</td>
<td>8</td>
<td>4.9</td>
<td>8</td>
<td>4.9</td>
</tr>
<tr>
<td>Flake</td>
<td>63</td>
<td>38.4</td>
<td>63</td>
<td>38.7</td>
</tr>
<tr>
<td>Natural Core</td>
<td>5</td>
<td>3.0</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>Rejuvenation Flake</td>
<td>15</td>
<td>9.1</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>Broken Retouched Flake</td>
<td>4</td>
<td>2.4</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2</td>
<td>1.2</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>164</strong></td>
<td><strong>100.0</strong></td>
<td><strong>86</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>(Below ½in. Size)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Broken Pieces</td>
<td>12</td>
<td>6.8 (of total of 176)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>164</strong></td>
<td><strong>86</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

(Products of use of 176) 15 8.5
<table>
<thead>
<tr>
<th>Size</th>
<th>Retouched</th>
<th>Used</th>
<th>Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over ( \frac{1}{2} ) in.</td>
<td>52.4%</td>
<td>99.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Total 164</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone II</td>
<td>25 (37.0%)</td>
<td>17 (27.2%)</td>
<td>95%</td>
</tr>
<tr>
<td>Zone III</td>
<td>12 (24.6%)</td>
<td>10 (19.5%)</td>
<td>95 (48.2%)</td>
</tr>
<tr>
<td>Under ( \frac{1}{2} ) in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total 176</td>
<td>69 8.5%</td>
<td>176</td>
<td>2</td>
</tr>
</tbody>
</table>

* Deduced from the 11 shell samples used in the analysis of the hidden's composition.*
### Table 4.7: Little Swanport Phases I and II

<table>
<thead>
<tr>
<th>STRATigraphical Position</th>
<th>LAND</th>
<th>FISH</th>
<th>WORKED</th>
<th>FLAKED</th>
<th>SHELL</th>
<th>PHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone I (Top)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 (37.6%)</td>
<td>1? (7.1%)</td>
<td>-</td>
<td>48 (27.2%)</td>
<td>97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 (37.6%)</td>
<td>1 (7.1%)</td>
<td>-</td>
<td>43 (24.4%)</td>
<td>98%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone III (Bottom)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 (24.6%)</td>
<td>12 (85.7%)</td>
<td>2 (100%)</td>
<td>85 (48.2%)</td>
<td>94% I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>69</td>
<td>13-14</td>
<td>2</td>
<td>176</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

* Deduced from the 11 shell samples used in the analysis of the middens' composition.
**TABLE 5.1: CROWN LAGOON FAUNAL REMAINS**

**KEY:**
- * = unidentifiable bone fragments
- **M** = tooth of Forester Kangaroo
- **MM** = teeth of Forester Kangaroo

<table>
<thead>
<tr>
<th>Square A</th>
<th>Square B</th>
<th>Square C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spits:</td>
<td>Spits:</td>
<td>Spits:</td>
</tr>
<tr>
<td>2. *</td>
<td>2. MM*</td>
<td>2. MM*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. *</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Square D</th>
<th>Square E</th>
</tr>
</thead>
<tbody>
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<td>Spits:</td>
<td>Spits:</td>
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<tr>
<td>1. *</td>
<td>1. *</td>
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<tr>
<td>2. *</td>
<td>2. *</td>
</tr>
<tr>
<td>3. *</td>
<td>3. M*</td>
</tr>
<tr>
<td>4. *</td>
<td>4. MM*</td>
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<tr>
<td>5. *</td>
<td>5. *</td>
</tr>
<tr>
<td>7. *</td>
<td>7. M*</td>
</tr>
<tr>
<td>8. *</td>
<td>8. *</td>
</tr>
</tbody>
</table>

| 10/11.   |          |          |

<table>
<thead>
<tr>
<th>Square A</th>
<th>Square B</th>
<th>Square C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spits:</td>
<td>Spits:</td>
<td>Spits:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Square D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spits:</td>
</tr>
<tr>
<td>1. M</td>
</tr>
<tr>
<td>2. *</td>
</tr>
<tr>
<td>3. *</td>
</tr>
</tbody>
</table>
### TABLE 5.2: FREQUENCY OF FLAKED STONE TOOLS - CROWN LAGOON

