# AN INTRASITE ANALYSIS OF PHILLIP'S GARDEN: A MIDDLE DORSET PALAEO-ESKIMO SITE AT PORT AU CHOIX, NEWFOUNDLAND



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# AN INTRASITE ANALYSIS OF PHILLIP'S GARDEN: A MIDDLE DORSET PALAEO-ESKIMO SITE AT PORT AU CHOIX, NEWFOUNDLAND

by

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## Abstract

An understanding of site function at a Middle Dorset Palaeo-Eskimo site known as Phillip's Garden (EeBi-1), has long been impeded by the quantity, complexity and overlap of the archaeological remains. As greater site complexity has been realized, it has become apparent that establishing contemporaneity amongst the archaeological features is crucial to understanding site function and settlement patterning. Potential contemporaneity is estimated from radiocarbon results, and is used as the basis from which to compare locational data; changes in house construction, and the frequency and distribution of artefacts. This analysis is intended as a means to evaluate the nature and duration of the various forms of occupation which have created this semi-sedentary looking archaeological site.

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# Chapter 1
# Introduction to Research

An understanding of the function of the Middle Dorset Palaeo-Eskimo community at Phillip's Garden in Port au Choix, has long been impeded by the complexity and overlap of the many temporal and physical components of this large archaeological site. Consequently, questions relating to settlement patterning, site development and house reoccupation have remained largely unanswered. As greater site variability has been realized, it has become apparent that establishing contemporaneity amongst the archaeological features is crucial to understanding the function(s) of the site (Renouf 1991:62). Hence, the basic methodological question is how to determine which of the houses were occupied simultaneously at any given time (Harp 1976:120).

In response to this challenge, it is the aim of this thesis to establish the function(s) of Phillip's Garden by determining how different occupational sequences contributed to the overall archaeological assemblage. There is strong evidence that the archaeological remains at Phillip's Garden represent different occupational events, site functions and various seasons of use (Renouf 1991:43, 1993:59). As such, it is argued that a definition of site function can only be derived by: (1) separating out the different components of residency, and (2) determining what the archaeological patterns should look like for different occupational events.

To facilitate a meaningful comparison of the archaeological findings, the following residency model is used to summarize the possible uses of Phillip's Garden into five occupation scenarios.

**A. Residency Model**

The first of these occupation scenarios is described as a *Regular Seasonal Occupation.* This refers to a place where people annually reside at about the same time of year, to extract known available resources. To date, the function of Phillip's Garden has generally been interpreted in relation to a spring seal hunt; since the recovered faunal material is dominated by harp seal remains, with only trace amounts of caribou, fox, beaver, birds and fish (Harp 1976:128; Renouf 1991:60). It can be expected that the archaeological patterning from a Regular Seasonal Occupation may be distinguished by: a narrow range of seasonality; similar house styles; similar tool assemblages; and, the potential at larger sites, for greater numbers of houses being occupied at the same time.

The second type of occupational event is a *Varied Seasonal Occupation.* This describes a place where people annually reside at different times of the year, to extract a wider range of resources. As such, the site may have been occupied as a residential base during both the spring and early winter seal hunts (Murray 1992); or even as a staging area from which small groups could have organized for inland caribou hunting and salmon fishing (Harp 1976:132; Renouf 1991:61). A Varied Seasonal Occupation may be distinguished by: different house styles; a wider range of seasonality; dissimilar tool assemblages; and by a lesser probability that houses were simultaneously occupied.

Third, the function of Phillip's Garden could have been according to a *Shifting Seasonal Occupation*. This describes a site which may have had different economic potential relative to its place within an overall sequence of hunter-base camp moves (Binford 1982:12). As such, the function of Phillip's Garden may have shifted according to the requirements prescribed by the overriding settlement and subsistence strategies of the various Dorset Palaeo-Eskimo groups which utilized the site. If this were the case, the use of Phillip's Garden may have been less regular than has generally been inferred. A Shifting Seasonal Occupation is also likely to have produced the widest diversity in site function and seasonality. Consequently, it is expected that this type of residency would result in: fewer houses being occupied concurrently; a wider range of house styles; and, different tool assemblages.

Fourth, Phillip's Garden may have been a *Meeting Place*, where social relationships as part of a larger group could be re-defined through communal activities (Renouf 1991:61).

While settlement patterns may be strongly influenced by economic demands, it is probable that social factors influenced the location, duration, seasonality and function of Palaeo-Eskimo sites like Phillip's Garden. Conversely, even if the principal reason for population aggregation at Phillip's Garden was social, this could have only occurred when it was "economically feasible, or when cooperation in hunting and gathering [was] economically necessary" (Renouf 1991:60). Consequently, population aggregation as a social phenomenon, rather than for strictly economic reasons, may have cross-cut all other settlement types (Hood: personal communication). As a Meeting Place, the archaeological patterning should include: structure(s) with communal function(s); uniformity in house styles reflecting similar utilization of the site, and, evidence of many houses being occupied simultaneously.

Lastly, the occupation of Phillip's Garden may be described as a *Composite Occupational Pattern*, comprised of a combination of the foregoing scenarios. Accordingly, the patterns of residence at Phillip's Garden may have developed from a series of different occupations, and varying seasons of use. As a result, the patterning of archaeological remains is likely to be less recognizable when different types of occupations are intermixed (Janes 1983:27). Accordingly, it is expected that patterning from this type of residency is likely to be the least recognizable of the five occupation types.

Determining which of these scenarios best describes the function of the site is complicated by: (1) the likelihood that the function of the site changed over time; and, (2) that the site probably had more than one function at a time. Consequently, if an understanding of site function is to be achieved, it is important that some degree of contemporaneity amongst the houses be established. That is to say, it is necessary to sort out the houses which were occupied simultaneously, in order to determine how the site was used at any one time, and over time.

To assess the degree to which the archaeological patterns at Phillip's Garden correspond to the occupational scenarios in this model, four methods of analysis are employed. In Chapter 3 the potential number of houses which could have been occupied simultaneously at any one time are estimated from radiocarbon dates (Helskog and Schweder 1989; Kintigh 1992; Shott 1992; Thomas 1986).

In Chapter 4 the spatial characteristics of house location are examined as a means of understanding site development over time. This is accomplished by comparing both the horizontal and vertical location of houses relative to their suggested temporal position (Badgley 1980; Carr 1984; Hietala 1984; Oetelaar 1987, 1993).

In Chapter 5 house structure and orientation are investigated to ascertain whether there were any significant changes in site function and/or social organization. This is accomplished by comparing the dimensions of certain structural elements within the houses (Kapches 1990; Maxwell 1980).

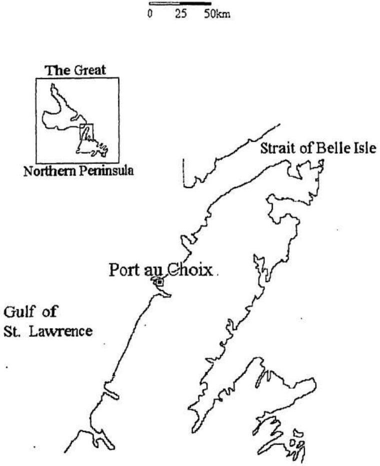
In Chapter 6 the types and frequencies of artefacts are compared over time. This comparison is intended as a means to determine house function, and is achieved with the aid of a multivariate statistical technique known as Correspondence Analysis (Blankholm 1991; Bølviken et. al. 1982; Greenacre 1993).

**B. Definition of Study Area**

Phillip's Garden is the largest known and most complex middle Dorset Palaeo-Eskimo site in the Province of Newfoundland. It is a 2.2 hectare grassy meadow which is located on the northern shore of the Point Riche peninsula near the town of Port au Choix. More particularly, Phillip's Garden is situated within the boundaries of the Port au Choix National Historic Park (see Figure 1.1).

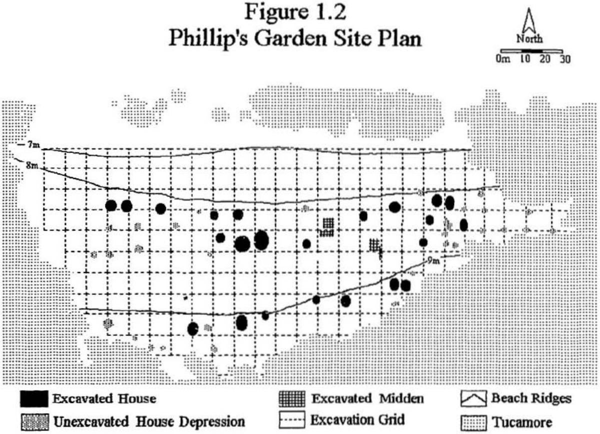
As indicated in Figure 1.2, the site is generally surrounded by tucamore (stunted spruce), and consists of fifty or more house depressions and midden features which are situated atop the upper two of three raised beach terraces. Other than from the activity of archaeologists, the cultural

Figure 1.1
Site Location




(Adapted from Renouf 1985)

Figure 1.2
Phillip's Garden Site Plan



remains of the site are predominantly undisturbed, having escaped the agricultural practices of the more recent residents of Port au Choix (Harp 1964:20).

Environmentally, the Port au Choix area is part of a highly variable West Coast Climate Region, which generally consists of moderate to heavy winter snowfall, and moderately warm, sunny summers (McManus and Wood 1991). Extending into the Gulf of St. Lawrence, the Point Rich Peninsula is exposed to intense storms and unpredictable wind and ice conditions which are characteristically frequent in this area (Gutsell in Harp 1964:17). Moreover, the local climate is also influenced by the cold Labrador current which generally moves southward down through the Strait of Belle Isle to the Gulf of St.Lawrence (Markham 1980). This flow of cold sea water, which travels as much as 35 kilometres per day, has surface temperatures of 0 to 15 degrees celsius (McManus and Wood 1991). In the spring, this flow brings arctic ice and icebergs which can remain in this area well into the summer months (Murray 1992:12).

There are approximately 1300 hours of annual sunshine, and 150 to 160 frost free days per year (McManus and Wood 1991). Fog is most frequent from May to August (Northland Associates 1985:19), and is often generated by warm winds from the southwest which pass over the cold currents in the gulf (Gutsell in Harp 1964:17). The annual precipitation consists of 1400 to 1600 millimetres, with snowfall accounting for 300 to 400 centimetres of this total (McManus and Wood 1991). The average January temperature ranges between -5 to -10 degrees celsius, and the average July temperature is between 10 and 15 degrees celsius (McManus and Wood 1991).

Located in a Forest and Tundra Region, the vegetation in the Port au Choix area is comprised of a patchwork of barrens and patches of stunted spruce, forming a transition zone between tundra and the subarctic forest and peatlands. Numerous vegetation types exist in over a dozen vegetation zones (Northland Associates 1985:47), including Rock Beaches, Sea Cliffs, Gravel Beaches, Limestone Barrens, Snowbed Communities, Anthropogenic Communities, and Disturbed Areas. Forested areas are generally restricted to inland sites, and tree height rarely exceeds four metres. Varieties of trees include: Balsam fir, White Spruce, Larch, Black spruce, White Birch and Mountain Ash.

While large numbers of marine mammals populate the Gulf of St. Lawrence, the range of abundantly available terrestrial animal species on the island is quite narrow. Of the sixteen terrestrial species which are native to Newfoundland, nine of these are carnivores. With such a simplified terrestrial ecosystem, species such as caribou are prone to periodic population crashes (Bergerud 1983) which could result from severe climatic conditions such as ice storms (Pastore 1989:53). Consequently, it has been argued that Newfoundland's prehistoric populations may have relied upon the more predictable marine species than the less stable terrestrial species (Tuck and Pastore 1985).

**C. Culture History**

From about 2500 years before present (years B.P.) to approximately 600 years B.P., the people of a Palaeo-Eskimo culture now known as Dorset, occupied much of the Canadian Arctic, Greenland, Labrador and the island of Newfoundland. While the Dorset culture survived for about 2000 years, its existence is marked by three perceptible cultural phases known as Early, Middle and Late Dorset. Early Dorset is dated at about 2500 to 2000 years B.P., Middle Dorset from around 2000 to 1000 years B.P., and Late Dorset from 1000 to 600 years B.P. (Maxwell 1985; Tuck and Fitzhugh 1986). Of these three phases, only Middle Dorset has been found on the island of Newfoundland. Radiocarbon dates for Middle Dorset on the island range from 1890+/-100 years B.P. at Shambler's Cove in Bonavista Bay, to 1090+/-80 years B.P. at Bordeaux II in Placentia Bay (Robbins 1986:122).

While the archaeological remains of the "Newfoundland" Dorset material culture was initially perceived as homogeneous (Harp 1964; Linnamae 1975), at least three regional variants have since been observed: west coast, north east coast, and south coast (Robbins 1986). These variants are generally characterized by differences in raw materials and artefact styles.

On the island of Newfoundland, Middle Dorset tools were generally fashioned from regionally available materials, and on the west coast they included Cow Head and Port au Port cherts. The tools from west coast Dorset sites, including those from Phillip's Garden, are generally distinguished by: unifacially flaked and tip fluted triangular endblades with concave bases; a wide variety of side and multiply notched bifaces; ground slate lance points; triangular endscrapers; ground burin-like tools with small side notches; slender microblades; and many fragments of angular soapstone bowls and lamps. Where there is sufficient preservation, bone artefacts such as: closed socketed harpoon heads; foreshafts; bilaterally barbed harpoons; sled runner fragments; needles; and stylized animal charms or amulets have been recovered (Harp 1964; Renouf 1993; Tuck n.d.).

The Dorset occupation of the island of Newfoundland continued for approximately 700 years; 500 of which are represented at Phillip's Garden. While there is much uncertainty regarding the fate of the Dorset culture in Newfoundland, there is no clearer picture of what happened to Dorset populations elsewhere in Labrador, Greenland and the eastern Arctic. On the island of Newfoundland, the Dorset culture appears to have disappeared prior to the Late manifestation of the culture, which survived in other areas such as northern Labrador until sometime between 1000 to 650 years B.P. (Tuck and Fitzhugh 1986:166).

# Chapter 2
# History of Research

Archaeological investigation of the Arctic is largely a practice of the twentieth century. In fact, by 1900, the only archaeological materials which had been collected consisted of a scattering of small collections from Greenland (Dekin 1978:8). Moreover, this early archaeological research was dominated by a concern for the collection, cataloguing and comparison of artefacts.

Arguably, the first systematic and most extensive archaeological investigation in the Arctic was made from 1921 to 1924 by Therkel Mathiassen of the Fifth Thule Expedition (Collins 1984:15). Mathiassen's investigations initially defined the Thule culture, which later became recognized as the ancestral culture to the modern Inuit (Maxwell 1985:58).

At about the same time as Mathiassen's expedition, Canadian archaeologist Diamond Jenness examined collections of "Thule" artefacts from Cape Dorset and Coats Island. From his inspection of these materials, Jenness (1925) suggested that apparent age and stylistic differences of certain artefacts were representative of an earlier and separate "Eskimo" culture. Jenness named this culture Cape Dorset, which now is simply known as Dorset. This hypothesis also served to explain the basis for Thule stories of an extinct group of people known as the "Tornit", which Boas (1888) documented almost forty years earlier.

Despite the apparent age and stylistic differences between many of the artefacts which he collected, Mathiassen (1927:8) concluded that they shared qualities which were noticeably Thule in nature. On the subject of "legendary" Tornit, Mathiassen admitted that their stories agreed "surprisingly well with the archaeological conditions" (1927:187), but resolved that these accounts were only an "admixture of fantastic embellishment which of course is to be found in all Eskimo legends" (1927:186). He argued that some of the artefacts which appeared to be technologically inferior, were evidence of an earlier and less proficient cultural manifestation of Thule (1927:191).

While conclusive proof of Jenness's hypothesis would not be obtained for another 25 years (Collins 1950), the discovery of "pure" Dorset remains in 1927 on the island of Newfoundland, including those from Phillip's Garden (Jenness 1933; W.J. Wintemberg 1929, 1939, 1940), served to strengthen Jenness's interpretations regarding the authenticity of the Dorset culture. Later excavations of Dorset sites in Foxe Basin at Abverdjar (Rowley 1940); in northern Labrador (Leechman 1943); and in Greenland (Holtved 1944), would also provide support for an earlier and separate Dorset culture.

As an example of "pure" Dorset remains, the artefacts collected from Phillip's Garden in 1927 and 1929 served as some of the earliest supporting evidence for Jenness's [Cape]

Dorset culture. Later, Phillip's Garden would be instrumental in Elmer Harp's (1964) investigations concerning the origins and cultural affinities of the Middle Dorset culture in Newfoundland. Today, the size, temporal range, and quality and quantity of the archaeological resources at Phillip's Garden continue to motivate archaeological investigations.

**A. The Early Years**

While residents of the nearby town of Port au Choix have long known about Phillip's Garden, the site received little outside attention until William John (W.J.) Wintemberg and Diamond Jenness visited the site in 1927, and again in 1929. Although Howley had surmised as early as 1915 that artefacts from Port au Choix were "Eskimo" in origin, it was not until Jenness and Wintemberg published the results of their Newfoundland explorations that this claim was verified.

Although Wintemberg made a preliminary report of his field work to the National Museum of Canada in 1929, he did not publish his conclusions in ***American Antiquity*** until 1939. In the meantime, Diamond Jenness reported on the archaeological finds from Newfoundland in "The American Aborigine, their Origin and Antiquity" (1933). In these writings, both Wintemberg and Jenness concluded that the remains from Phillip's Garden belonged to the newly discovered [Cape] Dorset culture.

Although the early years of research at Phillip's Garden were limited to surface collection and testing, the investigations intensified following World War II. In 1949, Phillip's Garden became the focus of a more sustained archaeological investigation, which eventually would help Elmer Harp Jr. define the Dorset culture on the island of Newfoundland.

**B. The Harp Years**

In 1949 Elmer Harp Jr. visited Phillip's Garden as part of the first intensive archaeological survey of the Cape Riche, Port au Choix and the Bonne Bay areas of the northwest coast of Newfoundland. Harp excavated most of two houses at Phillip's Garden during the summers of 1949 and 1950, and confirmed Wintemberg's initial identification of the artefacts as being Dorset in origin (Harp 1951).

Harp resumed investigations at Port au Choix in 1961, and identified 36 potential Dorset houses. His investigations of Phillip's Garden lasted until 1964, and resulted in the partial or complete excavation of 20 houses (Harp 1976). Through these investigations, Harp (1964) provided a comprehensive review of the Dorset culture in Newfoundland, and advanced the issues of Dorset origins and cultural affinities.

In subsequent years, Harp reexamined Phillip's Garden as a means to understanding Dorset settlement patterns. In a departure from his earlier culture-historical approach, Harp

(1976) examined settlement and community arrangements at the site level, as a means to a basic understanding of seasonality, settlement patterns, subsistence practices, and population trends.

From this later analysis of Phillip's Garden, Harp suggested that the "benign living conditions" and the abundance of marine resources may have precipitated the concentration of houses which eventually resulted in a "quasi-permanent base settlement" (Harp 1976:136). Further, he suggested that the growth of Phillip's Garden could be described as "a gradual expansion of population on a fairly even curve, followed by a stable period, and finally by a waning trend" (1976:136). Finally, Harp (1976:137) described the nature of the settlement as being pervasively conservative, and that this likely was attributable to a loss of contact with Dorset peoples in more northern locales.

**C. Parks Canada Research**

Subsequent to Harp's final field season in 1964, no further research was undertaken at Phillip's Garden until William Fitzhugh's 1981 discovery of an adjacent Groswater Palaeo-Eskimo site (Fitzhugh 1982). In 1984 a large portion of the Port au Choix peninsula was officially designated a National Historic Park. At that time, M.A.P. Renouf of Memorial University of Newfoundland, resumed archaeological investigations at Phillip's Garden on behalf of Parks Canada.

Following an intensive survey, a re-mapping of the site, and a series of test excavations, Renouf located an additional 12 unexcavated house depressions. This raised the total number of potential houses to 48 (Renouf 1985:39). Subsequent testing of the site increased this total to 53. Excavations have further revealed a likelihood for additional houses beneath some midden features (Renouf 1993:59).

During the field seasons in 1985 and 1986, two houses (Features 1 and 14)[1], and a separate midden (Feature 2) were also excavated (Renouf 1986, 1987). In 1990, extensive excavations focused upon areas outside of these two previously excavated houses. In addition, an external axial hearth (Feature 42) was excavated, and an unassociated midden (Feature 49) was tested. On the basis of these excavations, and subsequent faunal analyses (Murray 1992; Renouf 1991, 1993), a greater variability in seasonality and site function were eventually accorded to Phillip's Garden.

Field work in 1991 was limited, and consisted of a day and a half of test pitting (Renouf 1992). The first objective of this brief testing programme was to investigate a house depression (Feature 55) for disturbances. Notwithstanding the existence of a previous test pit, the depression was found to

[1]Note: Harp identified the twenty houses which he excavated numerically from 1 to 20. Renouf identified her houses as Features, which are also numerically ordered. As such, the three houses which Renouf excavated are designated as Features 1, 14 and 55. To avoid unnecessary confusion in the balance of this work, Harp's Houses will be identified as Houses 1, 2, 3, etc., and Renouf's as house Features 1, 14 and 55.

be undisturbed, and was fully excavated the following year. Second, an area of the site where Harp had previously found Groswater artefacts, was tested for the same, but provided no further evidence of this earlier Palaeo-Eskimo material. Third, various midden areas were tested for evidence of caribou, and other non-marine mammals. However, this testing only resulted in further marine mammal remains.

