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Stone artefact production and exchange among the Northern lesser Antilles
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1 Introduction and research Objectives

1.1 SHORT BACKGROUND OF THE RESEARCH

The first impetus to the work described in this dissertation came during Masters fieldwork at two pre-Columbian sites on St. Martin in 1993 (Knippenberg 1995; Knippenberg *et al.* 1999; Nokkert *et al.* 1999). With three fellow students I did a site-survey at the Preceramic Age site of Norman Estate and the Saladoid site of Anse des Pères. After our interests were evaluated, we decided that I should analyse the lithic artefacts that were found. During this analysis I noted the presence of a large amount of artefacts made of chert materials not originating from St. Martin. Intrigued by this finding I initiated a preliminary study to identify the provenance of this type of stone. To my surprise I discovered that very little had been done on this topic in Caribbean archaeology, despite the often rich lithic artefact assemblages found. Fortunately some years prior to my St. Martin investigations, a team from Leiden University had excavated at Long Island, a small island off Antigua's northern coast, where significant amounts of natural flint material could easily be exploited (Van Gijn 1996). As numerous boxes of flint boulders and artefacts collected from the Long Island were stored at Leiden University, I was able to become very well acquainted with this variably coloured chert material. Visual similarity between this material and many of the artefacts excavated on St. Martin, encouraged me to find a method that could further confirm the Long Island origin of the St. Martin items. Applying geo-chemical techniques I was indeed able to confirm the close similarity. This, in turn, proved that Long Island flint had been transported over approximately 175 km from Antigua to its destination on St. Martin, suggesting exchange between the islands (Knippenberg 1995, 1999a).

Over the following years I discovered that many more sites in the region produced Long Island flint and that the St. Martin case was not the exceptional case. This persuaded me, supported by several colleagues working in the region, to set up a broad study aimed at the understanding of flint distribution and exchange in the northern Lesser Antilles and beyond. Fortunately, but totally unexpected, it appeared that the island of St. Martin itself hosts two other important sources for stone materials, namely a fine grey-green mudstone and a multicoloured conglomerate, calci-rudite. My initial archaeological work there had enabled me to become familiar with these materials but I was initially unaware of their significance within the surrounding area. Therefore the regional scope of the present research provided room for the study of the distributions of these materials as well and this dissertation is the outcome of this investigation. Before discussing the objectives and methodology followed, I will first present some issues in Caribbean archaeology, which are relevant for a proper understanding of my research.

1.2 SHORT HISTORY OF CARIBBEAN ARCHAEOLOGY

The history of Caribbean archaeology shows that it was until recently dominated by a cultural-historic approach originally initiated by Professor Irving Rouse from Yale University. From the late 1930s onwards, Rouse developed a systematic line of research, focussed primarily on pottery typology (Rouse 1939, 1954, 1964, 1965, 1986, 1992). Armed with a thorough methodology, which was then very innovative within American archaeology (Willey & Sabloff 1974), Rouse conducted numerous small scale excavations in cooperation with local archaeologists on many different Caribbean islands and the adjacent South American mainland (Rouse 1939, 1941, 1947, 1952, 1974; Rouse & Alegria 1990; Rouse & Cruent 1963; Rouse & Morse 1999). Rouse's work resulted in the construction of a chronological framework for the whole Caribbean region, which he continually refined until recently (Rouse 1992; Rouse & Morse 1999).

During the 1970s attempts were made to change the attention in Caribbean Archaeology from cultural chronology to other research objectives. Although some other lines of research had been previously applied, for example, subsistence studies, most of this research was still indirectly or directly related to characterising cultures and relating them to a chronological framework. Some new lines of research, however, had a more ecological, adaptive objective. For example, systematic surveys on an island level were conducted to determine adaptive changes through time (Goodwin 1979; Watters 1980). Also, midden material, which was formerly used to define cultural complexes in most cases, now became the subject to objectives with a more ecological adaptive emphasis that aimed to reconstruct subsistence strategies (e.g. Reitz 1989; Wing 1991; Wing & Reitz 1982).

From approximately the 1990s onward, research has become more focused on understanding the social-political organisation of the Amerindian societies that inhabited the different islands (Curet 1992, 1996; Crock 2000; Haviser 1991; Delpuech & Hofman 2004; Keegan 1992). The present study aims to contribute to this recent investigation of social-political organization by studying inter-island exchange. Before I go on to outline my research objectives, I need to first discuss the current state of affairs related to different views about Amerindian social-political organisation in the region. In addition, I will specify how the study of exchange contributes to this line of research.

1.3 SOCIO-POLITICAL ORGANISATION IN CARIBBEAN PREHISTORY: CURRENT STATE OF AFFAIRS

1.3.1 *Early Ceramic Age societies*

The pre-Columbian period in the Caribbean is generally divided into two major periods: the Preceramic and Ceramic Ages (Keegan 1994, 2000). The earlier period, which is outside the range of the present study, witnessed the first occupation of the Caribbean islands by nomadic foragers, roughly dated from 5000 to 500 BC (Keegan 1994; Rouse 1992). The first arrival of horticulturalists who migrated from the South American mainland, marks the end of the Preceramic Age. This second major migration did not pertain to the whole Caribbean at once, but initially only involved the populating of the Lesser Antilles, the Virgin Islands, and the eastern part of Puerto Rico (Haviser 1997; Hofman 1993; Keegan 2000; Rouse 1992). The remaining part of the Greater Antilles continued to be occupied by Preceramic Age residents, who were overtaken or driven toward the western end of the archipelago during the following centuries (Keegan 2000; Rouse 1992) (figures 1.1 and 1.2).

These first horticulturalists originated in the Orinoco delta, and entered the Caribbean islands through the southern Lesser Antilles. They quickly moved northwards, using the chain of islands as stepping-stones. Early dates from Trants on Montserrat, Hope Estate on St. Martin, and Fond Brulé on Martinique place this migration around 500 BC. Initially, only the relatively high fertile volcanic islands were settled, leaving many of the smaller and low-lying limestone Antilles vacant.