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CL II (A-E)</th>
<th>CL I (A-D)</th>
<th>CL (I-II)</th>
<th>CL (I-II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Above ½ in. Size)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retouched Flake</td>
<td>28</td>
<td>5.8%</td>
<td>4</td>
<td>1.5%</td>
</tr>
<tr>
<td>Retouched Core</td>
<td>7</td>
<td>1.5%</td>
<td>5</td>
<td>1.9%</td>
</tr>
<tr>
<td>Core</td>
<td>2</td>
<td>0.4%</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Flake</td>
<td>86</td>
<td>18.0%</td>
<td>51</td>
<td>19.3%</td>
</tr>
<tr>
<td>Natural Core</td>
<td>3</td>
<td>0.6%</td>
<td>2</td>
<td>0.8%</td>
</tr>
<tr>
<td>Edge-Rejuvenation Flake</td>
<td>239</td>
<td>49.9%</td>
<td>146</td>
<td>55.3%</td>
</tr>
<tr>
<td>Rejuvenation (b) Flake</td>
<td>93</td>
<td>19.4%</td>
<td>49</td>
<td>18.6%</td>
</tr>
<tr>
<td>Broken Retouched Flake</td>
<td>10</td>
<td>2.0%</td>
<td>6</td>
<td>2.3%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>11</td>
<td>2.3%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>479</td>
<td>100.0%</td>
<td>264</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

(Below ½ in. Size) 4,810 2,249 7,059

*Note: CL (I-II) and CL (I-II) refer to different categories within the table.*
### TABLE 5.3: CROWN LAGOON FLAKED STONE ASSEMBLAGE: PERCENTAGE OF USED AND RETOUCHEP PIECES TO TOTAL FREQUENCY

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>FREQUENCY</th>
<th>RETOUCHEP</th>
<th>USED</th>
<th>REMAINDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Core</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Edge-Rejuvenation Flake</td>
<td>385</td>
<td>14</td>
<td>82</td>
<td>303</td>
</tr>
<tr>
<td>Rejuvenation (b) Flake</td>
<td>142</td>
<td>-</td>
<td>11</td>
<td>131</td>
</tr>
<tr>
<td>Broken Retouched Flake</td>
<td>16</td>
<td>16</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>11</td>
<td>-</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>743</td>
<td>85</td>
<td>195</td>
<td>548</td>
</tr>
</tbody>
</table>

**PERCENTAGE**

|                  | 100.0 | 11.4 | 26.2 | 73.7 |
TABLE -
5.4(a) : COMPARISON BETWEEN FLAKE STONE ASSEMBLAGES
OF CROWN LAGOON AND L S II

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>LS II (TOTAL 164)</th>
<th>CL (TOTAL 743)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Above ½in. Size)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retouched Flakes</td>
<td>40.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Flakes</td>
<td>38.4</td>
<td>18.4</td>
</tr>
<tr>
<td>Retouched Cores</td>
<td>4.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Cores</td>
<td>-</td>
<td>0.4</td>
</tr>
<tr>
<td>Natural Cores</td>
<td>3.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Edge-Rejuvenation Flake</td>
<td>9.1</td>
<td>51.8</td>
</tr>
<tr>
<td>Rejuvenation(b) Flake</td>
<td>-</td>
<td>19.1</td>
</tr>
<tr>
<td>Broken Retouched Flake</td>
<td>2.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>(Under ½in. Size)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>6.8</td>
<td>Total 7,059</td>
</tr>
</tbody>
</table>

TABLE -
5.4(b) : FUNCTIONAL CATEGORIZATION OF LS II AND CROWN LAGOON FLAKED STONE ASSEMBLAGE

<table>
<thead>
<tr>
<th>PRODUCTS OF USE</th>
<th>LS II PERCENTAGE</th>
<th>CL PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Above ½in. Size)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retouched</td>
<td>52.4</td>
<td>11.4</td>
</tr>
<tr>
<td>Used</td>
<td>99.3</td>
<td>26.2</td>
</tr>
<tr>
<td>Remainder Waste</td>
<td>1.8</td>
<td>73.7</td>
</tr>
<tr>
<td>(Under ½in. Size)</td>
<td>8.5</td>
<td>Total 7,059</td>
</tr>
</tbody>
</table>

| Flaked          | 5,139.9          | 40.3          |
| Abraded          | 4,610.2          | 39.9          |
| TOTAL            | 7,750.2          | 100.0         |

| Flaked          | 5,139.4          | 80.3          |
| Abraded          | 1,015.2          | 19.7          |
| TOTAL            | 6,154.6          | 100.0         |
TABLE 5.5 (a) : RAW MATERIALS - CROWN LAGOON (C L I-II)