In the most recent field season of 1992, a third house (Feature 55), and an associated midden (Feature 73) were excavated (Renouf 1993). Although the main objective of investigating Phillip's Garden was to "establish the range of variation within the site" (Renouf 1993:19), Renouf undertook the excavation of this house which she believed would be similar to the large "winter" houses which Harp had previously excavated. The objective of this excavation was to investigate house construction. It was assumed that this more substantial depression (house Feature 55) might yield a great amount of structural and artefactual information. To Renouf's initial dismay, house Feature 55 initially provided neither a great abundance of artefacts, nor a well-defined house outline.

However, this excavation did eventually provide an important glimpse into house construction, with the discovery of stone lined post-holes which likely accommodated whale bone uprights (Renouf 1993). Additionally, Renouf (1993:24) reported that the floor plan of this house did not resemble any previously found structures at Phillip's Garden, and curiously noted that it was more typical of Palaeo-Eskimo houses elsewhere.

For the most part, Renouf's investigations during and up to 1992 were designed to probe areas and features of the site which Harp had not focused upon. Specifically, she investigated less obvious house depressions, and excavated extensive areas outside these features. She also placed more emphasis on the investigation and analysis of faunal materials, midden features, and activity areas both inside and outside of the houses. By way of this more varied approach, Renouf has examined house design, activity areas, seasonality, subsistence, and the nature and extent of the Dorset occupation. From this research, she has concluded that Phillip's Garden possesses a high degree of intra-site variability, particularly in "house form, house contents, and midden sizes and seasonality" (Renouf 1993:59).

**D. Present Research**

The research on which this thesis is based, is intended to complement the on-going investigations at Phillip's Garden by more closely examining the function(s) of Phillip's Garden in view of the greater intra-site complexity suggested by Renouf. In particular, this issue is addressed by attempting to establish contemporaneity amongst the houses. The investigation of this issue was initially motivated by Harp's endeavours to understand the community arrangement at Port au Choix. ^~ Harp (1976:120) asserted, a most basic problem in the analysis of Phillip's Garden is to determine which houses were simultaneously occupied at any given time. Renouf reiterated the importance of this issue when she asserted (1991:62) that if site function is to be determined, it is crucial that we establish some degree of contemporaneity amongst the houses.

It is also argued that the issue of contemporaneity is basic to any archaeological site which possesses a large number of houses. As such, the methodological approach established by this research may not only facilitate other Palaeo-Eskimo investigations, but may also advance the means of addressing the basic problem of establishing house contemporaneity at any large archaeological site.

# Chapter 3
# Three Statistical Tests for Contemporaneity

The purpose of this chapter is to estimate the number of houses at Phillip's Garden which could have been occupied simultaneously at any one time. This is accomplished by comparing radiocarbon dates from the houses, and by calculating the probability of their contemporaneity. While statistical tests cannot alone establish the actual number of contemporaneous houses, they will provide a chronological guide from which to compare other data for evidence of contemporaneity. As such, the statistical tests applied in this chapter are intended to facilitate an understanding of the nature and extent of the occupation at Phillip's Garden over time, and at any point in time.

A comparison of the radiocarbon dates is not a simple matter, since the dating process does not actually provide a precise measurement of age. Rather, a radiocarbon date is a measure of probability which is expressed as an estimated mean and a range of possible error. Specifically, there is a 68.3% chance that the actual age of a radiocarbon sample lies within one standard deviation of the given mean (Bowman 1990:38). Consequently, the comparison of radiocarbon dates requires methods which are applicable to comparing statistical probability.

Many of the techniques which have been applied to the problem of house contemporaneity (Helskog and Schweder 1989;

Shott 1992; Thomas 1986) have been based upon the measurement of the statistical error inherent in radiocarbon dates. These techniques are used to establish whether the differences between radiocarbon dates are real, or whether the differences are merely a factor of statistical error. Where differences are found to be a result of statistical error, a case can then be made for possible contemporaneity. For example, if the difference between the dates 1400±100 and 1250±90 is proven to be the result of statistical error, then it may be that these radiocarbon dates pertain to the same period in time.

Establishing associations between the occupation of houses from radiocarbon dates is also problematical because of differences in the quality and context of the samples, and the length of time in which datable materials were utilized prior to their deposition. In addition there is a possibility of natural contamination in both marine and terrestrial environments (Bowman 1990:24-25). The reliability of radiocarbon dates is also dependent upon the technical procedures which are employed in the collection and handling of a sample (Bowman 1990:27-30).

Unreliable radiocarbon dates can also result from the long term use of organic materials prior to their deposition, and from any substantial differences in the time between the death of organic material and its use. For example, if a piece of wood was a century old before it was burned in a hearth, a radiocarbon date would reflect the age of the wood, and not the event of its burning. While there are various methods of contending with these problems (Bowman 1990:50-54), the simplest method of increasing the reliability of radiocarbon results is to employ multiple dates.

If radiocarbon dates are to be accurately associated with the occupation of a house at Phillip's Garden, an understanding of the context of the dated sample must be achieved. This is particularly important when assessing the validity of different radiocarbon results which may have resulted from a lengthy reoccupation of the same house. Consequently, when multiple dates with different means were available for a single house, the stratigraphic context of the samples were examined from the original field notes and summaries. This examination was conducted to determine a) the possibility of contamination, and b) whether the samples were taken from contexts which appeared to have a similar temporal relationship. Differences between radiocarbon results from similar contexts were then tested using the Stuiver and Reimer (1993) calibration program known as Calib3. Samples which proved to be statistically the same at a 95% level of confidence were averaged. The dates which were shown to be significantly different and which had no apparent signs of contamination were considered a result of house reoccupation.

Dates which were suspected of contamination were disregarded. The resulting dates from this procedure were then calibrated using the intercept method at one sigma (Stuiver and Reimer 1993).

A total of 32 total radiocarbon dates have been processed for Phillip's Garden (Renouf pers. comm.). Twenty of these were furnished through Harp's investigations and twelve by Renouf's. Of this total, 24 of the dates are wood charcoal-based, and six were derived from samples of seal fat. In all but two instances, seal fat-based dates were rejected in favour of the more reliable wood charcoal-based dates. Although seal fat samples are considered unreliable due to marine reservoir effects (Bowman 1990:25), the exceptions were made for Houses 13 and 15, since no other dates were available. Like the wood charcoal results, these fat-based dates were also calibrated at one sigma, using a facility of Calib3 which is specifically designed to correct marine-based dates. The radiocarbon dates which were chosen for the tests of house contemporaneity are summarized in Table 3.1. A complete description of all 32 radiocarbon samples from Phillip's Garden is included in Appendix 1.

In attempting to establish which houses were occupied simultaneously, the problems of association and context are further complicated by the longevity of house occupation. Since a single radiocarbon date is representative of only a

Table 3.1
Summary of Phillip's Garden Radiocarbon Samples

| Context | Lab | Material | Uncalibrated | Calibrated |
|---|---|---|---|---|
| H20 | P-737 | Charcoal | 1321 ± 49 | 1234 ± 56 |
| F55 | B-66435 | Charcoal | 1410 ± 100 | 1327 ± 62 |
| H17 | P-734 | Charcoal | 1465 ± 51 | 1348 ± 48 |
| H5 | P-676 | Charcoal | 1502 ± 49 | 1367 ± 44 |
| H11 | P-696 | Charcoal | 1509 ± 47 | 1372 ± 41 |
| H13 | P-731 | Fat | 1891 ± 56 | 1423 ± 74 |
| H12 | P-729 | Charcoal | 1538 ± 55 | 1427 ± 81 |
| H16 | P-733 | Charcoal | 1565 ± 53 | 1441 ± 82 |
| H4 | P-727 | Charcoal | 1580 ± 54 | 1465 ± 65 |
| H10 | P-694 | Charcoal | 1602 ± 49 | 1473 ± 64 |
| H6 | P-679 | Charcoal | 1623 ± 47 | 1482 ± 65 |
| H18 | P-736 | Charcoal | 1683 ± 49 | 1606 ± 78 |
| H2 | P-AVE | Charcoal | 1698 ± 35 | 1612 ± 73 |
| F1 | B-15379 | Charcoal | 1850 ± 110 | 1753 ± 132 |
| H15 | P-732 | Fat | 2294 ± 51 | 1887 ± 57 |
| F14 | B-AVE | Charcoal | 2016 ± 52 | 1942 ± 56 |

Note: B-AVE = the average of samples B-23976 and B-23977
P-AVE = the average of samples P-692 and P-693

point in a continuum of occupation, and because we may have no way of knowing which point it represents, it is essential that house longevity be considered. In this respect, both the length of occupation, and the number of times a structure is reoccupied will be affected by: a) the durability and/or function of the structure; b) the life span of owner-occupant; c) the seasons in which the structure was used; d) the availability of essential local resources, and; e) the relative difficulty of constructing a new dwelling, versus repairing the old.

Finally, it is noted that only sixteen of the over fifty known houses at Phillip's Garden are included in this analysis, since the majority have not yet been excavated. However, since this represents a large sample in statistical terms, the accuracy of these methods would only be marginally be improved if all the houses were dated. It is also noted that thirteen of the sixteen dated houses which are included in this analysis were chosen for excavation on the basis of a random sampling technique which had a 95% degree of confidence (Harp 1976:120). In this regard, the sample of house structures is considered adequate for the purpose of this analysis.

**A. Pair-Wise Testing**

The first method applied to the radiocarbon results from Phillip's Garden was a simple Pair-Wise test for contemporaneity (Helskog and Schweder 1989; Shott 1992; Thomas 1986). The Pair-Wise method applies a statistical test known as the Student's *t*-Distribution. With this test, radiocarbon dates for every combination of houses were compared in pairs to see whether there was any significant difference between them. The calculations were based on a test of two-tailed significance at the 0.05 level with infinite degrees of freedom, corresponding to a *t* value of 1.96 (Thomas 1986:250). An explanation of this method and a sample calculation are included in Appendix 2.

Table 3.2

Pair–Wise Test Results for Phillip's Garden

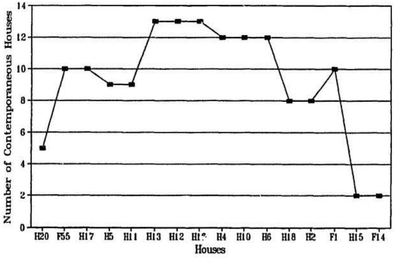
| Corrected 14C Dates | | Houses H20 | F55 | H17 | H5 | H11 | H13 | H12 | H16 | H4 | H10 | H6 | H18 | H2 | F1 | H15 | F14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1234 56 | H20 | 0 | | | | | | | | | | | | | | | |
| 1327 62 | F55 | 1.04 | 0 | | | | | | | | | | | | | | |
| 1348 48 | H17 | 1.65 | 0.45 | 0 | | | | | | | | | | | | | |
| 1367 44 | H5 | 2.04 | 0.76 | 0.35 | 0 | | | | | | | | | | | | |
| 1372 41 | H11 | 2.2 | 0.89 | 0.49 | 0.13 | 0 | | | | | | | | | | | |
| 1423 74 | H13 | 1.84 | 0.87 | 0.56 | 0.3 | 0.21 | 0 | | | | | | | | | | |
| 1427 81 | H12 | 1.71 | 0.79 | 0.49 | 0.25 | 0.17 | 0.03 | 0 | | | | | | | | | |
| 1441 82 | H16 | 1.82 | 0.91 | 0.62 | 0.39 | 0.31 | 0.09 | 0.11 | 0 | | | | | | | | |
| 1465 65 | H4 | 2.59 | 1.5 | 1.24 | 0.98 | 0.9 | 0.52 | 0.52 | 0.39 | 0 | | | | | | | |
| 1473 64 | H10 | 2.72 | 1.62 | 1.36 | 1.12 | 1.03 | 0.61 | 0.61 | 0.48 | 0.1 | 0 | | | | | | |
| 1482 65 | H6 | 2.79 | 1.69 | 1.45 | 1.2 | 1.12 | 0.69 | 0.68 | 0.55 | 0.19 | 0.09 | 0 | | | | | |
| 1606 78 | H18 | 3.65 | 2.64 | 2.49 | 2.29 | 2.24 | 1.66 | 1.62 | 1.49 | 1.26 | 1.18 | 1.09 | 0 | | | | |
| 1612 73 | H2 | 3.92 | 2.86 | 2.74 | 2.53 | 2.48 | 1.83 | 1.77 | 1.64 | 1.42 | 1.34 | 1.25 | 1 | 0 | | | |
| 1753 132 | F1 | 3.09 | 2.44 | 2.29 | 2.14 | 2.1 | 1.8 | 1.78 | 1.69 | 1.5 | 1.45 | 1.39 | 0.61 | 0.54 | 0 | | |
| 1887 57 | H15 | 8.16 | 6.71 | 7.11 | 7.04 | 7.11 | 5.15 | 4.89 | 4.72 | 4.97 | 4.9 | 4.78 | 3.13 | 3.14 | 1.45 | 0 | |
| 1942 56 | F14 | 8.94 | 7.43 | 7.95 | 7.91 | 8 | 5.79 | 5.48 | 5.31 | 5.66 | 5.61 | 5.47 | 3.73 | 3.77 | 1.85 | 0.7 | 0 |

Note: Shaded cells refer to houses which are potentially contemporaneous with House 5.

The difference between dates was not considered significant when a *t* value less than 1.96 was generated. Conversely, resultant *t* values greater than 1.96 indicated a greater probability that the difference between two dates was real, and not just a result of statistical error. Where the difference between two dates was not considered significant, a case for potential contemporaneity is made.

The complete results of the Pair-Wise testing are provided in Table 3.2. From this table, contemporaneity is calculated by summing the number of cells containing *t* values which are less than 1.96. For example, the highlighted cells in Table 3.2 indicate that House 5 is potentially contemporaneous with house Feature 55 and Houses 17, 11, 13, 12, 16, 4, 10, and 6.

Figure 3.1
Pair-Wise Test Results



A summary of these results for all the houses is depicted in Figure 3.1. This figure illustrates a high degree of potential contemporaneity amongst most of the houses. All of the houses, except for Houses 20, 15 and 14 are potentially contemporaneous with eight or more houses. In particular, Houses 13, 12 and 16 are potentially contemporaneous with thirteen of the sixteen houses. However, it is unlikely that this many houses were contemporaneous, since this method fails to account for the actual probability of any two houses being occupied at any one time. Rather, the Pair-Wise method yields the number of contemporaneous houses by simply summing the number of houses which have any probability of being contemporaneous.

Notwithstanding this deficiency in the Pair-Wise test, the method does help establish which houses may have coexisted. As such, it can be inferred from this sample of houses that the highest probability for the greatest number of contemporaneous houses coincides with the occupation of Houses 12, 13 and 16. This period also corresponds to about the middle period of the occupation of the site. Periods of lower potential contemporaneity correspond to both the beginning and ends of the occupation, with the lowest probability for contemporaneity coinciding with the initial occupation of Phillip's Garden.

While this method provides some sense of which houses may have been contemporaneous, it does not provide results relative to the number of houses which may have been contemporaneous at any specified point in time. To achieve this, and gain an understanding of contemporaneity during the different ages throughout the occupation of the site, a variation of the *t*-test is employed in the following method.

**B. Comparison to a Fixed Age**

The second method utilized to estimate potential house contemporaneity also employs the Student's *t*-Distribution. However, this method measures the statistical significance between a radiocarbon date and a fixed date (Thomas 1986:248-249). Where $t$ values are less than 1.96, the difference between the fixed date and the radiocarbon date is considered insignificant, and thus the radiocarbon date is potentially contemporaneous with the fixed date to which it was compared. See Appendix 3 for a sample calculation using this method.

Each radiocarbon date was tested against a range of fixed dates which encompasses the entire potential occupation span of the site. This range begins at 2050 years B.P. and terminates at 1150 years B.P. The results of this testing are provided in Table 3.3. Like the Pair-Wise test, resulting $t$ values which are less than 1.96 are indicative of potential contemporaneity. In accordance with Table 3.3, house Feature 55, has a radiocarbon date of 1327 ± 62 years B.P., and could have been occupied from a period of 1400 to 1250 years B.P..

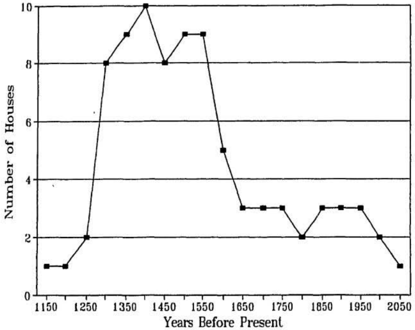
## Table 3.3
## Comparison to a Fixed Age as a Test for Contemporaneity

| House | Corrected 14C Date | | Years Before Present 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|---|---|---|---|---|---|---|---|---|---|---|
| H20 | 1234 | 56 | 1.50 | 0.61 | -0.29 | -1.18 | -2.07 | -2.96 | -3.86 | -4.75 |
| F55 | 1327 | 62 | 2.85 | 2.05 | 1.24 | 0.44 | -0.37 | -1.18 | -1.98 | -2.79 |
| H17 | 1348 | 48 | 4.13 | 3.08 | 2.04 | 1.00 | -0.04 | -1.08 | -2.13 | -3.17 |
| H5 | 1367 | 44 | 4.93 | 3.80 | 2.66 | 1.52 | 0.39 | -0.75 | -1.89 | -3.02 |
| H11 | 1372 | 41 | 5.41 | 4.20 | 2.98 | 1.76 | 0.54 | -0.68 | -1.90 | -3.12 |
| H13 | 1423 | 74 | 3.69 | 3.01 | 2.34 | 1.66 | 0.99 | 0.31 | -0.36 | -1.04 |
| H12 | 1427 | 81 | 3.42 | 2.80 | 2.19 | 1.57 | 0.95 | 0.33 | -0.28 | -0.90 |
| H16 | 1441 | 82 | 3.55 | 2.94 | 2.33 | 1.72 | 1.11 | 0.50 | -0.11 | -0.72 |
| H4 | 1465 | 65 | 4.85 | 4.08 | 3.31 | 2.54 | [illegible] | 1.00 | 0.23 | -0.54 |
| H10 | 1473 | 64 | 5.05 | 4.27 | 3.48 | 2.70 | 1.92 | 1.14 | 0.36 | -0.42 |
| H6 | 1482 | 65 | 5.11 | 4.34 | 3.57 | 2.80 | 2.03 | 1.26 | 0.49 | -0.28 |
| H18 | 1606 | 78 | 5.85 | 5.21 | 4.56 | 3.92 | 3.28 | 2.64 | 2.00 | 1.36 |
| H2 | 1612 | 73 | 6.33 | 5.64 | 4.96 | 4.27 | 3.59 | 2.90 | 2.22 | 1.53 |
| F1 | 1753 | 132 | 4.57 | 4.19 | 3.81 | 3.43 | 3.05 | 2.67 | 2.30 | 1.92 |
| H15 | 1887 | 57 | 12.93 | 12.05 | 11.18 | 10.30 | 9.42 | 8.54 | 7.67 | 6.79 |
| F14 | 1942 | 56 | 14.14 | 13.25 | 12.36 | 11.46 | 10.57 | 9.68 | 8.79 | 7.89 |

| House | Corrected 14C Date | | 1550 | 1600 | 1650 | 1700 | 1750 | 1800 | 1850 | 1900 | 1950 | 2000 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H20 | 1234 | 56 | -5.64 | -6.54 | -7.43 | -8.32 | -9.21 | -10.11 | -11.00 | -11.89 | -12.79 | -13.68 | -14.57 |
| F55 | 1327 | 62 | -3.60 | -4.40 | -5.21 | -6.02 | -6.82 | -7.63 | -8.44 | -9.24 | -10.05 | -10.85 | -11.66 |
| H17 | 1348 | 48 | -4.21 | -5.25 | -6.29 | -7.33 | -8.38 | -9.42 | -10.46 | -11.50 | -12.54 | -13.58 | -14.63 |
| H5 | 1367 | 44 | -4.16 | -5.30 | -6.43 | -7.57 | -8.70 | -9.84 | -10.98 | -12.11 | -13.25 | -14.39 | -15.52 |
| H11 | 1372 | 41 | -4.34 | -5.56 | -6.78 | -8.00 | -9.22 | -10.44 | -11.66 | -12.88 | -14.10 | -15.32 | -16.54 |
| H13 | 1423 | 74 | -1.72 | -2.39 | -3.07 | -3.74 | -4.42 | -5.09 | -5.77 | -6.45 | -7.12 | -7.80 | -8.47 |
| H12 | 1427 | 81 | -1.52 | -2.14 | -2.75 | -3.37 | -3.99 | -4.60 | -5.22 | -5.84 | -6.46 | -7.07 | -7.69 |
| H16 | 1441 | 82 | -1.33 | -1.94 | -2.55 | -3.16 | -3.77 | -4.38 | -4.99 | -5.60 | -6.21 | -6.82 | -7.43 |
| H4 | 1465 | 65 | -1.31 | -2.08 | -2.85 | -3.62 | -4.38 | -5.15 | -5.92 | -6.69 | -7.46 | -8.23 | -9.00 |
| H10 | 1473 | 64 | -1.20 | -1.98 | -2.77 | -3.55 | -4.33 | -5.11 | -5.89 | -6.67 | -7.45 | -8.23 | -9.02 |
| H6 | 1482 | 65 | -1.05 | -1.82 | -2.58 | -3.35 | -4.12 | -4.89 | -5.66 | -6.43 | -7.20 | -7.97 | -8.74 |
| H18 | 1606 | 78 | 0.72 | 0.08 | -0.56 | -1.21 | -1.85 | -2.49 | -3.13 | -3.77 | -4.41 | -5.05 | -5.69 |
| H2 | 1612 | 73 | 0.85 | 0.16 | -0.52 | -1.21 | -1.89 | -2.58 | -3.26 | -3.95 | -4.63 | -5.32 | -6.00 |
| F1 | 1753 | 132 | 1.54 | 1.16 | 0.78 | 0.40 | 0.02 | -0.36 | -0.73 | -1.11 | -1.49 | -1.87 | -2.25 |
| H15 | 1887 | 57 | 5.91 | 5.04 | 4.16 | 3.28 | 2.40 | 1.53 | 0.65 | -0.23 | -1.11 | -1.98 | -2.86 |
| F14 | 1942 | 56 | 7.00 | 6.11 | 5.21 | 4.32 | 3.43 | 2.54 | 1.64 | 0.75 | -0.14 | -1.04 | -1.93 |

Note: Shaded cells refer to houses which are potentially contemporaneous to a fixed age

Figure 3.2
Comparison to a Fixed Age Results




By summing the number of shaded cells in Table 3.3 by column (indicating *t* values between -1.96 and 1.96), it is possible to estimate the number of potentially contemporaneous houses at fifty year intervals for the entire period of occupation. The results of this estimation are graphed in Figure 3.2.