Up until the early 1980s all sites belonging to this so-called Early Ceramic Age were grouped under the Cedrosan Saladoid series, the Caribbean branch of the Saladoid culture related to the Ronquinan Saladoid complex on the South American mainland. The pottery of the Saladoid culture was well-made and characterized by typical use of White-on-Red painted decoration and very characteristic modelled adornos (Hofman 1993, 1999; Rouse 1992). However, since the excavations at La Hueca on Vieques, where a distinctive style of pottery was discovered that had Zoned-Incised-Crosshatching and dog shaped adornos, a serious debate about the cultural and social interpretation of this difference has developed (Oliver 1999). The archaeologists working at La Hueca, Louis Chanlatte Baik and Yvonne Narganes Storde, ascribe the distinctive La Hueca ceramics, which were found spatially separated from Cedrosan ceramics at the same site, to an earlier migration into the Antilles by a culturally distinct group of people as compared to the “Saladoid” people. However, Rouse and others see the producers of the “La Hueca” ceramic style as a distinctive social group within the larger Saladoid culture (Chanlatte Baik & Narganes Storde 1984; Rouse 1992). More recent excavations at sites producing Huecan ceramics did not provide a clear solution to this problem. In the Lesser Antilles all sites yielding Huecan type ceramics, such as Hope Estate, Morel, and Trants, also produced Saladoid ceramics in stratigraphically indistinguishable deposits. However, at the Punta Candelero site on the main island of Puerto Rico the Huecan deposits were again separated from the late Saladoid or Cuevas phase deposits (Chanlatte & Narganes 1984; Hofman 1999, 2001; Reed & Petersen 2001; Rodríguez López 1991; Watters & Petersen 1999). These new findings have reinforced the original contrasting viewpoints rather than bringing scholars together in a theory, that explains these different situations (Oliver 1999).

Despite this debate about the cultural classification of Early Ceramic Age settlers, it is generally agreed that their socio-political organisation was on an egalitarian tribal level without hereditary stratification. This is suggested by absence of burial differentiation, relatively constant settlement sizes, and wide distribution of supposedly valuable artefacts, indicating non-restricted availability (e.g. Curet 1992; Siegel 1999). Notwithstanding this view, some scholars have emphasized certain features of Early Ceramic Age society that deserve additional mention. Boomert (2000, 2001a), for example, pleads for the existence of Big-Men, achieved leaders with some regional power, because in his eyes the wide distribution of semi-precious stone valuables is suggestive for frequent gift-giving activities, which would have taken place between competing Big-Men living on the different islands.

Hoogland (1996) and Siegel (1989) have adopted the term “complex tribe” to more precisely describe the situation. This term was first used in an unpublished paper by Hoopes (1988). It comprises a situation in which societies “conduct



Figure 1.1. Map of the Caribbean.

communal activities, have status variation, but no centralized authority” (Siegel 1989, 202). Although burial differentiation and settlement hierarchy might be absent, they argue that the fast spread among the islands and relatively long uniformity in pottery decoration point to a society that was more complex than the tribal level (Hoogland 1996, 9). Thus, Boomert, as well as Hoogland and Siegel, stress the communal, connected character of Early Ceramic Age society, thereby contrasting it with the autonomous role that is usually attributed to villages in tribal societies (e.g., Carneiro 1998). Whether this communal character opened room for local village leaders to become regionally significant, in my opinion is not necessarily proven by the existence of a long-distance exchange network. Keegan *et al.* (1998) and Watters (1997a) argue that during first colonization this long-distance exchange network may have been crucial for the survival of different widespread villages in new environments. In this view, exchange functioned more as a means of bringing people together for purposes related to cooperation, rather than providing a platform for competing village leaders aiming at the acquisition of regional leadership.

1.3.2 Late Ceramic Age societies

From around AD 600 onward the typical traits of Saladoid pottery begin to disappear and new styles evolved. It is generally agreed that the transition toward new styles was a local process of acculturation and evolution, exhibiting regionally distinct developments. It did not involve a new migration of peoples from outside areas (Hofman 1993; Hofman & Hoogland 2004; Keegan 2000). A detailed discussion of these local developments for the entire Caribbean archipelago is too extensive and too complex for my present purposes and in some cases they are not well understood (e.g. Haiti). For the present research I



Figure 1.2. Map of the Lesser Antilles.

have specifically restricted myself to the northern Lesser Antilles and the eastern Greater Antilles.

Regarding post-Saladoid developments, the Lesser Antilles are sub-divided into the southern Windward Islands, and the northern Leeward Islands, with the island of Guadeloupe marking the border between the two. This sub-division largely results from the work of Rouse (1992). Rouse notes that the southern islands experienced influence from the Barrancoid culture during late Saladoid times. This culture replaced the Saladoid culture in the Orinoco delta. A “modified” Saladoid sub-series arose, and it was in turn, replaced by the Troumassoid series, which lasted till around AD 1000. The Suazoid series represents the latest development in this southern region after AD 1000.

Data from the northern Lesser Antilles were relatively more limited at the time of Rouse’s publication (1992) of his major overview. He saw this area as an eastern periphery under the influence of the Ostionoid series that arose on Puerto Rico after the Saladoid period. Recent investigations by Hofman on pottery styles in this northern region, however, revealed a more dynamic picture in which independent developments occurred, and style boundaries were somewhat fluid and changing (Hofman 1993; Hofman & Hoogland 2004). In the first place, Saladoid pottery style persisted much longer on some of the western islands in this area than elsewhere. Late Saladoid sites have been identified on St. Eustatius, Saba, Anguilla and St. Martin (Hamburg 1999; Hofman 1993; Knippenberg 1999b; Knippenberg *et al.* 1999; Versteeg & Schinkel 1992). Contemporary with this persistence, the more eastern islands of Antigua and Guadeloupe experienced local changes into post-Saladoid styles, called Mill Reef (Rouse 1992; Rouse & Morse 1999).

After AD 900, local post-Saladoid pottery complexes had completely replaced the Saladoid style, although in some cases more regional affiliations with the southern Troumassoid and eastern Elenan Ostionoid are noticed. The final period of indigenous occupation displays some marked influences and intrusions from outside. Hofman and Hoogland reported the discovery of a Chican Ostionoid site at Kelbey’s Ridge 2 on Saba, which appears to be affiliated with the Boca Chica style from Hispaniola. They argue for incorporation of Saba within the Greater Antilles interaction sphere (Hofman 1993; Hoogland & Hofman 1999; Hoogland 1996). More to the southeast two sites were identified on la Désirade producing a pottery style not known within the local area, suggesting foreign intrusions from the south, possibly the South American mainland (De Waal 1999a, 2006.; Hofman 1999; Hofman *et al.* 2004).

