UNIVERSITY OF SOUTHAMPTON

Pottery production during the post Saladoid period (c. AD 600-1500) on the island of Nevis, Eastern Caribbean.

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ABSTRACT

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POTTERY PRODUCTION DURING THE POST-SALADOID PERIOD (c. AD 600-1500) ON THE ISLAND OF NEVIS, EASTERN CARIBBEAN.

by Julie Ann Cathie

This thesis examined the production of pottery during the post-Saladoid (late prehistoric) period on Nevis focusing predominantly on two sites, Coconut Walk and Indian Castle. Three questions were addressed:

- Is the pottery found at Coconut Walk and Indian Castle on the island of Nevis manufactured from locally available resources?
- If it is not all local then where did the pottery originate from and was the movement of pottery vessel specific?
- To what extent are these assemblages from Nevis similar or different to one another?

Through the use of petrological analysis it was determined that all of the sherds analysed from Coconut Walk and Indian Castle were produced from material locally available on the island of Nevis. The second question was answered by the fact that no evidence was discovered to suggest that any of the vessels were produced on another island and brought to Nevis. The form and fabric of vessels analysed from the sites of Coconut Walk and Indian Castle were found to share a great many similarities possibly suggesting that either pottery was produced at one site and distributed to others or that potters were in close contact with one another sharing ideas about pot making and the raw material resources. This work was then placed in its wider context by comparing the Nevis assemblages with assemblages from other Leeward Islands as well as briefly examining the transition between the Saladoid and post-Saladoid periods.

This research represents the first comprehensive programme of petrological analysis as well as the first in depth analysis of post-Saladoid pottery assemblages ever undertaken on the island of Nevis.

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Chapter 1: Introduction

The Caribbean archipelago spans over 2,000 miles and is made up of hundreds of islands. These islands are located between the coasts of South America, Central America and Florida in North America and have been split into three main geographical regions, the Bahamian archipelago, the Greater Antilles, which stretch from the Yucatan peninsula to the Virgin Islands and the Lesser Antilles, which extend from the Virgin Islands to the north coast of Venezuela in South America (see figure 1). The Lesser Antillean chain of islands separate the Atlantic Ocean from the Caribbean sea and stretch some 430 miles from Sombrero in the north to Grenada in the south. The chain is further divided into the Windward Islands, from Grenada in the south to Dominica in the north, and the Leeward Islands, which include those islands between Guadeloupe in the south and St. Martin in the north (see figure 2). It is the Leeward Islands that form the particular focus of this research.

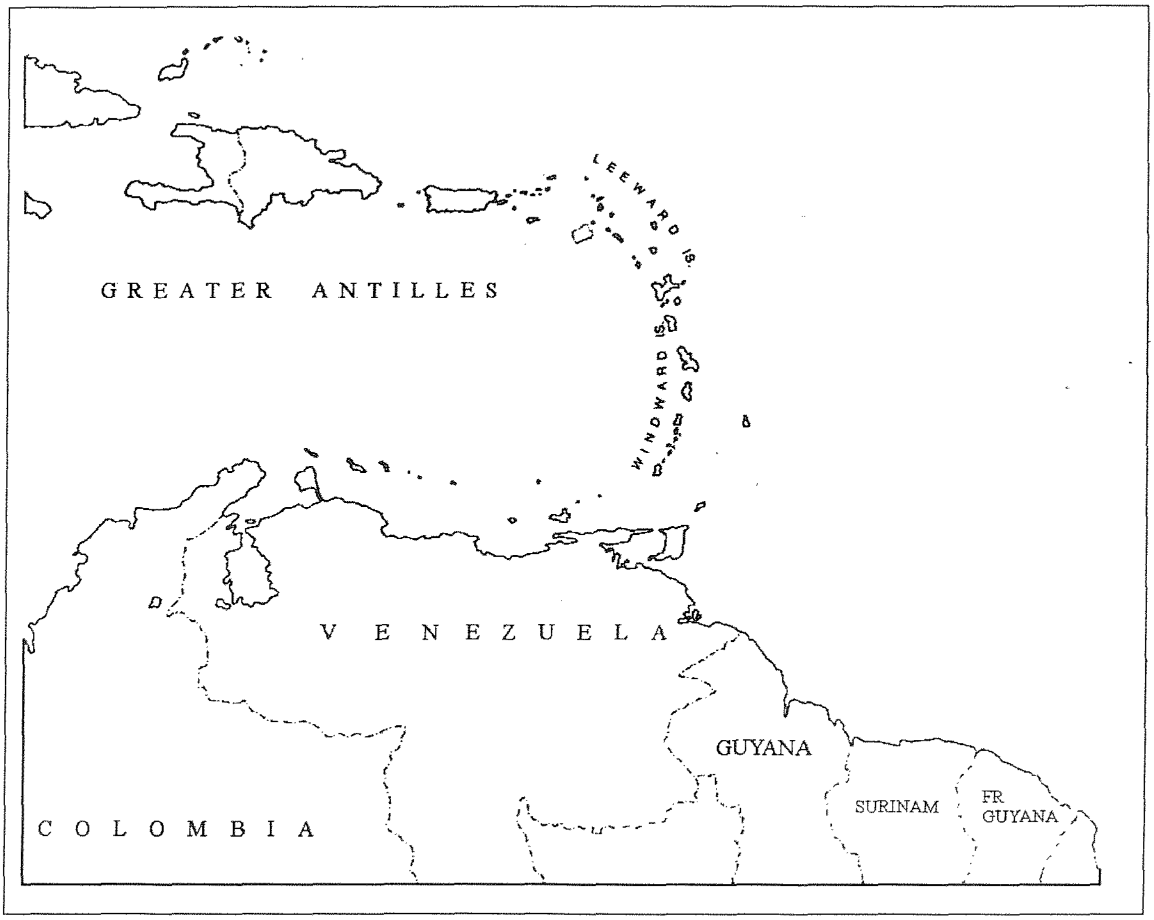

Figure 1: Map of the Caribbean

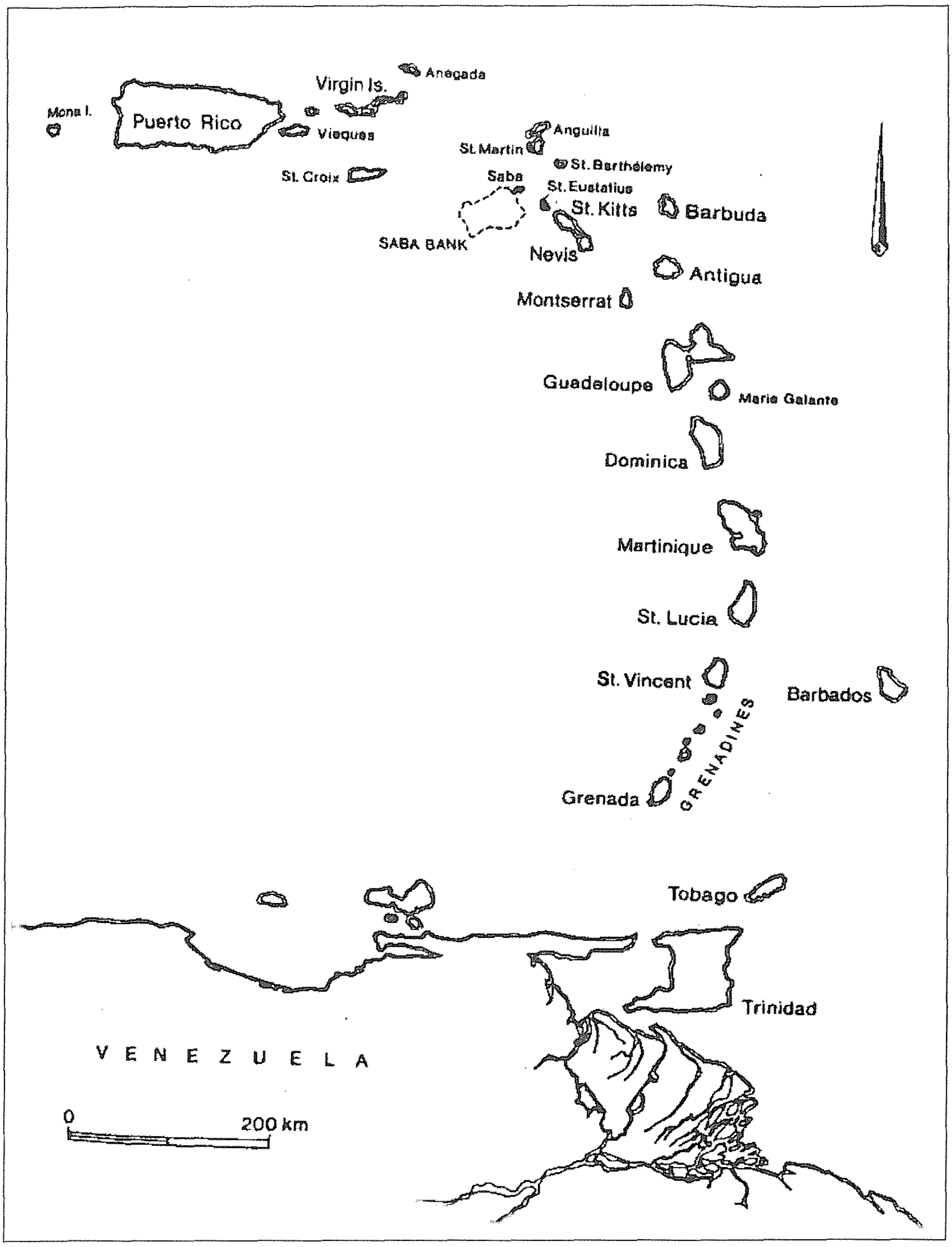

Figure 2: Map of the Lesser Antilles

The Caribbean islands were first colonised some 6,000 years ago and a considerable amount of movement and interaction has occurred throughout the archipelago during this time frame. The prehistory of the region has been divided into three broad periods, the archaic or pre-ceramic period (c. 4,000 – 1,000 BC), the Saladoid period (c. 500 BC – AD 500/600) and the post-Saladoid (c. AD 500/600 – 1500). The latest of these three periods, the post-Saladoid, is the time frame focused upon in this work.

Societies on different islands in the Caribbean region appear to change and develop at different rates and in some instances along different trajectories. The chronology of the region is based almost predominantly on the ceramic record. The first occurrence of pottery in the Caribbean divides the archaic period from the Saladoid period and changes in pottery style have been taken to indicate changes in the people present in the islands. The catalyst for these changes are either thought to represent the movement of groups of people from the mainland to the Caribbean Islands, or influences from the mainland as a result of sustained contact between the people of the Caribbean region and South America. In particular it is the type of decoration applied to vessels that has been used to distinguish changes in Caribbean prehistory.

The analysis of prehistoric pottery to date in the Caribbean region has been largely limited to answering questions about chronology and this has mainly been achieved through the analysis of the type of decoration applied to vessels. Little attempt has been made to address questions about the people that manufactured and utilised the pottery found at prehistoric sites. Pottery was produced and utilised for a wide variety of tasks and reasons some of the most obvious perhaps are those related to cooking, eating and drinking. It could be argued that the analysis of pottery is perhaps rather futile if it is not utilised to answer questions about the people that made and used it. Pottery is fundamentally useful in sorting out the chronology of a region however chronological questions are not the only ones that can be answered through pottery analysis. It is necessary now for Caribbean archaeologists to move beyond using pottery to answer just chronological questions and to begin creating more of a dialogue about the people who made the pottery, how it was used within society, and how that changed through time.

The aim of this research is to examine the production of post-Saladoid (late prehistoric) pottery from two sites, Coconut Walk and Indian Castle, on the island of Nevis. The research will address three broad questions:

- Is the pottery found at Coconut Walk and Indian Castle on the island of Nevis manufactured from locally available resources?

- If it is not all local then where did the pottery originate from and was the movement of pottery vessel specific?
- To what extent are these assemblages from Nevis similar or different to one another?

Other smaller assemblages from post-Saladoid sites on Nevis will also be discussed and in order to place this work in its wider context comparisons with post-Saladoid assemblages from other islands in the region will also be made. The transition between the Saladoid and post-Saladoid periods will also be touched upon, as during this transition there are changes in the type and quality of pottery being produced as well as wider socio-political changes.

Using the above questions to approach the analysis of post-Saladoid pottery will add a new dimension to the way in which ceramics have been studied during this time frame. These questions are elaborated on and discussed further in chapter three.

The purpose of this thesis is to outline the aims of this research and to place it in the wider context of work that has been so far conducted in the Caribbean region and to establish how this work on the post-Saladoid pottery from the Leeward Islands is unique and will increase the understanding of this subject area. Therefore the following chapter is concerned with outlining the prehistory of the Caribbean and the approaches thus far taken when studying ceramics in the Caribbean region. In chapter three the issues this research intends to address and how these approaches will add to what is already known will be outlined. The next chapter, chapter four, details the methodology used in this research for recording the assemblages of pottery and analysing them in the light of work carried out in the Pacific using attribute analysis. The fifth chapter outlines the use of petrology in this work and considers how petrology has been used to answer questions about ceramics in the Caribbean region to date. Chapter six and seven detail the results of work carried out so far on two assemblages from the island of Nevis, Coconut Walk and Indian Castle whilst chapter eight offers a comparison between the two sites and other smaller post-Saladoid assemblages from the island. A comparison of the Nevis post-Saladoid material and assemblages from other Leeward Islands is then made in chapter nine in order to place this work in its wider context. Finally chapter ten draws together the conclusions of this research and outlines further work that could be undertaken in the future.

Chapter 2: Prehistory of the Caribbean

2.1: Introduction

The Caribbean islands were first colonised some 6,000 years ago and during that time frame a considerable amount of movement and interaction throughout the archipelago has occurred (Wilson 1997:4). The Caribbean archipelago spans over 2,000 miles and is made up of hundreds of islands (Wilson 1997:3), it is therefore not surprising that the prehistory of the Caribbean region is complex and not yet fully understood.

The prehistory of the Caribbean region can be broadly divided into three major periods: the Archaic or pre-ceramic period, the Saladoid period and the Post-Saladoid period. The chronology of the Caribbean differs in various parts of the archipelago, perhaps the most noticeable differences occur between the Greater and Lesser Antilles. However societies on different islands within these broad geographic regions change and develop at varying rates. Therefore the three broad periods mentioned above can be further split into sub-divisions that differ depending on which part of the Caribbean archipelago is being focused upon.

The purpose of this chapter is to provide an outline of the prehistory of the Caribbean region and the archaeological work accomplished to date. The framework used for presenting this information follows that found in the literature. This has been adhered to in order to not only outline what is known about Caribbean prehistory but to show the ways in which it has been studied. The key themes that have received the majority of attention so far in prehistoric Caribbean pottery analysis will be discussed in the following chapter and the questions and approaches this research will address are also outlined. In this chapter particular attention will be paid to the prehistory of the Leeward Islands, with a separate section devoted to the prehistory of Nevis, and to the production of pottery through time in order to place this research in its wider context.

2.2: The Archaic or Pre-Ceramic Period

The origins of inhabitants and the timing of their initial arrival in the Caribbean region are widely contested in the archaeological literature. The hypotheses of migration movements into the region as discussed in the available literature will be outlined here and a consideration of those early inhabitants will be made.

The islands of Cuba, Haiti and the Dominican Republic in the Greater Antilles have yielded the earliest evidence of human occupation (Wilson 1997:4) and it has been proposed that the West Indies were initially settled during two waves of migration. The first wave of migrants are thought to have originated from the Yucatán Peninsula or other areas in Central America and to have made their way from the mainland via the mid-Caribbean chain of islands, which is now submerged, into the western end of the Greater Antilles, see Figure 1, in the previous chapter (Allaire 1997:21; Keegan 1995:407; Wilson 1989:430, 1997:4). A homeland of Central America is proposed on the basis of two factors, firstly the Casimiroid (name given to this wave of migrants) flaked-stone tools bear similarities to flaked-stone tools from sites on the Yucatán peninsula and secondly, no archaeological evidence has been located in the Lesser Antilles to suggest that the Casimiroid people spread that far (Wilson 1989:430; 1997:4).

The question of when these migrants first entered and started to settle in the Caribbean appears to be hard to answer at this stage. Some authors suggest an early date of c. 5,000 BC (Keegan 1995:407; Wilson 1989:430) whilst the majority of available radiocarbon dates belong to the period after c. 2,500 BC (Allaire 1997:21). One of the earliest known radiocarbon dates for the archaic period at present is that of 3,600 BC from the Vignier Site on Haiti (Allaire 1997:21). This date however was obtained from an unreliable context - a surface scatter of seashells, although it is consistent with a date from the Levisa site on Cuba of c. 3,100 BC (Allaire 1997:21). The Archaic occupation of Antigua in the Leeward Islands is thought to have ranged from as early as 2,800 BC until the beginning of the Saladoid period on the basis of radiocarbon dates obtained from various Archaic sites on the island (Davis 1993:690). On the basis of these dates it would appear that Antigua was the first of the Leeward

Islands to be inhabited. In time, however, this may not prove to be the case as more pre-ceramic sites are located and dated in this region.

A second possible migration is thought to have taken place some time before 2,000 BC (Keegan 1995:407; Wilson 1989:430, 1997:5). These people, known as the Ortoiroid (named after the Ortoire Site on Trinidad), are thought to have originated from the northeast coast of South America and to have moved up through the Lesser Antilles and into Puerto Rico, occupying many of the islands on the way (Wilson 1997:5; Allaire 1997:21). Allaire (1997:21,22) questions whether this migration actually occurred. He suggests that if another migration with a South American origin had occurred it would be expected that there would be more evidence from the Windward Islands, whilst in fact the majority of pre-ceramic sites are located in the Virgin Islands and the Leeward Islands, which are geographically closer to the Greater Antilles. On the basis of this argument Allaire suggests that the changes thus far attributed to a new influx of migrants from a South American homeland is perhaps more simply a result of locally occurring changes in the Greater Antilles (Allaire 1997:21,22). In response to Allaire's argument it is perhaps important to bear in mind that there are several factors that could explain the paucity of evidence for pre-ceramic sites in the Windward Islands. In comparison to the other major periods in Caribbean prehistory the Archaic has received less attention in terms of archaeological research. It could therefore be conceivable that the different frequencies of pre-ceramic site location between the Virgin and Leeward Islands and the Windward Islands could be attributable to differential amounts of research rather than a lack of occurrence of sites in the Windward Islands. Archaic sites are also prone to obliteration or concealment due to physiographic changes in topography; factors such as changes in relative sea level, volcanic activity and more recent land use severely limit the chances of locating pre-ceramic occupation (Armstrong 1980:156).

The first colonizers of the Caribbean region would have had to implement substantial changes in their methods of obtaining food as the islands' flora and fauna differed to that of the mainland (Wilson 1997:4). Therefore survival of each group of migrants that entered the Antilles was dependant on an adaptation of their economy to fit the island ecosystems (Wilson 1997:4). It is thought that both the Casimiroid and

Ortoiroid people did not practice horticulture and their economy was based primarily on the collection of coastal and shallow reef foods (Wilson 1989:430, 1997:4; Armstrong 1980:154; Davis 1982:116). Settlement location tended to be selected on the basis of proximity to exploitable resources. On the island of St. Kitts research by Armstrong has led to the conclusion that the archaic settlement pattern on the island fits a model of non-random distribution (Armstrong 1980:163). It is also apparent that site location was focused on coastal areas that provided protection and access to navigable waters (Armstrong 1980:163). In fact the pre-ceramic sites on St. Kitts, Nevis and St. Eustatius are all located near important reef locations (Versteeg *et al.* 1993:143). There also appears to be a deliberate selection of site location on the island of Antigua during this period. At least twenty-four archaic sites are known on the island and whilst all are located on or near the shore they are not evenly distributed along the coastline (Davis 1982:110). The majority of sites are located on the northern and western coast of the island and there is a correlation between site location and the distribution of shallow marine environments (Armstrong 1980:116). Proximity to these exploitable food resources and sources of flint used in tool manufacture seem to be prime factors in the location of archaic sites on the island (Armstrong 1980:116).

The archaic peoples were apparently competent ocean travellers. The fact that Ortoiroid sites are located throughout the Lesser Antilles is just one strand of evidence to support that fact. Sources of chert and flint used in the manufacture of their stone tools are only found on a number of islands (e.g. Antigua, Cuba, Hispaniola), yet the distribution of this material is diverse, suggesting the movement of these materials over considerable distances in some cases (Allaire 1997:21; Davis 1982:108, 1993:688; Wilson 1989:430, 1997:5). A midden excavated at the Sugar Factory Pier site on St. Kitts yielded some types of tools that were interpreted as those utilised in the canoe building process (Armstrong 1980:155). On what basis this interpretation was made is not stated.

The population sizes of the pre-ceramic inhabitants was never particularly large however non-agricultural groups remained in the Antilles for thousands of years until the arrival of yet another group of migrants from the South America coastline (Wilson 1997:5; Armstrong 1980:156).

2.3: The Saladoid Period

It would appear that most archaeologists are in agreement that the first horticultural peoples arrived in the Caribbean from the northeastern coast of Venezuela and the Guianas, sometime between 500 and 250 BC (Allaire 1997:22; Haviser 1997:59; Wilson 1989:430; 1997:5; Righter 1997:72; Rouse 1992:71). They originated from the Orinoco Valley and proceeded as far as Puerto Rico where they halted at the Ortoiroid-Casimiroid frontier (Allaire 1997:22; Haviser 1997:59; Wilson 1989:430; 1997:5; Righter 1997:72; Rouse 1992:71). These people brought with them a new subsistence system: agriculture, and new technology, primarily in the form of pottery production (Allaire 1997:22; Haviser 1997:59; Wilson 1989:430; 1997:5; Righter 1997:72). Froelich Rainey (1940) initially named this early population the Crab Culture on the basis of the large quantities of crustaceans in their diet. Rouse however renamed them Saladoid, on account of their ceramics rather than diet, after the site of Saladero in Venezuela (Righter 1997:72; Rodríguez 1997:81).

It is the ceramics produced by these new inhabitants that have largely been used to define the chronology of this period of prehistory. In particular it is the type of decoration used by Saladoid potters that has received the most attention and changes in decoration through time have often led to the creation of new sub-series for this period. Such changes in the ceramics occur at different times in different regions of the Caribbean.

Originally these new comers to the Caribbean possessed cultures belonging to the Ronquinan Saladoid sub series, however upon arrival at the South American coast a new sub series, the Cedrosan Saladoid, emerged which was carried into the Lesser Antilles (Rouse 1992:71). The Cedrosan Saladoid people had diverged into four regional lines of development by the middle of the ceramic age (Rouse 1992:71). One line of development was on the mainland, which included Trinidad and Tobago, a second was in the Windward Islands, a third in the Leeward and Virgin Islands and the fourth included the rest of the Greater Antilles and the Bahamian archipelago (Rouse 1992:71). On the mainland people belonging to the Barrancoid series succeeded the Cedrosan Saladoids, and these Barrancoid people were themselves superseded in turn by the people of the Arauquinoid and Guayabitoid series (Rouse 1992:72; Drewett & Harris 1991). The Windward Islands witnessed the evolution of several different cultures from the Cedrosan Saladoid to the Troumassoid, during the middle of the ceramic age, to the Suazoid in the latter stages (Rouse 1992:72; Allaire 1997; Wilson 1989:430). The Cedrosan Saladoid people in the Leeward and Virgin Islands jointly developed, with the Greater Antilles and Bahamian region a new Ostionoid series, locally referred to as Elenan (Rouse 1992:72; Curet 1996:118). Later in the ceramic age the Elenan cultures in the Virgin Islands and some of the northern Leeward Islands, in particular Saba, are thought to have been influenced by the Chican cultures of Puerto Rico and Hispaniola (Rouse 1992:72; Hofman and Hoogland 1991). In the Greater Antilles and Bahamian region the Cedrosan Saladoid inhabitants in Puerto Rico developed the Ostionian division of the Ostionoid series (Rouse 1992:73; Winter & Gilstrap 1990). They also advanced the Saladoid migration frontier to the eastern tip of Cuba (Rouse 1992:73). Two new sub series diverged through time, the Chican in their heartland and the Meillacan on the frontier, whilst a separate Palmetto people, who could be considered an offshoot of Ostionoid, emerged in the Bahamian Archipelago (Rouse 1992:73; Curet 1996:119; Winter & Gilstrap 1990).

RONQUINAN SALADOID

The Ronquinan population extended from the just above the juncture of the Orinoco River with the Río Apure to the top of the delta and radiocarbon dates for this sub series range from 2140 to 620 BC (Rouse 1992:75). It is thought that the Ronquinan Saladoid developed into the Barrancoid series in the lower-middle Orinoco Valley around 1500 BC, whilst the occupants of the upper middle and lower parts of the valley remained the same until around 1000 BC when the coastal part of the Ronquinan series developed into the Cedrosan Saladoid series (Rouse 1992:75).

The principle sites from the Ronquinan Saladoid series are located on the natural levees of the Orinoco River (Rouse 1992:75). The people of the Ronquinan Saladoid are thought to have practiced a slash and burn method of agriculture (Rouse 1992:75). Their pottery (see figure 3) was dominated by bell-shaped bowls decorated with red or white on red (WOR) painted geometric designs; wedge shaped lugs; modelled incised figures on lugs, handles and vessel walls, as well as sequences of curvilinear

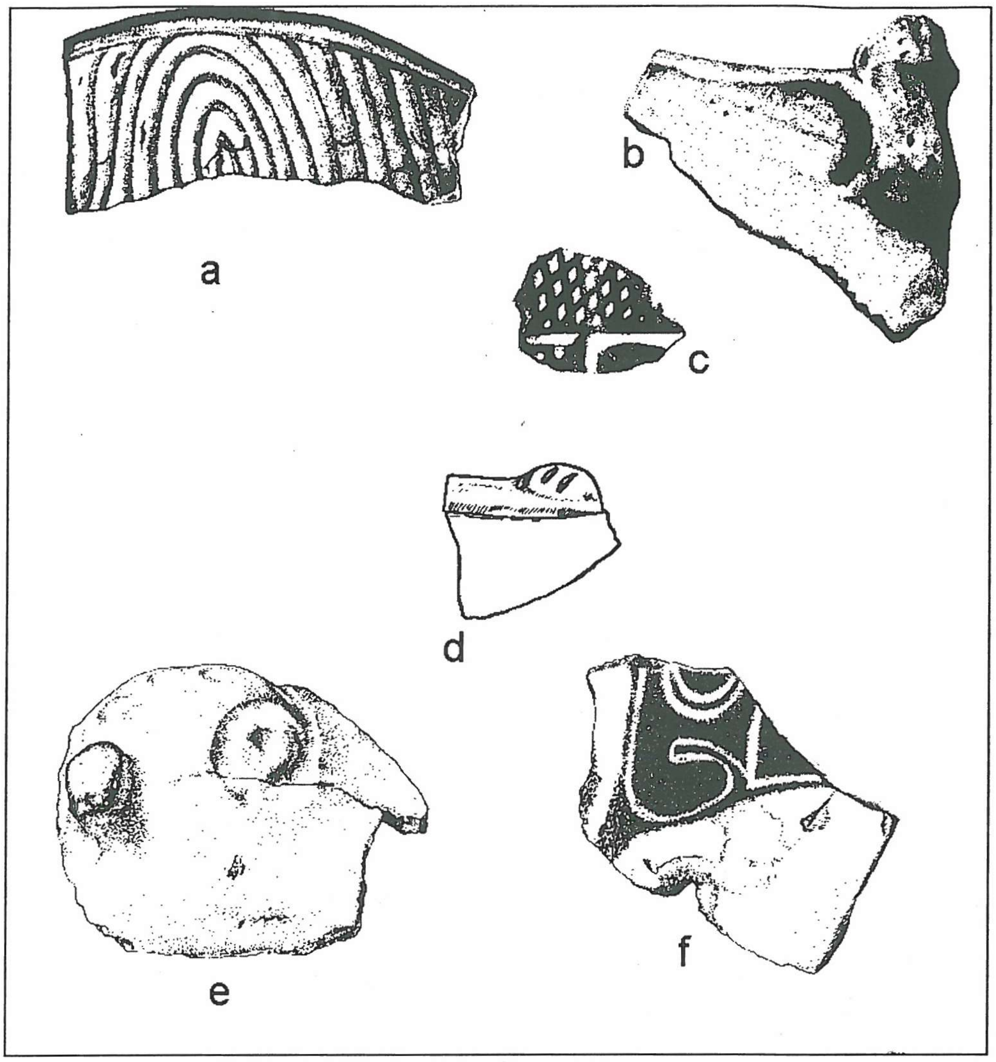

Figure 3: Ronquinan Saladoid pottery: *a,* curvilinear incision, *b*, strap handle with modelled lug, *c,* red-painted crosshatching, *d*, wedge shaped lug with incision, *e*, model incision and punctation, *f*, white-on-red painting (after Rouse 1992:76).

incised lines (Rouse 1992:75). Clay griddles are also present in these assemblages, however these were not supported over the fire by stones, as in later cases in the Caribbean, due to a lack of suitable stones being available, instead topias (baked clay cylinders) were used (Rouse 1992:76, 77).

CEDROSAN SALADOID

Some of the earliest cultural deposits containing Cedrosan Saladoid ceramics in the Caribbean have been radiocarbon dated to 560 BC at Hope Estate on St. Martin, 530 BC at Nancy, Martinique, 480 BC at Trants, Montserrat and 430 BC at Tecla, Puerto Rico (Haviser 1997:60-63; Righter 1997:72). The ceramics and material culture of the Cedrosan-Saladoid sub-series are widely distributed throughout the Caribbean region. The occurrence of Cedrosan-Saladoid artefacts extends along the north coast of South

America from the Wonotobo Valley in Suriname to Margarita Island in Venezuela and from Trinidad to the eastern tip of Hispaniola (Righter 1997:72).

Settlement Strategies / Spread of Saladoid people:

It has been suggested that the early Saladoid colonizers spread rapidly across the Antillean archipelago, perhaps in the space of under two hundred years, from Trinidad to eastern Hispaniola (Allaire 1997:23; Haviser 1997:68). It would appear that the earliest settlers focused their attention on eastern Puerto Rico and the northern Lesser Antilles (Haviser 1997:68). They also expressed a preference for settling on the northeast coast of individual islands at sites where fresh water and good horticultural soils were available (Haviser 1997:68; Rouse 1992:79). During the first centuries AD widespread colonization on every island in the Lesser Antilles had begun, with a shift in focus to the southern coast of these islands. Site location continued to be influenced by the occurrence of good soils and fresh water with a greater emphasis on coastal, rather than inland, resources (Haviser 1997:68).

The site of Golden Rock, which dates from the close of the Cedrosan Saladoid period, on St. Eustatius in the Leeward Islands, has yielded evidence of postholes from two small circular houses that were superseded by a larger circular structure (Versteeg & Schinkel 1992). Towards the centre of the site a small rectangular building has been identified. Behind this structure and in front of the circular structures a ceremonial area has been identified containing burials (Versteeg & Schinkel 1992). To the rear of the structures were mounded middens and other less well-prepared burials (Versteeg & Schinkel 1992).

A central burial ground surrounded by a ring of mounded middens has been discovered at the early Cedrosan Saladoid site at Maisabel in Puerto Rico. Beneath the middens traces of structures have been located, however it has not been possible to determine their shape. Grave goods revealed no sign of differentiation in rank or wealth of the deceased and it has been suggested that the central area could have functioned as a dance and ball ground. It has been concluded that this was a sacred place around which the daily and ritual life of the inhabitants revolved (Rouse 1992:80). At other later Saladoid sites, such as Punta Candelero, Tibes, and Poncé archaeologists have found specific areas that were used to bury the majority of these communities' dead (Rodríguez 1997:84). At all of these sites the central plaza of the town was selected as the burial site (Rodríguez 1997:84). Sites from the early phase of the Saladoid tend to lack such cemeteries indicating a possible differentiation between the early and late Saladoid in the way communities treated their dead (Rodríguez 1997:84).

Eighty per cent of the bodies uncovered at the cemetery site of Punta Candelero, Puerto Rico, were found buried in a squatting position (Rodríguez 1997:82). A number of the bodies were interred with grave goods including pottery, objects of personal use and food (Rodríguez 1997:83). Rodríguez suggests that the presence of such grave goods hints at a belief in an afterlife or reincarnation (Rodríguez 1997:83). Goods that are commonly associated with burials dating to the Saladoid period include amulets, necklaces, strings of stone beads and celts (Rodríguez 1997:83).

It is important to mention here that not all islands were extensively settled during this period. Certain island environments were favoured above others, particularly the higher, wetter islands such as Puerto Rico and those in the Virgin Islands and the Lesser Antilles, whilst most of the larger islands in the Greater Antilles were never settled by Saladoid people (Peterson 1997:120; Rouse 1992:79). The restriction of Saladoid settlement in parts of the Greater Antilles may have been a result of cultural factors, such as opposition from resident pre-ceramic groups, rather than environmental factors (Peterson 1997:120). Islands favoured for settlement by early farmers included Guadeloupe, Martinique, St. Lucia and Grenada in the Windward Islands and St. Martin, St. Eustatius, St. Kitts, Nevis and Montserrat in the Leeward Islands due to the rich soils of these higher volcanic islands (Peterson 1997:120; Rouse 1992:79). Lower, drier, less fertile islands such as Anguilla and Barbuda appear to have been largely bypassed (Peterson 1997:120; Rouse 1992:79).

Subsistence:

With the arrival of the Saladoid people there is thought to be a shift from the subsistence strategies practiced by pre-ceramic populations to an economic system dependent more on horticulture (Peterson 1997:120). The Saladoid people brought with them dogs and the agouti as well as a number of domesticated plants from the mainland, manioc in particular was a staple crop of the Caribbean (Wilson 1997:5;

Wing & Reitz 1982:13). Their subsistence was based on the collection of shellfish, fishing and the hunting of other small mammals and reptiles available on the islands such as the rice rat, agouti, iguana and sea turtle (Allaire 1997:23). Crab was also probably a major nutritional component of the Saladoid diet (Allaire 1997:22; Peterson 1997:123; Wilson 1997:5).

On the island of St. Kitts the faunal remains have been analysed from two Saladoid sites, Sugar Factory Pier and Cayon. The terrestrial species most abundantly represented was that of the native rice rat and the ameiva lizard (Wing & Scudder 1980:237). Mackerel and tuna were frequently caught in the pelagic waters close to the surface; parrot fishes, surgeon fishes and wrasses were found in shallow water reefs; whilst grouper, jack and grunt were caught in deep water reefs (Wing & Scudder 1980:237). The grouper was the most abundantly represented species from the deep water reefs found in the archaeological record (Wing & Scudder 1980:238). Molluscs and crabs were also found in abundance and are assumed to have played an important role in the prehistoric subsistence economy (Wing & Scudder 1980:238,239). At the Sugar Factory Pier site it has been recorded that there was a slightly greater dependence on terrestrial species, in particular the rice rat, and shallow reef species such as the parrotfish in the early faunal material, which was followed by a shift in emphasis to pelagic species, especially tuna, and deep reef species (Wing & Scudder 1980:238). At the inland site of Cayon terrestrial species such as the rice rat and doves were exploited to a greater extent than at the Sugar Factory Pier site (Wing & Scudder 1980:238). Pelagic and deep reef species were also represented at the Cayon site (Wing & Scudder 1980:238).

The occurrence of clay griddles in the archaeological record has often been cited as evidence for the introduction of agriculture to the region (Rouse 1992:84; Allaire 1997:21). Griddles are thought to have been used to make a type of bread known as 'cassava' made from the root plant Manioc (Winter 1978:231; Righter 1997:75). The white flesh of the Manioc tubers is grated and the juice, which can be poisonous, is extracted and the resulting pulp is cooked on the round clay griddles over a fire (Winter 1978:231; Righter 1997:75).

Pottery:

The pottery of the Cedrosan Saladoid (figure 4) is characterized by two methods of decoration, that of white-on-red painted ware (alternatively known as painted or wor-ware) and zone incised crosshatched ware (or zic ware) (Allaire 1997:22; Righter 1997:73; Rouse 1992:81). Rouse (1992:81) points out that whilst the names of these two wares are based on decorative techniques each is also characterised by differences in the materials used, technology and shape. Painted wares are common in Cedrosan assemblages and it would appear that this style is derived from the pottery used by the people of the Ronquinan Saladoid (Rouse 1992:81).

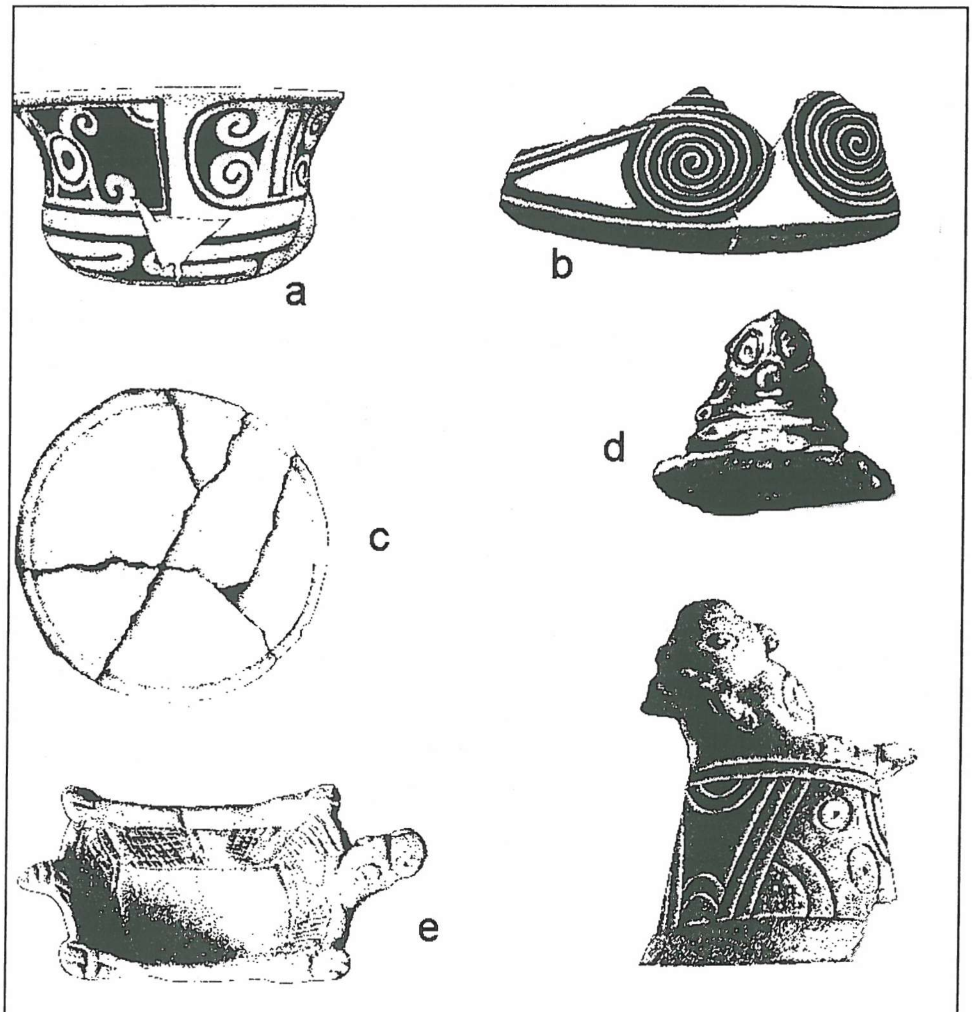

Figure 4: Cedrosan Saladoid pottery. *a*, white-on-red bowl, *b*, red slip with curvilinear incision overlaid with white paint, *c*, griddle, *d*, modelled-incised head lug, *e*, turtle shaped bowl with zic incision, *f*, incense burner showing Barrancoid influences. (after Rouse 1992:82).

Pottery from this period has been described as being technologically fine, delicate and graceful and that to execute the painted decoration, which follows rigid and complex rules of composition and symmetry, probably required a difficult apprenticeship (Allaire 1997:24). Painted wares are characterised by bell-shaped bowls with plain or flanged rims and a light coloured paste. In addition to white-on-red and red-painted decoration polychrome designs utilising orange or black paint are found (Rouse 1992:81).

Zic ware is similar to painted ware in that flanged rims, D-shaped handles and modelled incised lugs are utilised, however the common vessel form is a hemispherical bowl made of a darker paste. Painted designs are replaced by fine-line zic decoration and broad-line rectangular incised designs (Rouse 1992:83; Righter 1997:73). Other forms of decoration include modelled incised designs on the rim or handles of vessels often displaying zoomorphic or anthropomorphic designs (Rouse 1992:81; Righter 1997:73; Allaire 1997:22). It has been postulated that the decoration of Saladoid vessels could reflect a symbolic means of communication or a marked attempt to strengthen a group identity and ethnic affiliation, for example membership of a Saladoid social unit (Hofman 1995:236).

Ceramics played a significant role in the ritual life of the Saladoid people. It is thought that the myths and beliefs of South America may have existed for a time in the Caribbean but that these were changed, for example with a scarcity in the islands of large land mammals, native amphibians, fish, reptiles and birds acquired more symbolic relevance (Rodríguez 1997:86). Saladoid potters often portrayed sacred animals, fantastical creatures and personages on their vessels and the bodies and heads of zoomorphic and anthropomorphic figures were often used to adorn effigy vessels (Rodríguez 1997:84). Religious paraphernalia is abundant in Saladoid sites, especially those associated with the Huecan Saladoid (Rodríguez 1997:86). A great variety of containers are found at Huecan sites that were designed for inhaling substances or ingesting special beverages (Rodríguez 1997:86) and in the early part of the Saladoid period snuffing vessels used in rituals involving hallucinogens were particularly common (Curet 1996:118).

The Cedrosan Saladoids also used clay griddles. In the same manner as the Ronquinan they used clay cylinders to support their griddles over the fire and it was not until the Cedrosan Saladoid was drawing to a close that these cylinders were replaced by the use of stones (Rouse 1992:84).

La Hueca Debate:

Studies of the ceramics produced during the Saladoid period have identified a number of different distinctive styles, which tend to be defined on the basis of differences in the type of decoration applied to a vessel. Three basic views have been proposed to explain these variances (Haviser 1997:59). One suggestion is that the use of zone-incised crosshatching is separate from the use of white-on-red painting in the early phase of this period and that this is indicative of a pre-Saladoid or parallel Saladoid migration of different people from north-central Venezuela. This phenomenon has been named Huecoid, after the La Hueca/Source site on Vieques, or Guapoid after the Rio Guapo site in Venezuela (Haviser 1997:59). The second view is that the early styles of decoration, which did not involve painting, such as zoned-punctuation, represent a horticultural group that probably originated from the Guianas. It has been postulated that this group, known as the Early Ceramic, were older than the Saladoid and formed a transitional stage between the archaic and ceramic levels (Haviser 1997:59). The third proposal is that the different styles reflect plurality within the Saladoid group itself, possibly a reflection of different sub-groups of the population (Haviser 1997:59). On the basis of this suggestion the Saladoid has been divided into the Huecan-Saladoid and the Cedrosan-Saladoid. The Huecan-Saladoid is more typically associated with the zone-incised crosshatching form of decoration whilst the Cedrosan-Saladoid tends to be rather associated with white-on-red painted decoration (Haviser 1997:59,60; Righter 1997:74).

Rouse (1992:85) suggests that when the Cedrosan Saladoid people reached the Leeward Islands they were faced with a choice of two routes. The first route proceeded along the line of islands on the Atlantic side from St. John to St. Thomas in the Virgin Islands and on to the northern coast of Puerto Rico (Rouse 1992:85). The alternative route followed the line of islands located along the Caribbean side from St. Croix to Vieques to the eastern coast of Puerto Rico (Rouse 1992:85). Rouse postulates that Cedrosan migrants along the Atlantic route diversified in the Hacienda

Grande culture whilst migrants taking the Caribbean route diverged into the La Hueca people (Rouse 1992:102). These two cultures are thought to have emerged at around the same time and in terms of subsistence and settlement patterns differ little from one another (Rouse 1992:86). Artefacts, for example snuffing vessels, simple carved stone pendants and three pointers, found at sites from both cultures are similar (Rouse 1992:86). However the pottery from the La Hueca culture lacks painted wares whilst both painted and zic wares are present in Hacienda Grande assemblages (Rouse 1992:86).

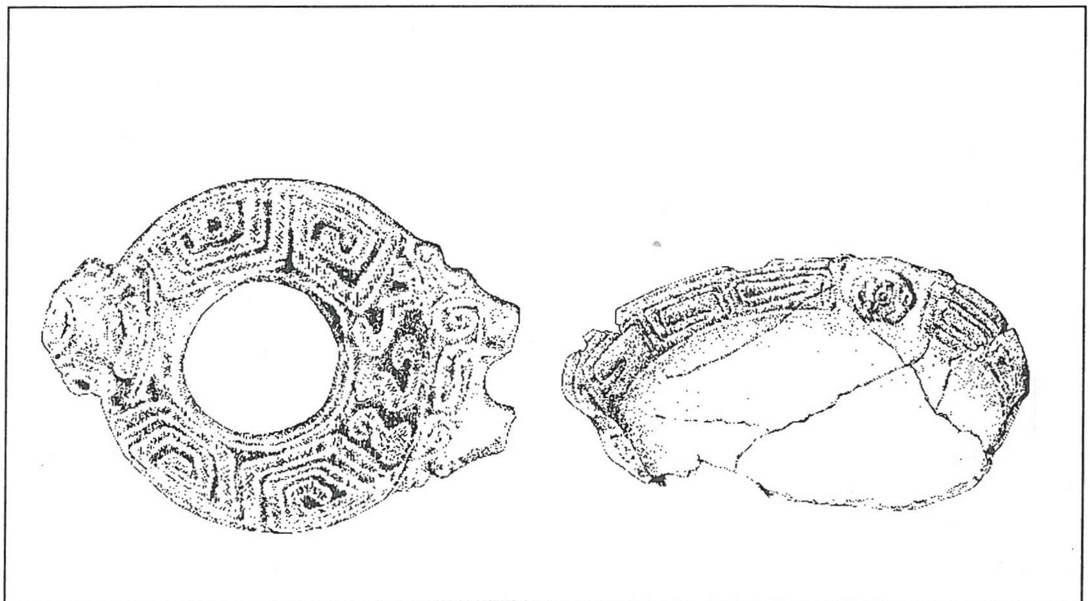

Figure 5: La Hueca artefacts: *left*, small bowl with modelled head lug at one end and a pair of snuffing tubes at the other, *right*, open bowl decorated with modelled head lug and curvilinear incision (after Rouse 1992:86).

It has been suggested that the La Huecan pottery is comparable with Rio Guapo pottery found at sites in Venezuela and as mentioned above some scholars have suggested that this is indicative of a Huecoid or Guapoid migration from South America (Rouse 1992:88). Rouse disagrees with this on the grounds that no comparable pottery has been located on the intervening islands so such a migration must have occurred directly from Venezuela to Vieques across the Caribbean Sea (Rouse 1992:88). This would seem unlikely, as the Rio Guapo people probably did not possess the ability or incentive to complete such a long journey over open water. Rouse has however tentatively assigned both La Hueca and Rio Guapo pottery to a separate Huecan Saladoid sub-series (Rouse 1992:88).

Movement of pottery:

A couple of petrological studies have been undertaken in the Leeward Islands to examine the movement of pottery within this region during the Saladoid and post-Saladoid periods. This research is discussed in detail in Chapter 5.

In the Windward Islands pottery of the Barrancoid series, which originated on the South American mainland, has been identified in assemblages from Trinidad, Tobago and St. Vincent (Righter 1997:72). This period is sometimes referred to as a form of 'developed Saladoid' and is a poorly understood phenomenon in Caribbean archaeology (Allaire 1997:25). Barrancoid pottery represents a further development of the Cedrosan style of ceramic decoration towards more elaborately decorated vessels (Allaire 1997:24).

The possibility that villages on Tobago may have functioned as ports of trade has been postulated due to the occurrence of unusually large quantities of purely Barrancoid potsherds in late Cedrosan sites on the island (Rouse 1992:85). It is possible that from these sites on Tobago Barrancoid designs spread to the Cedrosan potters of the Windward Islands between c. AD 300 and 500 (Rouse 1992:85; Hofman 1995:236). In the Leeward Islands and Puerto Rico these Barrancoid influences are less significant, if found at all (Hofman 1995:236). This Barrancoid intrusion is thought to mark the end of the Saladoid development in the Caribbean (Hofman 1995:236).

Trade and Exchange of non-ceramic artefacts:

Prehistoric inhabitants of the eastern Caribbean were well adapted to their maritime surroundings. The ocean, instead of being a barrier preventing interaction, acted as an aquatic highway linking islands and cultures throughout the region (Watters 1997:88). Artefacts recovered from the archaeological record document the existence of both long distance exchange with mainland South America and short distance exchange between nearby islands (Watters 1997:88).

Cody (1991) has recorded the occurrence of numerous exotic (non-local) stone artefacts at sites on Grenada, Guadeloupe, Montserrat, St. Croix, Vieques and Puerto Rico. Some of these sites, such as La Hueca/Source on Puerto Rico and Pearls on

Grenada, yielded evidence that some raw materials were imported to the islands and subsequently manufactured into ornaments rather than the ornaments themselves having been imported (Cody 1991:209,210; Watters 1997:98). Amethyst beads are found, for example, in various stages of manufacture on the island of Grenada whilst beads made of carnelian occur only as the finished product (Watters 1997:98). The opposite is true for the island of Montserrat. No sources of carnelian are known on the island, yet in the archaeological record this mineral is represented both in a raw state and as bead blanks (partially shaped beads that have not been polished or drilled) suggesting that whilst this material is exotic to Montserrat carnelian stone beads were in fact manufactured on the island (Watters 1997:98). Amethyst beads, on the other hand, are only found as finished beads in the Montserrat collections (Watters 1997:98).

This differential distribution of finished beads, blanks and raw materials made from particular minerals on different islands suggests the possibility that certain islands were associated with the production of beads made from particular minerals and these beads were then traded as finished products with other islands (Watters 1997:98). Cody suggests that this demonstrates the centralisation of power by elites who controlled the manufacture of prestige goods that played important roles in status enhancement, alliance formation and external exchanges (Cody 1991:210).

Artefacts made of durable materials such as stone and fired clay tend to receive more attention in discussions of trade and exchange due to the fact that they are well represented in the archaeological record (Watters 1997:98). It is important to mention, that items made of more fragile materials such as wood, which rarely survives in the Caribbean archaeological record, or perishable items such as food were also likely to be objects of exchange, however this cannot be verified archaeologically (Watters 1997:98).

The end of the Saladoid period:

The end of the Saladoid culture began at differing times in different areas. The widespread utilisation of similar decorative elements expressed on Saladoid ceramics ceased and the Saladoid cultural unit began to break down. This period of decline began around AD 400 in the Greater Antilles and the Virgin Islands when the Cuevas and Coral Bay Longford styles replaced the Hacienda Grande style of pottery. The Saladoid decline took place later in the Lesser Antilles starting between AD 600 and 850.

2.4 The Post Saladoid Period

A series of changes in pottery manufacture, economy and settlement organization took place between AD 500 and 1000 (Wilson 1997:6). Expansion of the Saladoid frontiers occurred with the colonization of Puerto Rico's interior and moved beyond the small foothold on Hispaniola to the islands of Cuba and Jamaica (Wilson 1997:6). It is postulated that rapid population growth occurred during this period, accompanied by the development of sizable political units (Wilson 1997:6). Chiefdoms are thought to have emerged by around AD 1000 along with the possible development of a more complex form of social hierarchy (Wilson 1997:6). This period witnessed not only political and social developments but also the emergence of a number of different ceramic traditions after the Saladoid period and between AD 1000 and 1492. During this later time scale the first ceremonial plazas and stone-lined ball courts were constructed in the Greater Antilles (Faber Morse 1997:38). By 1492 and the first entry of Europeans to the Caribbean region was probably populated by many different ethnic groups however these first European visitors divided the individuals they encountered into two groups – the Taino (or Arawaks) of the Greater Antilles and the Island Caribs of the Lesser Antilles (Wilson 1997:7; Peterson 1997:118; Olazagasti 1997:131).

There is also an apparent shift in the type of food resources exploited by Saladoid and Post-Saladoid people. Froelich Rainy, working on Puerto Rico in the 1960's identified an association between Saladoid ceramics and dense deposits of land crabs, whilst later Post-Saladoid remains were more typically found with marine shellfish remains (Peterson 1997:123). The details of what has been termed the 'crab/shell dichotomy' have received much attention within the literature (for example Goodwin 1979; deFrance 1989; Keegan 1989). The shift from crab to shell exploitation is now often seen as a gradual and variable shift in relative usage as opposed to the replacement of one resource by the other at the same point in prehistory for the whole region

(Peterson 1997:123). This shift does however represent a transition from more terrestrially dependant economies to more marine focused ones, although exceptions are evident (see Davis 1988; deFrance 1989).

Two main trajectories of ceramic development can be identified in the Caribbean region for this period. In the Greater Antilles the Saladoid ceramic series is replaced by the Ostionoid series, which comprise a number of sub-series that have been created on a spatial and/ or temporal basis. Whilst in the Windward Islands, at a similar time to the transition from Saladoid to Ostionoid in the north, the Saladoid series diverges into the Troumassoid between AD 500 and 600 and by the end of the first millennium this series develops into the Suazoid series (Rouse 1992:192; Allaire 1997:26).

The ensuing sections will discuss the changes that occurred during the Post-Saladoid period. Initial attention is focused on the Ostionoid series of the Greater Antilles, as the pottery from this region has been the centre of much analysis and the chronologies of the Greater Antilles are thus considerably well established. The differing developments that occur on the Windward Islands of the Lesser Antilles will be discussed and finally the situation in the Leeward Islands is outlined. It is still unclear how exactly the Leeward Islands fit in with the ceramic series so far identified in the Greater Antilles and Windward Islands and so an assessment as to how pottery from these islands has previously been classified to date will be offered.

OSTIONOID SERIES

The Cedrosan Saladoids survived in the Caribbean region until around AD 600 after which a new pottery sequence is documented in the Greater Antilles (Hofman 1993:35; Rouse 1992:107). This sequence, named Ostionoid, has been divided on a temporal and/or geographical basis into four sub-series: the Ostionan Ostionoid, Elenan Ostionoid, Meillacan Ostionoid and the Chican Ostionoid (Hofman 1993:35; Rouse 1992:107).

The Cedrosans initially diverged into two Ostionoid sub-series; the Ostionan in western Puerto Rico and the eastern tip of Hispaniola and the Elenan possibly extending from Guadeloupe to eastern Puerto Rico (Rouse 1992:107). The Ostionan Ostionoids of eastern Hispaniola evolved into the Chican Ostionoids at around AD

1200, whilst the Ostionans of the north-central part of the island evolved into the Meillacans (Rouse 1992:107). In western Hispaniola, Jamaica and Cuba the Ostionans adopted the Meillacan culture and the Ostionans of the Bahamas developed into the Palmetto people (Rouse 1992:107).

Ostionan Ostionoid sub-series:

This sub-series developed c. AD 600, from the Cuevas style of pottery, in the Mona Passage area on the western part of Puerto Rico and in the Dominican Republic (Hofman 1993:35; Rouse 1992:95). The evidence from this sub-series is entirely ceramic and little is known about other artefacts, settlement patterns and the behaviour of these people (Rouse 1992:95).

Ostionan pottery is well distributed and at two sites in the Cibao Valley it is found underlying Meillacan pottery, whilst at the north eastern Haiti site of Macady it has been found in association with Meillacan pottery (Rouse 1992:95). Initially discovered at Punta Ostiones on the west coast of Puerto Rico Ostionan pottery comprises a number of styles: Anadel on the Dominican Republic (AD 695-1245), Macady on north eastern Haiti (AD 850), Little River on Jamaica (AD 650) and Arroyo del Palo on eastern Cuba (AD 930-1190 (Hofman 1993:35; Rouse 1992:95).

Ostionan pottery is often referred to as redware because the potters continued to utilise red, but not white, painting from the Saladoid series (Rouse 1992:95). This pottery can be characterised as thin, hard and with smooth surfaces (Hofman 1993:35; Rouse 1992:95). The inverted bell shape vessels typical of the Saladoid series are replaced by a preference for open bowls with outsloping sides and inward thickened rims (Hofman 1993:35; Rouse 1992:95). The D-shaped handles of the Cedrosan and Cuevas styles are replaced by tabular lugs and loop handles (Hofman 1993:35; Rouse 1992:95). Decoration comprises bands of red slip and smudging, often applied to the interior of a vessel, in combination with geometric figures and simple wedge shaped modelled lugs (Hofman 1993:35; Rouse 1992:96).

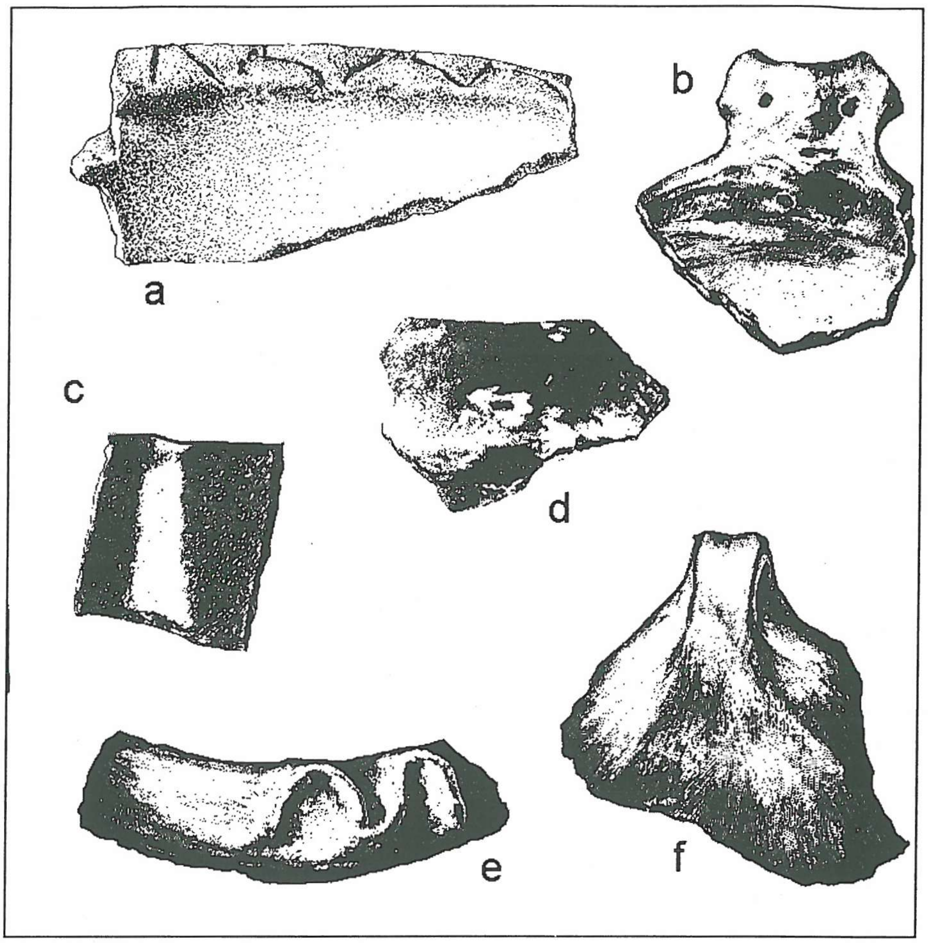

Figure 6: Ostionan Ostionoid pottery: *a*, red-slip bevelled rim with incision, *b*, modelled head lug, *c*, red-painting, *d*, red-slipped sherd, *e*, sigmoid design modelled on vessel shoulder, *f*, loop handle (Rouse 1992:93).

Elenan Ostionoid sub-series:

This sub-series developed at around the same time as the Ostionan Ostionoid sub-series in the Vieques Sound area, eastern Puerto Rico and the Virgin Islands and is characterised by a dramatic decrease in both the quality of pottery and elaborateness of decoration compared with Saladoid pottery (Hofman 1993:36). The Elenan Ostionoid, named after the site of Santa Elena on the north east coast of Puerto Rico, has been further subdivided into an early Monserrate style(c. AD 600-800/900) and a later Santa Elena style (c. AD 800/900-1200) (Curet 1996:119, 1997:499; Hofman 1993:36).

It is thought that during the Elenan Ostionoid the first ceremonial ball courts or plazas were constructed in eastern Puerto Rico (Curet 1996:119). Plazas dating to the period have been located at sites on Puerto Rico such as El Bronce, Las Flores and Tibes

(Curet 1996:119). The plaza at Tibes was built on top of a Saladoid cemetery and it has been suggested that this could represent a continuity of use of ceremonial space between the Saladoid and Ostionoid periods (Curet 1996:119).

In eastern Puerto Rico there appears to be a shift in the size of structures built to house families during the Elenan series, during the Monserrate sub-series large houses with sufficient room perhaps for extended families were favoured however by the Santa Elena sub-series houses decreased dramatically in size rendering them sufficient for just perhaps the nuclear family (Curet 1996:119). This shift has been thought to reflect major changes in production, distribution, reproduction and transmission within the household group (Curet 1996:119). Settlement patterns during the Elenan Ostionoid differ from those of the Saladoid period in two ways, firstly a hierarchy of site sizes developed and secondly the distribution of sites through the landscape are characterized by a combination of nuclear villages and dispersed settlement patterns (Curet 1996:119).

The Elenan Ostionoid's treatment of the dead also apparently varies across time and space with evidence of some burials concentrated in cemeteries whilst others are interred in trash middens, there seems little, if any, evidence of status representation in any of the burials in this series (Curet 1996:119). The first evidence of intensive agricultural production is found in Puerto Rico and the Dominican Republic during the Santa Elena style and the use of mounded fields and terraces during this period has also been identified (Curet 1996:119).

This period witnesses a decline in the frequency and quality of artefacts associated with religious activities compared to the Saladoid period, for example three pointed zemis, whilst still found, are less common and snuffing vessels are almost non-existent for the whole of this period (Curet 1996:119).

During the early part of the Monserrate style many of the late Saladoid traits of technology and shape were retained including red-painted and slipped ceramics, tabular lugs and strap handles (Curet 1997:499). The continuation of these late Saladoid traits in the early Elenan Ostionoid has caused complications in assigning ceramic material to one series or the other as there is no clear boundary between them (Curet 1997:499). In the later part of the Monserrate style a clearer distinction begins

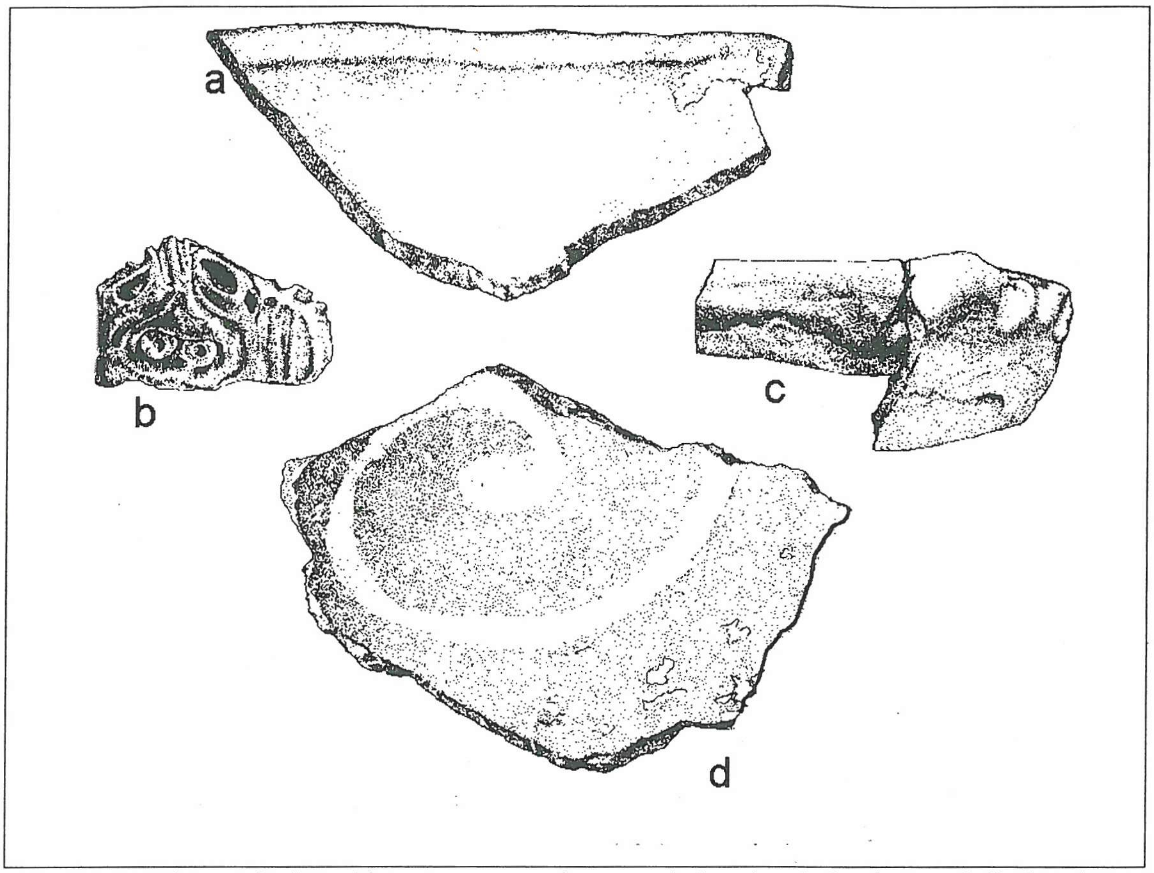

Figure 7: Elenan Ostionoid pottery: *a*, undecorated rim sherd, *b*, rim modelled and incised with bat-head design, *c*, rim with vestigial handle flanked by vertical grooves, *d*, red-on-plain spiral; *a-c* from Santa Elena culture, *d*, from Montserrate culture (after Rouse 1992:125).

to emerge as the pottery is characterised by the extensive production of plain and red-slipped pottery compared with the variety and quantity of decoration applied in the Saladoid series (Curet 1997:499).

The terminal date for this sub-series varies from island to island. At around AD 1200 on the island of St. Croix and in eastern Puerto Rico the Elenan Ostionoids give way to the Chican Ostionoids, whilst on Guadeloupe at the same time the Elenans are thought to have been replaced by Island Caribs (Rouse 1992:123).

Meillacan Ostionoid sub-series:

The Meillacan Ostionoid sub-series is thought to have evolved from the Ostionan Ostionoid, although at some sites it is found contemporaneously (Hofman 1993:37; Rouse 1992:95). The geographical origin of the Meillacan sub-series has been debated in the literature and several hypotheses have been suggested. Rouse (1992:96) suggests the Cibao Valley in north-eastern Hispaniola as the likely place of origin spreading westward to Cuba and southward to Jamaica. Veloz Maggiolo *et al.* (1981) have suggested a mainland South American origin for the sub-series on the basis of similarities of Meillacan pottery and historic Indian pottery from the Guyana Highlands. Yet another suggestion is that an Arauquinoid migration occurred directly from the Venezuelan Llanos to the Dominican Republic (Zucchi 1990).

The Meillacan sub-series dates from the end of the first millennium AD; radiocarbon dates range from AD 825-1220 for sites in the Dominican Republic, AD 830-1460 for sites on Cuba and AD 880-1490 for Jamaican sites (Rouse 1992:96, 97). Several different styles of pottery have been observed for this sub-series, Meillac in the northern Dominican Republic, Finca on south west Haiti, White Marl on Jamaica and Banìon Central Cuba (Hofman 1993:37). The Meillac culture on the Dominican Republic is superseded by the Chican culture, which explains the early terminal date obtained from this island, whilst other Meillacan cultures persisted until the time of Columbus (Rouse 1992:97).

Meillac pottery is similar to the preceding Ostionan pottery in that it is hard, thin and fine, but tending towards bowls with inturned shoulders rather than outsloping sides (Hofman 1993:37; Rouse 1992:97). The Meillac potters abandoned the use of paint and instead began to roughen the surfaces of vessels, decorating them with rectilinear designs of incised or applied hatching and crosshatching, punctations on ridges beneath the rim and incised, applied and punctated designs on vessel shoulders (Rouse 1992:97). This decoration is further embellished with anthropomorphic and zoomorphic lugs (Rouse 1992:97). The Meillac pottery is defined as rectilinearly incised ware by Rouse and in effect this incised ware replaced the redware of the Ostionan styles (Rouse 1992:97). Rouse suggests that influences from the Courian Casimiroid might be responsible for this change from the Ostionan to Meillac pottery (Rouse 1992:97, 98).

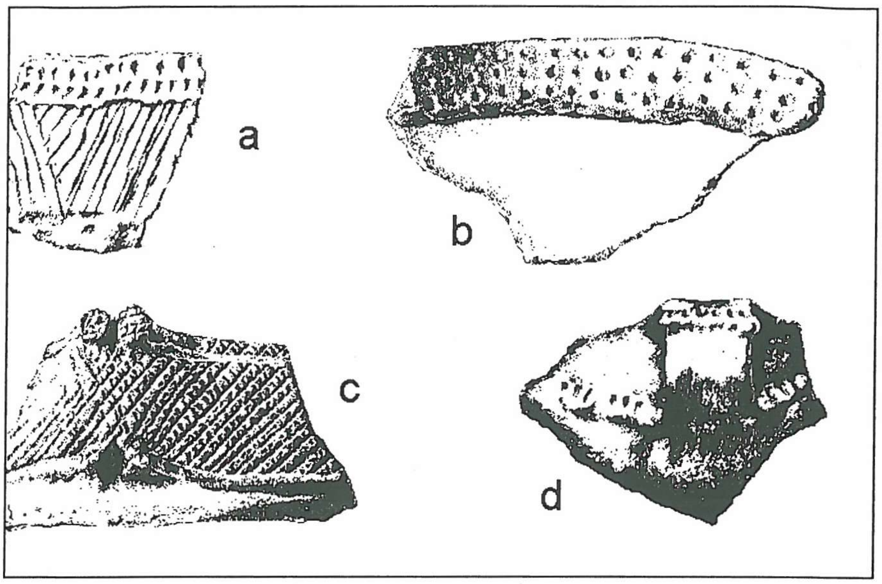

Figure 8: Meillacan Ostionoid pottery: *a,* incised hatching beneath punctuated ridge, *b*, punctuated ridge on interior of bowl, *c*, crosshatched design in incision beneath pair of geometric lugs, *d,* strap handle decorated with ridge and flanked by wedge-shape punctuated lugs (after Rouse 1992:98).