According to these results, the potential for house contemporaneity is relatively low, and remains this way from about 2000 years B.P. until about 1650 years B.P., during which time there could have been up to three contemporaneous houses. However, at approximately 1650 years B.P., there is a significant increase in estimated contemporaneity, which peaks at about 1400 years B.P.. During this peak period, there could have been up to ten contemporaneous houses. At about 1300 years B.P., this probability drops sharply, and the Palaeo-Eskimo occupation of Phillip's Garden apparently comes to a close.

**C. A Comparison of Longevity**

Both of the foregoing methods are valid means of testing the statistical relationship of radiocarbon dates. However, while they provide valuable information for comparative purposes, they do not take into account the problem of house longevity. Since a house may have been reoccupied for any number of years, the context of the materials from which radiocarbon results were derived is highly important. Simply, radiocarbon results based upon materials from the initial occupation of a house will be older than samples taken from the final occupation of the house. Thus, the issue of house longevity must be taken into account if estimations of house contemporaneity are to be meaningful.

To account for this problem of house longevity, Helskog and Schweder (1989) developed a method which estimates the number of contemporaneous houses by comparing radiocarbon dates to fixed ages with assumed reoccupation intervals. Since house longevity is an unknown variable at Phillip's Garden and is not easily interpreted from the archaeological remains, three different reoccupation intervals (25, 50 and 75 years) were employed for comparative purposes.

Like the previously described statistical tests, the basis for this method relies upon a test of confidence. However, in addition to testing the significance of the difference between a radiocarbon date and a fixed age, house longevity is added as a factor in these calculations. As such, this method requires that a fixed time (t) and a length of reoccupation (L) be chosen, and that they be compared to a radiocarbon date (x). The probable number of houses which were occupied at any give (t) time are then calculated by summing the resulting probabilities as shown:

$$N(t) = \sum_{i=1}^{n} p(t \mid x_i)$$

(Helskog and Schweder 1989:166)

This summation of the resultant probabilities is an important difference between this method and the two previous *t*-tests. In the previous two methods, potential contemporaneity was assumed whenever it was demonstrated that the difference between two dates was a result of statistical error. As a consequence, a case for contemporaneity was made in every instance where there was this statistical possibility, regardless of the actual probability.

In contrast, this method is sensitive to the actual statistical probabilities resulting from the comparison of radiocarbon dates. Instead of summing the number of potentially contemporaneous results, as in the previous two methods, the actual probabilities for contemporaneity are summed. For example, by adding the number of shaded cells in the column labelled 1350 B.P., from Table 3.3, it can be calculated that a total of nine houses were potentially contemporaneous at that time. However, from Table 3.4, a total of 2.08 contemporaneous houses are calculated for the same period by summing the probabilities from each of the cells in the column labelled 1350 B.P.. This reduced number of houses is considered a more appropriate estimate of the number of contemporaneously occupied houses, as compared to the previous methods, which do not account for the actual probabilities.

Helskog and Schweder (1989) have provided an extensive explanation of the mathematical basis for this method. Rather than repeating their lengthy mathematical proofs, a sample calculation is included in Appendix 4. Although it is possible to make the required calculations by hand, this technique is practical only with the aid of a computer. To this end, the calculations were made using a program which I composed in Borland's Turbo Pascal (Version 2.0). A copy of this program, and the instructions for its use are included on diskette in Appendix 5.

Using this method, tests were undertaken at 25, 50 and

75 year occupation intervals. The 25 year interval results are found in Table 3.4, the 50 year in Table 3.5 and the 75 year in Table 3.6. The result contained within each cell is equal to the probability that the house was occupied during the date to which it is compared. For example, in Table 3.4, the probability that Feature 55 was occupied at 1350 years B.P. is 0.15. This result can also be given as a percentage. As such, there is a 15 percent chance that Feature 55 was occupied at 1300 years B.P.. Accordingly, the sum of the probabilities (by column) for each date is equal to the number of contemporaneous houses at that date. Using Table 3.4 as an example, a total of 2.08 houses are shown to have been occupied simultaneously at 1350 years B.P., by summing the values in the shaded cells under that column.

The results of this exercise are illustrated in Figure 3.3. As depicted, the different reoccupation intervals greatly effect the number of potentially contemporaneous houses. In fact, the number of contemporaneous houses more than doubles between the 25 and 75 year intervals, thus demonstrating the importance of house longevity to the problem of establishing contemporaneity. It is also important to note that since this test only accounts for 16 of the 55 houses at Phillip's Garden, the number of contemporaneous houses would be higher if all the houses were considered.

Likewise, since the number of contemporaneous houses is

Table 3.4

Comparison to a Fixed Age with a Reoccupation Interval of 25 Years
As a Test For Contemporaneity

| Corrected 14C Dates | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | 1550 | 1600 | 1650 | 1700 | 1750 | 1800 | 1850 | 1900 | 1950 | 2000 | 2050 | 2100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Years Before Present | | | | | | | | | | | | | | | | | | | | | |
| H20 1234 56 | | 0.04 | 0.18 | 0.43 | 0.12 | 0.09 | 0.02 | | | | | | | | | | | | | | | |
| F55 1327 62 | | | 0.01 | 0.07 | 0.23 | 0.43 | 0.15 | 0.08 | 0.02 | | | | | | | | | | | | | |
| H17 1348 48 | | | | 0.01 | 0.09 | 0.38 | 0.14 | 0.12 | 0.02 | | | | | | | | | | | | | |
| H5 1367 44 | | | | | 0.03 | 0.23 | 0.38 | 0.17 | 0.04 | | | | | | | | | | | | | |
| H11 1372 41 | | | | | 0.01 | 0.18 | 0.49 | 0.19 | 0.04 | | | | | | | | | | | | | |
| H13 1423 74 | | | | 0.01 | 0.03 | 0.11 | 0.25 | 0.34 | 0.13 | 0.08 | 0.03 | 0.01 | | | | | | | | | | |
| H12 1427 81 | | | | 0.01 | 0.04 | 0.11 | 0.24 | 0.34 | 0.12 | 0.08 | 0.04 | 0.01 | | | | | | | | | | |
| H16 1441 82 | | | | 0.01 | 0.03 | 0.09 | 0.20 | 0.32 | 0.02 | 0.09 | 0.05 | 0.02 | 0.01 | | | | | | | | | |
| H4 1465 65 | | | | | | 0.02 | 0.10 | 0.28 | 0.24 | 0.13 | 0.07 | 0.02 | | | | | | | | | | |
| H10 1473 64 | | | | | | 0.01 | 0.08 | 0.25 | 0.38 | 0.14 | 0.08 | 0.02 | | | | | | | | | | |
| H6 1482 65 | | | | | | 0.01 | 0.06 | 0.21 | 0.40 | 0.12 | 0.09 | 0.03 | 0.01 | | | | | | | | | |
| H18 1606 78 | | | | | | | | 0.01 | 0.06 | 0.15 | 0.29 | 0.14 | 0.11 | 0.06 | 0.02 | 0.01 | | | | | | |
| H2 1612 73 | | | | | | | | 0.01 | 0.04 | 0.13 | 0.29 | 0.19 | 0.12 | 0.07 | 0.02 | 0.01 | | | | | | |
| F1 1753 132 | | | | | | | | 0.01 | 0.02 | 0.04 | 0.07 | 0.12 | 0.17 | 0.21 | 0.08 | 0.07 | 0.06 | 0.04 | 0.03 | 0.01 | 0.01 | |
| H15 1887 57 | | | | | | | | | | | | | | | 0.04 | 0.17 | 0.42 | 0.09 | 0.10 | 0.03 | | |
| F14 1942 56 | | | | | | | | | | | | | | | | 0.03 | 0.15 | 0.40 | 0.01 | 0.11 | 0.03 | |
| Probability | 0.00 | 0.04 | 0.19 | 0.53 | 0.57 | 1.65 | 2.06 | 2.32 | 1.52 | 0.97 | 1.00 | 0.55 | 0.41 | 0.34 | 0.16 | 0.28 | 0.62 | 0.53 | 0.13 | 0.14 | 0.04 | 0.00 |

Note: Shaded cells indicate which houses are potentially contemporaneous at 1350 years before present

Table 3.5

Comparison to a Fixed Age with a Reoccupation Interval of 50 Years

As a Test for Contemporaneity

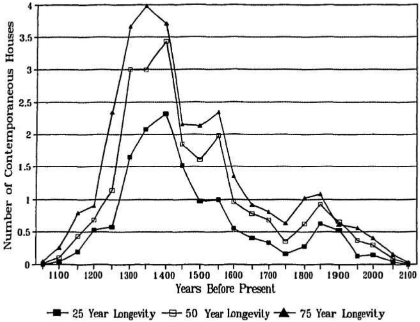
| Corrected 14C Dates | Years Before Present 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | 1550 | 1600 | 1650 | 1700 | 1750 | 1800 | 1850 | 1900 | 1950 | 2000 | 2050 | 2100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H20 1234 56 | 0.01 | 0.11 | 0.40 | 0.43 | 0.01 | 0.18 | 0.05 | 0.01 | | | | | | | | | | | | | | |
| F55 1327 62 | | | 0.03 | 0.36 | 0.47 | 0.35 | 0.11 | 0.16 | 0.05 | 0.01 | | | | | | | | | | | | |
| H17 1348 48 | | | | 0.03 | 0.25 | 0.88 | 0.27 | 0.23 | 0.06 | 0.01 | | | | | | | | | | | | |
| H5 1367 44 | | | | 0.01 | 0.11 | 0.53 | 0.30 | 0.22 | 0.10 | 0.01 | | | | | | | | | | | | |
| H11 1372 41 | | | | | 0.07 | 0.46 | 0.31 | 0.18 | 0.10 | 0.01 | | | | | | | | | | | | |
| H13 1423 74 | | | | 0.02 | 0.07 | 0.23 | 0.49 | 0.30 | 0.13 | 0.16 | 0.07 | 0.02 | | | | | | | | | | |
| H12 1427 81 | | | | 0.02 | 0.09 | 0.24 | 0.47 | 0.31 | 0.09 | 0.16 | 0.08 | 0.03 | 0.01 | | | | | | | | | |
| H16 1441 82 | | | | 0.02 | 0.06 | 0.19 | 0.40 | 0.45 | 0.08 | 0.19 | 0.10 | 0.04 | 0.01 | | | | | | | | | |
| H4 1465 65 | | | | | 0.01 | 0.06 | 0.24 | 0.56 | 0.27 | 0.20 | 0.14 | 0.04 | 0.01 | | | | | | | | | |
| H10 1473 64 | | | | | 0.01 | 0.04 | 0.19 | 0.50 | 0.32 | 0.15 | 0.15 | 0.05 | 0.01 | | | | | | | | | |
| H6 1482 65 | | | | | | 0.03 | 0.16 | 0.44 | 0.39 | 0.04 | 0.18 | 0.07 | 0.01 | | | | | | | | | |
| H18 1606 78 | | | | | | | 0.01 | 0.04 | 0.13 | 0.32 | 0.57 | 0.23 | 0.21 | 0.13 | 0.05 | 0.01 | | | | | | |
| H2 1612 73 | | | | | | | | 0.02 | 0.09 | 0.28 | 0.56 | 0.25 | 0.20 | 0.13 | 0.05 | 0.01 | | | | | | |
| F1 1753 132 | | | | | | | 0.01 | 0.02 | 0.04 | 0.08 | 0.14 | 0.23 | 0.33 | 0.41 | 0.15 | 0.14 | 0.12 | 0.08 | 0.05 | 0.03 | 0.01 | 0.01 |
| H15 1887 57 | | | | | | | | | | | | | | 0.01 | 0.10 | 0.38 | 0.47 | 0.04 | 0.19 | 0.06 | 0.01 | |
| F14 1942 56 | | | | | | | | | | | | | | | 0.01 | 0.08 | 0.34 | 0.54 | 0.13 | 0.21 | 0.07 | 0.01 |
| Probability | 0.01 | 0.11 | 0.44 | 0.89 | 1.14 | 3.00 | 3.30 | 3.43 | 1.85 | 1.61 | 1.99 | 0.95 | 0.79 | 0.68 | 0.36 | 0.63 | 0.92 | 0.66 | 0.37 | 0.29 | 0.09 | 0.02 |

Table 3.6

Comparison to a Fixed Age with a Reoccupation Interval of 75 Years As a Test for Contemporaneity

| Corrected | | | | | | | | Years Before Present | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14C Dates | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | 1550 | 1600 | 1650 | 1700 | 1750 | 1800 | 1850 | 1900 | 1950 | 2000 | 2050 | 2100 |
| H20 1234 56 | 0.04 | 0.24 | 0.87 | 0.30 | 0.10 | 0.26 | 0.09 | 0.02 | | | | | | | | | | | | | | |
| F55 1327 62 | | 0.01 | 0.08 | 0.32 | 0.73 | 0.30 | 0.01 | 0.25 | 0.09 | 0.02 | | | | | | | | | | | | |
| H17 1348 48 | | | 0.01 | 0.11 | 0.51 | 0.35 | 0.33 | 0.23 | 0.11 | 0.02 | | | | | | | | | | | | |
| H5 1367 44 | | | | 0.03 | 0.29 | 0.81 | 0.25 | 0.09 | 0.17 | 0.03 | | | | | | | | | | | | |
| H11 1372 41 | | | | 0.02 | 0.22 | 0.72 | 0.22 | 0.03 | 0.19 | 0.03 | | | | | | | | | | | | |
| H13 1423 74 | | | 0.01 | 0.04 | 0.15 | 0.39 | 0.69 | 0.30 | 0.04 | 0.24 | 0.11 | 0.03 | 0.01 | | | | | | | | | |
| H12 1427 81 | | | 0.01 | 0.05 | 0.16 | 0.39 | 0.69 | 0.30 | 0.00 | 0.24 | 0.13 | 0.05 | 0.01 | | | | | | | | | |
| H16 1441 82 | | | 0.01 | 0.04 | 0.12 | 0.32 | 0.60 | 0.38 | 0.17 | 0.24 | 0.16 | 0.07 | 0.02 | | | | | | | | | |
| H4 1465 65 | | | | | 0.03 | 0.14 | 0.42 | 0.59 | 0.30 | 0.12 | 0.21 | 0.07 | 0.02 | | | | | | | | | |
| H10 1473 64 | | | | | 0.02 | 0.10 | 0.38 | 0.71 | 0.30 | 0.04 | 0.24 | 0.09 | 0.02 | | | | | | | | | |
| H6 1482 65 | | | | | 0.01 | 0.08 | 0.30 | 0.68 | 0.31 | 0.07 | 0.26 | 0.11 | 0.03 | | | | | | | | | |
| H18 1606 78 | | | | | | | 0.02 | 0.08 | 0.23 | 0.51 | 0.48 | 0.30 | 0.18 | 0.19 | 0.08 | 0.02 | 0.01 | | | | | |
| H2 1612 73 | | | | | | | 0.01 | 0.05 | 0.19 | 0.46 | 0.54 | 0.30 | 0.15 | 0.20 | 0.08 | 0.02 | | | | | | |
| F1 1753 132 | | | | | | | 0.01 | 0.03 | 0.06 | 0.13 | 0.23 | 0.35 | 0.49 | 0.37 | 0.21 | 0.15 | 0.17 | 0.12 | 0.08 | 0.04 | 0.02 | 0.01 |
| H15 1887 57 | | | | | | | | | | | | | | 0.04 | 0.23 | 0.64 | 0.31 | 0.15 | 0.26 | 0.10 | 0.02 | |
| F14 1942 56 | | | | | | | | | | | | | | | 0.03 | 0.19 | 0.59 | 0.34 | 0.22 | 0.26 | 0.11 | 0.02 |
| Probability | 0.04 | 0.25 | 0.79 | 0.90 | 2.34 | 3.67 | 3.98 | 3.71 | 2.16 | 2.13 | 2.34 | 1.36 | 0.92 | 0.81 | 0.63 | 1.02 | 1.08 | 0.61 | 0.56 | 0.40 | 0.15 | 0.03 |

Figure 3.3
Number of Contemporaneous Houses




directly affected by the length of the reoccupation interval, intervals with values greater than 75 or less than 25 years would result in a corresponding increase or decrease of potential house contemporaneity. As such, it is reiterated that the intervals of 25, 50 and 75 years are simply employed for comparative purposes.

Based on this sample of 16 houses, there appears to have been an initial period of a slow and steady increase in the number of contemporaneous houses from about 2100 years B.P. until 1850 years B.P.. Followed by a slight decline at 1750 years. B.P., this period of relatively low contemporaneity is succeeded by a significant increase in the from 1750 to 1350 years B.P.. This period of increasing contemporaneity is marked by a short and somewhat stable period from about 1550 to 1450 years B.P.. The peak period of contemporaneity follows at about 1400 to 1350 years B.P.. Following this, the number of contemporaneous houses dramatically drops during the period between 1300 and 1200 years B.P. . By approximately 1050 years B.P., the site is no longer occupied.

D. Summary

Of the three tests for contemporaneity, the first two methods using *t*-tests provided evidence which suggested a high potential for house contemporaneity. While these methods were useful in determining whether or not the differences between radiocarbon dates were real or whether they were a matter of statistical error, they did not provide an accurate estimate of the actual number of contemporaneous houses. In this regard, the utility of the first two methods was limited to determining which houses were potentially contemporaneous.

The third method which accounted for house longevity, proved to be more useful in estimating actual numbers of potentially contemporaneous houses. However, while the first two methods yielded exaggerated results, it is important to note that all three methods indicated the same general trend over time, which noticed a significant increase in the use of

Phillip's Garden at about 1650 years B.P., and a comparable decrease at about 1300 years B.P..

Accounting for the fact that these analyses were conducted using only 16 of the 55 or more known houses, it would appear that for a period of about 300 years, Phillip's Garden may have had approximately six contemporaneous houses at any one time (assuming a 25 year reoccupation interval). While this amount of activity is already significant in terms of Palaeo-Eskimo populations, it stands in marked contrast to the overall decline in Dorset populations elsewhere at about the same period. More specifically, the population increase at Phillip's Garden between 1650 and 1350 years B.P. generally corresponds to the known period of Dorset decline from A.D. 200 to A.D. 500 (Maxwell 1985:212).

In addition to the tentative conclusions reached in this chapter regarding potential house contemporaneity, this temporal information is useful as a chronological guide from which to compare the spatial development of the site as a means to understanding the use of Phillip's Garden over time, and at any point in time. In the following chapters, the location and clustering of houses; the significance of superpositioning between structures; changes in house design over time; and, the frequency and distribution of artefacts will be assessed in conjunction with the temporal data generated from these tests for contemporaneity.

# Chapter 4
# The Spatial Characteristics of Phillip's Garden

The purpose of this chapter is to examine the spatial characteristics of house location at Phillip's Garden as a means of understanding site use over time. This is accomplished by making a comparison of the location of archaeological features to the temporal information pertaining to house contemporaneity. This analysis includes a description of the site, and an appraisal of the horizontal and vertical relationships of the fully and partially excavated houses, the excavated middens, and the unexcavated house depressions. More specifically, I intend to (a) identify spatial patterns and assess their meaning, (b) compare the spatial organization of the site to the temporal data provided by radiocarbon dating, and (c) make inferences regarding the chronological development of the site.

This strategy is based on the assumption that the development of Phillip's Garden was not a random process, since people tend to organize their space and activity areas in somewhat predictable and patterned ways (Binford 1978; Ferring 1984; Oetelaar 1993; Portnoy 1981). In an effort to understand the organization of living space, and the archaeological patterns which they produce, ethnoarchaeology has demonstrated that there are both functional and symbolic reasons for such organization (Binford 1978; Hodder 1987; Wandsnider 1992).

From a functional perspective, the location of houses at Phillip's Garden may have been influenced by an availability of building materials and a proximity to other natural resources. For example, a conveniently located quantity of paving stones, or a supply of sod, may have been important considerations in the building or rebuilding of a Dorset semi-subterranean house. This may have be particularly true if there was a desire or a need to minimize the expenditure of energy in the procurement and transportation of such materials.