Within the Greater Antilles, from the initially settled region in the eastern part of Puerto Rico, horticultural communities slowly started to occupy the western islands, at which time Preceramic groups disappeared. Whether this process involved acculturation, assimilation, hybridisation, or removal of the latter groups is still debated (Keegan 2000). The existence of proto-agricultural complexes on Cuba and Hispaniola contemporary with the Saladoid groups favours an acculturation model. From relatively a lot of research on Puerto Rico we know that the Saladoid series evolved into the Ostiones series after AD 600 on that island. From this period onward, expansion of Ostiones groups occurred toward the western islands, evidenced by small settlements on Hispaniola, Jamaica, Cuba and the Bahamas. Within the Greater Antilles, the Ostiones series is generally divided into four sub-series: Elenan, Ostionan, Meillacan and Chican (Hofman 1993; Petersen *et al.* 2004). The first two evolved out of the late Saladoid Cuevas style in the eastern and western part of Puerto Rico, respectively. The third evolved around AD 800 out of the western Ostionan sub-series, and spread towards the western Greater Antilles. Chican Ostionoid represents the latest development, first appearing around AD 1200 within the Dominican Republic, from where it spread into Puerto Rico and the Virgin Islands.

Regarding the socio-political organisation during this later period of Amerindian occupation, our knowledge was initially derived from historical documents written by the Spaniards directly after the discovery of the New World (Morosco 1981; Wilson 1990). There they first encountered the Taínos. From the writings of Columbus and later travellers it became clear that the Greater Antilles were divided into different *cacicazgos*. These were stratified polities under the reign of an ascribed leader, in the person of a *cacique*. The island of Hispaniola apparently hosted the most powerful and important polities in the region (Wilson 1990). It is now generally agreed that these Greater Antilles *cacicazgos* can be regarded as chiefdom type of societies.

Archaeological evidence is building up that supports the historical data with regard to the socio-political organisation of Taíno society (Curet 1992, 1996; Curet & Oliver 1998; Siegel 1996, 1999). One of the most obvious cases is formed by the appearance of a clear site hierarchy and site functional variability starting during the early Ostiones period (Curet 1992). This period also shows the first evidence of ball-court sites, which clearly stand out from the regular settlement sites that were characteristic throughout the preceding Saladoid period (Alegría 1983). The ball-court sites, which become increasingly larger over time, are interpreted as regional centres, where leaders assembled the people living in small hamlets surrounding these central places for ritual, political and social activities (Oliver 1999; Siegel 1999).

There has been a recent increase in archaeological research centred on this topic. The focus of attention has shifted

from an emphasis solely on the ball courts to the social environment related to these ball-courts and the forces that led to the development of socio-political stratification (Curet 1992, 1996; Curet & Oliver 1998; Oliver 1999). During the late 1980s, Antonio Curet (1992) initiated a regional archaeological project with the aim of determining the nature of these forces. Curet focussed on one variable: population pressure. Population pressure is often considered within archaeology as (one of) the driving force(s) behind socio-political evolution. By showing that the population in the valley of Maunabo in southeast Puerto Rico never exceeded the carrying capacity during the Ostiones and later periods, Curet argued that population growth was not the prime mover by which people reorganized themselves into socially and politically different relations. After having suggested that, he hypothesized for a more politically influenced scenario, in which local chiefs modified existing cosmology with the aim of improving and maintaining their own position and that of their heirs (Curet 1992, 1996).

In the Lesser Antilles we are much less informed by the Spanish documents and we essentially have none for most islands. Based on the accounts of the Taínos, the Spaniards divided the Caribbean region into two areas, with the Greater Antilles including the Bahamas and the Virgin Islands as the region where the Taínos lived on the one end, and the Lesser Antilles, inhabited by hostile Island Caribs on the other end. Not much is known about these supposedly fierce Island Caribs. In particular, for political reasons the Spaniards refer to them as aggressive and more importantly, as cannibals. This designation enabled the Spanish to legally enslave these peoples, as they were not believed to be able to ever become Christians (Sued Badillo 1992).

Unlike the information on the Taíno *cacicazgos*, hardly anything is known about the socio-political organisation of the Caribs in the Lesser Antilles. Consequently statements regarding this subject have remained vague, and the area often was seen as a peripheral in relation to the Greater Antilles, thereby suggesting that society never surpassed tribal level. I think that the French documents describing the Island Carib inhabitants of some of the Lesser Antillean islands, written more than a century later, have often contributed to this picture, as they describe small-scale egalitarian societies there (Breton 1978; Moreau 1994). In the light of the considerable time period that elapsed between the first Spanish arrival and the writing of these French documents, it can be questioned whether these latter sources are reliable when attempting to reconstruct pre-Columbian socio-political organisation in the Lesser Antilles. The Spanish occupation of the Greater Antilles and enslavement of its local population not only had a dramatic effect on the Taínos themselves. The Taíno became culturally extinct within 50 years after Columbus and the Spanish first set foot on the islands. However, they also had a considerable impact on the surrounding region, because as a consequence of the disappearance of local work-power, the Spanish raided the Lesser Antilles and the northern South American coast in search of new slaves (Sued Badillo 1992). This must have resulted in significant depopulation of these regions, totally altering the existing socio-political situation.

As argued in the introductory paragraph, until recently archaeological research has not been able to make a significant contribution to the understanding of socio-political developments in the Lesser Antilles for the period after the disappearance of the Saladoid culture. Recently, however, this line of research has received more attention. Jay Havisser (1991) was one of the first to opt the existence of a lesser chiefdom in the Anguilla – St. Martin region along with the larger polities of the Greater Antilles. He based his interpretation on the presence of large settlement sites and a regular exchange network between these islands involving the distribution of various stone materials. Initially Hoogland questioned this conclusion arguing that the very limited archaeological evidence collected from this micro-region did not yet provide a solid basis for this interpretation related to the development of social complexity. In contrast, Hoogland concluded on basis of his own work on Saba that there was no evidence of hereditary leadership, and that society remained at a tribal level, oscillating “between both extremes in the range of tribal social organization” (Hoogland 1996, 220).

Very recently, Crock (2000) brought the concept of chiefdom again to the foreground, however, when he concluded from his excavation work on Anguilla that this island formed the centre of multi-island chiefdom in the Lesser Antilles. He showed that a number of sites on Anguilla differed in their artefact inventory, in particular with regard to high status items, exotic materials, and subsistence related artefacts. From this he argued that these sites had differential access to resources suggesting stratification. Moreover, he noted that Anguilla hosted some of the largest sites in the near region, signifying its central position.