Clay griddles and other artefacts continued to be produced by the Meillac people in the same traditions as the Ostionans and the worship of zemis continued as previously (Rouse 1992:98). Agriculture was improved in the Cibao Valley with the development of a system of mounded fields, however on the northern coast the collection of shellfish and fishing was more heavily relied on (Rouse 1992:98).

One consequence of the previous Ostionan expansion was the advancement of the Ceramic/Archaic age frontier from the eastern tip of Hispaniola to the eastern tip of Cuba and the southern coast of Jamaica (Rouse 1992:96). The Ostionan inhabitants along this frontier became acculturated to the Meillacan sub-series and the Ostionan redware was replaced with simplified versions of the incised ware developed behind the frontier by the Meillac potters (Rouse 1992: 98, 99). There are no indications for any changes in agricultural or religious practice, however coastal settlement locations shift from Ostionan villages situated on beaches or islets to Meillacan sites on high ground back from the shore (Rouse 1992:99). The Meillacans also advanced beyond the frontier into central Cuba replacing the Redondan Casimiroid people and into Jamaica presumably occupying virgin land, introducing pottery, zemi worship and agriculture to both areas (Rouse 1992:99).

Chican Ostionoid sub-series:

The Chican Ostionoid sub-series, which is further divided on the basis of several different pottery styles into the Boca Chica, Capá and Esperanza, developed out of the Meillacan and Ostionan sub-series circa AD 1200. During the Chican Ostionoid settlement patterns comprised of both nucleated and isolated villages and large villages that included several plazas or ball courts have been reported (Curet 1996:120). The archaeological record for Puerto Rico shows that houses of the Esperanza Style tended to be small, perhaps for just the nuclear family as in the Santa Elena Style (Curet 1996:120).

Religious paraphernalia once again increases in quantity and quality during the Chican Ostionoid, three pointed zemis, idols made of cotton, wood and stone, vomiting spatulas, duhos or ceremonial benches and stone collars and elbows have all been found at sites on Puerto Rico and Hispaniola (Curet 1996:120). The methods of inhaling snuff had also changed by the Chican Ostionoid. Whereas the Cedrosan and Huecan Saladoids and the Ostionan Ostionoid worshippers inhaled snuff through small tubes attached to pottery vessels the Chican Ostionoids put snuff on the platforms on top of their zemis and inhaled it through separate tubes (Rouse 1992:119).

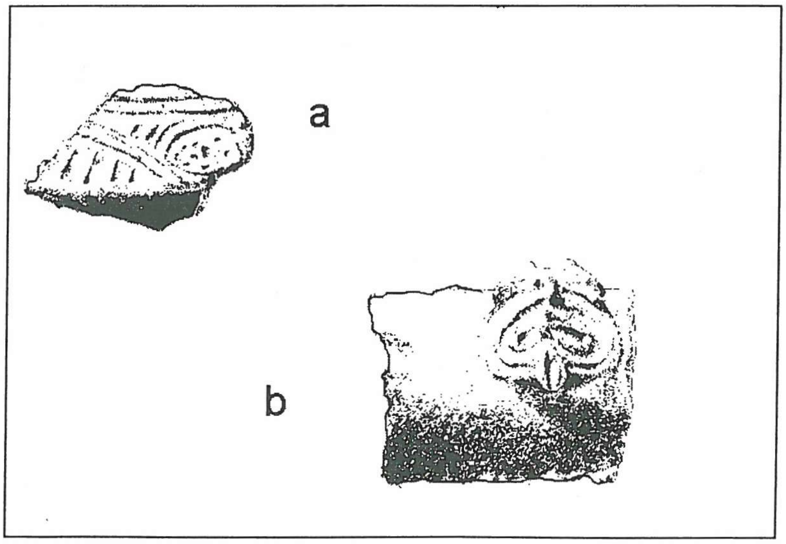

Figure 9: Chican Ostionoid pottery: *a,* Capá style, b, Boca Chica style (after Rouse 1992:112)

The Chican Ostionoid sub-series comprises of three pottery styles, the Boca Chica style that developed on Hispaniola, the Capá style in the Ostionian territory of western Puerto Rico and the Esperanza style in the Elenan territory of eastern Puerto Rico and the Virgin Islands (Hofman 1993:40; Curet 1996:120; Rouse 1992:111). Other local variations of the Chican sub-series are also recognised, for example the Carrier Style on Haiti and the Atajadizo and Guayabel styles in the western part of the Dominican Republic (Hofman 1993:40; Rouse 1992:52).

Elements of preceding styles are retained in the Chican pottery style, the characteristic incision applied to Meillacan style vessels and modelled incised lugs from the Cedrosan Saladoid period were still utilised (Hofman 1993:40). The Boca Chica, Capá and Esperanza styles can be differentiated from one another on the basis of the technical quality of the pottery and the elaborateness of decorative designs (Hofman 1993:40).

Boca Chica style:

Characteristic elements of the Boca Chica style pottery are vessels with necks that are either globular or cylindrical in outline with very small apertures and vessels with convex necks (Hofman 1993:40). These neck forms are unique to this style of pottery. In the Dominican Republic a large number of effigy vessels and bottles are found during the Boca Chica phase and these appear to be absent in the Capá and Esperanza styles (Curet 1996:120). Boca Chica vessels tend to be elaborately and carefully finished with highly polished surfaces and complex decoration (Hofman 1993:40). Typical decorative elements employed include elaborate modelled incised designs and designs comprising human faces, bat and monkey heads, semicircular and sigmoid lines and vertical ridges (Hofman 1993:40).

Capá Style:.

The Capá style is assumed to have developed from the Ostionan sub-series as a considerable amount of typical Ostionan elements are incorporated within the Capá style pottery (Hofman 1993:41). Vessel shapes are less varied than other styles, consisting primarily of hemispherical bowls with pronounced shoulders but with no necks or collars (Hofman 1993:40). Although lugs, knobbed ridges and modelled designs are used the most prominent decorative technique applied to this style of pottery is that of incised designs and whilst these motifs tend to be similar to those found on Boca Chica pottery the lines tend to be narrower; deeper and more closely spaced (Hofman 1993:40).

Esperanza Style:

In terms of vessel and rim shape Esperanza pottery bears more resemblance to Capá rather than Boca Chica pottery (Hofman 1993:41). The primary decorative technique applied to the Esperanza pottery is that of incision, which tends to be restricted to the upper part of simple hemispherical vessels (Hofman 1993:41). Modelled designs are also applied to Esperanza pottery however this type of decoration is less commonly utilised compared with its use in the Boca Chica and Capá styles (Hofman 1993:41).

Leeward Islands:

The pottery produced during the post-Saladoid period in the Leeward Islands has tended to be classified as Elenan Ostionoid or Elenoid. Elenan Ostionoid, as discussed previously, was the dominant pottery series of eastern Puerto Rico and the Virgin Islands and therefore there has been some debate as to the accuracy of applying this classification to the pottery of the Leeward Islands.

The attributing of Leeward Island pottery to the Elenan Ostionoid sub-series arose out of Rouse's work on Antigua. The Elenan sub-series in the Leeward Islands used to be described on the basis of pottery from Mamora Bay, Freeman's Bay and the Mill Reef site all on Antigua. The Mill-Reef style of pottery, which developed around AD 500 – 600, was considered to represent the transition from the Cedrosan Saladoid in the Leeward Islands. There is some discussion as to the terminal date of this style of pottery, some researchers such as Rouse, Allaire and Hofman suggest an ending date of around AD 800-900 whilst Davis has proposed that this style did not in fact end until sometime between the tenth and fourteenth centuries (Hofman 1993:39). If Davis were correct then that would mean that the Mill Reef dates overlap with those for the Mamora Bay and Freeman's Bay styles, which were initially considered to post-date the Mill Reef style of pottery (Hofman 1993:39).

The Mill Reef style pottery has been considered to represent a decline from the climax reached in the late phases of the Saladoid period (Rouse 1976:36). Although white on red painted designs persist the motifs degenerate to straight parallel designs, polychrome painting is abandoned, modelled incised lugs disappear, technologically the pottery deteriorates and potters began to roughen the surfaces of their vessels (Rouse 1976:36). Legged griddles appear in the Mill Reef complex for apparently the first time (Rouse 1976:36).

Broad-line curvilinear incision is the most distinctive decorative technique applied to Mamora Bay style pottery, however it is not prolifically utilised (Rouse 1976:36). White painting disappears, and red paint is used mainly as a means of covering limited parts of a vessel, most notably the lip (Rouse 1976:36). Lugs are rare, handles disappear altogether; vessel surfaces continue to be scratched and rims tend to be folded or thickened (Rouse 1976:36).

The incised decoration applied to Freeman's Bay pottery is said to be deeper, narrower and more irregular thus distinguishing it from the Mamora Bay style pottery (Rouse 1976:37). The form of vessels varies from earlier styles with the occurrence of more pronounced shoulders and necks, scratched surfaces are more common and the presence of dimple bases is said to be 'peculiar' to this style of pottery (Rouse 1976:37).

Rouse has attributed both the pottery from Mamora Bay and Freeman's Bay to the Elenan Ostionoid sub-series on the basis of resemblances with Santa Elena pottery on Puerto Rico and other Elenan assemblages in the Virgin Islands and the post-Saladoid ceramics of the northern Lesser Antilles was included within the Elenan Ostionoid sub-series (Rouse 1976:37, 39; 1986:143-144). Many assemblages of post-Saladoid pottery in the Leeward Islands were therefore classified as belonging to the Elenan Ostionoid sub-series (for example see Wilson 1989, Peterson & Watters 1991, Goodwin 1979). However the validity of this affiliation is currently under debate and some archaeologists question the applicability of the Elenan series over such a wide area without more detailed definitions (Goodwin 1979:305; Watters 1980:274). Watters and Peterson in their work at Fountain Cavern on the island of Anguilla suggest that the pottery may be generally related to the Elenan Ostionoid even though some of the sherds share general similarities to Magens Bay ceramics in the Virgin Islands and Troumassoid or later ceramics of Barbados, St. Vincent, Grenada, Martinique and the Grenadines (Peterson & Watters 1991:354). Some have postulated (see Goodwin 1979; Peterson & Watters 1991) that it is likely that local, island specific sequences as well as broader regional ceramic and cultural sequences will be ultimately discernable in the Lesser Antilles, but that a precise correlation between assemblages on different islands should not necessarily be expected even though similarities appear to be widespread. It would seem likely that inter island interaction in terms of trade and exchange would be one mechanism responsible for the widespread general similarities among the post-Saladoid ceramics (Peterson & Watters 1991:355).

Hofman (1993:157) has suggested evidence for the continuous development and fluidity of cultural boundaries during the post-Saladoid period on the island of Saba. From her work on the post-Saladoid pottery from various sites on the island she has identified three periods of development. The first spans from AD 400-850 and the pottery from this period is thought to mark the transition from the highly sophisticated pottery that was characteristic of previous periods, to the cruder, less elaborately decorated pottery of the post-Saladoid (Hofman 1993:157). The second period, AD 850-1300, is considered to be a continuous development from the preceding period and the pottery from this period tends to be less well finished, coarser and the use of decoration is diminished (Hoffman & Hoogland 1991:550). Hofman categorically states that due to a distinct lack of Elenan Ostionoid traits it would be incorrect to apply this label to the post-Saladoid pottery of Saba (Hofman 1993:157). She instead suggests that the Saban data indicates the possibility of a continuous development from the Cedrosan Saladoid with affiliations to both the pottery from the Windward Islands and the Greater Antilles (Hofman 1993:157). Saladoid traits, such as white-on-red painting, continued to be occasionally applied to pottery until AD 1350 on the island (Hofman & Hoogland 1991:554). The occurrence of such traits lasted much longer here than in the Greater Antilles where their application ceased around AD 500-600 (Hofman 1993:158).

In the third period, AD 1300-1450, developments occur that Hofman suggests are unique to Saba, and to date there appears to be no evidence to contradict this assumption. She has proposed that the developments of this period, which witnesses the cessation of diagnostic elements used in the preceding periods, parallels those on the Virgin Islands and Greater Antilles and has thus classified the pottery of this period as belonging to the Chican Ostionoid sub-series (Hofman 1993:158). Hoogland & Hofman (1991) propose that the site of Kelby's Ridge 2 on Saba represents a peripheral settlement of one of the chiefdoms of the Greater Antilles. Minor Chican influences on pottery have been recorded from other islands in the northern Lesser Antilles, however evidence of Chican impact is scarce (Hoogland & Hofman 1991:178). During the Chican period there was a shift in preference of settlement location towards the interior of islands, such locations are more susceptible to destruction through agricultural practices and modern developments and it is unclear whether the scarcity in evidence is in fact real or just a result of these factors (Hoogland & Hofman 1991:178).

Previously the eastern boundary for the Chican sub-series was drawn in the Virgin Islands (Rouse 1992:32), however if the classification of these later sites on Saba is correct then this boundary must perhaps be shifted to include Saba (Hofman 1993:158; Hoogland& Hofman 1991:178; 19:554).

Windward Islands:

The interaction sphere that had developed at the mouth of the Orinoco River on the South American mainland expanded into the West Indies around AD 300-400 (Rouse 1992:127). This is evidenced by a divergence in the pottery styles found in the Windward Islands at this time from those found in the more northern islands (Rouse 1992:127). The Barrancoid potters on the mainland influenced pottery styles as far north as Guadeloupe, however the Saladoid pottery of the islands north of Guadeloupe was apparently unaffected (Rouse 1992:127). The Windward Islands therefore followed a different trajectory to the rest of the Caribbean and the ensuing post-Saladoid period has been divided into the Troumassoid and Suazoid ceramic series and at some point the Island Caribs encountered during the contact period appeared in this region (Rouse 1992:127).

Troumassoid Series:

The transition from the Saladoid series to the Troumassoid in the Windward Islands occurred at a similar time to the transition from Saladoid to Ostionoid in the more northern islands at around AD 500 – 600 (Rouse 1992:127). This series was first identified by McKusick in the 1960s and named after the site of Troumassee on St. Lucia (Hofman 1993:39). Originally McKusick identified two phases – Troumassee A, with a median date of AD 430, and Troumassee B with a median date of AD 730; later Rouse (1992) redefined these divisions, classifying Troumassee A as Saladoid with Barrancoid influences and Troumassee B as the Troumassoid series that continued in the Windward Islands until c. AD 1000 (Hofman 1993:39). This period has also been called 'Calvinoid" after Calviny polychrome decoration, which is commonly found on the vessels, and was identified at the site of Calviny on Grenada (Bullen & Bullen 1972).

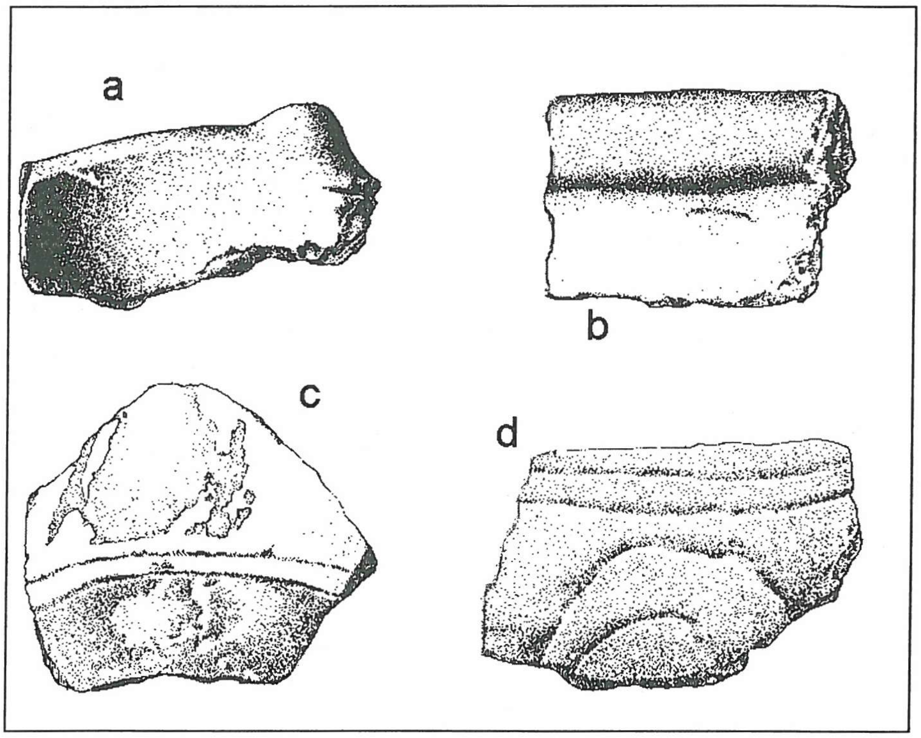

Figure 10: Troumassoid pottery: *a*, wedge-shaped lug on triangular rim, *b*, red-painted ridge inside rim, *c*, white design on badly worn red slip, *d*, curvilinear incised design (after Rouse 1992:128).

The potters of the Troumassoid series, unlike their Ostionoid counterparts in the northern Caribbean, continued to decorate their vessels with red, black and white painted designs and incised designs were also frequently applied (Rouse 1992:128). During the later part of the Troumassoid series the pottery becomes cruder and decoration is simplified (Rouse 1992:128; Allaire 1997:25). This downturn in pottery quality displays a number of stylistic similarities shared by later Barrancoid styles found in coastal Venezuela (Allaire 1997:25). Potters added legs, pedestals or annular bases to their vessels and griddles were produced with legs attached allowing the griddle to be placed directly over the fire when cooking cassava bread (Rouse 1992:128, 129; Allaire 1997:26).

Suazoid Series:

By the end of the first millennium AD the Troumassoid series had developed into the Suazoid series (also known as the Suazy series) named after the type site of Savanne Suazey on the island of Grenada (Rouse 1992:129; Allaire 1997:26). McKusick (1960) previously named this series Micoid on the basis of his work on St. Lucia however his classification of this series was later contradicted by Allaire (1974, 1984). Pottery of the Suazoid series is found widely throughout the Windward Islands and is greatly abundant on the island of Barbados (Drewett1991).

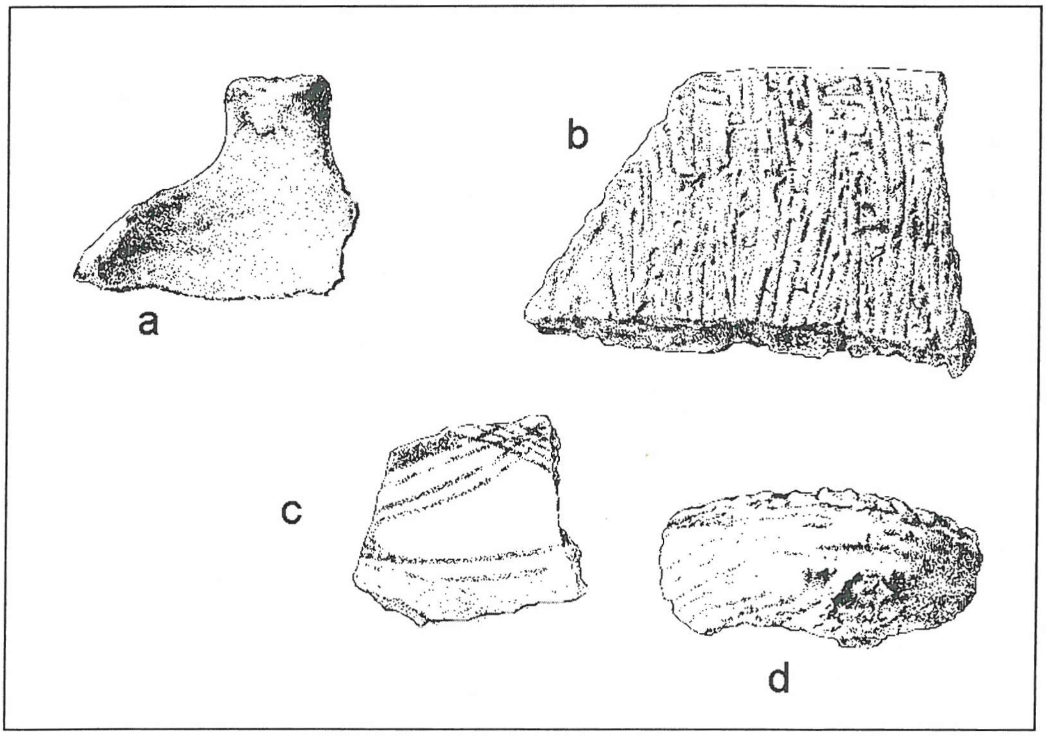

Figure 11: Suazoid pottery: *a*, peg shaped lug on end of bowl, *b*, scarified rim sherd, *c*, red slip and linear black design (Caliviny polychrome), *d*, hemispherical bowl with finger-impressed rim (after Rouse 1992:130).

The trend that began in the late Troumassoid series towards plainer coarseware vessels reached a climax during the Suazoid (Rouse 1992:129). Vessels tended to be thicker and more poorly made compared to the pottery of previous periods (Rouse 1992:129). Vessel surfaces were often scraped or scratched and footed griddles remained popular (Rouse 1992:129). Other clay artefacts such as spindle whorls, pot stands, stamps and figurines are also found associated with Suazoid pottery (Rouse 1992:129). Head lugs and figurines had been absent since the Saladoid period and their reappearance during the Suazoid is thought to indicate intensification in the worship of zemis (Rouse 1992:129). The presence of ritual objects of Chican Ostionoid types are cited as affirmation of this increased interest in zemi worship (Rouse 1992:130).

The Suazoid emphasis on plain coarse wares parallels that of the Palmetto potters in the Bahamian Archipelago, and like the Palmetto potters, Suazoid potters produced a minor quantity of fine, decorated pottery (Rouse 1992:129; Hofman 1993:39). Painted and incised designs were used to decorate this pottery as well as lugs, which included pegs, and heads with flat faces, pierced ears, applied noses and eyebrows, mouths, nostrils and eyes (Rouse 1992:129).

2.5 Prehistory of Nevis

Archaeological research on Nevis has not been as prolific as on some of the other islands in the Leeward group and therefore the prehistory of Nevis is not particularly well understood. During the late 1980's Professor Sam Wilson carried out a survey of the island in order to locate as many of the prehistoric settlements as possible and it is from this work that most of our understanding of the prehistory of the island stems. In 1998 the English television programme 'Time Team' visited the island. The programme mainly focused on several historical sites on the island but they did spend some time surveying and excavating the prehistoric site at Coconut Walk. The pottery obtained during that work was analysed by myself and forms a major part of this thesis. In the last few years the Nevis Heritage Project has undertaken several weeks of survey and excavation at the site of Hickman's. This work is still in progress and the results of analysis to date are preliminary but when this programme of research is complete it will add a great deal to our understanding of the prehistory of the island.

Twenty-two prehistoric sites have so far been located on the island, Wilson identified 21 of those during his survey of the island and the other, Pinney's Beach, was located after a hurricane when tourists found potsherds on the beach. Figure 12 shows the location of all the known prehistoric sites on Nevis and as can been seen two sites have been attributed to the pre-ceramic period, two sites have both a Saladoid and post-Saladoid component and 16 single occupation sites have been located and dated to the post-Saladoid period.

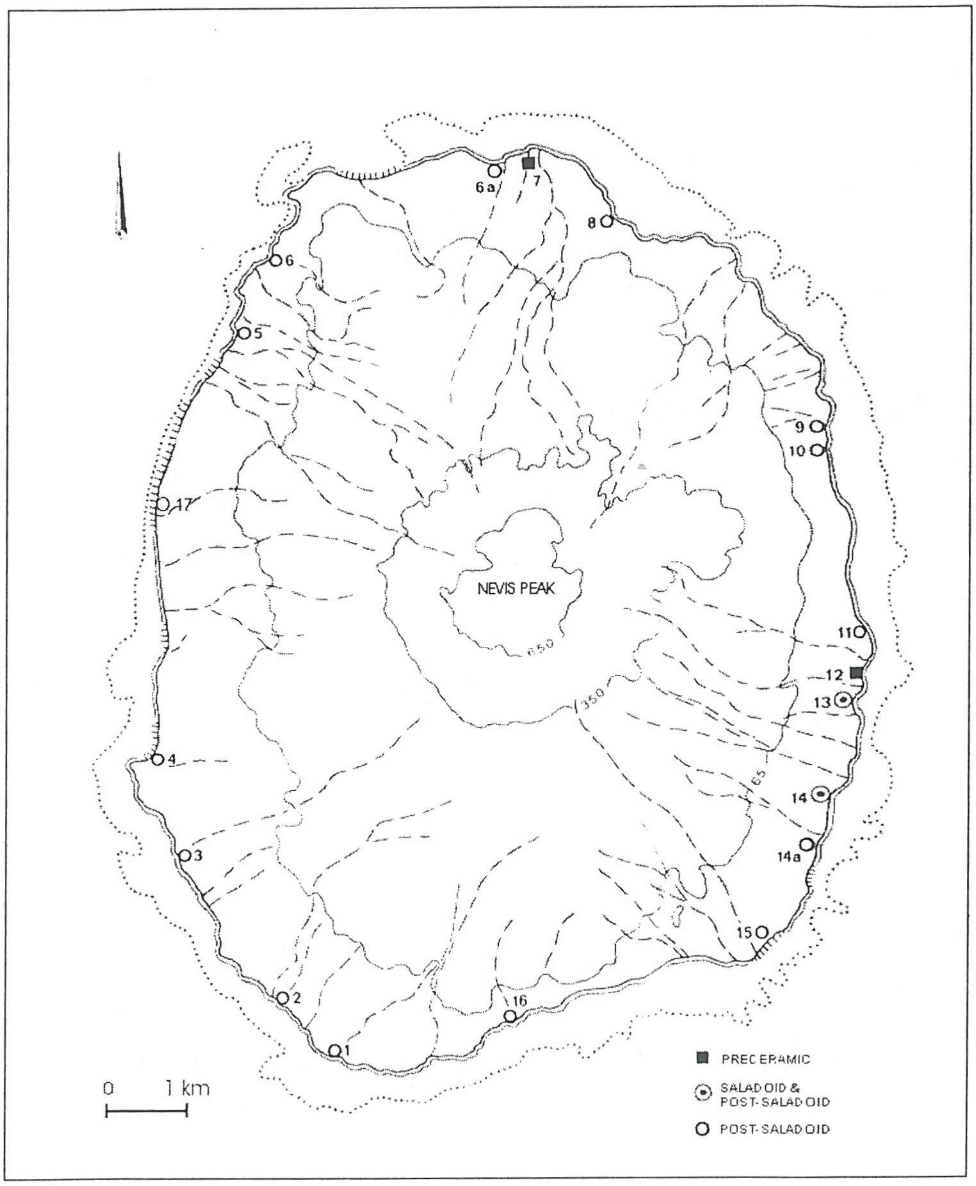

Figure 12: Map of Nevis showing all the prehistoric sites so far located. 1 = Lighthouse, 2 = Sulphur Ghut, 3 = Bath Plain 1, 4 = Bath Stream mouth, 5 = Nelson Springs, 6 = Cades Bay, 6a = Newcastle, 7 = Nisbetts, 8 = Hick's Cove, 9 = Tittle Ghut, 10 = Butlers, 11 = Coconut Walk, 12 = Hickman's Shell heap, 13 = Hickmans, 14 = Indian Castle (North and South), 14a = White Bay N., 15 = Indian Castle Estate, 16 = Whitehall Estate, 17 = Pinney's Beach (after Versteeg *et. al.* 1993).

Wilson notes that there appears to be a preference for the location of prehistoric sites on the windward (east) coast of the island as slightly more sites are located on this coast than the leeward coast and their combined surface area is much greater (Wilson 1989:433). The pattern of settlement location also seems to correlate with the distribution of reefs as the greatest concentration of prehistoric sites is situated near the most extensive series of coral reefs (Wilson 1989:433). However as Wilson rightly points out other factors may have been responsible for this apparent preference for settling on the windward coast. For example some sites on the north east coast are located on the edge of badly eroding cliffs and the sites on this coast might have been larger or more numerous in prehistoric times. Sites on the leeward coast may well have been destroyed by storms, beach formation processes and tectonic activity adding to the disparity between the number and size of sites on the east and west coasts of the island (Wilson 1989:433). It may also be conceivable that not all the prehistoric sites on the island have so far been identified. Weight is given to this argument by the fact that another post-Saladoid site was found in the last couple of years on the leeward coast after a hurricane.

The two pre-ceramic sites identified, Nisbetts and Hickman's shell heap, both consist of scatters of molluscs, land crab shells, fish bones, chert tools and conch-shell tools and both sites are located adjacent to large reefs and stream beds that would have supplied water in prehistoric times (Wilson 1989: 435). The Hickman's shell heap has been radiocarbon dated to 605 ± 290 BC and the analysis of the faunal remains indicates the abundant occurrence of shallow reef fish such as parrotfish. Grouper, surgeonfish, moray eel, needlefish and sea turtle remains were also identified (Wilson 1989: 435).

The ceramic age sites on the island have been largely dated by the presence or absence of typical Saladoid traits in the ceramic assemblages. Two sites, Indian Castle and Hickmans have been identified as having both a Saladoid and post-Saladoid component and both are located on the islands windward (east) coast (Wilson 1989:435). At Indian Castle a small scatter of Saladoid sherds was located at the northern end of the site whilst the rest of the site dates to the post-Saladoid period (Wilson 1989:435). The Nevis Heritage Project is currently carrying out more extensive work at the site of Hickmans. They have surveyed the site, made surface collections and dug a number of test pits. Preliminary results suggest that the ceramic assemblages recovered from the excavations date mainly to the Saladoid period;

whilst in the surface collected material there appears to be a post-Saladoid component (Morris *et. al.* forthcoming). During Wilson's work at the site ten one meter square test pits were dug, which yielded ceramics, chert stone tools, a polished greenstone celt, and several drilled and polished granite beads (Wilson 1989:436). A burial was also discovered; the body had been desiccated, prepared in a compact bundle and placed on an oval bed of stones in a pit (Wilson 1989:436). Two grave goods were found in conjunction with the burial, one was a small oval dish placed in front of the skull and the other was a large complexly modelled bat's head, both items were finished with red paint (Wilson 1989:436).

The largest post-Saladoid sites so far identified are all located on Nevis's windward coast but sites do occur almost everywhere that fresh water would have been available on the coast (Wilson 1989:436). Sites on the island that are thought to date just to the post-Saladoid period have so far received relatively little archaeological attention. At Indian Castle a test pit was dug in the post-Saladoid end of the site and a radiocarbon date of AD 745 ± 135, based on carbonised wood, was obtained. A small-scale excavation was undertaken at the Coconut Walk site by the television programme Time Team and the results of that excavation are discussed in more detail in chapter six. Work at the other post-Saladoid sites mainly consists of the collection of surface material by Wilson during his settlement survey of the island. Wilson has carried out a brief analysis of the pottery he collected and has concluded that the ceramics from the post-Saladoid sites were very similar and he was unable to differentiate between the assemblages from these sites either chronologically or functionally (Wilson 1989:437).

2.6 Conclusions

Within 6,000 years the Caribbean region has seen many changes and developments. The research carried out to date on the ceramics of this region continues to focus on the decoration and quality of pottery. The plain utilitarian wares, especially in the Saladoid period, continue to receive little attention. The transition from Saladoid to post-Saladoid has also been studied from the decorative stance as well, only in this case focusing on the loss of decoration and the 'deteriorating' quality of the pottery.

Differences in the ceramics produced within the different geographical regions of the Caribbean Archipelago have received much attention yet it remains unclear where the Leeward Islands fit in terms of the post-Saladoid period. It is only through further research on the individual islands that comprise the Leeward group that this question is going to be resolved. It may well be that these islands, although grouped together in the modern Caribbean, were in fact not affiliated to the same cultural groups in the post-Saladoid period, and even though neighbouring islands maybe close in proximity it does not necessarily follow that those islands were affiliated one to the other.

The major themes of Caribbean prehistory and the way in which the analysis of prehistoric ceramics in the Caribbean region has been approached to date will be discussed in the following chapter. The ways in which this research differs in terms of methodology and the questions it is seeking to answer will also be discussed in order to show how this research will add a new dimension to the study of post-Saladoid pottery.

Chapter 3: Research Themes

3.1 Introduction

A synopsis of the prehistory of the Caribbean as understood to date was provided in the previous chapter. The framework for presenting the prehistory of the region, established predominantly by Rouse, was followed as this shows the approaches adhered to so far in Caribbean archaeological research. It is the intention of this chapter to draw out the major themes and approaches that have dominated the analysis of the ceramics and prehistory of the Caribbean and to outline the questions this research aims to answer and the approach that is being taken to achieve that. This chapter will therefore provide a means to show the ways in which this research differs from what has been done before and how it will broaden what is known and understood about the prehistory of the Leeward Islands in the post-Saladoid period.

3.2 Major themes in Caribbean prehistory

A major concern in the analysis of Caribbean prehistory has been to understand when and how the archipelago of islands was first populated and to determine changes in those populations through time. Possible migration routes have been suggested to explain how the islands were colonised and this area continues to be researched and debated as more archaic sites are located, studied and dated. The people who moved from the mainland had to make a number of adaptations in order to survive in the Antilles. One such adaptation was the way in which they procured food, as the islands' ecosystems were substantially different to those that they left behind.

The populations that inhabited the islands have been studied through the remains they left behind and cultural groups have been identified on the basis of similarities and differences, both temporally and spatially, in those remains. With the introduction of ceramic producing populations to the region cultural groups were most often defined on the basis of differences identified in the ceramic assemblages.

A series of changes in settlement organization, subsistence and pottery manufacture took place between AD 500 and 1000 in the Caribbean (Wilson 1997:6). The transition from the Saladoid to the post-Saladoid period has received a considerable amount of attention and it is thought that the transition occurred at different times in different parts of the Caribbean region. During this time frame there seems to be a rapid growth in the population accompanied by the development of sizeable political units (Wilson 1997:6). Previously every village had been autonomous but by around AD 1000 chiefdoms are thought to have emerged meaning many villages would have been united under the leadership of one family or individual (Wilson 1997:6). It is also postulated that a more complex form of social hierarchy marked by a distinction between the elite and commoners may also have developed at this time (Wilson 1997:6). There also seems to be a shift in the type of food resources being exploited with evidence of a general transition from more terrestrially dependant economies to more marine focused ones.

Research into the prehistory of Nevis is still in its infancy so it is not clear as to how any broad changes in the social, political or economic structure of post-Saladoid societies may have affected the inhabitants of the island. However Wilson does intimate from his work that some of these changes did most likely occur on Nevis. For example he suggests that the greater number of post-Saladoid sites compared to Saladoid sites as well as the fact that post-Saladoid sites cover a much greater surface area than Saladoid ones indicates the likelihood that there was a rapid increase in population size during the post-Saladoid period (Wilson 1989:444).

The transition from the Saladoid to the post-Saladoid period and the emergence of more complex social and political systems are major themes in Caribbean prehistory. However the extent to which these changes have affected changes in the production of pottery during the Saladoid and post-Saladoid periods is not often discussed within the literature.

3.3 Previous approaches to ceramic analysis

Ceramics are the most abundant archaeological artefact recovered from prehistoric sites in the Caribbean, yet the analysis of ceramics to date has focused on just a narrow range of topics.

Primarily ceramics have been used to answer chronological questions, and as should be abundantly clear from the previous chapter, the whole chronology of the region is predominantly based on the ceramic sequence and how it changes both temporally and spatially. Decoration has also received much attention in ceramic analysis, especially the highly decorated pottery of the Saladoid period. In fact one would be forgiven to assume from the corpus of literature on the subject that hardly any undecorated vessels were manufactured during this period. However this was not the case, as plain sherds tend to vastly outnumber decorated sherds at Saladoid sites. For example at the Saladoid site of Trants on Montserrat only 7.5% of the pottery assemblage was decorated (Peterson & Watters 1995:136). However undecorated Saladoid sherds have received far less attention and changes in decorative styles have been taken to indicate broader changes in society or the occurrence of different 'cultures' on both a temporal and spatial level.

Irving Rouse has been perhaps the largest catalyst in ceramic studies in the Caribbean region and his work has provided archaeologists with the chronological framework outlined in the previous chapter. The analysis of ceramics has received far more attention than any other artefact group or aspect of archaeology in the Caribbean region and the chronological framework as it is currently understood is based, as mentioned previously, predominantly on pottery. The validity of such a framework, which relies so heavily on one artefact class, remains to be proven. It is only now that Rouse's work is starting to be challenged (see Keegan 2000). However it is important to state that Rouse's contribution to the understanding of Caribbean archaeology has been enormous but it is beneficial and only right to challenge and assess previous ideas in the light of new research.

It is not the concern of this research to challenge the chronological systems so far established in the Caribbean, nor to address the ways in which these systems were created. Chronology has been one topic that has been widely discussed in the light of ceramic analysis and it is time to move away from this discussion and to begin discussing the ceramic data in a new way.

It is still unclear from the work so far carried out just how the Leeward Islands fit into the chronological framework already established elsewhere for the post-Saladoid period. Rouse has included them in his Elenan Ostionoid sub-series, but the validity of that has been rightly questioned. Researchers of this period in the Leeward Islands have not been so constrained by trying to fit their discoveries into well-established chronological frameworks, such as those that exist in the Greater Antilles and the Windward Islands. This has therefore meant that research on individual islands has been able to focus on what has been found on those islands and then comparisons can be made with other islands to determine what is similar and different.

There are many new topics that the analysis of prehistoric ceramics in the Caribbean could be used to discuss. Pottery was produced by and for people but these people are hardly ever discussed. The function of vessels is rarely discussed, in fact the preparation, cooking and presentation of food and drink are topics that so far have not been talked about and yet it is these functions that the majority of ceramic artefacts were produced to fulfil. For example it is known that there was a shift in the type of food sources being exploited during the Saladoid and post-Saladoid period but did this effect the type of pottery being produced? With a general transition from an economy based on the exploitation of terrestrial resources to one focused more on marine resources were there changes in the way food was prepared, cooked and served and if so are these changes reflected in the ceramic assemblages? In order to determine whether changes in subsistence are reflected in the types of ceramics being produced the plain utilitarian wares of the Saladoid and post-Saladoid period would need to be compared. Unfortunately the Saladoid plain ware receives little attention in the literature.

The distribution of pottery is an area that is starting to be considered for the post-Saladoid period and, as is discussed in chapter 5, a limited amount of work has been carried out in the Leeward Islands surrounding this topic. Determining the extent to which pottery is distributed throughout the islands by mechanisms such as trade and exchange will provide important insights into the amount of contact there was between islands and it may even be possible to tell which islands were trading with one another. For example did all islands produce pottery or did some islands lack suitable resources and so had to import their pottery from elsewhere? Were certain types of vessels the focus of trade and exchange or were all vessel types moving around the islands?

Another area that would benefit from research is that of pottery production, what was the scale of production in the post-Saladoid period, was pottery produced on a household level or is there evidence for more sophisticated levels of production such as workshop production. Was production year round or just seasonal and who was responsible for producing pottery and how far were potters travelling to collect resources such as clay and temper? During the transition from the Saladoid to post-Saladoid period political and social changes took place but what effect did those changes have on the production of pottery? If power was more centralised in the form of chiefdoms then was the production of pottery controlled and centralised as well?

It has been noted that the post-Saladoid pottery is similar throughout the Leeward Islands, but what exactly are the inter and intra island similarities and differences, and why are there such similarities – is it as a result of close and sustained contact with other islands or some other reason?

The plain ware pottery from the Saladoid period has tended to receive far less attention than the decorated wares. However this pottery is important in order to fully understand the transition in pottery production from the Saladoid to post-Saladoid periods. For example are the Saladoid plain wares similar to the post-Saladoid plain wares or can changes be seen that might be a result of broader social and political changes in society or a changing preference in the type of food being eaten? During the post-Saladoid period there is an increase in population size, what affect does this have on the production of pottery? If the population were growing would the demand for pottery vessels increase as well? If there was an increase in demand then it may mean that less time could be spent on 'costly' elements of production such as elaborate decoration and maybe that is why the post-Saladoid assemblages contain less decorated wares. The loss of highly decorated wares may be a result of other

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3.4 Themes of this research

The aim of this research is to examine the production of pottery within the post-Saladoid period at two sites, Coconut Walk and Indian Castle, on the island of Nevis, in order to compare the similarities and differences of the assemblages. This research will address the following three questions and from these questions it is hoped that a number of other topics will be touched upon.

- Is the pottery found at Coconut Walk and Indian Castle on the island of Nevis manufactured from locally available resources?
- If it is not all local then where did the pottery originate from and was the movement of pottery vessel specific?
- To what extent are these assemblages from Nevis similar or different to one another?

The first question is concerned with identifying whether the material found was predominantly made from locally available resources or whether some vessels were being brought to Nevis from other islands. If all the vessels found were made on Nevis then there is the possibility that either the island was very insular in its activities and had little to no contact with other islands, or that contact between islands was prevalent but pottery was not a trading commodity, or Nevis exported its pottery in exchange for other commodities. The next question therefore is simple, if pottery was brought to Nevis then which islands did these vessels originate from. Another related question is whether certain types of vessels were traded or exchanged, for example were certain forms of vessels such as bowls or platters the focus of movement between islands as opposed to cooking pots or griddles. The examination of these questions will begin to provide answers as to the extent to which post-Saladoid people from various islands within the Leeward group were in contact with one another, for example were people from Nevis just in contact with people from neighbouring islands such as St. Kitts or Montserrat, or did they have affiliations with other islands such as Saba or Antigua and little to do with those islands closest to them?

The third question is designed to examine the extent of similarity or difference between assemblages on an intra island scale. These questions, like the first, will probe at the extent to which post-Saladoid people were in contact with one another. For example were people from various locations on the same island sharing ideas about pottery making, were they making similar vessels or is it possible to distinguish distinct forms of pottery that were only being produced at a certain site.

Whilst these three questions begin to provide a forum within which to discuss the nature of pottery production during the post-Saladoid period it is also hoped that discussion will be initiated as to how pottery was used by post-Saladoid people in everyday life in connection with eating and drinking. Pottery is manufactured to fulfil a purpose; each vessel is designed and produced by the potter in order to perform a particular function. Whilst the types of vessels produced, for example, cooking pots, griddles, dishes, are sometimes mentioned in the literature little discussion is offered as to the actual processes of preparing, cooking, serving and storing the food and drink. Very little in fact is either mentioned or known about how the pottery found at post-Saladoid sites in the Leeward Islands was used or viewed by the people.

3.5 Conclusions

There is enormous scope for expanding the understanding of pottery production in the Caribbean region. As has been demonstrated the approach so far has been very focus on understanding the chronology of the region, and whilst this is an important place to start it is now time to begin to use ceramics to discuss other topics. This research has to be focused in what it attempts to achieve but the results this work will yield will be valuable and increase what is known about the post-Saladoid ceramics in the Leeward Islands. Nevis is an island that has perhaps received less attention than others and work that is currently being undertaken by others focuses heavily on the Saladoid occupation of the island. The following two chapters outline the methodology used to analyse the pottery assemblages focused on in this research and the results of the analysis undertaken is outlined in chapters six, seven and eight.

Chapter 4: Methodology of pottery analysis

4.1 Introduction

The analysis of post-Saladoid pottery in the Leeward Islands is still in its infancy and it has not yet been possible to fully describe or define the nature of pottery development within this period. As discussed in Chapter 2 scholars previously hypothesised that the Leeward Islands formed part of the Elenan Ostionoid sub-series identified in the Greater Antilles and Virgin Islands (see Rouse 1976; Wilson 1989; Peterson & Watters 1991). This theory has however come under question and work by Hofman on Saba has started to show that a blanket assumption that all Leeward Island post-Saladoid pottery falls into the Elenan sub-series cannot be applied to this region. The pre-occupation with answering such questions as where the Leeward Islands fit in the chronology charts already well defined for other areas of the Caribbean has had a marked influence on the way the pottery has been studied in the past. To date, with a few notable exceptions (Peterson & Watters 1991; Hofman 1993; Donahue *et al.* 1992; Goodwin 1979), the analysis of pottery in this region has been based on the classification of a small number of morphological features or stylistic characteristics such as decoration or rim form (see Rouse 1976; Wilson 1989 for example), an approach to pottery analysis characteristic of much of the Caribbean region. In the Leeward Islands there has at least been some attempt to deviate from just using pottery to answer chronological related questions. For example Goodwin's analysis of sherd 'pastes' from St. Kitts and Donahue *et al.* petrological analysis of sherds from different islands within the Leeward group attempted to look at questions of technology and vessel movement. Probably the most holistic study of post-Saladoid pottery in the Leeward Islands to date has been that of Corine Hofman's work on the island of Saba. Her analysis comprised the examination of stylistic, morphological and technical aspects of the Saban pottery (Hofman 1993).

Hofman's work has set an important precedent for the analysis of pottery in this region. It is necessary for similar studies to be undertaken on other islands within the Leeward group in order to aid in the definition of pottery attributes that are diagnostic to the post-Saladoid period in this area and to enable cross assemblage comparisons to be made and to start to unravel the development and changes in pottery production during this period.

The intention of this chapter is to justify why and outline how the recording process was executed and to explain how the approach used for the material found on Nevis will aim to answer the questions this research hopes to address. The three questions proposed in the introductory chapter required the pottery from Nevis to be analysed in certain ways. The first two questions raised – was the pottery found on the island of Nevis manufactured from locally available resources or were some vessels brought to the island from elsewhere – is best addressed by identifying the inclusions within a vessel through macroscopic and petrological analysis. The method of such analysis is explained in the ensuing sections of this chapter. The third question raised about the similarities and differences of the assemblages are investigated through the recording of hand specimens of pottery and attribute analysis to allow comparisons between assemblages to be made.

4.2 Recording the Hand Specimens

One of the three questions this research hopes to address is:

1. To what extent are the assemblages from Coconut Walk and Indian Castle on the island of Nevis similar or different to one another?

In order to compare inter assemblage similarities and differences a coherent methodology needs to be established that can be applied to all the material being studied. It is essential to ensure that the pottery is recorded in the same way so as to limit the occurrence of any inconsistencies that would prevent consistent comparisons to be made between and across assemblages, for example it is paramount to ensure as much as possible that any differences observed are real differences rather than just a result of different recording strategies. It is therefore the intention of this section to discuss the methods used to record various aspects of the pottery that would allow for such comparisons of similarity and difference to be made.

Sherd thickness

The thickness of a sherd can be related to the size of a vessel and in some cases might aid in the assessment of vessel function (PCRG 1995:36). In general terms the larger the vessel the thicker the walls need to be in order to provide structural support and ultimately such vessels will require a greater amount of temper to reinforce the clay (Rice 1987:227). It has been suggested that in the Caribbean region there is a distinct difference between the thickness of sherds recovered from Saladoid and Post-Saladoid sites, Saladoid sherds reportedly being thinner than post-Saladoid sherds (Wilson 1989). If sherd thickness is important then it might be a variable that differs between vessel types within the post-Saladoid period or even through time as vessels are thought to become cruder and less well made vessel walls may increase in thickness. The thickness of a sherd was measured in millimetres and then converted using the thickness codes, which can be found in appendix 1.

Diameters, percentage present and height

The diameter of every rim, griddle and base sherd was measured and the percentage of the whole represented by the sherd was recorded using a rim chart. The diameters of sherds that represented less than 5% of the complete vessel were not recorded, as it is difficult to obtain an accurate reading from such small sherds. The heights of vessels were recorded in cm where a complete vessel profile could be identified and the standing height of all griddle sherds was also recorded. Rim, base and griddle forms were classified during the attribute analysis and are detailed in the next section.

Surface Treatment

This can be defined as any decorative or functional method that has been used by the potter in order to alter the surface of a vessel (Gibson & Woods 1997:206). In this instance decorative techniques were not recorded in the category of surface treatment but as a separate entity under decoration. There are a number of surface treatments that have been applied to the pottery studied, smoothing, burnishing, scrapping and dipping the vessel in a slip. A smoothed or burnished surface is achieved by closely related techniques. Burnishing is undertaken when the vessel has dried to a 'leather hard' state at which time the potter rubs the surface of the pot with a smooth stone or other such implement in order to modify the texture of the surface (Orton *et al* 1993:126; Rye 1981:89). The burnishing of a pot requires considerable expenditure in terms of time and effort and is therefore usually undertaken for a specific purpose. This can either be functional, in that it can reduce the permeability and increase the strength of a pot, or purely aesthetic (Gibson & Woods 1997:114-5). The treatment process utilised for burnishing is also adhered to for the creation of a smoothed surface, only to a lesser degree. The surface lustre that is so prominent with burnishing is not achieved and the pores of the clay are not entirely closed (Rice 1987:138). Often in the case of the Nevisan pottery burnishing was carried out after the application of a thin red orange slip. Some sherds had also been scrapped all over with an implement in order to roughen the surfaces. The type of surface treatment was recorded by a two-letter code and the position of surface treatment was record using a numeric code, both these codes can be found in appendix 1.

Sherd Colour

The colour of a potsherd is dependant on several variables, two of which are of particular importance (Rice 1987:333):

1. The amount, size and distribution of impurities, mainly in the form of iron and organic material present in the clay
2. The time, temperature and atmosphere of the original firing process.

The presence of iron is the primary determinant of the final colour of low-fired clay, however this element cannot begin to play an active role until any organic matter present in the clay has been oxidised and eliminated. During the firing process there are two types of atmospheres that can be created an oxidising atmosphere and a reducing atmosphere (Orton *et al.* 1993:133; Sinopoli 1991:30). An oxidising atmosphere will only occur when the amount of oxygen present is more than required to combust the fuel (PCRG 1995:28). When a vessel is fired in such an atmosphere the organic material contained within the clay will burn and form carbon dioxide, once this material has been largely eliminated the colour development or iron compounds within the clay can begin (Rice 1987:335). Due to the conversion of iron compounds to ferric oxide in the clay during fully oxidising conditions, the colour of the pottery produced will fall into the orange, brown, red spectrum (Orton *et al.* 1993:133; PCRG 1995:28). If there is no excess in the amount of oxygen (known as a reducing or unoxidising atmosphere), or if the duration of firing is not sufficient then the carbon will not burn and a black or dark grey pot will result (Orton *et al.* 1993:133). Firing conditions can be controlled to some extent and therefore the potter does have a degree of choice in the colour of the pot created, for example by standing vessels upside down a different exterior and interior colour can be created. The type of clay, the conditions under which that clay was fired and choices made by the potter, therefore dictates the resulting colour of the potsherd.

Conventionally the colour of a potsherd is often recorded using a Munsell Colour chart in order to avoid odd descriptive terminology and to achieve consistency in the recording process (Rice 1987:339). It is also useful to include Munsell colour references so that someone reading about the colour of pottery from a site can refer to the chart and gain an idea of the sherd colour without having the actual sherds in front of them. Although Munsell charts do provide a comparatively high degree of standardisation it is, as with all systems, still subjective to some extent. A Munsell colour chart was not utilised in this instance for a variety of reasons. The use of the chart involves the recording of an alphanumeric code, for example a sherd recorded as being 5 YR 6/8 would mean it had a hue of medium reddish yellow, a medium high value of brightness with a high purity or chroma (Rice 1987:341). The process of recording the interior, exterior and core colour of thousands of sherds in this way was perceived as being too laborious for the amount of useable information it would yield about an assemblage.

All the sherds analysed were fired in bonfire type structures as opposed to kilns and therefore there is a lack of conformity in the colour of a sherd. The exterior surface of a single sherd may vary quite considerably in colour due to the firing conditions achieved during the firing process and therefore the use of the Munsell chart in describing these inconsistencies would have been extremely complicated.

The system of recording colour therefore had to be easy to apply to large amounts of pottery, encompass the range of colours that could occur on one sherd surface and yet be manageable to enable comparisons to be made in an uncomplicated way. It was thus decided that the Munsell approach would be too complicated and cumbersome to apply in this case. It was also decided that the construction of another system to describe colours would suffer the same difficulties and be more subjective. Therefore the interior, exterior and core colour of a sherd were all recorded as being oxidised (falling into the red, orange, brown spectrum), unoxidised (encompassing the black, grey spectrum) or irregular (colours varying from oxidised to unoxidised). These divisions were considered to provide enough information as to the general colour of a sherd whilst allowing for any complexity in colour to be recorded but the system is not so convoluted that it renders comparisons between sherds impossible at a later stage of analysis.

Inclusions

The term inclusion is used to describe all non-clay and or non-plastic materials present within a clay body or fired fabric (Gibson & Woods 1997:192). Within any given fabric two types of inclusions can be found, those that were already present in the clay matrix, and those that have been deliberately added by the potter as temper (PCRG 1995:29).

The identification of inclusions within a vessel can often provide information as to where the material used to manufacture that pot was obtained. It can also help in determining whether the pottery found at a site was all made from the same resources of clay and temper or if different clay sources were being exploited to create those vessels. The identification of inclusions, and their texture, within the Nevis pottery is therefore important in order to answer the question of whether or not the pots were all made from resources available on the island. By identifying the inclusions present in a pot and inferring likely geological sources for the clay and temper used it is possible to determine whether vessels were produced from locally available materials or made elsewhere and brought to the site through mechanisms of trade and exchange. For example if a vessel found on Nevis, a wholly volcanic island, was found to be made from a limestone rich clay then it would be apparent that such a vessel could not have been made from resources available on the island and thus must have been brought to Nevis from elsewhere.

A number of considerations had to be taken into account when approaching the identification of inclusions found in the pottery. Nevis is a volcanic island and therefore the majority of sherds were assumed to include fragments of volcanic rock. Such rock fragments are hard to identify by eye and thin sectioning is generally advised in such cases. The second consideration was that there appeared to be little obvious differences in the types of inclusions found and a 'traditional' approach to fabric analysis was thought to be perhaps too laborious for the amount of useable information it would yield. Therefore during the initial stages of analysis the types of inclusions were recorded as being either igneous or limestone as this would reflect the division found between the geology of the islands within the Leeward group and would also indicate if any sherds were made off island. A more detailed fabric analysis was carried out on samples of rim sherds after they had been grouped into a rim typology, these sherds were then also analysed petrologically. The execution of that recording process and the reasons for such an approach are further explained in the section about petrological analysis.

Use Wear Evidence

The way in which a vessel was used during its life can often leave physical traces that provide clues as to the possible function of a pot. The majority of pottery found on settlement sites will have been used to perform some kind task connected with the processing of food or drink whether that be storage, cooking or serving (obviously this is just a generalisation and there are of course exceptions). The processing of consumables by mixing, stirring, grinding or pounding if done repeatedly will over the course of time damage the interior surfaces of a vessel. The identification of abrasion or striations on the interior surface of a sherd may well indicate that such processes were being used in conjunction with this vessel.

Often cooking vessels will retain traces of their role in the form of soot deposits or burnt food residues. If a vessel has been repeatedly placed over a fire for cooking purposes soot may be visible on the exterior surfaces and a change in colour of the surface may also be noted. In some cases it might be possible to see fine cracks developing on the surface where the vessel has been repeatedly heated and cooled. Frequently these indicators of use are undistinguishable from a potsherd, soot will often be removed inadvertently during post-excavation washing and processing. It is also hard to identify changes in a vessel's colour that are a result of cooking as opposed to the conditions in which the pot was originally fired, this is especially so when dealing with pottery fired in a bonfire where fire clouding and variation in colour are frequent characteristics of the finished article. Other traces of use evidence can include pitting of the interior vessel wall, this can be particularly noticeable if a vessel with a calcareous fabric has been used to hold slightly acidic material as the calcareous inclusions on the interior surface are leached out but such inclusions are still visible on the exterior surface. Deposits of lime scale can also be left on the interior surface of a vessel that has repeatedly been used to store water, again if this is evidence of use as opposed to effects in the post-depositional environment the evidence will only occur on the interior surface as opposed to the whole sherd.

Not a great deal of use wear evidence was found amongst the Nevisian assemblages. This can either be because none existed or that evidence such as sooting and burnt residues were removed during post-excavation washing. The use wear evidence identified was recorded using a two-letter code and its position on a sherd was also noted.

Decoration

The vast majority of sherds analysed so far from the post-Saladoid Nevisian assemblages bore no decoration. Often the sherds that have been decorated are small and fragmented so it has not been possible to identify decorative motifs. Therefore in this instance only the type of decoration and its position on the sherd have been recorded.

The definition of decoration used here is 'the embellishment of a vessel beyond the procedures used to form the clay mass into the final vessel shape and finishing its overall surface' (Rice 1987:144). There is some debate as to what constitutes decoration and what constitutes a surface treatment, for example the addition of a slip can be seen as either. In the case of this work slip has been classified as a surface treatment as it is often applied to a substantial proportion of a sherd whilst the use of incision or painting in generally confined to the exterior surface of a sherd. It is also not possible to identify the use of slip to form decorative patterns and this is another reason it has been classed as a type of surface treatment. This is not the place to debate the merits and flaws of such distinctions but to be aware of those modifications to a vessels surface that have been recorded as decorative as opposed to surface treatments.

Two categories of decorative treatments have been distinguished, those that involved additions to the surface and those that involve the penetration or displacement of the surface of a sherd (Rice 1987:144). Types of decoration that involved the penetration or displacement of the surface include incision, punctation, impression, stamping, rouletting and tooling (Rice 1987:144). The most common type of decorative technique applied to the pottery being studied is that of incision. Incised designs are created by cutting lines into the surface of a vessel with a pointed implement and the size of the incision achieved is dependant on the type and size of tool used (Rice 1987:144). Incision can be carried out when the vessel is leather hard, after firing or before or after the application of a slip (Rice 1987:144). Incising a wet or leather hard vessel creates a clean line where as post firing incision may cause fine chipping of the clay at the margins of the line (Rice 1987:144). If a slip has been applied it is often easy to see if the incision was made before or after application by discerning whether the lines are covered by the slip or penetrate it (Rice 1987:144).

Another technique that modifies the surface of a vessel by displacing the clay is that of tooling. This technique is similar in execution to that of incision in that a pointed implement is used, however it differs in that the surface is not entirely penetrated, just indented slightly.

The techniques employed to decorate a vessel's surface by additions to it may include the joining of formed clay elements to the pot, such as modelling, or the application of treatments that alter the colour such as painting, glazes and slips. As has been mentioned previously the additions of slips in this cases has been recorded elsewhere. Decorative techniques such as modelling and painting are not employed as frequently in the post-Saladoid as they were in the preceding period so not surprisingly relatively little occurrence of such decoration was recorded.

4.3 Pottery Classification and Attribute Analysis

Classification can be defined simply as the grouping of similar entities. The object of classification is to create groups comprised of members that are very similar the principal being that the similarity in entities within a group does not occur by chance but instead reflects something inherently significant in their nature (Rice 1987:274). In the case of pottery, groups are usually created on the basis of common features such as material, technique and style (Rice 1987:274, 275). For example groups of pottery maybe formed on the basis of fabric similarities, known as fabric groups, or on the basis of the type of vessel, such as bowls, jars, dishes etc. The characteristics that comprise a particular entity to be classified or identified are usually termed attributes (Rice 1987:275). Common attributes that are recorded include those mentioned in the previous section, thickness, colour, inclusions, decoration, surface treatment etc. In this section the methodology used to classify the pottery on the basis of the occurrence of common attributes is described. This method was essentially used for the creation of a rim typology as is explained during the course of this section.

The island of Mailu is located just off the southeastern coast of Papua New Guinea in the Pacific (Irwin 1985:4). The Mailu islanders maintained a large fleet of sea-going canoes and their island was the point of articulation for both local and long distance trade networks (Irwin 1985:4). The Mailu participated in the making and movement of shell and other objects as well as holding the monopoly in the manufacture and supply of pottery to a large surrounding area (Irwin 1985:4). Irwin's work was primarily concerned with comparing pottery assemblages across space and time and it is the methodology of classification that he developed and applied to the Mailu pottery that is of concern here. Certain characteristics of the Mailu pottery assemblages affected the way in which it could be studied and some of these characteristics are evident in the material from Nevis. The main issue Irwin faced was that his assemblages were fragmentary and no whole vessels were present, in addition to this factor the assemblages were also of varying size and quality and yet it was desired that comparisons be made between them. A similar scenario occurs with the assemblages from Nevis. The main advantage of Irwin's attribute analysis therefore is that it has been designed specifically for comparing across assemblages on the basis of sherds as opposed to whole vessels and varying sizes of assemblages can be compared (Irwin 1985).

Discussion of attributes selected

Attributes of form, surface treatment and decoration are focused upon in this stage of analysis. Attributes of the materials used to produce these vessels have been recorded separately for various reasons that will be explained in the following section. The attributes selected for analysis were done so on the basis of those identifiable in the pottery assemblage and by following Irwin's selection of attributes where appropriate. The attributes included in the pottery classification are listed below.

Categories 1 to 11 are obviously not single attributes but classes of potsherd defined according to the part of the vessel they originate from and the categories that comprise class II are clearly only applicable to rim sherds.

ATTRIBUTE CODES

Class I – classes of potsherd defined according to what part of the vessel they originate.

1. Open Rim
2. Closed Rim
3. Neutral Rim
4. Uncertain as to 1, 2 or 3
5. Neck **5a.** curved, **5b.** angular
6. Shoulder **6a.** curved, **6b.** angular
7. Base **7a.** rounded, **7b.** angular, **7c.** pedestal or annular
8. Handle
9. Griddle. **9a.** Griddle with leg
10. Body
11. Unknown

Class II – class of rim shape

12. Rim course – straight
13. Rim course – concave
14. Rim course – convex
15. Rim Profile – simple parallel profile
16. Rim Profile – gradual thickening towards lip
17. Rim Profile – gradual reduction towards lip
18. Rim Profile – Abrupt thickening towards lip
19. Rim Profile – Abrupt reduction towards lip

Class III – class of griddle shape

20. Perpendicular raised rim
21. Triangular raised rim
22. Overhanging raised rim
23. Rounded raised rim
24. Un-thickened rim

Class IV – class of lip shape

25. Lip flattened
26. Lip flattened with thickening or reduction on exterior surface
27. Lip flattened with thickening or reduction on interior surface

28. Lip rounded
29. Lip rounded with thickening or reduction on exterior surface
30. Lip rounded with thickening or reduction on interior surface

Class V – class of surface modification

35. Plain
36. Decorated

Class VI – class of surface treatment

37. Burnished
38. Slip
39. Slip and burnished
39a. Smoothed
39b. Wiped

Class VII – class of surface treatment location

40. All surfaces
41. Exterior surface only
42. Interior surface only
43. Exterior surface and lip
44. Interior surface and lip
45. Lip only
46. Rim interior only
47. Base interior only
48. Back edge of griddle

Class VIII – class of decoration
49. Incision
50. Modelled
51. Tooled
52. White on Red painting

Class IX – class of decoration location
55. All surfaces
56. Exterior surface only
57. Interior surface only

Types of rims are divided as to their orientation in relation to the central vertical axis of a pot. Rims classed as open have an everted orientation in relation to the central vertical axis; whilst rims classed as closed are inverted and neutral rims are parallel in relation to the central vertical axis. Bases are classed in terms of their form being either rounded, angular or pedestal/annular.

The general course of a rim is the next attribute to be recorded and this can either be straight or curved, if curved then the curvature can either be concave or convex. Then the rims may be classified according to the details of rim profile. Attribute number 15 refers to rim sherds where the inner and outer wall surfaces lie parallel, whilst the inner and outer surfaces of 16 and 17 diverge or converge respectively as they approach the lip resulting in a gradual thickening or reduction of the rim. Attribute numbers 18 and 19 describe rims where the thickening or reduction of the rim is abrupt.

Irwin points out that it is important to consider the amount of detail that should be taken into account and he suggests that not all of the minutia of rim form are of equal significance and the problem is to distinguish the potters' conventions from more or less chance variations that can occur (Irwin 1985:105). As this attribute code is applied to more assemblages and the results are analysed it should be possible to determine the significance of certain attributes and simplify the rim shape classifications by combining attributes thus reducing the number of classes.

Lip shape refers to the shape of the rim at its upper margin (Irwin 1985:105). Types of lip shape are divided broadly into two categories and then further subdivisions are made within those categories. The two kinds of lip shape are therefore flattened lips and rounded lips, these can then be classed as either flattened or rounded in equal proportions or with reduction or thickening towards the interior or exterior surface. Attribute number 26 for example would be a flattened lip with thickening or reduction on exterior surface. The combination of this information and that of the preceding class, which was concerned with the profile of a rim, will mean it is possible to determine whether a rim converges or diverges, abruptly or gradually, towards the exterior or interior surface.

Griddle shapes are based on those identified by Hofman in her work on Saba, which were in turn based on classifications of griddle rim shapes by Bullen (see Hofman 1993:70, 71). Five shapes have been identified as outlined in Class III of the attribute code; attribute 24 describes un-thickened griddle rims, which unlike the others are completely flat and also known as 'pancake' shaped griddles. The bottom of some griddles bear ridges that could be reed imprints as reported from elsewhere (see

Hofman 1993:70). This is recorded as a type of surface treatment as opposed to decoration.

The types of surface treatments (coded as attributes) can be found singularly or sometimes in combination for example a slip may have been applied to the exterior surface of a sherd whilst the interior surface was burnished. Explanations of the types of surface treatment and decoration recorded were given in the previous section.

The attributes listed above are all measured at the nominal or ordinal scale, other attributes of sherds were measured on interval or ratio scales. These include sherd thickness; rim, base and griddle diameter and percentage present, height of griddles and height of vessels when complete profiles could be identified.

All the sherds recorded from an assemblage were therefore given a code and these codes were entered into a Microsoft Excel database for each site. To give an example of how the coding system works a sherd recorded as being 1; 12, 15; 25; 36; 37; 41; 49; 56 would be an open rim that had a straight course with a simple parallel profile and a flattened lip. The rim was decorated, burnished on the exterior surface only and the type of decoration used was that of incision on the exterior surface. Once all the sherds had been coded and entered in the database the rim sherds were selected and sorted so that sherds sharing the same attributes were grouped together. From this it was possible to start to distinguish groups of rim sherds. At the broadest level a distinction could be made between open, closed and neutral rim forms; then further divisions within these categories could be made in terms of open rims with a straight course and parallel profile compared to open rims with a straight course and abrupt thickening. Rim groups were then given an arbitrary label such as R1, R2 etc. This was done for simplicity's sake so that each time reference was made to a particular group of rims with the same attribute code the whole code did not need to be written out each time. Further discussion of how the rim groups were formed can be found in chapter 6, where the analysis of material from the site of Coconut Walk is outlined.

4.4 Conclusions

The objective of this chapter has been to outline the various stages of methodology used in order to collate data that will, once analysed, begin to answer the questions stated in the introduction. There have been three components that have comprised the collection of data for this research. The first two, the initial recording of a sherds characteristics, and then the collation of those characteristics into an attribute code where some aspects such as rim, base and griddle form were expanded have been outlined in this chapter. The third component, recording the fabrics of a sample of sherds in more detail and making thin sections for petrological analysis is discussed in the following chapter along with the geology of the Leeward Islands and similar work that has been carried out in the region to date that might aid this research.

Chapter 5: Petrological analysis

5.1 Introduction

This research aims to address several questions, one of which is whether the pottery found on the island of Nevis was made from locally available resources. If a component of the post-Saladoid pottery was found not be made from locally available resources then where did the pottery originate from and was the movement of pottery vessel specific, for example was it just a particular form of vessel that was being brought to the island. In order to answer such questions it is necessary to identify the types of inclusions found within potsherds recorded from the sites. Then with the use of geological maps it may be possible to locate the most likely source for the material used to make that pottery and this in turn can be used to infer whether the vessel was made locally, i.e. on Nevis or on another island.

It is the intention of this chapter to discuss the approach to petrological analysis undertaken in this research. Firstly the methodology used is discussed and the geology of the Leeward Islands is outlined. Then a consideration will be made as to the effectiveness of this type of analysis and the results that could reasonably be expected, as well as the limitations it poses and this is followed by a brief synopsis of previous petrological analysis undertaken within the region.

5.2 Methodology

As mentioned previously, the identification of types of inclusions found in every individual sherd recorded was not attempted. Nevis is a volcanic island and the pottery was therefore in the main composed of clay bearing igneous rock fragments and associated minerals. The identification of such inclusions with any degree of certainty is difficult by eye so it was decided to use a broad scale approach and just to note the type of inclusions present as either being igneous or sedimentary as the islands within the Leeward group fall into one of these two categories. The identification of sedimentary inclusions in sherds found on Nevis would indicate that they originated elsewhere and were brought to the island, if such sherds were found then they would be subjected to further analysis.

As there seemed to be no strikingly obvious visual differences between the types of volcanic rock inclusions found during the recording of the hand specimens it was decided that a sample of sherds should be recorded in more detail and thin sectioned. The sample selected consisted of rim sherds as these would help in answering the question of whether the movement of pottery was vessel specific and sherds were chosen on the basis of rim groups formed during the attribute analysis. All sherds were recorded initially by using a binocular microscope and the, size, sorting, rounding, sphericity and quantity of inclusions were recorded. A sample of each sherd was then consolidated due to their fairly friable nature, and thin sectioned.

An attempt was made to identify the types of inclusions visible under the binocular microscope by using Peacock's key to visual identification of principle inclusions as found in the PCRG guidelines (1995:44-45). It was not possible to identify all of the inclusions with any degree of certainty, so often just a description of what the inclusions looked liked was recorded. Inclusions were then identified in thin section under the petrological microscope by their optical properties.

The frequency of each type of inclusion within a sherd was recorded using the visual representations provided in the Prehistoric Ceramics Research Group's general policies and guidelines (1995:30). Instead of using the density class terms of sparse, moderate, common, etc. a percentage was recorded. This was done as generic terms such as sparse, moderate etc do not mean much if you do not have the density charts in front of you and also it is harder to use in quantification.

The degree to which the inclusions within a pot fabric have been sorted depends on two variables, the geological deposit exploited and the extent to which the potter has prepared the clay. For example, a potter could make two vessels from clay that is derived from one source, yet for one vessel the clay or temper is sieved and carefully prepared. The fabrics of those two vessels might appear to be different in that the inclusions in one pot are well sorted due to the preparation techniques employed and the inclusions of the other pot are poorly sorted. It is important to bear this factor in mind when looking at the differences between say fine and coarse wares. As both could have been made from the same clay resources yet one would expect the clay used to produce the fine ware vessels might have been more thoroughly prepared and therefore the inclusions might be better sorted. The diagrams of sorting of inclusions (PCRG 1995:48) were used to record the sorting of each type of inclusions.