Likewise, the positioning of houses may also have been related to site activities such as hunting and processing. In this respect, it is possible that some of the structures at Phillip's Garden may have been used for non-residential purposes, and were arranged according to the requirements of such activities. For example, the significance of house location relative to the shoreline may have been different according to the relationship between tasks and the seasonal availability of open water.

Another factor which may have influenced the positioning of houses is the planned or expected duration of residence, and the avoidance of refuse from previous occupations. For example, studies of refuse accumulation and disposal in Mayan villages have demonstrated that there may be a correlation between occupation length and the distance between residential areas and the location of refuse heaps (Hayden and Cannon 1983). In other words, if the residents of Phillip's Garden planned to stay awhile, they may have preferred to locate their garbage heaps away from their homes. In this regard, the study of the quantity and location of refuse material relative to living areas, could also provide clues as to the types and lengths of occupation at Phillip's Garden.

Alternatively, less permanent structures may have been quickly abandoned when amounts of refuse within close proximity to the dwelling became intolerable. Likewise, the abandonment of more permanent houses may have occurred at a time when structures were no longer serviceable, and when the building of a new dwelling was more practical.

Topographic conditions and natural features, including vegetation, drainage and the proximity of the site to both the sea and fresh water, may have been other factors influencing the location of houses in the development of Phillip's Garden. While it is arguable that the Dorset settlement of Phillip's Garden can largely be attributed to the availability of abundant marine resources in the area, considerations relating to its geographical setting may have been important. Set on a peninsula which extends into the Gulf of St. Lawrence, the location and physiography of this large flat expanse offers access to both the sea and shore.

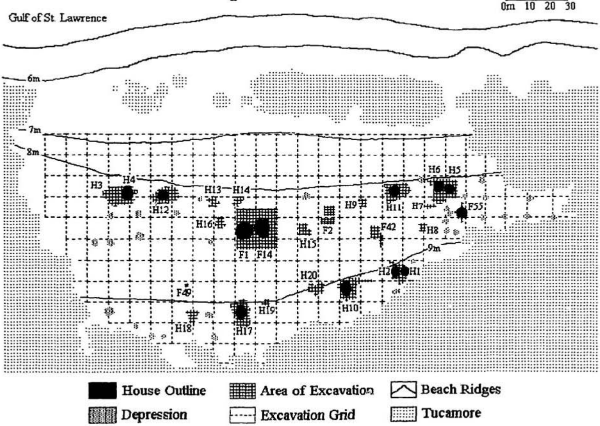
The splendid view of the sea from this site may have been both functionally and aesthetically appealing, making Phillip's Garden an inviting place for Palaeo-Eskimo life.

Culturally, the location of houses may have been influenced by rules of social behaviour and the relationships between the occupants of the site. More specifically, the relatedness of the occupants may have been a factor which determined the proximity of their dwellings. Other matters such as kinship patterns, the sexual division of space, and conventions regarding the "ownership" of existing dwellings and their subsequent reoccupation could have also influenced the development of the site. If the Dorset peoples possessed the concept of personal, familial or ancestral ownership, the reoccupation of dwellings could have resulted in the development of family-occupied areas within the site. Likewise, friendships, or the lack thereof, could have influenced the location of residences, lengths of stay and times of occupation.

**A. Site Characteristics**

At the two hectare site of Phillip's Garden, there has been full or partial excavation of 23 houses, two large refuse middens, an outdoor hearth, and a number of other smaller middens. There are also 30 unexcavated depressions which could contain as many additional archaeological features. As illustrated by Figure 4.1, all of these features

## Figure 4.1
## Phillip's Garden Site Plan



are located atop two of three raised beach terraces which span the site in an east west direction. The difference in elevation between each terrace is about one metre. Seven of the 23 excavated houses, and eight of the unexcavated house depressions are located along the upper terrace which is nine metres above sea level. The remaining 15 excavated houses, the three middens, and 22 of the unexcavated house depressions are located along the lower beach ridge at about eight metres above sea level.

**B. Cluster Analysis**

While an appreciation for spatial relationships can be gained through the casual inspection of a site map, this "eyeball method" lacks the means from which to make standardized observations and comparisons. Consequently, a replicative method of analysis has been employed to define pairs and clusters of archaeological features. To this end, a nearest neighbour analysis (Carr 1984; Whallon 1974) was used to measure the horizontal relationships between the archaeological features.

Operationally, this analysis involves the measurement of the nearest distance between every feature at the site. However, since the full dimensions of every house and midden are both unknown and variable, measurements could not be taken from the edges of every feature. Consequently, feature size was approximated to facilitate the calculation of these distances. By comparing the size of the known houses, the average feature was estimated to have a radius of approximately 3.75 metres. In accordance with this estimate, nearest neighbour distances were then calculated for every known feature.

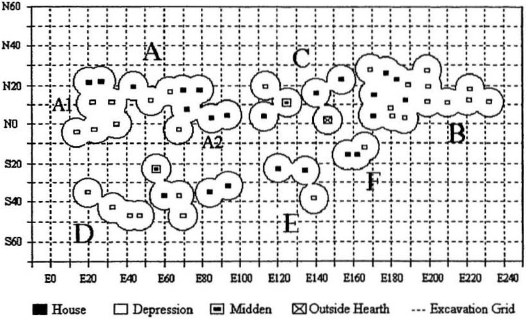
Assuming a normal distribution of measurements, the mean ($\mu$) and the standard deviation ($\sigma$) of the nearest neighbour (NN) distances are calculated. These figures are then used to determine the "cut-off" distance (D), at 1.65 standard deviations above the mean (Carr 1984:181). This is achieved as follows:

$$D_{1.65} = 1.65 \times \sigma + NN\mu$$

In accordance with this equation, the cut-off distance (D), is expected to be greater than 95% of all the measured nearest neighbour distances. The limits of clustering are then identified by drawing circles (with radii equal to this value) around every house, midden and feature. Where the circles meet or overlap, a cluster is identified.

Based on the foregoing methodology, the mean nearest neighbour distance for houses, middens, and depressions was calculated to be 2.04 metres, with a standard deviation of 3.31. At 1.65 standard deviations above the mean, the "cut-off" distance was calculated to 7.5 metres. Circles with radii of 7.5 metres were then drawn around every feature. The results of this analysis are illustrated in Figure 4.2.

# Figure 4.2
## Phillip's Garden Cluster Analysis



As indicated in this figure, there are six clusters of houses. The largest two clusters, which are labelled "A" and "B", are situated at opposite ends of the site. They consist of sixteen and seventeen features respectively. Combined, these clusters account for approximately 62 percent of the 55 identified and potential archaeological features. Cluster "A" can also be subdivided into sub-clusters; labelled "$A_1$" and "$A_2$". Sub-cluster "$A_1$" contains seven features, and "$A_2$" has nine features. The remaining four clusters (labelled "C" through "F") contain ten or less features.

From these six clusters, three general patterns emerge. From E10 to E160, there are two rows of features which are situated in an east-west linear arrangement. The northernmost of these rows is comprised of clusters "A" and "C"; the southern row of clusters "D", "E" and "F". These two rows are separated in the north-south direction by a distance of about 20 metres. In the central area of the site, from E100 to E160, there is a secondary pattern which is composed of clusters "C","E" and "F". This arrangement of houses consists of four sets of triplets, and is characterized as the area of the site which has the fewest house features. In the easternmost portion of the site, from E160 to E240, cluster "B" is composed of a single dense conglomeration of houses and depressions. In all cases, every house, depression and midden is within the 7.5 metre "cut-off" radius with at least one other feature. This simply means that there is no single house, midden or feature which stands alone.

To test whether there is anything meaningful about these clusters, a comparison of radiocarbon results for each feature was made. These results are summarized in Table 4.1. In accordance with the Pair-Wise results from Chapter 3, there is potential for contemporaneity between features in three of the six clusters.

All of the houses in cluster "A", except for Feature 14 are potentially contemporaneous. However, there is some uncertainty regarding Feature 1, given the 132 year range of error within the radiocarbon result. Accordingly, Feature 1 could have been contemporaneous with any of the houses in this cluster. Very similar radiocarbon dates from within cluster "B" indicate that all of the houses were potentially contemporaneous. In cluster "C", House 11 does not appear to have been contemporaneous with either House 15 or midden Feature 2. However, as House 11 is located in close proximity to cluster "B", it is possible that it was contemporaneous with these more recent houses. While none of the houses within clusters "D" or "E" appear to have been potentially contemporaneous, this may be a result of the lack of radiocarbon results which are provided. As such, additional dates are required if contemporaneity is to be assessed. The lack of comparable radiocarbon dates in cluster "F" also

Table 4.1
Temporal Comparison of Clusters

| Cluster | Description of Feature | $^{14}C$ Date |
|---|---|---|
| A | House 3 | n/a |
| | House 4 | 1465±65 |
| | House 12 | 1427±81 |
| | House 13 | 1423±74 |
| | House 14 | n/a |
| | House 16 | 1441±82 |
| | House Feature 1 | 1753±132 |
| | House Feature 14 | 1942±56 |
| B | House 5 | 1367±44 |
| | House 6 | 1482±65 |
| | House 7 | n/a |
| | House 8 | n/a |
| | Feature 55 | 1327±62 |
| C | House 9 | n/a |
| | House 11 | 1371±41 |
| | House 15 | 1887±57 |
| | Feature 2 | 1830±102 |
| | Feature 42 | n/a |
| D | House 17 | 1348±48 |
| | House 18 | 1606±78 |
| | House 19 | n/a |
| E | House 10 | 1473±64 |
| | House 20 | 1234±56 |
| F | House 1 | n/a |
| | House 2 | 1612±73 |

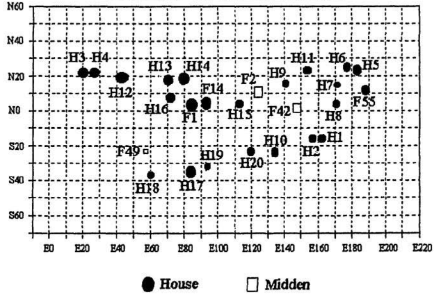
Note: All radiocarbon dates are calibrated using the intercept method at one sigma, Stuiver and Reimer (1993).

makes such an assessment impossible.

From this cursory comparison of radiocarbon results and house location, it appears that the clusters generally tend to contain features which are similar in age. Accordingly, the age of other features within the clusters may be predictable. It is concluded that houses which are clustered are more likely to be contemporaneous than houses which are not. This proposal is tested by comparing: (a) the houses and features by pairs, (b) the actual probability for potential contemporaneity, and (c) the relative position of the pairs.

The results of this comparison are summarized in Table 4.2. Column one of this table, identifies the pair of archaeological features which is being compared. While every possible combination of features is examined, only those which have been excavated are included for comparison. To facilitate this comparison, the location of the relevant features are provided in Figure 4.3.

Figure 4.3
Location of Paired Houses



Column two contains the Pair-Wise test results from the previous chapter. These values are suggestive of the statistical probability that the pair of features were contemporaneous. It is noted that smaller results are representative of a greater probability for contemporaneity. Pair-Wise values over 1.96 are not considered contemporaneous.

Column three is an indicator of the horizontal proximity of the houses. It indicates whether or not the pair of houses are situated within the nearest neighbour "cut-off" distance of 7.5 metres. For convenience, a nearest neighbour pairing is defined as a pair of features which is within 7.5 metres of one another.

Column four indicates the relative position of the pairs as being either north/south or east/west. A north/south orientation is defined when the east/west distance between a pair of houses is less than the north/south distance. Conversely, an east/west position is defined when the north/south distance is less than the east/west distance.

In view of the initial analysis, it appeared that the clusters generally contain features which are similar in age. As such, it was proposed that houses which are in close proximity have a high probability of being contemporaneous. To further test this assumption, the nearest neighbour results were compared to the Pair-Wise test results.

Table 4.2
Paired Comparison of Houses Within Clusters

| Cluster | Pair Compared | Pair-Wise Result | Nearest Neighbour | Relative Position |
|---|---|---|---|---|
| A1 | H3 & H4 | n/a | Yes | E/W |
| | H3 & H12 | n/a | No | E/W |
| | H4 & H12 | 0.52 | No | E/W |
| A2 | H13 & H14 | n/a | Yes | E/W |
| | H13 & H16 | 0.09 | Yes | N/S |
| | H13 & F1 | 2.1 | No | N/S |
| | H13 & F14 | 8.0 | No | E/W |
| | H14 & H16 | n/a | Yes | N/S |
| | H14 & F1 | n/a | No | N/S |
| | H14 & F14 | n/a | No | N/S |
| | H16 & F1 | 1.69 | Yes | E/W |
| | H16 & F14 | 5.31 | No | E/W |
| | F14 & F1 | 1.85 | Yes | E/W |
| B | H5 & H6 | 1.20 | Yes | E/W |
| | H5 & H7 | n/a | Yes | E/W |
| | H5 & H8 | n/a | No | N/S |
| | H5 & F55 | 0.76 | Yes | N/S |
| | H6 & H7 | n/a | Yes | N/S |
| | H6 & H8 | n/a | No | N/S |
| | H6 & F55 | 1.69 | No | N/S |
| | H7 & H8 | n/a | Yes | N/S |
| | H7 & F55 | n/a | No | E/W |
| | H8 & F55 | n/a | No | E/W |
| C | H9 & H11 | n/a | Yes | E/W |
| | H9 & H15 | n/a | No | E/W |
| | H9 & F2 | n/a | No | E/W |
| | H9 & F42 | n/a | Yes | N/S |
| | H11 & H15 | 7.11 | No | E/W |
| | H11 & F2 | 3.61 | No | E/W |
| | H11 & F42 | n/a | No | N/S |
| | H15 & F2 | 0.87 | Yes | E/W |
| | H15 & F42 | n/a | No | E/W |
| | F2 & F42 | n/a | No | E/W |
| D | H17 & H18 | 2.49 | No | E/W |
| | H17 & H19 | n/a | Yes | E/W |
| | H17 & F49 | 3.47 | No | E/W |
| | H18 & H19 | n/a | No | E/W |
| | H18 & F49 | 1.37 | Yes | N/S |
| | H19 & F49 | n/a | No | E/W |
| E | H10 & H20 | 2.72 | Yes | E/W |
| F | H1 & H2 | n/a | Yes | E/W |

Note: Smaller results equal a greater probability for contemporaneity. Values over 1.96 are not considered contemporaneous.

From Table 4.2, it can be observed that there are eight pairs of features which: 1) have Pair-Wise test results, and 2) are nearest neighbours. It is notable that seven of these eight pairings are considered potentially contemporaneous, since their Pair-Wise results are less than 1.96. The only exception is a pair of houses from cluster "E" (H10 & H20), which has a non-contemporaneous result of 2.72.

Furthermore, there are nine pairings of features which: 1) have Pair-Wise results, and 2) are not nearest neighbours. Of these nine pairings, seven are considered not to be potentially contemporaneous, since they have Pair-Wise test results which are greater than 1.96. The only exceptions are H4 & H12, and H6 & F55, which have potentially Pair-Wise test results of 0.52 and 1.69, respectively. From these comparisons of nearest neighbours, it is concluded that features which are situated within close proximity to one another are more likely to be contemporaneous than houses which are spatially separated.

As the majority of houses at Phillip's Garden are oriented in an east/west direction, parallel to the sea, it is proposed that a north/south orientation of houses is a result of succeeding, and thus non-contemporaneous occupations. To test this assertion, the relative positioning of the features was also compared to the Pair-Wise results.

From Table 4.2, it is also determined that there are twelve pairs of features which: 1) have Pair-Wise test results, and 2) are situated in an east/west position. From these twelve pairings, only five are potentially contemporaneous, since they have Pair-Wise results less of than 1.96. In addition, there are five pairings which: 1) have Pair-Wise test results, and 2) have a north/south orientation. Of these five pairs, four are potentially contemporaneous.

As there are a greater number of contemporaneous features which are oriented north/south than east/west, it would appear that the relative position of houses in this manner is not patterned in any recognizable way. Although, if the positioning of houses is considered in concert with the nearest neighbour results, a somewhat different picture emerges.

Of the five pairs of features which: 1) have Pair-Wise results, 2) are situated in an east/west position, and 3) are nearest neighbours, four pairs (H16 & F1, H14 & F1, H5 & H6, H15 & F2) are potentially contemporaneous and only one pair (H10 & H20) is not. Furthermore, there are three pairings of features which: 1) have Pair-Wise results, 2) are situated in a north/south position and 3) are nearest neighbours. All three of these pairings (H13 & H16, H5 & F55 and H18 & F49) are potentially contemporaneous.

Although there appears to be a strong east/west linear arrangement of dwellings and features at Phillip's Garden, this pattern is derived without reference to time. As such, this analysis suggests that the spatial patterns we see today are not the result of occupations which were based solely on an east/west evolution of houses and features. Rather, this spatial analysis suggests that the arrangement of houses at Phillip's Garden resulted from occupations which differed in organization, size, duration and purpose. Like the palimpsest effect used to describe the formation of artefact assemblages, the present configuration of Phillip's Garden appears to be a product of a wide range of activities.

**C. Beach Ridge Associations**

As a further method of testing the east/west relationship of the houses and features at Phillip's Garden, an examination of the location of houses is undertaken relative to their position along the ancient raised beaches of the site. As can be seen by evidence of the exposed beach ridges, which are illustrated in Figure 4.1, this area has been affected by post-glacial isostatic rebound. Consequently, it can be expected that earlier houses should be located along higher ridges, and that later dwellings should be situated along lower ridges (Harp 1976). While contemporaneity can not be inferred from the positioning of archaeological remains atop these beach ridges, it can provide additional means from which to scrutinize radiocarbon results, and to explore the spatial and chronological development of the site.

Of the seven excavated houses situated on the upper terrace, calibrated $^{14}C$ dates have been provided for five. As highlighted in Table 4.3, these dates range from 1234±56 (House 20) to 1612±73 (House 2) years B.P.. The average calibrated date for the five houses is 1454±50 years B.P..

**Table 4.3**
**Comparison of Beach Ridge Location to 14C Results**

| $^{14}C$ Date[3] | Description | Elevation | Ranking |
|---|---|---|---|
| **1234±56** | **House 20** | **9 metres** | **1** |
| 1327±62 | Feature 55 | 8 metres | 2 |
| **1348±48** | **House 17** | **9 metres** | **3** |
| 1367±44 | House 5 | 8 metres | 4 |
| 1372±41 | House 11 | 8 metres | 5 |
| 1423±74 | House 13 | 8 metres | 6 |
| 1427±81 | House 12 | 8 metres | 7 |
| 1441±82 | House 16 | 8 metres | 8 |
| 1465±65 | House 4 | 8 metres | 9 |
| **1473±64** | **House 10** | **9 metres** | **10** |
| 1482±65 | House 6 | 8 metres | 11 |
| **1606±78** | **House 18** | **9 metres** | **12** |
| **1612±73** | **House 2** | **9 metres** | **13** |
| 1753±132 | Feature 1 | 8 metres | 14 |
| 1818±108 | Feature 49 | 8 metres | 15 |
| 1830±102 | Feature 2 | 8 metres | 16 |
| 1887±57 | House 15 | 8 metres | 17 |
| 1942±56 | Feature 14 | 8 metres | 18 |

[3]All radiocarbon dates are calibrated using intercept method at one sigma, Stuiver & Reimer (1993).

Of the 19 excavated houses and middens on the lower terrace, calibrated $^{14}C$ dates have been provided for eleven houses and two middens. These dates range from 1327±55 years B.P. (Feature 55) to 1942±56 years B.P. (Feature 14) with an average calibrated date of 1533±10 years B.P.. From these results, there appears to be little correlation between the position of houses and their elevation. This is consistent with Harp's original findings (1976:120), as he concluded that the ages of the houses were not consistent with their position atop the ancient beach ridges. In fact, as Table 4.3 indicates, the five oldest radiocarbon dates are from the lower terrace, and three of the ten most recent dates are from the upper terrace.

Theoretically, this lack of correlation between expected dates and elevations could be a result of inaccurate radiocarbon results. For example, it is possible that the latest dates for Houses 17 and 20 are erroneous, owing to the fact that they were based only on single samples. In addition, an earlier date of 1619±74 years B.P. was provided for House 10, although this older date was derived from a sample which may have may have been contaminated by the presence of rootlets (Harp n.d.).

Four of the five earlier dates from the lower terrace can also be explained as a consequence of potential dating error. For example, house Feature 1 has a very wide range of error, consisting of 132 years. It also has a conflicting and much later date 1166±99 from a layer situated lower than the sample from which the earlier date was acquired. Although midden Feature 49 is situated on the lower terrace, it could have easily been used by people living on the upper terrace, since it is less than 10 metres north of the 9 metre ridge. The radiocarbon date for Feature 49 also has a wide range of error (108 years), which could make it considerably younger than its stated mean. A similar explanation can be given for midden Feature 2, as it has a 102 year range of error, and could have been used by the occupants of the upper terrace. The radiocarbon date for House 15 is also questionable, since it was derived solely from a fat-based sample. The very early uncorrected date associated with this house, of 2294±51 years B.P., is approximately 200 years earlier than all other uncorrected dates. Although the corrected $^{14}C$ date of 1887±57 years B.P. is not unacceptable in view of the other corrected dates, the accuracy is suspect.

However, of the five earliest dates, the result for house Feature 14 seems the most reliable, since it was derived from more than one charcoal-based sample. Moreover, the dates from Feature 14 had smaller amounts of error, than did the others. As such, it can be argued that early dates from Feature 14 provide the best evidence that isostatic rebound may not have been a factor in the development of Phillip's Garden.