The discovery of a similar large site at Anse à la Gourde, along the northern coast of Grande Terre (Guadeloupe), displaying a similar high status artefact inventory, did not lead Hofman and Hoogland (2004) to reach the same conclusions. Although they see that differentiation is becoming more evident between sites, they still did not identify conclusive evidence of hereditary status differences, one of the important characteristics of a chiefdom society. The burials found at the site suggest complex and differential rituals, but lack clear stratification in burial gifts. Moreover, Anse à la Gourde itself may be a large site seen within a composite regional perspective, in absolute size, but more importantly in absolute number of

inhabitants during the different occupation phases it may be considered as a moderate village, not hosting more than a small number of houses.

This short introduction clearly shows that viewpoints regarding socio-political organisation within the region display considerable agreement when examining the egalitarian level attributed to the society of the first agriculturalists within the region, as well as to the chiefdom structure of Taíno society on the Greater Antilles prior to the arrival of the Spanish in the region. Controversy, however, exists surrounding the developments during post-Saladoid times on the Lesser Antilles, in particular the northern region. The debate mainly focuses on the question whether society reached a chiefdom level or it remained egalitarian.

1.4 SOCIO-POLITICAL ORGANISATION: TRIBAL VERSUS CHIEFDOM SOCIETIES

Before I continue with clarifying to what extent this study of exchange may contribute to this debate, let me first comment on what is exactly meant by “chiefdom” society and “egalitarian” society. An important volume edited by Redmond (1998a) recently appeared, which specifically relates to the change from egalitarian societies to chiefdoms in the Americas. This work, in particular, is important to the present study since it describes cases within the culturally related region of the Amazon. In this work, Spencer (1998, 105) defines a chiefdom society as “a human society that has centralized political authority and institutional social status differentiation but lacks an internally specialized central government”. Despite an emphasis on social stratification in this definition Carneiro sees ranking only as an epiphenomenon of chiefdoms and not its central core. “A much more fruitful approach in characterizing a chiefdom is to look at its component units - a multiplicity of villages - and at the political means by which these villages are organized and integrated.” So in Carneiro’s eyes chiefdoms are rather political entities more than ranked societies. This is different from egalitarian tribal society, where village autonomy still plays an important role and that exhibits “a nested arrangement of consensual decision making” (Redmond 1998b, 3).

In Redmond’s volume considerable attention is paid to the trajectory from egalitarian societies to the development of chiefdoms. The contributors, therefore, introduce the concept of “chieftaincy” to define the intermediate situation. It is considered as the more general equivalent of the Melanesian Big Man concept, which is abandoned because of its strong cultural connotation. Redmond (1998b) following Johnson (1982, 402-3) defines the chieftaincy as “a situational hierarchy occurring from time to time among nonhierarchical, uncentralized tribal societies”. “Thus, the chieftaincy represents an emergent simultaneous hierarchy in which an achieved leader exercises hierarchically differentiated decision-making functions, albeit on a temporary basis”. This situation is further illustrated in this book by cases among Amazon societies, in which strong village leaders are able to become regionally renowned and exercise control over a multi-village assemblage. Redmond further argues that if members of the leader’s lineage are able to succeed him during the following generations and continue the regional hegemony, the path to a chiefdom is set.

It is evident from this short discussion of growing complexity from tribal towards chiefdom societies, that village autonomy versus regional centralization is an important distinction, which characterizes both extremes in this particular case. In relation to the study of exchange, which is the primary focus of the present work, this forms an interesting perspective, as these two cases primarily speak of changing inter-village relationships. Therefore, as part of a larger research project in which inter-island interaction is being studied from three different perspectives - with style affiliation and settlement patterns representing the other two besides exchange (De Waal 2006, Hofman & Hoogland 2004) - the following chapters are devoted to study of stone material distribution as a means of understanding inter-island exchange within the northern Lesser Antilles. The derived exchange patterns may form a valuable contribution to a better understanding of inter-village relationships.

1.5 STUDY OF EXCHANGE: AN ANTHROPOLOGICAL PERSPECTIVE

Since the important work of Marcel Mauss (1990), first appearing in 1925, it has become clear that in non-western societies exchange in general has a different form and plays a different role than exchange in the capitalistic world. Through the analysis of agonistic and non-agonistic gift exchange rituals among the cultures of the American Northwest and the islands of Melanesia and Polynesia, Mauss clearly showed that exchange should not be merely considered as an economic relation, but that it is embedded in all aspects of society, including social, political, economic, as well as religious aspects. This work and later studies clearly highlighted some of the features that distinguish these gift exchange acts from exchange commonly

found in Western (capitalistic) society. One of the most basic differences is that within gift exchanges the relationship between the persons exchanging is at stake, and not necessarily the items being exchanged, although they are often much valued too. In essence, these objects serve the goal of pleasing the other in the non-agonistic forms of exchange, or flattening the other in the agonistic forms of exchange. Given the important role attributed to the personal relationship, gift exchanges result in long lasting bonds between exchange partners. Furthermore, as the items merely function to please or beat the other, they do not necessarily represent economic value, but often have strong personal, religious, or historical connotations. Therefore, it is seen that the act of exchange itself occurs on special and important occasions, during which often large groups of people are assembled, and witness a sequence of acts involving highly normative behaviour, where ritual, dance, and feasting play an important role.

This is in sharp contrast to the essentially economic role fulfilled by exchange in capitalistic Western society, where the items form the main purpose of the transaction. Furthermore, both exchange partners in such cases do not necessarily have long lasting relationships. These relationships are often considered as impersonal. Although the act of exchange may be surrounded by highly normative behaviour, it often is part of everyday life and is considered to be purely economic.

The contrast I have sketched between non-Western societies and Western capitalistic society strongly follows Mauss' original distinction and is exaggerated (see Bazelmans 1996).¹ Although exchange in both types of societies generally follows the descriptions written above, more economic forms of exchange also occur in non-Western societies, and gift exchange is obviously (still) part of Western capitalistic society as well. The former is usually grouped under the term "barter" and involves the exchange of commodities, a term generally used for items which are not considered to be gifts. Malinowski, in his important work on the Kula exchange of the Trobrianders (1984), mentions the existence of *gimwali*, a form of barter, that was considered to be different from the Kula gift exchange. Malinowski specifically notes that it lacked ceremony, haggling was permitted, and it could be done between anyone, even between strangers (Malinowski 1984, 189-90). Chapman (1980) lists many other examples of barter among non-Western societies. Although barter may occur on different occasions than gift exchange ceremonies, it is often seen that during these ceremonies, which may last for several days and involve the gathering of many peoples, a lot of commodities are exchanged besides the actual gift exchange (Malinowski 1984; see also Thomas 1981, who explicitly notes the co-occurrence of different forms of exchange among the indigenous people of the Guyanas).