<table>
<thead>
<tr>
<th>STONE MATERIAL</th>
<th>C L II</th>
<th></th>
<th>C L I</th>
<th></th>
<th>C L I-II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WT</td>
<td>%</td>
<td>WT</td>
<td>%</td>
<td>WT</td>
<td>%</td>
</tr>
<tr>
<td>Chert</td>
<td>2,642.0</td>
<td>84.1</td>
<td>2,124.7</td>
<td>51.4</td>
<td>4,766.7</td>
<td>65.5</td>
</tr>
<tr>
<td>Quartzite</td>
<td>385.6</td>
<td>12.2</td>
<td>1,947.6</td>
<td>47.1</td>
<td>2,333.2</td>
<td>32.1</td>
</tr>
<tr>
<td>Quartz</td>
<td>5.8</td>
<td>0.2</td>
<td>0.6</td>
<td>0.01</td>
<td>6.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Chalcedony</td>
<td>22.4</td>
<td>0.7</td>
<td>12.8</td>
<td>0.3</td>
<td>35.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Silicious Chert</td>
<td>58.5</td>
<td>1.9</td>
<td>9.5</td>
<td>0.2</td>
<td>68.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Other (including 19.8</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
<td>19.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Petrified wood, opal,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>agate.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5.8</td>
<td>0.2</td>
<td>40.2</td>
<td>1.0</td>
<td>46.0</td>
<td>0.6</td>
</tr>
<tr>
<td>(including shale and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>metallic pebble)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,139.9</td>
<td>100.0</td>
<td>4,135.4</td>
<td>100.0</td>
<td>7,275.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>WT</th>
<th>%</th>
<th>WT</th>
<th>%</th>
<th>WT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandstone</td>
<td>66.5</td>
<td>1.4</td>
<td>252.9</td>
<td>24.9</td>
<td>319.4</td>
<td>5.7</td>
</tr>
<tr>
<td>Dolerite</td>
<td>4,543.8</td>
<td>98.6</td>
<td>762.2</td>
<td>75.1</td>
<td>5,306.0</td>
<td>94.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,610.3</td>
<td>100.0</td>
<td>1,015.1</td>
<td>100.0</td>
<td>5,625.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 5.5 (b) : COMPARISON OF WEIGHT OF FLAKED (SILICIOUS) STONE TO COARSE STONE

<table>
<thead>
<tr>
<th></th>
<th>C L II</th>
<th></th>
<th>C L I</th>
<th></th>
<th>C L I-II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WT</td>
<td>%</td>
<td>WT</td>
<td>%</td>
<td>WT</td>
<td>%</td>
</tr>
<tr>
<td>Flaked</td>
<td>3,139.9</td>
<td>40.5</td>
<td>4,135.4</td>
<td>80.3</td>
<td>7,275.3</td>
<td>56.4</td>
</tr>
<tr>
<td>Abraded</td>
<td>4,610.3</td>
<td>59.5</td>
<td>1,015.1</td>
<td>19.7</td>
<td>5,625.4</td>
<td>43.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,750.2</td>
<td>100.0</td>
<td>5,150.5</td>
<td>100.0</td>
<td>12,900.7</td>
<td>100.0</td>
</tr>
<tr>
<td>REGION</td>
<td>NO. OF HUTS</td>
<td>NO. OF OBSERVATIONS</td>
<td>TOTAL NO. OF OBSERVATIONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>---------------------</td>
<td>---------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central and South-East (post 1829)</td>
<td>1</td>
<td>3</td>
<td>20.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inland</td>
<td>&quot;numerous&quot;</td>
<td>12</td>
<td>80.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central and Min.</td>
<td>1</td>
<td>1</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South-East (Coast)</td>
<td>1</td>
<td>10</td>
<td>42.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(pre 1805)</td>
<td>&quot;some&quot;</td>
<td>14</td>
<td>58.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North-West, North-East (Coast) (post 1829)</td>
<td>1</td>
<td>13</td>
<td>46.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Inland and Coast)</td>
<td>&quot;several&quot;, &quot;huts&quot;,</td>
<td>15</td>
<td>54.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Coast (post 1829)</td>
<td>1</td>
<td>6</td>
<td>29.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Coast and Inland)</td>
<td>2-5, &quot;several&quot;, &quot;village&quot;, &quot;some&quot;.</td>
<td>15</td>
<td>71.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* One post 1829 observation of "some" huts also exists.