If $^{14}C$ dates are generally correct, and isostatic rebound was not important in the development of the site, it is likely that both terraces were habitable throughout the entire occupation of the site. As such, this result is consistent with the previous cluster analysis which indicated that a north/south orientation of contemporaneous houses was a realistic probability. As such, the location of houses and features may have been related to other factors, such as the need to be in proximity to the shore during ice-free periods. More specifically, summer houses may be situated closer to the shore for convenience, while the location of winter houses could have been more variable (Hood pers. comm.). This possible explanation is further investigated in Chapter 5.

D. Stratigraphy

A comparison of the superpositioning of archaeological remains is another spatial method of exploring the temporal relationships between the houses at Phillip's Garden. Separate periods of occupation can be recognized where there is clear evidence of superpositioning between houses. In addition, the composition and the relative thickness of the cultural layers can also be used to assess the nature and duration of the occupation. Combined, these methods are a means of assessing temporal relationships. In particular, the assessment of the stratigraphic relationships between nearest neighbours can be used to facilitate an understanding of the temporal relationship between features which have been identified as nearest neighbours, and which are potentially contemporaneous.

By comparing the stratigraphy from the various excavations at Phillip's Garden, a standard soil profile has been recognized (Harp 1964; Renouf 1985). As indicated in Figure 4.4, the soil profile for Phillip's Garden is relatively simple. It consists of one main cultural layer, situated between the sod layer and the sterile subsoil. More specifically, both Harp (1964) and Renouf (1985) report that level 2 is comprised of a greasy dark stained soil which contains the majority of the recovered cultural material. More precise divisions of the main cultural layer (level 2) have not yet been achieved, owing to the homogeneous nature of the soil profile. Level 2A is a faunal-associated lens with sandier, fattier and less compact soil. Level 3 is situated just above the sterile sand and limestone beach cobble, and is comprised of clay-like material which contains small amounts of well-preserved faunal remains. The formation of this level is considered a natural process, which resulted from the reaction of the acidic humus with the basic limestone (Renouf pers. comm.).

Since hundreds of years of occupation are sometimes condensed into this cultural layer, which is only a few centimetres thick, a clear understanding of superpositioning

Figure 4.4
Phillip's Garden
Standard Soil Profile

Level 1 Sod Layer of Grass and Peat
Level 2 Brown to Black Cultural Layer
Level 2A Faunal Associated Lense
Level 3 Mottled Grey or Light Brown Clay
Level 4 Sterile Sand and Gravel

(Adapted from Renouf 1986)

is often problematic. Although stratigraphic profiles have been prepared for portions of all of the excavated houses and middens, the value of this method is also limited to areas where excavations between adjacent houses has overlapped. In this regard, there are only four pairs of houses at Phillip's Garden where the stratigraphic relationship can be assessed. These include the combination of Houses 1 and 2, Houses 3 and 4, Houses 5 and 6, and house Features 1 and 14.

While the actual contemporaneity cannot be determined through this comparison, stratigraphic evidence can be used to reject a case for simultaneous occupation. As such, the results of the Pair-Wise testing, which indicated potential contemporaneity between Houses 5 and 6, and between Features 1 and 14, can be further assessed. Where Pair-Wise results were not available, such as for Houses 1 and 2, and Houses 3 and 4, this analysis can indicate if there is any possibility for contemporaneity.

Much of House 1, and part of House 2 were excavated by way of trenches in 1949 and 1950. More extensive excavations were undertaken by Harp in 1961 and 1962. During these later field seasons, the area between the two houses was fully excavated. According to Harp's 1961 field notes, a midden or fire pit consisting of a solid mass of earth, sand, charcoal, and many burned, unburned and calcified bones, flakes and artefacts was discovered on the eastern edge of House 2 in excavation area R1-47. (See Appendix 6 for a description of

Harp's excavation Grid System). Located over top of this midden was a ridge of rocks which appeared to be associated with House 1. As such, Harp noted in his field notes that House 1 must have been occupied subsequent to House 2. Since there is no $^{14}C$ date for House 1, this temporal relationship is particularly useful in furthering the chronology of the site.

The stratigraphic relationship between Houses 3 and 4 is not clear, as an area between these houses was not excavated. However, in a portion which was excavated (Z4-12), an amount of burnt and calcified bone was found to be overlying several lenses of wood charcoal and fire cracked rock. About this feature, Harp noted in his 1963 field notes that it had the "general appearance of a midden". However, it could also be argued that the lower charcoal level and the fire cracked rock of this feature, may be the remnants of an external hearth. This interpretation is supported by evidence of a circular rock pattern which was found to be situated at the base of the cultural layer. In addition to many artefacts, a large number flakes were also associated with this feature. To determine the most probable context of these artefacts, a closer examination of the nature of this assemblage is required. While there is no stratigraphic evidence suggesting that this midden and/or hearth was associated with either of the houses, a radiocarbon date based on the charcoal for this feature may be useful in determining such an association.

Excavations between Houses 5 and 6 have produced stratigraphic evidence which negates the Pair-Wise test result of 1.20 for this pairing, which indicated that the houses may have been contemporaneous. More specifically, Harp's 1961 field notes indicated that within square A1-24, the floor of House 5 overlies a possible hearth which was associated with House 6.

In addition, an external hearth feature, situated between Houses 5 and 6, was also noted by Harp in his 1961 field notes. Located in an adjacent square (A1-25), along the ridge which separates these two houses, a 2.5 centimetre thick layer of blackened earth and ash was found between the underlying sterile beach, and a 10 to 15 centimetre thick cultural layer. Harp noted that this "definitely suggests a secondary occupation" (Harp n.d.), and as such provides additional evidence for warm weather occupation.

The stratigraphic relationship between Features 1 and 14 was assessed by Renouf (1987:7). She indicated that the walls from both structures appear to be independent of one another. The fact that the houses are physically separated, but are closely aligned in an east/west orientation, suggests that they could have been simultaneously occupied, as the Pair-Wise test indicated.

The stratigraphic association between middens is another source of information which can be used to understand the chronological development of the site. In this regard, there is evidence from Feature 2 which suggests that a house structure may have been buried beneath this midden. Specifically, Renouf (1987:27) noted that the depth of the cultural layer increased from 9.5 centimetres at E122 N14, to 24.5 centimetres at E122 N11, without any change in surface elevation. (See Appendix 7 for a description of Renouf's excavation Grid System). This downward slope of the underlying layer marks the central depression of a house. At the bottom of this depression Renouf (1986:21) also located a pit feature which was probably associated with this earlier house.

Other buried house features are also suspected beneath midden Features 49 and 73 (Renouf 1991:44, 1993:54). Feature 49 is a large midden located at E050 S021. A calibrated $^{14}C$ date of 1818±108 has been furnished from an amalgamation of nine charcoal samples taken from Level 2A. As such, a house feature situated below would be older still. Feature 73 is located to the west of house Feature 55. This midden ranges from 1 to 10 centimetres in depth, and like the previously described midden features, is suspected of being located in an abandoned house depression. If so, such a house would predate both house Feature 55 and midden Feature 73, which have corrected radiocarbon dates of 1327±62 and 1259±75 years B.P. respectively.

Based upon test pit programs for 1984 and 1991, four other potential house features and four midden deposits were identified (Renouf 1985, 1992). More specifically, a large quantity of broken faunal material and charcoal was located in area 7A250A[1], which suggested that this material belonged to a midden. A test pit at 7A258C revealed two well-defined midden deposits in an area where there are no visible house depressions, suggesting possible infilling. An abundant amount of faunal material, upright stones and compact soil found at 7A349 was interpreted as a possible midden and house feature. At 7A367B, flat laying rocks situated in a curved configuration, with soapstone bowl fragments in association, were regarded as evidence for a house feature. Slab-like stones at 7A376D which were in proximity to a house depression suggest that this area was also the interior of a house feature.

These features revealed during the testing programs demonstrate that much of Phillip's Garden contains cultural remains which are not visible from the surface. Given that middens are generally not detectable as surface features, they must have been deposited in either natural or cultural depressions. Since only a few of the areas outside of the obvious house depressions have been excavated, the full extent of the Phillip's Garden is unknown. As such, it can be expected that much of the early evidence for occupation remains buried beneath the midden material of more recent

[1]Note: 7A250A refers to an excavation square in the Parks Canada Provenience system. This provenience system is used in conjunction with Renouf's survey grid. For further explanation, see Appendix 7.

houses. Likewise, many of the unfilled house depressions are probably representative of later occupations. Prior to Renouf's excavations, much of the archaeological evidence was based on these more obvious house features. Consequently, any interpretation about the chronological development of the site that is based only upon the fully excavated houses, is surely distorted due to the similar nature of most of these features.

Despite the lack of intelligible stratigraphic relationships for the majority of houses, it can be expected that the relative thickness and make-up of cultural layers within the houses is related to the nature and duration of the occupation. It also expected that the depth and composition of this cultural material may vary according to the amount of house cleaning which occurred during and/or between occupations.

As a means to facilitate an understanding of house duration and function, a comparison of the accumulation of cultural material was conducted. Since the depth of the cultural layers can vary significantly in different areas of a house, measurements were made only from the central floor area. The results of this exercise are summarized in Table 4.4. As indicated by this summary, the depth of the cultural layers ranges from 2.5 to 30.5 centimetres, and the average thickness ranges between 7.5 and 20.4 centimetres. This information was sorted by summing the depth range for each

**Table 4.4**
**Depth Comparison of Cultural Layers**

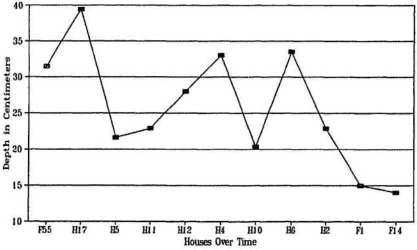
| House | Cultural Layer Depth (in cm) | | Location of Samples | Extent and Area of Excavations (in m²) | |
|---|---|---|---|---|---|
| F42 | 2.0 - 10.0 | (12.0) | 7A341, 7A349 | full | 24.0 |
| F14 | 4.0 - 10.0 | (14.0) | 7A294A&D | full | 83.0 |
| F1 | 5.0 - 10.0 | (15.0) | 7A284D | full | 85.0 |
| H19 | 8.9 - 10.2 | (19.1) | J3-51 | partial | 11.6 |
| H10 | 2.5 - 17.8 | (20.3) | H2-48, K2-50 | full | 95.2 |
| H16 | 7.6 - 12.7 | (20.3) | S3-28 | partial | 16.3 |
| H1 | 5.1 - 15.2 | (20.3) | 1949 Trench | partial | 38.3 |
| H5 | 5.1 - 16.5 | (21.6) | Y-25, Z-24 | full | 32.5 |
| H2 | 5.1 - 17.8 | (22.9) | S1-49, T1-49 | full | 88.2 |
| H11 | 5.1 - 17.8 | (22.9) | R1-25, S1-22 | full | 85.9 |
| H18 | 7.6 - 20.3 | (27.9) | E4-51, E4-53 | partial | 20.9 |
| H8 | 7.6 - 20.3 | (27.9) | H1-34, H1-36 | partial | 11.6 |
| H12 | 5.1 - 22.9 | (28.0) | K4-17, M4-17 | full | 48.8 |
| H14 | 5.1 - 25.4 | (30.5) | O3-20 | partial | 16.3 |
| H9 | 5.1 - 25.4 | (30.5) | A2-26, B2-25 | partial | 11.6 |
| F55 | 10.5 - 21.0 | (31.5) | 7A368C | full | 61.0 |
| H4 | 7.6 - 25.4 | (33.0) | W4-14, W4-15 | full | 84.8 |
| H7 | 12.7 - 20.3 | (33.0) | F1-28, G1-29 | partial | 9.3 |
| H6 | 7.6 - 27.9 | (35.5) | B1-26, C1-25 | full | 69.7 |
| H3 | 12.7 - 25.4 | (38.1) | B5-13 | partial | 11.6 |
| H15 | 7.6 - 30.5 | (38.1) | T2-31, U2-34 | partial | 18.6 |
| H17 | 14.0 - 25.4 | (39.4) | P3-54 | full | 91.7 |
| H13 | 12.7 - 30.5 | (43.2) | V3-21, V3-22 | partial | 13.9 |
| H20 | 12.7 - 30.5 | (43.2) | R2-51 | partial | 18.6 |

Sources: (Harp n.d., 1964; Renouf 1986, 1987, 1988, 1992, 1993)

house. These results are bracketed in the second column of Table 4.4. The thinnest layer of occupation, ranges from 2 to 10 (12) centimetres, is represented by Feature 42, which was identified as an external hearth (Renouf 1993). The thickest cultural layers, ranging from 12.7 to 30.5 (43.2) centimetres were excavated in Houses 13 and 20.

In view of the likelihood that some houses were cleaned prior to, or during reoccupation, there may a relationship between the amount of refuse and the relative permanence of the house. That is, houses which were reoccupied or intended for reoccupation, may have been subject to greater house cleaning activities than those which were not. As such, the depth of the cultural material may not consistently reflect the intensity of the occupation or the number of times the house was reoccupied. Consequently, less permanent structures which were not intended for reoccupation, may have greater depths of cultural material than houses which were reoccupied. This premise is further examined by comparing the depths of the cultural material from the fully excavated houses over time. As indicated in Figure 4.5, there appears to be an increase over time toward deeper cultural deposits. In the more permanent houses, this may reflect less house cleaning, and in less permanent houses, deep deposits may reflect a greater intensity of a single occupation.

Figure 4.5
Depth of Cultural Layers Over Time



## E. Summary

Although there are numerous ways to spatially sort and group the features of Phillip's Garden, it is difficult to know whether these relationships are meaningful. While it is proposed that the exploration of spatial characteristics can be used to understand site development, little can be inferred directly from this analysis alone. However, used in conjunction with temporal information, it is possible to estimate which spatial relationships are more or less meaningful. As such, temporal relationships were tested, while others were established where no radiocarbon dates were available.

Furthermore, it has been demonstrated that: (1) the occupation of houses was not based solely upon a linear east/west arrangement; (2) the whole of the site was accessible for occupation during the entire occupation of the site; (3) houses which were spatially related are more likely to have been temporally related than houses which were spatially unrelated; (4) the depth of cultural deposits is not solely a function of intensity of use, but may also be a function of intended reoccupation.

These findings are further examined in the following chapter by way of a comparison of the orientation and the physical characteristics of the houses, with particular attention to the issue of house permanency, and how it relates to house construction and function.

# Chapter 5
# Changes in House Structure Through Time

The purpose of this chapter is to identify and examine the changes in house structure through time, and to assess whether such information can be used to further define the chronological development of the site. This plan assumes that variation in house design can be attributed to: (a) changes in style over time, (b) differences in function, (c) seasonality, (d) varying organizations of different social groups, and (e) individual human idiosyncrasies.

Since the houses at Phillip's Garden appear to display substantial variation in design (Renouf 1993:59), a comparison of these differences, relative to time, may provide clues regarding the nature and duration of different occupation periods. To make this comparison, only the fully excavated houses which have $^{14}C$ dates are included in the analysis. Since there are radiocarbon results for all eleven of the fully excavated houses, a comparison of house styles throughout much of the occupation of the site is possible.

Archaeological study of Dorset house remains has demonstrated that there is considerable variation in the construction and stylé of structures throughout the eastern Arctic and Newfoundland (Maxwell 1980:506). Such differences are not well understood because similar house forms can have different functions depending upon a variety of factors including: location, seasonality, settlement pattern, temporal position, etc. (Hunter-Anderson 1977:207-324). Likewise, different house forms can have similar functions for many of the same reasons (Janes 1983:56).

As a means of understanding changes in house design though time, Kapches (1990), in her study of Iroquoian longhouses, proposed that analyses must go beyond spatially static techniques of comparison which fail to account for the functional reality of a structure. As such, she notes that both synchronic and diachronic studies of house structure are severely limited if they only consist of a description and comparison of measured structural elements. Further, Kapches argues that the analysis of descriptive categories describing structural elem . ts such as: total house area; storage area; number of hearths; number and size of storage pits; and so on, "are very basic and interpretationally quite limited" (Kapches 1990:49). Alternatively, Kapches favours an approach which is based upon the analysis of the activity areas within a house. Simply, her analysis is intended as a means to examine the elements of a house which were associated with the activities that were held within.

Following this approach, Kapches proposes that the structural variables of a house should first be categorized according to their relative permanence. For example, the exterior wall of a dwelling is the most permanent structure of most houses. This feature limits the living space within, and as such, is the most basic variable. Within this limit, Kapches (1990:51) defines for the Iroquoian situation, three categories of internal variables: (1) temporary structural variables such as storage and refuse pits; (2) semipermanent variables, which are usually situated in permanent locations, such as hearths; and, (3) permanent structures, such as partitions and bench areas, which are determining factors in the interior organization and function of a house.

Since temporary variables are easily altered without major changes to more permanent features in house design, they are considered to be the least indicative of long term social, cultural and economic change. Rather, the placement of temporary variables is likely to reflect short term change. Consequently, these variables may reflect the variation generated by individual endeavours. As such, these variables are less likely to be representative of larger group actions.

In contrast, semipermanent and permanent structures are considered to be more relevant indicators of long term social, cultural and economic change, since they are principal components of the design, construction and the interior arrangement of a house. It is argued that the configurations which emerge from the changes of more permanent variables, are likely to reflect major changes in function, technology, the availability of building materials, social organization, and cultural tradition (Kapches 1990:64). It is proposed that this approach can be applied to the Dorset situation at Port au Choix, in view of: the number of comparable houses; the long term reoccupation of the site; and the identification within the houses of semi-permanent and permanent features.

Throughout the eastern Arctic, Greenland, Labrador and Newfoundland, Dorset house styles range from little more than a few artefacts amongst a concentration of rocks, to semi-subterranean and stone longhouses (Maxwell 1985:153-158). At Phillip's Garden, Dorset dwellings had typically been described according to the season in which they were thought to have been occupied. Larger, deeper and more substantial house remains were generally interpreted as cold weather occupations; while a single house with less prominent remains was equated with a warm weather occupation (Harp 1976:130). Likewise, the placement of pits, either internal or external to the structure, may also be an indicator of seasonality. However, more recent investigations have shown a greater diversity in house form, and such a simple summer/winter dichotomy has since been questioned (Renouf 1987; Murray 1992; Jensen 1993).

To date, four basic forms of shelter have been identified at Phillip's Garden. "Winter" houses have been recognized as rectangular shaped, semi-subterranean stone structures, with internal dimensions ranging in size from 5X6 to 5X7 metres (Harp 1964; Renouf 1993:24). A shallow 3X5 metre oval-shaped arrangement of rocks was identified by Harp (1976:130) as a "summer" house. An external hearth and an associated windbreak, is another structure associated with warm weather occupation of the site (Renouf 1991:56). A qarmat or "intermediate season" house, was also identified on the basis of associated faunal remains (Murray 1992).

As a consequence of being the largest, most elaborate, and thus, most noticeable, the "winter" house became the focus of most of the early investigations conducted by Harp. As such, this house form is over-represented in the sample of excavated houses from Phillip's Garden. However, Harp's decision to excavate so many substantial dwellings has made it possible to compare changes in style over time, since stylistic differences are only relevant if like-structures are compared.

While there is no single feature which characterizes the Dorset dwelling, there are a number of structural properties which can be compared. In the semi-subterranean style "winter" dwelling, the primary architectural feature is the wall or bench area. This gravel and stone structure surrounds the central depression, and generally defines the extent of a structure. Within this primary feature, there are a number of comparable internal structural variables, such as pits, rear platforms, and axial features.

The rear platform is typically constructed by leaving the rear portion of a house unexcavated, and by levelling the remaining rocks (Renouf 1993:24). Essentially, this feature is an extension, or widening of the rear portion of the wall. Functionally, the rear platform may have been a bench and/or sleeping area. Furthermore, the rear platform is considered to be a permanent structural variable, since it is a principal component of the structure.

Another distinguishing internal house featurr is the mid-passage or axial structure. Considered as the domestic focus of the dwelling (Renouf 1993:24), this feature is often indicative of domestic activity. By dividing the dwelling into two halves, this feature is the internal structural variable which most clearly defines the interior activity areas of the house. More specifically, Dorset mid-passages have been described as:

> "central linear features which usually run perpendicular to the nearest body of water. These axial structures may be on an extant surface or in a pit; the linear feature may be parallel rows of vertical slabs incorporating box hearths, or it may be a trench and hearth, or a mosaic pavement" (Maxwell 1980:506).

At Phillip's Garden, there are a variety of these linear features which more or less fit this description. Most are comprised of a hearth, pits and stone features which are aligned perpendicular to the sea. However, a few of these features are situated parallel to the sea. As an internal feature, which may have been subject to modification over the life of the dwelling, the axial feature is defined as a semi-permanent variable.

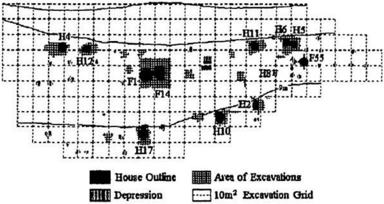
Pits are another internal feature which are common to most of the houses at Phillip's Garden. They are often bone-filled and located in association with the axial feature, and/or the rear platform. Where there are numerous pits within a single house, it is difficult to assess whether they were associated with a single occupation, or whether they were the result of succeeding occupations (Kapches 1990:51). It is also arguable whether such bone-filled features were used as storage and/or refuse repositories. Since pits are one of the least permanent of the internal structural variables, they also appear to be less significant relative to the internal organization and use of the house. As such, differences in pit size and location may be indicative of personal preferences.