The modern capitalistic equivalent of gift exchange ("giving gifts"), e.g. at birthdays, Christmas, or other special occasions, still has many of the characteristics of gift-exchanges within non-Western societies, including the personal relationships involved, the transaction of special items with the aim to please the other, and the special occasion upon which it takes place. Considering the dual occurrence of both types of exchanges, anthropologists often make a distinction between societies in which gift-exchanges are predominant (non-Western society) and those in which the exchange of commodities is the most important form (capitalistic society) (Bazelmans 1996).

In the light of its embedded nature in all aspects of society, the study of exchange may provide information on a broad array of subjects. For example, T. Earle (1999, 608) has recently listed three broad perspectives from which exchange generally has been studied. The first perspective to a large degree corresponds with the role it fulfils in the adaptive strategies of societies, how humans "extract, process, and distribute the necessities of human existence". It sees exchange as a means of risk-controlling behaviour or the way in which products from localized resources were evenly distributed in sedentary societies (R. Kelly 1995; Thomas 1981). The second perspective focuses on the role exchange fulfils in the political economy, or how it "functions to finance the institutions of chiefdoms and states and to support the stratification on which these societies rest." (T. Earle 1999, 608). The third one studies "how a society's relationships and categories become objectified ('real' if you will) through the economic process... the production and distribution of material goods are part of a broad social process in which individuals actively construct systems of meaning and relationships" (T. Earle 1999, 608). "The important point from this perspective is that social structure and political process are the main determinants of economic organization and operation. Individuals act within this system to position themselves advantageously, and in these individual acts transform the system." (T. Earle 1999, 626)

The first and third perspectives form the most interesting ones in relation to this study. This can be mainly attributed to the small scale and primarily non-complex character of the societies under consideration, essentially ranging from tribal towards incipient chiefdoms, and the particular nature of the exchanged items being studied, ranging from ordinary tools to items with a very special cosmological value. The objects considered in the present investigation include chert and flint nodules used for making expedient flake tools, greenstone axes, and conglomeratic *zemis*, the latter which are three-pointed objects reported by the

¹ Mauss' work on the "Gift" was not only an anthropological analysis of gift-exchanges, but also a critique of western capitalistic society, which in his view was becoming too individualistic.

Spanish to be representations of the supra-natural entities and deified ancestors (Siegel 1997). The latter category of artefacts may, in theory, have been part of an elite exchange network involving wealth items, and thereby touching upon the subject of wealth finance supporting an elite (Brumfiel & Earle 1987; T. Earle 1999). However, it is primarily this cosmological meaning with associated intrinsic power that was valued and constituted the important aspect when possessing or exchanging *zemis*.

The socially structuring aspect of exchange is also clearly evident within anthropological accounts for indigenous societies of the Amazonian rainforest.² Chagnon (1983) explicitly notes in his famous work on the Yanomamö that exchange fulfilled a social-political role of bringing people together with the aim of forming allies in village raids, rather than an economic adaptive role, of distributing exotic artefacts across the region. Chagnon describes a situation in which each village is specialized in making a certain commodity, that no other village produces. This specialisation is not a result of uneven resource distribution, but it is an artificially maintained differentiation in order to secure the continuation of inter-village contacts. To support this notion Chagnon gives the example of a village that did not make pottery, as they “forgot” how to do it. After another village with which they were carefully initiating an alliance began asking for pots, the former community suddenly “remembered” how to produce them again (Chagnon 1983, 149-50).

This example illustrates another important aspect of exchange within Amazonian cultures, namely its relation to warfare. Kelekna (1985) has emphasized that warfare and exchange are seen as the two extreme forms of social relations: with friends one exchanges and with enemies one makes war. This important relation between exchange and warfare has also been highlighted by Redmond (1998c), among others. She pays specifically attention to this by showing how a war leader may be able to acquire the position of chieftain. Through distinguishing himself as a very strong person in war, a successful war leader may easily attract exchange partners who can become allies in raids and war. His ability to keep these people bonded through reciprocal exchange relationships is of pivotal significance in his wish to acquire and keep regional leadership and prestige.

Redmond presents another important individual in Amazon society, the spiritual specialist, who may become regionally known. He often holds a distinct place within his community as the only person who is able to communicate with and may actually obtain control over the supra-natural forces or entities that surround and influence every-day life. Strong spiritual specialists may become regionally renowned or feared for their ability to control and manipulate these powerful forces. As a result they attract apprentices from far around them. The specialist will teach them his knowledge in exchange for valuable objects, thereby creating a hierarchical relationship. By sustaining these relationships after the apprentices return to their home communities again, he may acquire a regional significance in local societies.

Apart from these essentially social-political and religious motives behind exchange relationships, more economic related reasons also may initiate exchange. For example, many communities in the Amazon host trade middle-men, who are persons standing in relatively frequent contact with the world outside the community, and therefore are able to obtain exotic objects or raw materials. These people may become important figures in the community, as they are able to acquire highly-desired items, that are not locally available. In contrast to the other two roles in Amazonian society, these trade middle-men are only important for this ability, and as they often lack the much rewarded strength in combat or power in spiritual matters, they never will be able to acquire a similar high position within society. These people, however, will ensure the flow of exotic goods. In relation to this Thomas (1981) notes an interesting feature of inter-village exchange among the indigenous peoples of the Guianas. In many cases the real non-local items or raw materials are exchanged for items that are more commonly available, and may not necessarily be needed by the communities obtaining them. However, it is this seemingly unequal exchange of different valued objects that ensures the distribution of much desired exotics throughout the region.

In the preceding discussion I examined the role exchange fulfils in small-scale society. This discussion provides a starting point on how to view exchange and its relation to socio-political organisation. Next, I will describe the current state of knowledge about exchange within the archaeology of the Caribbean, followed by an explanation of this research’s objectives and its methodology used to reach these goals.