(See Also Appendix 7.2)
### Table 7.2: Correlation between Group Size Estimates from Observations of Hut Densities and Numerically Stated Group Size Observations from Each Tasmanian Region

<table>
<thead>
<tr>
<th>Region</th>
<th>HUT NUMBERS</th>
<th>ESTIMATED GROUP SIZE</th>
<th>OBSERVED GROUP SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central and</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South-East (Inland)</td>
<td>Min. 1</td>
<td>6-9</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Average 4.5</td>
<td>27-40</td>
<td>c.70</td>
</tr>
<tr>
<td></td>
<td>Max. 17</td>
<td>c.100-150</td>
<td>c.120-180</td>
</tr>
<tr>
<td></td>
<td>(pre 1805 and post 1819)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Observations</td>
<td>15</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>South-East</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Coast)</td>
<td>Min. 2</td>
<td>12-18</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Average 4</td>
<td>24-36</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Max. 8</td>
<td>48-72</td>
<td>200 (?)</td>
</tr>
<tr>
<td>No. Observations</td>
<td>24</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td><strong>North-West and</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North-East (Coast and Inland) (mainly post 1815)</td>
<td>Min. 1</td>
<td>6-9</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Average 2</td>
<td>12-18</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Max. 8</td>
<td>48-72</td>
<td>200 (?)</td>
</tr>
<tr>
<td>No. Observations</td>
<td>28</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>West Coast</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(mainly post 1829)</td>
<td>Min. 1</td>
<td>6-9</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Average 3</td>
<td>18-27</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Max. 5</td>
<td>30-45</td>
<td>40-50+</td>
</tr>
<tr>
<td>No. Observations</td>
<td>21</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

(See Appendix 7.3)
(Listed north to south as they appear in Fig. 3.1. All examples are from personal observations.)

1. Mussel Roe Bay
2. Cape Naturaliste
3. Cobler Rocks
4. Eddystone Point
5. Ansons Bay (South head)
6. Bay of Fires
7. Binalong Point
8. Dianas Basin (North head)
9. Shelley Beach
10. Piccaninny Point
11. Long Point
12. Blue stone Bay
13. Swan River mouth
14. Coles Bay
15. Sleepy Bay
16. Promise Bay
17. Swansea area
18. Mayfield area
19. Little Swanport (North head)
20. Little Swanport (North bank)
21. Little Swanport (South bank)
22. Little Swanport (South head)
23. Point Leseur (Maria Island)
24. Midway Point
25. Old Beach
26. Risdon area
27. Carlton River (Carlton)
28. Carlton River (mouth)
29. Sandy Bay
30. Droughty Point
31. Saltwater River area
32. South Arm
33. Blackmans Bay (Channel)
34. Dennes Point (Bruny Island)
35. Oyster Cove (Channel)
36. Cloudy Bay (Bruny Island)
APPENDIX 3.2 : NATIVE STONE QUARRY SITES OF THE MAJOR CHERT-HORNFELS OUTCROP AREA IN TASMANIA

(Listed north to south as they appear in Fig. 3.3. All, except where labelled otherwise, are from my own observations.)

1. Piccaninny Point.
2. Long Point.
3. Great Lake (south-west bank) (E. Rodway, pers. comm.).
4. Great Lake (south bank) (" " " " ).
5. Syndal, Ross (Noetling 1908b).
6. Lake Leake (" " ; Jones 1966, Fig. 1).
8. Mayfield Property.
11. Crown Lagoon Area (c. 1 mile south-west of the lunette).
12. Lake Dulverton (E. Rodway, pers. comm.).
13. Little Swanport Estuary.
15. Bothwell.
16. Clyde River (south-west of Bothwell) (E. Rodway, pers. comm.).
17. Behind Point Bailly. (" " " " ).
19. Prosser River.
21. Behind Northern Marion Bay (E. Rodway, pers. comm.).
22. Stapleton Point.
23. Sandford.
25. Margate.
26. Oyster Cove.
27. Great Bay.
28. Remarkable Cave.
APPENDIX 5.1: COMPOSITION OF THE CROWN LAGOON SITE

This soil analysis was carried out by Dr. Albert Goede. Nine samples were tested in a column through the lunette's profile in depths as shown below. Tests were carried out on both the material composition and sand grain size. One premise being tested was whether the modern-looking banded lenses of layer I (as defined above) had been deposited under different climatic conditions to the older dune below. The results indicated that no such differences could be detected from these tests.