Since pits are easily constructed, movable and may be personally utilized, they are not considered to be a reliable indicator of any long term change. Consequently, pits are not included in the principal analysis. However, as they are the only internal feature in a number of the less-substantial house remains, their size and location will be compared in a secondary comparison of dwelling types.

In this analysis of activity areas, area measurements for semi-permanent and permanent variables are made and compared over time. More specifically, measurements are taken for: a) the bench or walls areas, b) the rear platform, and c) the axial feature. In addition, the total area of semi-permanent and permanent variables [a+b+c] will be compared to the total area of the structure. By defining these spaces as "organized areas" of activity, and by comparing their similarities and differences over time, it may be possible to infer changes in house function, social organization and cultural practices.

This interpretation of houses is also intended to serve as a model from which to compare changes in house function over time. Included in this analysis are Houses 2, 4, 5, 6, 10, 11, 12, 17 and house Features 1, 14 and 55. The location of these is depicted in Figure 5.1.

Figure 5.1
Location of Houses



For information purposes, a stylized sketch of each house and a brief descriptive summary is provided. Measurements of external house dimensions are made from the outside edge of the wall or bench area. The wall or bench area does not include the rear platform area, which is calculated separately.

**A. House Descriptions**

House 2, as depicted in Figure 5.2, is a semi-subterranean style house; measuring 8.2 by 10.1 metres in size. It has a well-defined outer wall or bench area, a rear platform, and a series of pits which form the axial feature. The rear platform is situated on the southern wall and contains two pits. The axial feature is oriented perpendicular to the sea.

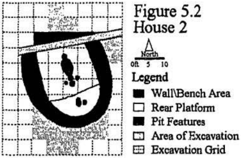


Figure 5.2
House 2

House 4, as depicted in Figure 5.3, is very similar in appearance to House 2. It measures approximately 7.6 by 9.8 metres in size, and has a well-defined wall or bench area, rear platform, and an axial feature comprised of a series of interconnected pits. As in House 2, the rear platform is located along the southern wall and the axial feature is perpendicular to the sea.

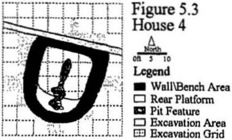



Figure 5.3
House 4

House 5, as depicted in Figure 5.4, is approximately 6.1 by 7.9 metres in size, and is comprised of a simple oval arrangement of rocks. There are no discernable walls or internal structures, nor is there any definite indication of orientation of the dwelling. The structure is wider east to west, than it is north to south.

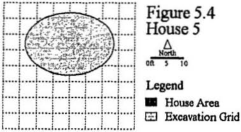



Figure 5.4
House 5

House 6, as depicted in Figure 5.5, is approximately 5.8 by 10.4 metres in size. There are no discernable walls, and there are four pits situated in the western half of the structure. While there is no definite indication of orientation, the structure is wider north to south, than it is east to west.

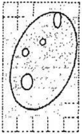


Figure 5.5
House 6

North
0ft 5 10

Legend
House Area
Pit Features
Area of Excavation
Excavation Grid

House 10, as depicted in Figure 5.6, is rectangular in shape, and is approximately 7.6 metres by 12.1 metres in size. The exterior wall area is poorly defined, and only in the south west quadrant of the structure. The house appears to be oriented toward the sea, with a possible entrance along

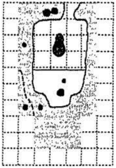


Figure 5.6
House 10

North
0ft 5 10

Legend
Edge of Wall
Rear Platform
Axial Feature
Pit Features
Area of Excavation
Excavation Grid

the northern wall. Internally, there are eight pit features, two of which are located in the central depression. There is a rear platform situated along the southern wall which also contains two pit features. Four other pits are located in the presumed wall or bench area, and one additional pit is located outside the house.

House 11, as depicted in Figure 5.7, is approximately 4.3 by 6.1 metres in size, and is roughly rectangular in shape. The outline of the house is poorly defined; particularly along the north east side of the structure.

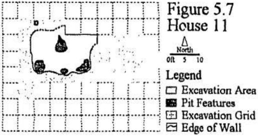



Figure 5.7
House 11

There are four large internal pit features located along the southern perimeter, and another large pit in the middle of the main depression. The location of this main pit feature, relative to the other features and to the southern perimeter, suggests that this house was oriented toward the sea.

House 12, as depicted in Figure 5.8, is generally square in shape, and is approximately 7.9 by 8.5 metres in size. This dwelling has a well-defined wall or bench area, and contains a series of centrally located pit features. While there is no apparent entrance to this structure, the orientation of the central pit feature, suggests that the

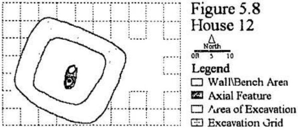



Figure 5.8
House 12

house may have faced the sea. However, results from preliminary studies of soapstone distributions, suggest that there was an east/west alignment of internal activities (Renouf pers. comm.).

House 17, as depicted in Figure 5.9, is a moderately to well-defined square structure which measures approximately 9.1 by 9.9 metres in size. The wall or bench area widens in the rear portion of the house. An axial feature bisects the house in a north/south direction. There are eight pit

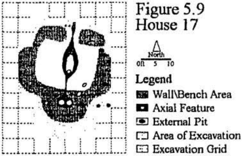



Figure 5.9
House 17

features inside, and four outside the house. The orientation of the axial feature, and an entrance in the northern wall, are evidence that this house faced northward, toward the sea.

House Feature 1, as depicted in Figure 5.10, measures approximately 8.5 by 10 metres in size. It is comprised of a roughly circular arrangement of rocks, and contains three large, centrally located pits. There are remnants of the inside edge of the west, north and south walls. However, the outside edges of the house perimeter are less clearly defined.

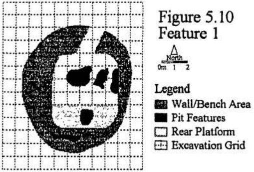



Figure 5.10
Feature 1

Along the north and south walls, there are raised platforms, and a break in the north wall suggests a possible entrance. Three additional pit features are located outside, and to the south, of the central depression. While not readily apparent, the house appears to have an east/west internal organization, as defined by the alignment of pits, and the distribution of flakes and artefacts (Murray 1992).

House Feature 14, as depicted in Figure 5.11, is an oval structure which measures approximately 7 metres by 10 metres in size. The dwelling has a well-defined wall/bench area with an entrance in the south wall and faces away from the sea. A large pit feature is centrally located in the main house depression. Two smaller pits are located in the rear wall/bench area of the house. A single pit is also located in the southern entrance.

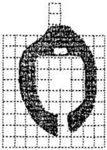


Figure 5.11
Feature 14

North
0m 1 2

Legend
Wall\Bench Area
Pit Features
Excavation Grid

House Feature 55, as depicted in Figure 5.12, is a well-defined circular dwelling measuring approximately 6.0 by 7.0 metres in size. The house contains a large axial feature that bisects the structure in an east/west direction. The bench

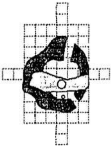


Figure 5.12
Feature 55

North
0m 1 2

Legend
Wall\Bench Area
Axial Feature
Pit Features
Excavation Grid

area has breaks in both the northern and southern walls. Considering ethnographic evidence for the year round occupation of semi-subterranean dwellings (Nagy 1994), the two entrances may be indicative of occupation during different seasons. A widening of the bench area in the northern portion of the house suggests a possible platform, although it is partially obliterated by one of the entrances. This house also contains four internal pits, the largest of which, is situated at the centre of the axial feature. The position of the axial feature suggests an east/west orientation of internal activities, similar to Feature 1.

**B. Variation in House Structure**

As illustrated by the foregoing description of houses and their features, there appears to considerable variation in size and structure of the houses at Phillip's Garden. While the overall range of structural variation can be gained from these descriptions, a comparison of houses over time is necessary to assess whether any of these differences are meaningful in terms of social, cultural or economic change. By doing so, it is possible to: a) assess the range of variation in house design during different periods in the occupation of the site, and; b) make arguments relative to potential house contemporaneity.

As indicated in Table 5.1, the internal layout of each house is expressed as a percentage of the total house area. The organized area is equal to the sum of the axial feature; the rear platform; and the wall/bench area. The unorganized area is calculated by subtracting the organized area from the

## Table 5.1
## Variable Dimensions of House Structure

| House | Total Area | Mid Feature Area | Mid Feature % | Rear Platform Area | Rear Platform % | Wall/Bench Area | Wall/Bench % | Unorganized Area | Unorganized % | Organized Area | Organized % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H2 | 67.5 | 2.0 | 3.0 | 10.9 | 16.1 | 32.9 | 48.7 | 21.7 | 32.1 | 45.8 | 67.9 |
| H4 | 59.8 | 2.5 | 4.2 | 5.0 | 8.4 | 29.0 | 48.5 | 23.3 | 39.0 | 36.5 | 61.0 |
| H5 | 39.2 | - | - | - | - | - | - | 39.2 | 100.0 | 0.0 | 0.0 |
| H6 | 47.1 | - | - | - | - | - | - | 47.1 | 100.0 | 0.0 | 0.0 |
| H10 | 71.2 | 2.5 | 3.5 | 12.4 | 17.4 | 33.1 | 46.5 | 23.2 | 32.6 | 48.0 | 67.4 |
| H11 | - | 1.1 | - | - | - | - | - | - | - | 1.1 | - |
| H12 | 58.3 | 1.9 | 3.3 | - | - | 35.3 | 60.5 | 21.1 | 36.2 | 37.2 | 63.8 |
| H17 | 63.9 | 5.9 | 10.8 | 8.2 | 12.8 | 31.2 | 48.8 | 17.6 | 27.5 | 46.3 | 72.5 |
| F1 | 60.1 | 3.8 | 6.3 | 9.5 | 15.8 | 28.0 | 46.6 | 18.8 | 31.3 | 41.3 | 68.7 |
| F14 | 56.8 | 1.2 | 2.1 | - | - | 36.1 | 63.6 | 19.5 | 34.3 | 37.3 | 65.7 |
| F55 | 29.2 | 7.4 | 25.2 | - | - | 14.0 | 48.1 | 7.8 | 26.7 | 21.4 | 73.3 |

Key: Areas are expressed in square metres, and percentages are of total house area

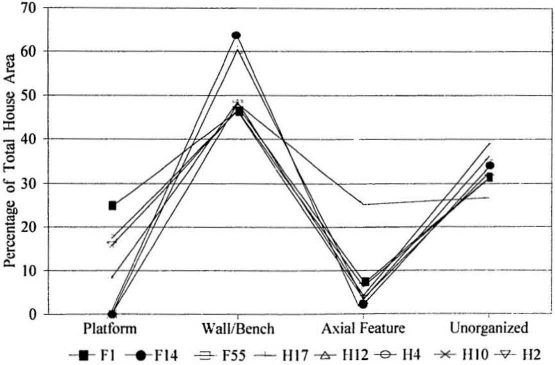
total house area. All measurements are expressed in square metres, and percentages of each variable are based upon the total house area.

House 11 could not be included in the full analysis since the external dimensions were not defined. Houses 5 and 6 have no internal structural variables other than pit features and are considered separately. Structures with more identifiable internal structural variables include Houses 2, 4, 10, 12, 17 and house Features 1, 14 and 55. The total area of these structures ranges from 29.2 to 71.2 m². Axial features range in area from 1.1 to 7.4 m²; the rear platforms from 5 to 12.4 m²; and the wall/bench areas from 14 to 36.1 m². Excluding houses 5, 6 and 11, the amount of unorganized space ranges from 7.8 to 23.3 m², and the amount of organized space ranges from 21.4 to 48.0 m².

While there is considerable variation in the dimensions of the internal variables, there is also a large variation in the total area of the houses. As such, the differences between the internal variables are more meaningfully expressed as a percentage of total house area. Specifically, axial features range from 2.1 to 25.2 percent of the total house area; rear platforms from 8.4 to 17.4 percent; and wall/bench areas from 46.5 to 63.6 percent. Unorganized spaces account for 26.7 to 39.0 percent, and organized spaces from 61.0 to 73.3 percent. These results are more clearly illustrated in Figure 5.13, which graphically compares all of these variables relative to house area.

As indicated by this comparison, axial features possess the widest variation in area (23.1%) relative to total house area. However, this figure is somewhat misleading since Feature 55 accounts for the majority of this variation. In fact, if Feature 55 is excluded from the equation, the range in variation is only 7.8%, making the axial feature the least variable element. While the large size of the axial feature in Feature 55 appears to be an anomaly, it may be explained as a consequence of being defined exclusively on the basis of the arrangement of the rocks (Renouf pers. comm.). In this regard, the definition of the axial feature in house Feature 55 differs from the axial features from Harp's houses, which were defined as a combination of pits and associated rocks.

## Figure 5.13
## Comparison of House Structure

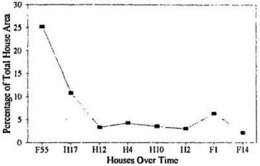


Moreover, the axial feature from house Feature 1 was identified on the basis of pit location and the distribution of artefacts. In view of Renouf's on-going analysis of the spatial distribution of artefacts, it is very likely that we will soon learn more about the extent and function these important areas of activity.

Notwithstanding Feature 55, the area of the axial feature relative to house size appears to be the most stable of the three internal variables. Assuming that the axial feature was the focus of household activities, and since it effectively serves to bisect a dwelling into two halves, it would have been the most important variable in the internal organization of space within the house. As such, changes to the internal organization of a house would likely reflect changes in household organization and/or house function. Since there appears to be little variation between the axial features, it is arguable that there were no major changes in Middle Dorset household organization, and/or house function at Phillip's Garden.

However, when axial features are compared over time they appear to have increased in size relative to house area. In Figure 5.14, the houses arc arranged along the "X" axis in a time line from earliest on the right (F14), to the most recent on the left (F55). While this tendency toward larger axial features over time may be exaggerated by Feature 55, the remaining houses do appear to have some propensity for larger axial features, relative to house size over time.

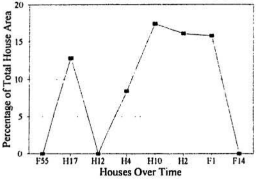
Figure 5.14
Axial Feature vs House Area




Identified in only five of the eleven houses, the rear platform is the least common internal structure amongst the fully excavated houses at Phillip's Garden. Interestingly, these houses (H4, H17, F1, H2 and H10) are also the five largest structures in total area. Furthermore, rear platforms were not present in any houses which had total areas less than 59 m². The percentage of rear platform area to house area also increases with an increase in the size of the structure. This simply suggests that the size of the platform is related to the number of people who occupied the dwelling, rather than it being a structural requirement.

As indicated in Figure 5.15, there also appears not to be any meaningful pattern relating to rear platform area over time. In fact, both the earliest (house Feature 14) and latest (house Feature 55) houses have no clearly defined rear platforms. Assuming that rear platforms were used as sitting and sleeping areas; these results suggest that there was little change in character and/or size of the domestic groups which utilized these structures over time.

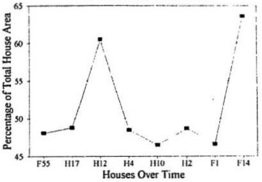
Figure 5.15
Platform vs House Area




If there was significant change in the Dorset social organization during the period in which Phillip's Garden was occupied, it is not explicitly expressed in the housing form. This however, does not mean that Dorset social organization was unchanging during this period. Rather, the similarities in house design may be a reflection of technical limitations relative to house construction and/or material availability.

Of the three internal variables which were compared, the wall/bench area exhibited the largest amount of variation (17.1%) relative to the total house area. Figure 5.16 indicates that there also appears not to be any meaningful pattern relative to the area of the wall/bench area over time. However, by comparing Figures 5.15 and 5.16, there appears to be an inverse association between the percentage of rear platform area and the percentage of wall/bench area.

Figure 5.16
Wall/Bench vs House Area

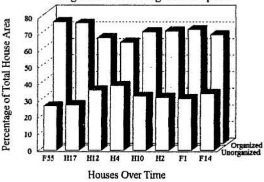



Specifically, houses which have a high percentage of rear platform area are likely to have a low percentage of wall/bench area. Conversely, houses which have a low percentage of rear platform area are likely to have a high percentage of wall/bench area. This relationship is likely a result of the platform being physically part of the wall/bench area, which effectively reduces the calculated wall/bench area.

This comparison also helps to clarify the definition and function of the wall/bench structure. While it is arguable that these structures may be walls and/or benches, the presence or absence of rear platforms may help clarify their precise function. Specifically, if rear platforms were sitting and sleeping areas, their absence in some houses suggests that the side walls may have been utilized for such purposes. As such, wall/bench areas may actually have been bench areas in houses which did not have rear platforms. Likewise, wall/bench areas may have been walls in houses which contained rear platforms (Renouf pers. comm.).

In summary, only the axial feature is suggestive of a trend toward increasing internal organization over time. However, as illustrated in Figure 5.17, when all three variables are considered together, they indicate that the amount of organized space appears lowest at about the mid-point of the occupation of the site. This coincides with the

Figure 5.17
Organized vs Unorganized Space




period, as outlined in Chapter 3, in which there was the highest potential for house contemporaneity. Conversely, the periods with the least potential for house contemporaneity, appear to correspond to the houses with the highest percentage of organized space.

Consequently, it appears that house construction may have been less substantial and more specialized during periods when the largest number of houses were simultaneously occupied. This is based on the view that increasing internal organization within houses is indicative of: (1) a greater expenditure of time and effort in the construction of dwellings; (2) longer and more permanent periods of occupation; and (3) a function which is more generalized than specialized. As such, the increased internal organization of space within houses which have been dated to the beginning and end of the occupation, suggests that the function of Phillip's Garden may have shifted between generalized periods of occupation, separated by a more highly specialized function. This line of reasoning will be further tested in the following chapter through the comparison of artefact assemblages.

**C. Comparison of Temporary Internal Variables**

The most common internal variable from the houses of Phillip's Garden is the pit feature. While all but one structure (House 5) contains at least one pit feature, there are two structures (Houses 6 and 11) which have pits as their only identifiable internal variable. House 6 contains four pits which have an area of approximately 2.0 $m^2$. House 11 has six pits, having a combined area of approximately 1.9 $m^2$. It is arguable that the lack of any permanent structural remains in these two houses may be seen as evidence for specialized use, or even warm weather occupation.

Likewise, Harp described the sparse structural and artefact remains of House 5 as evidence for a warm weather occupation (1976). However, the absence of pits in House 5 suggests that: (1) they were missed during the excavation; or (2) that the structure was the only one which did not contain pit features; and/or (3) that the remains are not that of a house, but rather of a sheltered work area.

In every other house where pits were found, they have been described as rather shallow depressions which contain the remains of harp seals (Renouf 1986, 1987, 1993). The function of these features can be described as storage pits and/or refuse middens. Preliminary studies of body part representation have indicated that there is often an over or under representation of certain body parts within these features. For example, the contents of pit Feature 7, of House Feature 1 are comprised primarily of seal flippers; while pit feature 5, within the same house mostly contains seal head and torso remains (Renouf pers. comm.).

An argument could be made that the pits were predominantly used for storage, since the disposal of refuse would easily be accommodated by tossing it out the door.

However, this may not have been the case if there was any significance placed on the items for "disposal". In this regard, the ethnographic literature regarding aboriginal hunting practices contains many accounts relative to the ideological significance of hunting (Brody 1987; Tanner 1979). As such, certain skeletal elements may have had ideological significance, requiring a ritual disposal in accordance with spiritual beliefs.

Alternatively, it can be argued that the buried seal flippers in pit feature 7 of house Feature 1, may have been a storage area for items with a more utilitarian use. For example, the Inuit utilized seal flipper bones as pieces an elaborate game (Brody 1987:57-58). As such, Dorset play may have also utilized similar materials.

If the Dorset made the distinction between personal and private space, the presence of pit features may be used as a potential means of distinguishing dwellings from non-residential structures. Since all but one of the dwellings contain pit features, it can be concluded that they are a significant variable in the definition of a Dorset dwelling.

**D. Summary**

The variability displayed by the comparison of similar house forms demonstrates that semi-permanent and permanent internal structural variables which define activity areas can be acceptable indicators of change over time. While temporary features such as pits may not be suitable indicators of such change, they may serve to as indicators of: (1) residential use; (2) ideological concerns regarding hunting and/or butchering practices; and (3) internal organization of private and public space.

Although differences in house forms may be primarily a corollary of function and seasonality, the comparison of activity areas can provide a means to sort out the function of like houses. The differences in the dwellings compared in this chapter provide support for greater diversity in both house form and occupation strategies.

From the comparison of house structures and the activity areas within, it can be concluded that there is a higher ratio of organized space to house area during periods of lower house contemporaneity, and a lower ratio of organized space to house area during periods of high potential contemporaneity. This indicates that the use of Phillip's Garden was more specialized during the periods when there were the greatest number of people occupying the site. The validity of this conclusion is further tested in the following chapter, with the analysis of house function over time.

# Chapter 6
# Patterns in Artefact Type and Frequency

The purpose of this chapter is to compare the type and frequency of artefacts from the fully excavated houses at Phillip's Garden. This is intended as a means of understanding the differences and similarities in house function over time. In doing so, it is assumed that: a) the type and frequency of artefacts within the houses is associated in some meaningful way to the function of the dwelling, and b) that such associations are perceptible as archaeological patterns.

One of the most significant impediments to the interpretation of house function from artefacts is that there is not necessarily a direct relationship between occupational and depositional events (Binford 1982). For example, the types and frequencies of artefacts associated with any one house may be representative of the sum of a number of occupations, rather than with any single occupation. Furthermore, much of the debris at residential sites has also been shown to come from post-abandonment activities, depending upon the proximity between the abandoned structure and the occupied areas of the site (Deal 1985).