² Many anthropologists, linguists, and archaeologists have emphasized the cultural relatedness between the indigenous peoples of the Amazonian rainforest and the Caribbean archipelago. I will not go into much detail on the use of the anthropological accounts from the Amazon as analogies for the Caribbean pre-Columbian societies, as others have dealt with this before (*cf.* Hofman 1993; Hoogland 1996). It is generally considered that the first agriculturalists entering the Caribbean were speaking an Arawakan language, strongly related to some of the languages still spoken in the Guianas and Venezuela today. Furthermore, influences from Carib speaking peoples living in the Guianas have become evident during the latest phases of indigenous occupation of the islands (Taylor & Hoff 1980).

1.6 EXCHANGE STUDIES WITHIN CARIBBEAN ARCHAEOLOGY

The occurrence of artefacts and materials non-local to the island of discovery, hereafter referred to as exotics, is a common feature among excavated samples from Caribbean sites, and those within the Lesser Antilles in particular (Cody 1991, 1993; Crock & Bartone 1998; Donahue *et al.* 1990; Fuess 2001; Knippenberg 2001a; Murphy *et al.* 2000; Narganes Storde 1995, 1999; Serrand 2001; Vescelius & Robinson 1979; Walker 1980; Watters & Scaglione 1994). In some cases these exotics make up a large part of a site's artefact inventory, as is shown by sites on Anguilla (Crock 2000), while in other cases it only concerns rare items, as is the case of sites on Antigua and St. Martin (De Mille 1996; Knippenberg 2001a). Materials that were identified as exotic include different varieties of stone (Watters & Scaglione 1994; Knippenberg 2001a), specific species of worked shell (Serrand 2001), pottery temper (Fuess 2001), as well as ceramic pots (Crock 2000; Peterson & Watters 1991).

Closely comparing the various types of exotic materials shows that stone artefacts make up the major part. In general, this predominance may be misleading to some degree since stones often are more easily recognized as exotic. This can be attributed to the fact that on the one hand specific types of stone materials can be restricted in occurrence, and on the other hand to the regional variability in geological composition of the different islands within the Caribbean archipelago, where limestone islands occur in close proximity to volcanic ones. This indicates that the presence of exotic rocks did not necessarily involve transport over large distances, although sometimes it did. As this study deals with the northern Lesser Antilles, it may be rewarding in this respect to distinguish materials, that are local within the Caribbean island archipelago, but were frequently transported between the different islands, and those that came from outside the Caribbean altogether, e.g. the South American mainland or the Yucatan Peninsula. These latter materials suggest long-distance transport, at least from this northern perspective point of view.

Among the long-distance materials, we may reckon certain varieties of semi-precious stone such as nephrite and turquoise used for making beads and pendants (Cody 1991; Rodríguez Lopéz 1993; Watters & Scaglione 1994). A much larger variety of rock types can be named within the regionally available but restricted group of stones. Recurrent materials include cherts, flints, a limited variety of semi-precious stone (amethyst, carnelian, quartz, calcite, serpentinite), as well as varieties of igneous and metamorphic rock (Cody 1991; Crock 2000; Murphy *et al.* 2000; Rodríguez Lopéz 1993; Watters 1997a; see also this study). This large variation of rock types is also evident among the artefacts, which include beads, pendants, axes, zemis, flake tools, as well as all sorts of pebbles.

A second material category consists of ceramics and temper. Donahue *et al.* (1990) and Fuess (2001) have shown that ceramic pots from sites on the two limestone islands Anguilla and Barbuda, contain volcanic inclusions. As these islands are built up by carbonate rocks, these volcanic inclusions suggest three possible ways in which exotics were transported from volcanic or composite islands to these limestone islands: (1) volcanic sand was transported and added to local clays as temper; (2) clay naturally containing volcanic inclusions and originating from the volcanic or composite islands was transported and pots were locally produced; and (3) complete finished pots were transported between islands, which were made on the volcanic or composite islands. Thus far, a conclusive answer has not been given as to which type of material was transported. Given the occurrence of clay sources on all the islands, and lack of knowledge with regard to these sources, it is not possible to either exclude possibility 1 or 2/3 at the moment. In addition, the difficulties of identifying the manufacture of ceramics on a household production level will often inhibit a distinction between 2 and 3. Faced with the same problem for material found on Anguilla, Crock (2000) assumes the 3rd possibility was the case, considering the poor clay sources on the island, especially since non-volcanic, carbonate temper would have been easily available on the carbonate islands.

The clear identification of exotic stone and temper contrasts to artefacts made of shell material. Most shell species employed in artefact manufacture have broad, general occurrences along the coasts of most of the islands. Therefore, a prehistorically transported or exchanged shell artefact generally will not be recognized as exotic. This will only be the case when the species does not naturally occur in the islands local environment, as Serrand has shown for the *Unionoida* shells found at Hope Estate (2001). Still, there are indications, based on restricted shell bead and pendant manufacture, that shell items may have been more frequently transported and exchanged than has been suggested by the few examples of demonstrated exotic shell species usage (for studies of shell bead production, see Carlson (1995) and Lammers-Keijzers (2001a)).

The above-mentioned cases provide evidence that inter-island transport was a recurrent feature for the acquisition of materials used for ceremonial, and subsistence related activities. This inter-island transport, however, does not necessarily indicate the existence of inter-island exchange relationships, as the close proximity of islands hosting different types of

resources may facilitate direct procurement by peoples living on the nearby islands. Although in many of these cases the exotic origin is acknowledged, attempts to integrate these data within a systematic and region wide study to better understand how these exotics were distributed are very scarce. Some scholars have hypothesized on basis of non-local material from a single site or island how its inhabitants obtained these exotics. Crock (2000), for example suggested for many of the lithics found on Anguilla and originating on nearby St. Martin that they were obtained by direct procurement. In case of the ceramics and some of the exotic chert varieties, however, including material from Antigua, exchange more likely formed the means of acquisition (for other examples see Crock & Bartone 1998; Crock 1999, 2000; Murphy *et al.* 2000; Rodríguez Ramos 2001a).

Studies in which transport and exchange are seen within a regional Caribbean perspective are rare. Cody (1991), in her study on the distribution of semi-precious stone used for the making of beads and pendants, is one of the few scholars who has attempted to interpret this wide distribution. She links the occurrence of the wide spread of these lapidary items among Caribbean Early Ceramic Age sites with the existence of a long-distance exchange network, although she does not go any further into the type of exchange responsible for this distribution.