The shape of inclusions within a pot can yield information as to the depositional origin of the clay used to produce that vessel (Rice 1987:72). The rounding or sphericity of inclusions is caused as a result of the abrasion received during wind, wave or stream action (Rice 1987:72). Therefore the shape of inclusions can reflect their erosional history, in general the rounder the grains the longer the history (Orton *et al.* 1993:139).

The roundness of inclusions can also aid in the differentiation between temper and natural inclusions (PCRG 1995:30). In general terms you would expect that inclusions that have been added as temper would be more angular than if they were found to be naturally occurring in the clays. For example if rock fragments were used as temper then they would need to be crushed before being added to the clay and quite angular fragments would be produced, if these inclusions were found naturally within the clay then you would expect them to be rounder due to their erosion within the clay. The relationship between shape of inclusion and whether it was added or naturally occurring within clay is quite simplified and does not always hold true. For example a potter may add to the clay temper that has a long erosional history such as beach sand where the inclusions are already well rounded.

The sphericity of inclusions was recorded as either being high or low using the visual representations for sphericity (PCRG 1995: 50) and the final variable to be recorded was that of inclusion size. Measurements were taken for each type of inclusion and usually the range of sizes was recorded in millimetres, this was done under both the binocular and petrological microscopes.

5.3 The Geology of the Leeward Island

The Lesser Antillean chain of islands stretches 430 miles from Sombrero in the North to Grenada in the south and separates the Caribbean Sea from the Atlantic Ocean (Martin-Kaye 1969:173). The islands that form the Lesser Antilles are comprised of two closely related arcs. Both of these arcs are essentially volcanic construction but differ in age (Martin-Kaye 1969:172). The outer eastern arc, extending from Sombrero to Granada (see Figure 13) was formed in the early Tertiary and volcanic activity in this arc ceased during the Miocene (Martin-Kaye 1969:172). The inner arc, where volcanic activity continues in present times, was formed during the late Miocene and Pliocene (Martin-Kaye 1969:173).

The outer and inner arcs are evident also in the Leeward Islands. The older outer arc comprises the islands of Anguilla, St. Martin, St. Bartholomew, Barbuda and Antigua; whilst the islands of Saba, St. Eustatius, St. Kitts, Nevis and Montserrat form the interior arc. A brief account of the geology of each of the Leeward Islands is outlined below in order to give an idea of the different geology of this island group. This is important information to collate in order to answer the question of whether pottery found at a site was made from resources available locally on that island or if it could represent an import from another island. Particular focus is given to the geology of Nevis as the vast majority of thin sections analysed for this research were made from the post-Saladoid pottery found on the island.

Anguilla

Anguilla has an area of 35 square miles and is 16 miles long by 3 miles wide. The island is composed of a limestone and marl series that overlies poorly exposed volcanic rocks (Martin-Kaye 1969:185). The limestones are abundantly fossiliferous and more specifically contain corals and echinoids (Martin-Kaye 1969:185). A source of clay has been identified at Sandy Ground and through analysis was found to be suitable for making pottery (Hofman 1993:188). The clay contained large lumps of carbonate that needed to be removed during the production process otherwise after firing they would have destroyed the vessel (Hofman 1993:188).

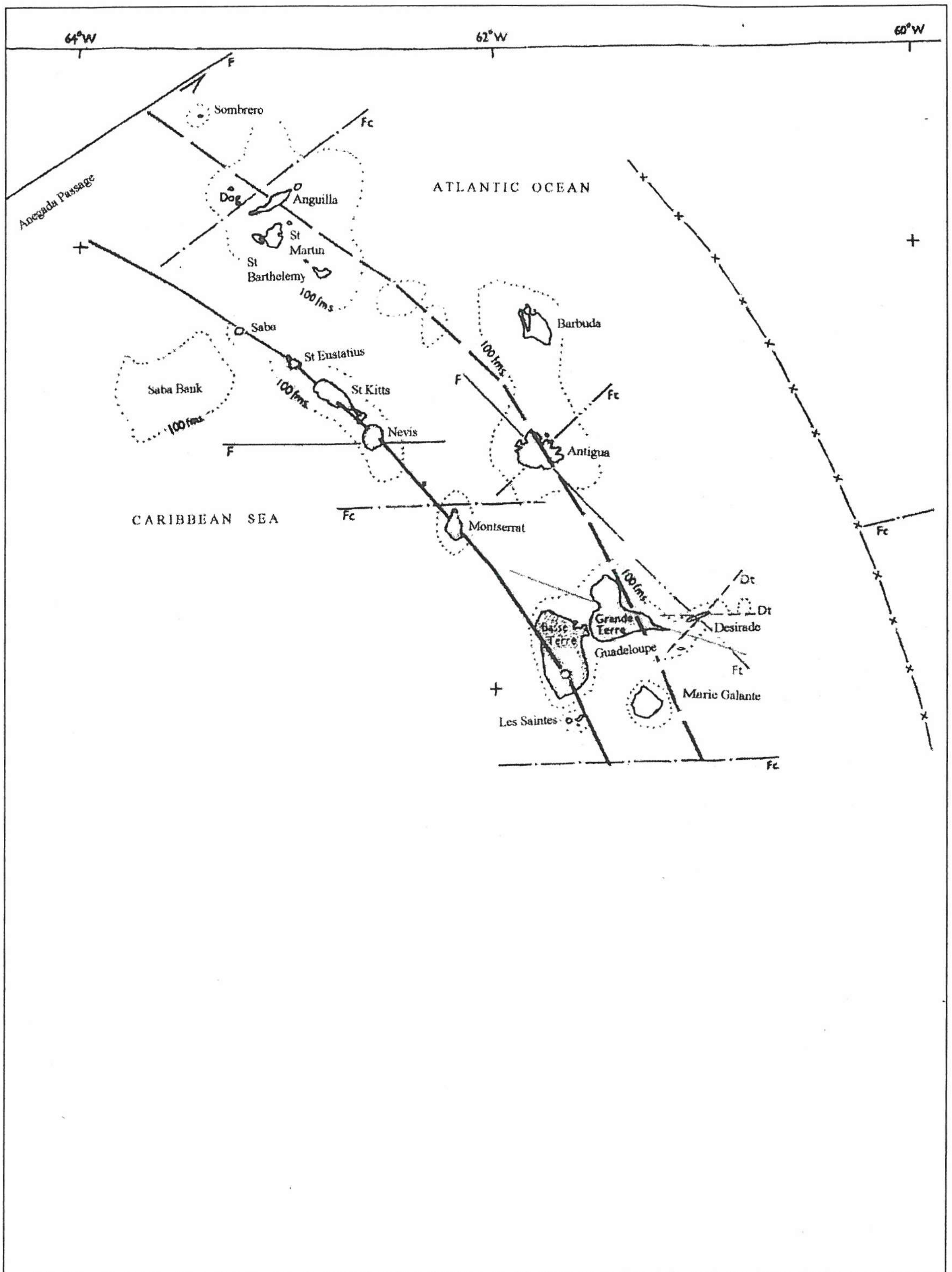

Figure 13: Map of the Leeward Islands showing the inner and outer arcs (after Martin-Kaye 1969)

St. Martin

The island displays important intrusions in a tuff formation, which is locally capped by limestone beds (Martin-Kaye 1969:186). Igneous rocks occupy more than half the surface area of the island, which is 38 square miles in total and range widely between granite-aplite and quartz-basalt with quartz diorite and andesite-porphyry being the most prevalent (Martin-Kaye 19:186).

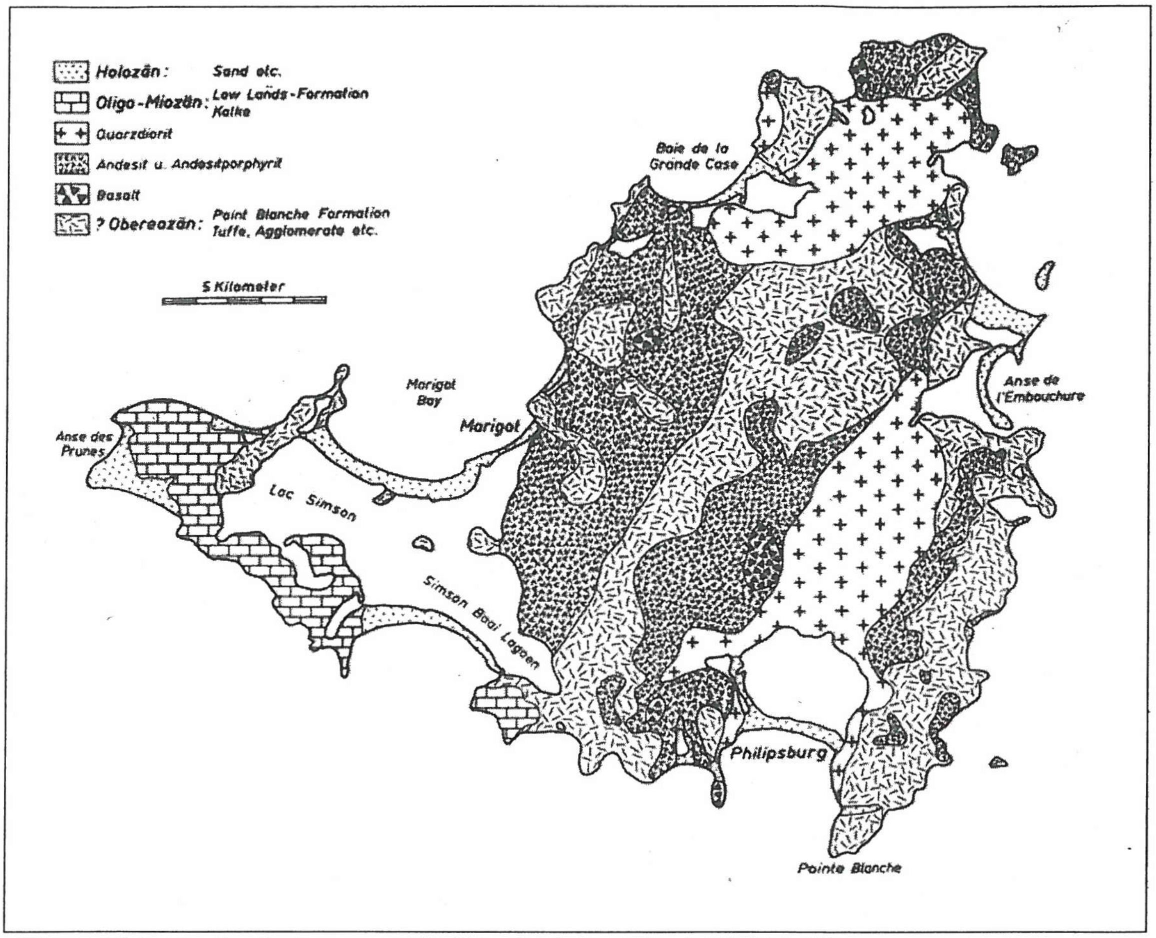

Figure 14: Geological map of St. Martin (after Weyl 1966:245)

St. Bartholomew

The island of St. Bartholomew comprises a total area of 10 square miles and measures 2 miles wide and approximately 6 miles long (Martin-Kaye 1969:187). The solid formations consist of a thick succession of pyroclastics containing interbedded limestones cut by andesite to dioritic intrusions and small outcrops of foraminiferal limestone are also encountered (Martin-Kaye 1969:187). A third of the total island area is covered by igneous rocks and include quartz-diorite, quartz-microdiorite, andesite and dacite, felsite and small bodies of basalt (Martin-Kaye 1969:187).

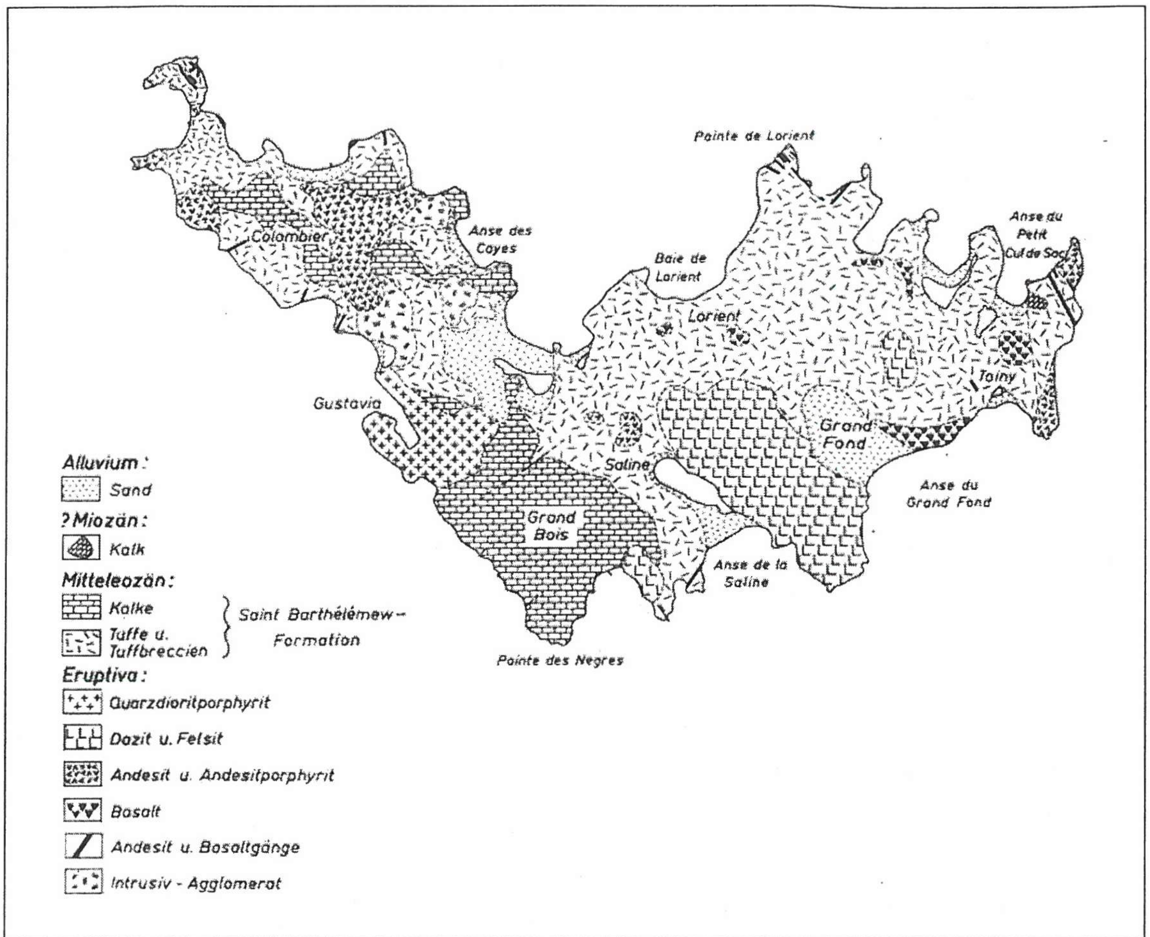

Figure 15: Geological map of St. Bartholomew (after Weyl 1966:247)

Antigua

This island, which is 108 square miles in area, is essentially comprised of limestones resting on volcanic rocks (Martin-Kaye 1969:187). The volcanics include agglomerates and tuffs cut by or intercalated with basalt-andesite-dacite flows and minor intrusions (Martin-Kaye 1969:188). These tuffs are overlain by the 1,500 ft thick Antiguan formation, which almost wholly consists of limestones (Martin-Kaye 1969:188). Cherts and conglomerates are also predominant and widespread, but patchy, clays and marls are also encountered (Martin-Kaye 1969:188). Two such clay sources were located and their suitability for potting tested by Hofman (1993:188). The first, obtained from a trench from the water supply on Long Island, was found to contain too many large pieces of calcium carbonate for it to be successfully used in pottery production (Hofman 1993:188). The second was collected from Flinty Bay and this clay was very plastic and certainly suitable for making pottery (Hofman 1993:189).

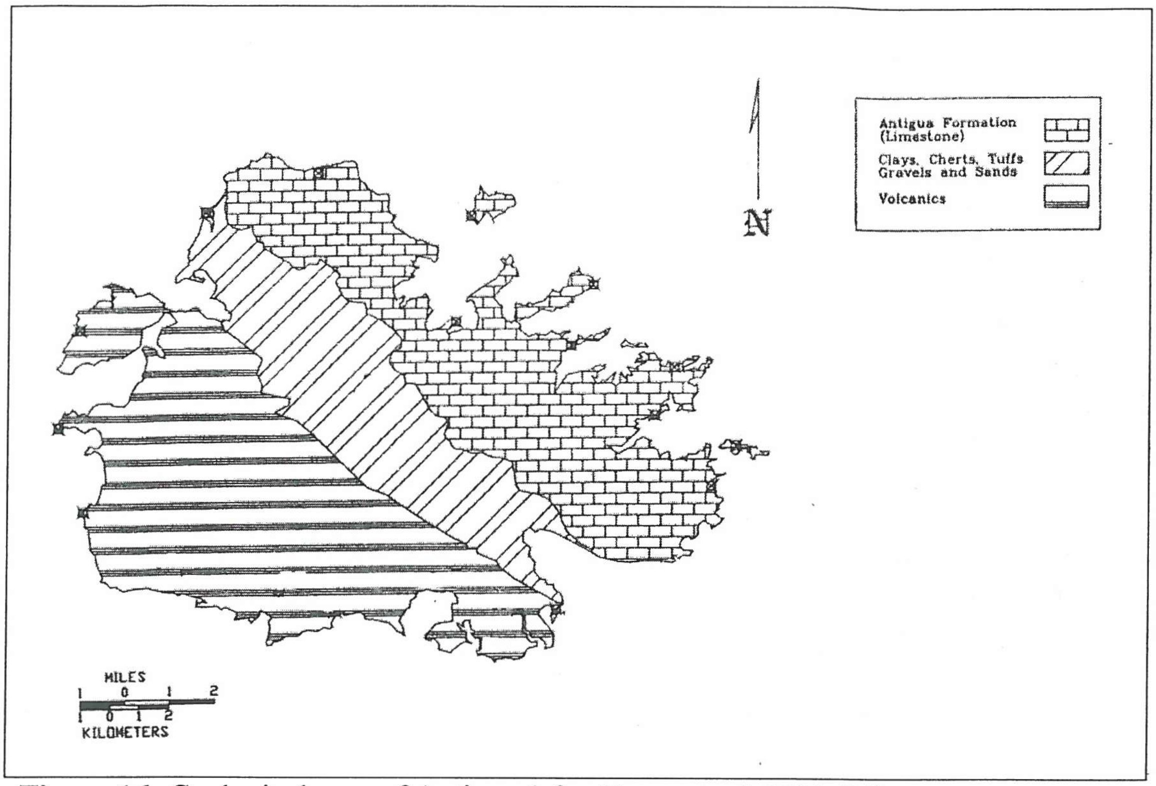

Figure 16: Geological map of Antigua (after Fuess *et. al.* 1991:34)

Barbuda

Situated 25 miles north of Antigua, Barbuda has an area of 60 square miles and is comprised of Quaternary limestones and calcarenites (Martin-Kaye 1969:188).

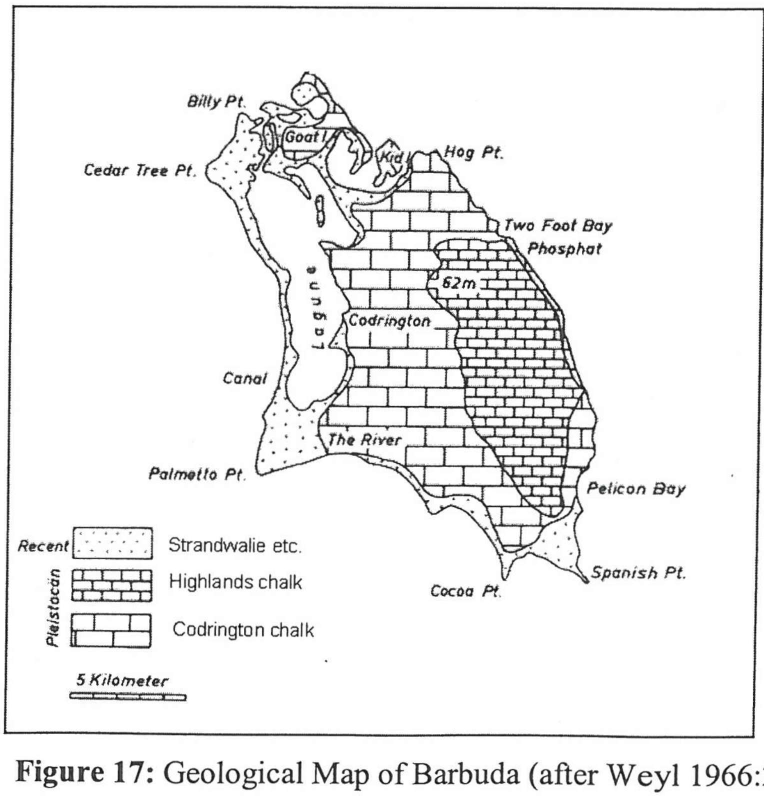

Figure 17: Geological Map of Barbuda (after Weyl 1966:250)

Saba

Saba, 4.8 square miles in area, consists of a strato-volcano surrounded by a number of lower volcanic domes (Martin-Kaye 1969:190). Hornblende-pyroxene-andesites and basaltic olivine bearing andesites are common and part of the hornblendes is oxyhornblendes (lamprobolite) (Martin-Kaye 1969:190). Andesites without hornblende are less widespread (Martin-Kaye 1969:190). Large parts of the volcano are composed of agglomerates and tuffs and no fossiliferous rocks have been encountered in any part of the island (Martin-Kaye 1969:190).

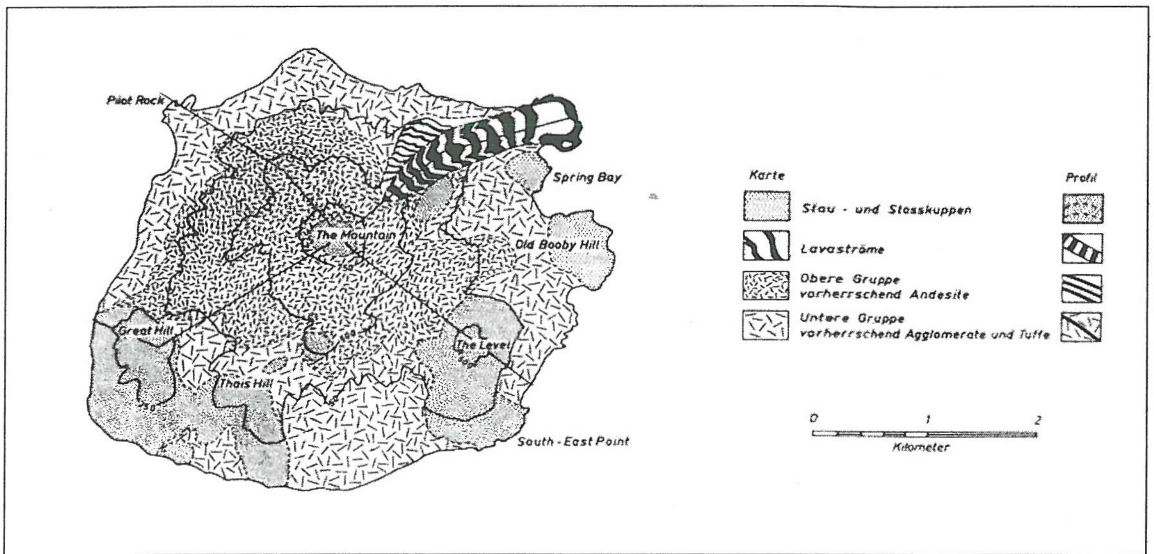

Figure 18: Geological map of Saba (after Weyl 1966: 190)

Two clay sources on the island have been identified; one is located at Rendez-Vous and the other at Mount Scenery (Hofman 1993:184). One clay sample was analysed from Rendez-Vous and three samples from varying heights at Mount Scenery were examined (Hofman 1993:185). Two of the three samples collected from Mount Scenery were found to be unsuitable for making pottery however the other clay sample from Mount Scenery and the clay from Rendez-Vous were both deemed to be adequate for potting (Hofman 1993:187, 189). The clay obtained from Rendez-Vous contained a great deal of feldspar and basaltic hornblende as well as hypersthene, augite and hornblende (Hofman 1993:187, 189). However the only suitable potting clay obtained from Mt. Scenery contained fewer inclusions made up of feldspar, hornblende, basaltic hornblende and epidote (Hofman 1993:189).

The differences in mineral content of the two clays are thought to be most likely a reflection of their respective geographical locations (Hofman 1993:191). For example the clay located on Mt. Scenery was formed as a result of in-situ weathering without any significant lateral supply of minerals and therefore has the characteristics of a primary clay (Hofman 1993:192). Whilst with the Rendez-Vous clay slope processes will have provided a supply of minerals to the site through lateral movement (Hofman 1993:192).

St. Eustatius

The island covers 8.2 square miles and encompasses a greatly denuded volcano in the north west of the island (no actual crater and cone form remain) and the Quill, a volcano that has erupted almost within historic times (Martin-Kaye 1969:190). In the north western part of the island the old volcanic basement is exposed where pyroxene-andesites and basaltic pyroxene andesites are the predominant lavas, whilst occurrences of hornblende-augite-andesites are rare (Martin-Kaye 1969:190). The crater rim of the Quill consists of massive blocks of pyroxene-andesite, and andesite pumice and dacite pumice have also been identified (Martin-Kaye 1969:190). The only instance of fossiliferous rocks on St. Eustatius has been located on the White Wall limestone formation, which faces the island of St. Kitts (Martin-Kaye 1969:191).

St. Kitts

Like St. Eustatius, this island is almost exclusively composed of volcanic rock. Pleistocene limestones have been located only at Godwin Gut and Brimstone Hill (Martin-Kaye 1969:191). At the latter site the limestones are richly fossiliferous with coral, foraminifera and molluscs predominating and have been uplifted on the flanks of a small hypersthene-andesite dome (Martin-Kaye 1969:191). There are three main volcanic centres on the island that become successively younger towards the northwest culminating in Mount Misery (Martin-Kaye 1969:191). Coarse-grained gabbroic blocks are occasionally found amongst the ejecta but augite-andesites and hypersthene-andesites predominate (Martin-Kaye 1969:191-192). Dacites are also recorded and olivine-basalt flows at Black Rocks and Profit Mountain have been identified (Martin-Kaye 1969:192).

Six major classes of soil have been recognised on St. Kitts, however only soil classes V and VI – the shoal soils – are of particular relevance here. These shoal soils cover an area of approximately 5,000 acres and are principally situated in the south eastern peninsular area region of the island (Goodwin 1979: 24). These soils are mature lithosols and protocols that have formed heavy poorly drained residual clay (Goodwin 1979: 24). The decomposition of basement rock at Morne Hills, south east of Basseterre, has produced kaolin clays and ochres in quantity (Goodwin 1979: 25). A mature clay source has also been identified at Frigate Bay on the peninsula where the basement formation has been altered to produce a weathered geological profile consisting of a variety of coloured ochres; yellow, brown and grey clays; kaolin and gypsum (Goodwin 1979: 25).

Platzer recorded in her thesis *The Potters of Nevis* that there was no locally made pottery on St. Kitts as there was no clay suitable for ceramic work on the island (Platzer 1979: 38). In May 2000 I spoke with the potter Carla Astaphan who lives and works on St. Kitts. She told me that she predominantly imported her clay from Barbados as she could readily obtain suitable clay from there. The clay was yellowish in colour and contained no non-plastic inclusions whatsoever and this fact was apparently important for Carla, as many of her pieces were very fine textured and finished with glazes or paint. She also said that she sometimes used clay from Nevis but that this was not a regular source of material for her. Carla had recently found clay on St. Kitts at a friend's farm near Conaree, however Carla did not achieve very good results when making pots from this clay. Carla usually produces wheel thrown pottery, which she then fires in a small kiln. The pottery she made using the Kittian clay cracked and chipped and the handles of vessels became detached during firing so she could not sell any of these vessels. She then made several small pots and fired them in a bonfire rather than the kiln. A far worse result was achieved using this method of firing; the vessels shattered and Carla reported that 'it was almost like the fire just ate the pots'. The resulting sherds she presented were extremely brittle and deformed. Carla did however successfully manage to fire several flat fish shaped pieces in the kiln, these had been glazed on one surface and they did not crack or chip during the firing process so she wondered if the glaze had helped the clay in some way. Professor Gerald Schroedl has however suggested that clay from Conaree is suitable for pot making and that another local potter has successfully produced pottery using this clay source (Schroedl *pers. comm.*)

Nevis

Nevis is geologically similar to St. Kitts and St. Eustatius and has an area of 40 sq miles measuring approximately 6 miles by 8 miles (Martin-Kaye 1969:192). The Nevis Peak volcano dominates the centre of the island, which is composed almost entirely of Upper Pliocene to Lower Pleistocene volcanic rocks (Martin-Kaye 1969:192). There are a number of different eruptive centres that have been identified on the island (see Figure 19). These range from the relatively recent Nevis Peak centre to the older, denuded residuals of well jointed dacite such as Windy Hill, Hurricane Hill, Cades Bay and Saddle Hill (Hutton 1978:1). Many of these older eruptive centres have been partially obliterated by ash-and-block flow deposits from Nevis Peak (Hutton 1978:1). Occasional blocks of re-crystallised poorly fossiliferous limestone have been found in ash-and-block flow immediately overlying an obscure outcrop of conglomerate on the slopes of Saddle Hill (Hutton 1978:1). Recent sands and gravels, reef and beach-rock deposits of limited coverage have also been identified (Hutton 1978:1). Apart from these rare incidents the island is comprised entirely of volcanic rocks (Hutton 1978:1). These are all dacites, ranging from normal to low-silica varieties transitional to basalt or andesite (Hutton 1978:1). The domes of the Nevis Peak volcano are comprised of vitrophyric hornblende-orthopyroxene dacites (Hutton 1978:1). The volcanics at Hurricane Hill consist of porphyritic hornblende-dacites whilst porphyritic pyroxene-dacites form Windy Hill (Hutton 1978:1). Blocky porphyritic dacites have been located at Cades Bay, low-silica pyroxene dacites have been identified at Saddle Hill and at Red Cliff volcanic breccias have been observed (Hutton 1978:1).

In 1979 Platzer carried out a study of current day pottery production on the island. During this work several clay sources that were being exploited by island potters at the time were identified and the clay was analysed using x-ray diffraction analysis and x-ray fluorescence analysis.

The soil at the northern end of the island has been termed 'shoal soil' and is found overlying volcanic deposits (Platzer 1979: 57). The upper layer of soil consists of

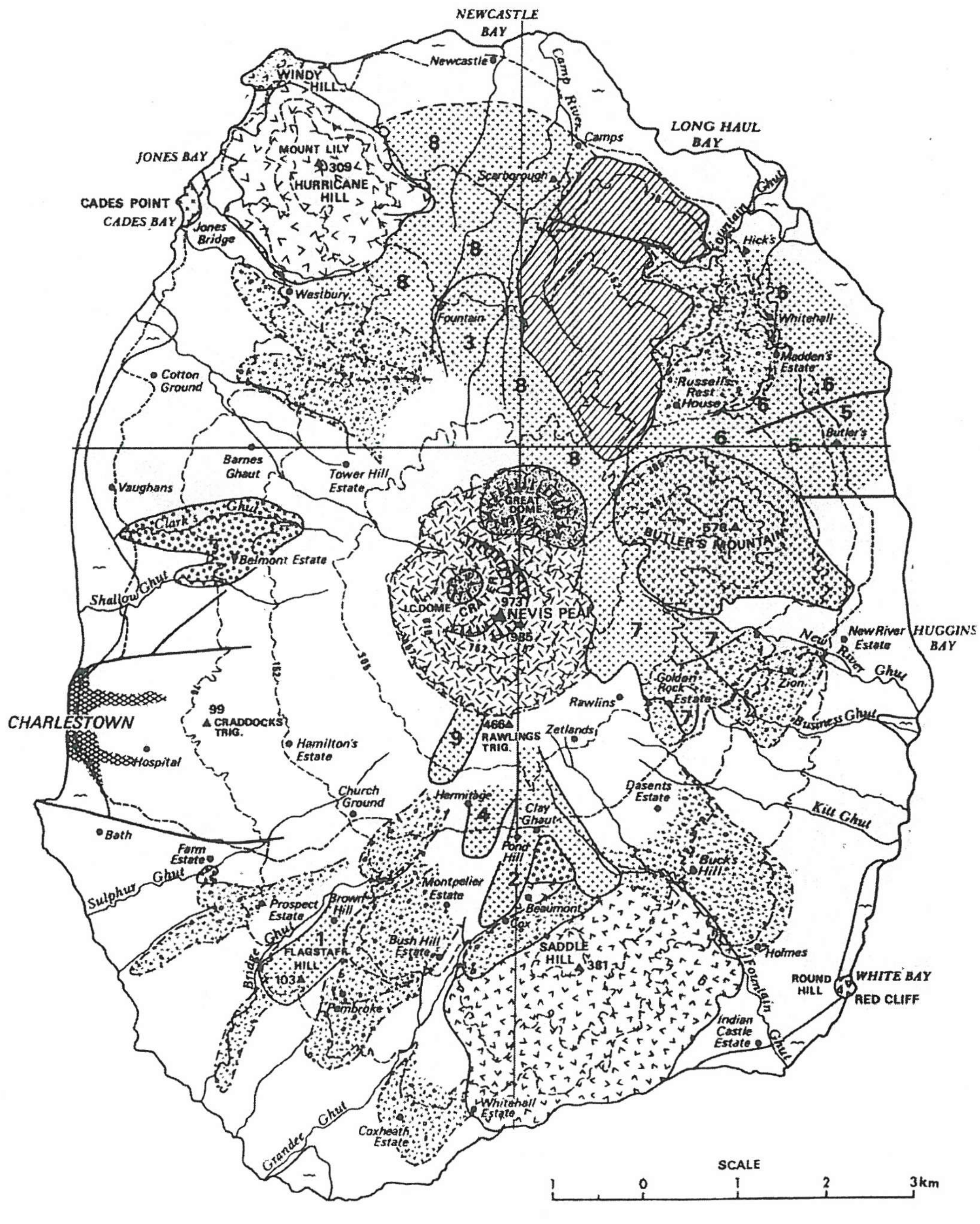

Figure 19: Geological map of Nevis (after Hutton 1978:3)

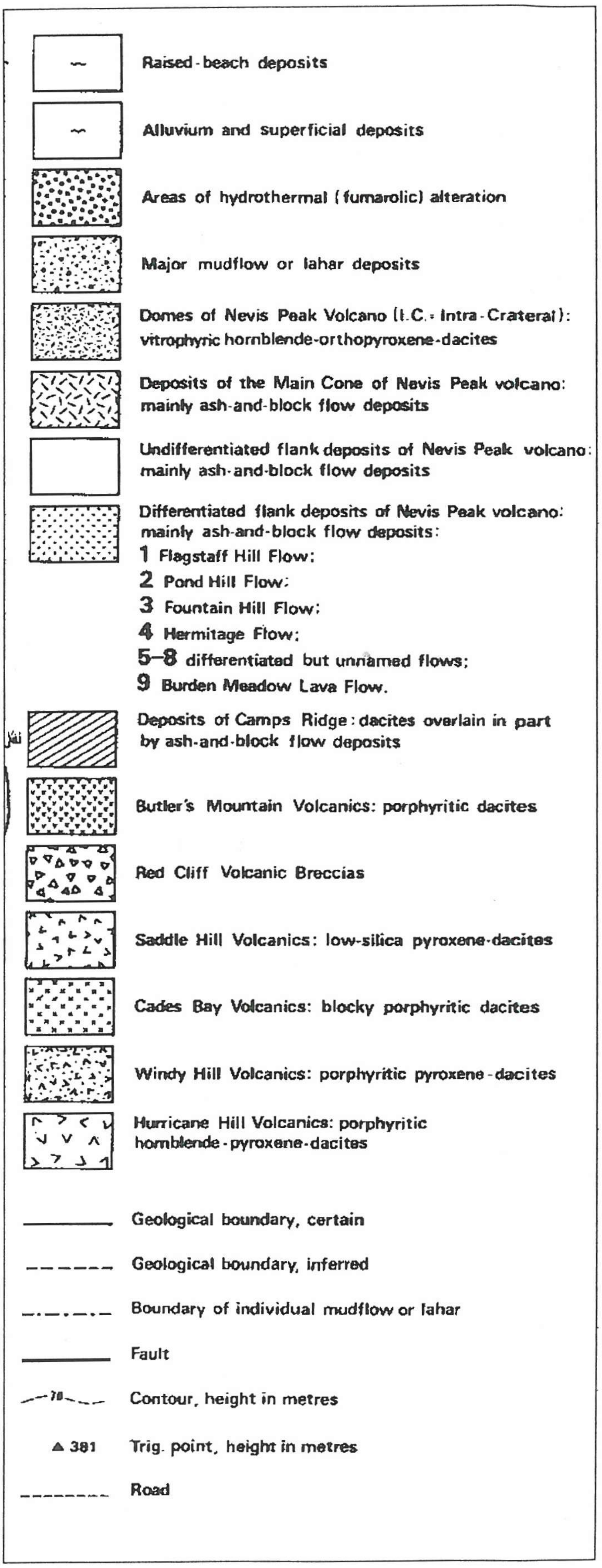

Figure 20: Key to geological map of Nevis (after Hutton 1978:2)

clay, which has been described as 'difficult to cultivate' and erosion of this shoal soil in parts of the island has been severe (Merrill 1958:40). In the late 1970's potters obtained clay from three general areas on the northern end of the island – Potwork Estate, Camps and various fields on Nisbett Plantation (Platzer 1979: 41). Samples of clay were obtained from these various sources for analysis and Platzer noted that the Nevis clay was 'quite sandy and felt gritty or coarse when worked' (Platzer 1979: 43). The modern day potters did not add any temper or non-plastic material to the clay as it was already heavily packed with inclusions and in fact the potters tended to remove as many of these as possible before working the clay (Platzer 1979: 43, 46). The x-ray diffraction and x-ray fluorescence analysis results identified two clay types from her sample (Platzer 1979: 56, 57). The first, clay type A, was found to contain mainly albite and quartz as well as montmorillonite or montmorillonite-chlorite (Platzer 1979: 56). Clay type B contained cordierite, magnetite, pyrite and rutile as well as quartz and albite, whilst the clay group montmorillonite was not discernable in this clay type (Platzer 1979: 57).

A further two clay samples (1919 and 1920) obtained from the forest near Rawlins displayed similarities to both clay types A and B and there was also an indication of a high percentage of organic material in the clay (Platzer 1979: 60). The local potters however did not exploit either of these sources as the clay was deemed, by them, to be unsuitable for potting (Platzer 1979: 102). A clay sample was also collected from a field near the pond on Clay Ghut Estate and found to resemble those clays from clay type B, however this source was also deemed unsuitable for potting by the locals (Platzer 1979: 59).

In May 2000 I spoke with one of the potters at the Newcastle pottery in the north of the island. He told me that he used to obtain clay from sources at Nisbett Plantation. However building work on the Plantation meant that he was unable to dig clay from there any longer and he was currently obtaining clay from Potwork Estate. This potter also said that clay could be found all over the island, but that not all clay sources were suitable for making pottery as some contained too much salt. During fieldwork on the island in May 2000 a clay source was located at the newly discovered site on Pinney's Beach and clay was collected near to the Indian Castle site.

Montserrat

Seven volcanic centres have been identified on this 32 square mile island. The oldest in the north, Silver Hill, consists of labradiorite-dacite (Martin-Kaye 1969:192). Other centres are comprised of intrusive andesitic rocks, pyroxene-dacite and hornblende-dacite and basaltic to dacitic agglomerates (Martin-Kaye 1969:192-193).

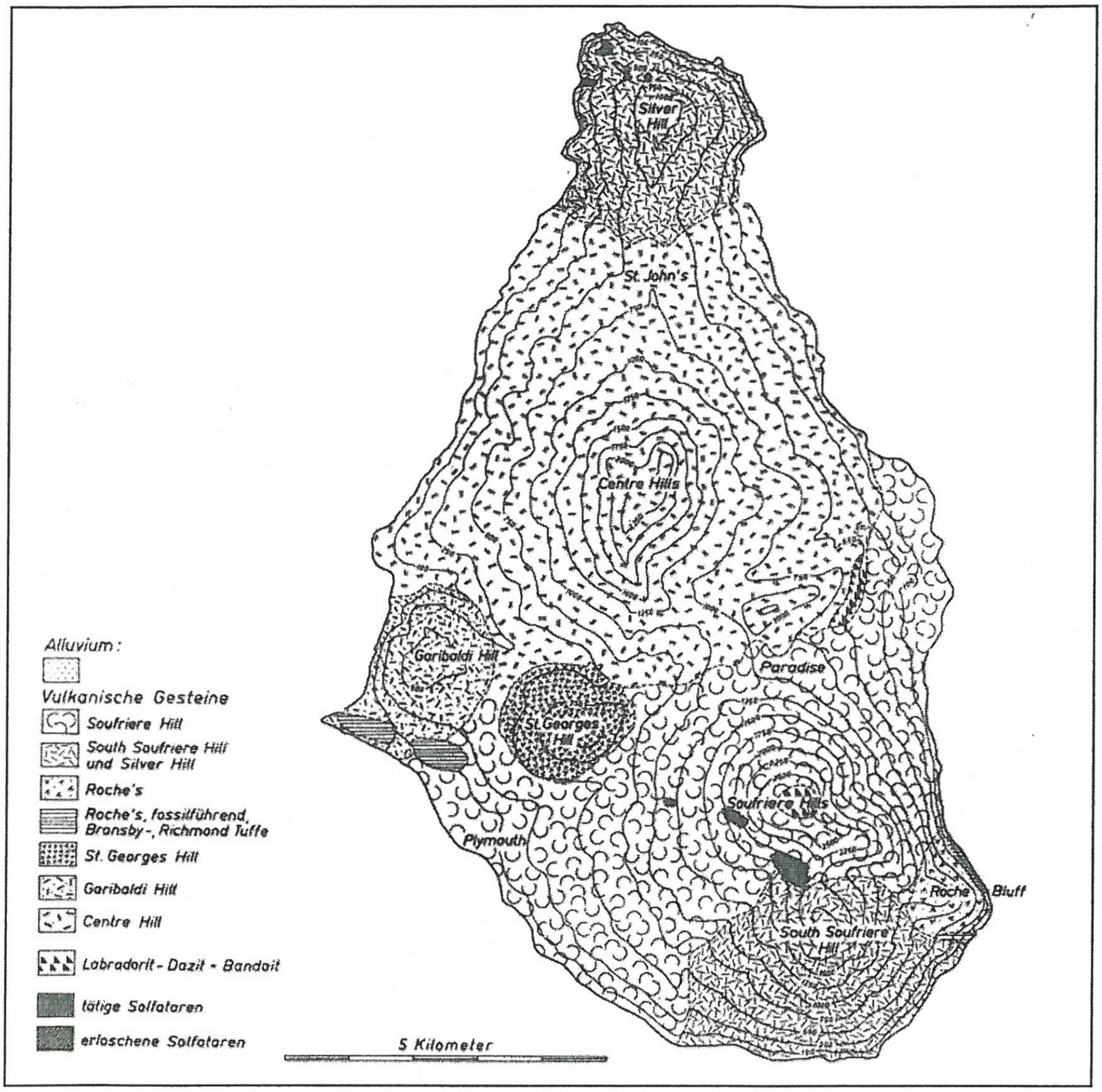

Figure 21: Geological map of Montserrat (after Weyl 1966:198)

Island	Limestone	Volcanic	Other
Anguilla	Fossiliferous, corals and echinoids	Poorly exposed, no further details	
St. Martin	Limestone beds	Range between granite-aplite and quartz-basalt, quartz-diorite and andesite-porphyry most prevalent	
St. Bartholomew	Interbedded limestone and foraminiferal limestone	Quartz-diorite, quartz-microdiorite, andesite, dacite, felsite, basalt	
Antigua	Limestone dominates	Basalt-andesite-dacite	Cherts and conglomerates
Barbuda	Limestone and calcarenites	None	
Saba	None	Hornblende-pyroxene-andesites; basaltic olivine bearing andesites; basaltic hornblende, feldspar, hypersthene, epidote	
St. Eustatius	Fossiliferous rock found in one location	Pyroxene andesites and basaltic pyroxene andesites dominate, hornblende-augite-andesites (rare), andesite pumice, dacite pumice	
St. Kitts	2 locations of Pleistocene limestone, Brimstone Hill – richly fossiliferous with coral, foraminifera and molluscs	Augite-andesites and hypersthene-andesites, dacite, olivine basalt	
Nevis	None	Dacite, hornblende-orthopyroxene-dacite, porphyritic-hornblende-dacite, porphyritic-pyroxene-dacite	
Montserrat	None	Andesite rocks, pyroxene-dacite, hornblende-dacite, basaltic-dacitic agglomerates	

Table 1: Summary of the geology of the Leeward Islands

5.4 Benefits and limitations of petrological analysis

Petrological analysis is often used to answer questions about the movement of pottery within a particular geographical region, for example a commonly asked question is whether the pottery found at a particular site was made locally or brought to the site from elsewhere through mechanisms of trade or exchange. Petrology can also be used to help answer questions about pottery production technology. For example the angularity of inclusions visible in thin section can often aid in determining whether that type of inclusion was added as temper or found naturally within the clay. Also in some instances it can be possible to roughly estimate the temperature at which the clay was fired, identify different types of clay used within an assemblage and to recognise layers of slip or glaze etc.

Generally speaking, the main use of petrological analysis has been to aid in identifying the sources of particular vessels by locating the likely origin of the clay and temper used to produce that pot. In order to locate a likely origin it is necessary firstly to identify the types of inclusions found within a vessel and secondly to determine from geological maps of the region of the find site whether that material occurs locally or not. For example if a vessel containing inclusions of volcanic rock was found on a site in a limestone region it would be fairly safe to assume that that vessel was not produced from locally available clay and that either the clay or the actual vessel was brought to the site from elsewhere. The next step would then be to locate the nearest outcrops of the same volcanic rock to that found in the vessel in order to determine the closest likely source of that piece of pottery.

When using petrological analysis to locate possible sources for clay and temper it is important to define what is termed by local and non-local. Dean Arnold (1985) has developed one method of defining local and non-local production at a site. He carried out an ethnographical study of potters, largely from South America, to determine how far they would travel to collect clay and temper. Arnold's findings showed that the majority of potters would usually travel just 1km to collect clay, but would on occasion travel up to 7 km, whilst they would travel a maximum distance of around

10 km to collect temper. In order to use this model it is necessary to draw circles of 1 km, 7 km and 10 km radius round the site on a geological map. The model assumes that pottery found at a site made from resources situated within 1 km of the site were produced from local resources, pottery made from resources found between 1 and 7 km of the site could have been locally produced and pottery made from resources found at greater distances are most likely non-local in origin. The application of this model to determining local or non-local production has its shortcomings, for example, it does not consider the terrain across which potters have to travel, nor does it allow for the fact that suitable potting clay might not be available within those distances and therefore definitions of local and non-local production will inevitably change. It is not the intention here to discuss the merits of this model, just to note its existence and to explain why it is certainly not suitable for defining local and non-local production areas in the Caribbean. Applying such a model to the Caribbean is obviously unreasonable as this is a group of often fairly small islands rather than one coherent land mass. Therefore the definition of local and non-local in this instance is fairly straightforward. If a vessel was produced locally it was made from resources available on the island where it was found, if it represents non-local production it originated from another island.

One of the questions that petrological analysis is being used to answer here is whether or not the pottery found on Nevis was locally made, or whether there is any evidence for vessels being brought to the island from elsewhere. Definitions of what constitutes local and non-local origins have been discussed above and it is the intention now to discuss the likely effectiveness of this approach to determining local and non-local production in the Leeward Islands.

At the broadest level it should be possible to determine whether the pottery analysed was originating from a volcanic island, a limestone island or perhaps a composite island. For example, sherds containing purely volcanic inclusions would have originated from volcanic islands, which would include those from Saba to Montserrat in the volcanic arc but also islands such as Antigua, St. Martin and St. Bartholomew which have outcrops of volcanic rock. Sherds containing limestone and no igneous inclusions could have originated from Barbuda or Anguilla, which are limestone islands or from the limestone areas of composite islands such as Antigua, St. Martin and St. Bartholomew.

Determining the likely source of pottery containing just igneous inclusions may prove a little difficult. As can be seen in table 1, which summarises the geology of the Leeward Islands, there are a great deal of similarities between some of the volcanic islands. For example dacite is commonly found on Nevis but it is also found on Montserrat, St. Kitts, St. Eustatius, Antigua and St. Bartholomew. However it may well be that the combination or texture of inclusions found within pottery will differ from island to island. If a sherd was found on Nevis containing dacite and quartz-microdiorite then it might suggest that that sherd originated from St. Bartholomew as opposed to Nevis as no quartz-microdiorite has been reported from Nevis (Hutton 1978). It seems apparent that due to the fact some islands are geologically very similar it may not be possible to be absolutely certain where sherds containing solely igneous inclusions were manufactured. Therefore it might only be possible to narrow down the original location of production to a couple of islands.

5.5 Previous petrological work carried out in the Leeward Islands

The approach to prehistoric ceramics in the Caribbean has largely dealt with chronological and typological topics. There are, however, a number of instances where analysis has been taken beyond these areas and discussions of pottery production, use and distribution have been initiated. Although such discussions are still very much in their infancy it is the intention here to examine a couple of cases where petrological analysis has been used to examine pottery production and distribution. This will serve to highlight how the research being carried out on the prehistoric ceramics from Nevis will begin to fit in with similar work on other islands and why this work is necessary.

There are only a few instances where petrological analysis has been specifically employed to analyse pottery in the Leeward Islands (for example Donahue *et. al.* 1990, Fuess *et. al.* 1991, Hofman 1993) and these studies vary in their aims and successfulness. The study carried out by Donahue *et. al.* (1990) was amongst the first in this region of the Caribbean and has to some extent influenced proceeding studies. They analysed thin sections taken from 44 sherds, which represented eight different prehistoric sites from four different islands in the northern Lesser Antilles (Leeward Islands). The sample consisted of a mixture of Saladoid and post-Saladoid sherds and the aim of their work was 'to examine and describe inclusions within prehistoric ceramics from the islands of Barbuda, Montserrat, Anguilla and St. Martin (Donahue *et. al.* 1990:229).

Point count analysis was employed to determine the percentage of temper, matrix and voids for each sample. During the course of this work they state that they have been able to identify three different temper associations within the assemblage, firstly exclusively volcanic, secondly volcanic and carbonate and thirdly volcanic, carbonate and grog (Donahue *et. al.* 1990:229). Their use of the term temper gives cause for concern. It is unclear from their methodology whether they are calling every inclusion within the clay matrix temper or if they have simply not included any naturally occurring inclusions within their analysis and are therefore only focusing on those inclusions that they think have been deliberately added. Whichever scenario is accurate the presentation of the data is misleading as it seems to suggest that all inclusions found within the sherds were deliberately added by the potter and that no inclusions were naturally occurring in the clay, which from my own work seems highly questionable. Another assumption that they make which is questionable is concerned with the percentages of temper, matrix and voids found for each of the three temper associations (Donahue *et. al.* 1990:245). They state that the number of voids found in sherds containing carbonate grains and grog increases and that the voids are large and elongated, the conclusion they reach from this is that sherds containing grog and carbonate grains comes from vessels that were not as strong and compact as those that contain only volcanic grains (Donahue *et. al.* 1990:246). The increased number of voids in sherds containing carbonate grains could be explained in an entirely different way that would not necessarily imply that the quality of pottery was affected by the type of inclusions present. Carbonate grains can often be leeched out of pot sherds during post-depositional processes leaving characteristic voids and this point appears to have been overlooked in this case.

One important discovery that is made during this study is that some of the sherds found from the limestone islands of Barbuda and Anguilla were found to contain volcanic inclusions. This would suggest that one of the volcanic islands in the region served as a source for this pottery and either finished vessels or the raw materials necessary for producing this pottery were brought to the islands of Barbuda and Anguilla. Unfortunately the authors of this paper have not suggested islands that might have been the source of this pottery. This must partly be due to the fact that the identification of inclusions appears to have been carried out at a broad level, for example volcanic rock inclusions are not identified further than that so it is unclear whether these rock inclusions are andesite, dacite, basalt etc. If different rock types had been identified then it might have been possible to determine further differences between samples from different islands. The fact that rock fragments have not been identified is also disappointing as this would have helped determine whether it is possible to distinguish differences between sherds from volcanic islands and would have served as a useful comparison for the work on Nevis.

The work carried out by Fuess *et. al.* (1991) on the island of Antigua explores similar aims and utilises the same methodology as the work by Donahue *et. al.* They have taken a sample of 97 sherds, 44 of which have been thin sectioned, from various sites across the island of Antigua with the aim of examining inter and/or intra-island distribution. A mixture of excavated and surface collected material has been included in the sample as well as Saladoid and post-Saladoid sherds. Like Donahue *et. al.* they have used point counting to determine the percentages of inclusions/temper, matrix and voids within each sample. Unfortunately no results are reported in the paper so it is not possible to determine what type of inclusions they found in their thin sections, whether there was any difference between the Saladoid and post-Saladoid sherds, or if there was any intra-island differences.

Hofman (1993) has carried out a fairly detailed fabric analysis of sherds from the post-Saladoid sites on Saba, which has yielded some interesting results. Hofman analysed a sample of 626 sherds macroscopically and from that work has defined 11 fabric groups, 13 sherds from these different fabric groups were also thin sectioned (Hofman 1993:171). Chi squared measures of association were then performed on the data to test whether there was any significant degree of association between fabric type and provenance, fabric type and functional category and fabric type and sherd thickness. The results showed that there was no significant degree of association between provenance and fabric type suggesting that the same clay sources were being exploited to produce the pottery found at the different sites analysed (Hofman 1993:180). This is also significant as it would suggest that there was little chronological variation in the manufacturing techniques employed for pottery production as the assemblages analysed were known to span the whole of the post-Saladoid period (Hofman 1993:193). Hofman suggests that the potters used the same techniques and materials for many generations but that this does not necessarily imply that there has been a continuous tradition of pottery making on the island (Hofman 1993:193).

A greater degree of association was found between fabric and functional category than fabric and site (Hofman 1993:181). Red slipped and decorated sherds bore some relation to fabric group 4; undecorated, rim and body sherds bore some relation to fabric group 9 whilst griddles and bases bore some relation to fabric group 8. From this Hofman suggests that different clay and temper associations were used to produce the base and rim portions of the same vessel (Hofman 1993:194). However on closer examination fabric group 8 and fabric group 9 are very similar, they are identified by exactly the same inclusions and the only difference between them is that fabric 8 is described as 'coarse to fine' and fabric 9 is described as 'medium to fine'. On the basis of these fabric descriptions being so similar it would seem more plausible that additional temper was added to the clay when making the base of a vessel, or conversely that the clay used to make the rim of a vessel was refined in some way, rather than different clays having been utilised. Coarse inclusions are often desirable in vessels that are used for cooking as they increase the thermal shock resistance of a pot. Therefore as suggested by Hofman's results, coarser fabrics would perhaps be more desirable for griddles, which were placed over heated rocks, and for cooking vessels where the bases were exposed to great changes in heat.

Hofman has also identified a significant association between fabric and sherd thickness. The thinnest sherds (1-7mm) occurred most often in fabric groups 9 and 10, medium sherds (8-10mm) are most frequent in fabric group 9, whilst the thickest sherds (11-15mm) occur most frequently in fabric groups 8 and 9. All three fabric groups vary only on coarseness, fabric 10 is described as being 'fine', fabric 9 is described as 'medium to fine' and fabric 8 is described as 'coarse to fine'. The fact that these three fabrics appear to be very similar to one another and that fabric 9 is dominant in all the thickness categories perhaps suggests that the relationship between fabric and thickness is not really that strong.

A couple of fabrics were identified as possibly being non-local in origin. Shell was found in one fabric and as no clay has been located on Saba containing shell it was suggested that this pottery was produced on a neighbouring island such as Anguilla were shelly clay can be found (Hofman 1993:192). Another fabric (fabric 11) was thought to have been made from clay different to that found on Saba as it bore more resemblance to a clay sample taken from Antigua (Hofman 1993:192). The rest of the fabrics identified were found to contain inclusions that were entirely consistent with the geology of the island and were therefore assumed to represent local production. Hofman, like others, has not identified the volcanic rock fragments found in the Saban pottery, nor is any detail given as to the type of feldspar identified. This again makes it difficult to fully compare the fabrics of the Saban pottery to those found on Nevis.

5.6 Conclusions

It is hoped that petrological analysis will begin to answer certain questions about pottery production on the island of Nevis. These questions include whether or not the pottery found on the island was produced from locally available resources and if not where that pottery might have originally come from. The purpose of this chapter has been threefold. Firstly the methodology employed to analyse thin sections was discussed and then the geology of each of the islands in the Leeward group was outlined. It is important to have an idea of the different geology of this group of islands in order to determine whether pottery found on a particular island could have been made from locally available resources or was brought to the island from elsewhere. The aims of petrological analysis and its limitations were then discussed and likely results for this research were discussed. It seems apparent that sourcing pottery made of entirely igneous material might prove difficult, however it will be possible to determine the sources of certain types of pottery, for example sherds found on Nevis produced from clays containing limestone would most likely have been brought to the island from elsewhere. Finally a brief synopsis of petrological analysis carried out in the Leeward Islands is given. From this it is clear that this type of analysis is still very much in its infancy within Caribbean research and the petrological analysis of sherds from Nevis will add valuable information to a currently very limited corpus of work.

Chapter 6: Coconut Walk

6.1 Introduction

The post Saladoid site of Coconut Walk, located on Nevis' Windward (eastern) coast (see Figure 22), was first identified and dated by Wilson during a settlement survey of the island carried out during the late 1980's (Wilson 1989). In 1998 'Time Team' undertook three days work at the site carrying out geophysical surveys, small-scale excavations and the collection of surface material and the pottery that is discussed during the course of this chapter was obtained from this programme of work.

In order to place this work in context the excavation and survey results obtained by Time Team are firstly presented. The analysis carried out on the pottery assemblage from this site is then outlined in the following sections. The results of this analysis will be compared to results obtained from similar work undertaken on the assemblage collected from Indian Castle in order to begin to assess to what extent these assemblages are similar or different to one another.

This analysis also aims to begin to answer the question of whether the pottery found on the island was locally made and if not the most likely origins of that material and whether the movement of pottery was vessel specific. The results of the petrological analysis conducted at both Coconut Walk and Indian Castle were so similar that a discussion of this aspect of the research is included in chapter 8 rather than this chapter to avoid needless repetition.

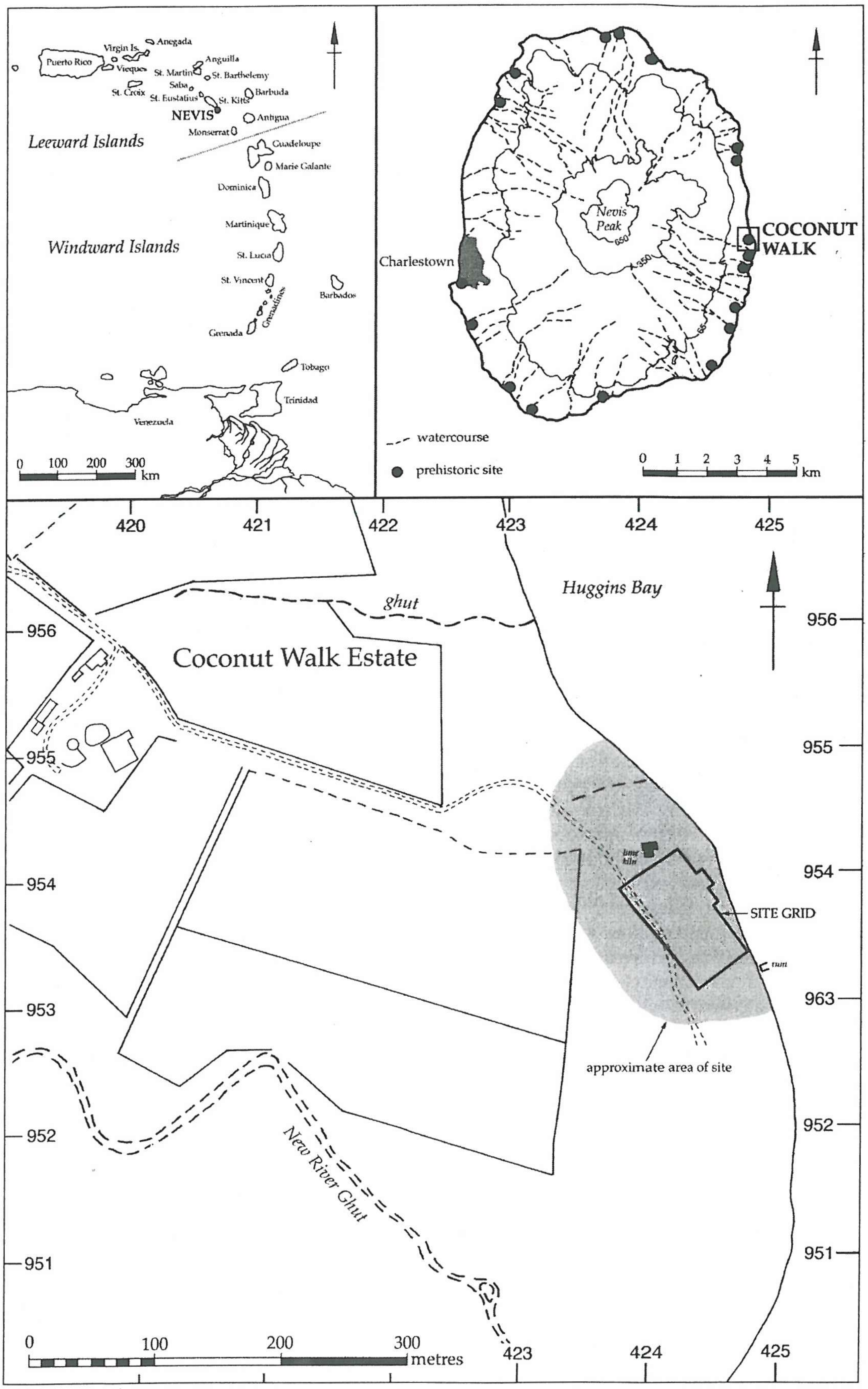

Figure 22: Location of Coconut Walk (map courtesy of Peter Bellamy)

6.2 Time Team Explorations

Time Team spent a total of three days at the site of Coconut Walk during October 1998, during that period of time geophysical surveys, excavations and a collection of surface material was undertaken. Figure 23 shows a picture of the site and as can be seen the ground cover primarily comprised bare earth or very short grass with areas of impenetrable clumps of prickly pear bushes. The surface of the site was littered with pot fragments and other remains (see figure 24). The following discussion is a summary of Bellamy's forthcoming report on Time Team's work on the island and all the information included originates from his paper.

Figure 23: Picture of the site, Coconut Walk

The geophysical survey was two fold encompassing a rapid magnetic survey followed by a more detailed gradiometer survey over the available open ground. The levels of magnetic susceptibility recorded were very high, and thought to most probably be a reflection of the volcanic soils that predominate, yet wide variations in the readings were evident. The total area investigated (a maximum of 0.5 ha) unfortunately was too small to detect any patterns that might support any kind of archaeological

Figure 24: Surface of the site showing sherds of post-Saladoid pottery

interpretation. Strong anomalies were also identified during the gradiometry survey however these appeared to be related to occurrences of deep-seated volcanic intrusions. A number of test pits were however excavated in order to investigate several of the anomalies identified during the geophysical surveys.

Seven trenches were dug in total and figure 25 shows their location at the site. Trench five was later abandoned due to lack of time and resources and four yielded no archaeological features or deposits. Of these four, two, trenches two and three, were located over geophysical anomalies, in both cases it would appear that the occurrence of volcanic rock caused the anomalies rather than archaeological features. The location of the other two trenches was dictated by the occurrence of dense scatters of surface material. Trench four was situated in an area where a highly dense surface scatter of pottery was located whilst trench six was dug on the shoreline adjacent to an area of dense animal and fish bones, neither yielded any archaeological remains.

Trench one (figure 26) was located over a geophysical anomaly identified in the western par of the site. Originally 1 m^2 in size the trench was extended to a maximum

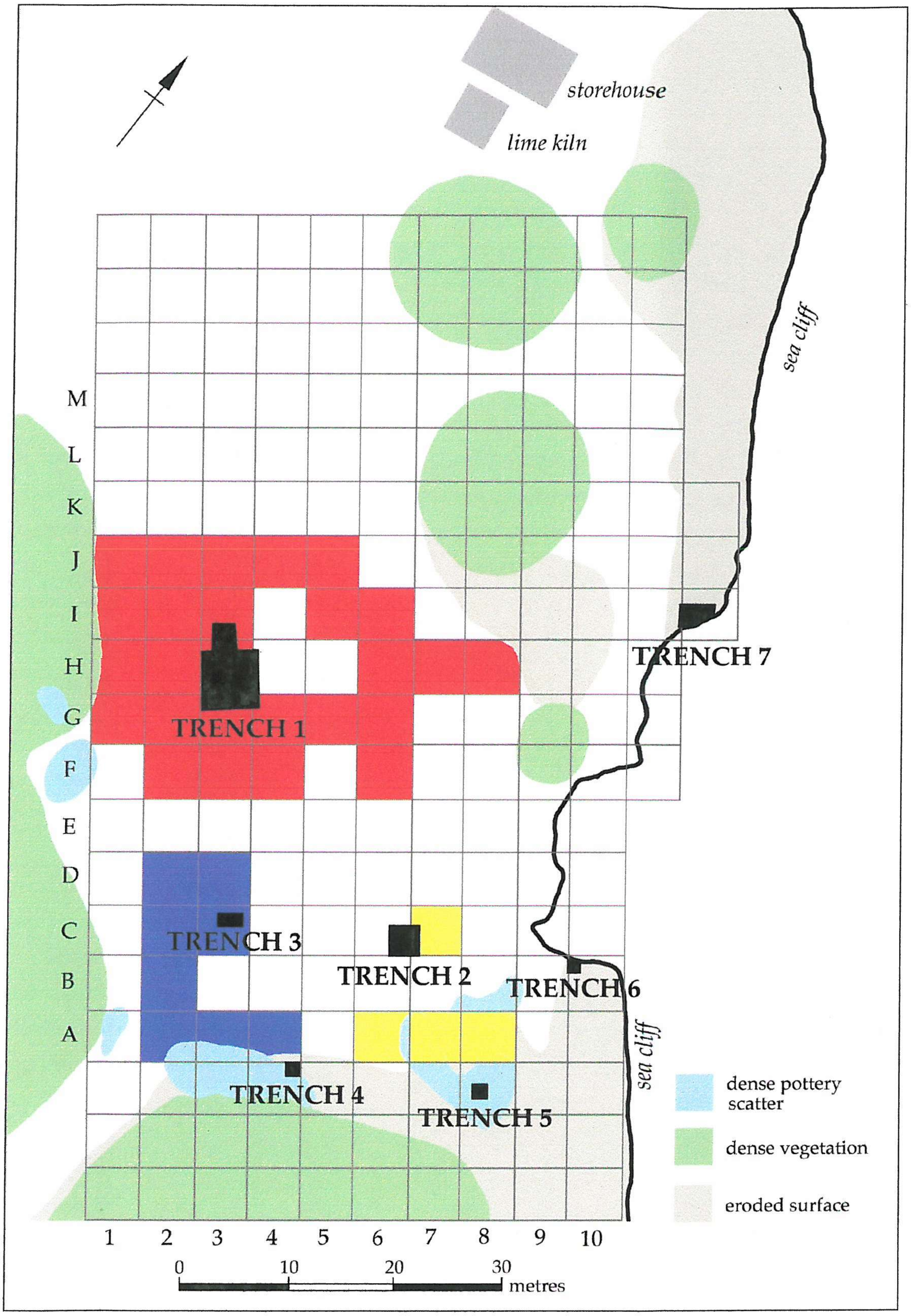

Figure 25: Site Map showing location of trenches and the surface collection grid. Grid squares coloured bright blue, yellow and red represent areas 1, 2 and 3 used in the spatial analysis, see section 6.4 (map courtesy of Peter Bellamy, demarcation of areas 1,2 and 3 authors own)

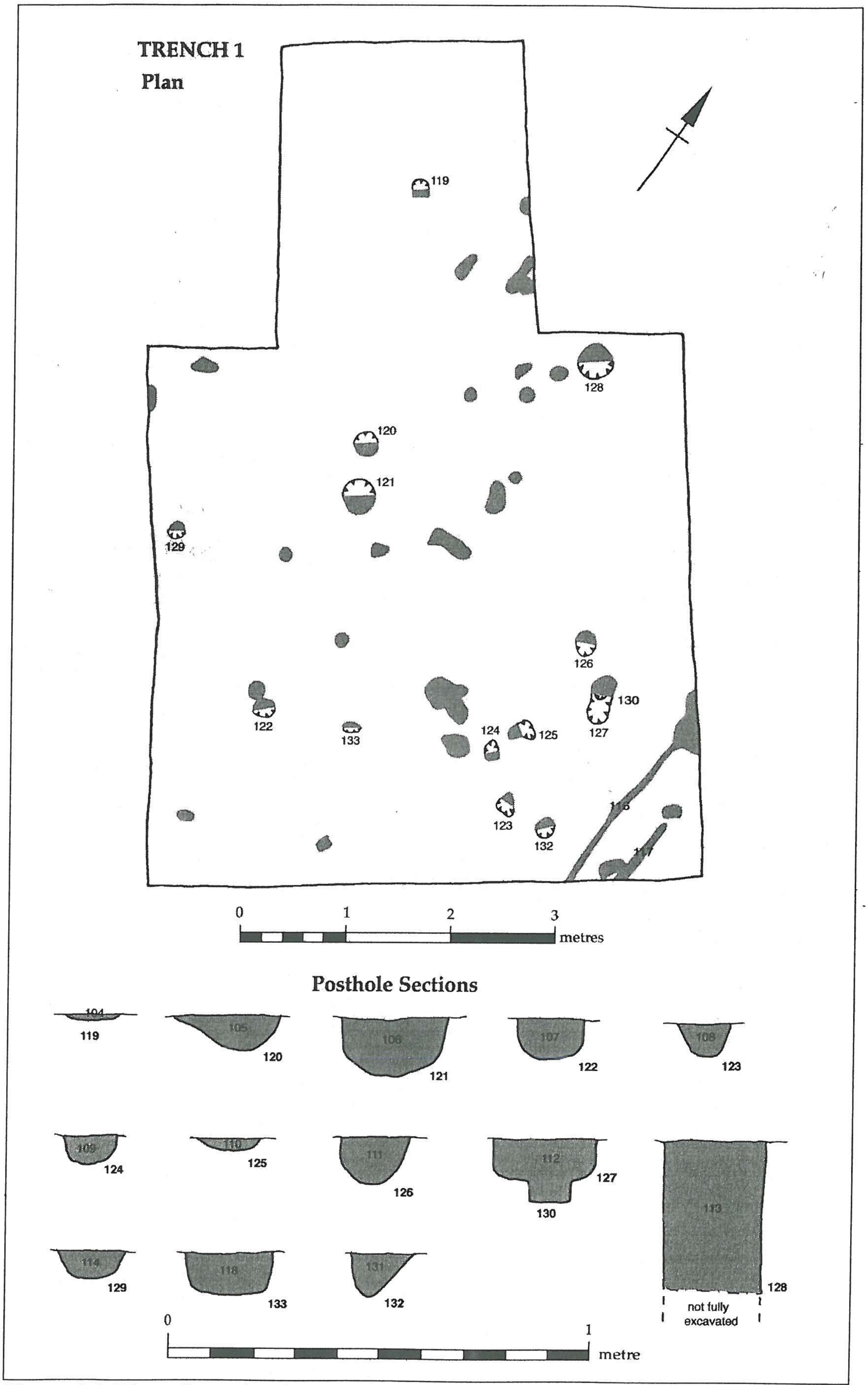

Figure 26: Plan of trench 1 (courtesy of Peter Bellamy)

size of 8.5m by 5.2m after a posthole was revealed on the edge of the trench. A total of 41 features were discovered, all of which were cut into an orange brown silty layer, interpreted as a natural subsoil layer, at a depth of between 0.15 and 0.25 m below the surface. Thirteen of the 41 features were half sectioned and the majority of these comprised small circular to sub-square features between 0.1 and 0.3 m across with vertical or steeply sloping sides and a rounded base approximately 0.1 m deep. Due to the size and shape of the features excavated it has been concluded that the majority, if not all, were the remains of postholes. Two parallel linear features were also exposed at the south-east corner of the trench however neither were excavated.