While a number of the artefact assemblages from the houses at Phillip's Garden are likely the result of such accumulative effects, it is arguable that the last occupation of each of the houses contributed most to the archaeological record. Moreover, the low tool frequencies in some of the houses; a lack of discernable superpositioning; some recognizable patterns in small debris; and the existence of large external middens (Renouf pers. comm.), suggest that: (1) not all the houses were necessarily reoccupied, (2) much of the house debris was likely removed prior to subsequent reoccupations, and (3) post-abandonment activities such as the infilling of a house pit with midden material can be recognized as such. Consequently, it is argued that an analysis of the artefact discard frequencies may produce some credible results relative to house function.

The interpretation of house function from artefact types and frequencies also requires some understanding of the function of artefacts. Even though they were distinct cultures, Thule and Inuit material culture has provided the ethnographic basis for the interpretation of much of the Dorset Palaeo-Eskimo toolkit. While it can be argued that like tools may have similar purposes, they may have had different functions or meanings for different people.

> "If archaeologists consume ethnographically derived theory without prior testing, there is a great danger that they merely reproduce the form and structure of ethnographically perceived reality in the archaeological record. This form and structure may spuriously confirm the ethnographically derived theoretical expectations, in a never ending vicious circle" (Wobst 1978:303).

Even within the same culture, similar looking tools may be multi-purpose; or have different purposes depending upon individual idiosyncrasies. Consequently, assumptions regarding tool function are made in this analysis with the realization that they are largely founded upon what we think we know of Inuit and Thule material culture.

In addition to these problems, the interpretation of the overall functional similarities and differences between houses is also statistically complex because of the number of variables which must be compared, and by the large differences between artefact counts within and between assemblages. As a means to reduce this complexity, a method known as Correspondence Analysis is employed to facilitate interpretations of function from so many variables.

Correspondence Analysis is a graphically-oriented multivariate statistical technique which is particularly useful in analysing "cross-tabular data in the form of numerical frequencies" (Greenacre 1993). The results of this technique are visually displayed in a simple graph which can often facilitate the interpretation of complicated data sets.

The concept of Correspondence Analysis was founded in the 1930s (Hirschfeld 1935); its application in the 1960s by Goff and Cottam (1967) and by Benzécri (1969) proved to be the catalyst for a more wide-spread application of this technique (Blankholm 1991; Greenacre 1993). However, in archaeology, the use of Correspondence Analysis is more recent. While Hill (1974) is credited with first publishing archaeological results using Correspondence Analysis, it was not until an article by Bølviken et. al. (1982) that the technique became more widely recognized for its archaeological applications (Blankholm 1991). Since then, Correspondence Analysis has become widely accepted as a useful technique for archaeological analyses (Baxter 1994).

In this study of the Dorset dwellings at Phillip's Garden, Correspondence Analysis is used to simplify the artefact data set, and to ascertain whether there are meaningful patterns in the type and frequency of tool assemblages. In particular, this analysis will provide a preliminary understanding of the diversity of habitation patterns, and will facilitate interpretations regarding the functional similarities and/or differences between houses over time.

**A. Artefact Types and Frequencies**

Renouf (1993) has identified 28 categories of artefacts from the eleven fully excavated houses at Phillip's Garden. While Renouf fully excavated an additional feature which has been interpreted as windbreak or tent structure, it is not considered in this comparison since it is so different than any structure previously described. In addition, the twelve other houses which Harp partially excavated are also not included since it is unknown whether the partial artefact assemblages are representative of each house.

## Table 6.1
## Frequency of Artefact Types by House

| Artefact | F1 | F14 | F55 | H10 | H11 | H6 | H5 | H17 | H2 | H4 | H12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Utilized Flake | 46 | 46 | 90 | 180 | 253 | 149 | 28 | 337 | 277 | 174 | 176 | 1756 |
| Microblade | 75 | 51 | 155 | 561 | 929 | 556 | 45 | 551 | 675 | 390 | 367 | 4355 |
| Burin-like Tool | 8 | 11 | 7 | 15 | 50 | 24 | 4 | 50 | 29 | 0 | 21 | 219 |
| Axe/Adz | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 7 | 0 | 0 | 9 |
| Core | 146 | 68 | 97 | 24 | 67 | 29 | 10 | 47 | 45 | 23 | 28 | 584 |
| Soapstone | 14 | 83 | 106 | 243 | 181 | 201 | 13 | 413 | 408 | 195 | 165 | 2022 |
| Endblade | 53 | 82 | 60 | 236 | 342 | 277 | 42 | 331 | 212 | 342 | 232 | 2209 |
| Biface | 22 | 8 | 88 | 128 | 267 | 62 | 11 | 229 | 241 | 345 | 206 | 1607 |
| Whetstone | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 |
| Sideblade | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Scraper | 28 | 43 | 18 | 233 | 308 | 162 | 28 | 433 | 404 | 337 | 204 | 2198 |
| Hammerstone | 0 | 3 | 5 | 2 | 3 | 2 | 0 | 14 | 17 | 5 | 0 | 51 |
| Abrader | 9 | 11 | 8 | 0 | 0 | 10 | 0 | 19 | 6 | 2 | 1 | 66 |
| Ground Slate | 16 | 14 | 11 | 105 | 108 | 106 | 13 | 160 | 175 | 115 | 124 | 947 |
| Graver/Awl | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Sled Runner | 34 | 35 | 8 | 54 | 13 | 37 | 15 | 49 | 18 | 56 | 45 | 364 |
| Harpoon Head | 0 | 3 | 0 | 33 | 17 | 35 | 3 | 78 | 187 | 60 | 25 | 441 |
| Foreshaft | 1 | 12 | 0 | 26 | 25 | 31 | 8 | 19 | 27 | 13 | 27 | 189 |
| Carved Bone | 7 | 33 | 51 | 74 | 118 | 316 | 18 | 343 | 145 | 194 | 167 | 1466 |
| Plug | 1 | 2 | 6 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 45 |
| Whalebone 2X4 | 3 | 10 | 0 | 1 | 8 | 9 | 0 | 11 | 0 | 24 | 0 | 66 |
| Ornamentation | 2 | 6 | 7 | 9 | 5 | 17 | 0 | 17 | 4 | 14 | 17 | 98 |
| Point | 0 | 4 | 0 | 4 | 1 | 0 | 0 | 10 | 0 | 7 | 1 | 27 |
| Haft | 0 | 1 | 3 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 3 | 13 |
| Lance | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | [illegible] | 0 | 15 |
| Needle | 0 | 1 | 0 | 6 | 3 | 39 | 3 | 21 | 2 | 3 | 6 | 84 |
| Wedge | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Other Tools | 2 | 0 | 0 | 2 | 4 | 8 | 2 | 8 | 6 | 12 | 9 | 53 |
| Total | 467 | 531 | 728 | 1938 | 2703 | 2111 | 243 | 3144 | 2885 | 2318 | 1824 | 18892 |

Source: (Renouf 1993)

The assemblages which are utilized in this analysis are summarized in Table 6.1. With the exception of unutilized flakes, the entire artefact assemblage from each house is considered.

**B. Correspondence Analyses**

Correspondence Analysis relies on the chi-square statistic which compares the difference between empirically derived observations and theoretically expected frequencies. Expected frequencies are based upon the "hypothesis of homogeneity" (Greenacre 1987:24-31), which means that if the function of every house was the same, we would expect that the artefact profile for each house would also be more or less the same. Since each house has a different artefact profile, the chi-square statistic can be used to test how different the artefact profiles actually are. The chi-square statistic accomplishes this task by measuring how "far" each artefact profile is from the average artefact profile.

The differences in artefact profiles are then visually presented by transforming them from their multi-dimensional state into two dimensional plots with X,Y axes. For example, if the frequencies of three types of artefacts are compared for any number of houses, the analysis can essentially be considered as a three dimensional problem (Moran et. al. 1988:635). If more artefacts are compared, more dimensions are involved. The reduction in dimensionality can be explained as a "flattening" of the multi-dimensional profile into two dimensions. Although this produces inaccuracy in the plot, it provides a comparison of artefacts and houses which would otherwise be incomprehensible (Greenacre 1993:38-47).

The amount of information lost in this procedure is measured according to the amount of information (known as inertia) contained within the dimensions which are displayed (Greenacre 1993:47). In the case of a two-dimensional plot, the accuracy is expressed as a percentage of the information which is contained within the first two dimensions (or axes). For example, if the first axis of a plot accounted for 50 percent of the information, and the second axis, for 30 percent; the plot would be representative of 80 percent of the total inertia of the total profile.

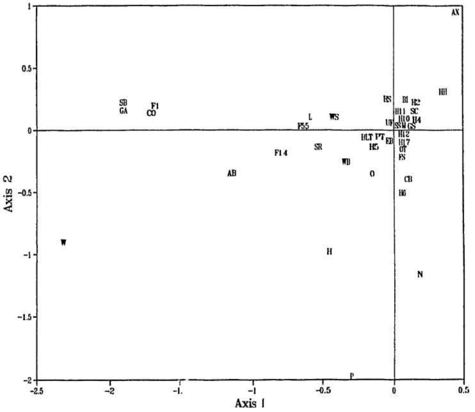
To interpret the location of artefact categories (row profiles) from a plot, the distance which a point is from the origin is an approximate indication of how different it is from the *average artefact profile*. Moreover, the distance between the points of artefact categories is a measure of the approximate difference *between individual row profiles* (artefact categories). These rules of interpretation also apply to the houses (column profiles). Consequently, the interpretation of the relationship between column profiles (houses) and row profiles (artefacts) can be based upon a comparison of their relative distance from the origin of the plot (Moran et. al. 1988:633-670).

The use of Correspondence Analysis in comparing the artefact profiles is based upon the assumption that houses which had similar functions will have similar artefact assemblages. As such, it is expected that houses with similar functions will "cluster" according to the similarities in their tool assemblages. By superimposing houses (column profiles) and artefacts (row profiles) on the same plot with a common origin, house function can be interpreted from the position of the houses relative to the types of artefacts that they are associated with.

In the analysis of artefact assemblages from Phillip's Garden, two Correspondence analyses were undertaken using the BMDP Statistical software package supplied by the Department of Computing and Communications of Memorial University. The first analysis consisted of a comparison of all 28 artefact categories from the eleven fully excavated houses. The second analysis was based upon the amalgamation of the 28 artefact categories into five groups which were considered to be functionally similar.

Figure 6.1 illustrates the results of the first of the Correspondence plots. From the analysis of the observed frequencies, the first two axes accounted for a total of 61.7 percent of the total information. This amount is relatively low; almost 40 percent of the inertia lays outside these

# Figure 6.1
## Correspondence Analysis




**LEGEND**

| | | | | | |
|---|---|---|---|---|---|
| UF | Utilized Flake | GA | Graver/Awl | SC | Scraper |
| L | Lance | HS | Hammerstone | N | Needle |
| AB | Abrader | W | Wedge | GS | Ground Slate |
| M | Microblade | SR | Sled Runner | BLT | Burin Like Tool |
| HH | Harpoon Head | AX | Axe/Adz | FS | ForeShaft |
| CO | Core | CB | Cut Bone | SS | Soapstone |
| P | Plug | EB | Endblade | WB | Whale Bone 2X4 |
| BI | Biface | O | Ornamentation | WS | Whetstone |
| PT | Point | SB | Sideblade | H | Haft |
| OT | Other Bone Tools | | | | |

first two dimensions. With this amount of information loss, the results of this plot should be should be considered with some caution. Notwithstanding this amount of potential error, the plot seems to indicate that there is little variation between the artefact assemblages. This interpretation is based upon the fact that most of the points are centred around the origin.

However, as indicated in Figure 6.1, there are a number of artefacts situated in outlying areas of the plot; (W) Wedge, (P) Point, (N) Needle, (H) Haft, (SB) Side Blade, and (GA) Graver/Awl. Since there are few houses in these outlying areas, with the exception of Feature 1, the "pull" or "attraction" of these artefacts is considered to be weak. The weakness is a result of their low frequencies relative to the other artefact categories which have much higher frequencies; microblades, endblades, scrapers, etc. (See Table 6.1). This demonstrates that Correspondence plots have the tendency of being biased toward cells containing higher frequencies. Moreover, the houses tend to be pulled toward the centre of the plot, since the differences between the "expected" and "observed" are generally small within the artefacts categories which have high frequencies. Consequently, the relative significance of the outlying artefact categories is diminished.

This bias toward artefact categories with higher frequencies can be problematic, particularly when the presence of low frequency of one artefact is relevant to the interpretation of house function. For example, Houses 6 and 17 account for 60 of the 84 needles found amongst the eleven houses. The significance of the number of needles in these two houses is lost in the Correspondence plot, since there are much higher frequencies of other artefacts which have a greater "pull" than the needles. Consequently, Houses 6 and 17 appear to have no relationship with needles, when in fact this may be important evidence for certain fabrication processes.

Of all the outlying artefact categories, only the (CO) cores were of sufficient frequency to "attract" one of the houses (Feature 1). The significance of cores in Feature 1 is easily verified in Table 6.1, by comparing the frequencies of cores to the frequencies of other artefact categories within Feature 1. In doing so, it is noted that cores comprise 31 percent of the artefact assemblage in Feature 1.

From a closer look at the distribution of houses and artefacts within the plot, it appears that Features 14 and 55 are different than the remaining eight houses which are generally centred around the origin. In fact, the location of Features 14 and 55 appear not to be strongly associated with any single artefact category. Rather, their location appears to be a consequence of equally balanced influences.

While Features 14 and 55 appear different than the other houses, the degree to which this is true is questionable owing to the fact that they, along with Feature 1, were excavated by Renouf; and that all of the houses situated around the origin were excavated by Harp. While Renouf's three houses (Features 1, 14 and 55) may be functionally different from Harp's houses (Houses 2, 4, 5, 6, 10, 11, 17), this difference may be partially attributable to differences in the research goals and excavation techniques employed by each researcher.

More specifically, Renouf (pers. comm.) stated that in the case of Features 1 and 14, she deliberately chose to excavate the type of houses which Harp generally ignored, that is, house depressions which were not well-defined. However, in the case of Feature 55, she presumed that it would be similar to Harp's houses, since it was such a well-defined depression prior to excavation (Renouf 1993:19). However, the internal arrangement of house Feature 55 turned out to be unlike any which Harp had previously described. Consequently, Renouf (pers. comm.) has remarked that it is not surprising that the artefacts from Feature 55 are also different. In addition, it may be significant to note that Feature 55 is also the most recent house. As such, the differences between Harp's houses and Feature 55 may reflect some change in the nature and/or function of the residency during the latter period of the occupation of Phillip's Garden.

Since the overall value of Correspondence plots primarily depends on the amount of variation for which they account (Bølviken et. al. 1982:44), the lack of variation between the artefact assemblages in this first Correspondence Analysis makes it difficult to assess whether there are any significant differences in the artefact assemblages which could be used to interpret house function.

While this lack of variation may reflect an actual similarity between the houses, Bølviken et. al. (1982:46) explains that a lack of discernable variation in archaeological patterning can also be attributable to the "noise" produced by data matrices which contains many low and/or "0" cell values. This problem is particularly acute when such variables are responsible for outlying points (Bølviken et. al. 1982:56). Since the data matrix in Table 6.1 does contain many low and "0" cell values, and since it appears to have been responsible for a number of "outliers", it is likely that some of the variation between houses was masked by the "noise" created by these values.

As a means to eliminate these low cell values and reduce the "noise", all of the artefacts, except whalebone 2X4s (which are interpreted as structural elements of the houses) were grouped into five categories on the basis of their

## Table 6.2
## Frequency of Artefact Types by House and Function

| Houses | F1 | F14 | F55 | H10 | H11 | H6 | H5 | H17 | H2 | H4 | H12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Procurement** | | | | | | | | | | | |
| Endblade | 53 | 82 | 60 | 236 | 342 | 277 | 42 | 331 | 212 | 342 | 232 |
| Sideblade | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sled Runner | 34 | 35 | 8 | 54 | 13 | 37 | 15 | 49 | 18 | 56 | 45 |
| Harpoon Head | 0 | 3 | 0 | 33 | 17 | 35 | 3 | 78 | 187 | 60 | 25 |
| Foreshaft | 1 | 12 | 0 | 26 | 25 | 31 | 8 | 19 | 27 | 13 | 27 |
| Ornamentation | 2 | 6 | 7 | 9 | 5 | 17 | 0 | 17 | 4 | 14 | 17 |
| Point | 0 | 4 | 0 | 4 | 1 | 0 | 0 | 10 | 0 | 7 | 1 |
| Haft | 0 | 1 | 3 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 3 |
| Lance | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 6 | 0 |
| Total | 90 | 144 | 84 | 363 | 403 | 402 | 68 | 509 | 448 | 498 | 350 |
| **2. Processing** | | | | | | | | | | | |
| Utilized Flake | 46 | 46 | 90 | 180 | 253 | 149 | 28 | 337 | 277 | 174 | 176 |
| Microblade | 75 | 51 | 155 | 561 | 929 | 556 | 45 | 551 | 675 | 390 | 367 |
| Axe/Adz | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 7 | 0 | 0 |
| Biface | 22 | 8 | 88 | 128 | 267 | 62 | 11 | 229 | 241 | 345 | 206 |
| Scraper | 28 | 43 | 18 | 233 | 308 | 162 | 28 | 433 | 404 | 337 | 204 |
| Ground Slate | 16 | 14 | 11 | 105 | 108 | 106 | 13 | 160 | 175 | 115 | 124 |
| Total | 187 | 162 | 362 | 1208 | 1866 | 1035 | 125 | 1710 | 1779 | 1361 | 1077 |
| **3. Fabrication** | | | | | | | | | | | |
| Burin-like Tool | 8 | 11 | 7 | 15 | 50 | 24 | 4 | 50 | 29 | 0 | 21 |
| Graver/Awl | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carved Bone | 7 | 33 | 51 | 74 | 118 | 316 | 18 | 343 | 145 | 194 | 167 |
| Plug | 1 | 2 | 6 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 |
| Needle | 0 | 1 | 0 | 6 | 3 | 39 | 3 | 21 | 2 | 3 | 6 |
| Wedge | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Tools | 2 | 0 | 0 | 2 | 4 | 8 | 2 | 8 | 6 | 12 | 9 |
| Total | 18 | 50 | 65 | 97 | 175 | 423 | 27 | 422 | 182 | 209 | 203 |
| **4. Toolmaking** | | | | | | | | | | | |
| Core | 146 | 68 | 97 | 24 | 67 | 29 | 10 | 47 | 45 | 23 | 28 |
| Hammerstone | 0 | 3 | 5 | 2 | 3 | 2 | 0 | 14 | 17 | 5 | 0 |
| Whetstone | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Total | 146 | 71 | 103 | 26 | 70 | 31 | 10 | 62 | 62 | 29 | 28 |
| **5. Soapstone** | | | | | | | | | | | |
| Soapstone | 14 | 83 | 106 | 243 | 181 | 201 | 13 | 413 | 408 | 195 | 165 |
| Abrader | 9 | 11 | 8 | 0 | 0 | 10 | 0 | 19 | 6 | 2 | 1 |
| Total | 23 | 94 | 114 | 181 | 181 | 211 | 13 | 432 | 414 | 197 | 166 |

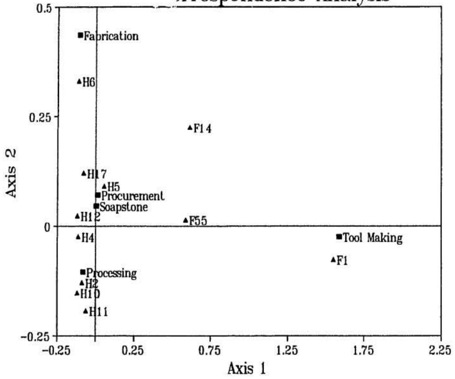
(Source: Renouf 1993)

functional similarity. These categories include: 1) Procurement, 2) Processing, 3) Toolmaking, 4) Fabrication, and 5) Soapstone. Whalebone 2X4s were excluded from this comparison, as they were considered part of house structure rather than an artefact of house function (Renouf pers. comm.). The remaining artefacts and their frequencies are summarized in Table 6.2.

The resulting plot from this Correspondence Analysis are depicted in Figure 6.2. In comparison to the first plot, the accuracy of this second plot is considerably greater. Specifically, the first two axes accounted for 88 percent of the variation; the first for 68 percent, and the second for 20 percent. In addition, this second plot provides a clear and more understandable representation of the functional differences and similarities between the houses. There is a wider range of variation between the artefact categories, and a more clearly defined separation of houses. Most notably, Feature 1 and "Tool Making" are associated in the bottom right quadrant of the plot. This result is consistent with the outcome of the first analysis.

It can be argued that the large quantity of cores in house Feature 1 is a product of post-abandonment discard, being deposited in an abandoned house depression. However, this does not appear to be the case, since: (a) the patterns in the spatial distribution of cores appear to coincide with

Figure 6.2
Correspondence Analysis




certain activity areas within the house (Renouf pers. comm.); and (b) other post-abandonment activities such as dumping episodes, have been recognized elsewhere within this house.