Another important aspect of rock material distribution studies, which has received very little attention in Caribbean archaeology, is the identification of raw material sources, the characterisation of source materials, and the comparison of these materials with artefacts (cf. Glascock *et al.* 1998). Although some attempts have been made (Pantel 1988; Walker 1980, 1985) and others are being elaborated (Walker *et al.* 2001), many studies so far have relied on written reports, which mention the occurrence of sources of specific rock types without actually comparing source materials with artefacts (Cody 1991; Rodríguez López 1993), as Watters specifically noted for the bead and pendant materials (Watters 1997b).

The lack of knowledge about regional distribution and prehistorically exploited sources, poses significant limitations about the understanding of past exchange relationships and networks. Furthermore, a better knowledge about regional variation in production and consumption behaviour might also identify commonly available materials as actual exchanged commodities. In this respect I refer to the above-mentioned example of limited shell artefact production places, which may have functioned as regionally important suppliers for such artefacts (Carlson 1995; Lammers-Keijzers 2001a; Watters 1997a).

1.7 RESEARCH OBJECTIVES

To start filling the knowledge gap about raw material sourcing, regional distribution and identification of exchange relationships within the Caribbean, this study will focus on three different rock materials, that have restricted occurrences but which were widely used within the northern Lesser Antilles during the pre-Columbian era. These materials include a variety of flint, a grey-green mudstone, and a conglomeratic pack-stone.

The objective of the present study is to specify the distribution of these specific rock materials within the northern Lesser Antilles during the different periods of the Ceramic Age. These distributions will be used to identify exchange patterns and possibly get at the underlying mechanisms behind them. In addition to these three rock materials, the use of several additional rock types is described and discussed as well to provide a more complete picture on rock material acquisition and usage. Finally, the results are evaluated against present knowledge about the development of socio-political complexity within this portion of the Caribbean region, as described in the introductory paragraphs.

Most attention will be given to the period that marks the transition from Saladoid into post-Saladoid society, i.e. AD 400 – 1200. The study area includes the chain of islands lying between Puerto Rico on the west all the way to Martinique on the southeast (figure 1.3). This region largely corresponds with the distribution area of the three above-mentioned rock materials.

In order to reach these objectives a number of sub-goals are approached. These can be roughly divided into two parts, more or less corresponding with distinct data collecting episodes:

- 1) At first, sources need to be identified, mapped, and described, followed by a detailed study of material characterisation. This latter aspect also includes the search for a method by which inter-related rock varieties can be distinguished on the basis of objective criteria.
- 2) If materials can be distinguished and their provenance can be determined, then their distribution and use in the archaeological record need to be mapped through the study of numerous collections of samples from excavated sites.

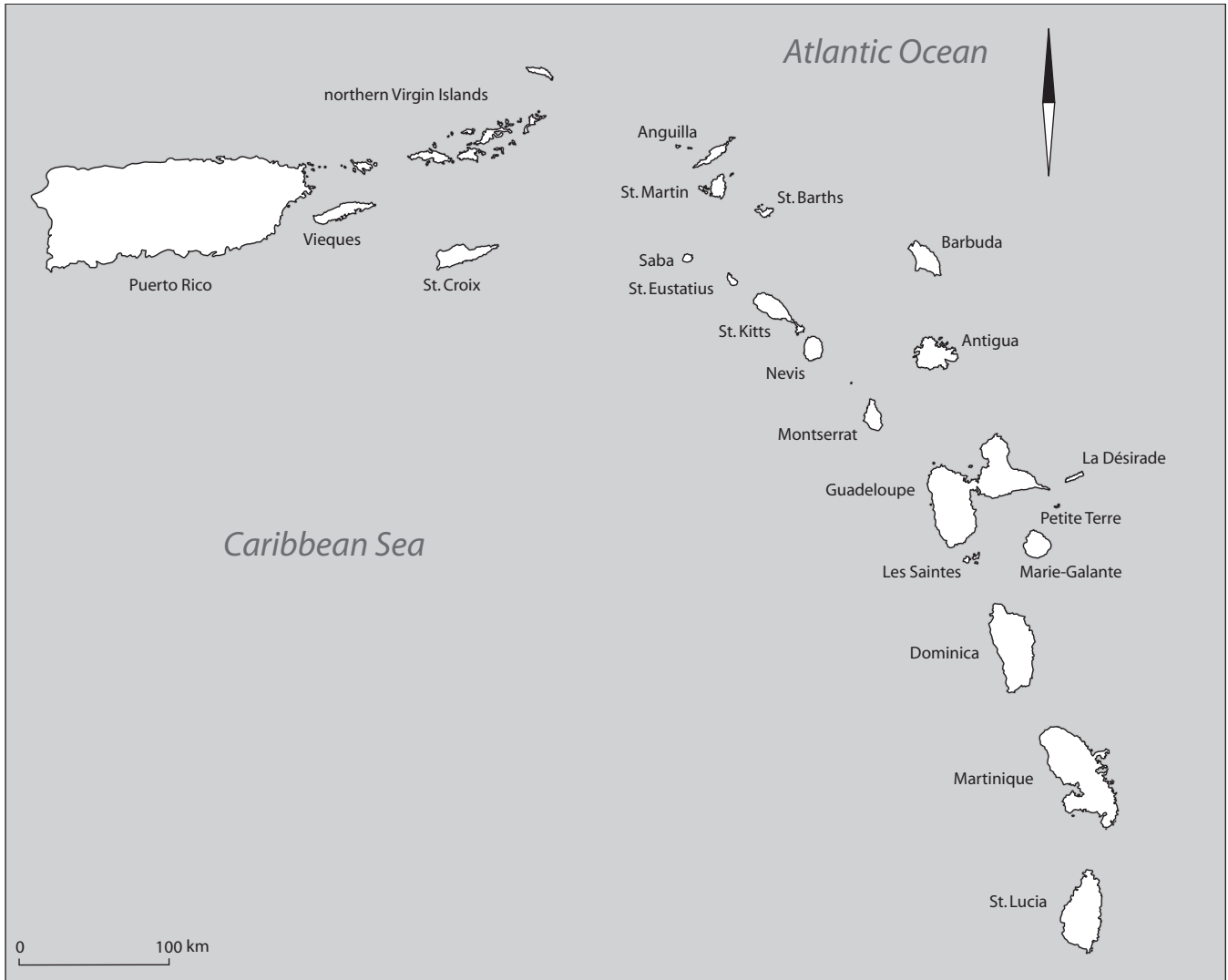


Figure 1.3. Map of the area studied in this work.