It is thought that the number of postholes in this trench represents at least one structure. Taking into consideration the fact that the site is deflating it has been assumed that the original ground surface was at least at the same height as the present ground surface making the postholes about 0.4m deep and suggesting a relatively substantial structure. It is clear that the whole structure has not yet been revealed and the distribution of the exposed postholes does not readily suggest the form of the structure or structures.

Trench seven, measuring approximately 3m by 2m and situated on the eroding edge of the shoreline was the only other trench dug on the site to yield archaeological remains, unfortunately the character of the context is poorly understood.

The same grid that was used for the geophysical survey was used to collect the surface material. The grid was divided into 5m squares with the aim of collecting all the finds within each grid square. During post-excavation analysis it became apparent that material was not present from a number of grid squares. This could mean that either these grids contained no archaeological remains or that they were not surveyed. It is entirely unclear as to which scenario is accurate.

In addition to the pottery assemblage, which is discussed throughout the rest of this chapter, other artefacts recovered included pieces of worked chert and stone, beads and faunal remains. Fifty pieces of worked chert were collected, 47 were recovered during the surface collection and 3 pieces came from the excavations. The general condition of the assemblage has been described as good with only a slight indication of post-depositional damage. Twenty two percent of the chert assemblage had been burnt. There are no known sources of chert on the island of Nevis (see chapter 5), which implies that the material must have been transported to the island from elsewhere. Fresh nodules and rolled pebbles were identified in the assemblage and as yet it is not entirely clear as to whether the rolled pebbles were brought to the island by human agency. It seems more likely that they were brought to the island but a local source cannot be entirely ruled out as rolled pebbles have been found at beaches on St. Kitts. The dominant type of chert is similar to that found on Antigua, yet sources for the rest of the assemblage have not as yet been identified. The analysis of some of these artefacts has led to the postulation of the idea that the raw material was brought to the island as unmodified nodules or pebbles rather than as finished artefacts or prepared cores. Although the chert assemblage was too small to draw any confident conclusions as to its nature a few observations have been noted. Namely it appears that the assemblage represents a non-specialized flake industry with no formal tool types being produced. Based on the range of material present it has been suggested that knapping took place on the site and a number of the thicker flakes apparently were intentionally snapped, possibly to form other implements. Unspecialised flake industries appear to be characteristic for both the Saladoid and post-Saladoid periods, the small size of the Coconut Walk assemblage however has meant that the detection of any specialisation at this site has not been possible.

The other ten fragments of worked stone recovered included one almost complete and two broken ground stone axes. Chips and flakes, possibly originating from ground stone axes were also recovered. It has been suggested that there is evidence for the deliberate removal of flakes from axes for use as implements but it is unclear as to whether this occurred as a deliberate act of destruction or just after the axes had been already broken. One quern fragment was also recovered as well as two beads, one of which was made from a translucent blue-green rock.

6.3 Analysis of the Pottery

Introduction

The entire assemblage of pottery recovered from the site consists of 5,631 sherds: 313 from the excavation trenches; 4,853 from the surface collection; and 465 sherds from unstratified contexts. A sample of 2038 sherds, weighing 33409g, was recorded and analysed. This sample comprised all 313 sherds (10967 g) from the excavations, and a sample of 1725 sherds, weighing 22442 g, from the surface collected material. The surface collected sample included all diagnostic sherds (rims, bases, etc), in order to gain a more complete understanding of the types of vessels used, and a random sample of body sherds obtained by randomly selecting squares from the survey grid (Figure 24, p 89). Table 1 shows the breakdown of the sample recorded in terms of number and types of sherds analysed from the surface collected material and the excavations.

Type of Sherd	Excavated material	Surface Collected material
Plain Body Sherds	198	1180
Decorated Body Sherds	6	35
Griddles	9	18
Bases	14	44
Shoulders	9	25
Rims	69	398
Total Profiles	2	5
Other	6	20
Total Number of Sherds	313	1725

Table 2: Number and type of sherds included in the sample from Coconut Walk

Body Sherds

Well over half of the sample of pottery analysed comprised of body sherds and of the 1419 body sherds recorded only 41 were decorated. Figure 27 shows the type of decoration and the position it was found on each of the sherds. The most common type of decorative technique used was that of incision, 51% and then tooling, 36%.

Incision occurs when the surface of the sherd is actually cut, as opposed to tooling where the surface is pushed inwards creating a softer shallower impression. As might be expected the vast majority of decoration was applied to the exterior surface of a vessel, however a couple of examples were found where the interior surface had been decorated. This might suggest that such sherds came from very open vessels, such as open dishes, platters or vessels used for serving or displaying food, where the interior surface would be highly visible. It would not make much sense to decorate the interior of a vessel that had restricted access as the decoration would not be seen and application would be difficult. The vast majority of decorated sherds found in the assemblage were body sherds and it was therefore not possible to determine where the decoration was actually located on the vessel. Many of the sherds were also fairly small and so patterns of decoration were not discernable either. Decoration was found on a small number of rim sherds, and this decoration tended to consist of one or more incised lines either on the rim lip or just below it on the exterior surface. One white on red painted sherd, a decorative technique commonly utilised in the Saladoid period, was recovered from trench six. What has been described as a shark head was also recovered from square A9 of the surface collection grid.

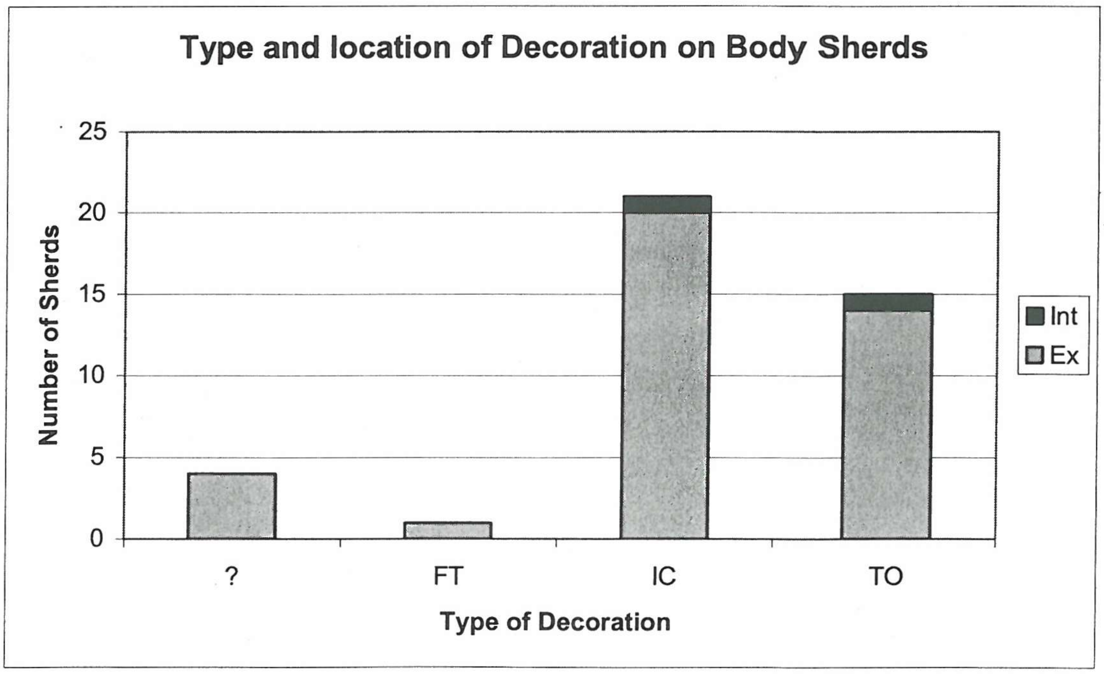

Figure 27: Type and location of decoration on body sherds from Coconut Walk

Figure 28 shows the type and location of surface treatment applied to decorated body sherds. The categories on the x-axis are the type and location of treatments. The first set of letters indicates the treatment on the exterior surface whilst the second set of letters after the / division identifies the type of surface treatment on the interior surface. For example BU/BU would mean burnishing on both exterior and interior surfaces whilst NT/SL would imply no treatment on the exterior and slip on the interior surfaces. It would appear that the majority of decorated body sherds either came from vessels without any surface treatments or vessels where the interior surface alone had been burnished. Figure 29 illustrates the association between decoration and the type and location of surface treatment. From this bar chart there seems to be little relationship between the type of decoration and the type and location of surface treatment. For example a vessel that was just burnished on the interior surface may have been decorated using tooled, finger tipping, or incised techniques.

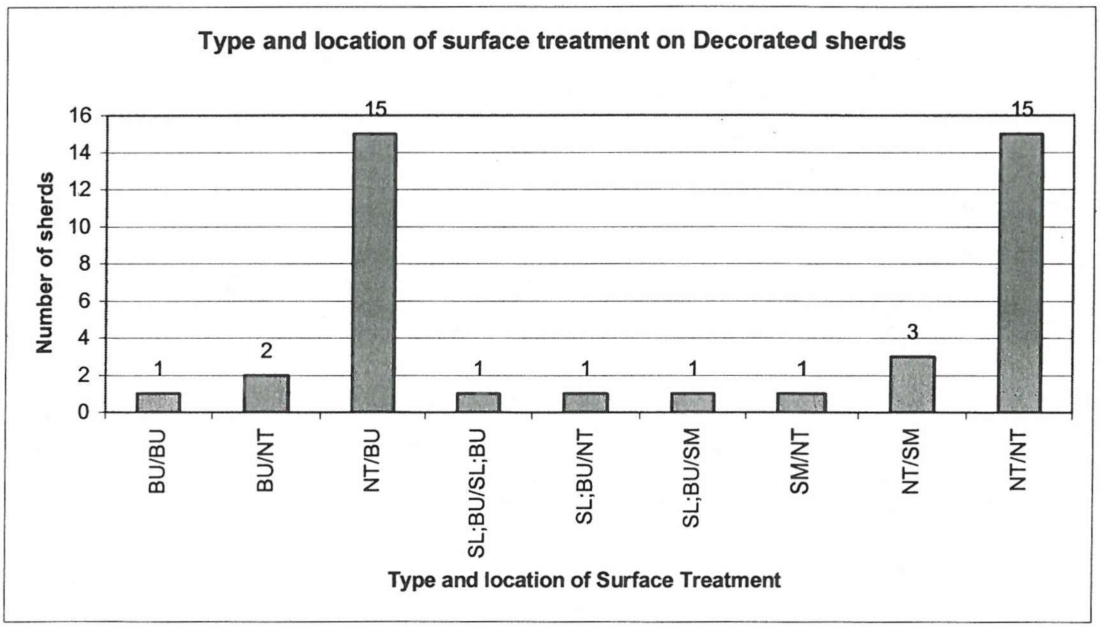

Figure 28: Type and location of surface treatment applied to decorated sherds at Coconut Walk

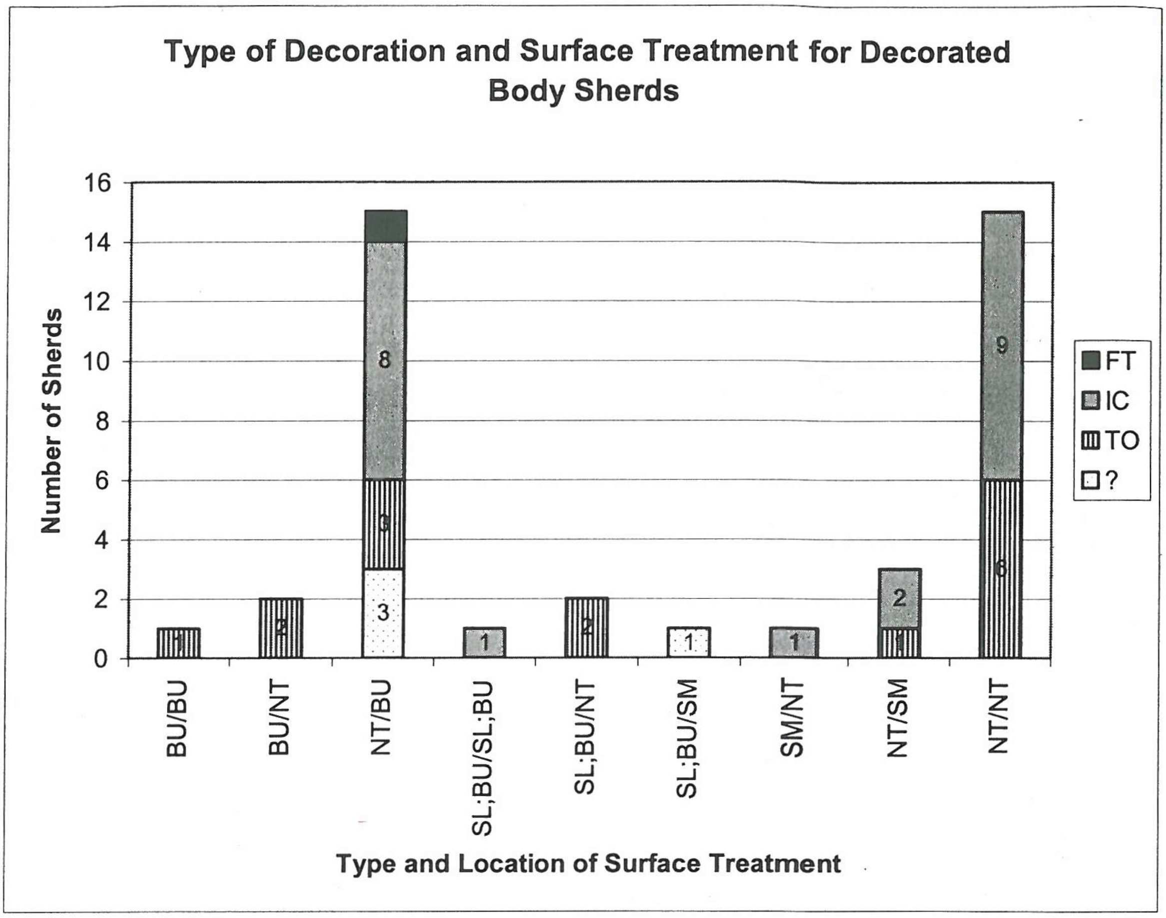

Figure 29: Type of decoration and surface treatment applied to body sherds at Coconut Walk

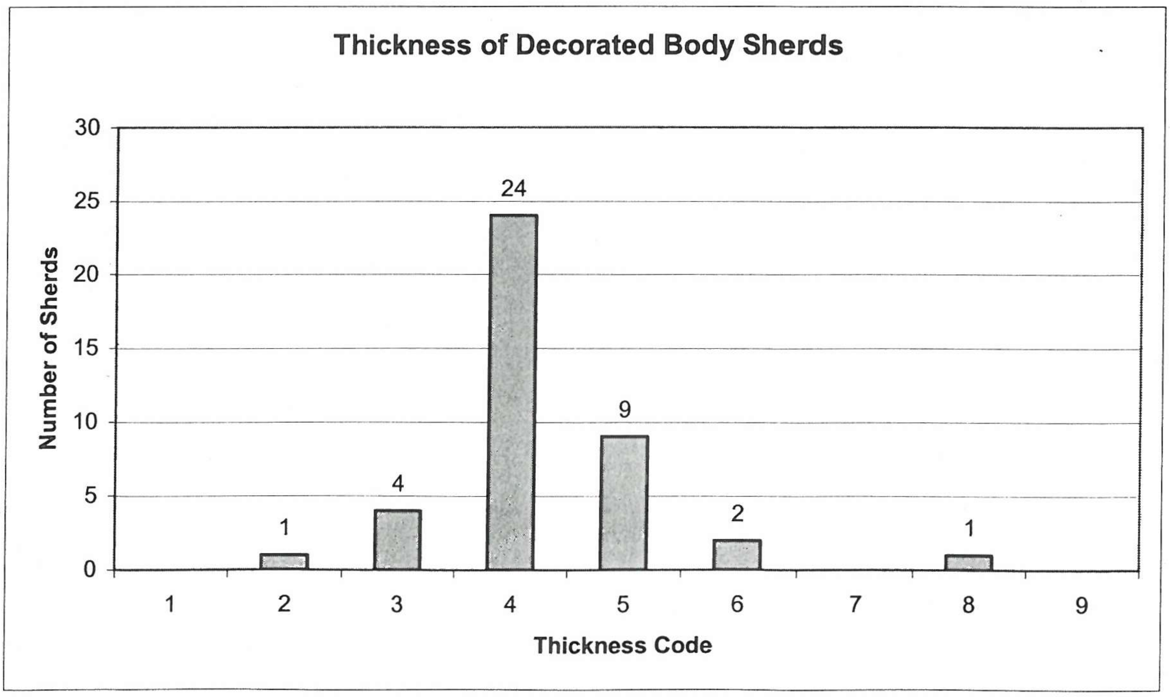

Figure 30: Thickness of decorated body sherds from Coconut Walk

The different thickness of decorated body sherds is represented in figure 30 and as is apparent the majority of sherds are of thickness code 4. The thickness of plain body sherds were also analysed and again the majority of sherds were a thickness code 4, see figure 31. The cumulative percentage graph of sherd thickness for plain and decorated sherds shows that the curves of the graphs are fairly similar, see figure 32, one difference that can be noted is that a slight proportion of plain body sherds have a thickness of code 9, whereas decorated sherds do not. The bar charts and cumulative percentage graph suggests that there would be no significant association between the thickness of a sherd and whether it was decorated or not. In order to test this statistically a Chi squared test was carried out.

Chi squared (8, $\underline{N} = 1419$) = 10.106, $\underline{p} = >0.05$ ns

The result obtained indicates that there is no significant association between the thickness of a sherd and whether it was decorated or not.

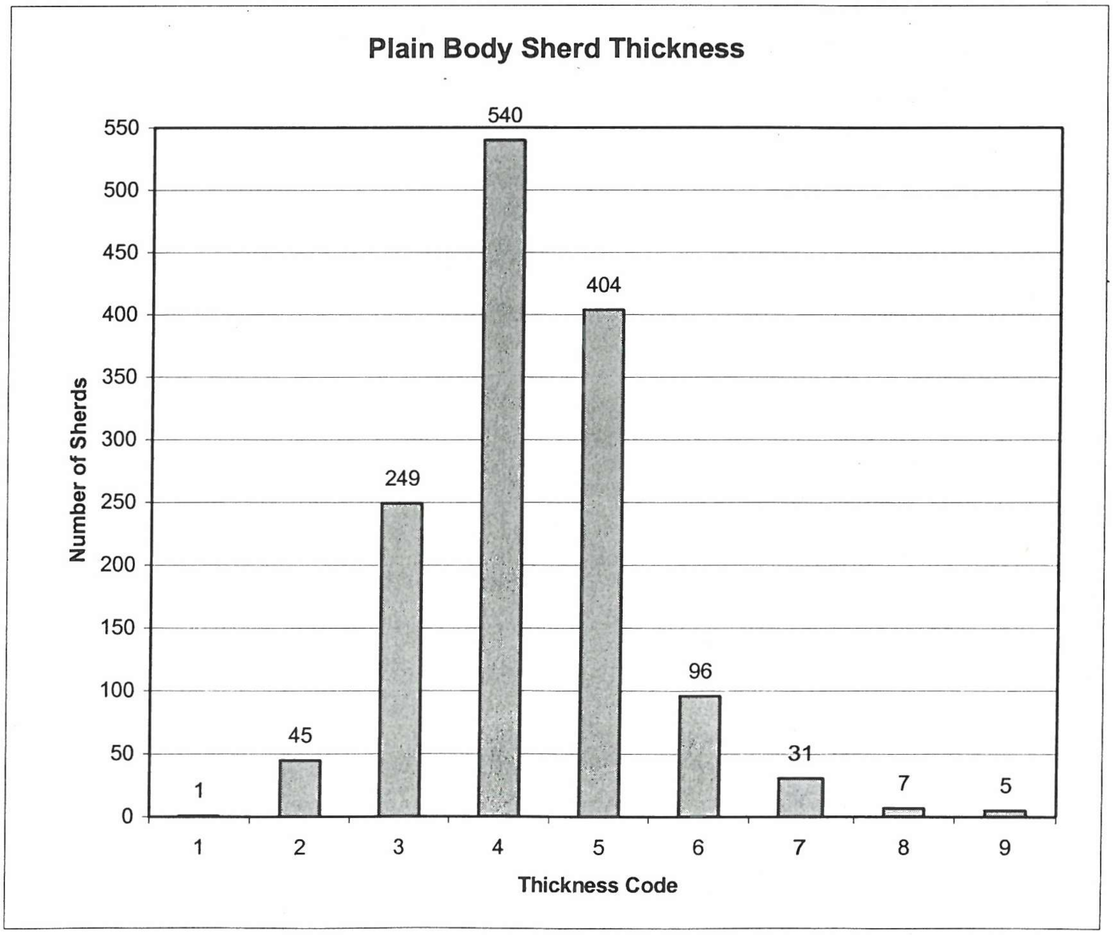

Figure 31: Thickness of plain body sherds from Coconut Walk

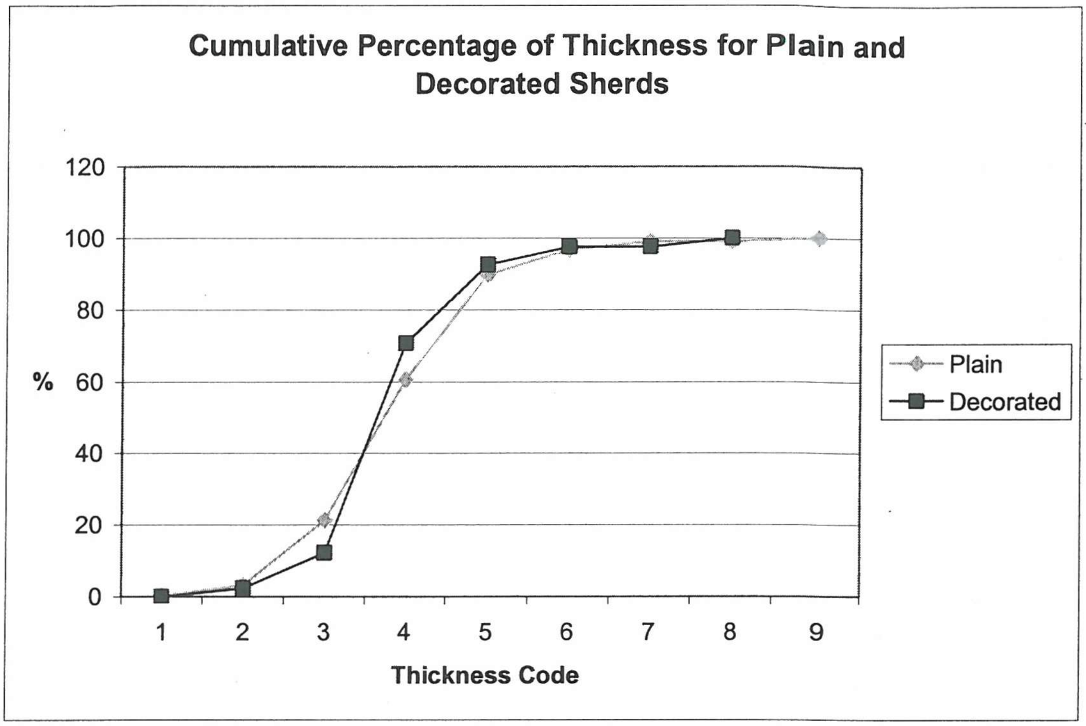

Figure 32: Cumulative percentage of thickness for plain and decorated sherds at Coconut Walk

The commonest form of surface treatment applied to plain body sherds was that of burnishing, see figure 33. The application of a slip that was then burnished was the second type of surface treatment most frequently applied to plain body sherds.

Bases

Fifty-eight base sherds were collected in total from the site and three different base forms have been identified see figure 34. Due to the fact that hardly any complete bases were recovered the identification of different base types has been done on the basis of whether the join between the base and body wall of the pot was angular, B1, rounded, B2 or raised B3. The most frequent base form identified was that of B1 (see figure 35), which accounted for 62% of all the bases found. Figure 36 shows the range of base diameters for each of the base types and as can be seen 22 (38%) of the sherds were too small or uneven to measure accurately. The diameters of base type B1 ranges from 6 to 30 cm, and most of these fall in the range of 6-10 cm. There appears to be

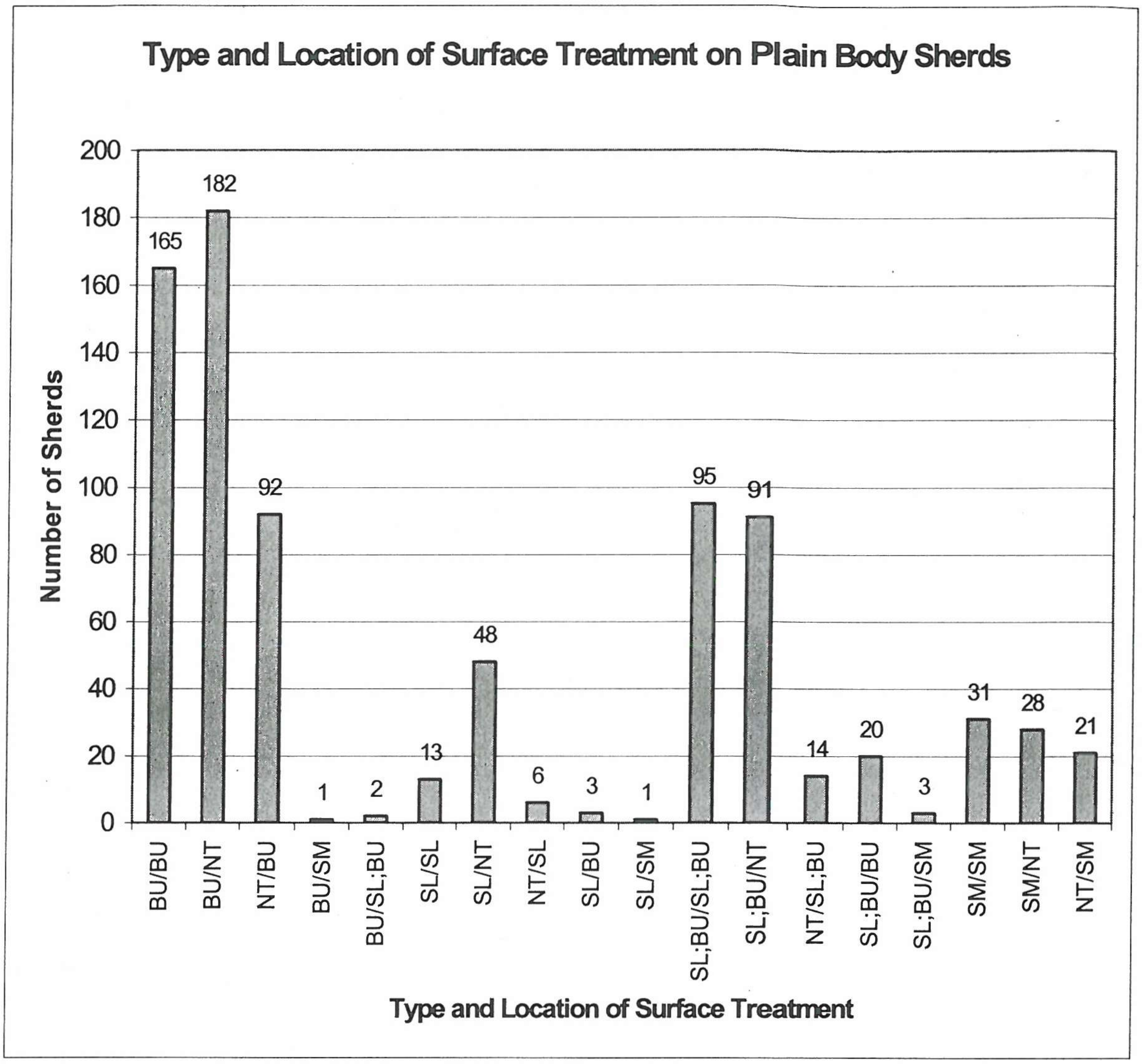

Figure 33: Type and location of surface treatment applied to plain body sherds at Coconut Walk

little correlation between the base type and base diameter from this graph. The thickness of bases ranges from code 3 to code 7. There does appear to be some difference between the thickness of bases and the type of base. Figure 37 shows that for base type B1 the graph peaks within thickness code 4, whereas for base type B2 the graph peaks at code 6, indicating that B2 base types tend to be thicker. The cumulative percentage for B1 bases of code 4 or less is 57.2% whereas for type B2 it is only 18.75% (see figure 38).

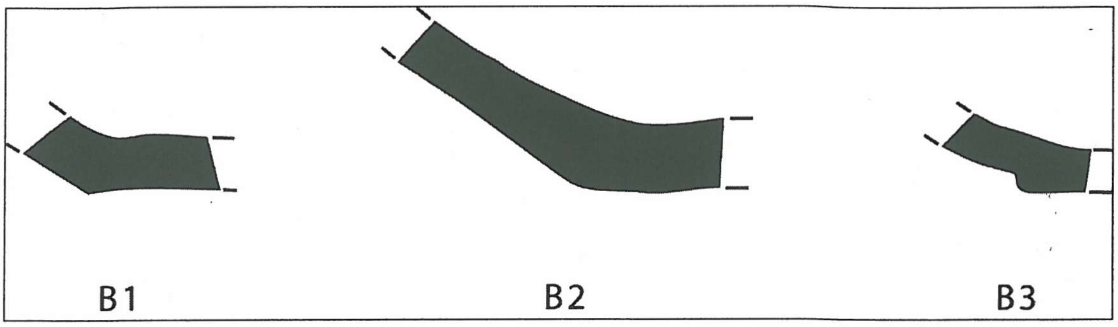

Figure 34: Base types found at Coconut Walk, from left to right, B1, B2 and B3 (courtesy of Christopher Chaplin)

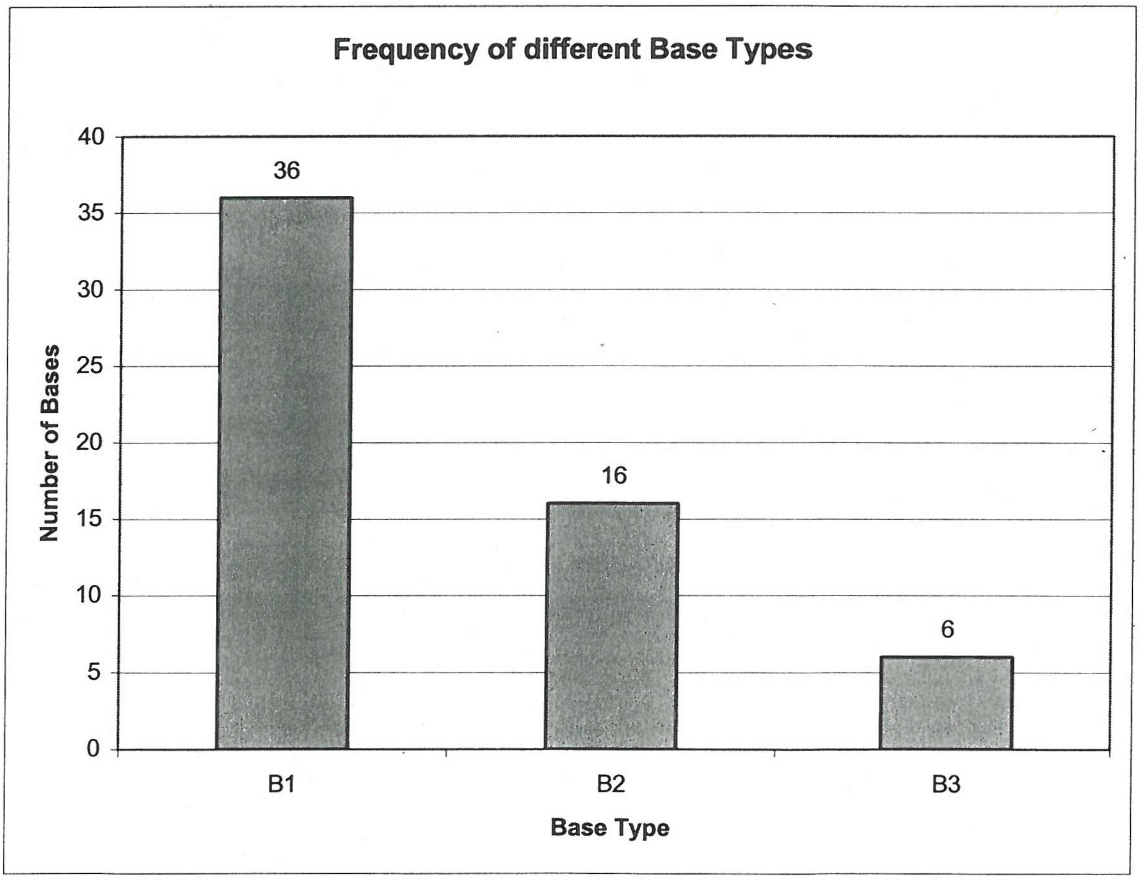

Figure 35: Frequency of different base types found at Coconut Walk

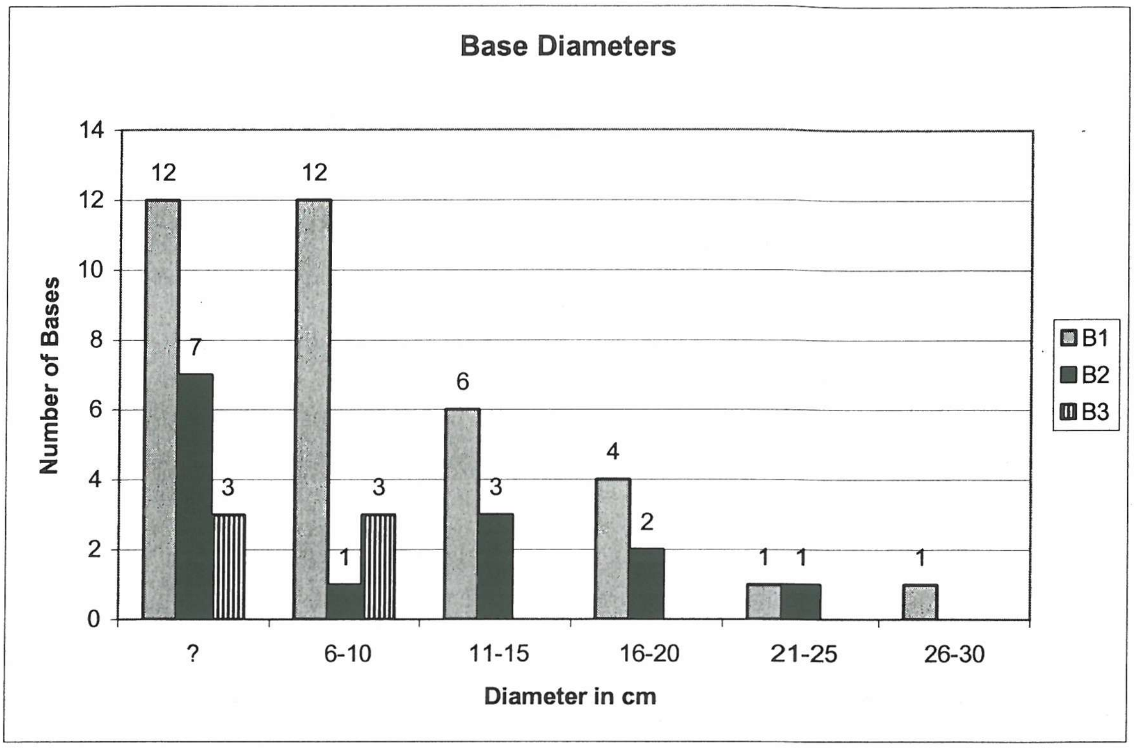

Figure 36: Range of base diameters for each base type at Coconut Walk

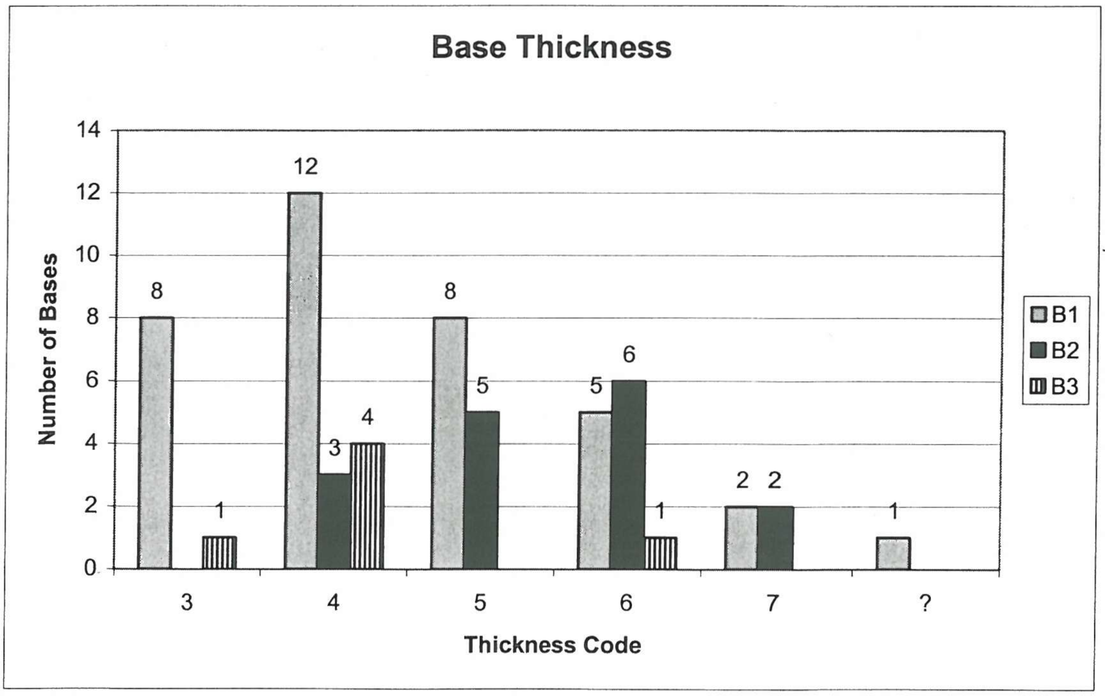

Figure 37: Base thickness for each base type at Coconut Walk

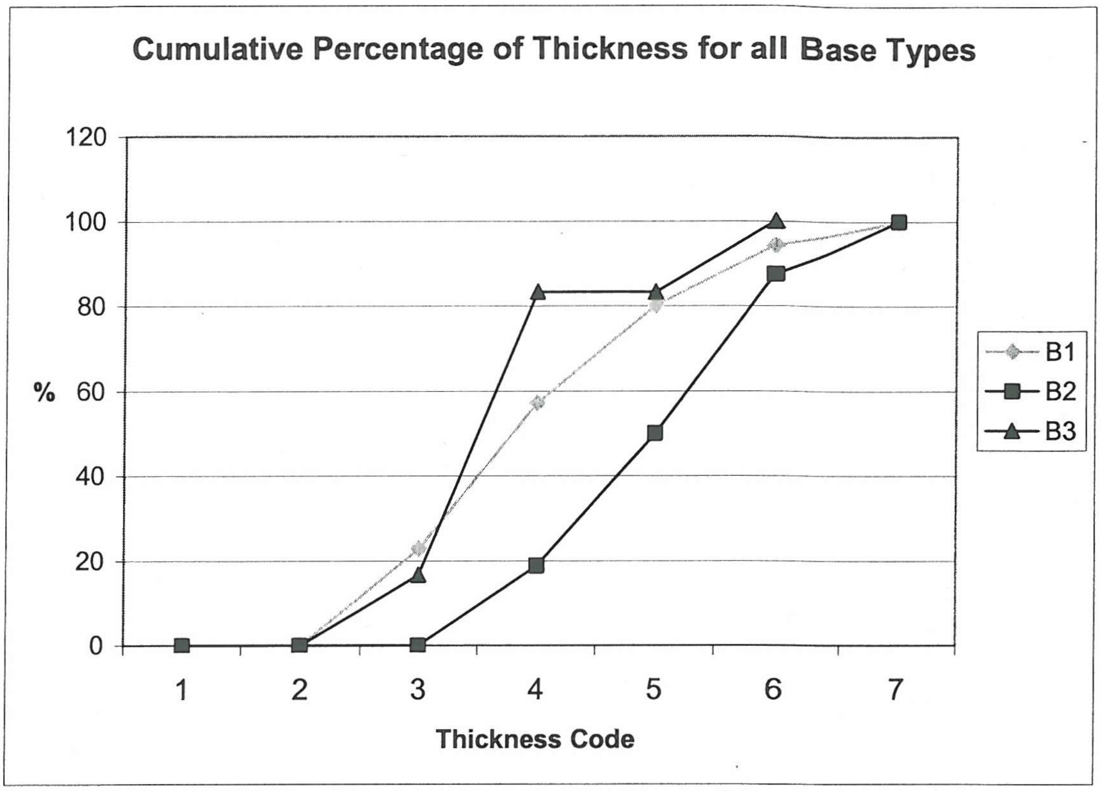

Figure 38: Cumulative percentage of thickness for all base types at Coconut Walk

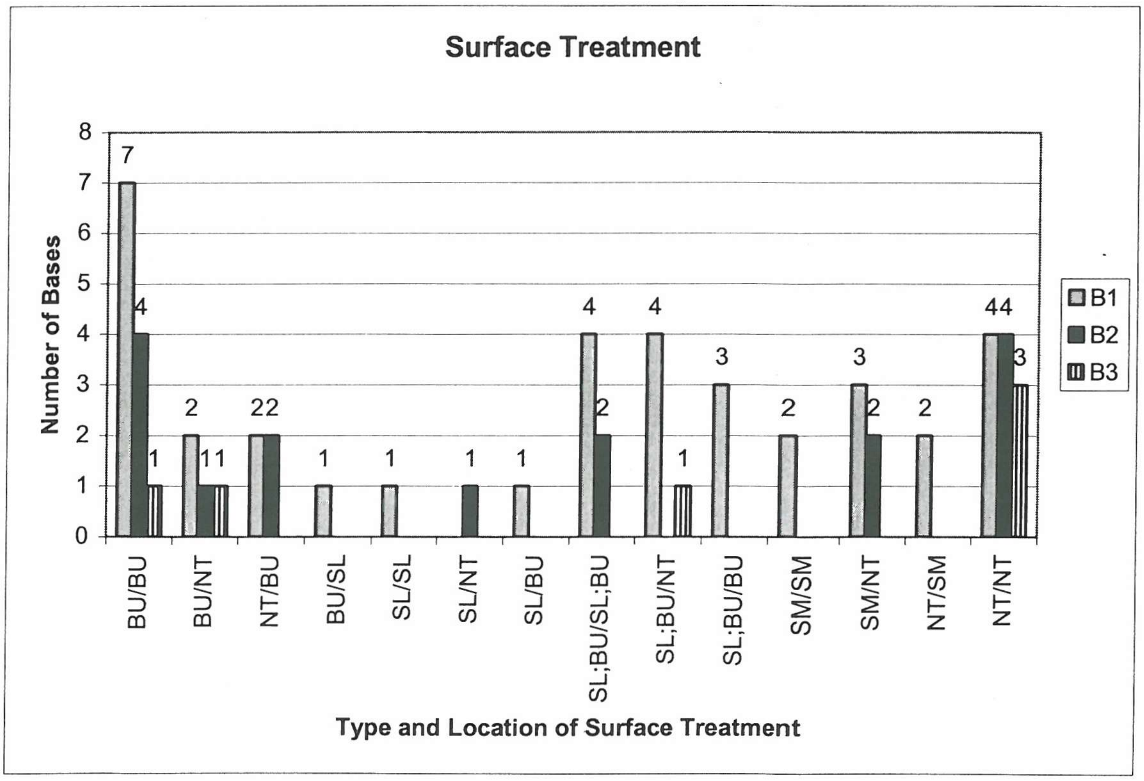

Figure 39: Type of surface treatment and location on bases at Coconut Walk

There seems to be little distinction between the type of base and surface treatment applied and the conditions in which different base types were fired as can be seen from figures 39 and 40 respectively. The commonest form of surface treatment used is that of burnishing on both exterior and interior surfaces, and the use of slip appears to be more common for base type B1 than any of the other types. The fact that many vessels were burnished on the interior surface as well as the exterior may suggest quite an open form for these vessels, as vessels with restricted access are much less likely to be treated in this way. Twenty percent of base type B2 displayed no surface treatment on either surface, whilst only 11% of B1 base types were not treated. None of the bases showed any signs of having been decorated.

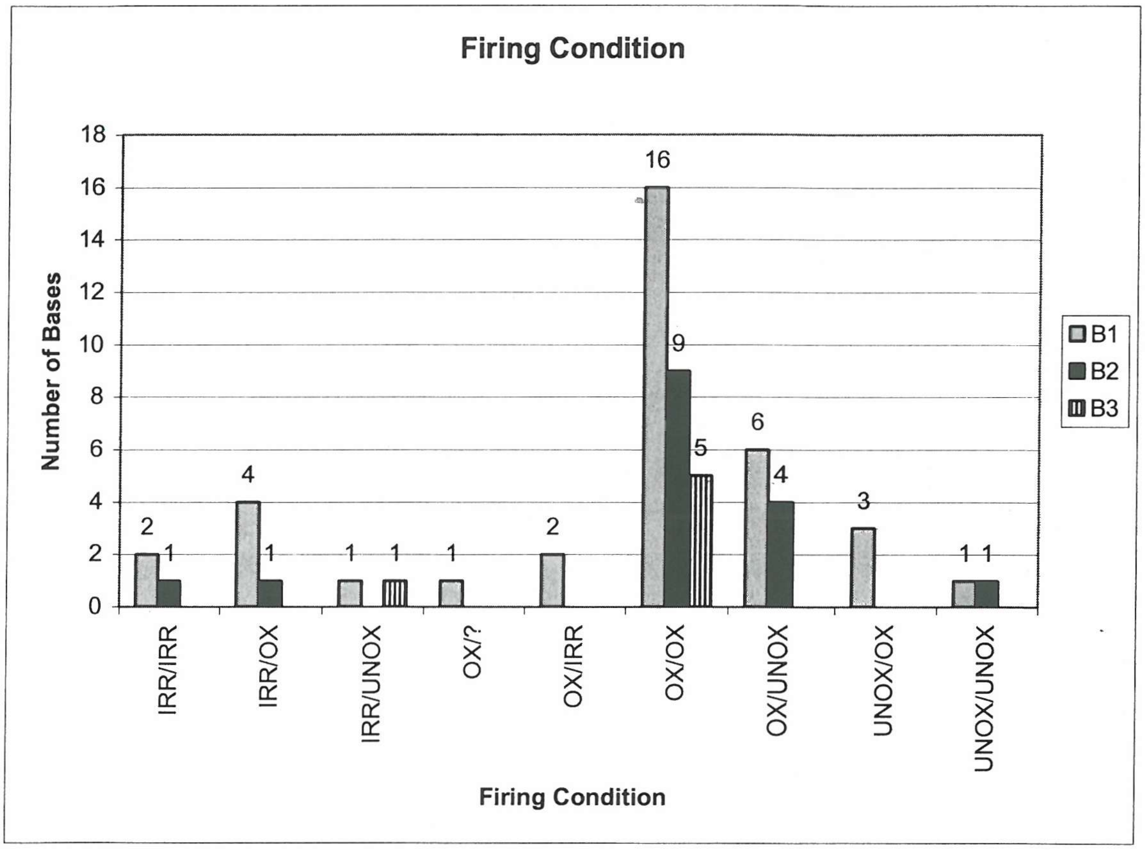

Figure 40: Condition in which bases were fired at Coconut Walk

It has been established that B1 bases tend to be thinner than B2 bases and that a slightly higher percentage of B2 bases displayed no surface treatment. It was therefore decided that thickness and the occurrence of surface treatment would be investigated for each of the three base types to see whether for example the thicker bases were left plain whilst the surfaces of thinner bases were treated. The expenditure in terms of time and effort it takes to apply surface treatments would perhaps only have been made for pots where the treatment was either necessary for the specific function of that vessel or because of aesthetic reasons.

In order to simplify the analysis four categories were selected to describe surface treatment. These categories focused on the location of treatment rather than the type of treatment and they consisted of bases displaying all over treatment, i.e. both interior and exterior surfaces had been treated, those that had been treated just on the exterior surface, those that had been treated on just the interior surface and those that had received no surface treatment on either surface. Figures 46 - 48 show the relationship between thickness and the location of surface treatment for each of the base forms. The thinner B1 bases generally were treated on both interior and exterior surfaces though some were not treated at all. A number of the thicker B2 bases were treated on both surfaces but interestingly the majority of sherds with a thickness code 6 were treated only on the interior surface of the vessel. This would perhaps suggest that these thick B2 bases were originally from quite open vessels where the interior surface could not only be accessed with ease in order to apply the surface treatment but was highly visible. The majority of B3 bases were either treated just on the exterior surface or not at all, perhaps these bases came from more closed vessel forms where the interior surface was not as easily accessible, or from vessels that did not require the application of surface treatments.

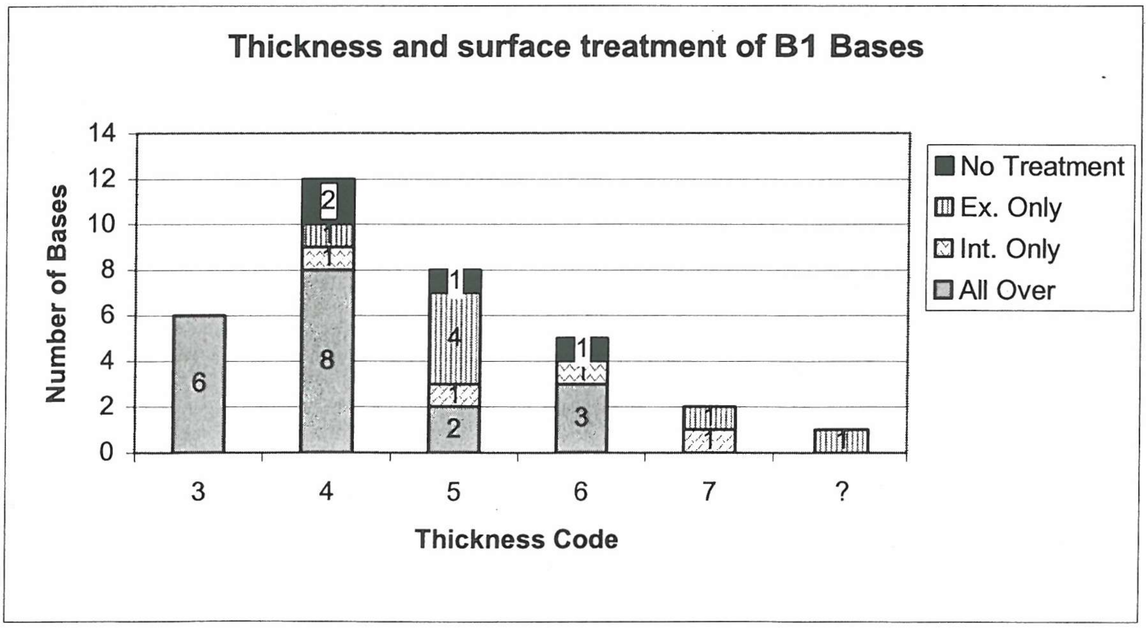

Figure 41: Thickness and surface treatment of B1 bases at Coconut Walk

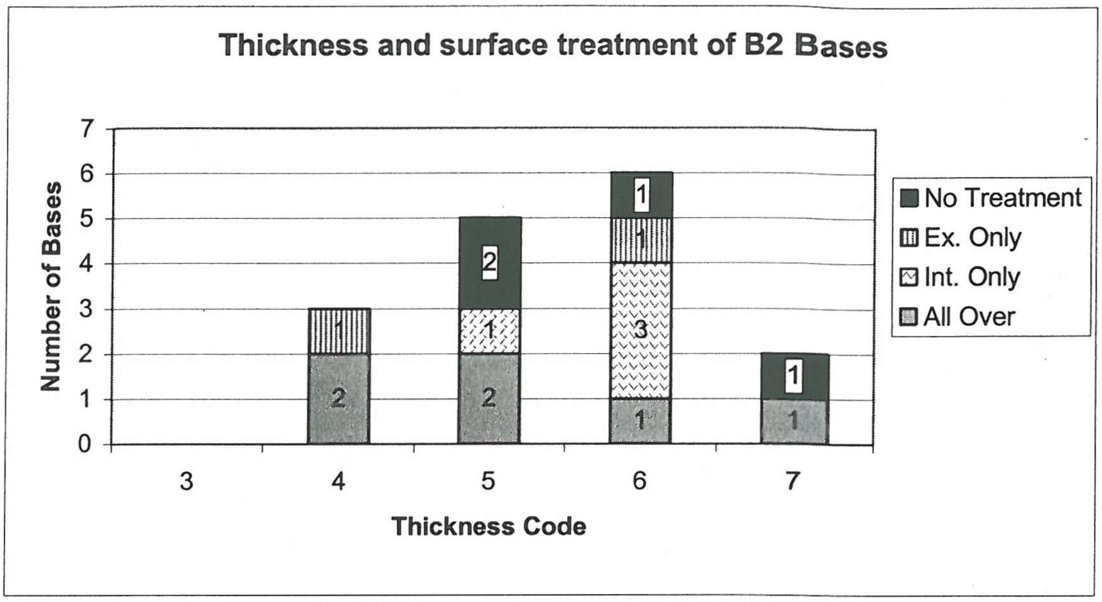

Figure 42: Thickness and surface treatment of B2 bases from Coconut Walk

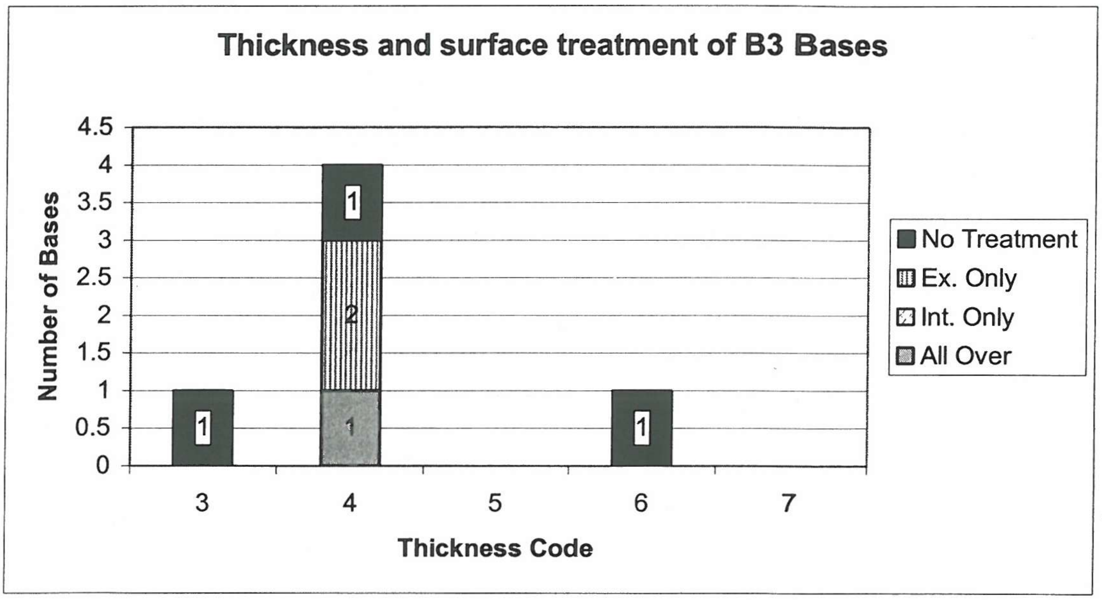

Figure 43: Thickness and surface treatment of B3 bases from Coconut Walk

Rims

In total 467 rim sherds and 27griddle rim sherds were recorded, as outlined in chapter 4, and an attribute code was assigned to each sherd. The rims were then grouped on the basis of shared attributes and a total of 29 groups were formed (R1 – R29), see table 3, as well as five different rim groups that are applicable just to griddles (G1 – G5). In this analysis the griddle rim sherds have been treated separately from the rest of the rim sherds because they are easily distinguished from the rims of other vessel types and the function of griddles as a specific cooking vessel is well documented (for example see Rouse 1992; Hofman 1993:70; Winter 1978:231).

The majority of rims originate from very open vessel forms such as bowls, dishes and platters. Rim types R1 through to R13 represent a variety of rims from open vessel forms, whilst rim types R14 to R19 originated from closed vessel forms and rim types R20 to R29 came from vessels with a more neutral form.

The aim of the attribute code is to enable cross-assemblage comparisons to be made as part of wider research being carried out, so the formation of the rim groups is at this stage tentative and will possibly be subject to change. As can be seen from table 3 there are some groups that contain only one or two sherds. Any attempt to identify whether these groups are 'real' or just variations as a result of vessel construction is hard to accomplish at this stage and perhaps a little futile. It may well be that a rim group such as R7 or R19 that is underrepresented in the Coconut Walk assemblage is in fact a predominant form elsewhere on the island. Therefore it is important to state clearly that these rim groups will almost inevitably alter slightly as work progresses on inter-assemblage comparisons. Bearing this factor in mind it was decided that brief analysis of the larger rim groups would be undertaken and, as detailed in the ensuing section, a number of sherds from each of the 29 groups identified to date were examined petrologically.

Wilson has identified 14 different rim types from work on Nevis (Wilson 1989 Fig 1.6). These rim forms were not used as a starting block for identifying rim groups at Coconut Walk as it is not clear from Wilson's work which site each of the rim forms originated from, nor whether they were Saladoid forms or post-Saladoid forms. Also, the aim of this research was to define a methodology that would be easily transferable to other sites on the island in order to allow for easy comparison. Table 3 details which rim forms found at Coconut Walk correspond to those rim forms identified by Wilson (e.g. W1) and Morris (e.g. AR1) at Hickmans (Morris *et. al.* Forthcoming).

Although complete vessel profiles were rarely found at the site comparisons of rim profiles with complete vessel profiles from the sites of Spring Bay 2, Spring Bay 3 and The Bottom on Saba (all dated to AD 850-1250/1300) would suggest that many of the rims identified at Coconut Walk perhaps originated from vessels that were fairly simple in shape. Bowls and dishes with unrestricted and simple contours and rims similar to Coconut Walk types R1 and R3 were identified at the Saban sites (see Hofman 1993:97,108). Open dishes with simple contours and rims similar to type R4 at Coconut Walk are also found at these sites in Saba as well as bowls with restricted simple forms and rims similar to type R14 (Hofman 1993:97,118).

Rim Group	Attribute Code	Number of Sherds	Cross Reference
R1	1; 12, 15	107	W1
R2	1; 12, 16	7	Similar to W13
R3	1; 12, 17	31	Similar to W14
R4	1; 12, 18	93	W4
R5	1; 12, 19	10	
R6	1; 13, 15	10	W10
R7	1; 13, 17	4	Similar to AR24
R8	1; 13, 18	3	
R9	1; 14, 15	19	
R10	1; 14, 16	2	
R11	1; 14, 17	2	
R12	1; 14, 18	4	Similar to AR22
R13	1; 14, 19	1	
R14	2; 12, 15	18	
R15	2; 12, 17	1	
R16	2; 14, 15	8	AR18
R17	2; 14, 16	1	
R18	2; 14, 17	1	
R19	2; 14, 19	1	
R20	3; 12, 15	102	
R21	3; 12, 16	5	
R22	3; 12, 17	9	AR21
R23	3; 12, 18	12	
R24	3; 12, 19	8	
R25	3; 13, 15	2	
R26	3; 13, 16	1	
R27	3; 13, 18	1	
R28	3; 13, 19	2	
R29	3; 14, 15	2	

Table 3: Attribute Code for each of the rim groups at Coconut Walk

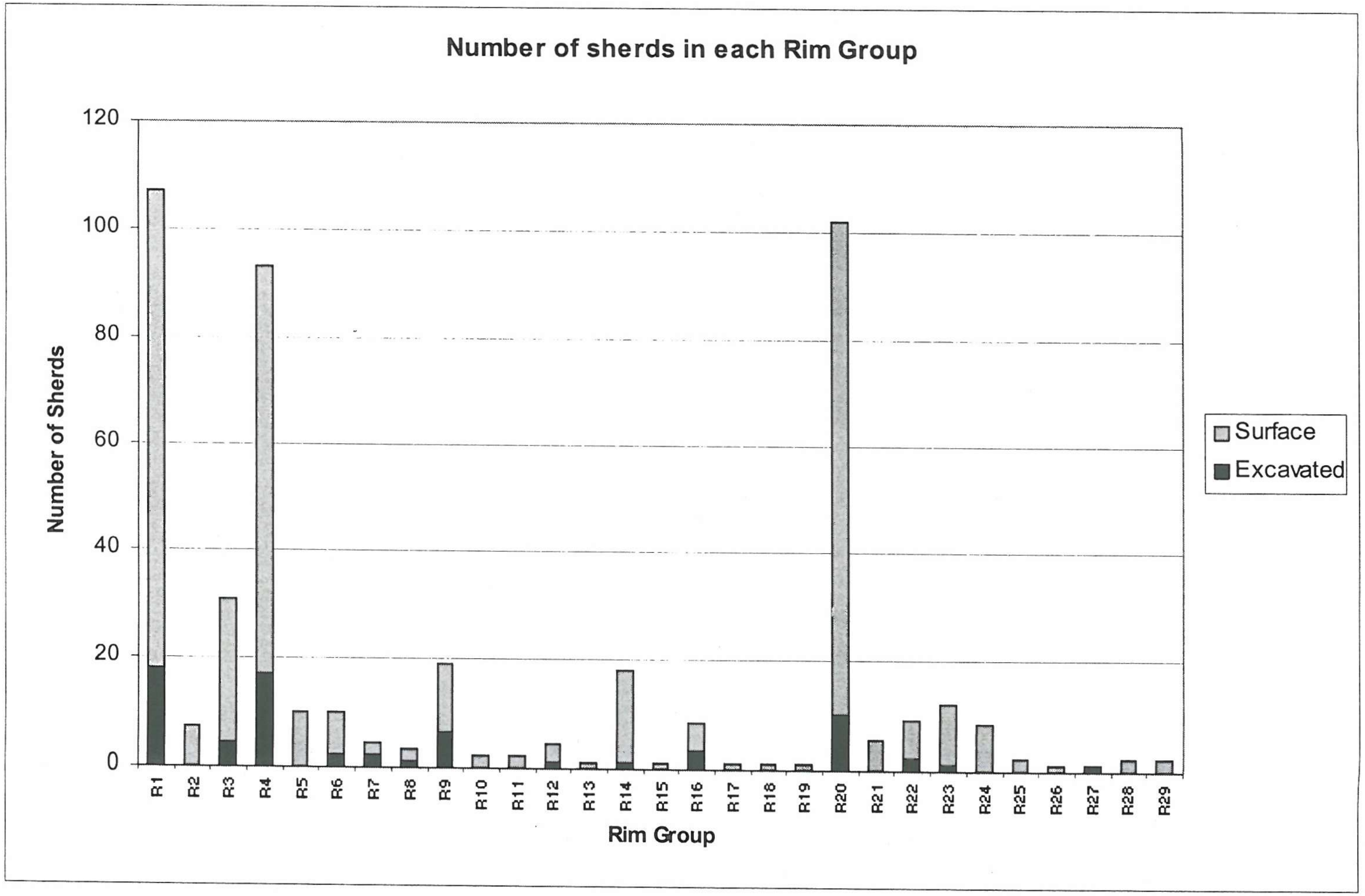

Figure 44: Number of sherds in each rim group at Coconut Walk

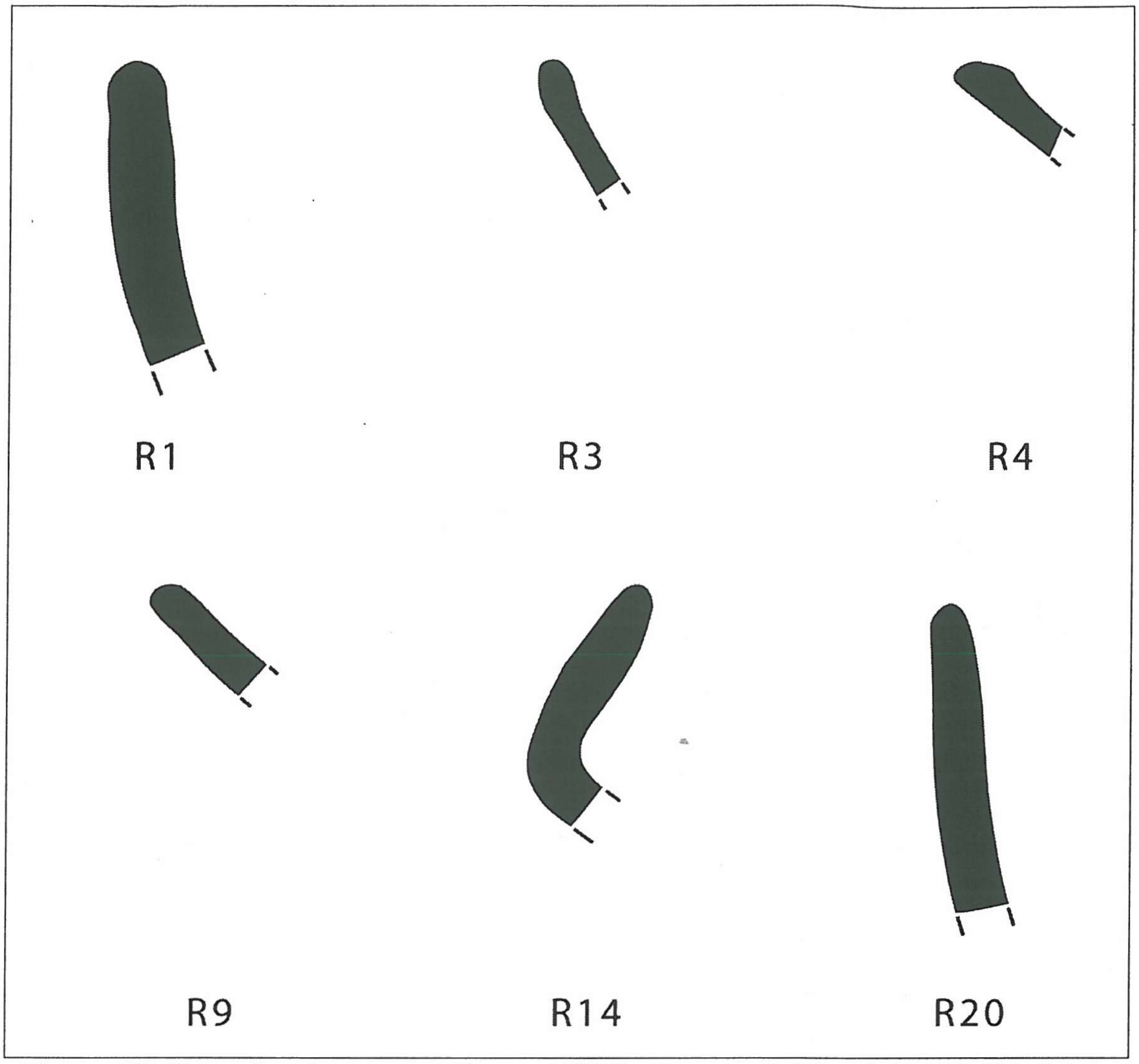

Figure 45: Six major rim types at Coconut Walk, from top left to right, R1, R3, R4, R9, R14 and R20 (courtesy of Christopher Chaplin). The diameter of each of the rims illustrated has not been included because these rim types occur on vessels of varying sizes.