The composition of the dune was mainly of sand (c. 90%) with small amounts of clay and silt (see Table below).

PERCENTAGES

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>VERY COARSE SAND</th>
<th>COARSE SAND</th>
<th>MEDIUM SAND</th>
<th>FINE SAND</th>
<th>VERY FINE SAND</th>
<th>SILT AND CLAY</th>
<th>DEPTH (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>0</td>
<td>0.0059</td>
<td>25.8</td>
<td>62.60</td>
<td>8.65</td>
<td>4.90</td>
<td>0.5</td>
</tr>
<tr>
<td>V2</td>
<td>0</td>
<td>0.0143</td>
<td>29.5</td>
<td>60.40</td>
<td>7.90</td>
<td>2.87</td>
<td>0.9</td>
</tr>
<tr>
<td>V3</td>
<td>0.0025</td>
<td>0.296</td>
<td>32.2</td>
<td>52.10</td>
<td>7.26</td>
<td>9.95</td>
<td>1.4</td>
</tr>
<tr>
<td>V4</td>
<td>0</td>
<td>0.136</td>
<td>29.6</td>
<td>53.50</td>
<td>7.69</td>
<td>9.01</td>
<td>1.8</td>
</tr>
<tr>
<td>V5</td>
<td>0</td>
<td>0.215</td>
<td>28.2</td>
<td>58.40</td>
<td>8.04</td>
<td>5.39</td>
<td>2.5</td>
</tr>
<tr>
<td>V6</td>
<td>0</td>
<td>0.138</td>
<td>26.8</td>
<td>59.10</td>
<td>8.30</td>
<td>5.69</td>
<td>3.0</td>
</tr>
<tr>
<td>V7</td>
<td>0.0006</td>
<td>0.620</td>
<td>36.2</td>
<td>54.60</td>
<td>6.05</td>
<td>2.49</td>
<td>3.5</td>
</tr>
<tr>
<td>V8</td>
<td>0.0043</td>
<td>1.161</td>
<td>34.6</td>
<td>53.50</td>
<td>7.52</td>
<td>3.40</td>
<td>4.0</td>
</tr>
<tr>
<td>V9</td>
<td>0</td>
<td>0.012</td>
<td>21.8</td>
<td>50.70</td>
<td>9.75</td>
<td>17.64</td>
<td>4.4</td>
</tr>
</tbody>
</table>

1. Department of Geography, University of Tasmania.
APPENDIX 6.1: SHELL MIDDENS WITH SIGNIFICANT QUANTITIES OF TERRESTRIAL FAUNAL REMAINS ASSOCIATED

WEST COAST (Fig. 6.1)

1. Studland Bay - Mt. Cameron West (Pulleine 1929:310; and personal observation)
2. Green Point (Personal Observation)
3. West Point (Jones 1966)
4. West Point Lighthouse (south) (Personal observation)
6. Ordnance Point (Legge 1928:327)
7. Sandy Cape (Pulleine:312)
8. Area south of Cape Sorell (P. Sims, pers. comm.)
9. Sloop Point (P. Sims pers. comm.)
10. Port Davey Caves (Report in Pulleine:313)

NORTH-WEST COAST (Fig. 6.3)

11. Rocky Cape North (Excavated by Jones (Jones 1966))
12. Rocky Cape South
13. Sisters Creek

NORTH-EAST CORNER (Fig. 6.3)

15. Cape Naturaliste
16. Cobler Rocks
17. Eddystone Point
APPENDIX 6.2: ARCHAEOLOGICAL EXAMPLES OF SITES WITH HUT-PIT DEPRESSIONS

(Sites as appear in Fig. 6.1)

1. Green Point. Number of depressions about 8. (Pers. obs.)
2. West Point. Number of depressions about 12. (Pers. obs.)
3. West Point Lighthouse (south). Number of depressions about 8. (Pers. obs.)
5. Temma. Number of depressions 13. (Pulleine:311)
6. Ordnance Point. More than one depression described. (Pulleine:311)
7. Sandy Cape. Several depressions. (Pulleine:312)
APPENDIX 6.3: ARCHAEOLOGICAL MIDDENS WITH SEAL BONE ASSOCIATED

(Sites as appear in Fig. 6.2; references as in Appendix 6.1.)