Alternatively, much of the activity within Feature 1 can be interpreted as being related to tool production. The considerable difference between Feature 1 and the other houses suggests the possibility that this structure was the residence and/or workplace of a toolmaking specialist/s, or a place known in the ethnographic literature as a qaggi, or men's house; "where men and older boys took their meals and worked on projects" (Murdoch 1892:80 in Reinhardt 1986:130). This preponderance for tool production may also be a consequence of seasonality. In this regard, Murray (1992) argued that house Feature 1 was a late fall Qarmat in which the occupants were preparing for a seal hunt.

Along the vertical axis, "Fabrication" is positioned in the top left quadrant of the plot. Composed primarily of carved bone, burin-like tools, and needles, the artefacts which comprise this category are most frequent in Houses 6 and 17 (See Table 6.2). In particular, House 6 appears most closely associated with artefacts related to fabrication processes. As such, the activities represented by the frequency of these artefacts may be representative of the preparation required for a seal hunt.

Processing activities are represented in the bottom left quadrant. Microblades, scrapers, utilized flakes, and bifaces comprise the majority of artefacts in this category. Located away from the origin, the position of this category suggests variation between the artefact assemblages relative to these types of processing tools. According to their relative position on the plot, Houses 2, 10, 11 and 4 appear to have the strongest association with the processing of seals.

Procurement activities are represented by a point located near the origin of the plot. This position indicates that there is little variation between the proportions of artefacts related to procurement activities. Houses 5 and 12 have the strongest tendency toward this category, while Houses 17 and 4 also appear to have some association with procurement activities.

The Soapstone category is also positioned near the centre of the plot, suggesting that proportions of soapstone and abraders does not differ from the overall artefact profile. Although house Feature 1 and House 5 have little amounts of soapstone, which suggests that these houses may not have been occupied during the coldest months, all of the houses have comparable amounts of soapstone relative to the other categories of artefacts.

As in the first plot, Features 14 and 55 appear to be peculiar cases. While most houses have strong associations with at least one functional category, both Features 14 and 55 have no strong connections with any category. In this respect, their location in this plot is comparable to their position in the first Correspondence plot. Feature 14 is located at almost mid-point between Fabrication, Toolmaking and Procurement. Feature 55 is similar to Feature 14, except that it has less of a propensity for fabrication activities. The assemblage from Feature 55 appears to be slightly more generalized than that of Feature 14. Located along the horizontal axis, between the Procurement and Toolmaking categories, the function of Feature 55 also appears to be somewhat similar to Houses 5 and 12, although it again has a tendency toward toolmaking activities.

From the plot positions of Features 14 and 55, it can be interpreted: 1) that the function of these structures were less "domestic" than the other houses, or 2) that their assemblages were a product of varying depositional events which resulted in a generalized tool assemblage.

**C. Summary**

In a comparison of function over time, the houses are arranged from earliest to latest in Table 6.3. During the period of the highest probability for house contemporaneity (as highlighted in Table 6.3), the predominant activities

**Table 6.3**
**House Function Over Time**

| House | Functional Activity | $^{14}$C Date[1] |
|---|---|---|
| F14 | Generalized | 1942±56 |
| F1 | Toolmaking | 1753±132 |
| H2 | Processing | 1612±73 |
| H6 | Fabrication | 1482±65 |
| **H10** | **Processing** | **1473±64** |
| **H4** | **Processing/Procurement** | **1465±65** |
| **H11** | **Processing** | **1372±41** |
| **H12** | **Processing/Procurement** | **1427±62** |
| **H5** | **Procurement** | **1367±44** |
| H17 | Procurement/Fabrication | 1348±48 |
| F55 | Generalized | 1327±62 |

[1]All radiocarbon dates are calibrated using the intercept method at one sigma, Stuiver and Reimer (1993).

appear to be procurement and processing. The combination of these two activities is to be expected, since they are complementary. Furthermore, it is probable that procurement and processing activities were most important during periods of high contemporaneity, and when there was a regular seasonal occupation of the site, since the procurement of seals was likely one of the principal reasons that people came together at Phillip's Garden. During the periods of lower potential house contemporaneity, there appears to be greater diversity in the function of the structures. This may be a reflection of the coming and going of separate groups of people who used Phillip's Garden for different purposes in a less regular manner.

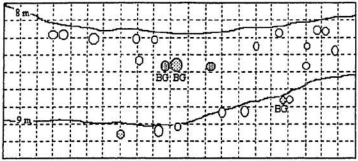
# Chapter 7
# Summary and Conclusions

As a means to understand the function of Phillip's Garden, it has been the design of this thesis to (1) separate out the different components of residency, and (2) to determine what archaeological patterns should look like for the different occupational events. This was achieved by establishing a chronological framework which utilized the radiocarbon dates from sixteen of the excavated houses. The number of houses which could have been simultaneously occupied at any time during the occupation was estimated from the comparison of these radiocarbon results.

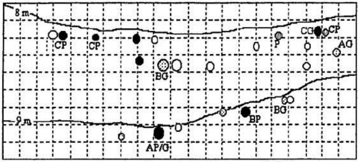
From this temporal analysis, it was then possible to determine when the site was most frequently inhabited at any point in time, and over time. Consequently, it was concluded that the number of concurrently occupied houses was low at the beginning of the occupation, and remained that way until about 1500 years ago. At that time, the occupation apparently doubled in size, peaking at 1350 years B.P.. Following this, the use of the site declined quite rapidly in the following 100 years, when the occupation of the site apparently ceased.

This temporal foundation was used as a framework to assess: (1) the spatial characteristics of the site; (2) the style of houses; and (3) differences and similarities of the artefact assemblages. To this end, it was possible to roughly determine what was happening at Phillip's Garden over time,

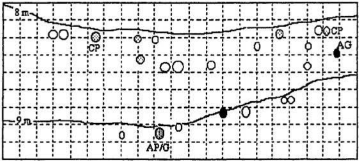
# Figure 7.1
## Location, Permanence and Function of Houses Over Time




Occupation at 1750 years B.P.




Occupation at 1350 years B.P.




Occupation at 1200 years B.P.

Probability of Occupation
- Unoccupied
- Low (up to 10%)
- Medium (10 to 30%)
- High (over 30%)

% of Organized Space
- A >70%
- B 65 to 70%
- C <65%

Function
- P Processing / Procurement
- G Generalized / Fabrication & Toolmaking

and in particular, during the peak and low periods of the occupation.

By assessing the location of the houses, as illustrated in Figure 7.1, it appears that the initial occupation, at about 1750 years B.P., originated at approximately the centre of the site, with the houses situated between eight and nine metres above sea level. During the period in which the greatest number of houses were simultaneously occupied, at about 1350 years B.P., the focus of occupation is located along the eight metre terrace. During the terminal phase of the occupation, at about 1200 years B.P., the location of houses is more scattered over the site, with houses situated over the two terraces.

Since it has been established that any portion of the site could have been occupied at any time during the occupation, it is concluded that the location of the houses is a likely indicator of function and seasonality. As such, it is argued that the majority of houses which were occupied during the peak period of house contemporaneity were occupied during open water seasons, since they are primarily located along the eight metre terrace, closest to the shore. While Harp (1976) puzzled over the lack of any chronological order to the location of the houses atop the beach ridges, it now seems apparent that the location of houses was probably ordered more according to season than to age.

The function of the site was also assessed in view of changes in house design over time. This analysis was based upon the assumption that certain aspects of house design may be indicators of social, cultural or economic change. Following this premise, the areas of the permanent structural components of each house were compared to the overall area of each house. Changes to these features over time were considered representative of differences in house function and/or social organization; the idea being that major variations in house design are likely to reflect long term change and larger group actions. Conversely, minor variations in house design are considered more reflective of short term change and individual endeavours.

Using this approach, an estimate of the relative permanency of the structures was made upon the assumption that houses which required a greater investment in time and energy for their construction were characteristic of any or all of the following: (a) cold weather occupation; (b) longer periods of occupation; and (c) intended house reoccupation.

Upon examining the results of this analysis over time, it appears that houses were generally less permanent during the time in which the greatest number of houses were simultaneously occupied. That is, these houses tended to have less clearly defined internal structure. Likewise, houses tended to be more permanent during periods at the beginning and the end of the occupation in which fewer houses were concurrently occupied. Consequently, it was argued that differences in permanency of occupation are likely to reflect the function of the site. This argument was further explored by assessing house functions via the artefact assemblages of each house.

Using the multivariate statistical technique known as Correspondence Analysis, the total artefact assemblage from each house simultaneously compared. As such, it was possible to make some interpretations regarding house functions by assessing the relative similarities and differences between the houses and tool assemblages. When these results were compared over time, it was found that the procurement and processing activities were predominant during the period in which the greatest number of houses were concurrently occupied. During periods of lower potential house contemporaneity the range of house functions appeared to be wider, including fabrication processes, toolmaking and generalized activities. As such, it is concluded that the use of the site was most specialized and the least permanent when the greatest number of houses were simultaneously occupied.

To relate this information back to the Residency Model as outlined in Chapter 1, there is strongest evidence for a Regular Seasonal Occupation during the period of highest potential house contemporaneity. During this period the houses are structurally and functionally similar, and are generally situated along the lower terrace, nearest open water. This is consistent with Renouf's current interpretation of the site as a spring seal hunting spot (Renouf 1993:59). Beyond this main function, Renouf (pers. comm.) had interpreted the other activities at Phillip's Garden only as "noise". However, put into chronological perspective, the "noise" becomes more understandable when the occupations of the site are interpreted over time.

Variations in seasonality also suggest that a Varied Seasonal Occupation was possible at the beginning and the end of the occupation. It is during these periods that Phillip's Garden seems to have been occupied much less regularly, and for a wider range of uses. The combination of houses along both of the terraces also suggests a wider range of seasonality which is consistent with this type of occupation.

It could also be argued that there is evidence for a Shifting Seasonal Occupation during periods when occupation of the site was less regular. However, the high proportion of seal remains, and the lack of all else, strongly suggests that residency during these periods also occurred as a consequence of the seal hunt. As such, there is little evidence for this type of occupation.

As a Meeting Place, Phillip's Garden seems to have been well-suited during a Regular Seasonal Occupation when there were the greatest number of concurrently occupied houses. Since the peak periods of potential house contemporaneity correspond to processing and procurement activities, this would also well-afford population aggregations for social purposes as it would make it economically feasible.

To summarize, three gross phases of occupation at Phillip's Garden can be recognized. First, there was an initial phase of slow growth with varied function. This was followed by the period of rapid growth, with increased house contemporaneity, and a narrower range of functions. The terminal phase of the site had less house contemporaneity, and a wider range of functions.

From this research, I have observed that the patterns over time are strongest during the period in which the greatest number of houses were simultaneously occupied. Furthermore, it is concluded that during this period: (a) the use of the site was most consistent; (b) houses were less permanent; and, (c) aggregation was possible, if not likely. Conversely, the archaeological evidence from the beginning and end of the occupation deviates from these patterns. It is during these periods in which fewer houses were simultaneously occupied that: (a) site function was wider in scope and; (b) the occupation appeared to be more permanent.

Finally, by offering a method which separates some of the temporal and functional strands of evidence, this work may have implications for the study of other large and complex sites. More specifically, I have demonstrated that what might appear as "noise" if viewed synchronically, may in fact be the "echo" of development over time when viewed diachronically.

# Appendix 1
# Summary of Radiocarbon Dates from Phillip's Garden

| Lab # | Provenience | Description | C14 Dates Uncalibrated | Years B.P. Calibrated |
|---|---|---|---|---|
| P-676 | House 5 | Charcoal from SW quadrant at a depth of 6" | 1502 ± 49 | 1410-1323 |
| P-678A | House 6 | Charred fat from house center at a depth of 6" | 1986 ± 51 | 1579-1480 |
| P-679 | House 6 | Charcoal from 2 samples taken from quadrant "D" at a depth of about 24" | 1623 ± 47 | 1547-1417 |
| P-682 | House 2 | Charred fat collected 4" below surface, suspected contamination of sample | 1859 ± 50 | 1440-1324 |
| P-683 | House 2 | Charcoal from SW quadrant 5" below surface and rock | 1593 ± 49 | 1533-1406 |
| P-692 | House 2 | Charcoal from a depth of 8" in Quadrant "B" | 1736 ± 48 | 1704-1558 |
| P-693 | House 2 | Charcoal from a midden at a depth of 15" | 1659 ± 48 | 1603-1517 |
| P-694 | House 10 | Charcoal from a depression 10-15" below surface | 1602 ± 49 | 1536-1409 |
| P-695 | House 10 | Charcoal from a depth of 8.5" suspected root contamination | 1712 ± 40 | 1692-1545 |
| P-696 | House 11 | Charcoal sample | 1509 ± 47 | 1412-1331 |
| P-727 | House 4 | Charcoal from 3-4" below a rock layer in front center area of the house | 1580 ± 54 | 1529-1400 |
| P-729 | House 12 | Charred wood sample | 1538 ± 55 | 1508-1346 |
| P-730 | House 12 | Charred fat sample | 1886 ± 46 | 1482-1353 |

| Lab # | Provenience | Description | C14 Dates Uncalibrated | Years B.P. Calibrated |
|---|---|---|---|---|
| P-731 | House 13 | Charred fat sample | 1891 ± 56 | 1497-1349 |
| P-732 | House 15 | Charred fat sample | 2294 ± 51 | 1944-1830 |
| P-733 | House 16 | Charcoal sample | 1565 ± 53 | 1523-1359 |
| P-734 | House 17 | Charcoal sample | 1465 ± 51 | 1395-1300 |
| P-735 | House 17 | Charred fat sample | 1817 ± 51 | 1391-1292 |
| P-736 | House 18 | Charcoal sample | 1683 ± 49 | 1684-1528 |
| P-737 | House 20 | Charcoal sample | 1321 ± 49 | 1289-1178 |
| Beta 15379 | 7A284D284 | From level 2A, a bone filled pit from a central depression of Feature 1 | 1850 ± 110 | 1885-1621 |
| Beta 15381 | 7A323A211 | Level 2 of midden Feature 2 | 1570 ± 70 | 1532-1354 |
| Beta 15638 | 7A323A540 | A possible dumped hearth low in Level 2 of Feature 2 | 1920 ± 110 | 1981-1715 |
| Beta 15639 | 7A284C92 | Feature 4, a charcoal stained deposit from level 3, over top of Feature 1 | 1250 ± 60 | 1266-1069 |
| Beta 19084 | 7A324D1118 | From a charcoal sample in Feature 2T, probably more recent in dump sequence which comprises midden | 1520 ± 90 | 1519-1309 |
| Beta 23976 | 7A294A142 | From levels 3 and 4 of Feature 19, a possible hearth in Feature 14 | 2140 ± 100 | 2310-1986 |
| Beta 23977 | 7A294A535 | Level 4, near pit Feature 18 within Feature 14 | 1970 ± 60 | 1981-1835 |

| Lab # | Provenience | Description | C14 Dates Uncalibrated | Years B.P. Calibrated |
|---|---|---|---|---|
| Beta 23978 | 7A324D1058 | From Feature 2U, a dumped hearth in the lowest part of midden Feature 2 | 1900 ± 110 | 1946-1706 |
| Beta 42967 | 7A250A47 | An amalgamation of nine samples taken from level 2A of Midden Feature 49 | 1890 ± 90 | 1925-1710 |
| Beta 42968 | 7A295D301 | An amalgamation of twelve samples from Level 2A of midden Feature 52, north of house Feature 14 | 1770 ± 120 | 1826-1534 |
| Beta 66435 | 7A368C743 | Level 2, central area of the house Feature 55 | 1410 ± 100 | 1388-1265 |
| Beta 66436 | 7A368D79 | Midden Feature 73, associated with house Feature 55 | 1370 ± 90 | 1333-1184 |

Source: Renouf (pers.comm.)

# Appendix 2
# Pair-wise Test for Contemporaneity

A. Given two radiocarbon dates:

(1) 1400 B.P. ± 100 and (2) 1250 B.P. ± 90

B. Is there a difference between these radiocarbon dates, or can the difference be accounted for by statistical error?

C. Statistical Hypotheses:

$$H_0: \mu_{(1)} = \mu_{(2)}$$

$$H_1: \mu_{(1)} \neq \mu_{(2)}$$

D. Region of rejection: For a two tailed test at $\alpha = 0.05$, and with infinite degrees of freedom, $t_{0.05} = 1.96$.

E. The Standard Error of the difference between the sample means is calculated:

$$\text{Standard Error} = \sqrt{100^2 + 90^2} = 134.5 \text{ years}$$

G. The Student's $t$ ratio is calculated:

$$t = (1400-1250) - (100-90) \div 134.5 = 1.04$$

H. Since $t = 1.04 < t_{0.05} = 1.96$, $H_0$ is not rejected.

I. Thus it can be concluded that the difference between the two dates is not significant, and that the radiocarbon results could be representative of a contemporaneous event.

Adapted from Thomas (1986).

# Appendix 3
## Dates Compared to A Fixed Age as a Test for Contemporaneity

A. Given one radiocarbon date and a fixed age:

(1) 1400 B.P. +/-100 and (2) 1200 B.P.

B. Is the difference between the radiocarbon date and the fixed age a true difference, or can it be accounted for by statistical error?

D. Statistical Hypotheses:

$H_0$: $\mu$ = 1200 B.P.

$H_1$: $\mu \neq$ 1200 B.P.

E. Region of rejection: For a two tailed test at $\alpha$ = 0.05, and with infinite degrees of freedom, $t_{0.05}$ = 1.96.

F. The Student's $t$ ratio is calculated:

$$t = (1400-1200) \div 100 = 2.00$$

G. Since $t = 2.00 > t_{0.05} = 1.96$, Hypothesis$_0$ is rejected.

H. Thus it can be concluded that the difference between the radiocarbon date and the fixed age is significant, and that there is no potential for contemporaneity.

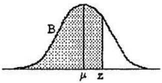
Adapted from Thomas (1986).

# Appendix 4
# Estimating Contemporaneity with an Assumed Length of Reoccupation

A. Given a radiocarbon date: 2040 ± 120, and a reoccupation interval of 50 years, calculate the probability that this date is contemporaneous to the date 2200 B.P.

B. Thus: $x=2040$, $\sigma=120$, $L=50$, $t=2200$ and $d=t-x$

C. The values for $\Phi$ (Area B under a Standard Normal Curve) and $\varphi$ (*y* ordinate at *z* of the Standard Normal Curve) are derived from an Areas and Ordinates Table (Thomas 1986:487-496).




D. The probability is calculated:

$$p(t|x) = \Phi\ ((d+L) + \sigma) - \Phi\ ((d-L) + \sigma)$$

$$+\ d+L\ [\Phi\ ((d+L)+\sigma) - 2\ \Phi\ (d+\sigma) + \Phi\ ((d-L) + \sigma)]$$

$$+\ \sigma+L\ [\varphi\ ((d+L) + \sigma) - 2\ \varphi\ (d+\sigma) + \varphi\ ((d-L + \sigma)]$$

$$= 0.069$$

E. This calculation must be repeated for every radiocarbon date which is to be compared to 2200 B.P. The sum of the resulting probabilities = the number of contemporaneous houses at that date:

$$N(t) = \sum_{i=1}^{n} p(t|x)$$

F. If this test is carried out for a number radiocarbon samples, at a series of fixed dates, the number of contemporaneous houses at a chosen reoccupation interval can be estimated.

Adapted from Helskog & Schweder (1989)

# Appendix 5
# ContemPro Computer Program

Attached to the back cover of this document is a diskette containing a copy of the DOS-based ContemPro (Version 1.0) program. The recommended minimum system requirements are 640K, and 386 or better. Maximum performance is achieved with a math co-processor. Note: while ContemPro will operate on lesser systems, it runs very slowly!

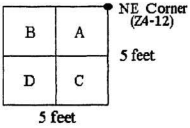
ContemPro is a program that performs calculations which are required to estimate potential house contemporaneity from radiocarbon dates. It is based upon a technique developed by Knut Helskog and Tore Schweder, as described in American Antiquity 63 (1989):166-72. While prior knowledge of their paper is not required to make use of this program, it provides useful information regarding the basis, utility and limitations of this technique.

ContemPro is a simple to use interactive menu-based program. Instructions for use of the program are provided by way of the main menu. To start ContemPro, place the program diskette in the drive, type C at the DOS prompt, and then press Enter.

# Appendix 6
# Harp's Excavation Grid System

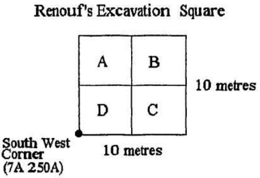
Harp's initial survey of Phillip's Garden consisted of a grid measured by stakes at 50 foot intervals. Within this framework, he set up an excavation grid based on five foot squares. These five foot squares were numbered alphabetically in the east west direction, and numerically in the north south direction. Each five foot excavation square was designated by the stake located in the north east corner. Each square was further subdivided into quadrants: "A" the north east; "B" the north west; "C" the south east; and "D" the south west. Artefacts were sorted by excavation grid and quadrant. See diagram below for further information.

Harp's Excavation Square



# Appendix 7
# Renouf's Excavation Grid System and the Parks Canada Provenience System

Renouf's survey of Phillip's Garden Grid consists of a grid measured by 10 metre square intervals along a datum line which bisects the site from east to west. The initial datum point is numbered E0 N0 (Renouf 1985:39a). Each 10 metre square is numerically labelled using the Parks Canada Provenience system (from 7A201 to 7A379). Each operation is divided into four $5m^2$ suboperations on a quadrant basis. Quadrant "A" the north west; "B" the north east; "C" the south east; and, "D" the south west. Locations within the quadrants are further defined by the distance between the south west corner of the quadrant to the E0 N0 Datum. See the diagram below for further information.



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