It is clear from table 3 that six rim groups predominate, R1, R3, R4, R9, R14 and R20, rim profiles for each of these groups can be found in figure 45. These groups are dominant in both the excavated and surface collected material.

R1 – Open orientation with straight course and simple parallel profile

R3 – Open orientation with straight course and gradual reduction towards the lip

R4 – Open orientation with straight course and abrupt thickening towards the lip

R9 – Open orientation with convex course and simple parallel profile

R14 – Closed orientation with straight course and simple parallel profile

R20 – Neutral orientation with straight course and simple parallel profile

Rim drawings of some of the rim forms as well as a couple of complete or near complete vessels are shown in figure 46.

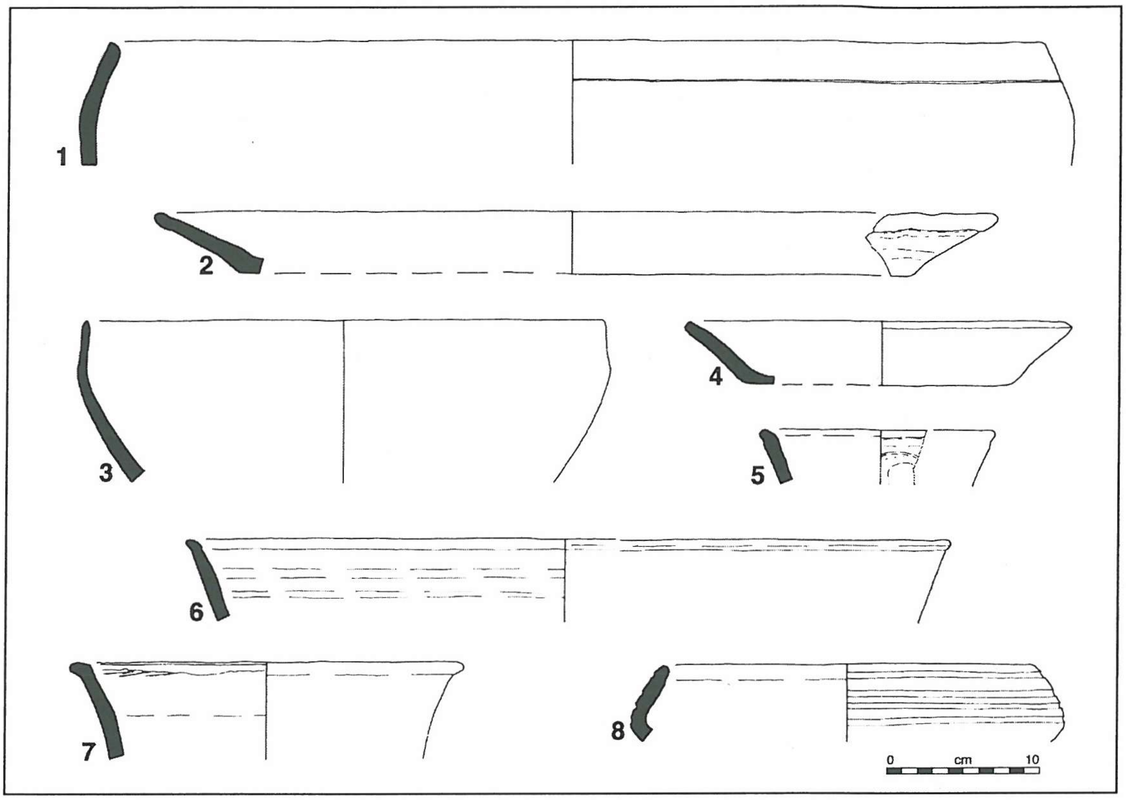

Figure 46: Rim drawings and vessel profiles from Coconut Walk (courtesy of Christopher Chaplin). 1 = Rim type R22, 2 = Rim type R1, 3 = Rim type R14, 4 = Rim type R1, 5 = Rim type R4, 6 = Rim type R4, 7 = Rim type R8, 8 = Rim type R14.

The thicknesses of different rim types are shown in figures 47-52. The median thickness code for five of the six rim groups is code 4 (9 - <11 mm) whilst the median thickness code for group R3 is code 3 (7 - <9 mm). This is further demonstrated in figure 53, which shows the cumulative percentage of rim thickness for all six rim groups. As can be seen from the graph (Figure 53) 51% of R3 rims are thickness code 3 or less whilst only 31% of R1 rims, 36% of R4 and R9 rims, 38% of R14 rims and 30% of R20 rims are thickness code 3 or less. The other rim groups all peak at thickness code 4 however there is some degree of variation in the cumulative % this represents for each group, which evens out by thickness code 5.

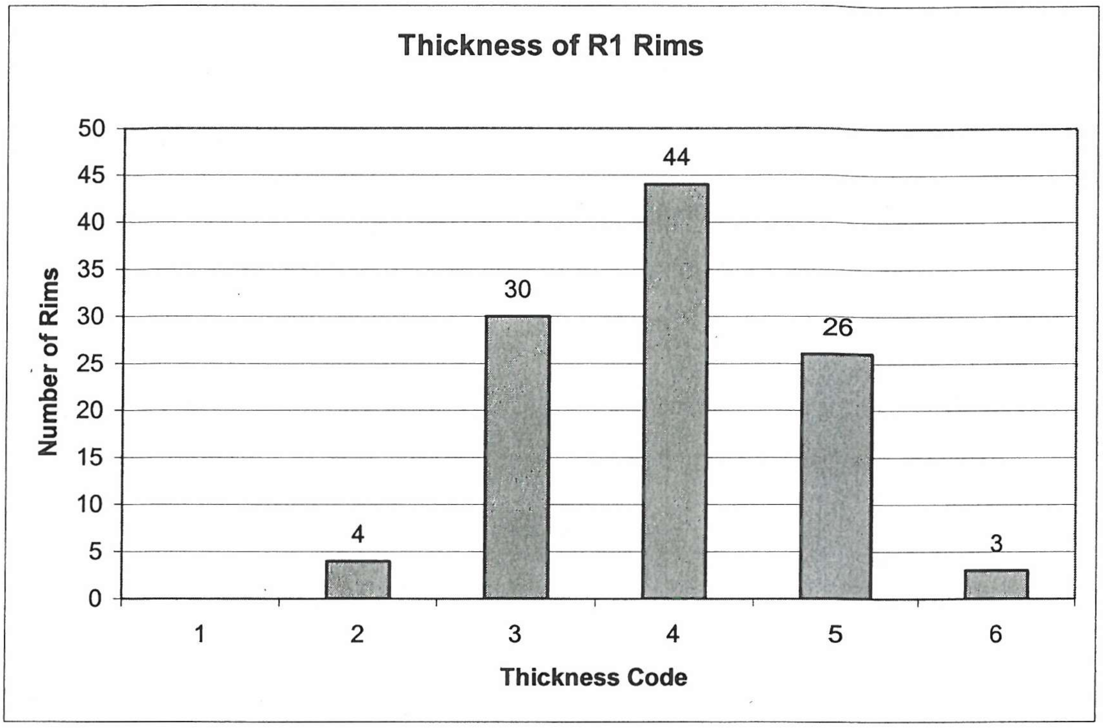

Figure 47: Thickness of R1 rims at Coconut Walk

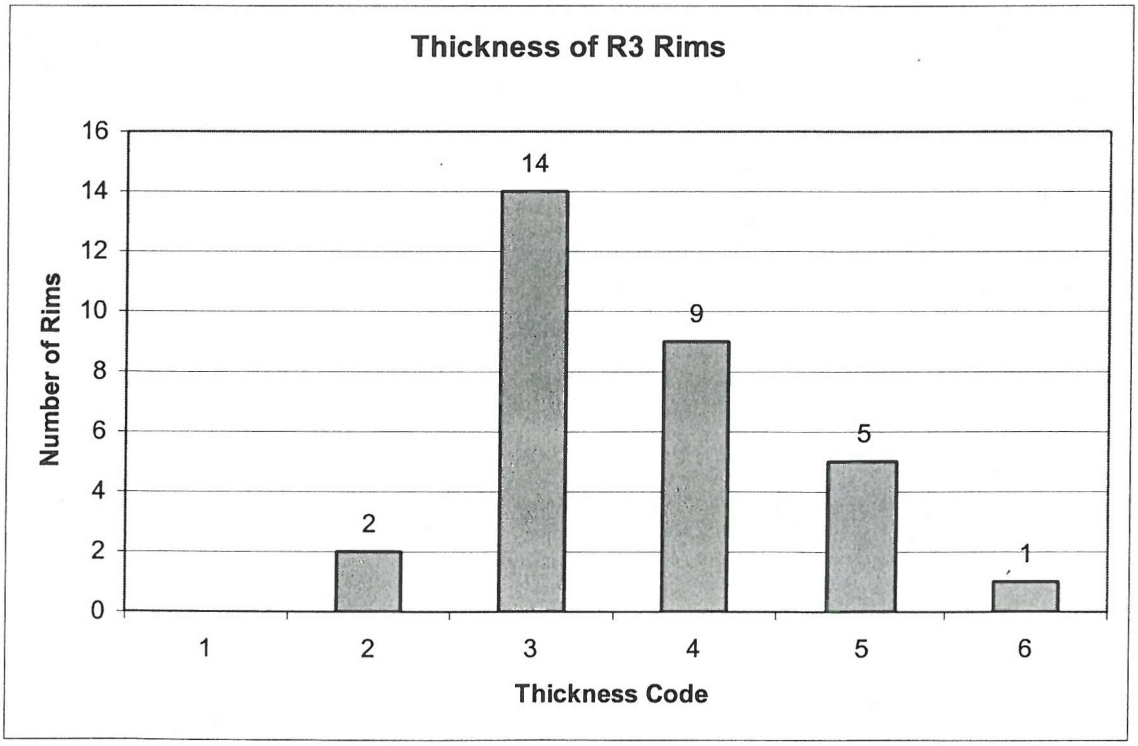

Figure 48: Thickness of R3 rims at Coconut Walk

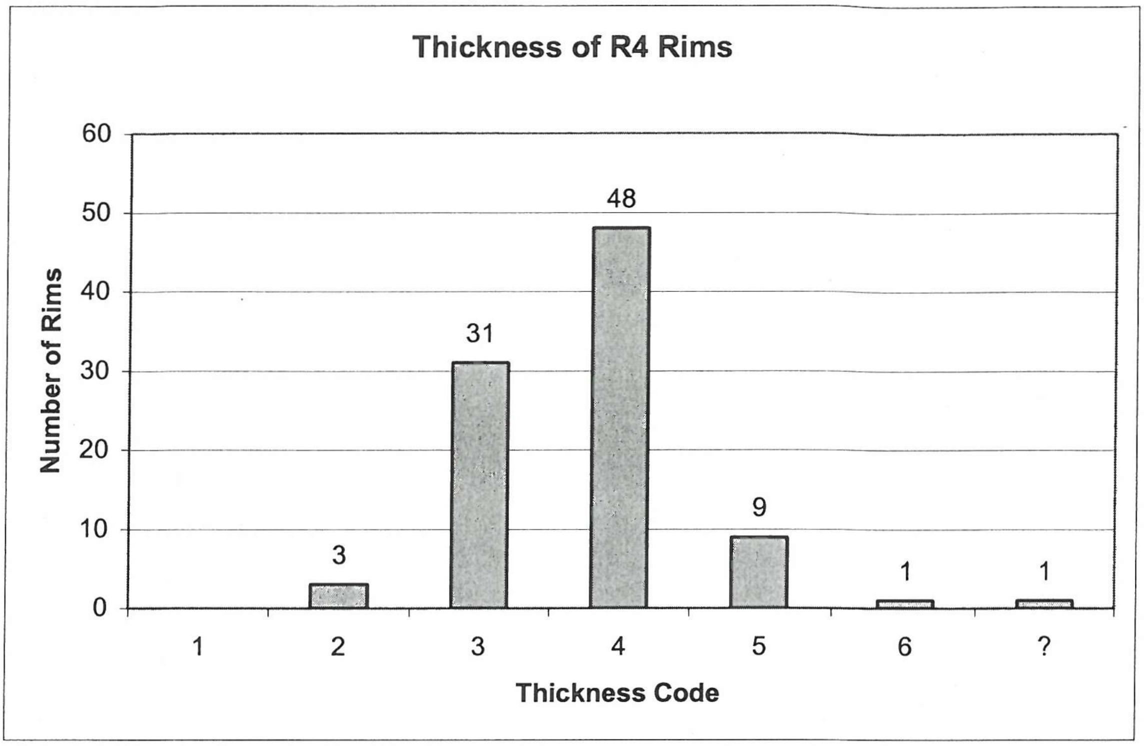

Figure 49: Thickness of R4 rims at Coconut Walk

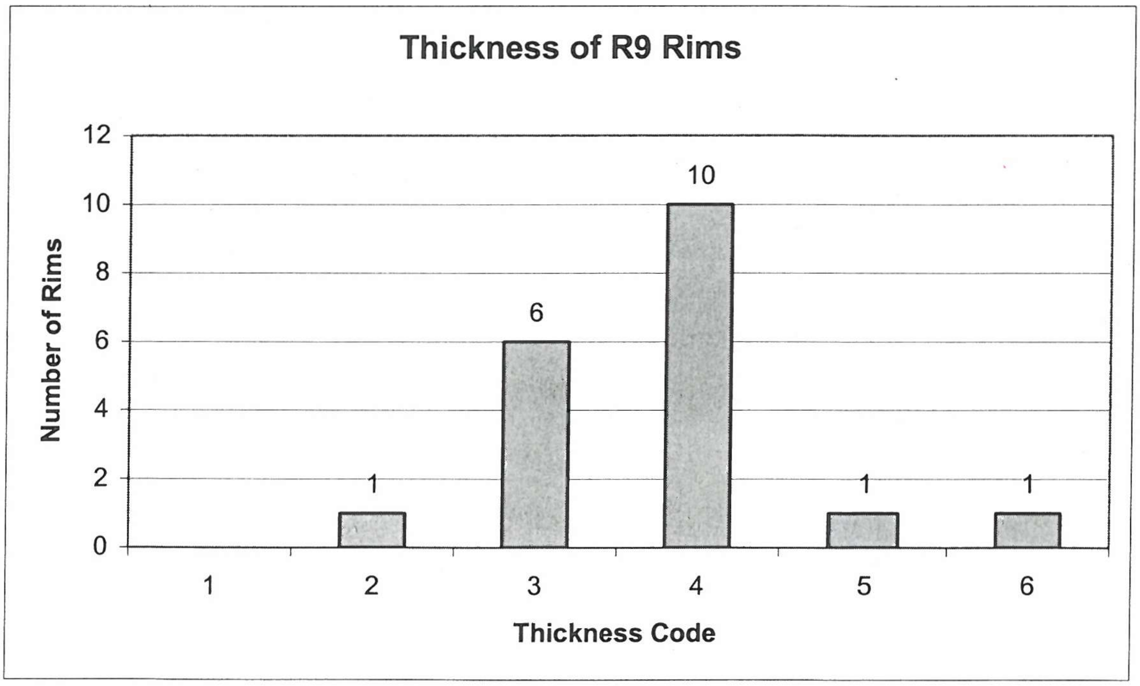

Figure 50: Thickness of R9 rims at Coconut Walk

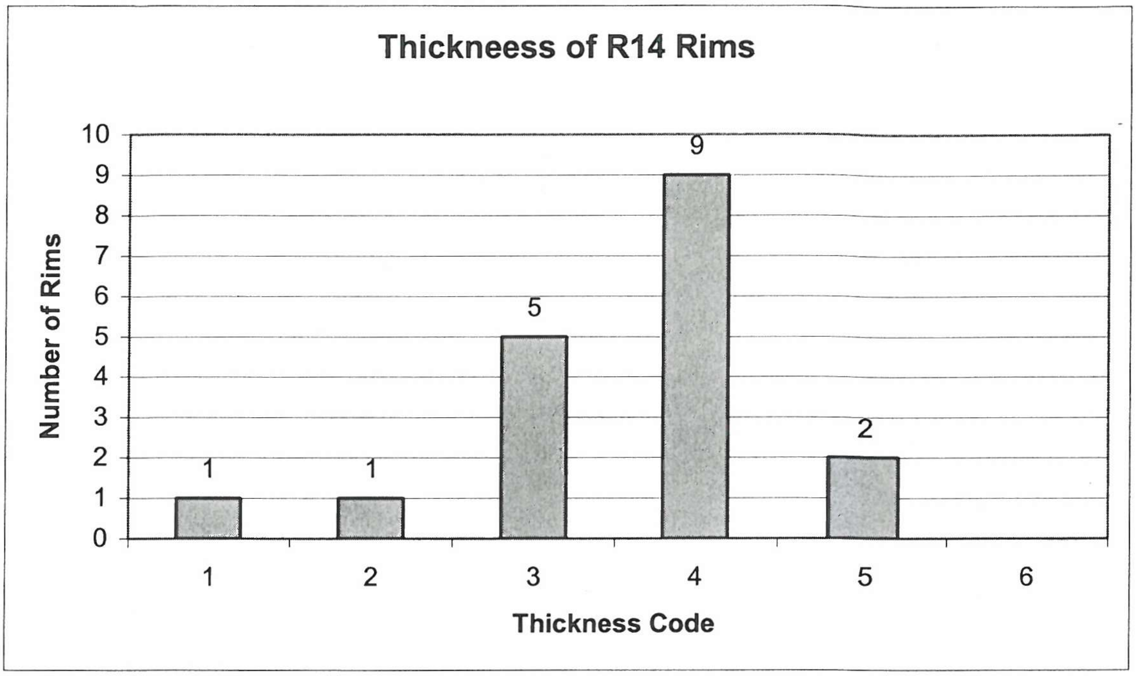

Figure 51: Thickness of R14 rims at Coconut Walk

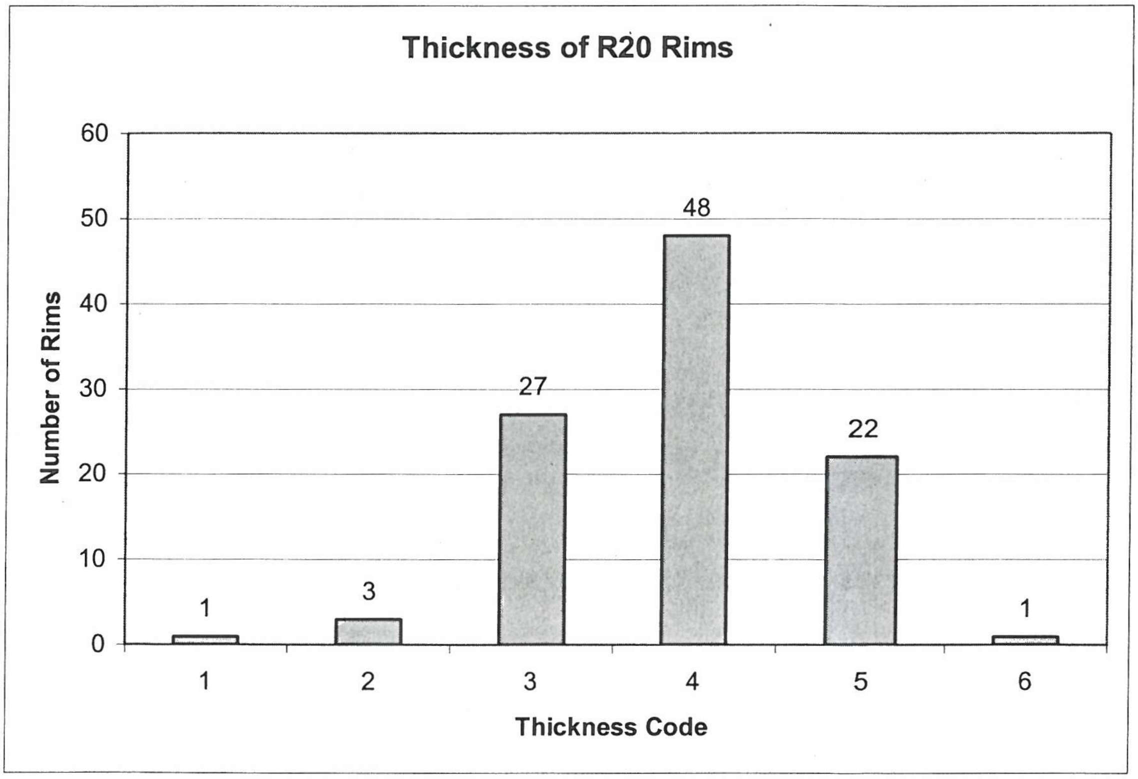

Figure 52: Thickness of R20 rims at Coconut Walk

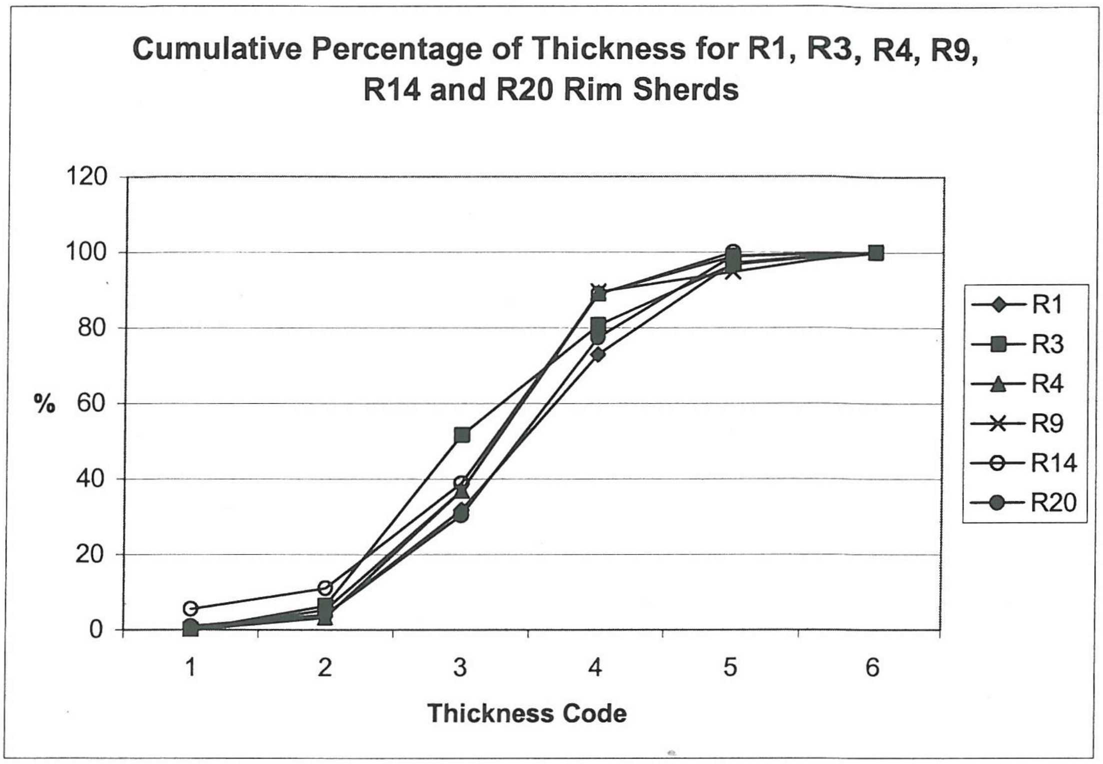

Figure 53: Cumulative percentage of thickness for the six major rim groups at Coconut Walk

The association between rim form and thickness was then tested statistically using the Chi squared test and the results showed that there was no significant association between thickness and rim form.

Chi squared (25, $\underline{N}$ = 369) = 29.923, $\underline{p}$ = >0.05 ns

Therefore, this would imply that a potter is not selecting a specific rim form for vessels of a particular size, so for example an R1 rim is not just being applied to thin vessels whilst another rim type is being applied just to thicker vessels.

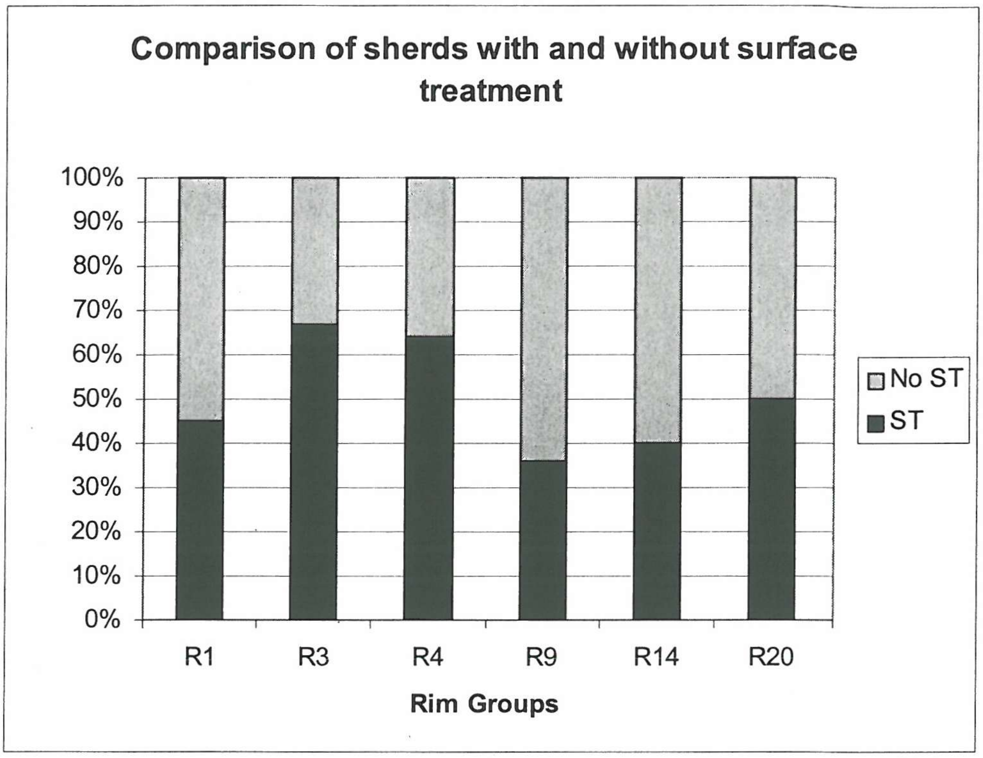

Figure 54: Occurrence of surface treatment on each of the major rim groups at Coconut Walk

Rim group R3, out of the six, displayed the highest ratio of sherds with surface treatment (figure 54). Only two of the six rim groups have more than 50% of sherds with surface treatment. This may or may not indicate that there is a high proportion of utilitarian wares in the assemblage. However it does indicate that expenditure in terms of effort and time it takes to apply a surface treatment was often being invested for less than 50% of vessels made. Rim type R4 was most commonly found to have had slip applied to all surfaces, however it is interesting to note that slip and other surface treatments were being applied in varying degrees to all six rim types (Figure 55).

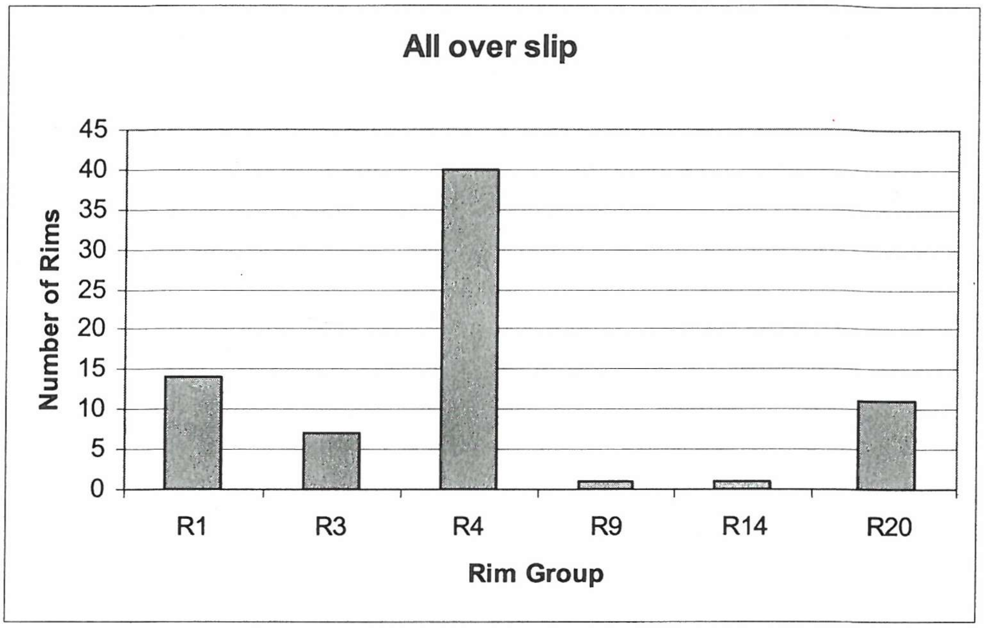

Figure 55: Number of rims with slip on both surfaces at Coconut Walk

Rim diameters were examined as ranges of diameters, e.g. 6-10 cm, as opposed to individual measurements as the proportion of vessels represented by each sherd was often relatively small, therefore, including sherds in a range of measurements would limit bias in the data on this account. It must also be borne in mind that the vessels were all handmade and therefore a rim on a complete vessel may not necessarily be standardised all the way round. Figures 59-64 show the range of rim diameters for each of the larger rim groups. The size range of vessels for R1 type rims is considerably large ranging from 6-50 cm. The majority of rims for this group fall in the range of 11-30 cm and the mean rim diameter is 21.19 cm. Rims of type R4 range in diameter from 6-40 cm and two groups are visible in the data, the first at 16-20 cm and the second at 26-30 cm, the mean diameter for this group is 22.74 cm. Half of the measurable rims that comprise group R9 fall in the 16-20 cm range and the diameter of all R9 rims extend from 16-40 cm, which is narrower in range than the majority of other groups, the mean diameter is also slightly larger than all the other groups at 24.74 cm. Group R14 also displays a fairly narrow range of rim diameters from 11-35 cm, the peak for this occurring at 21-25 cm and the mean diameter being 22.67 cm. The rim diameters for group R20 ranges from 6-40 cm with a mean diameter of 23 cm. From this data it does not appear that there are specific sizes of vessels being produced with certain types of rims.

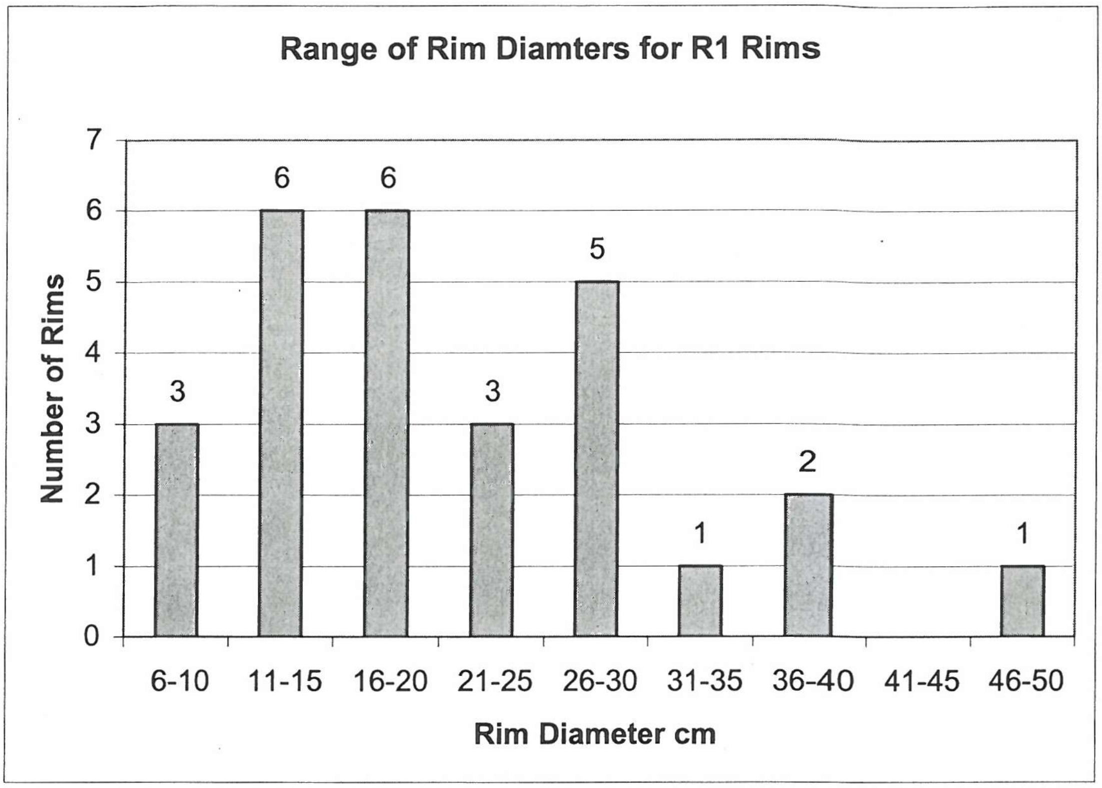

Figure 56: Range of rim diameters for R1 Rims at Coconut Walk

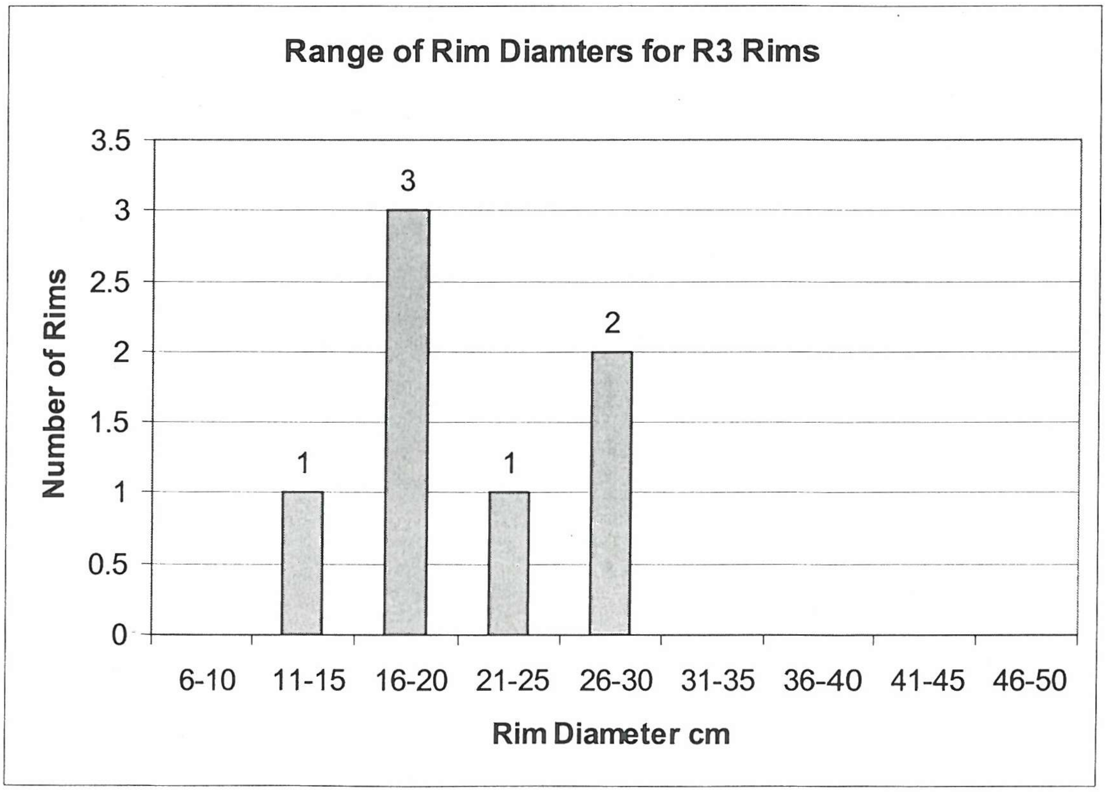

Figure 57: Range of rim diameters for R3 Rims at Coconut Walk

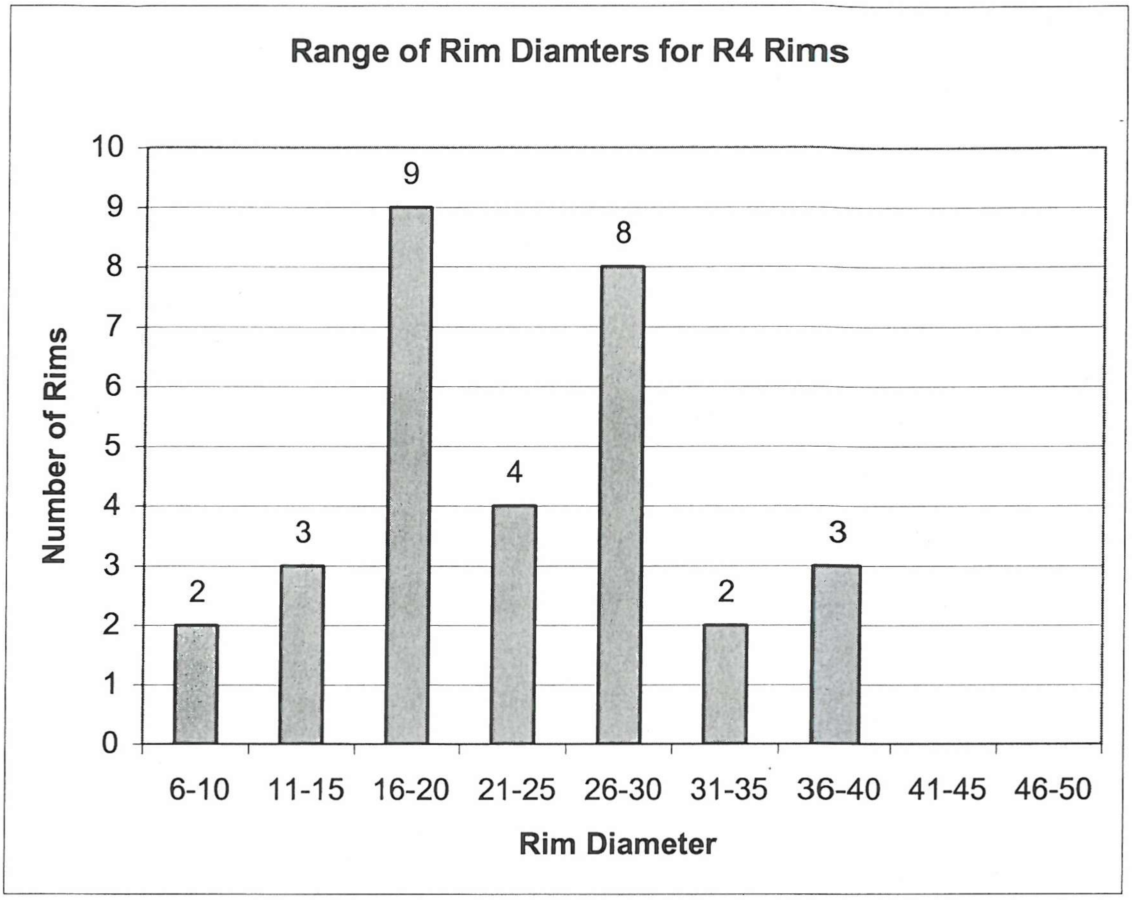

Figure 58: Range of rim diameters for R4 Rims at Coconut Walk

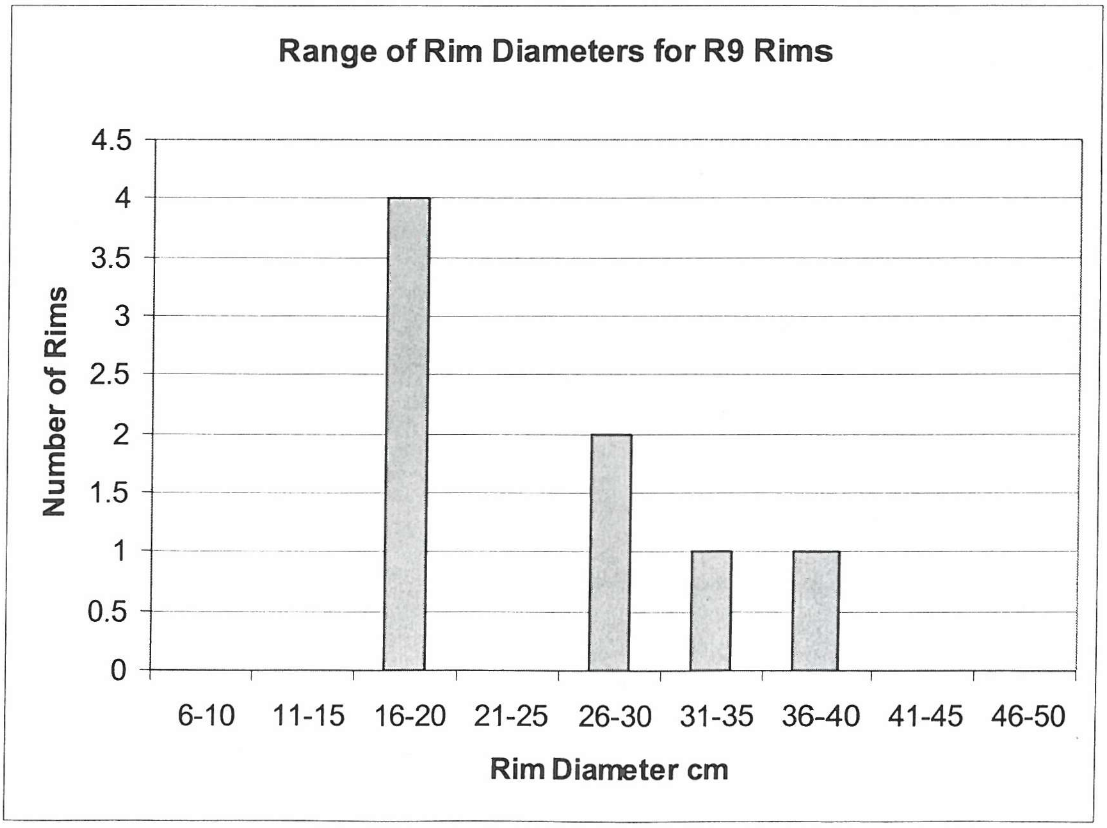

Figure 59: Range of rim diameters for R9 Rims at Coconut Walk

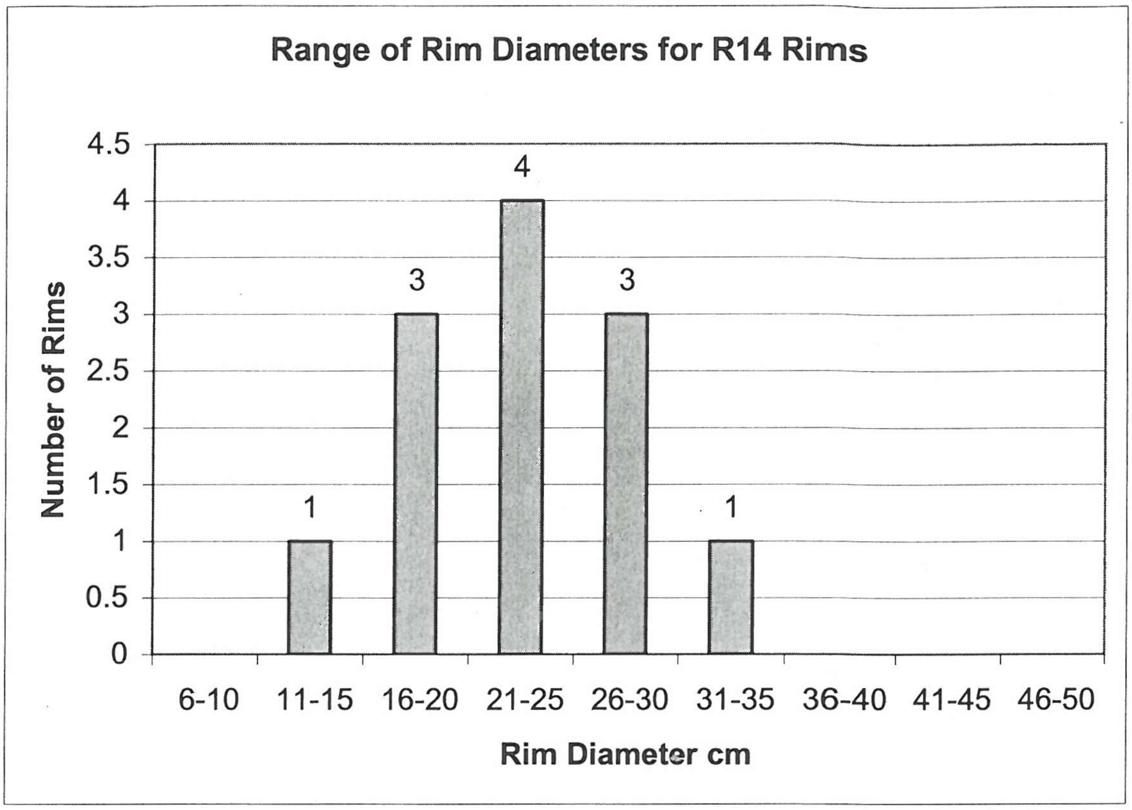

Figure 60: Range of rim diameters for R14 Rims at Coconut Walk

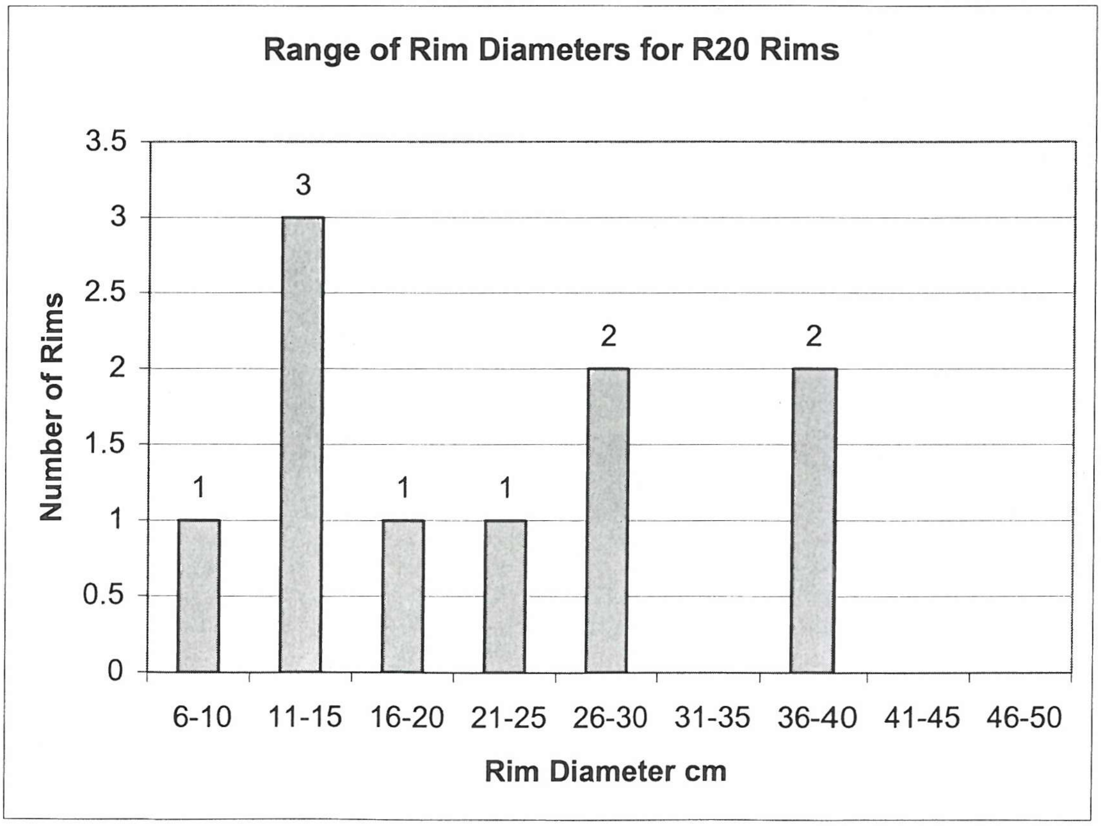

Figure 61: Range of rim diameters for R20 Rims at Coconut Walk

In order to investigate this idea the association between rim diameter and form was tested. From the data analysed above it would suggest that there was no significant association between rim diameter and form. The Chi squared test results confirmed this proposal that there was no significant association between rim diameter and rim form.

Chi squared $(35, \underline{N} = 95) = 24.399$, $\underline{p} = >0.05$ ns

Therefore the type of rim form found on a vessel was not related to the rim diameter of vessel being produced.

The association between rim thickness and rim diameter was also tested for each of the rim groups. There was a significant association between thickness and rim diameter for the R1 rim group, which would suggest that vessels with a greater rim diameter were thicker than vessels with a smaller rim diameter.

Chi squared $(28; \underline{N} = 27) = 42.715$, $\underline{p} = < 0.05$

There was no significant association between thickness and diameter for groups R3, R4, R9, R14 and R20. This would perhaps suggest that thicker vessels were not necessarily ones with a large rim diameter.

R3 – Chi squared $(9; \underline{N} = 7) = 12.444$, $\underline{p} = >0.05$ ns
R4 – Chi squared $(24; \underline{N} = 31) = 14.301$, $\underline{p} = >0.05$ ns
R9 – Chi squared $(6; \underline{N} = 8) = 2.667$, $\underline{p} = >0.05$ ns
R14 – Chi squared $(16; \underline{N} = 12) = 24.250$, $\underline{p} = >0.05$ ns
R20 – Chi squared $(20; \underline{N} = 10) = 28.056$, $\underline{p} = >0.05$ ns

These results are not surprising however. In order for Chi squared to be effective there needs to be a minimum number of cases that occur in each of the cells in the contingency table. For all of the rim groups the entire number of cells contained less than the expected count of cases. Therefore to increase the statistical power of the analysis and to confirm with more confidence the results obtained so far that there is no significant association between thickness and diameter for the majority of rim groups, it was necessary to refine the number of rim diameter and thickness groups. It was decided that the number of rim diameter groups should be reduced from the current ten to just three; small, medium and large and the thickness codes would be reduced to thin and thick. In order to accomplish this it was necessary to perform a percentile split on the diameter data and a median split on the thickness data in order to determine where the real divisions lay in the data rather than just constructing arbitrary groups. In the ensuing chapters the material from Coconut Walk is compared with material from the site of Indian Castle. In order to make comparison between sites accurate the percentile and median splits were performed on the combination of both the Coconut Walk and Indian Castle data. It was essential to do this so that what is classed as small, medium and large is the same for both sites. If this was just carried out on the rim data from one site then later comparisons between sites would be futile as the definition of what is small, medium, large, thin or thick might well be different. Rim group R9 is subsequently not included in the following analysis as this rim group is under represented at Indian Castle and is therefore not included in any comparative discussions of the sites.

As the rim diameter data was to be divided into three groups the 33rd percentile and the 66th percentiles were calculated. Thirty three percent of the rims had a diameter of 18 cm or less so the first group 'small' contains all the rims with a diameter of 18cm and less. Sixty six percent of the rims had a diameter of 26 cm and less and so the second category, 'medium', included all rims with a diameter between 19 and 26 cm and the third group, 'large', comprises all rims with a diameter of 27 cm and greater. A median split could be performed on the thickness data and so 'thin' rims equalled all those with a thickness code 3 or less, whilst 'thick' rims were a code 4 or above.

When the Chi squared test was performed again there was no significant association between diameter group and thickness group for any of the five rim groups.

R1 – Chi squared (2; $\underline{N}$ = 27) = 3.419, $\underline{p}$ = >0.05 ns

R3 – Chi squared (2; $\underline{N}$ = 7) = 3.938, $\underline{p}$ = >0.05 ns

R4 – Chi squared (2; $\underline{N}$ = 31) = 1.296, $\underline{p}$ = >0.05 ns

R14 – Chi squared (2; $\underline{N}$ = 12) = 5.143, $\underline{p}$ = >0.05 ns

R20 – Chi squared (2; $\underline{N}$ = 10) = 1.875, $\underline{p}$ = >0.05 ns

These results confirm further that the rim diameter of a vessel and the thickness of a vessel are not associated, and that the potters were therefore not producing vessels with a larger rim diameter that were thicker or vessels with a small rim diameter that were thinner.

Griddles

Twenty-seven griddle sherds were recovered from the site. Five griddle types were identified mainly on the basis of rim forms see figure 34. Griddle types G1, G2 and G3 correlate with forms identified by Hofman, however G4 and G5 types from Coconut Walk are distinctly different from Hofman's other griddle identifications (see Hofman 1993:70?).

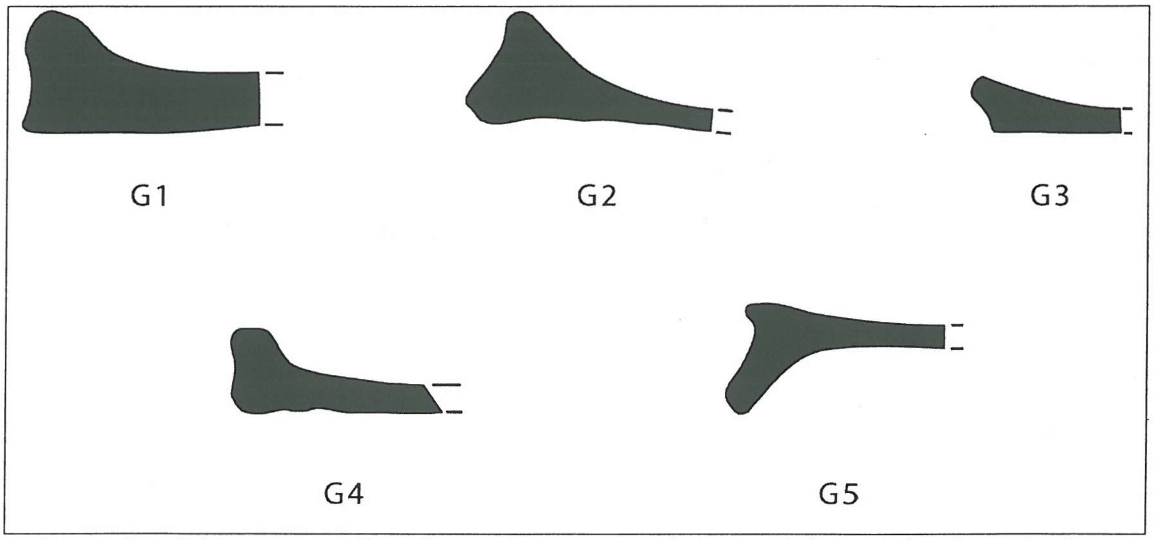

Figure 62: Griddle forms found at Coconut Walk from top left to right, G1, G2, G3, G4, G5

G1 – perpendicular raised rim

G2 – triangular raised rim

G3 – overhanging raised rim

G4 – squared raised rim with lip

G5 – footed griddle with slightly raised rounded rim

As can be seen from figure 63 griddle type G1 predominates the assemblage. Types G4 and G5 could represent variations on the basic forms represented by types G1, G2 and G3, however at this stage it is not possible to determine whether that is the case or not. If these forms are found in greater abundance at other sites on Nevis, their validity as a separate form of griddle will be affirmed. The rim diameters for over half of the griddle sherds (55%) could not be measured, as the sherds were too small. However as can be seen in figure 63 the diameters of those sherds that could be measured tended to be of a medium size, between 21 and 30 cm. One was 41 cm in diameter. Nineteen of the 27 griddle sherds had been burnished (86%) on the cooking surface and several of these had also had the exterior surface of the griddle edge burnished. The common usage of burnishing on the cooking surface may have been done to fulfil a functional rather than aesthetic purpose. These griddles were used to cook cassava bread and perhaps to grill other food. By burnishing the cooking surface, food was less liable to stick to the surface, reducing the likelihood that food would burn as well as helping in the removal of food once cooked. The bottom of some griddles bear impressions that have been interpreted either as being reed or grass imprints caused by forming the griddles on a reed mat or directly on the ground (see Hofman 1993:70; Winter 1978:232; Caeser *et. al.* 1991:206) or a means of improving heat distribution (see Morris et al. forthcoming:29). All of the sherds also tended to be oxidised or irregularly fired and no use wear evidence such as sooting was identified. The absence of such use wear evidence on a known cooking implement may be a result of two factors. Firstly any evidence of use could have been destroyed by post-depositional processes or during the cleaning of the sherds. Alternatively, it could indicate that the griddles were not placed over direct fire but perhaps over heated rocks.

The thickness of griddle cooking surfaces is shown in figure 65. Cumulative percentage graphs were drawn for griddle types 1-3 (figure 66), types G4 and G5 were excluded as these two groups contained only one sherd each. The cumulative

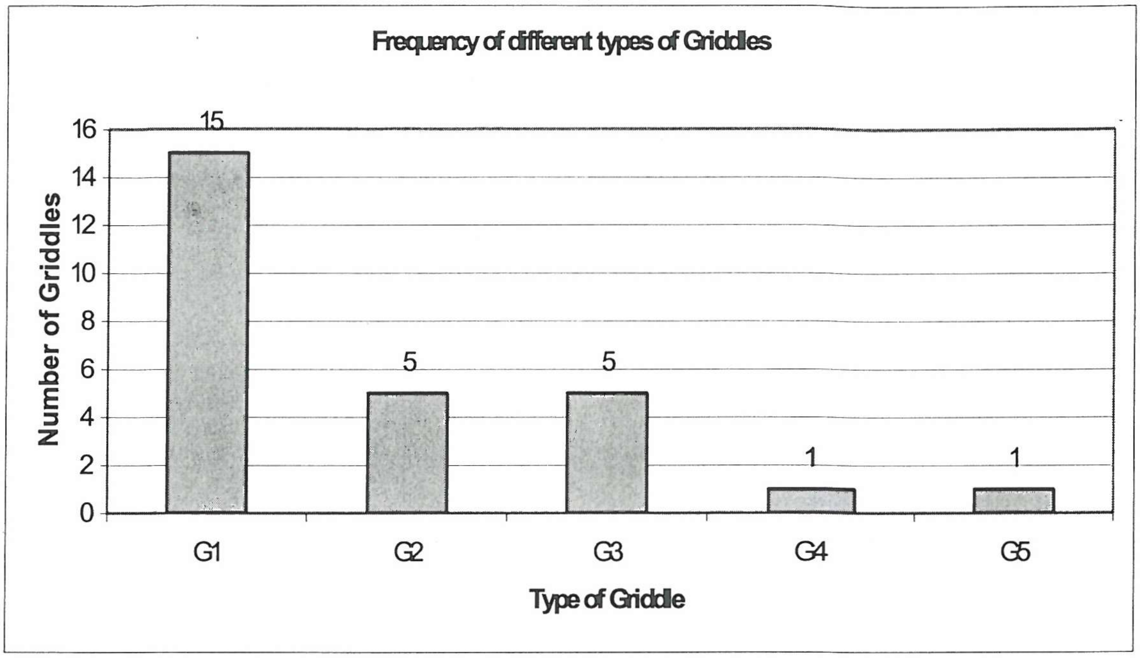

Figure 63: Frequency of griddle types found at Coconut Walk

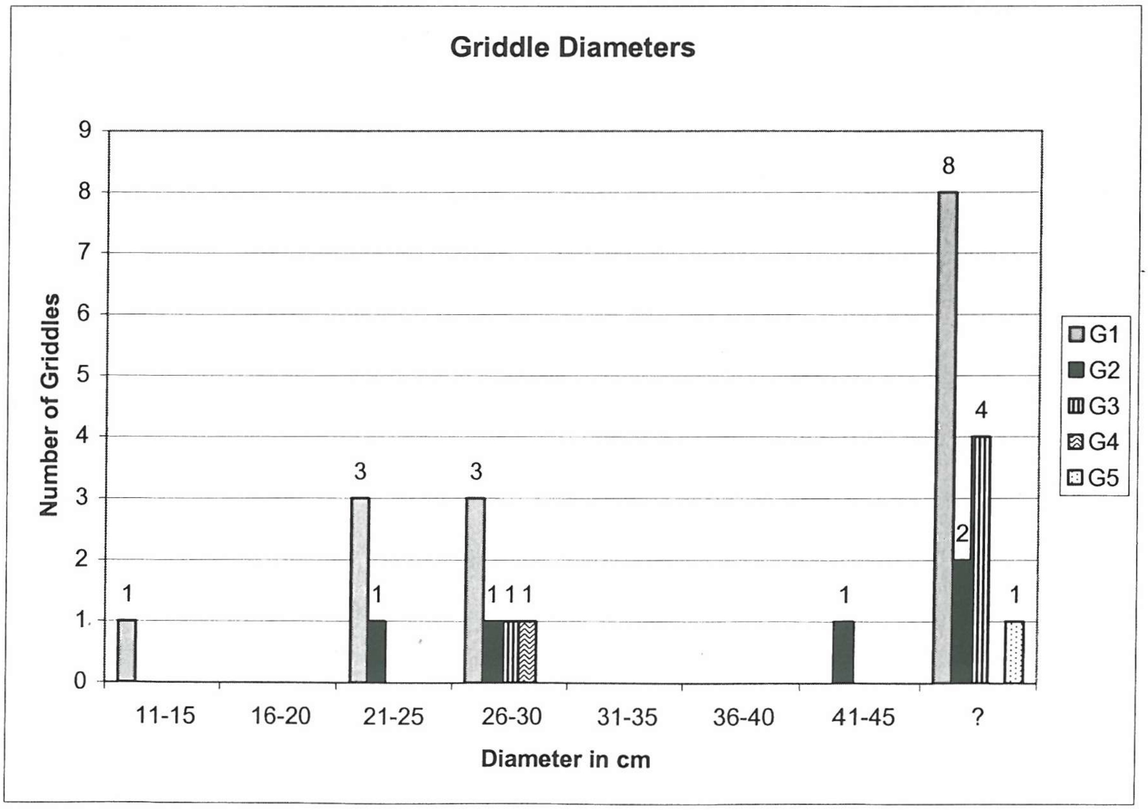

Figure 64: Range of rim diameters for each type of griddle

percentage for griddle groups G1 and G2 peaks at the same thickness, code 5, as can be seen 83.5 % of all G1 griddles and 100% of G2 griddles were thickness code 5 or less. However 75% of griddle type G3 had cooking surfaces that were thickness code 3 or less. The small numbers of sherds represented in these griddle groups makes any firm conclusions very difficult to draw, however if these patterns are borne out in other assemblages with larger samples of griddles then it may suggest that for the majority of griddles the thickness of the cooking surface is fairly standardised and does not tend to differ a great deal with form. Statistical measures such as Chi squared could be used to test this theory and to see if there is a significant association between the type of griddle rim form and the thickness of the cooking surface or not. This was not attempted however as the numbers represented in the sample are perhaps far too small to gain valid results.

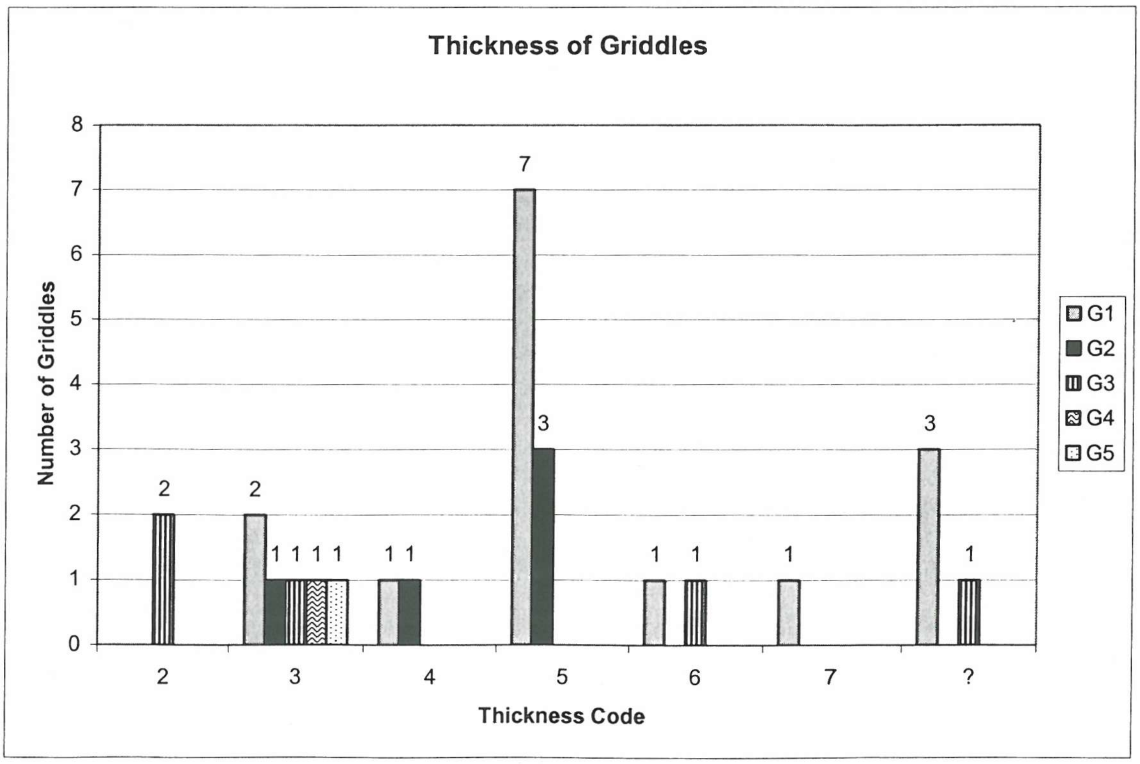

Figure 65: Thickness of griddle cooking surfaces

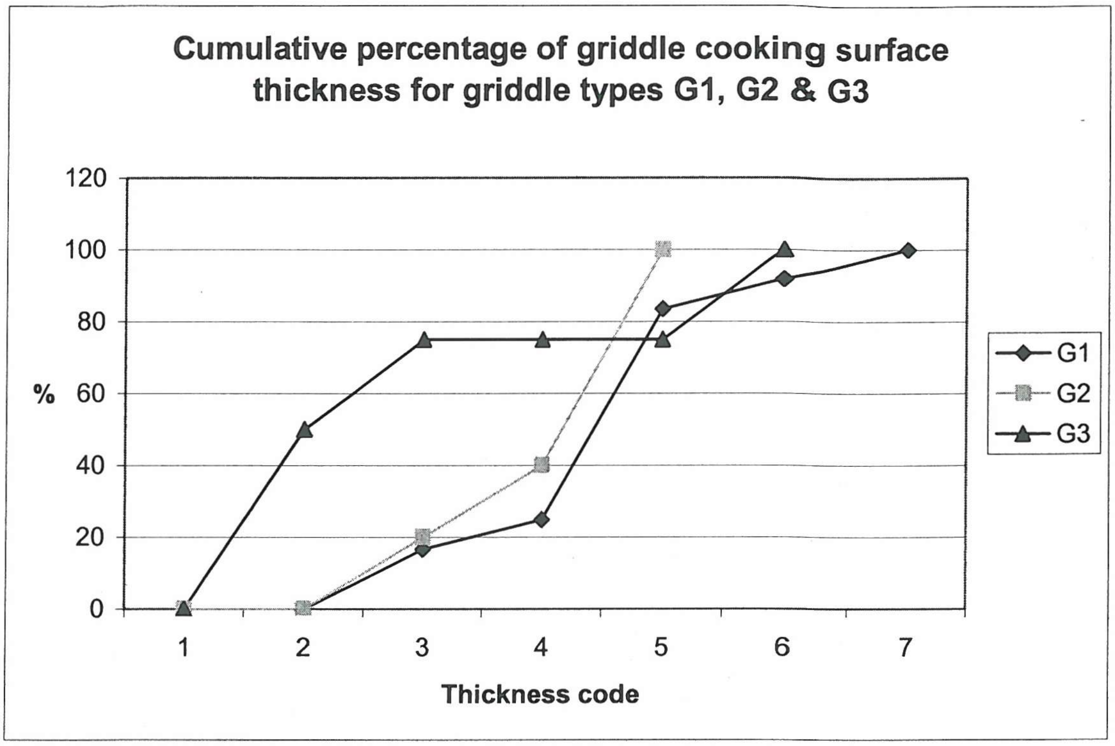

Figure 66: Comparison of cooking surface thickness for griddle types G1, G2 and G3

6.4 Intra site comparisons

The type and quantity of sherds recovered from the excavation and surface collected material was examined in order to discover whether the occurrence of material was spatially dependant and whether different activity areas were visible. There are a number of constraints that need to be taken into consideration throughout this intra site analysis. Firstly, as mentioned previously, material is lacking from a number of the squares from the survey grid and it is unclear as to whether material was just not found or if some of the squares were not surveyed. This would mean that any patterns found in the distribution of material might be affected by the fact that possibly not all the surface material from the site was collected. In addition to this a sample of squares were recorded and analysed from various parts of the site so not all the squares containing pottery were analysed. However the rims from every square were recorded and so intra site comparisons between the types of rims found can be carried out with some degree of confidence. Bearing these factors in mind it was decided to divide the surface collected material into three different areas, as shown in figure 25, and each area was analysed as a whole rather than on the basis of individual squares.

Initially a comparison between the excavated and surface collected material was made. No major differences in the types of sherds found were noticed, except that rim types R7 and R27 were only found in the excavated material. Table 4 shows the different rim types and their occurrence in the surface collected and excavated material, as can be seen a number of rim forms such as R2 and R5 for example are found in the surface collected material but not in the excavated material and a couple of rim forms, R17 and R19 were identified only in the unstratified material.

Rim Form	Occurrence
R1	Excavation and surface collection
R2	Surface Collection
R3	Excavation and surface collection
R4	Excavation and surface collection
R5	Surface Collection
R6	Excavation and surface collection
R7	Excavation and unstratified material
R8	Excavation and surface collection
R9	Excavation and surface collection
R10	Surface Collection
R11	Surface Collection
R12	Excavation and surface collection
R13	Surface Collection
R14	Excavation and surface collection
R15	Surface Collection
R16	Excavation and surface collection
R17	Unstratified material only
R18	Surface Collection
R19	Unstratified material only
R20	Excavation and surface collection
R21	Surface Collection
R22	Excavation and surface collection
R23	Excavation and surface collection
R24	Surface Collection
R25	Surface Collection
R26	Surface Collection
R27	Excavation only
R28	Surface Collection
R29	Surface Collection

Table 4: Occurrence of different rim forms in the surface collected and excavated material at Coconut Walk.