WEST COAST

1. Studland Bay  (Pulleine; pers. observation)
2. Mt. Cameron West Carvings Promontory  (Personal observation)
3. Green Point  (Personal observation)
4. West Point  (Jones)
5. West Point Lighthouse (south)  (Jones)
6. Bluff Point  (Pulleine)
7. Greens Creek area  (Personal observation)
8. Ordnance Point  (Legge)
9. Sandy Cape  (Pulleine)
10. Sloop Point  (Sims)
11. Port Davey Caves  (Pulleine)

NORTH-WEST

12. Rocky Cape Caves  (Jones)
13. Sisters Creek  (Jones)

NORTH-EAST CORNER

14. Cape Naturaliste  (Personal observation)
15. Cobler Rocks  (" " )
16. Eddystone Point  (" " )
APPENDIX 7.1: FOOD — PROCURING

ACTIVITY OBSERVATIONS (Total 69)

(See Fig. 7.1)

Crozet (Marion Du Fresne) 1771, March 3, P.21.
Furneaux 1773, March 10, Pp. 110,113.
Cook 1777, January 29.
Bligh 1788, September 3; 1792, February 9.
Mortimer (Cox) 1789, July 3, 8.
Bass 1799 Pp. 168, 186.
Peron Pp. 176-177, 189-190, 198.
Kelly 1815, December 21, 28; 1816, January 4, 17.
King 1819, January 25.
Ross c. 1822 Pp. 146, 154.
Kellye 1828 Pp. 341.
Robinson 1830, March 18,24,26,27,28,29;
    April 10,20,23;
    June 1-2,21;
    July 27;
    September 16(2),17,19;
    October 20;
    November 1.
1831, July 15,20;
    August 16,22;
    November 11;
    December 4,5,17.
1832, June 18,23;
    July 15;
    September 3.
1833, May 18,20,23;
    June 17;
    July 12(2).
1834, June 5.
Backhouse 1833, January 7, P.121.
APPENDIX 7.2: OBSERVATIONS OF ABORIGINAL HUTS

(See Fig. 7.3)

Crozet (Marion Du Fresne) 1771 P.21
Labillardiere Pp. 96, 97, 101(2), 102, 103, 109, 114, 125, 127, 134, 282.
Burneaux 1773, March 10, P.112.
Cook 1777, January 29.
Eligh 1788, August 23, September 3 (2); 1792, February 9, 12.
Cox (Montimer) 1789, July 3, 8.
Bass 1799 Pp. 168, 188.
Knopwood 1804, March 7.
Ross (Bondick: 49; Ling Roth: 108).
Hellyer 1828 Pp. 24, 34; Bischoff P.171.
Possey 1828 P.40.
Robinson 1829, April 3.
1830 February 4, 21, 23;
March 7, 19, 26;
April 5, 11(2), 19, 20;
May 24;
June 2, 6, 9;
July 26;
August 22, 23, 24;
September 13, 14, 15, 20, 27(2);
October 19;
November 1, 2;
December 3, 4;
1831 January 4;
July 8;
August 16, 22;
October 20, 22;
November 9, 10, 11, 12, 24, 25, 28;
December 6, 13, 23, 29; P.571.
1832 April 28;
June 18;
1833 May 18, 19;
June 17(2);
July 21;
September 3, 4;
1834 March 9, 29;
July 11, 12(2), 16(3).
APPENDIX 7.3 : NUMERICALLY STATED GROUP-SIZE OBSERVATIONS

(See Table 7.2)

Crozet (Marion Du Fresne) 1771, P. 18.
Cook 1777, January 28, 29(2).
Bligh 1788, September 2, 3; 1792, February 19.
Cox (Mortimer) 1789, Pp. 18, 19.
Flinders 1798, November 6.
Bass 1799, P. 187.
Knopwood 1804, June 21.
Kelly 1815, December 13, 14; 1816, January 4(2), 12, 13, 18.
King 1819, January 25 Pp. 155, 159.
Ross c.1822, P. 146(2).
Hobbs 1824, P. 18.
Robinson 1830 March, 18, 25;
        April 20(2);
        May 23;
        June 1, 9, 12, 21;
        September 20;
        November 1, 3.
1831 July 20;
        November 10;
        December 29.
1832 June 23;
        July 15;
        September 3.
1833 May 20;
        June 17;
        July 12.