Figures 67 – 69 show the number of different rim forms present in each of the three areas defined from the surface collected material. As can be seen area three contains the most varied rim forms, this area also contains the largest number of rims, 211 and covers the greatest area of the survey grid. All three areas contain examples of rims

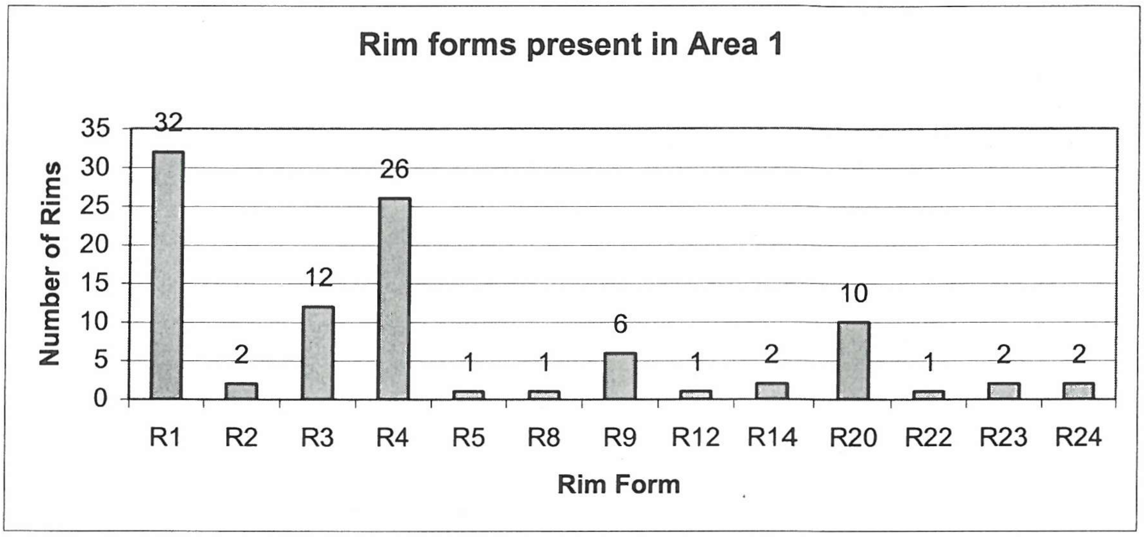

Figure 67: Number of rim forms found in Area 1 at Coconut Walk

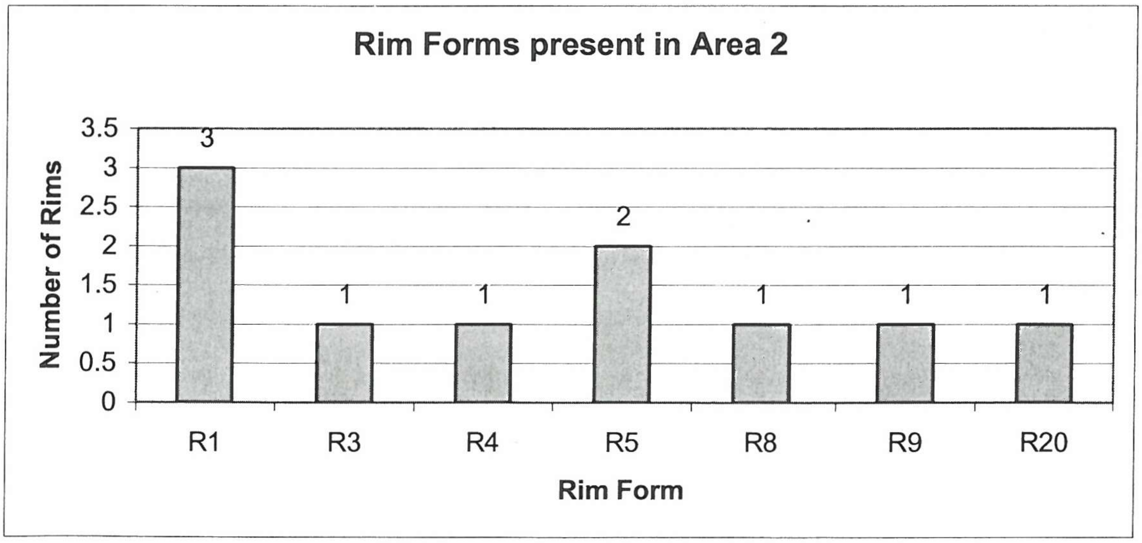

Figure 68: Number of rim forms found in Area 2 at Coconut Walk

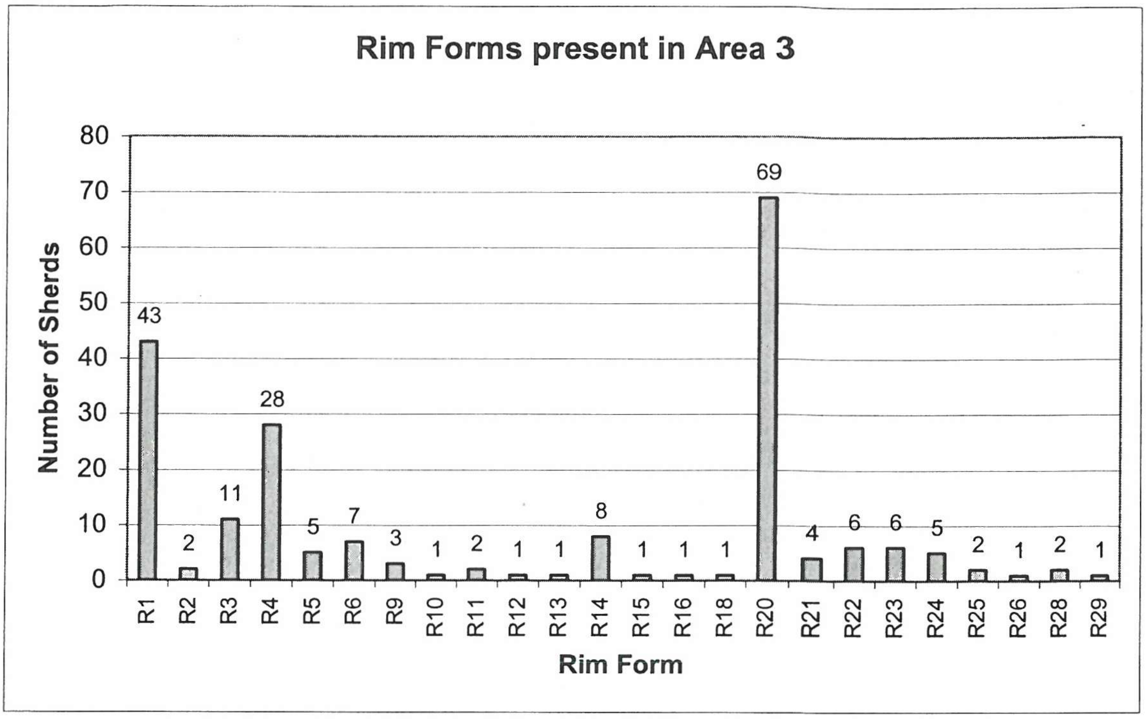

Figure 69: Number of rim forms found in Area 3 at Coconut Walk

from the six major rim groups apart from area 2 where no R14 rims have been identified. Only 10 sherds were recovered from the whole of area two perhaps indicating that less material was present in this area of the site. It is important to note the close proximity of area 2 to the shoreline, as material would most likely have been lost through erosion of the site. The number of rims from the six major groups found in each of the areas does vary, area three contains the most number of rims from groups R1, R4, R14 and R20, whereas area 2 contains the most number of rims from groups R3 and R9. Differences also occur in the location of rims from the more minor rim groups for example a number of rim types are only found in area 3 such as R6, R10, R21, R22 etc.

Rim Form	Area One	Area Two	Area Three
R1	32	3	48
R2	2	0	2
R3	12	1	11
R4	26	1	28
R5	1	2	5
R6	0	0	7
R7	0	0	0
R8	1	1	0
R9	6	1	3
R10	0	0	1
R11	0	0	2
R12	1	0	1
R13	0	0	1
R14	2	0	8
R15	0	0	1
R16	0	0	1
R17	0	0	0
R18	0	0	1
R19	0	0	0
R20	10	1	69
R21	0	0	4
R22	1	0	6
R23	2	0	6
R24	2	0	5
R25	0	0	2
R26	0	0	1
R27	0	0	0
R28	0	0	2
R29	0	0	1

Table 5: Number of rim forms in each of the three areas of the surface collection grid.

Figures 70 - 72 illustrate the thickness for each of the six major rim groups in the three different areas of the site. As can be seen there appears to be little difference between the thickness of rims of a certain form and their location within the site. Area three is the only area where rims of thickness code 1 are ever found and R9 rims from area 3 tend to be slightly thicker than the R9 rims from area 1. R14 rims from area 3 also display a greater variety in thickness than the R14 rims in area 1. On the whole though there is no striking differences between the areas. It has not been possible to identify distinct locations for any of the six major rim groups at the site, nor was there any immediately obvious differences between rim thickness, type and location. This perhaps serves to strengthen the idea that rim form does not appear to be necessarily associated with certain types of vessels that would have been used in distinct areas of the site.

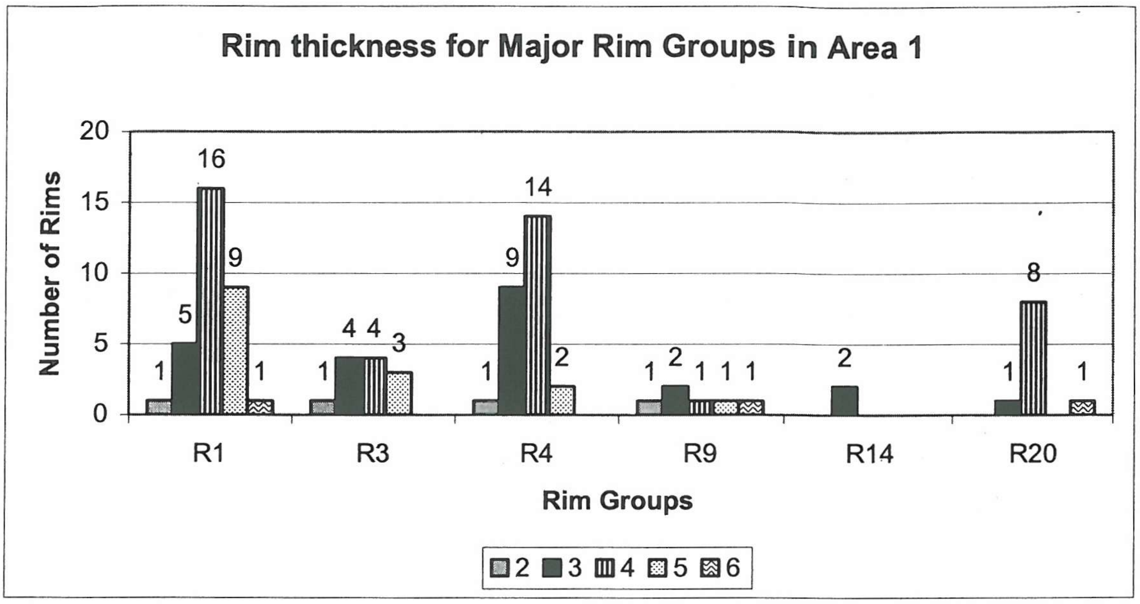

Figure 70: Thickness of rims for major rim groups in Area 1 at Coconut Walk

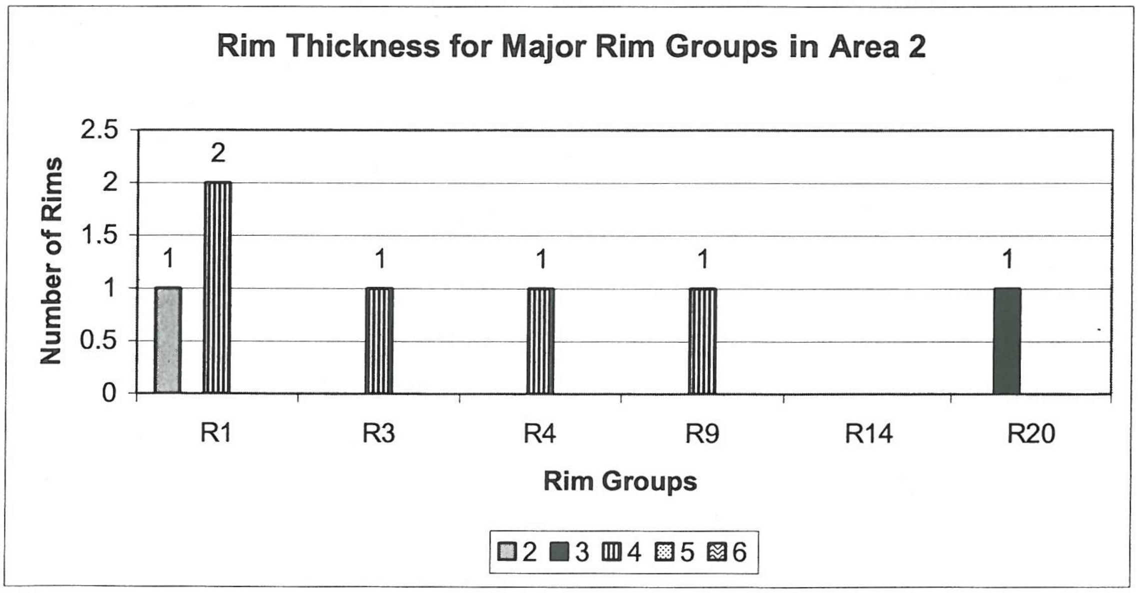

Figure 71: Thickness of rims for major rim groups in Area 2 at Coconut Walk

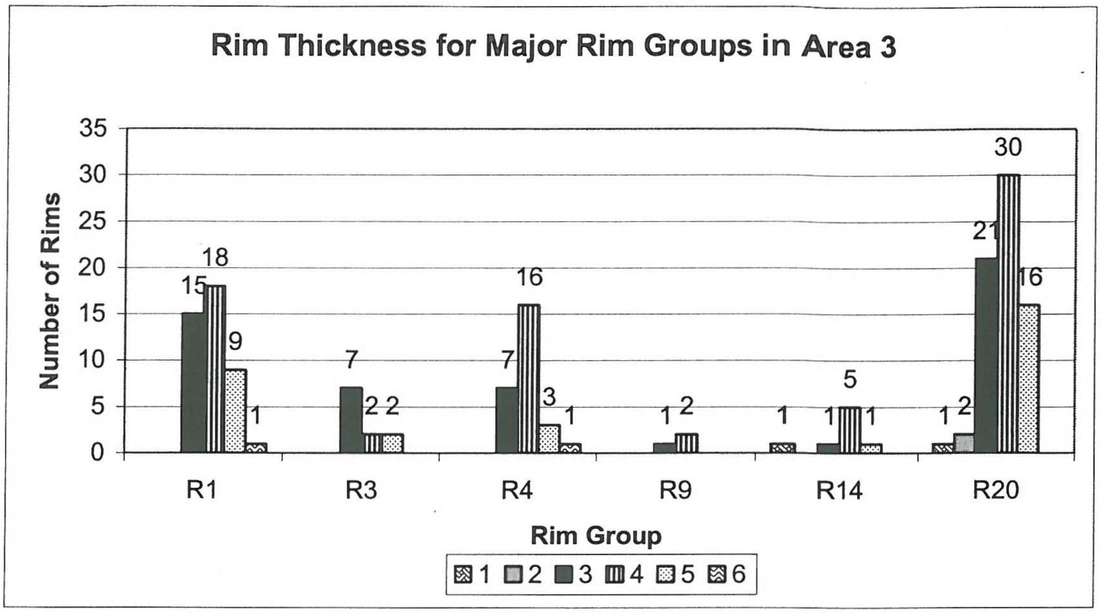

Figure 72: Thickness of rims for major rim groups in Area 3 at Coconut Walk

6.5 Date

As outlined in chapter 2 the ceramic periods in the Caribbean have been divided in two, the earlier Saladoid period dates from c. 500 BC to AD 500/600 and the later post-Saladoid period dates from AD 500/600 – 1500. The chronology of the Caribbean research has received a great deal of attention (see Rouse 1992) and the differences between the periods is largely based on a shift in the use of decoration and the quality of the pottery being produced. In the Saladoid period decorative techniques such as white-on-red painting (WOR) and zone-incised-crosshatching (ZIC) are commonly applied to vessels. The use of these decorative techniques cease in the majority of places at around AD 500-600 and on this basis a new ceramic period, the post-Saladoid, has been defined.

There is a distinct lack of 'typical' Saladoid decorative traits in the Coconut Walk assemblage, in fact only one sherd was found to have been decorated with white-on-red painting out of over 4,000 sherds that were collected. It has been suggested that in the Caribbean region there is a difference between the thickness of sherds recovered from Saladoid and post-Saladoid sites. Wilson has reported from his analysis of eight sites (one Saladoid and seven post-Saladoid) on Nevis that Saladoid sherds had a mean thickness of 8.57 mm whilst sherds from post-Saladoid sites had a mean thickness of 9.99 mm (Wilson 1989:439). This represents a difference in thickness of only around 1 mm between Saladoid and post-Saladoid sherds. A number of points must be considered when using Wilson's analysis of sherd thickness to distinguish between periods. Firstly all the pottery analysed is hand made so it is unlikely that each vessel had a uniform thickness, therefore to determine whether a pot was made during the Saladoid or post-Saladoid period on the basis of a difference in thickness of 1 mm leaves little room for any margin of error. Secondly Wilson's analysis only included one Saladoid assemblage and a greater sample of Saladoid assemblages would be desirable in order to determine whether this difference in sherd thickness between periods is in fact accurate. The use of sherd thickness alone to distinguish Saladoid sherds from post-Saladoid sherds is perhaps unreliable however used in conjunction with other attributes it may prove useful in helping to date sites. For example Morris (forthcoming) has suggested that at the site of Hickmans, Nevis vessel wall thickness can be used in conjunction with other attributes of the assemblage to distinguish between areas of Saladoid and post-Saladoid occupation. The majority of sherds at Coconut Walk were between 9 and 11 mm thick.

It is not only the lack of Saladoid traits that suggests this site is definitely post-Saladoid in date. The vessel forms found at this site are similar to pottery found on post-Saladoid sites on other Leeward islands that have been radiocarbon dated for example the sites of Spring Bay and The Bottom on Saba which have been dated to AD 850-1250/1300.

6.6 Conclusions

It has been the intention of this chapter to outline the results of analysis conducted on the pottery from the site of Coconut Walk. It has become apparent that rim form does not necessarily equate to a particular type of vessel in the Coconut Walk assemblage. This is highlighted by a lack of association between factors such as rim diameter and rim form, and vessel thickness and rim form. One would perhaps expect that if there were a relationship between rim form and vessel type, i.e. cooking vessels have a particular type of rim that is different to storage jars or serving dishes, then there would be more of an association between rim form and rim diameter or rim form and thickness. There are perhaps two possible scenarios to explain this. Firstly it could suggest that potters applied a number of different rim forms to their pots but the application of a certain rim form was not dependant on the size of type of vessel being produced. The second possible scenario could be that pottery was produced infrequently and therefore every time a potter made a certain vessel its size might vary and over time the size range of a particular type of pot such as a cooking pot or serving dish might be quite marked. This might mean that the same type of rim form was being added to certain types of vessels but a lack of standardisation as a result of say infrequent potting has led to the lack of association between rim form and rim diameter or thickness found in the assemblage. In order to determine with any certainty which scenario may be the more accurate it would be necessary for more detailed comparisons to be made between this material from Coconut Walk and other contemporary sites which had yielded more vessels with complete profiles.

The next chapter is concerned with examining the pottery recovered from the site of Indian Castle following a similar approach employed in this chapter. Then chapter 8 offers a comparison of the two sites as well as outlining the fabric and petrological analysis that has been carried out.

Chapter 7: Indian Castle

7.1 Introduction

The site of Indian Castle is, like Coconut Walk, located on the windward (eastern) coast of Nevis and lies south of Coconut Walk. The site is experiencing severe erosion and due to coastal processes prehistoric pottery is found in great quantity on the beach. The site extends over approximately 600 meters of badly eroding coast line and whilst predominantly post-Saladoid in date there is a small Saladoid component, that was identified by Wilson, at the northern end of the site, see figure 73.

The majority of material analysed in this research was collected from the southern end of the site and represents a small sample of surface collected pottery. Wilson during his work on Nevis dug a test pit in the post-Saladoid part of the site and a radiocarbon date of AD 745 ± 135 was obtained. It is unclear as to where this test pit was actually dug or the significance or accuracy of the radiocarbon dates obtained. Visual examination of the pottery would suggest that its attributation to the post-Saladoid is however correct.

It is the intention of this chapter to outline the analysis of the pottery collected from the site of Indian Castle. Chapter 8 where the results from both Coconut Walk and Indian Castle are compared and contrasted to begin to answer questions of similarity and differences between the sites then follows this. The results of the petrological work carried out on the Indian Castle assemblage are also included in the next chapter.

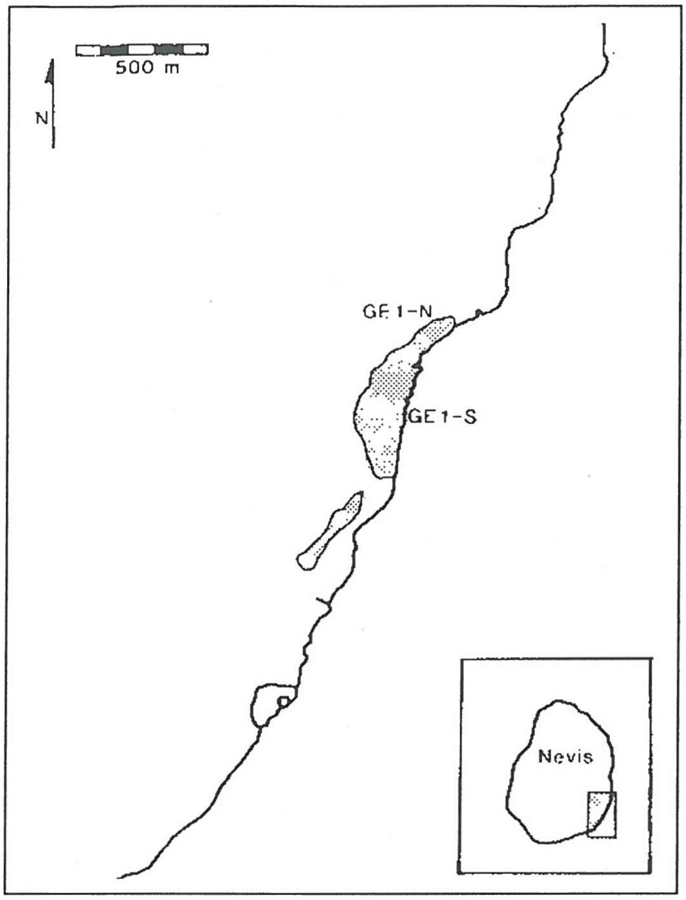

Figure 73: Location of Indian Castle (GE1-S – post Saladoid component of site, GE1-N – Saladoid component, after Wilson 1997:436)

7.2 Pottery Analysis

Introduction

A sample of 1,245 sherds was collected from the site during fieldwork undertaken in May 2000 and was subsequently recorded. All the rims have been assigned an attribute code and rim groups have been formed on the basis of this. The attribute code for each of these rim groups can be found in table 7. A sample of rim sherds have also been thin sectioned, similarly to Coconut Walk, this sample comprised sherds from each of the different rim groups. Table 6 shows the number of different types of sherds included in the sample analysed from Indian Castle.

Plain Body Sherds	900
Decorated Body Sherds	15
Griddles	20
Bases	26
Shoulders	30
Rims	241
Total Profiles	1
Other	12
Total Number of Sherds	1245

Table 6: Number of different types of sherds in the sample from Indian Castle

Body Sherds

Nine hundred and fifteen body sherds were collected from the site and of those only 15 were decorated. Figures 74 and 75 show the sherd thickness for plain and decorated sherds respectively and as can be seen the majority of plain body sherds peak at code 4 whilst the majority of decorated sherds are a thickness code 3. The range of thickness for both plain and decorated sherds also varies quite considerably as can be seen in figure 76. Decorated body sherds range in thickness from code 1 to code 4 whilst plain sherds range from code 1 to code 9. From figure 76 it would appear that there was an association between the thickness of a sherd and whether it was decorated or not, as decorated body sherds tend to be thinner on average than plain body sherds. A Chi squared test was performed to determine whether this apparent association between thickness and decoration was real or not. There was a significant association between the thickness of a sherd and whether it was decorated or not.

$$\text{Chi squared } (7, \underline{N} = 915) = 32.209, \underline{p} = < 0.05$$

This would suggest that the potter was more likely to decorate a thinner walled vessel than a thicker walled vessel.

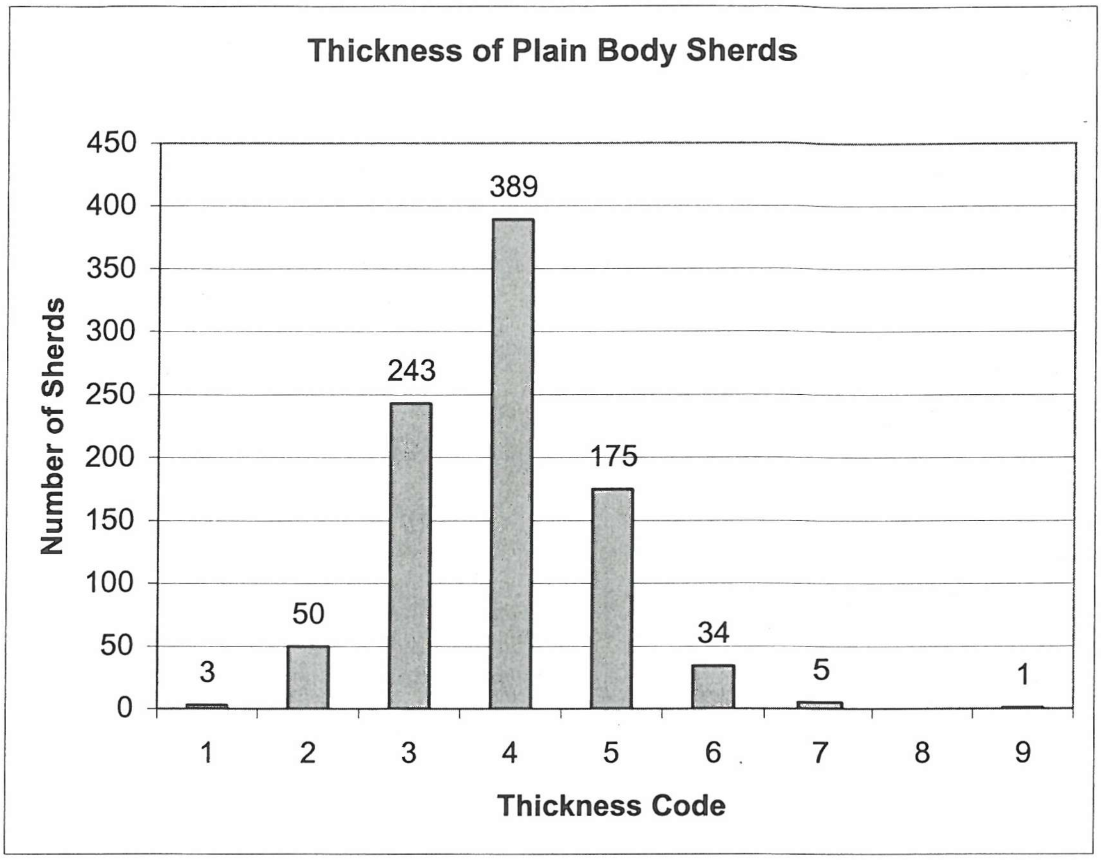

Figure 74: Thickness of plain body sherds at Indian Castle

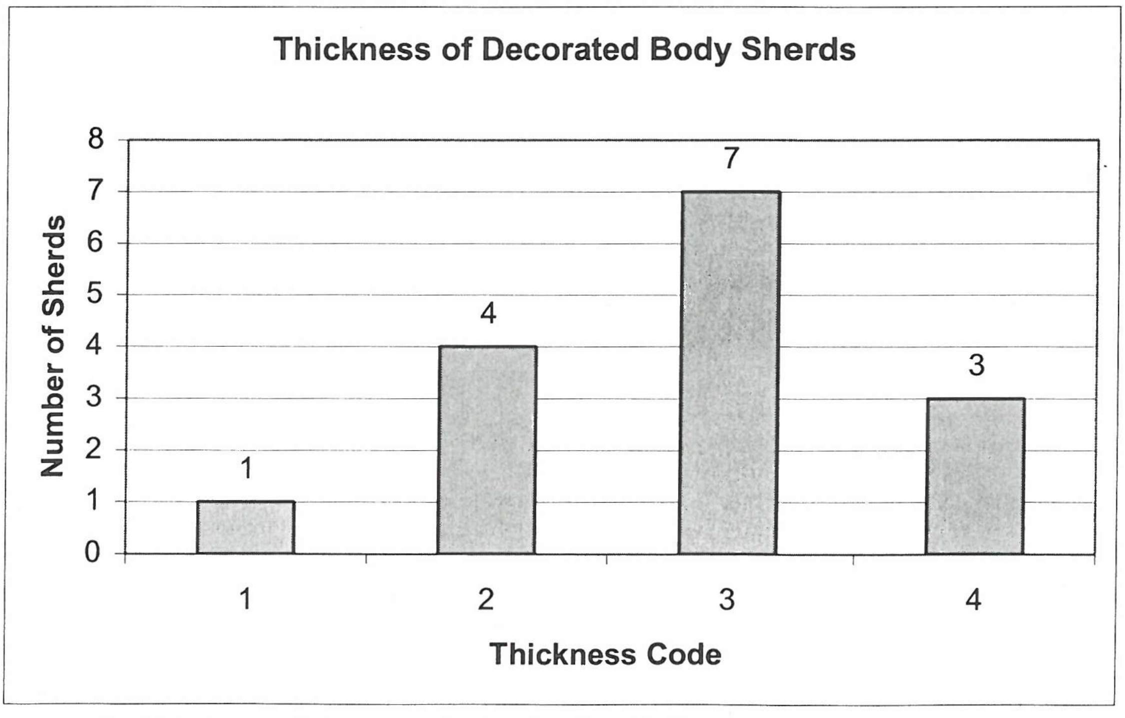

Figure 75: Thickness of decorated body sherds at Indian Castle

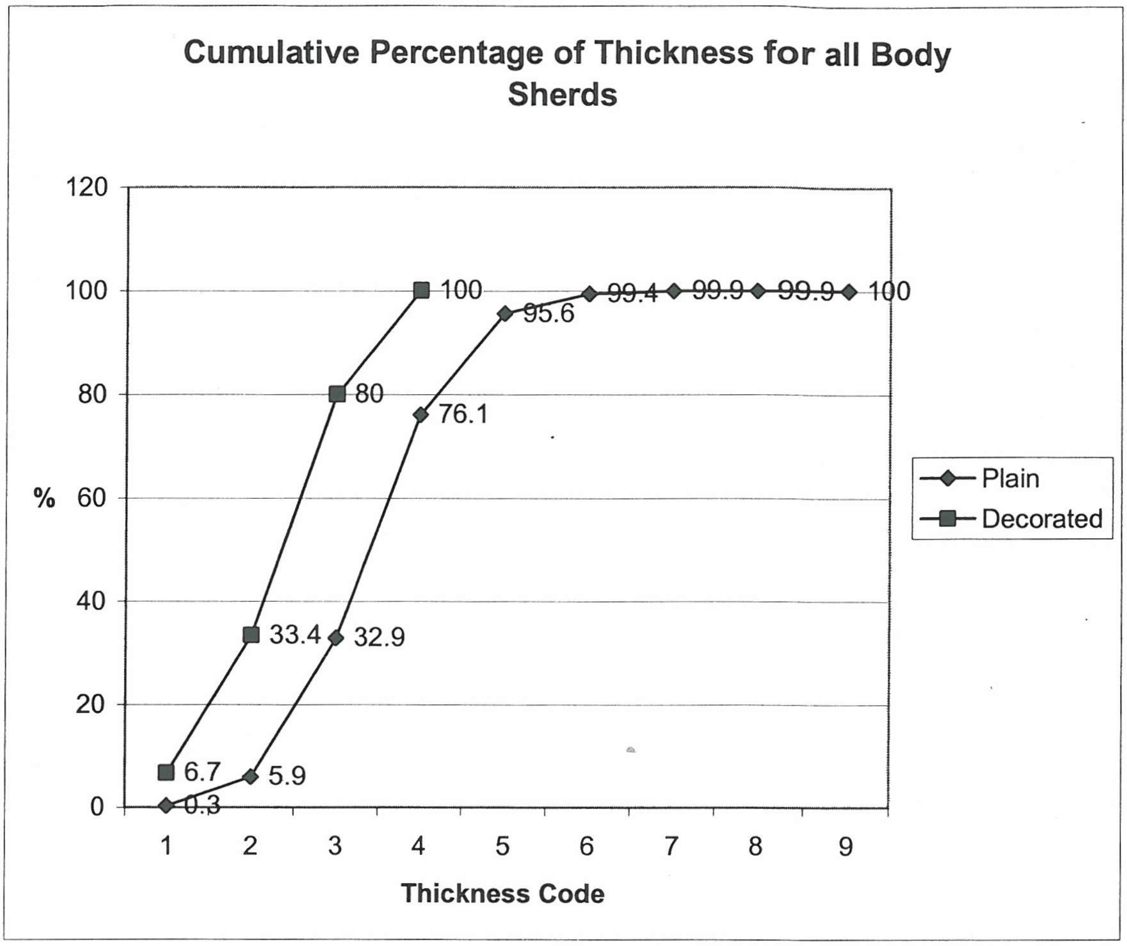

Figure 76: Cumulative percentage of body sherd thickness at Indian Castle

Base Sherds

A total of 26 sherds from different bases were recovered from Indian Castle and one complete base was found. One new base type was identified at Indian Castle, type B4, and no B3 type bases were identified at the site. Of the 26 bases 17 sherds were large enough or even enough to measure. Figure 77 shows the base diameters for each of the types of bases, the majority of bases tend to be quite small falling in the 6-10 cm range. The size of the sample is too small to comment with any degree of confidence on any significance this may have.

The thickness of different base types is illustrated in figures 78 and 79. Base types B1 tend to be thinner than those of type B2 with the peak of thickness for B2 bases being code 5 whilst more B1 types sherds are a thickness code 3 or 4. This could suggest that the B2 base types, which are a rounded base form, may have been favoured slightly more for larger vessels. This is perhaps again reflected in the base diameter data as B2 vessels have a greater range of base diameters.

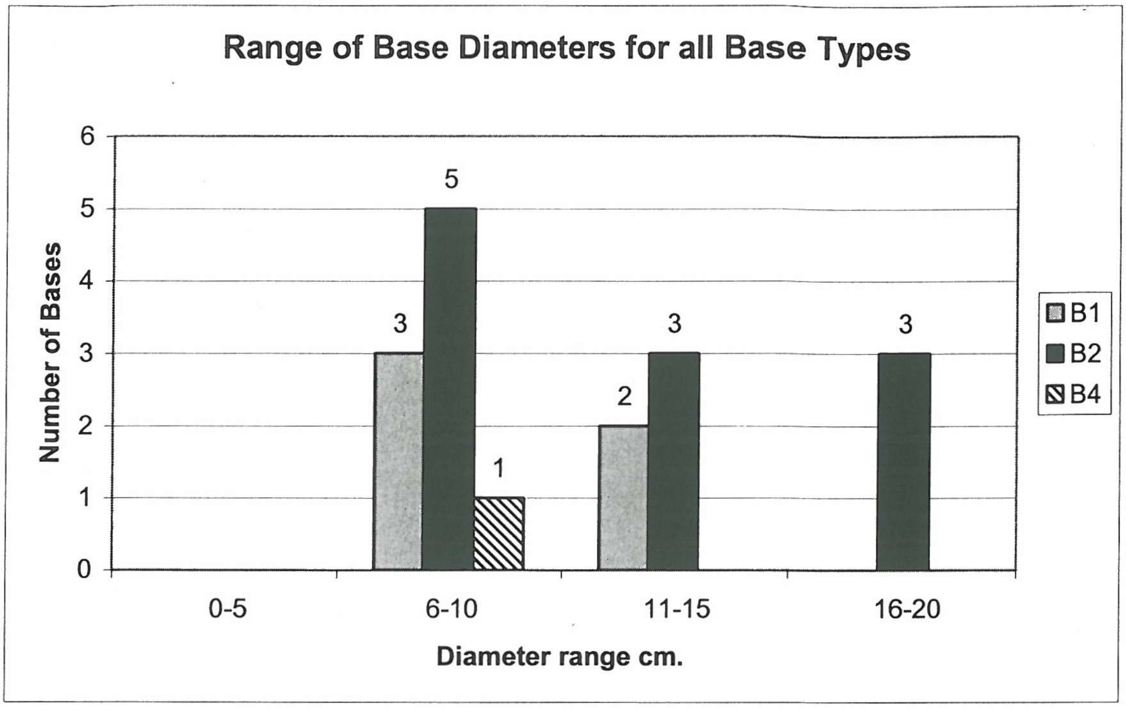

Figure 77: Base diameters of all base types found at Indian Castle

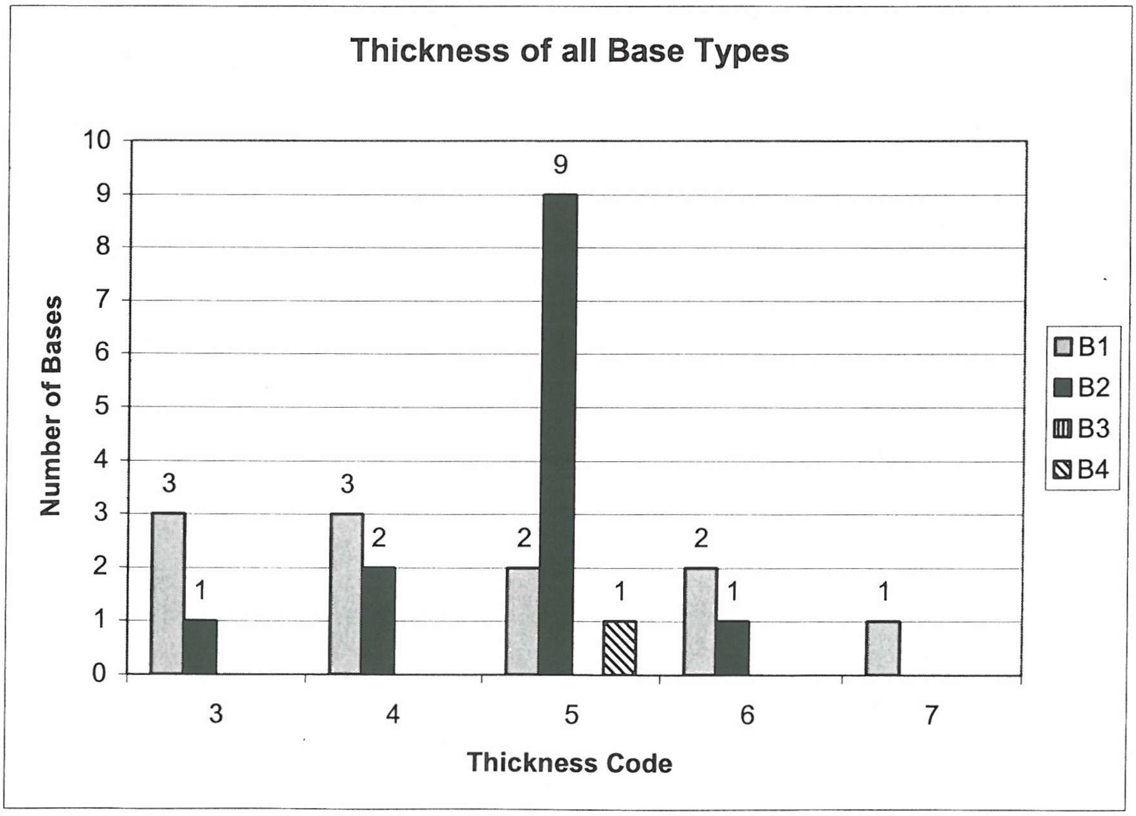

Figure 78: Thickness of bases found at Indian Castle

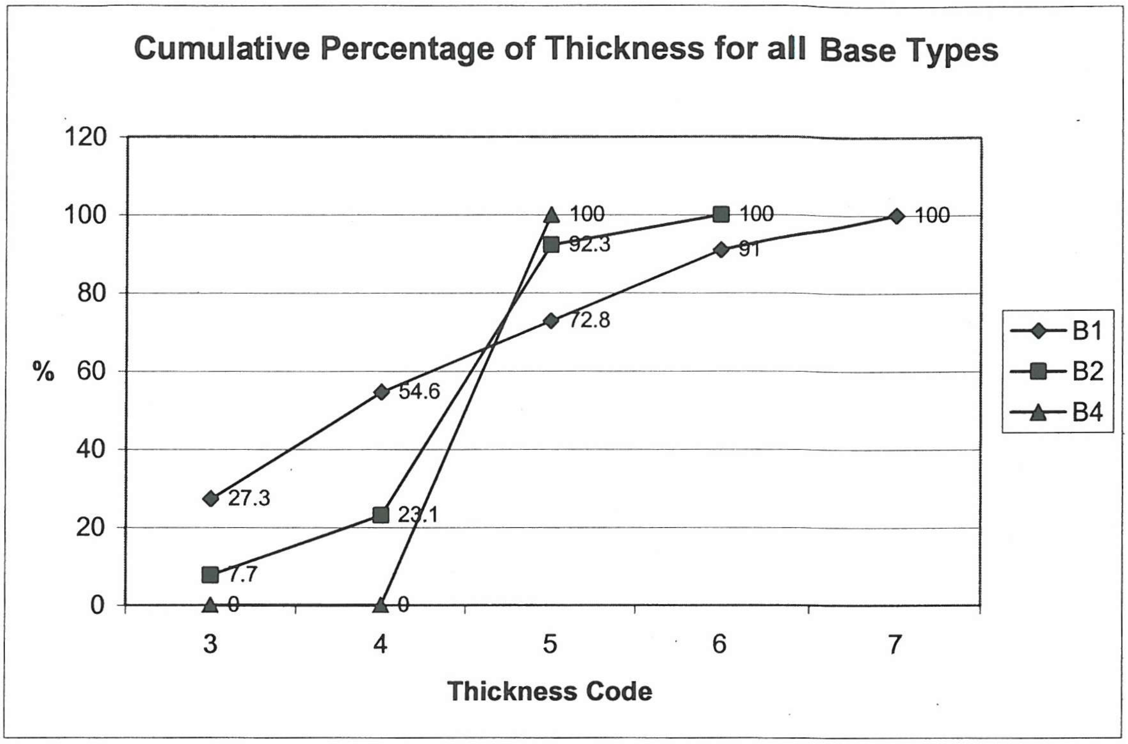

Figure 79: Cumulative percentage of base thickness at Indian Castle

Rims

The number of rims found for each rim group at Indian Castle is illustrated in figure 80 and table 7 outlines the attribute code for each of the rim groups. As with the Coconut Walk material there are a number of groups with only one or two sherds present and as can be seen the dominant rim groups are R1, R3, R4, R14 and R20. These in the main, group R9 excluded, are the same groups looked at from the Coconut Walk assemblage and will therefore form the basis of the ensuing analysis.

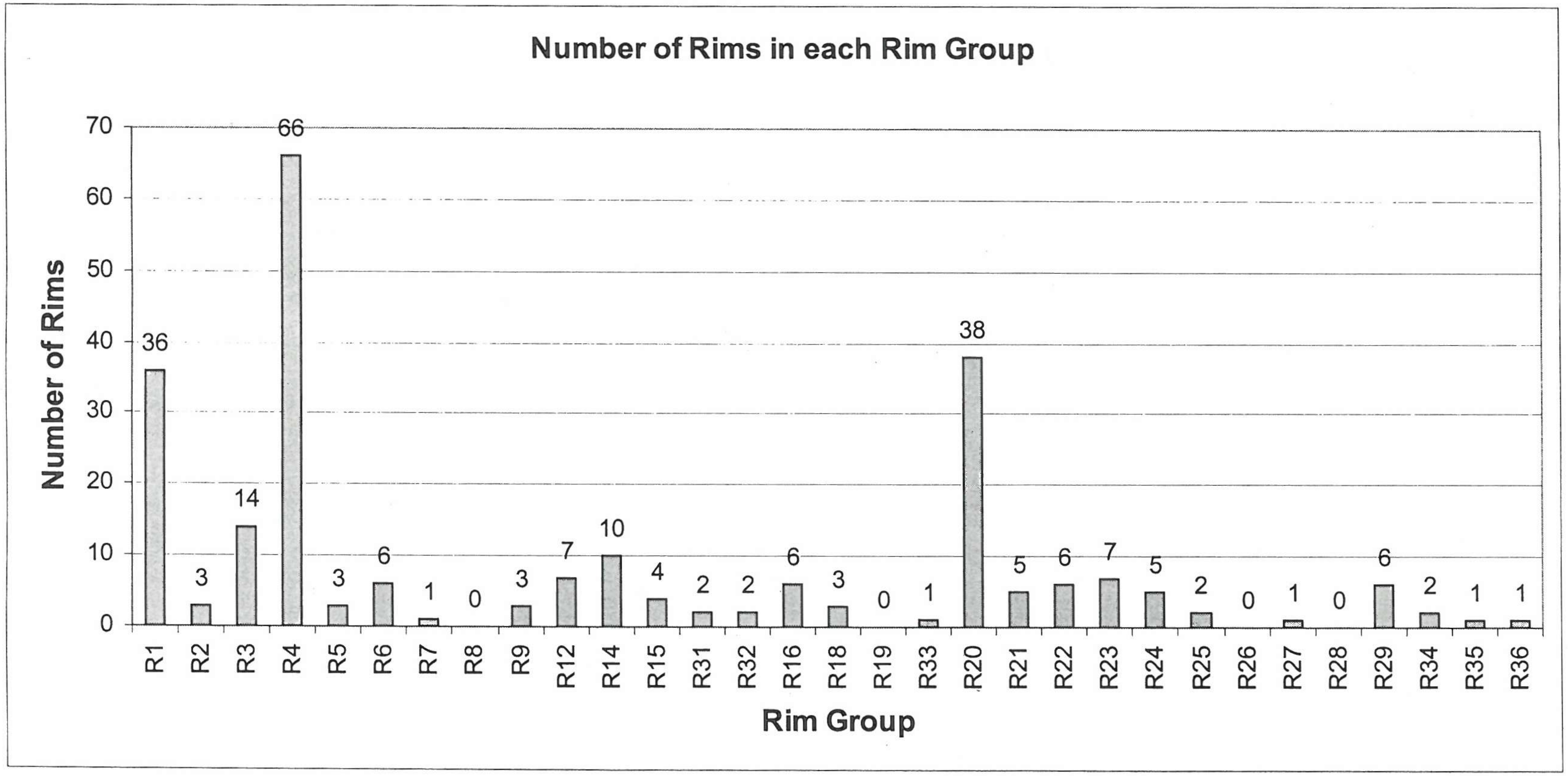

Figure 80: Number of rims in each rim group at Indian Castle

Rim Group	Attribute Code	Number of sherds
R1	1; 12, 15	36
R2	1; 12, 16	3
R3	1; 12, 17	14
R4	1; 12, 18	66
R5	1; 12, 19	3
R6	1; 13, 15	6
R7	1; 13, 17	1
R8	1; 13, 18	0
R9	1; 14, 15	3
R10	1; 14, 16	0
R11	1; 14, 17	0
R12	1; 14, 18	7
R13	1; 14, 19	0
R14	2; 12, 15	10
R15	2; 12, 17	4
R31	2; 12, 18	2
R32	2; 12, 19	2
R16	2; 14, 15	6
R17	2; 14, 16	0
R18	2; 14, 17	3
R19	2; 14, 19	0
R33	3; 12, 14	1
R20	3; 12, 15	38
R21	3; 12, 16	5
R22	3; 12, 17	6
R23	3; 12, 18	7
R24	3; 12, 19	5
R25	3; 13, 15	2
R26	3; 13, 16	0
R27	3; 13, 18	1
R28	3; 13, 19	0
R29	3; 14, 15	6
R34	3; 14, 17	2
R35	4; 12, 15	1
R36	4; 12, 17	1

Table 7: Attribute Code for each of the rim groups at Indian Castle

The thickness of rim sherds from the five major rim groups can be found in figures 81-85. The median thickness of R1 rims is a code 4 and thickness ranges from a code 2 to code 5. The thicknesses of R3 sherds are all very similar either being a code 3 or code 4. Rim sherds from this group tend to be slightly thinner with a median thickness of code 3 for the group. The majority of R4 rims are a thickness code 3 or 4. The median thickness of R14 rims is a code 4 and these rims range in thickness from a code 1 to a code 5.

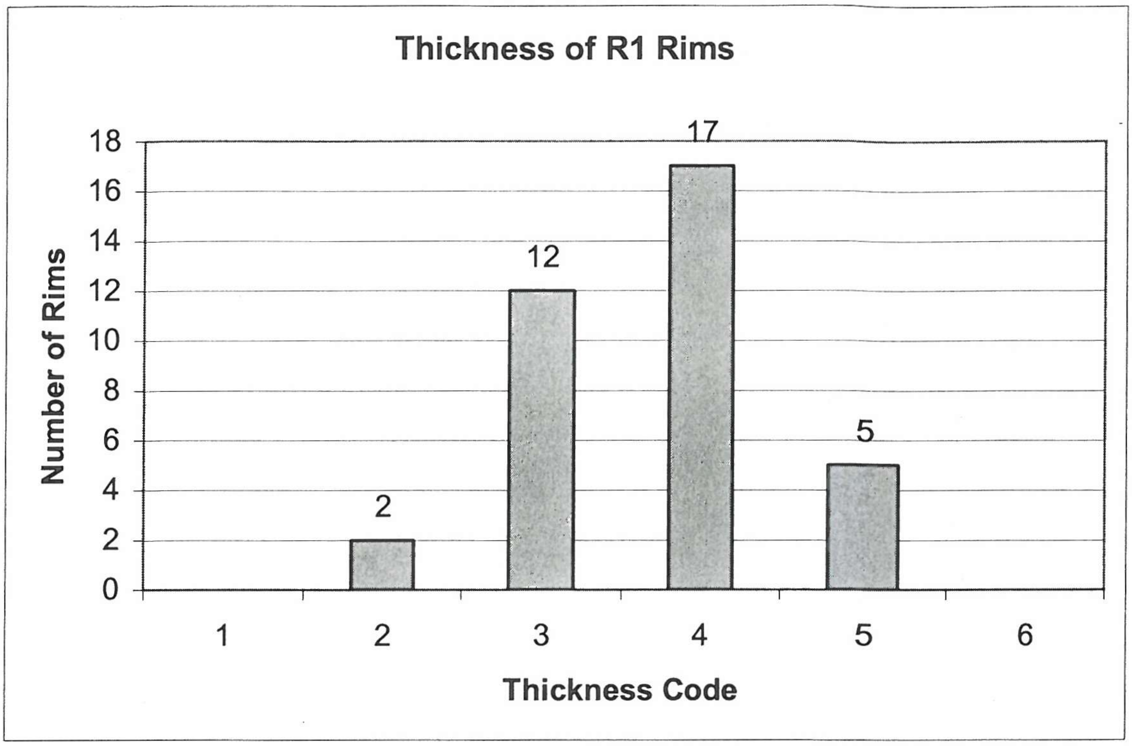

Figure 81: Thickness of R1 Rims at Indian Castle

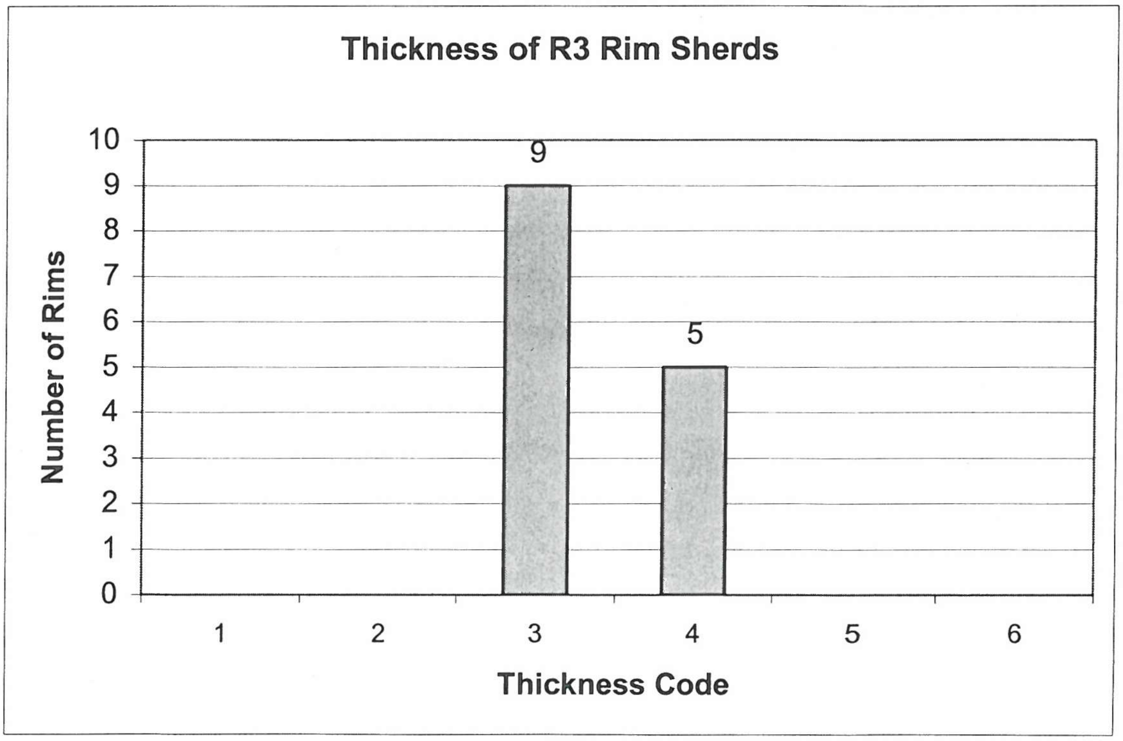

Figure 82: Thickness of R3 Rims at Indian Castle

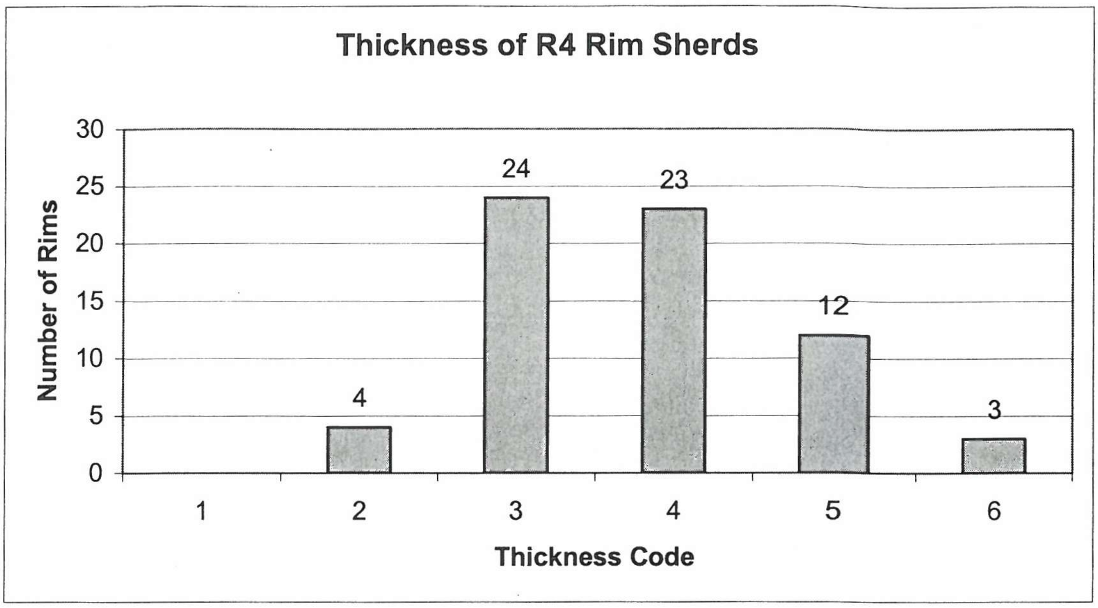

Figure 83: Thickness of R4 Rims at Indian Castle

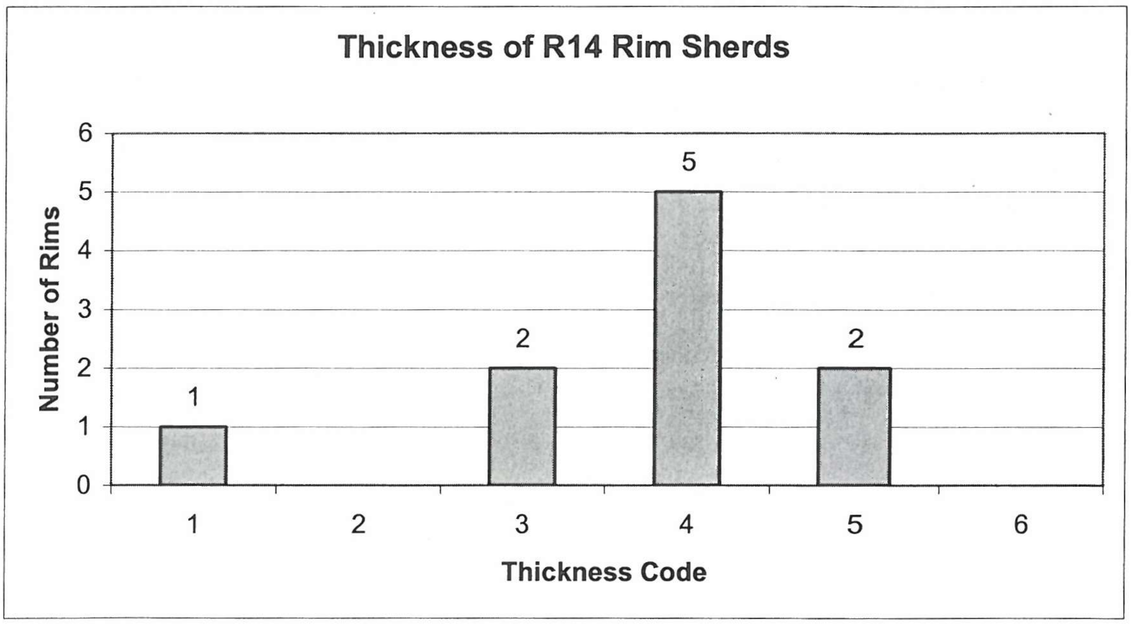

Figure 84: Thickness of R14 Rims at Indian Castle

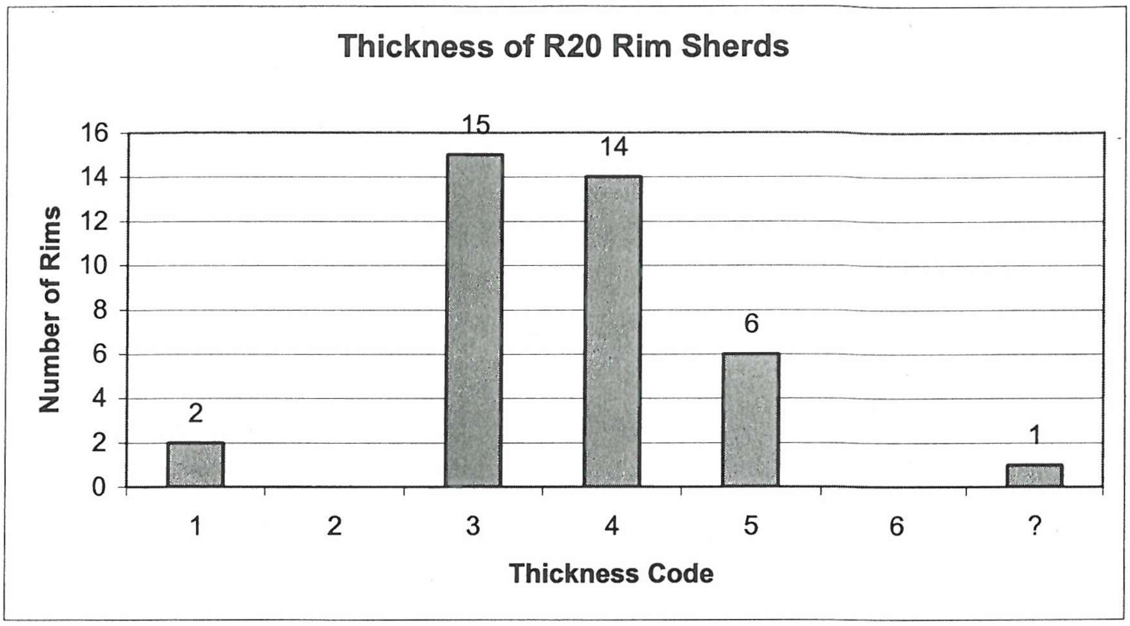

Figure 85: Thickness of R20 Rims at Indian Castle

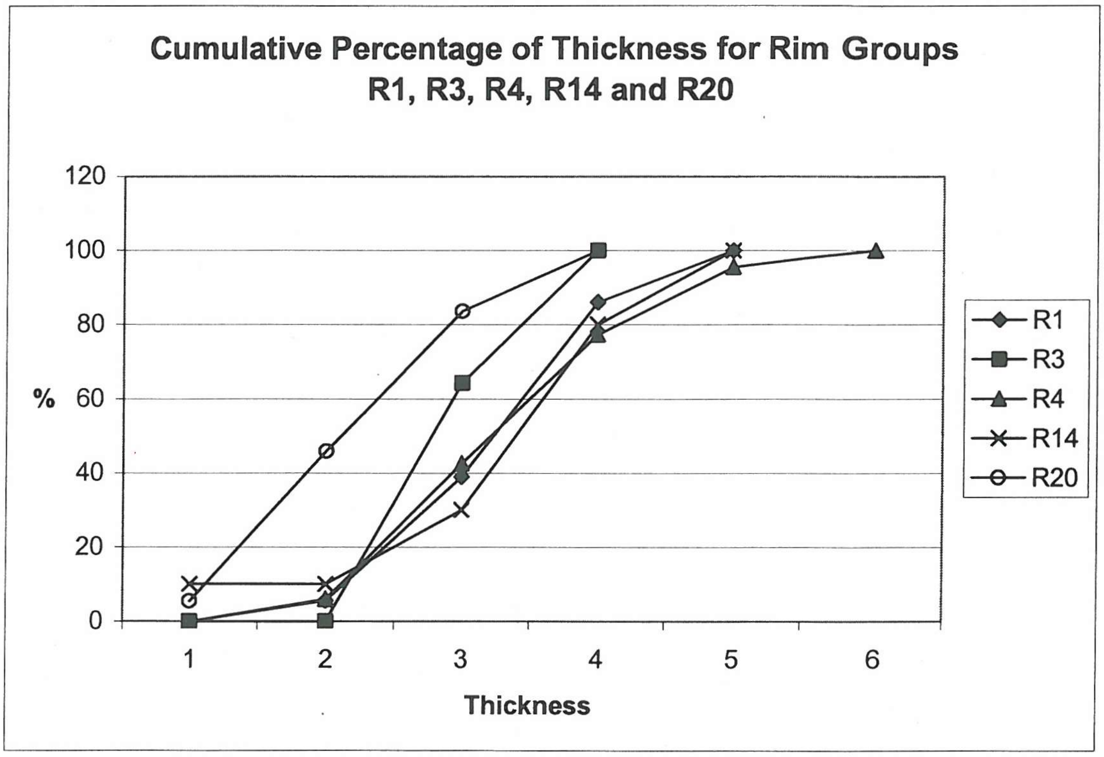

Figure 86: Cumulative percentage of thickness for the five major rim groups at Indian Castle

The majority of R20 rims fall into thickness code 3 or 4 and again range from code 1 to code 5. In summary the majority of R1 and R14 rims are a thickness code 4, whilst the majority of R3 rims are thinner with a thickness of code 3. R4 and R20 rims are similar in that they majority of sherds are a code 3 but almost exactly the same number of sherds is a code 4. These results are further highlighted by the comparison of the cumulative percentage of thickness for each rim group in figure 86.

A Chi squared test was performed to see if there was any significant association between rim thickness and rim form. The results showed that there was no significant association however a large number of cells in the contingency table did contain less than the required count, which might have effected the significance of association.

Chi squared (20, N = 163) = 24.002, p = >0.05 ns

The analysis of rim diameters (see figures 87-91) was executed in the same manner as the Coconut Walk material was so the diameters were grouped in divisions of 5 cm. Rim group R1 ranged in diameter from 14 cm to 40 cm and the mean diameter was 26.24 cm. The range of rim diameters for group R3 was 12 cm to 34 cm with a mean of 20.67 cm. The mean rim diameter for R4 rims was 23.80cm and the group ranged in diameter from 12 to 42 cm. R14 rims had a mean rim diameter of 19.25 cm, which is the smallest for all the rim groups, and a range of 12 to 32 cm. Lastly R20 rims ranged in diameter from 8 to 38 cm with a mean of 21.78 cm.

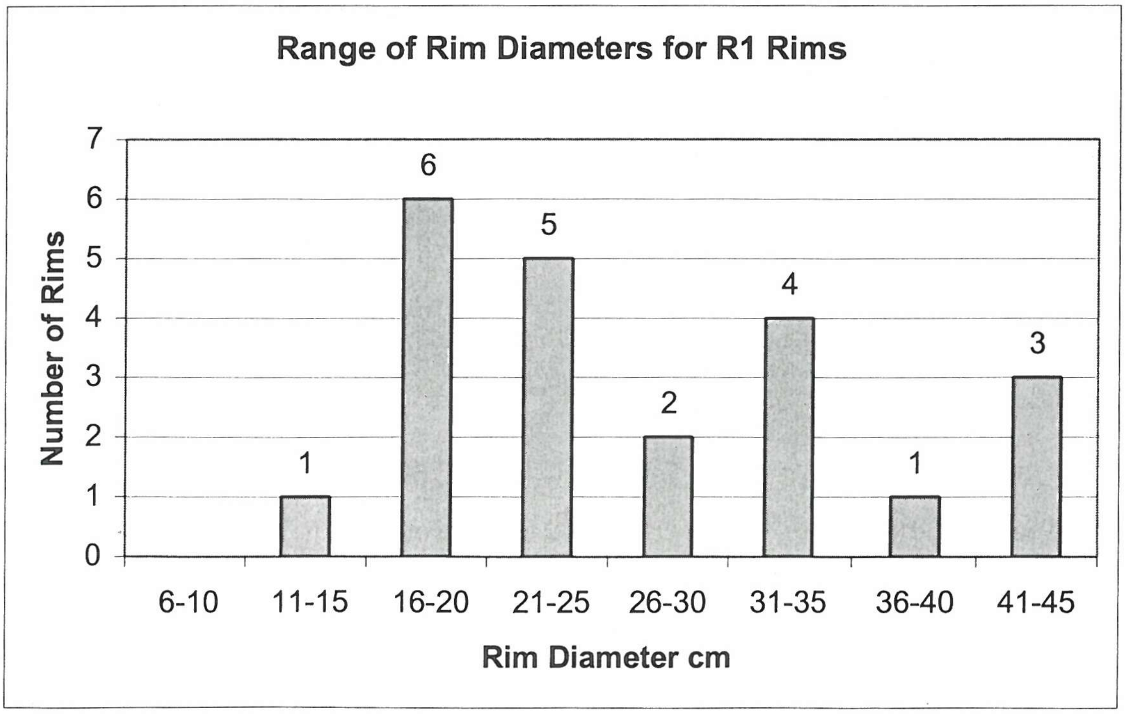

Figure 87: Rim diameters of R1 rims at Indian Castle

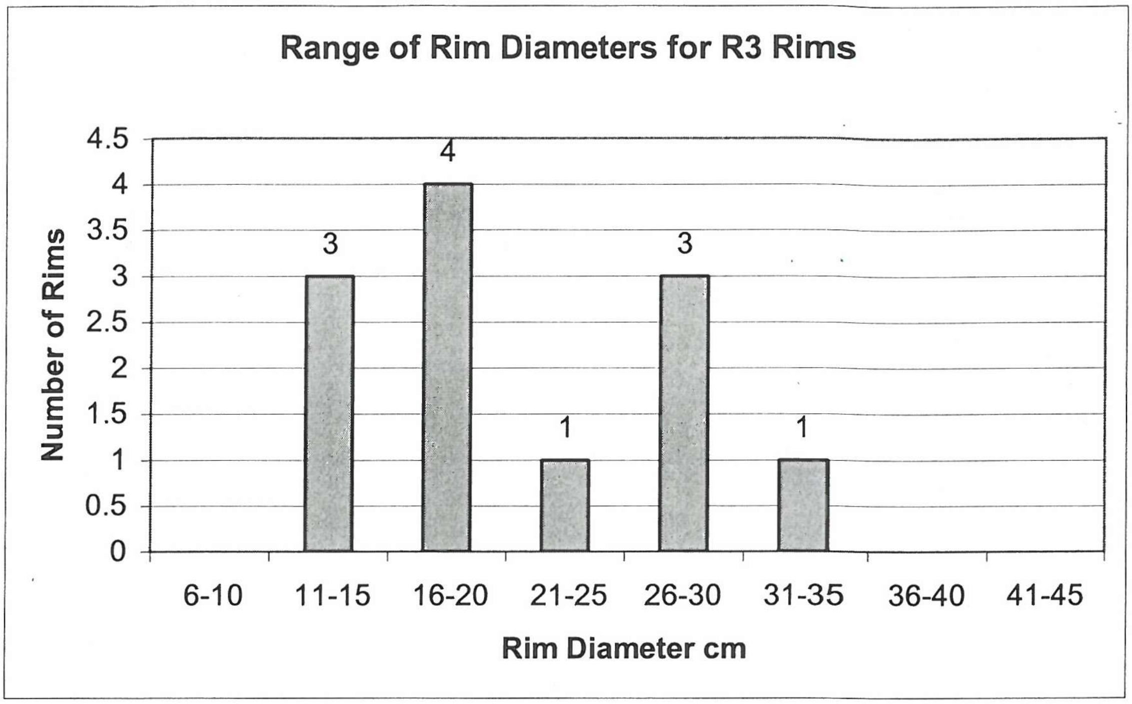

Figure 88: Rim diameters of R3 rims at Indian Castle

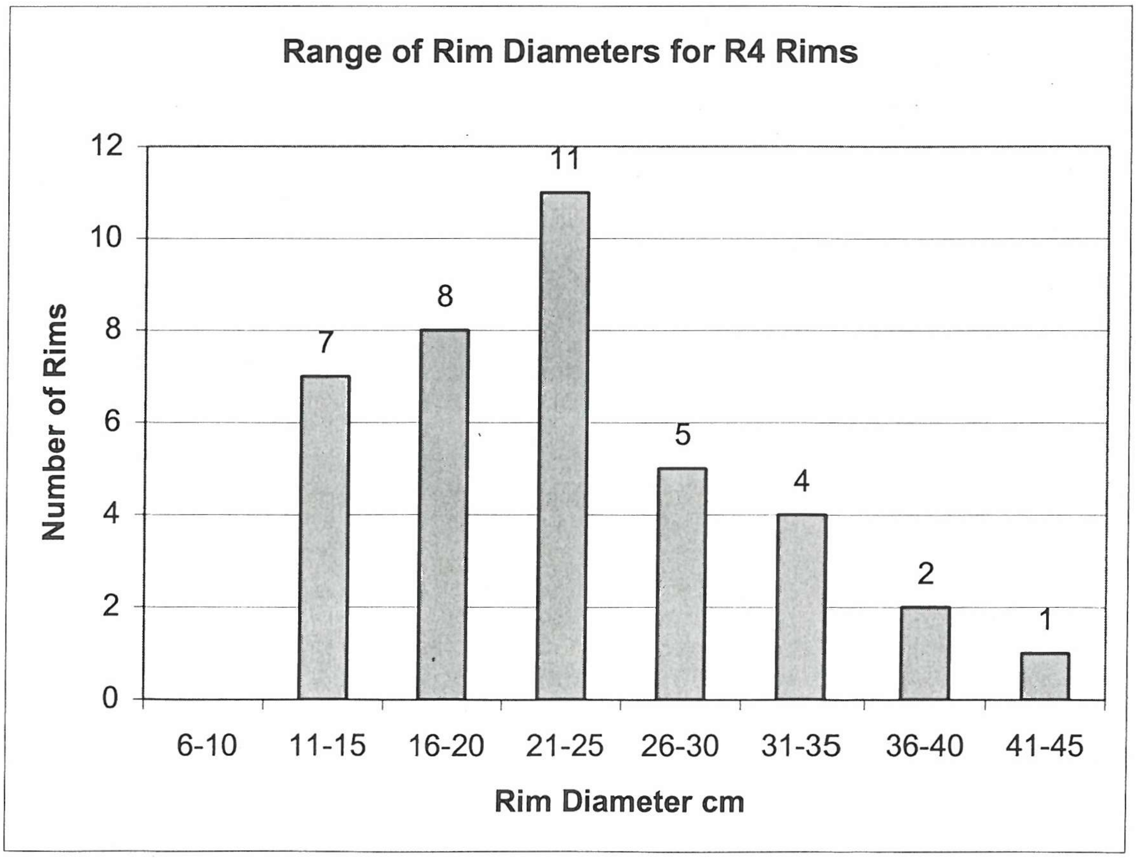

Figure 89: Rim diameters of R4 rims at Indian Castle

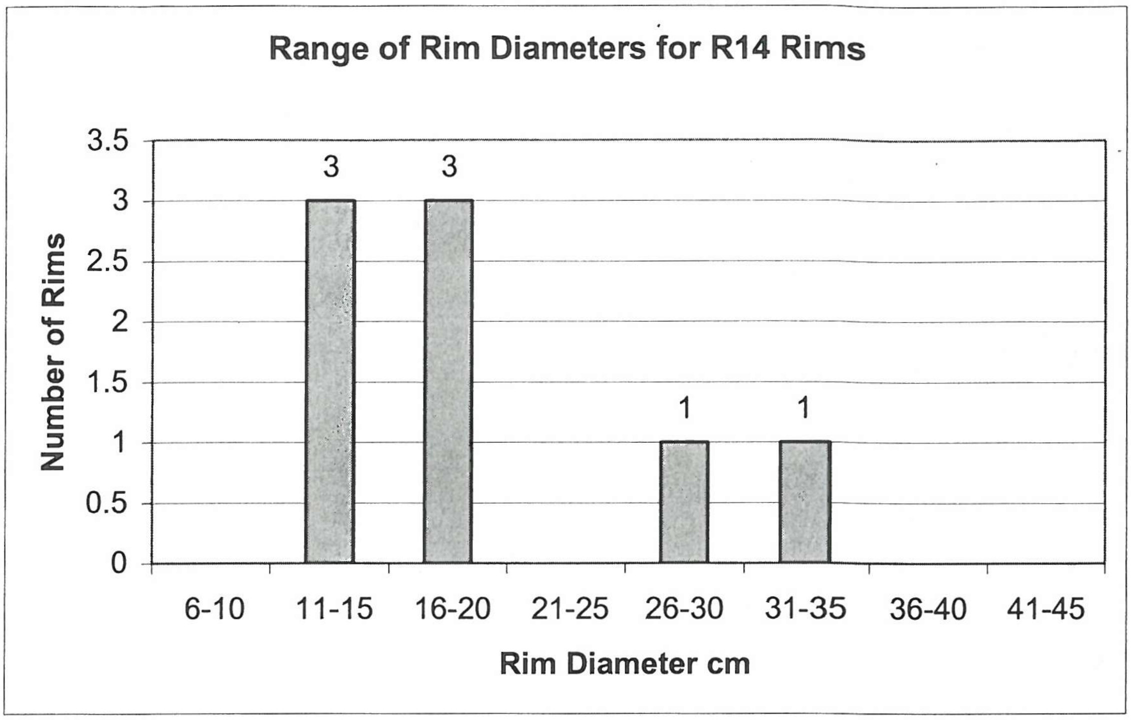

Figure 90: Rim diameters of R14 rims at Indian Castle

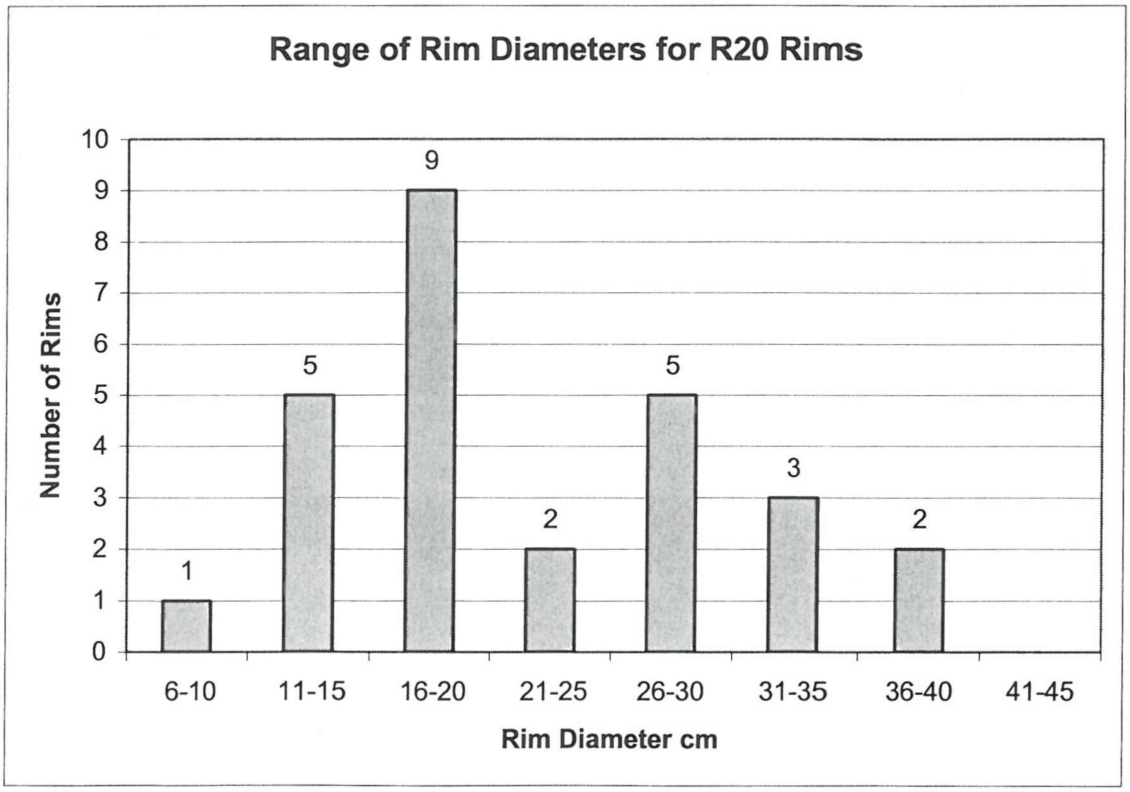

Figure 91: Rim diameters of R20 rims at Indian Castle

The Chi squared test was used to determine whether or not there was a significant association between rim diameter and form, for example were vessels from one rim group smaller or larger than those from another rim group. The results showed that there was in fact no significant association between form and diameter.

Chi squared (28, $N = 112$) = 22.863, $p = >0.05$ ns

The association between thickness and rim diameter for the five major rim groups was tested using Chi squared. There was no significant association between the thickness and rim diameter for rim groups R1, R3, R4 and R14.

R1 Chi squared (15, $N = 25$) = 17.535, $p = >0.05$ ns
R3 Chi squared (4, $N = 12$) = 6.171, $p = >0.05$ ns
R4 Chi squared (24, $N = 40$) = 34.514, $p = >0.05$ ns
R14 Chi squared (9, $N = 8$) = 7.111, $p = >0.05$ ns

There was a significant association between thickness and diameter for R20 rims.

R20 Chi squared (18, $N = 27$) = 31.108, $p = <0.05$

As outlined in the previous chapter in order to increase the statistical power of the analysis it was necessary to refine the groups of diameter ranges and thickness. This was done by performing a percentile split for the rim diameter data and a median split for the thickness data on a combination of the Coconut Walk and Indian Castle rims. The exact methodology employed was outlined in the previous chapter. The final groups created for a vessels rim diameter were 'small', vessels with a rim diameter of 18 cm and less, 'medium', vessels with a rim diameter of 19 to 26 cm and 'large', vessels with a rim diameter greater than 27 cm. Two classes of thickness were formed, 'thin' vessels with a thickness code 3 or less, and 'thick' vessels with a thickness of code 4 or greater.

There was found to be no significant association between thickness and rim diameter for any of the rim groups after refinement of the data.

R1 Chi squared (2, $N = 25$) = 2.477, $p = >0.05$ ns

R3 Chi squared (2, N = 12) = 0.147, p = >0.05 ns

R4 Chi squared (2, N = 40) = 0.855, p = >0.05 ns

R14 Chi squared (2, N = 8) = 2.880, p = >0.05 ns

R20 Chi squared (2, N = 27) = 3.444, p = >0.05 ns

This would imply that there is no significant association between the size of a vessels rim diameter and the thickness of that vessel for any of the five major rim groups at the Indian Castle site. Therefore potters were not necessarily making vessels of a certain rim diameter a certain thickness as well, for example vessels with a large rim diameter are no more likely to have thicker or thinner walls than a vessel with a smaller rim diameter.

Griddle Sherds

Twenty griddle sherds were recorded from the site and of these 17 had rims large enough to measure the griddles diameter. A couple of different griddle forms were identified in the material, however only one or two examples of each new type of griddle was represented so it is difficult to asses whether they hold any significance at this stage. These two new griddle forms can be seen in figure 92.

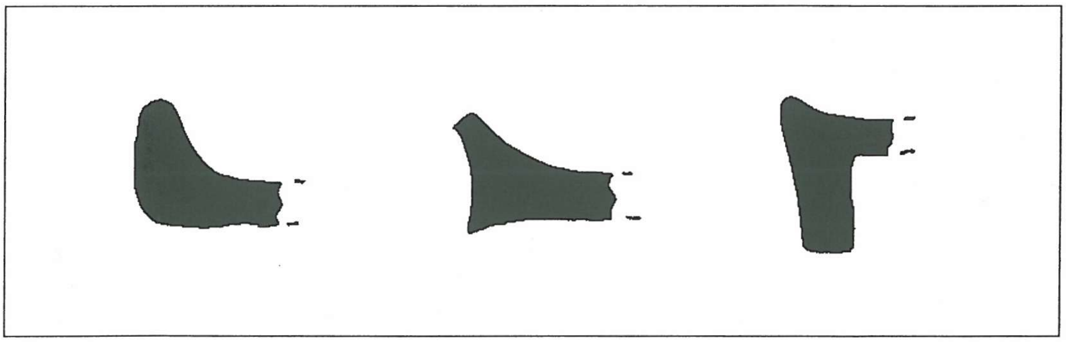

Figure 92: New griddle forms found at Indian Castle, left to right G1a, G3a and G5a

The range of griddle diameters is shown in figure 30. As can be seen the griddles tend to be fairly large in diameter the smallest being 16-20 cm and the largest 36-40 cm. The number of griddles that could be measured was not very large for any type of griddle so patterns are hard to determine with any degree of confidence.

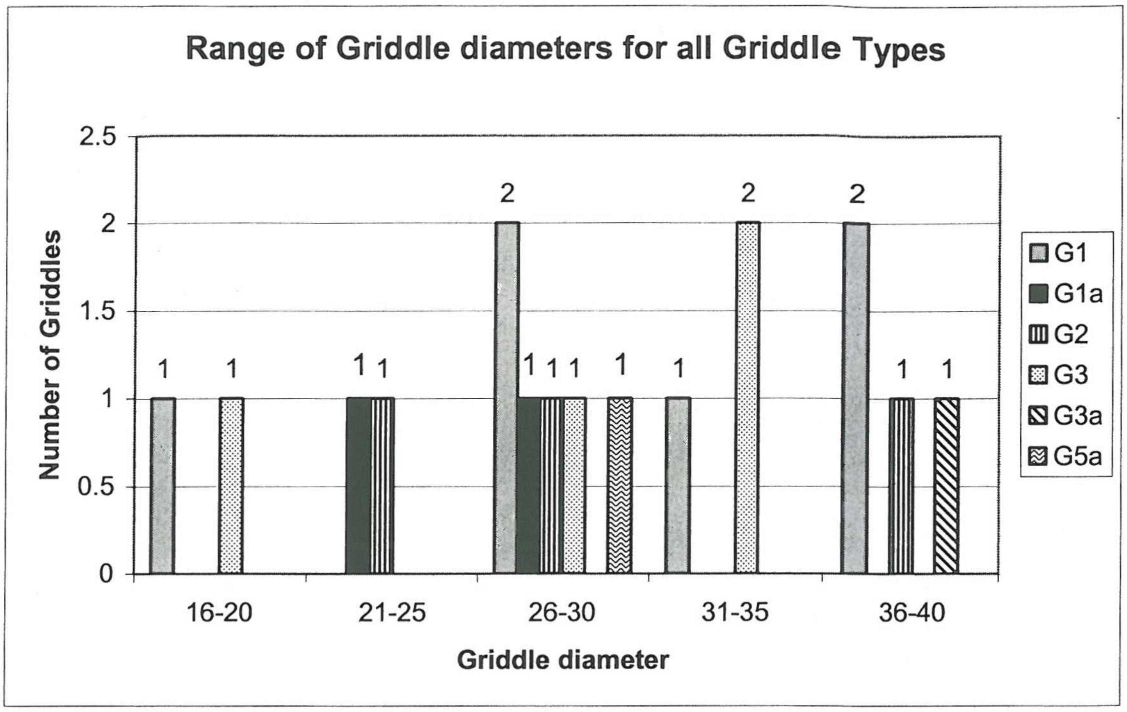

Figure 93: Range of diameters of all griddle types found at Indian Castle

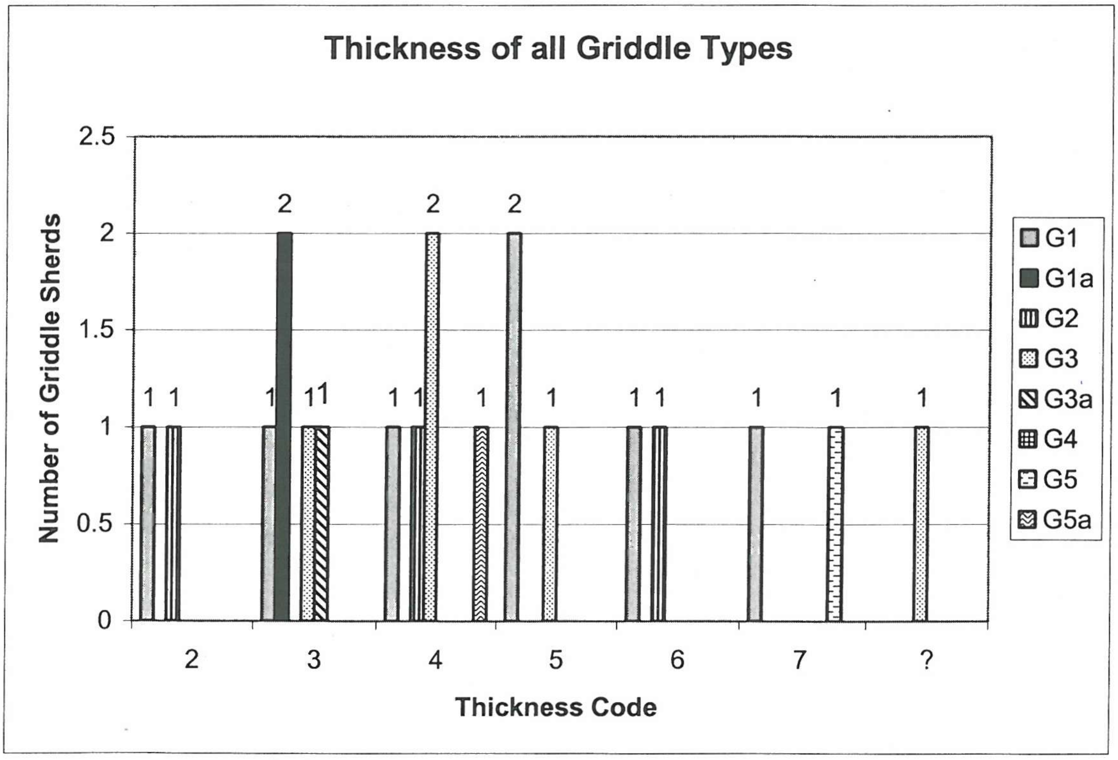

Figure 94: Thickness of griddle cooking surfaces at Indian Castle

The paucity of data is further highlighted in figure 94, which illustrates the thickness of the cooking surface of griddles; no meaningful patterns can be distinguish as the size of the sample is too small. One thing that can be noted however is that the thickness of cooking surfaces does vary quite considerably ranging from a code 2 to code 7.

A tentative explanation of the variation in griddle diameter and thickness of cooking surface for each of the griddle types could be that griddles were produced on a need only basis. This would mean that a potter made griddles when they were broken and needed replacing as opposed to producing them every time pot making was undertaken. If griddles were rarely broken and the demand for them was low infrequent production might lead to the lack of standardisation visible in the data and would perhaps also explain the paucity of griddle sherds in the record.

7.3 Conclusions

At the site of Indian Castle a few new forms of griddle, base and rim sherds were identified. Whether these sherds actually represent new forms or just variations of pre-existing forms waits to be proven.

The analysis of the rim data has yielded interesting results. It would seem that there is no association between the type of rim form found on a vessel and the thickness of that vessel of the diameter of its rim. Therefore within each groups there are a wide range of vessel sizes. This would suggest, as with the Coconut Walk material, that rim types were either not vessel specific or that the production of vessels was infrequent resulting in a lack of standardisation in terms of vessel size.

This chapter and the previous one have outlined the results of analysis undertaken at the sites of Indian Castle and Coconut Walk respectively. The following chapter is concerned with offering a comparison of the data from the two sites as well as outlining the petrological analysis undertaken at Indian Castle.

Chapter 8: Comparison of pottery from sites on Nevis

8.1 Introduction

The main purpose of this chapter is to draw out some of the similarities and differences between the assemblages from Coconut Walk and Indian Castle. Such a comparison will serve to begin to answer the question of to what extent these assemblages on the island of Nevis are similar or different to one another. A number of smaller pottery assemblages from other post-Saladoid sites on the island were also recorded during the course of this research and these are also discussed in this chapter.

The other two questions this research aims to address are:

- Is the pottery found at Coconut Walk and Indian Castle on the island of Nevis manufactured from locally available resources?
- If it is not all local then where did the pottery originate from and was the movement of pottery vessel specific?

In order to begin to answer these questions it was necessary to analyse the fabrics of the vessels found at both Coconut Walk and Indian Castle with the more specific aim of identifying inclusions found within the clay matrix. Once the range of inclusions found within the fabric of a pot is identified then it may be possible to locate the potential source of the clay used by comparing this information with what is known about the geology of the island. The fabric and petrological analysis carried out on the Coconut Walk and Indian Castle assemblages is included in this chapter. The results obtained from the separate analysis of the two assemblages were so similar that it was decided to include them in this comparison chapter rather than in the previous two chapters to avoid needless repetition.

8.2 Comparison of Assemblages from Coconut Walk and Indian Castle

The pottery assemblages from Coconut Walk and Indian Castle share many similarities and a few notable differences. Table 8 shows how the samples of pottery from Coconut Walk and Indian Castle compare in terms of size and composition.

	Coconut Walk	Indian Castle
Plain Body Sherds	1378	900
Decorated Body Sherds	41	15
Griddles	27	20
Bases	58	26
Shoulders	34	30
Rims	467	241
Total Profiles	7	1
Other	26	12
Total Number of Sherds	2038	1245

Table 8: Numbers and types of sherds represented in the Coconut Walk and Indian Castle assemblages

Body Sherds

A larger number of body sherds were recovered from Coconut Walk than Indian Castle and over double the number of decorated sherds were found in the sample of pottery from Coconut Walk. During the analysis of body sherd thickness at the two sites it was discovered that at Coconut Walk there was no significant association between the thicknesses of a sherd and whether it had been decorated or not whilst at Indian Castle there was a significant association. A Chi squared test was performed to determine firstly whether there was any association between the thickness of body sherds, irrespective of whether they had been decorated or not, and the site from which they originated. There was a significant association between the thickness of body sherds and site.

Chi squared (8, $\underline{N} = 2334$) = 85.359, $\underline{p} = <0.05$

This would suggest that the body sherds at one site were thinner or thicker than the body sherds at the other site. A closer examination of the data leads to the tentative suggestion that the body sherds at Indian Castle were slightly thinner than the body sherds at Coconut Walk.

Chi squared tests were also carried out to determine the association between the thickness of plain body sherds and site and the association between the thickness of decorated body sherds and site. There was a significant association between the thickness of plain body sherds and the site from which they came. This would mean that plain body sherds found at one site were thinner or thicker than those from the other site.

Chi squared (8, N = 2278) = 77.581, p = <0.05

Further examination of the data would suggest that plain body sherds from the site of Coconut Walk were generally thicker than those found at Indian Castle. Figure 95 shows a comparison of the cumulative percentage for plain body sherd thickness at Coconut Walk and Indian Castle and as can be seen more body sherds tend to be thinner at Indian Castle than Coconut Walk.

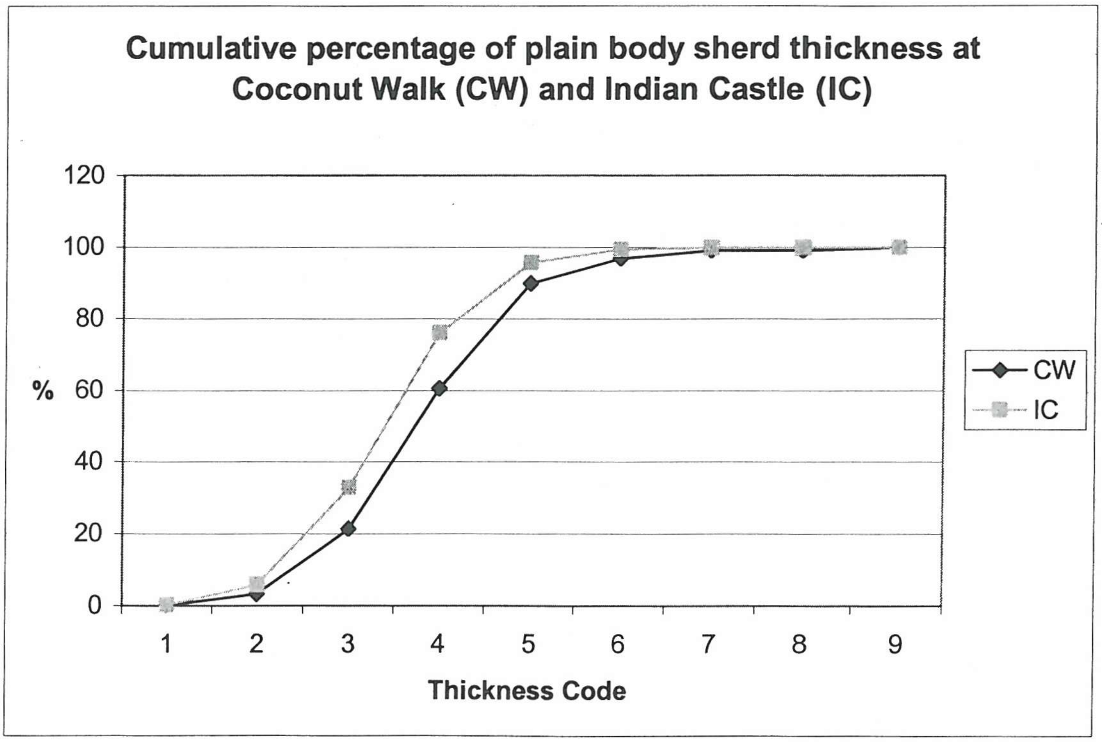

Figure 95: Comparison of plain body sherd thickness

There was also a significant association between the thickness of decorated body sherds and site.

Chi squared (6, $\underline{N}$ = 56) = 25.343, $\underline{p}$ = <0.05

It would seem that, as with the plain body sherds, the decorated body sherds were generally thicker at Coconut Walk than at Indian Castle. This is highlighted in figure 96, which shows the cumulative percentage for decorated body sherd thickness at both the sites. As can be seen a higher percentage of sherds are thinner at Indian Castle than at Coconut Walk and the differences is more marked than can be seen between the thickness of plain body sherds from each site.

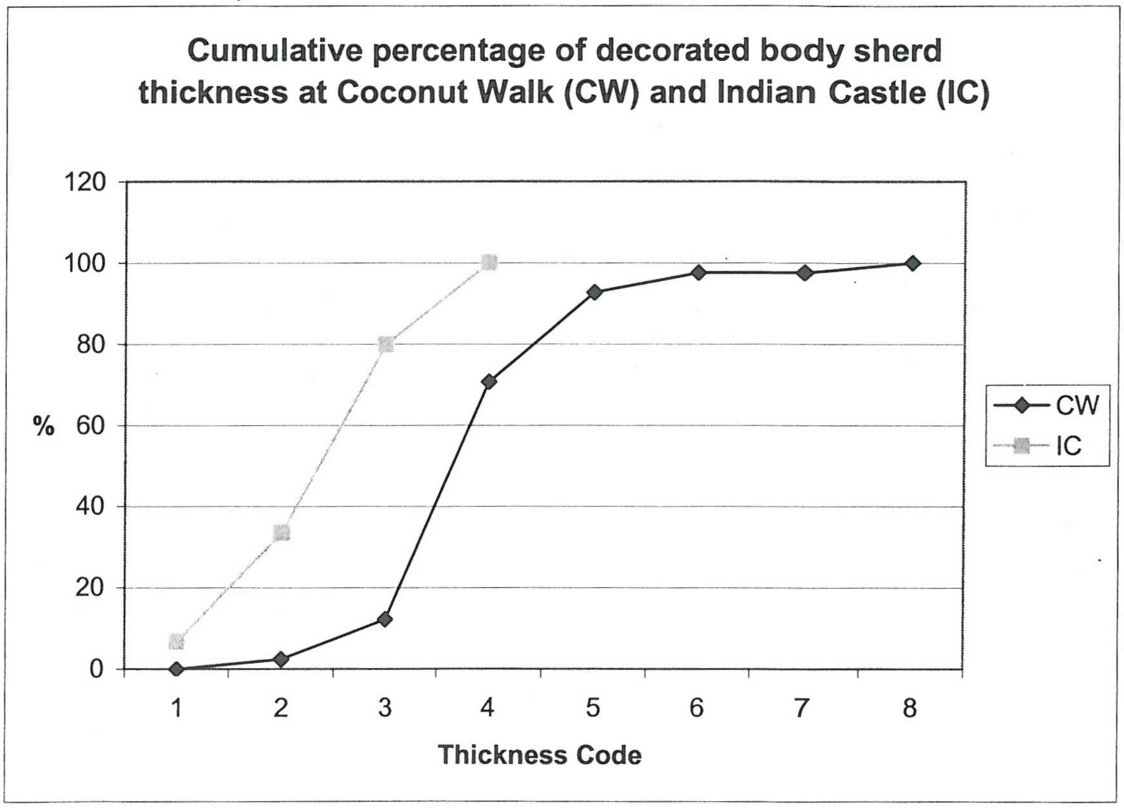

Figure 96: Comparison of decorated body sherd thickness

This comparative analysis suggests quite clearly that on the whole body sherds recovered from Coconut Walk tended to be thicker than those recovered from Indian Castle and this was irrespective of whether a sherd had been decorated or not. One important point to note, which is perhaps highlighted from the cumulative percentage comparisons in figures 95 and 96, is that the Chi squared test indicates whether or not there is an association between two variables such as thickness and site, it does not indicate the strength of that association. So in the case of the decorated body sherds there appears to be a stronger association between thickness and site than perhaps there was between thickness and site for plain body sherds.

Rims

Figure 97 shows a comparison of the rim groups from Indian Castle and Coconut Walk. As can be seen the dominant groups of rim type are the same in the majority of cases for both sites. It is also evident that there are a number of forms that at this stage appear unique to either Coconut Walk or Indian Castle, however it must be stressed that these groups only tend to include one or two sherds and therefore may not represent 'real' differences but just slight variations. A number of rim groups have been focused upon so far from both sites. The major rim groups are predominantly the same except that at Indian Castle rim group R9 was under represented compared to Coconut Walk so the ensuing comparisons are based on five groups R1, R3, R4, R14 and R20.

A comparison between the mean rim diameters and the range of rim diameters for each of the five major rim groups represented at the two sites can be found in table 9. As was discussed in the separate analysis of each site in the previous two chapters, there is little difference between the mean rim diameter and the ranges of rim diameters for each of the rim groups at Coconut Walk and Indian Castle. Differences between the mean diameter of rims from the same rim group at Coconut Walk and Indian Castle are also fairly negligible, except for group R1 where the difference in mean diameter is approximately 5 cm.

Chi squared tests were performed to determine whether there was any significant association between rim diameter and site for each of the rim groups. If a significant association between rim diameter and site for any of the rim groups was found then that would suggest that rims from one group would be larger or small in diameter at one site than rims from the same group at the other site. So for example from table 9 it could be postulated that there would be a significant association between rim diameter and site for R1 rims with R1 rims from Coconut Walk being slightly smaller in diameter than R1 rims from Indian Castle. There was however no significant association between rim diameter and site for any of the rim groups.

R1 Chi squared (7, N = 52) = 10.477, p = >0.05 ns

R3 Chi squared (4, N = 19) = 1.103, p = >0.05 ns

R4 Chi squared (7, N = 71) = 8.422, p = >0.05 ns

R14 Chi squared (4, N = 20) = 5.417, p = >0.05 ns

R20 Chi squared (6, N = 37) = 4.701, p = >0.05 ns

	Mean Diameter (cm)		Range (cm)	
	CW	IC	CW	IC
R1	21.19	26.24	8-48	14-40
R3	21.14	20.67	12-30	12-34
R4	22.74	23.80	8-37	12-42
R14	22.67	19.25	12-34	12-32
R20	23	21.78	10-40	8-38

Table 9: Comparison of mean rim diameter and the range of rim diameters for each of the five major rim groups at Coconut Walk (CW) and Indian Castle (IC).

In order to strengthen the statistical power of this analysis it was necessary to refine the number of rim diameter groups from ten to three. The method used to achieve this was outlined in chapter 6, and three new groups were formed, 'small' those rims with a diameter of 18 cm and less, 'medium' rims with a diameter of 19-26 cm and 'large' rims of diameter 27 and greater. No significant association between rim diameter and site for each of the rim groups was found as would be expected.

R1 Chi squared (2, N = 52) = 2.301, p = >0.05 ns

R3 Chi squared (2, N = 19) = 0.38, p = >0.05 ns

R4 Chi squared (2, N = 71) = 0.90, p = >0.05 ns

R14 Chi squared (2, N = 20) = 4.375, p = >0.05 ns

R20 Chi squared (2, N = 37) = 1.147, p = >0.05 ns

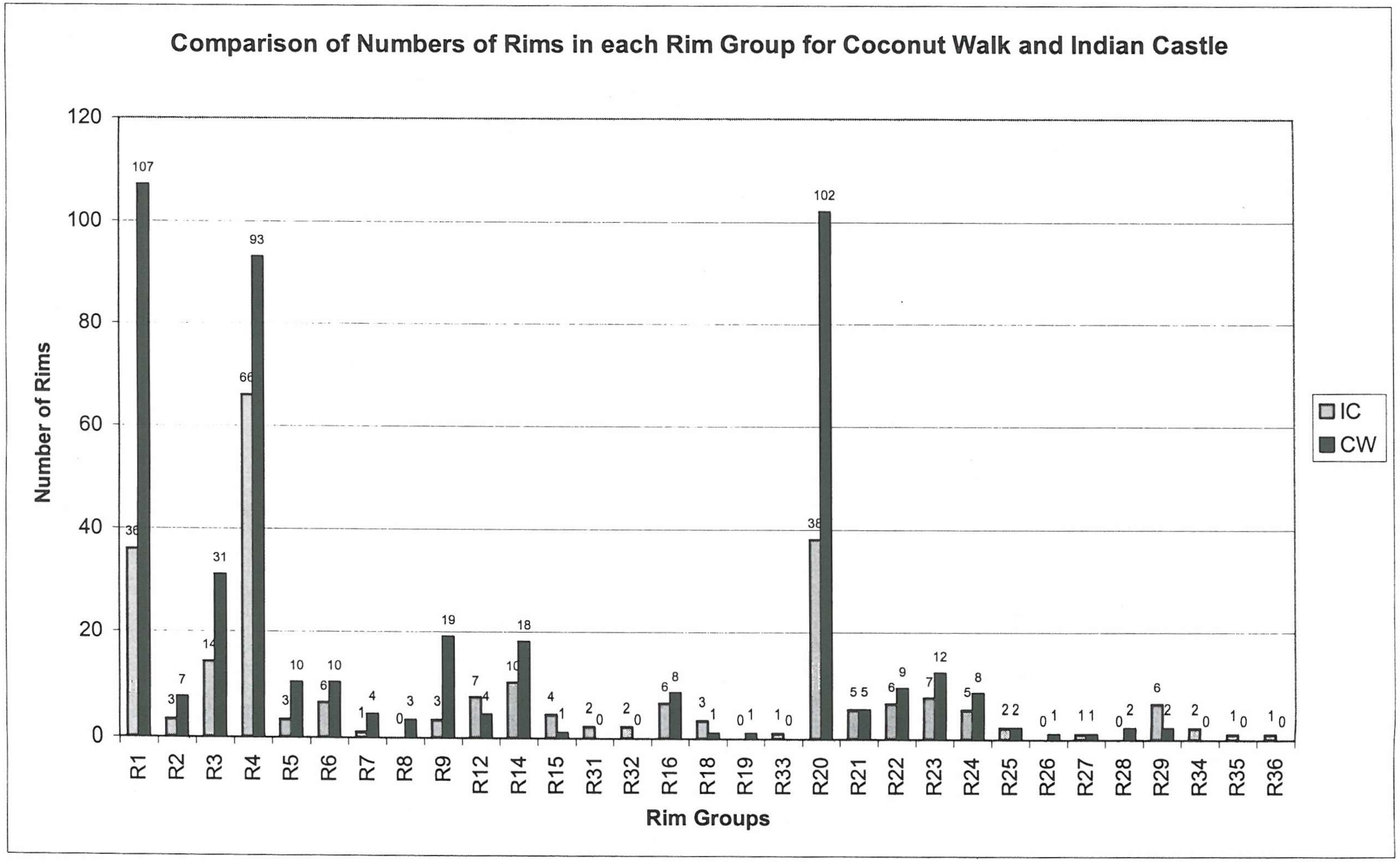

Figure 97: Number of rims in each rim group at Coconut Walk and Indian Castle

A comparison of the median thickness and the range of thickness for the major rim groups at Coconut Walk and Indian Castle can be found in table 10. As can be seen R3 rims tend to be thinner on average at both sites compared to rims from the other major groups.

	Median Thickness Code		Range of Thickness Code	
	CW	IC	CW	IC
R1	4	4	2-6	2-5
R3	3	3	2-6	3-4
R4	4	4	2-6	2-6
R14	4	4	1-5	1-5
R20	4	4	1-6	1-5

Table 10: Comparison of the median thickness and range of thickness codes for each of the major rim groups at Coconut Walk (CW) and Indian Castle (IC).

During the analysis of rims at the individual sites of Coconut Walk and Indian Castle no significant association between thickness and rim form was found (see chapter 6 and 7). The association between rim thickness and site for each of the rim groups was therefore tested in order to determine whether for example R1 rims were thicker at Coconut Walk than Indian Castle. A median split was performed on the thickness data (as detailed in chapter 6) and two groups were formed, 'thin' rims that had a thickness of code 3 or less and 'thick' rims with a code 4 or greater. No significant association between rim thickness and site was identified for any of the five rim groups.

R1 Chi squared (1, $\underline{N} = 143$) = 0.611, $\underline{p}$ = >0.05 ns

R3 Chi squared (1, $\underline{N} = 45$) = 0.627, $\underline{p}$ = >0.05 ns

R4 Chi squared (1, $\underline{N} = 158$) = 0.482, $\underline{p}$ = >0.05 ns

R14 Chi squared (1, $\underline{N} = 28$) = 0.221, $\underline{p}$ = >0.05 ns

R20 Chi squared (1, $\underline{N} = 39$) = 2.905, $\underline{p}$ = >0.05 ns

These results would imply that sherds in one rim group at one site are not significantly different in thickness than sherds from the same rim group at the other site.

Griddles

The paucity in griddle data for both the sites makes any comparisons difficult. A couple of new griddle forms were identified at Indian Castle but their significance is yet to be established. The small numbers of griddle sherds in the samples from both the sites may be of some significance. The easiest way to identify the occurrence of griddles in the assemblage is by the edge portion of the griddle, i.e. the rim and base of the griddle. A sherd found from the cooking surface of the griddle, unattached from the griddle edge can be difficult to distinguish from body sherds of other types of vessels in an assemblage. Therefore the number of griddle sherds identified in each of the assemblages could represent the minimum number of griddles within the assemblage. If this is the case then not many griddles were identified compared to other vessels represented in the assemblages. This would suggest that either griddles were not used regularly in culinary activities and so not many were produced or they broke rarely so their replacement over the course of time was not as great as perhaps other vessels. Another explanation could of course be that for some reason griddle sherds did not survive as well in the archaeological record, but this seems unlikely. The theory that griddles were produced infrequently may perhaps be supported by that fact that griddle production appears to be fairly non-standardised in terms of griddle size and the thickness of the cooking surface. This lack of standardisation may however be a result of the paucity of actual griddle sherds on which analysis has been possible. The possibility still exists though that griddles were just made as and when they were needed.

8.3 Comparison of other assemblages from Nevis

In addition to the assemblages from Coconut Walk and Indian Castle a number of much smaller assemblages from various post-Saladoid sites on the island were also recorded. All of the assemblages, apart from the sample from Pinney's Beach, were collected by Wilson during his settlement survey of the island. The assemblages are housed at the museums on Nevis and were recorded as part of this research during my visit to the island in 2000. The actual assemblages collected from each of these sites were, in some cases, much larger and the majority of that material is currently being analysed by Wilson in the United States. The assemblages as discussed here were too small for any detailed analysis to be conducted so they are just described in order to give some idea of what has been found at other post-Saladoid sites around the island.

The assemblages discussed in this section were collected from the post-Saladoid sites of Pinney's Beach, Sulphur Ghut, Butlers, Nelson Springs, Lighthouse, Newcastle and Cades Bay, figure 98 shows the location of all these sites. Table 11 shows the number of sherds recorded from each of these sites. Relatively few sherds were available from the sites of Newcastle, Butlers, Nelson Springs and Lighthouse. The majority of sherds from these sites were small rim sherds, which tended to be from vessels with an open form, and a few undecorated body sherds.

The assemblage from Sulphur Ghut consisted of 132 sherds, 36 of which were rim sherds, 9 base sherds, 4 griddle sherds, 71 plain body sherds and 8 decorated body sherds. There were also four vessels with complete profiles, one was a small jar with a rim diameter of 10 cm and the other three were dishes with rim diameters ranging from 8 to 14 cm. The commonest rim type was that of R1 and 25 of the 36 rims originated from vessels with a fairly open form, most probably bowls and dishes, which varied in diameter from 6 to 58 cm.

SITE	NUMBER OF SHERDS
Pinney's Beach	336
Sulphur Ghut	132
Cades Bay	37
Newcastle	7
Butlers	4
Nelson Springs	4
Lighthouse	3

Table 11: Number of sherds analysed from other post-Saladoid sites

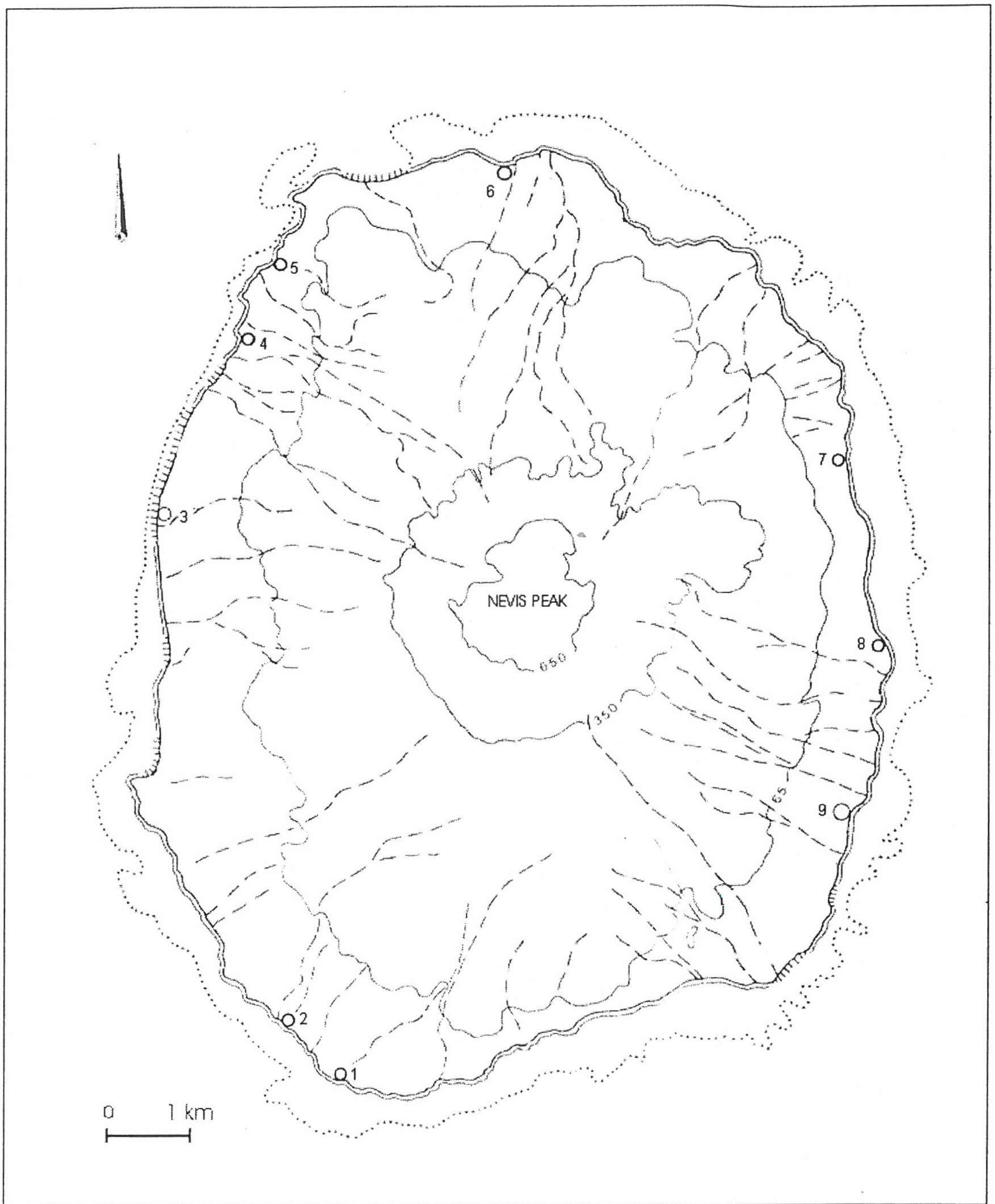

Figure 98: Map of Nevis showing the location of post-Saladoid sites analysed. 1 = Lighthouse, 2 = Sulphur Ghut, 3 = Pinney's Beach, 4 = Nelson Springs, 5 = Cades Bay, 6 = Newcastle, 7 = Butlers, 8 = Coconut Walk, 9 = Indian Castle, (after Versteeg *et. al.* 1993).

The site on Pinney's Beach was located after a hurricane when potsherds were picked up on the beach by tourists. I visited the site in May 2000 and made an additional collection of sherds from the surface of the site and a further collection was made in the summer of 2001. In total 336 sherds have so far been collected from the surface of the site. The site has been dated to the post-Saladoid period as no typical Saladoid traits have been identified in the ceramic assemblage and the pottery appears to be very similar to that analysed from Coconut Walk and Indian Castle. Plain body sherds dominate the assemblage, 267 sherds in total, and only 7 decorated body sherds were identified. The predominant type of decoration is that of incision however no patterns of decoration could be identified as the sherds were fairly small. Forty-nine rim sherds were collected and of those 36 originated from vessels with an open profile. Rim types R1 and R4 were most common and the rim diameters of vessels ranged from 10 to 40 cm but there appeared to be little relationship between rim diameter and rim type.

It is obviously impossible to draw any firm conclusions from the analysis of these assemblages as they are, on the whole, very small. However it is interesting to note that the rims that have been recorded tend to come from vessels with open profiles and that rim types R1 and R4 are most common. Rim types R1 and R4 were amongst the most common in the Coconut Walk and Indian Castle assemblages and open vessels such as bowls and dishes were also prevalent. The analysis of larger samples of pottery from these post-Saladoid sites is obviously necessary in order to better determine the extent to which assemblages around the island are similar or different to those from Coconut Walk and Indian Castle, however this is beyond the scope of this work and an area for future research.

8.4 Fabric Analysis

The methodology used to study the pottery fabrics at Coconut Walk and Indian Castle, and justification for its use, was outlined in detail in chapter 5. After an initial examination of the sherds from both sites there appeared to be little obvious differences in the types of inclusions found within the fabrics. It was therefore decided that any very detailed fabric analysis of these assemblages by eye would be too unreliable and time consuming for the amount and quality of information that would be obtained. Therefore initially each sherd was recorded as containing either igneous or sedimentary inclusions as this reflects the major geological division found in the Leeward Islands. This approach would mean that any sherds definitely manufactured off island would be instantly recognisable as Nevis is composed entirely of volcanic rocks. All of the sherds analysed from both the Coconut Walk and Indian Castle assemblages were identified as containing inclusions of volcanic origin and no evidence was found of any sherds containing sedimentary inclusions. This initial analysis also gave the impression that there was a great deal of homogeneity between the fabrics of sherds. The types of inclusions present seemed to vary little, as did the general size, sorting and quantity of inclusions. There were no strikingly obvious contrasts between the sherds to suggest the occurrence of vastly different fabric groups and any variance appeared to be very discrete. This was the case for both the Coconut Walk and Indian Castle assemblages individually but there also appeared to be little fabric variation between the two sites.

A more detailed analysis of fabrics was carried out on samples of rim sherds from each of the sites once the rim sherds had been grouped into a rim typology. Rim sherds were selected from different rim groups and where possible rims with a measurable diameter were analysed. This was done in order to maximise the amount of information known about the vessel from which the sherd originated to aid in answering the question of whether particular types of vessels were being produced locally or non-locally.

A sample of 50 rims was selected from the different rim groups identified in the Coconut Walk assemblage, this represents a little over 10% of the entire number of rims analysed from the site. A sherd from every rim group was thin sectioned and in the case of the six major rim groups identified (R1, R3, R4, R9, R14 and R20) several rims were selected for analysis. A sample of 28 rim sherds was thin sectioned from the Indian Castle assemblage. This sample again represented just over 10% of all the rims analysed and a sherd from every rim group was included in that sample. A description of all the thin sections made from Indian Castle and those made from the major rim groups at Coconut Walk are provided in the next section.

The results of the petrological analysis served to support the impression of homogeneity in the fabrics gained from the initial work carried out on the hand specimens. The appearance of many of the slides from both sites were very similar and the dominant inclusions identified tended to be the same in the majority of sections made from both Coconut Walk and Indian Castle. Some of the more discrete minerals varied in quantity from section to section but in no way enough to suggest the definite exploitation of different clay sources or the deliberate use of very different fabric recipes.

The vast majority of thin sections from both sites were characterised by a clay matrix that was dominated by extremely abundant inclusions, typically 60-70%, which were predominantly poorly sorted (see figures 99, 103 and 104). The sheer quantity of inclusions commonly found in the sections from both sites raises the question of whether these inclusions were all naturally occurring within the clay or if some had been added as temper. If inclusions had been added then an obvious choice would perhaps have been to use beach sand as temper. However none of the inclusions were as well rounded as one might expect them to be if beach sand had been added. Neither were the inclusions highly angular, which would suggest that rocks had not been crushed up into order to use as temper. The appearance of the inclusions would tend to suggest that they did most likely occur naturally in the clay.

The predominant inclusion identified in all the slides was that of discrete pieces of plagioclase feldspar. The plagioclase ranged from andesine to labradorite, andesine tending to be more common than labradorite, and in many instances displaying very complex zoning (see figure 100). This range of plagioclase feldspar and the characteristic complex zoning, which was often displayed, is entirely consistent with the range and appearance of the plagioclase identified in the volcanic rocks from every eruptive centre on the island of Nevis (Hutton 1978). Fragments of dacite were probably the second most common inclusion found in the majority of the sections. The dacite tended to be sub-angular to slightly round in shape, poorly to moderately sorted with a frequency of between 3 and 20%. The size of dacite varied within each slide and often the large pieces were porphyritic. The porphyritic dacite tended to contain phenocrysts of complexly zoned plagioclase feldspar, which ranged again from andesine to labradiorite (see figure 101). In some instances phenocrysts of pyroxene, generally clinopyroxene, and amphibole, often hornblende (see figure 102), were also identified. Dacite containing phenocrysts of plagioclase feldspar ranging from andesine to labradorite have been identified at a number of the eruptive centres, including Butler's Mountain, Round Hill, Red Cliff and Saddle Hill, all of which are close to the sites of Coconut Walk and Indian Castle, as well as at other locations on the island (Hutton 1978). Hornblende-pyroxene-dacites have been identified at a number of these eruptive centres as well (Hutton 1978).

Discrete inclusions of quartz, pyroxene and amphibole were also identified in the majority of slides. These inclusions will most probably all have been derived from a volcanic parent rock and bore much similarity to those described by Hutton from his geological work on the island. Clinopyroxenes and orthopyroxenes were both identified in the thin sections. The clinopyroxenes tended to be green in colour, often pale and fairly blocky in shape. In some rare instances these inclusions of clinopyroxene were elongated and an extinction angle could be measured. In such instances the clinopyroxene was identified as being augite. The general characteristics of the clinopyroxenes identified in the sections taken from the Coconut Walk and Indian Castle pottery appear to be comparable with the descriptions of clinopyroxenes given in the geological report of the island (Hutton 1978:23). The composition of clinopyroxene from all the eruptive centres falls into a restricted area that straddles the augite-salite boundary (Hutton 1978:23), so the identification of augite in the pottery thin sections appears to be consistent with the local geology.

The orthopyroxenes identified in the pottery thin sections from both sites tended to display high interference colours, generally first order, and most pieces were slightly pleochroic in plain light. It was not possible to take any measurements in order to further identify the types of orthopyroxene present, however the main optical properties appear to be similar to those reported for the orthopyroxene identified on the island (Hutton 1978:23).

The amphibole identified in these thin sections tended to be hornblende. The hornblende was most commonly strong brown to deep red in colour, although there were some pieces that tended to be a more greenish brown colour. The extinction angle for more elongated grains generally averaged around 16-20° and in some rare instances both sets of cleavage lines were visible. Hutton reports that such hornblende occurs as phenocrysts in many of the rocks found on Nevis and the strongly coloured brown to red hornblende is described as oxyhornblendes (Hutton 1978:23).

The apparent similarities between the range of inclusions identified in the sections taken from the Coconut Walk and Indian Castle pottery and those described by Hutton from his geological work on the island strongly suggests that the pottery analysed from these two sites were produced from locally available clay resources. In order to validate this conclusion and to investigate further the likelihood of any temper having been added to the clay used to produce these pots some additional analysis was undertaken.

During fieldwork on the island a potential clay source was located near to the Indian Castle site. A small brick was made and fired from this clay and subsequently thin sectioned. The section contained the same range of inclusions as those identified in the prehistoric sherds analysed from the two sites, which adds weight to the argument that the pottery found at Coconut Walk and Indian Castle was manufactured from locally available clay sources. However the quantity, size range and sorting of inclusions varied considerably (a more detailed petrological description of the thin section is provided in the next section). A great deal of temper would have had to have been added to this clay had it been used to produce the post-Saladoid pottery found at Coconut Walk and Indian Castle. The clay source was highly exposed to the elements and so could conceivably have altered a great deal through time due to weathering processes. It seems highly unlikely that this clay source would be the same today as in prehistoric times. It is therefore extremely difficult to determine whether this clay could have been used to produce the pottery found at Coconut Walk and Indian Castle and if it was whether or not temper needed to be added to it.

Pottery is still being produced on the island today using locally available clay. During my research visit to Nevis in May 2000 I spoke with one of the potters at the Newcastle pottery, which is located in the north of the island. The clay he used to produce his pots was dug from Potwork Estate. He told me that there was no need to add any temper as the clay was already rife with inclusions but that prior to working with the clay he would remove the larger inclusions. All of his pottery was handmade and fired in a bonfire kiln and these manufacturing techniques were probably very similar to those employed by the post-Saladoid potters. A sample of his pottery was thin sectioned in order to compare with the post-Saladoid pottery from Coconut Walk and Indian Castle. The range of inclusions identified in the modern pottery was identical to those identified from the prehistoric potsherds. The quantity of inclusions and the appearance of the clay matrix were also very similar. The inclusions in the modern pottery were much better sorted than those in the prehistoric sherds but this can be accounted for by the fact that the larger inclusions found in the clay used to produced the modern pottery had been removed prior to manufacturing. The overwhelming similarity between the modern potsherd made from a known local clay source and the prehistoric potsherds from Coconut Walk and Indian Castle again suggests that the pottery from these post-Saladoid sites was most likely manufactured from clay sources found on Nevis.

In order to take this analysis one step further two post-Saladoid potsherds were thin sectioned from the neighbouring island of St. Kitts. The latter is also a volcanic island and whilst dacite has been reported in the geological survey of the island the predominant volcanic rock tends to be andesite. The two thin sections taken from the St. Kitts pottery showed some variation to the Nevis sections (see figure 105). The sections from St. Kitts were dominated by inclusions of plagioclase feldspar, which was identified as being oligoclase, whereas the plagioclase in the Nevis pottery ranged from andesine to labradorite. The volcanic rock fragments in the pottery from St. Kitts were also different in appearance to the dacite identified in the Nevis pottery. Although only two sherds were analysed from St. Kitts the differences discovered serves to strengthen the argument that the pottery from Coconut Walk and Indian Castle was produced from resources found on Nevis.

The sites of Coconut Walk and Indian Castle are close to one another geographically and this could conceivably be a reason why there is such apparent homogeneity between the two assemblages. A brief programme of work was therefore undertaken to compare the sections taken from pottery at Coconut Walk and Indian Castle with sections made from several post-Saladoid sites located on the other side of the island. This was done in order to see if there were any obvious differences that also might aid in locating more specifically the sources of clay used on the island to produce these vessels. Although the geology of the island is very similar there are discrete differences between some of the eruptive centres on the island. These differences may be reflected in some of the clay sources and if so it might be possible to recognise such variation in the pottery assemblages.

Three post-Saladoid sites from the Leeward (western) side of the island were selected for comparison with the Coconut Walk and Indian Castle material. Two sherds were sectioned from Cades Bay (see figures 106 and 107) and Pinney's Beach (see figure 108) and three sherds were sectioned from Sulphur Ghut (see figures 109 and 110). The sample was obviously very small but this was due to time restraints and the fact that this work is in addition to the aims initially set out for this piece of research. The range of inclusions identified in the sections taken from these three sites were again practically identical to those identified in the Coconut Walk and Indian Castle material. Plagioclase feldspar often displaying complex zoning tended to be the dominant inclusion and the range of feldspar was again andesine to labradorite. The composition of the dacite, its quantity shape and sorting was again very similar as were the more discrete minerals identified. The general appearance of the fabrics, the quantity of inclusions and the size shape and sorting of inclusions were all very similar, not only between these three sites but also compared to the Coconut Walk and Indian Castle sections. Obviously the results presented here are based on a very small sample and so to draw any firm conclusions would be premature but it would appear that the homogeneity in fabrics identified at Coconut Walk and Indian Castle could conceivably be replicated around the island as well. Further, more in depth, research would clearly be necessary to validate this hypothesis.

If the majority of pottery found on Nevis during the post-Saladoid period was produced from materials available on the island then the next question to investigate would be whether pottery from Nevis was exported to other islands. In order to begin to investigate this possibility the literature published concerning the fabric and petrological analysis conducted at post-Saladoid sites on other islands within the Leeward chain was studied. Unfortunately the petrological descriptions included within these papers tend not to be very detailed at all. If volcanic rock fragments are identified then no further description is given as to their composition. Feldspars are also often identified in this material but at worse they are just described as feldspar and at best plagioclase feldspar, no indication is given as to the range of plagioclase feldspar identified or even whether it shows complex zoning or not. This would mean that it would be necessary to compare actual sherds from each of these islands, this is again beyond the scope of this research, but it would be an area for future research.

8.5 Petrological descriptions

The petrological descriptions of the thin sections taken from the major rim groups identified at Coconut Walk, all the sherds sectioned from Indian Castle, Sulphur Ghut, Cades Bay, Pinney's Beach and St. Kitts as well as the section taken from the modern Nevis pottery and the clay source located near the Indian Castle site are included in this section. Photomicrographs are also included showing sections of sherds from various sites and in particular showing some of the types of inclusions described in the previous section.

COCONUT WALK

Rim Group R1

PRN 2889 – Groundmass of poorly sorted abundant inclusions (60-70%) including plagioclase feldspar (andesine), some zoned, hornblende and dacite. Dacite round to sub-angular in shape, moderate to poorly sorted with frequency of 20-25% some pieces contain phenocrysts of plagioclase feldspar.

PRN 1049 – Groundmass of poorly sorted abundant inclusions (60%) including zoned plagioclase feldspar (andesine), quartz, amphiboles, pyroxenes and dacite. Dacite is round to sub-angular in shape, moderately sorted with frequency of around 30%, some pieces contain phenocrysts of plagioclase feldspar.

PRN 1054 – Groundmass of abundant (60-65%) moderately sorted inclusions including zoned plagioclase feldspar (andesine – labradiorite), quartz and dacite. Dacite is moderately sorted and rounded to sub-angular in shape with a frequency of 20-25%, some pieces contain phenocrysts of plagioclase feldspar.

PRN 1160 – Groundmass of poorly sorted abundant inclusions (70-75%) including plagioclase feldspar (andesine), quartz, pyroxenes and dacite. Dacite is round to sub-rounded in shape with a frequency of around 20%. Some pieces of dacite have phenocrysts of plagioclase feldspar.

PRN 1162 – Groundmass of poorly sorted abundant inclusions (60-65%) including plagioclase feldspar (andesine – labradiorite), quartz, pyroxene and dacite. The dacite tends to be rounded to sub-rounded in shape, poorly sorted with a frequency of around 20%, some pieces contain phenocrysts of plagioclase feldspar.

PRN1235 – Groundmass of moderate to poorly sorted abundant inclusions (70-75%) including hornblende, pyroxene, quartz, zoned plagioclase feldspar (andesine) and pieces of dacite. The dacite tends to be rounded to sub-angular in shape, poorly sorted with a frequency of 20-25%

Rim Group R3

PRN 1096 – Groundmass of very poorly sorted abundant inclusions (60-70%) comprising of zoned plagioclase feldspar (andesine – labradiorite), quartz, hornblende and dacite. The dacite is poorly sorted and rounded to sub-angular in shape and some pieces have phenocrysts of plagioclase feldspar and hornblende.

PRN 1769 – Groundmass of poorly sorted abundant inclusions (70-75%) comprising of zoned plagioclase feldspar (andesine – labradiorite), quartz, pyroxene, hornblende and dacite. The dacite is poorly sorted, rounded to sub-angular in shape with a frequency of 10-15%. Some pieces have phenocrysts of plagioclase feldspar.

PRN 1777 – Groundmass of moderately sorted abundant inclusions (60-65%) predominantly plagioclase feldspar (andesine), quartz, pyroxene, hornblende and dacite. The dacite is round to sub-angular in shape, poorly sorted with a frequency of 15-20%.

PRN 1795 – Groundmass of poorly sorted abundant inclusions (65-70%) including plagioclase feldspar (andesine), quartz and dacite. The dacite is rounded to sub-angular in shape, moderately sorted with a frequency of 15-20%, some pieces have phenocrysts of plagioclase feldspar.

Rim Group R4

PRN 1002 – Groundmass of moderately sorted abundant inclusions (60-65%) comprising of zoned plagioclase feldspar (andesine), hornblende, quartz and dacite. The dacite tends to be rounded to sub-angular in shape and poorly sorted.

PRN 1063 – Groundmass of moderately sorted abundant inclusions (60-70%) with larger inclusions of zoned plagioclase feldspar (andesine – labradiorite), hornblende, quartz and dacite. The dacite is rounded to sub-rounded in shape, poorly sorted with a frequency of 15-20%

PRN 1080 – Groundmass of poorly to moderately sorted abundant inclusions (70-75%) comprising of zoned plagioclase feldspar (labradiorite), quartz and dacite. The dacite is poorly sorted, rounded to sub-angular with a frequency of 10-15%.

PRN 1124 – Groundmass of poorly sorted moderately abundant inclusions (40-45%) comprising mainly of plagioclase feldspar (andesine), quartz and dacite. The dacite is poorly sorted and fairly rounded with a frequency of around 10%.

PRN 1145 – Groundmass of poorly sorted abundant inclusions (70%) including plagioclase feldspar (labradiorite), quartz, pyroxene, hornblende and dacite. The dacite is sparse (10-15%), rounded to sub-rounded and poorly sorted, some pieces have phenocrysts of plagioclase feldspar.

PRN 1199 - Groundmass of moderately sorted abundant inclusions (60-65%) comprising of plagioclase feldspar (labradiorite), hornblende, pyroxene, quartz and dacite. The dacite tends to be round to sub-angular, poorly sorted with a frequency of 15-20%. Some pieces contain phenocrysts of hornblende or pyroxene.

PRN 1219 – Poorly sorted groundmass of abundant inclusions (70-75%). Inclusions consist of zoned plagioclase feldspar (andesine), quartz, pyroxene, hornblende and dacite. The dacite is moderately sorted, 15-20% in quantity and rounded to sub-angular in shape. Some pieces contain phenocrysts of hornblende.

PRN 1232 – Groundmass of poorly sorted abundant inclusions (75-80%) mainly consisting of plagioclase feldspar (andesine), quartz, pyroxene and dacite. The dacite is poorly sorted, rounded to sub-angular with a quantity of around 15-20%, some pieces have phenocrysts of plagioclase feldspar.

PRN 1246 – Moderately sorted groundmass of abundant inclusions (65-70%) comprising of zoned plagioclase feldspar (andesine), hornblende, quartz and dacite. The dacite is very sparse in quantity (5-10%), moderately sorted and round to sub-angular in shape.

PRN 1472 – Groundmass of poorly sorted abundant inclusions (65-70%). Inclusions consist of zoned plagioclase feldspar (andesine – labradiorite), hornblende, quartz, pyroxene and dacite. The dacite is poorly sorted, round to sub-angular in shape with a frequency of 20-25%, some pieces contain phenocrysts of feldspar.

PRN 1691 – Groundmass of poorly sorted abundant inclusions (65-70%) comprising of plagioclase feldspar (andesine – labradiorite), pyroxene, quartz and dacite. The dacite tends to be rounded to sub-angular, poorly sorted with a frequency of 20-25%. Some of the dacite has phenocrysts of feldspar.

PRN 1697 – Poorly sorted groundmass of abundant inclusions (60-65%) predominantly consisting of plagioclase feldspar (labradiorite), quartz and dacite. The dacite is poorly sorted with a frequency of 15-20% and tends to be rounded to angular in shape.

PRN 1834 – Groundmass of poorly sorted abundant inclusions (70-75%) consisting of plagioclase feldspar (labradiorite), quartz, hornblende and dacite. The dacite is rounded to sub-angular in shape, moderately sorted with a frequency of around 15-20%.

PRN 2320 – Groundmass of moderately sorted abundant inclusions (75-80%) including plagioclase feldspar (andesine), quartz, hornblende and dacite. The dacite is moderately sorted, rounded to sub-angular in shape with a frequency of 20-25%.

Rim Group R9

PRN 1112 – Poorly sorted groundmass of abundant inclusions (70-75%) comprising of zoned plagioclase feldspar (andesine), quartz, hornblende, pyroxene and pieces of dacite. The dacite is poorly sorted, rounded to sub-angular in shape with a quantity of around 20%.

PRN 1767 – Groundmass of poorly sorted abundant inclusions (65-70) including zoned plagioclase feldspar (labradiorite), quartz, hornblende and dacite. The dacite is rounded to sub-angular, poorly sorted with a frequency of 10-15%. Some pieces have phenocrysts of plagioclase feldspar.

Rim Group R14

PRN 2348 - Poorly sorted groundmass of moderately abundant inclusions (50%) comprising mainly of plagioclase feldspar (andesine), quartz, hornblende and dacite. The dacite is poorly sorted with a frequency of 15-20% and tends to be rounded to sub-angular in shape. Some pieces contain phenocrysts of feldspar.

Rim Group R20

PRN 1783 – Groundmass of moderately sorted abundant inclusions (65%) consisting of zoned plagioclase feldspar (andesine), pyroxene, hornblende and dacite. The dacite was poorly sorted, rounded to sub-angular in shape with a frequency of around 15-20%, some pieces contained phenocrysts of zoned plagioclase feldspar.

PRN 2751 – Moderately sorted groundmass of abundant inclusions (60-70%) including pyroxene, hornblende, zoned plagioclase feldspar (labradiorite) and dacite. The dacite was poorly sorted, rounded to sub-angular in shape with a frequency of 10-15%. Some pieces of dacite had phenocrysts of zoned plagioclase feldspar.

PRN 3434 – Groundmass of poorly sorted moderately abundant inclusions (50-60%) consisting predominantly of pyroxene, hornblende, zoned plagioclase feldspar (andesine – labradiorite) and dacite. The dacite was moderately sorted, rounded to sub-angular in shape with a quantity of 10-15%, some pieces contained phenocrysts of zoned plagioclase feldspar.

PRN 3510 – Poorly sorted groundmass of abundant inclusions (60-65%) comprising of hornblende, plagioclase feldspar (andesine – labradiorite), quartz, hornblende and pieces of dacite. The dacite was sparse (7%), poorly sorted and rounded to sub-angular in shape.

PRN 3516 – Groundmass of poorly sorted moderately abundant inclusions (50%) consisting of plagioclase feldspar (andesine),hornblende, pyroxene, quartz and dacite. The dacite was sparse (7%), rounded to sub-angular and moderately sorted.

PRN 2302 – Poorly sorted groundmass of abundant inclusions (60%) comprising mainly of plagioclase feldspar (andesine), quartz, hornblende and pieces of poorly sorted, rounded to sub-angular dacite.

INDIAN CASTLE

PRN 4729 R15 - Abundant (60-65%) poorly sorted inclusions of plagioclase feldspar (andesine and labradorite), some zoned, quartz, dacite. Dacite is rounded to sub-rounded, moderately sorted, with a frequency of 10-15%, some pieces have large (around 0.5 mm) phenocrysts of plagioclase feldspar.

PRN 4732 R9 – The clay contains a moderate quantity of inclusions (30-40%), which are poorly sorted. Discrete inclusions of plagioclase feldspar (andesine), some of which are zoned, quartz, pyroxene, amphibole and dacite. The dacite is rounded, small in size (around 0.2 mm) and sparse (5-7%). There are also other volcanic rock fragments but these appear different to the dacite, the laths within them are much larger and appear to be from a rock that has cooled down slightly slower than the dacite that is typical of these slides. These rocks are larger in size (0.5 mm to greater than 1 mm) than the dacite and fairly well rounded, some have larger phenocrysts of zoned plagioclase feldspar.

PRN 4669 R1 – Abundant (75-80%) poorly sorted inclusions. Dense groundmass of small inclusions with larger (0.2 mm to 0.5 mm) inclusions of zoned plagioclase feldspar (andesine), quartz, hornblende and dacite. The dacite is well rounded, small (around 0.2 mm), moderately sorted (different from usual) and does not tend to contain any phenocrysts.

PRN 4851 R25 – Moderately sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine), some zoned, quartz, pyroxene and amphibole - hornblende. There is also a sparse quantity of small (around 0.2 mm), rounded pieces of dacite.

PRN 4629 R4 – Similar to PRN 4851. Moderately sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine), some zoned, quartz, pyroxene, amphibole and small (around 0.2 mm), rounded pieces of dacite.

PRN 4777 R6 – Moderately to poorly sorted abundant (65-70%) inclusions of plagioclase feldspar (andesine to labradorite), some zoned, quartz, rounded dark red inclusions, pyroxene, amphibole (hornblende) and dacite. The dacite is rounded to sub-angular, poorly sorted, with a frequency of around 7-10%, some pieces contain phenocrysts of zoned plagioclase.

PRN 4733 R1 – Moderately abundant (45-50%) moderately to well-sorted inclusions of zoned plagioclase feldspar (not possible to measure any), quartz, pyroxene, amphibole (most likely hornblende) and dacite. Dacite is sparse (3-5%), small to medium in size (0.2 mm to 0.5 mm), poorly sorted and rounded to sub-angular in shape. Some larger (around 0.5 mm to 1 mm) pieces of dacite contain phenocrysts of zoned plagioclase feldspar.

PRN 4657 R21 – Moderately to poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine), some zoned, quartz, pyroxene (possibly augite), hornblende and dacite. The dacite is poorly sorted, moderately sparse (10-15%), rounded to sub-angular in shape and some pieces have phenocrysts of quartz and zoned plagioclase feldspar.

PRN 4769 R31 – Moderate to poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine to labradorite), some zoned, quartz, hornblende, pyroxene (probably some augite) and dacite. The dacite is sparse (3-5%), rounded to sub-angular in shape and small (around 0.2 mm). Some large (0.5 mm to 1 mm) pieces of dacite contain phenocrysts of feldpsar.

PRN 4822 R29 – Moderately sorted abundant (65-70%) inclusions of plagioclase feldspar (andesine to labradortite), some zoned, quartz, pyroxene (possibly augite), amphibole and volcanic rock fragments. Some rock fragments appear to be dacite, others are much darker with small phenocrysts of hornblende and feldspar. The rock fragments are sparse (5-7%) poorly sorted and round to sub-angular in shape.

PRN 4820 R27 – Poorly sorted abundant (60-65%) inclusions of plagioclase feldspar (andesine), some zoned, quartz and volcanic rock fragments. The rock fragments are similar to the darker fragments found in PRN 4822, they are poorly sorted, some are very large in size (greater than 1 mm) and contain large phenocrysts of zoned plagioclase feldspar or completely black elongated minerals. The rock fragments are rounded to angular in shape.

PRN 4764 R22 – Moderate to poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine to labradorite), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is sparse (5-7%), rounded to sub-angular, moderately sorted and some pieces contain phenocrysts of hornblende and zoned plagioclase feldspar.

PRN 4718 R2 – Poorly sorted abundant (60-65%) inclusions of plagioclase feldspar (andesine), some of which is zoned, quartz, amphibole (hornblende) and dacite. The dacite is poorly sorted, rounded to sub-angular in shape, sparse (7-10%) and some pieces contain phenocrysts of zoned plagioclase feldspar.

PRN 4727 R12 – Moderately to well sorted abundant inclusions (70-75%) of plagioclase feldspar (andesine), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is sparse (5-7%) rounded to sub-angular, moderately to poorly sorted and some larger (greater than 0.5 mm) pieces contain phenocrysts of zoned plagioclase feldspar.

PRN 4712 R5 – Moderately to well sorted abundant inclusions (65-70%) of plagioclase feldspar (andesine), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is round to sub-angular in shape, sparse (3-5%) and moderately sorted, some pieces have phenocrysts of zoned plagioclase feldspar.

PRN 4773 R16 – Well sorted abundant inclusions (65-70%) of zoned plagioclase feldspar (unable to measure), quartz, hornblende and dacite. The dacite is rare (2-3%), rounded to sub-angular in shape and fairly small in size (around 0.2 mm).

PRN 4697 R4 – Moderate to poorly sorted abundant (65-70%) inclusions of plagioclase feldspar (labradorite), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is sparse (7-10%) rounded to sub-angular, poorly sorted and some of the larger (greater than 1 mm) pieces contain phenocrysts of zoned plagioclase feldspar and pyroxene.

PRN 4838 R3 – Moderate to well-sorted abundant (60-65%) inclusions of plagioclase feldspar (andesine to labradorite), some of which are zoned, quartz, pyroxene (?), hornblende and dacite. The dacite is rare (2-3%) rounded to sub-angular in shape and fairly small (around 0.2 mm). Some large (greater than 1 mm) pieces contain phenocrysts of zoned plagioclase feldspar.

PRN 4843 R34 – Moderate to poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine), some of which are zoned, pyroxene, quartz, hornblende and dacite. The dacite is sparse (5-7%), fairly well rounded, moderately sorted and small in size.

PRN 4818 R32 – Poorly sorted moderately abundant (50-60%) inclusions of plagioclase feldspar (andesine to labradorite), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is sparse (10-12%) fairly well rounded and moderately sorted, some pieces contain phenocrysts of zoned plagioclase feldspar.

PRN 4863 R18 – Well sorted to moderately well sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine to labradorite), some of which is zoned, quartz, pyroxene, amphibole and dacite. The dacite is moderately to poorly sorted, rounded to sub-angular, sparse (10-15%) and some larger (greater than 1 mm) pieces contain phenocrysts of zoned plagioclase feldspar.

PRN4828 R3 – Moderately sorted moderately abundant (45-50%) inclusions of plagioclase feldspar (andesine), some of which is zoned, quartz, pyroxene, amphibole and dacite. The dacite is extremely rare (1-2%), small in size (0.2 mm to 0.5 mm) and fairly well rounded in shape.

PRN 4853 R24 – Moderately sorted abundant (55-60%) inclusions of plagioclase feldspar (andesine), some of which are zoned, quartz, pyroxene, hornblende and dacite. The dacite is rare (3-5%) fairly well rounded, moderately sorted and some of the larger (greater than 1 mm) pieces contain phenocrysts of zoned plagioclase feldspar.

PRN 4707 R33 – Moderately sorted very abundant (85-90%) inclusions. There is a very dense groundmass of smaller (less than 0.2 mm) inclusions, which appear to be comprised of feldspar and quartz as well as larger (0.2 mm to 1 mm) inclusions of plagioclase feldspar, quartz, pyroxene and possibly one or two pieces of dacite.

PRN 4852 R23 – Moderate to poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine to labradorite), some of which is zoned, quartz, pyroxene, hornblende and dacite. The dacite is rounded to sub-angular in shape, poorly sorted, sparse (5-7%) and some larger (greater than 1 mm) pieces contain phenocrysts of feldspar.

PRN 4674 R20 – Moderately to poorly sorted abundant (65-70%) inclusions of plagioclase feldspar (andesine), some of which are zoned, quartz, hornblende and dacite. The dacite is round to sub-angular, sparse (7-10%) and poorly sorted, some larger (greater than 1 mm) pieces contain phenocrysts of plagioclase feldspar.

PRN 4776 R20 – Poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine), some of which were zoned, quartz, pyroxene, hornblende and dacite. The dacite was fairly large in size (often greater than 1 mm), rounded to sub-angular in shape, poorly sorted and moderately sparse (10-15%), some of the larger pieces contained phenocrysts of plagioclase feldspar.

PRN 4737 R14 – Moderately sorted abundant (60-65%) inclusions of plagioclase feldspar (andesine), some of which was zoned, quartz, pyroxene, hornblende and dacite. The dacite was small to medium in size (0.2 mm –1 mm), rounded to sub-angular in shape, moderately sparse (10-15%) and moderately sorted, some pieces contained phenocrysts of plagioclase feldspar.

Indian Castle Clay Sample – Moderate to well sorted sparse to moderate (15-20%) inclusions of quartz, plagioclase feldspar (andesine), some of which is zoned, hornblende and pyroxene. One or two very small (less than 0.2 mm) pieces of dacite may also be present. Although the range of inclusions present are similar to those found at Indian Castle the quantity, size range and sorting is considerably different.

Modern handmade pottery from the Newcastle pottery (clay obtained from Potwork Estate) – Moderate to well sorted abundant (70-75%) inclusions of plagioclase feldspar, some of which are zoned, quartz, pyroxene (probably augite), amphibole (hornblende) and pieces of dacite. The dacite is well sorted, small in size (0.2 mm – 0.5 mm), rounded to sub-angular and sparse (7-10%). The fabric looks very similar to sherds examined from Indian Castle and Coconut Walk. The clay had been prepared to the extent that larger inclusions had been removed, this would explain why the clay was moderately well sorted and why there were no very large pieces of dacite present (nothing over 1 mm).

Thin section analysis of sherds from other post-Saladoid sites on Nevis

SULPHUR GHUT

PRN 3100 R16 – Poorly sorted abundant (70-75%) inclusions of plagioclase feldspar (andesine to labradorite), some of which is zoned, quartz, pyroxene, hornblende and dacite. The dacite is sparse (7-10%), rounded to sub-angular in shape, moderately well sorted and medium to large in size (0.5 mm to over 1 mm). Some of the larger pieces contain phenocrysts of plagioclase feldspar.

PRN 3306 R1 - Moderately well sorted, moderately (50-60%) abundant inclusions of plagioclase feldspar (labradorite), some of which is zoned, quartz, pyroxene, hornblende and dacite. The dacite is rare (2-3%), rounded to sub-rounded and moderately sorted.

PRN 3105 R20 – Moderately sorted, moderately abundant (40-45%) inclusions of plagioclase feldspar (labradorite), some of which is zoned, quartz, hornblende and dacite. The dacite is sparse (5%), small (0.2 mm – 0.5 mm), rounded to sub-angular in shape and moderately well sorted.

CADES BAY

PRN 3178 R9 - Moderately to well sorted abundant (55-60%) inclusions of plagioclase feldspar (andesine), some of which is zoned, quartz, pyroxene, amphibole (hornblende) and dacite. The dacite is rare (3-5%), rounded, small (0.2 mm – 0.5 mm) and moderately well sorted.

PRN 3251 R1 – Moderately to poorly sorted abundant (50-60%) inclusions of plagioclase feldspar (andesine), some of which is zoned, quartz, pyroxene, amphibole (hornblende) and dacite. The dacite is rare (1-2%), rounded, moderate to well sorted and fairly small in size (0.2 mm – 0.5 mm).

PINNEY'S BEACH

PRN 4603 R29 – Moderate to well sorted abundant (65-70%) inclusions of plagioclase feldspar (andesine), some of which is zoned, quartz, pyroxene (most probably augite), hornblende and dacite. The dacite is extremely rare (1%), rounded and small (0.2 mm – 0.5 mm).

PRN 4605 R1 – Moderate to well sorted abundant inclusions (50-60%) of plagioclase feldspar (andesine), some of which is zoned, quartz, pyroxene, amphibole (hornblende) and dacite. The dacite is rare (2-3%), small (0.2 mm – 0.5 mm) and fairly well rounded.

ST. KITTS

PRN SK1124, rim sherd from the Dieppe Bay site

The section contained moderately to poorly sorted abundant (60-70%) inclusions of plagioclase feldspar (oligoclase), some of which was complexly zoned, amphibole (hornblende), pyroxene and volcanic rock fragments, most probably andesite.

PRN SK1102, rim sherd from the Black Rocks site

The section included moderately to well sorted abundant inclusions (50-60%) of zoned plagioclase feldspar (oligoclase), pyroxene, amphibole and volcanic rock fragments, most likely andesite.

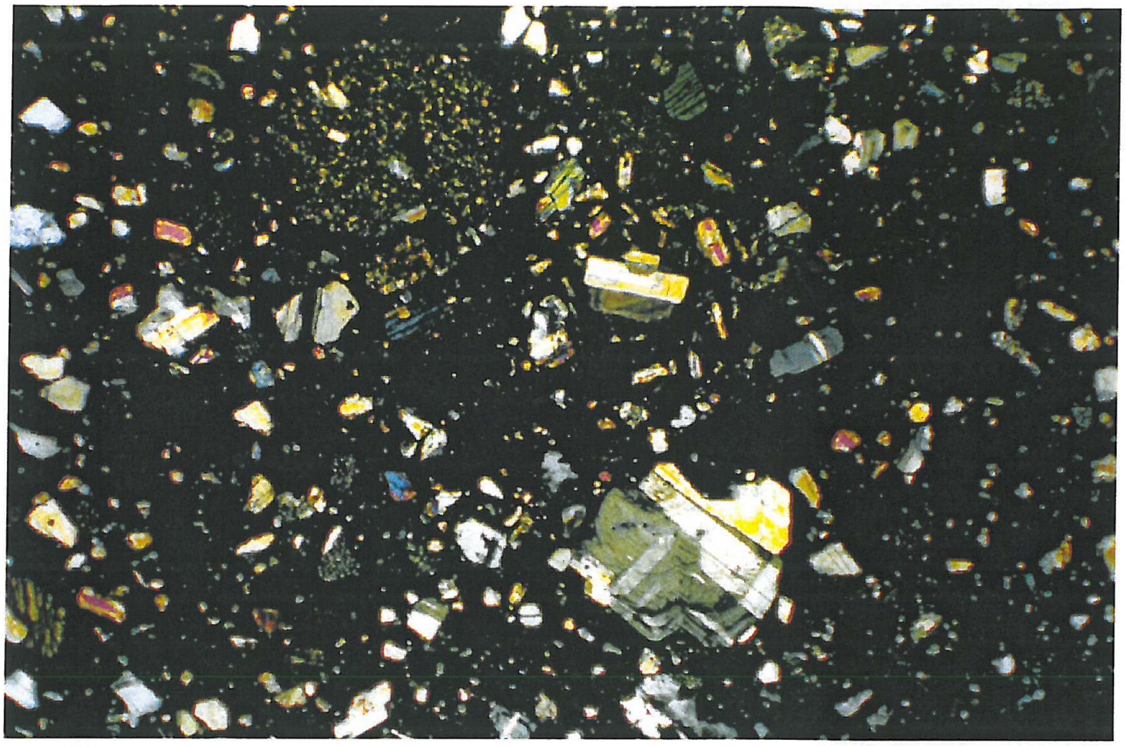

Figure 99: Thin section of sherd from Coconut Walk (scale x 40 cross polars)

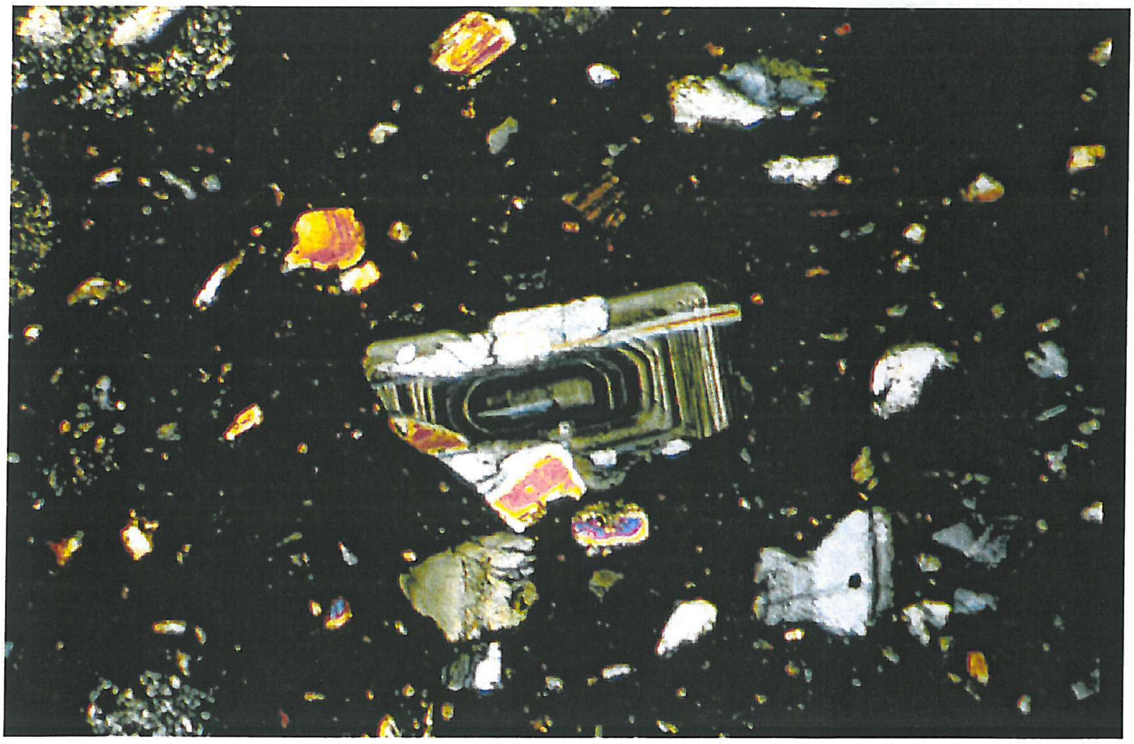

Figure 100: Thin section of sherd from Coconut Walk showing a piece of complexly zoned plagioclase feldspar (scale x 40 cross polars)

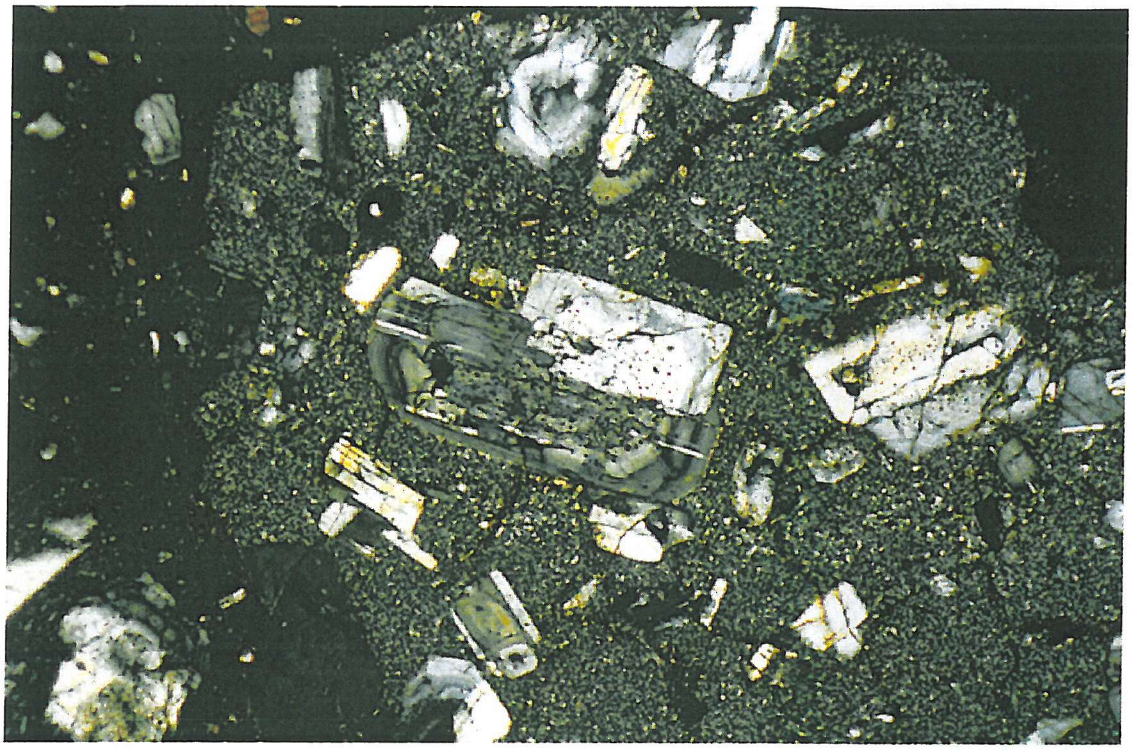

Figure 101: Thin section of sherd from Coconut Walk. The picture is dominated by a piece of porphyritic dacite, the phenocrysts are mainly pieces of complexly zoned plagioclase feldspar (scale x 40 cross polars)

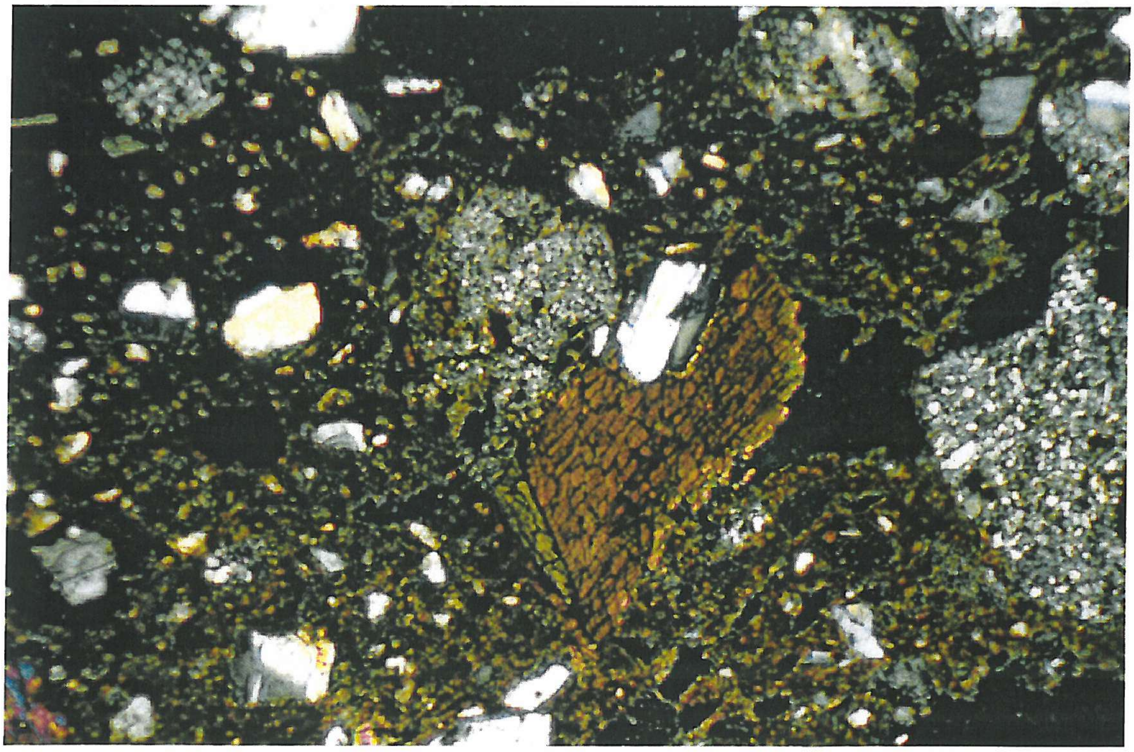

Figure 102: Thin section of sherd from Coconut Walk showing a piece of dacite with a large phenocryst of hornblende (scale x 40 cross polars)

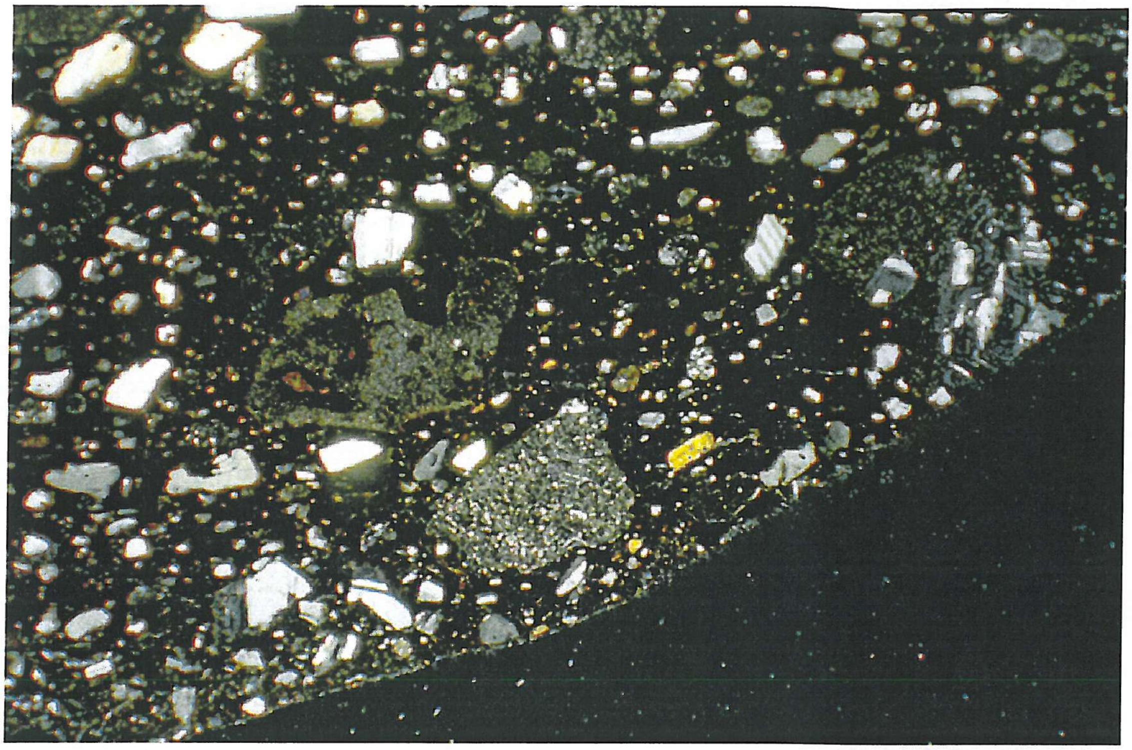

Figure 103: Thin section of sherd from Indian Castle (scale x 40 cross polars)

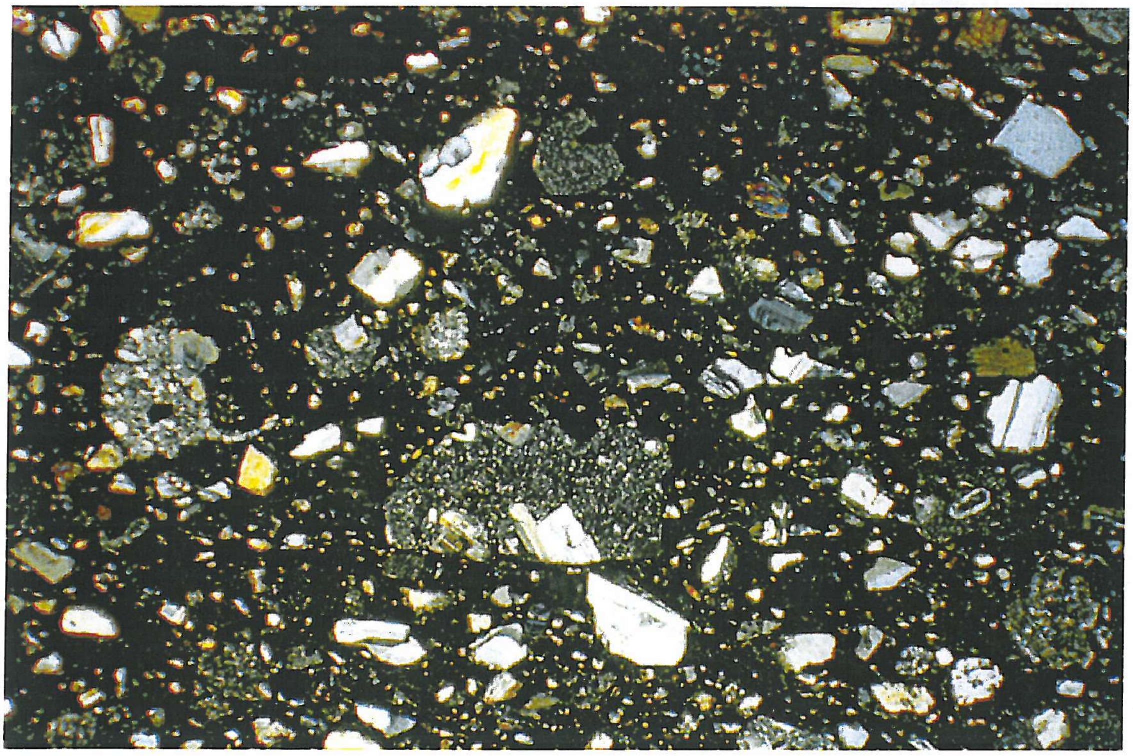

Figure 104: Thin section of sherd from Indian Castle (scale x 40 cross polars)

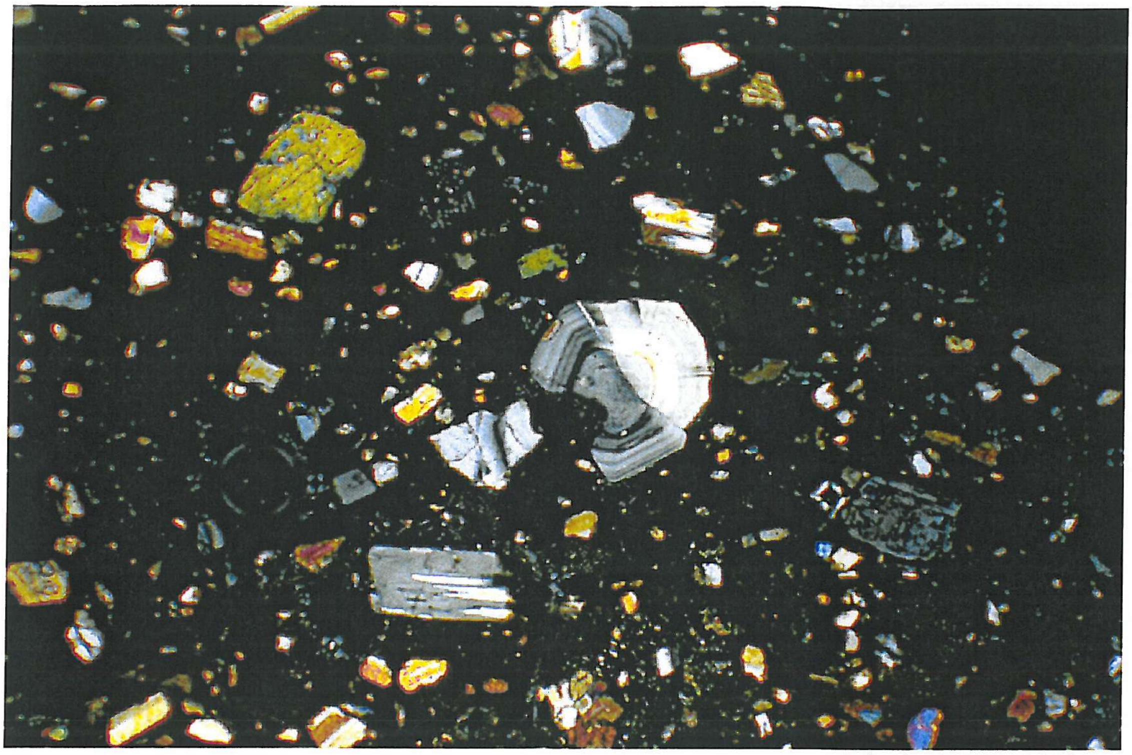

Figure 105: Thin section of sherd from St. Kitts showing a piece of complexly zoned plagioclase feldspar in the centre of the picture (scale x 40 cross polars)

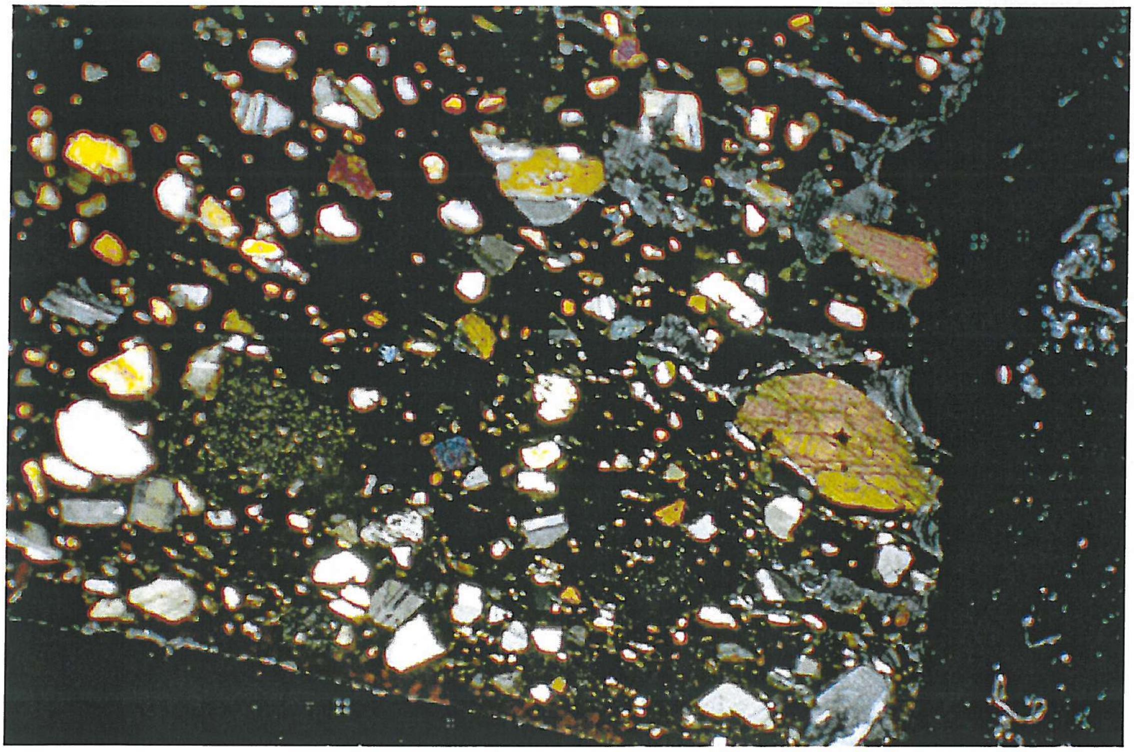

Figure 106: Thin section of sherd from Cades Bay. A piece of hornblende is visible to the right of the section (scale x 40 cross polars)

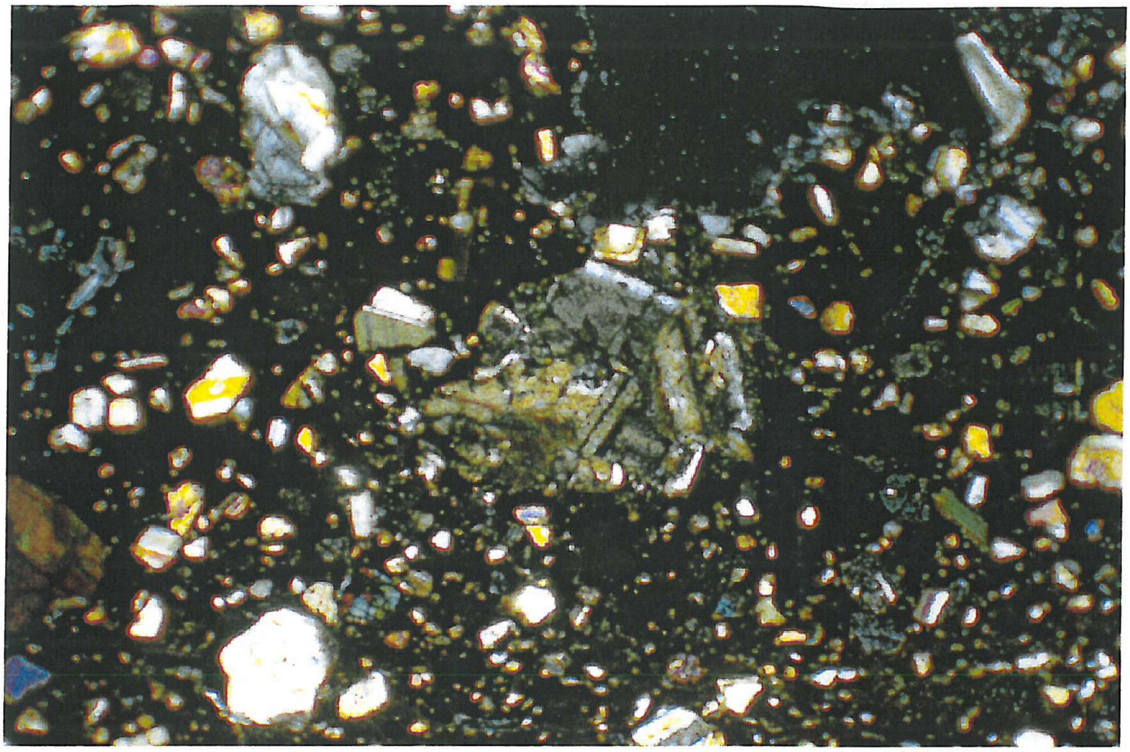

Figure 107: Thin section of sherd from Cades Bay (scale x 40 cross polars)

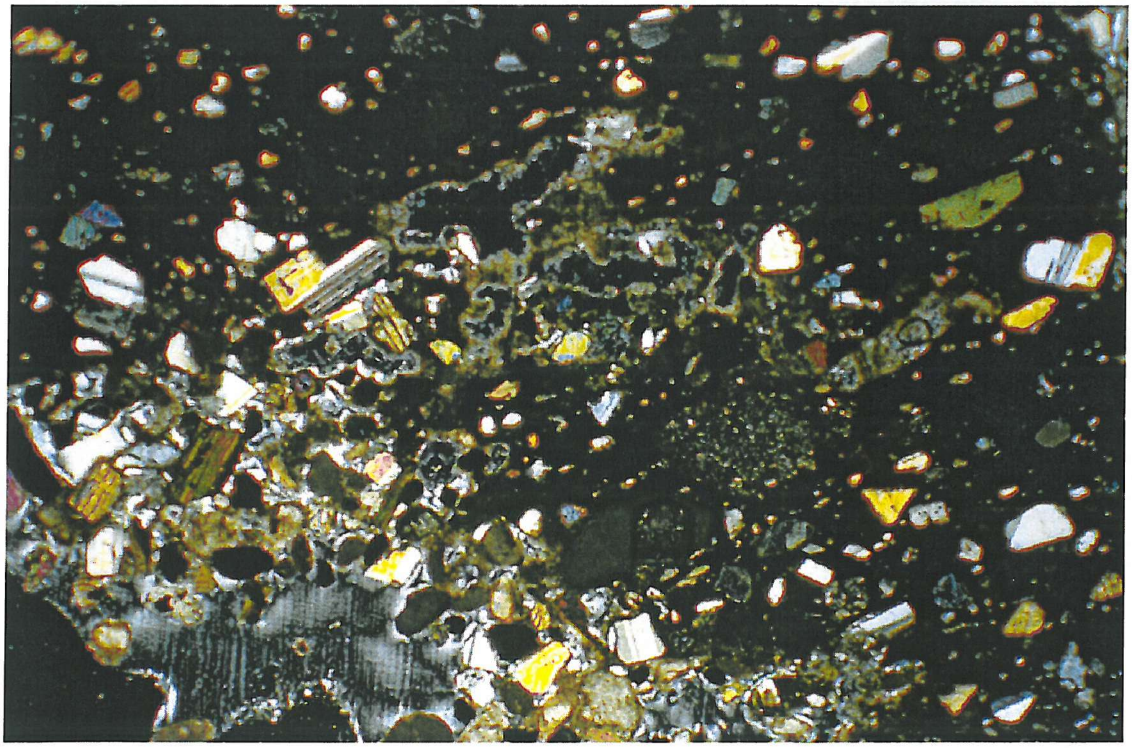

Figure 108: Thin section of sherd from Pinney's Beach (scale x 40 cross polars)

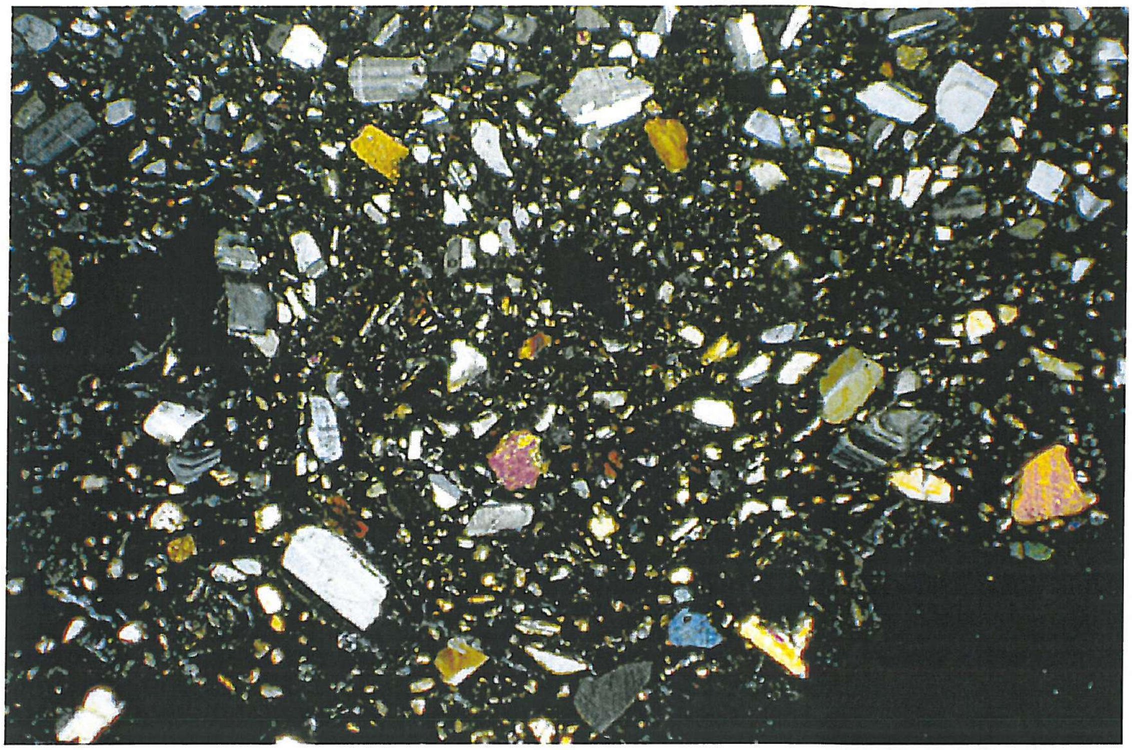

Figure 109: Thin section of sherd from Sulphur Ghut (scale x 40 cross polars)

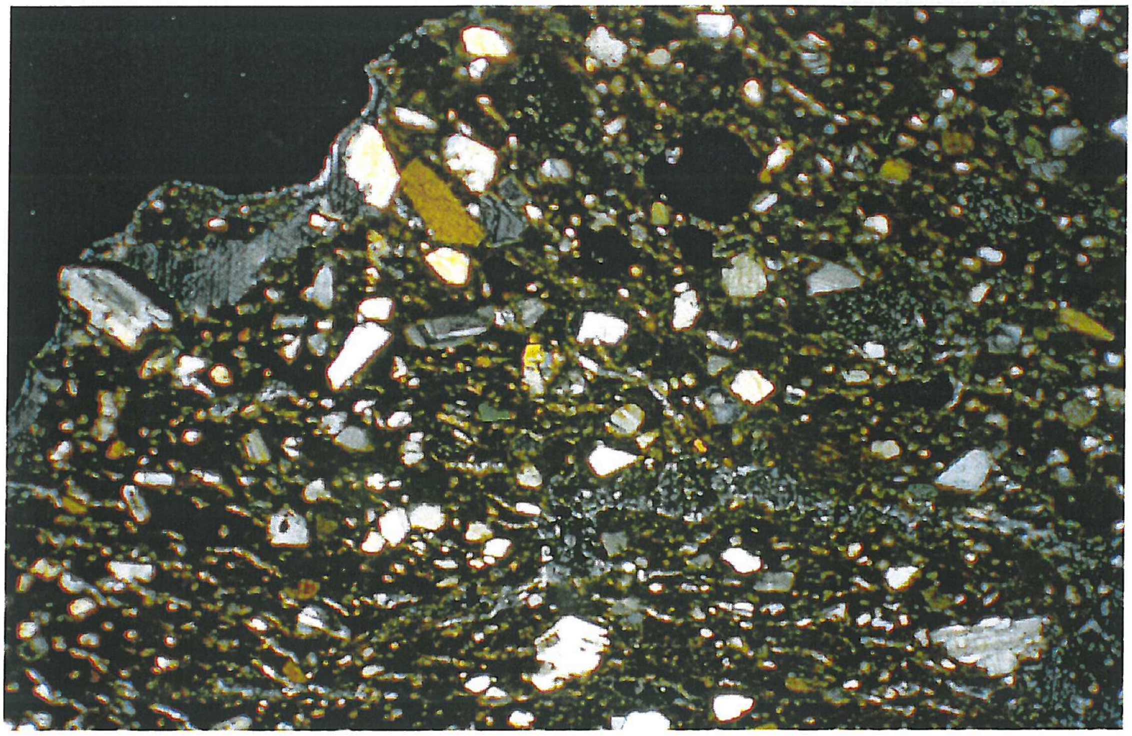

Figure 110: Thin section of sherd from Sulphur Ghut (scale x 40 cross polars)

8.6 Conclusions

A number of differences and similarities between the two samples of pottery collected from Coconut Walk and Indian Castle have been observed. A number of rim, base and griddle forms have been identified that are specific to either one site or the other. As has been mentioned on several occasions prior to this these unique forms tend to include only one or two sherds and so at this stage their significance is unclear. These forms may just represent variations of other forms that are represented in larger number and such slight variations might be a result of the mode of production, i.e. the pottery is hand made, rather than representing deliberately different forms of rims. At this stage it is enough to note their presence in the samples and further analysis and comparisons with other, larger, assemblages from Nevis and elsewhere may perhaps determine the extent of their significance.

The comparison of body sherds, both plain and decorated, from the two sites has shown that sherds from Indian Castle tended to be thinner than those at Coconut Walk. The difference in thickness of decorated sherds was particularly marked with a higher proportion of those from Indian Castle being thinner than those from Coconut Walk.

The types of rims found at Coconut Walk and Indian Castle were on the whole fairly similar. Although new forms individual to each site were identified the predominant rim groups at both these sites were the same except for group R9, which was less well represented at Indian Castle compared with Coconut Walk. There was no significant association between rim diameters and site for each of the main rim groups and neither was there any significant association between the thickness of rims and site. This would suggest that these rim groups are very similar and do not vary much according to site. This would also appear to be supported from the analysis of the smaller assemblages from other post-Saladoid sites on the island as the major rim types identified at Coconut Walk and Indian Castle are also found to dominate. Vessel forms are also similar with a large proportion of rim sherds originating from open vessels such as bowls and dishes. The picture that is emerging to date is one of perhaps a completely if not, predominantly, local production base for Nevis pottery.

The similarities in the types and quantities of rims recorded from each of the samples is also interesting, suggesting that the potters responsible for producing the pottery found at both the sites were perhaps in close contact with one another. Whether this means that pottery was produced at one central place and distributed to sites or the potters from individual sites were in close contact with one another cannot be determined at this stage. However if this degree of similarity can be confirmed between other sites on Nevis and between sites on Nevis and other islands this will have interesting implications in terms of suggesting perhaps a closer degree of contact between post-Saladoid people than previously thought.

The similarities in pottery fabrics both within and between the two sites further strengthens the impression of homogeneity in pottery production at Coconut Walk and Indian Castle. This apparent homogeneity perhaps hints that the preparation of the clay, and maybe even the sources being exploited, was hardly altered depending on the type of vessel being produced or during the course of pottery production through time.

It would appear, from the petrological work carried out, that all the sherds analysed from both sites were more than likely produced from clay resources located on Nevis. The range of inclusions identified in the post-Saladoid sherds bare remarkable consistency with the types of volcanic inclusions identified in the geological survey of the island. The case for local production is further supported by the similarities found between the post-Saladoid sherds and the sections taken from pottery produced from clay dug on Nevis. The differences discovered between the post-Saladoid sherds analysed from Nevis and those analysed from the neighbouring island of St. Kitts adds further weight to the argument. In the future it would be interesting for more petrological work to be carried out to determine if there are any discrete differences between fabrics and sites. These discrete differences might be recognised if the types of orthopyroxenes, clinopyroxenes and amphibole present were identified in more detail as well as possibly using point-counting to determine the exact frequencies of different inclusions.

It would also be interesting in the future to investigate whether the post-Saladoid pottery from Nevis is found on other sites in the Leeward Island. The presence of chert, which is not local to Nevis, at the Coconut Walk site would suggest that the inhabitants of Nevis were involved in some mechanisms of trade and exchange. It might well be that pottery was exported from Nevis rather than imported to it. However the aim of this research was to determine whether the pottery from Coconut Walk and Indian Castle was made from locally available resources and if not then whether any particular types of vessels appeared to be the focus of trade and exchange. The fact that all of the pottery seems to be of local origin has in turn answered this last question.

Chapter 9: Comparison of Nevis with other Leeward Islands

9.1 Introduction

The work carried out so far on the post-Saladoid pottery assemblages from Nevis has begun to characterise the nature of pottery production during this period of prehistory on the island. The questions this research has aimed to address have been specifically concerned with post-Saladoid pottery production on Nevis, however in order to place this work in its wider prehistoric context it is necessary to start to compare the Nevis pottery with pottery from other islands in the Leeward group.

During the post-Saladoid period a number of social, economic and political changes occurred in the Caribbean region, for example the emergence of chiefdoms, the differentiation between commoners and the elite and a rapid increase in population size. These changes are fairly well documented for the Greater Antilles however whether such changes also occurred in the Leeward Islands are not yet known at this stage.

Changes in the political, social and economic structure of cultures may have had an affect on other aspects of society such as the way in which food was procured or craft activities were managed. If this was the case then it might be possible to identify changes in pottery production, both temporally and spatially, that were a result of broader social, political and economic changes. In order to identify any such changes in pottery production through time it is necessary to first characterise the nature of production for the different prehistoric periods. The aim of this research has therefore been to begin to characterise the production of pottery during the post-Saladoid period on Nevis by focusing specifically on two of the islands' larger sites: Coconut Walk and Indian Castle. The recognition of similarities or differences between these post-Saladoid assemblages from Nevis and post-Saladoid assemblages from other islands may help in our understanding of some of the broader social, political and economic changes that occurred during this period.

Analysis of post-Saladoid pottery in the Leeward Islands is still very much in its infancy and although research is being carried out on post-Saladoid assemblages from a number of islands not much has so far been published. The work carried out by Hofman on the post-Saladoid assemblages of Saba is probably the most comprehensive published study of pottery production during this period in the Leeward Islands. The methodology used in this research to study the Nevis pottery is also similar in many ways to the methodology Hofman employed to study the Saban ceramics. Therefore the results obtained from her analysis of the post-Saladoid assemblages on Saba will be used to compare with the results so far obtained from my work on the Nevis material.

9.2 Summary of work carried out on Saba

The island of Saba is situated to the north west of Nevis and is also one of the islands that comprise the interior volcanic arc of the Leeward Islands (see Figure 13). Saba is one of the smallest islands in the Lesser Antilles and with a surface area of just 4.8 square miles it is much smaller than Nevis, which has a surface area of 40 square miles (Martin-Kaye 1969:190, 192). On a very clear day Saba can just faintly be seen from Nevis' leeward coast.

Hofman's research centred on six settlement sites situated in the north eastern part of the island. On the basis of stratigraphic and radiocarbon dating as well as from the nature of the pottery assemblages a chronological sequence has been established for the island and three periods have been defined (Hofman 1993:76). The earliest, and least well represented, period spans from AD 400 to 850 and two assemblages from the island, Spring Bay 1a and Kelbey's Ridge 1, date to this period (Hofman 1993:145). This period is thought to represent the transition from the more sophisticated pottery that characterised the Saladoid period on other neighbouring islands to the less well made and generally undecorated pottery that is typical of the post-Saladoid (Hofman 1993:157). The second period, thought to be a continuous development from the preceding period, dates from AD 850 to 1250/1300 and is represented by the Spring Bay 1b, Spring Bay 2, Spring Bay 3 and The Bottom assemblages (Hofman 1993:157). The pottery from this period tends to be coarser, less well finished and the use of decorated has considerably diminished (Hofman & Hoogland 1991:550). The third and final period of prehistoric occupation on the island dates from AD 1300 to 1450 and is represented by the Kelbey's Ridge 2 and Spring Bay 1c assemblages (Hofman 1993:148). These assemblages both contain traits that have been attributed to the Chican Ostionoid sub-series and it has been proposed that these sites may have been a peripheral settlement of one of the chiefdoms of the Greater Antilles (Hoogland & Hofman 1991).

The pottery from the second period on Saba seems to bear the most similarities with the pottery analysed from the post-Saladoid sites on Nevis. The pottery that dates to the second period on Saba (AD 850 to 1250/1300) is typically rather thick and crudely finished and there is a large amount of undecorated utilitarian ware (Hofman 1993:148). The four assemblages from Saba which date to this period are similar to one another in many respects although some minor variations between the sites has been discerned (Hofman 1993:145). The following discussion centres on these four assemblages from Saba.

9.3 Comparison of assemblages from Nevis and Saba

Vessels from the Saban assemblages tend to have a broad range of shapes with bowls and dishes with either simple or composite contours being most common (Hofman 1993:148). It is difficult to determine the full extent of the different vessel forms represented in the Coconut Walk and Indian Castle assemblages as the profiles of only a handful of vessels could be completely reconstructed. However it has been possible from a number of partial vessel profiles to get a feel for some of the forms present in the Nevis assemblages. For example there appears to be a dominance of open vessels, of varying sizes that are thought to be bowls or dishes, the contours of which are either simple (see figure 45 profiles 2 and 4 in chapter 6) or composite (see figure 45 profile 3 in chapter 6). A number of vessels also appear to be dishes and bowls with a more restricted orifice with either simple (see figure 45 profile 8 in chapter 6) or composite contours (see figure 45 profile 1 in chapter 6 and see Hofman 1993:65 for comparison). The variety of lip shapes identified in the Saban assemblages also appears to be reflected in the Nevis assemblages. The commonest lip shapes identified in the Saban assemblages is a rounded lip followed by inwardly thickened lip (Hofman 1993:138). The analysis of the assemblages from Nevis has followed a slightly different methodology to the Saban analysis and lip shape has been one attribute that has been used to define different rim groups on Nevis and therefore lip shape on its own has not been quantified. Many of the different rim types found within the Nevis assemblages do however have a rounded or inwardly thickened lip. The range of vessel orifice diameters is also fairly similar for both the assemblages from Saba and Nevis. The majority of vessels from Saba had an orifice diameter of between 21 and 30 cm (Hofman 1993:139) and the average orifice diameter for the major rim groups identified at Coconut Walk and Indian Castle fell between 20 and 25 cm. There appears to be a slight difference in the wall thickness of vessels in the assemblages from both the islands. The majority of vessels from Saba are between 6 and 8 mm thick (49%) and 42% of the vessels are between 9 and 11 mm thick. The trend is reversed for the assemblages at Coconut Walk and Indian Castle with 32% of vessels being between 6 and 8 mm thick and 43% between 9 and 11 mm thick. However it must be noted that vessel thickness was measured only for the rim sherds in the Saban assemblages and so just the thickness of rims from Nevis have been used as a comparison. It must be noted though that only the thickness of rims from the major rim groups identified in the Nevis assemblages were analysed and so this might explain the slight difference in results.

Decorated sherds account for between 0.4 and 2 percent of the entire Saban assemblages and the commonest decorative mode is that of incision followed by white on red painting (Hofman 1993:146). Two percent of the sherds from the Coconut Walk assemblage and 1.2 percent of the sherds from the Indian Castle assemblage were decorated. Incision was also the most common mode of decoration, however only one white on red painted sherd was found at Coconut Walk and none at Indian Castle. White on red painting is a typical decorative mode used in the Saladoid period and it might just be that this form of decoration was used for a longer period on Saba than Nevis. Or another explanation for the disparity could be in the nature of the assemblages, the material from the sites on Nevis was predominantly surface collected material and so sherds that were once painted might have been damaged due to their exposure. This however seems a little unlikely for a couple of reasons. Firstly if weathering had impaired the visibility of painted decoration amongst these assemblages then it would also have impaired the visibility of other surface treatments but this does not seem to be the case as treatments such as red slip and burnishing are fairly commonplace. Secondly the sherd from Coconut Walk which was painted came from the surface of the site, it therefore seems likely that the lack of white on red painted sherds is most probably due to the fact that this mode of decoration was not favoured by the post-Saladoid potters on Nevis rather than as a result of post-depositional processes.

The number of griddle sherds identified in the Saban assemblages tends to be far greater than those identified at Coconut Walk and Indian Castle. Both the number of griddle sherds and griddle rim sherds were recorded in the Saban assemblages, however only the griddle rim sherds were quantified separately in the Nevis assemblages. This was done because it was often very difficult to distinguish with great certainty griddle sherds from other body sherds due to the nature of the assemblages. The number of griddle rim sherds recorded from the Coconut Walk and Indian Castle assemblages was still comparatively small compared to the Saban assemblages. Two hundred and twenty three griddle rims were recorded from Spring Bay 1b, 92 from Spring Bay 3, 27 from Spring Bay 2 and 112 from The Bottom (Hofman 1993:144), whilst 27 griddle rims were recorded at Coconut Walk and only 20 at Indian Castle. The shape of the griddle rims was fairly similar in both the assemblages from Saba and Nevis with perpendicular rims being the most common in all assemblages. The range of griddle diameters and the thickness of the griddle cooking surfaces were also fairly similar.

The fabric analysis undertaken on the Saban assemblages and the results obtained were previously outlined in detail in Chapter 5. The vast majority of the Saba material was thought to have been produced from clay resources available on the island. This appears to be true for the Nevis assemblages as well as no evidence was found to suggest that the pottery was not made from resources available on the island.

Hofman has suggested that this second period on Saba has associations with the Mill Reef and Mamora Bay styles on Antigua as well as other complexes from Nevis, St. Kitts, St. Eustatius, Anguilla and St. Maarten (Hofman 1993:152). The association of the Saban material to these other complexes is based on similar radiocarbon dates as well as shared traits such as a low percentage of decorated wares, simplicity in design, vestigial use of white on red painting, inwardly folded or thickened rim lips and the use of red slip (Hofman 1993:153). Hofman has also found that there are quantitative and qualitative similarities both in vessel morphology and decoration between the pottery from The Bottom on Saba and Sandy Hill on the island of Anguilla (Hofman 1993:153).

Whilst there are a number of similarities between the assemblages from Saba and Nevis there are some differences. In particular no material has so far been identified in the Nevis assemblages that is comparable with the pottery that comprises the third period identified on Saba. The pottery from this third period on Saba, which dates to AD 1300-1450, strongly resembles pottery from the Chican Ostionoid sub-series which was at the time dominant in the Greater Antilles and Virgin Islands (Hofman 1993:156). It has been suggested that the site dating to this period on Saba may represent a peripheral settlement of one of the chiefdoms of the Greater Antilles (Hoogland & Hofman 1991).

9.4 Conclusions

Hofman has drawn a number of conclusions from her analysis of the pottery assemblages from the island of Saba. The lack of standardisation identified in the assemblages has led her to postulate that pottery production was being carried out at the household level (Hofman 1993:214). There is a similar lack of standardisation in the Nevis assemblages and I have suggested previously that a possible explanation for this could be that pottery was being produced on an infrequent basis. Hofman has also concluded that this pottery held a low symbolic value because there was a decrease in the amount of decorated wares and an increase in stylistic diversity (Hofman 1993:214). Hofman suggests that these changes could be a result of decreasing interaction over vast distances or that other items were being used as prestige objects or as a means of demarcating group affiliations instead of pottery during the post-Saladoid period (Hofman 1993:210)

Pottery is produced and used within a specific social, political, economic and symbolic context and potters will produce vessels in accordance with the demands placed on them by those contexts and their consumers (Sinopoli 1991:119). If the social, political, economic or symbolic context within which pottery is produced changes or the demands of the consumer changes then there may well also be changes in the type and style of pottery being produced. It would therefore seem possible that the transition from the highly decorated well made Saladoid pottery to the cruder, plainer pottery of the post-Saladoid may be a result of altering demands of the consumer due to changes in the social, political, economic and symbolic context within which pottery production is taking place. On the Greater Antilles changes in the political and social organisation of societies takes place with the eventual emergence of chiefdoms during the late post-Saladoid period. Whether such complex social and political changes occur between the Saladoid and post-Saladoid periods in the Leeward Islands is unclear at this stage. However the analysis of pottery production through time may well help in our understanding of broader social and political change. The post-Saladoid pottery and the plain Saladoid pottery in the Leeward Islands has received little attention compared to the decorated Saladoid pottery yet the analysis of this material is vital in order to provide a more complete picture of why and how pottery production changes during these periods with the aim of contributing to our understanding of broader changes in society through time.

Chapter 10: Conclusions

To date the analysis of prehistoric pottery in the Caribbean has been largely focused on answering questions about chronology and this has mainly been accomplished through creating vessel typologies and the analysis of the types of decoration applied to pots. This work has been extremely important in laying the foundations upon which other discussions about pottery production can be built. It is therefore time that Caribbean archaeologists move beyond using pottery solely as a means of discussing chronology and start to initiate discussions focused more on the people who manufactured the pottery, how it was used within society, and how that has changed through time. New approaches and new ways of discussing the pottery found at prehistoric sites have been initiated in some regions, most notably perhaps is the work of Hoffman on the island of Saba (Hoffman 1993) and her continuing programme of research into pottery production on the island of Guadeloupe (Hoffman pers. com.).

The aim of this research has been to examine the production of post-Saladoid pottery at two sites, Coconut Walk and Indian Castle, on the island of Nevis with the aim of addressing the following three broad questions:

- Is the pottery found at Coconut Walk and Indian Castle on the island of Nevis manufactured from locally available resources?
- If no then where did the pottery originate from and was the movement of pottery vessel specific?
- To what extent are these assemblages from Nevis similar or different to one another?

In order to address the first two questions it was necessary to examine the fabrics of the sherds collected and identify the inclusions found within these sherds. The vast majority of sherds were gritted with fragments of volcanic rock. These rock fragments were hard to identify macroscopically and therefore a sample of sherds were thin sectioned. Due to the fact that there appeared to be little obvious differences in the types of inclusions found the identification of detailed fabric groups by eye was not attempted as it was thought to be too laborious for the amount of useable information it would yield. Initially sherds were recorded as containing igneous or sedimentary inclusions as this reflected the major geological division found in the Leeward islands and it meant that any strikingly obvious non-local fabrics could be identified. During this initial examination by eye none of the sherds recorded from either the Coconut Walk or Indian Castle assemblages appeared to contain any obvious sedimentary inclusions. This therefore led to the assumption that the sherds analysed were most probably being manufactured from material found on volcanic islands.

A programme of thin sectioning was undertaken on a sample of rim sherds from each of the sites. Rims were selected from different rim groups and wherever possible rims with a measurable diameter were selected. This was done in order to maximise the information known about particular sherds because if it was found that a portion of pottery was being produced from material that was not local to Nevis then one of the questions asked was whether the movement of pottery was in fact vessel specific. The sections analysed from both sites appeared to display a certain level of conformity. The slides were generally characterised by a groundmass of extremely abundant and predominantly poorly sorted inclusions with discrete inclusions of plagioclase feldspar, amphibole and pyroxene. This range of inclusions is commonly found in dacite, the local volcanic rock of Nevis. Indeed, fragments of dacite can also be identified in thin section. These results would therefore suggest that potters were most likely using locally available clays to produce their vessels. Further more detailed analysis may yield more information. For example it may be possible to determine more discrete differences between fabrics, which may help in locating more specifically where on the island the clay used by potters originated. More detailed analysis may also be used to determine whether the pottery found at Coconut Walk and Indian Castle was likely to have been made from the same or different clay sources. It has not been possible within the scope of this research to tackle these topics, however the results this work has yielded have been an important starting point in order for further discussions about pottery production to take place.

The third area this research aimed to address was the extent to which the assemblages from Coconut Walk and Indian Castle were similar or different to one another. A number of rim, base and griddle forms were identified that appeared to be specific to either Coconut Walk or Indian Castle. The significance of these unique forms is at this stage unclear as they tended to only be represented by one or two examples. These forms may just represent slight variations of other forms that have been identified in larger numbers at the sites. Such slight variations may be a result of the mode of pottery production rather than a conscious effort on the behalf of the potter to use a different rim or base form. The pottery was all handmade and as has been shown through the statistical analysis there appeared to be little standardisation between certain attributes of the vessels analysed. It may, therefore, be plausible to infer that the unique forms identified were a result of a non-standardised mode of pottery production, rather than deliberate intention. This may of course not be the case however and it would be necessary to compare these forms with material found at other post-Saladoid sites on Nevis and at contemporary sites elsewhere in the Leeward Islands in order to determine whether these rim, base and griddle forms can in fact be treated as separate form groups.

Another difference noted between the two assemblages concerned the thickness of plain and decorated body sherds. A comparison of body sherds from both sites showed that those analysed from Indian Castle tended to be thinner than those found at Coconut Walk. The difference in thickness of decorated body sherds was particularly marked with a higher proportion of sherds at Indian Castle being thinner than those at Coconut Walk.

A number of similarities between the two assemblages have been identified. The picture that appears to be emerging from this analysis is that the pottery at both sites was most probably being produced from locally available resources on the island of Nevis. The assemblages were also dominated by similar open vessel forms such as bowls and dishes, presumably used in the preparation and consumption of food and drink. Griddle sherds were also identified at both sites and these griddles were most likely utilised in cooking cassava bread and perhaps for grilling other types of food. The rim forms identified at both sites were on the whole fairly similar, with of course the exception of a few forms which were individual to each site. Apart from rim group R9, which was underrepresented at Indian Castle, the predominant rim forms were the same at both sites. It has become apparent from this work that rim form did not necessarily equate to a particular type of vessel at either Coconut Walk or Indian Castle. This is highlighted by the lack of association between attributes such as rim form and rim diameter, or rim form and vessel thickness. It could be expected that if there was a relationship between rim form and vessel type, i.e. cooking vessels had a particular type of rim that was different to the type of rim applied to serving dishes, then there would be more of an association between rim form and rim diameter or rim form and vessel thickness. There are perhaps two possible scenarios to explain this. Firstly it could be that pottery was being produced infrequently at these sites and therefore every time a potter made a certain type of vessel its size might vary and over time the size range of a particular vessel type such as a serving dish or cooking pot might become quite marked. This could therefore mean that the same type of rim form was always used for certain types of vessels but a lack of standardisation as a result of infrequent potting has led to the lack of association between rim form and rim diameter or thickness found in the assemblages. The second conceivable scenario is that potters applied a number of different rim forms to their pots but the application of a certain rim form was not dependant on the size or type of vessel being produced. In order for these ideas to be investigated further it would be necessary to make further comparisons with material from other sites that might have more complete vessel profiles.

There was also no significant association found between rim diameters and site or rim thickness and site. This would perhaps suggest that these rim groups were fairly similar and varied little between the two sites. The similarity in types and quantities of rims recorded from each of the samples and the fact that the sites are geographically near one another is interesting. It could be suggested that the potters responsible for producing the pottery found at Coconut Walk and Indian Castle were perhaps in close contact with one another. Whether this meant that pottery was produced at one central location and distributed to other sites or that the potters at individual sites were themselves in contact with one another cannot be fully determined at this stage.

In order to place the work carried out on the post-Saladoid assemblages from Nevis in its wider context it was necessary to begin to compare the results obtained with pottery from other islands in the Leeward group. The post-Saladoid pottery from Saba formed the basis of this comparison, as Hofman's work is probably the most comprehensive published study of pottery production in the Leeward Islands for this period to date. A number of similarities were identified between the assemblages from

Saba and Nevis. Most notably are the similarities in rim type and vessel forms and the fact that the pottery found on both islands appears to have been predominantly produced from raw materials that were locally available. It has only been possible to compare the similarities and differences between the assemblages from Saba and Nevis at a fairly basic, and subjective, level and it has therefore not been possible to draw any firm conclusions as to the significance of these similarities and differences. It would be necessary to carry out some statistical analysis in order to provide a better comprehension of the similarities and differences between the assemblages from the two islands. This is obviously not possible to do from the published data alone and would require comparisons to be made between the original data sets for the assemblages from both islands. This is far beyond the scope of this work but would be an area that would definitely benefit from further research.

A number of social and political changes took place during the post-Saladoid period in the Caribbean region. These changes are well documented for the Greater Antilles but it is as yet unclear the extent to which such changes may have occurred in the Leeward Islands. Such socio-political changes may well have had an impact on other aspects of society such as pottery production. If this was the case, it would be necessary to understand the changes in pottery production through time in order to discuss broader socio-political changes. The decorated pottery from the Saladoid period has already received much attention to date, therefore it is necessary to analyse both the plain Saladoid pottery and the post-Saladoid pottery, in order to increase our understanding of changes in pottery production through time in the Caribbean region. The aim of this research has therefore been to begin to understand the nature of pottery production during the post-Saladoid period on the island of Nevis.

This research obviously represents an initial step in analysing the production of pottery during this period on the island however there is much scope for further work. A continuation of research on the sites of Coconut Walk and Indian Castle as well as other archaeological sites on Nevis will determine the validity of some of the tentative conclusions drawn from this research. The analysis undertaken so far at these sites has contributed greatly to our understanding of post-Saladoid pottery production on Nevis and it is hoped the information gathered from this programme of work will provide a sound basis for further research.

Appendix 1

Thickness Codes:

<5 mm = 1
5 - <7 mm = 2
7 - <9 mm = 3
9 - <11 mm = 4
11 - <13 mm = 5
13 - <15 mm = 6
15 - <17 mm = 7
17 - <19 mm = 8
20 - <22 mm = 9

Surface Treatment:

BU = Burnished
BU; SL = Slip that has also been burnished
SL = Slip
SM = Smoothed

Decorative Techniques:

IC = Incision
TO = Tooled
WOR = White on Red painting
FT = Finger tipping

Usewear Evidence:

SO = Sooting
RS = Residue
BR = Burnt residue
AB = Abraded

Position on Vessel:

1 = All over
2 = Exterior surface
3 = Interior surface
10 = Top of Rim
13 = Shoulder
14 = Neck
15 = Exterior edge of griddles
16 = The break of the sherd
17 = Rim / neck join
18 = Exterior surface, underneath shoulder

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