In relation to the first set of goals, known raw material source localities were visited and primary deposits of rock material (as well as secondary surface scatters), as likely available to the Amerindian settlers were mapped. Furthermore, evidence of actual Amerindian exploitation was recorded. For the characterisation study, macroscopic description, microscopic, and chemical analyses were employed in an attempt to find a method, that would discriminate among different inter-related rock varieties. Related to this characterisation and discrimination aspect, an additional subject was addressed that aimed at understanding how and why varieties differed. The reader is referred to Chapter 2 for a detailed description of the methodology employed. With regard to the study of distribution and the identification of exchange patterns, a more extensive discussion of the methodology is given below, as this part of the research guided the outline of this dissertation to a large degree.

1.8 METHODOLOGY

The study of stone materials and artefacts to identify exchange relationships and patterns offers great advantages over some other materials commonly encountered during archaeological excavations. I have already mentioned the restricted occurrences of some stone varieties, as well as their specific characteristics, that enable reliable discrimination. Torrence (1986), however, also stresses the subtractive nature of stone tool making, during which each step of the production process (from acquisition to tool finishing) leaves residues within the archaeological record. These steps may be distinguished, at least on a general level, presenting the archaeologist with a situation where he or she can arrive at a relatively detailed knowledge of stone working behaviour.

Torrence, therefore, paid particular attention to the production process when studying the prehistoric exchange of obsidian among the Greek islands. This was different from many other studies on the exchange of stone artefacts, that primarily investigate the relative abundances of different materials. She correctly emphasizes the important role that the production process should receive when studying exchange, as she sees them interrelated. In the opening chapter of her book "Production and Exchange of Stone Tools" Torrence states one of her important premises:

"...artifact manufacture will vary according to the ease of access of the producer to the source of raw material, that is, the type of exchange" (Torrence 1986, 24). Further, "exchange as used here is seen as varying according to the amount of competition by actors for strictly material gains or profits", and "the degree of behavior directed toward the achievement of profits provides us with one fairly detailed description of the nature of exchange in question". Thus Torrence attempts to construct a middle range theory that provides links between the type of exchange, the associated stone tool production behaviour, and the actual material residues. To reach this goal Torrence presents a series of ethnographic case studies, that describe stone tool manufacture and exchange. By carefully selecting cases, that cover the whole continuum of exchange, from direct access, where there is no competition, to laissez-faire market exchange, she provides a relatively complete picture of stone tool production and exchange.

Torrence considers the efficiency of the production process as an important parameter for measuring competition. In other words, "as systems of exchange become more competitive and more profit-orientated, then one would expect that more types of behavior which were increasingly efficient would be adopted" (Torrence 1986, 40). To measure this efficiency, Torrence introduces a number of cost-control devices, which following Rathje (1975), are "methods which decrease time, energy and material inputs while at the same time increase the numbers and range of the distribution of the commodities". Torrence lists four devices:

- 1) Sophistication of technology, which relates to the use of a very specialized tool kit that may increase efficiency.
- 2) Simplification: simplifying the production process may increase efficiency.
- 3) Standardization: this will reduce the choices to be made during the production, and if trained, increase the speed at which products are made
- 4) Specialisation: important in considering specialisation is the type of specialist involved. Following Rathje, Torrence distinguishes craft production (craft specialists) and mass replication production (industrial specialists), the latter being able to make products at great efficiency, whereas the former is a very skilled craftsman producing highly individualistic products. Many of the ethnographic cases do conform to the general assumption that production becomes more efficient as exchange becomes more competitive, although it has to be noted that data on stone tool production, in particular regarding efficiency, are limited. In this respect intensive time and labour input, as shown for New Guinea mine shafts, does not necessarily indicate higher levels of socio-economic complexity, since the quantity of time and labour invested is not as important as the quality of the input, in other words the efficiency (Torrence 1986).

I want to make a few additional comments on how to relate these premises to the issue of socio-political organisation within the northern Lesser Antilles. Specifically looking at artefact production, the distinction between egalitarian and chiefdom societies is gradual, and organisation of production may in some cases be rather similar. Generally, it is agreed that within egalitarian societies most production occurs at the household level, in which certain individuals in each household are responsible for the specific productions of different things. Craft-specialisation in a village may occur, but usually is on a part-time basis. Considering the fact that exchange generally takes place on a reciprocal basis, it is assumed, following Torrence, that the application of cost-control devices only minimally took place. In chiefdom societies these features to a large degree may be encountered as well, in particular when looking at a single village on the periphery of the polity. However, the existence of a hereditary elite may have induced the appearance of full-time specialists operating in the service of this elite.

The research of Torrence provides a series of important guidelines for the study of stone tool production and

exchange. For my study I used her key argument considering that production is a parameter of exchange. This study also uses an approach more on the consumption side as an additional line of research because it is the first within the region, that pays particular attention to stone tool production and distribution. However, many scholars have criticized this approach, where raw material abundance is a key variable (see Torrence 1986 for a discussion). Still, it was made necessary by the limited data on production behaviour. “Fall-off” analysis forms one of the most widely applied methods within this general approach.

Colin Renfrew (1977; Renfrew & Dixon 1976; Renfrew *et al.* 1968) has paid much attention to this method in his work. Although later work by Hodder & Orton (1976) amongst others, showed that different mechanisms of distribution may produce similar fall-off curves, this form of analysis is still regarded as a first base-line and informative way of analysing material distribution, in particular where island environments are involved. The central premise in the study of fall-off curves is the Law of Monotonic Decrement (LMD), that states:

“In circumstances of uniform loss or deposition, and in the absence of highly organized directional (i.e. preferential, non-homogeneous) exchange, the curve of frequency or abundance of occurrence of an exchanged commodity against effective distance from a localised source will be a monotonic decreasing one” (Renfrew 1977: 72).

Basing himself on earlier work within geography, Renfrew regarded two models as significant for the study of fall-off patterns because they can be mathematically described. These are the “down-the-line” and “random walk” models. The first relates to the exchange of a commodity between villages, that are linked in a linear chain, and where the abundance of the commodity exponentially decreases after each exchange transaction, in other words by moving further from the source. This case assumes that reduction of the material is dependent on the number that will be left at an exchange point, e.g. a village keeps half of what it acquires and passes the other half to the next village in line, which in its turn keeps half of that (a quarter of the original quantity) and passes the other half to the next one, etc.. If one modifies this assumption to the situation in which this reduction is independent on the amount that is exchanged (direct access to the source), then abundance will solely be dependent on distance to the source and the fall-off curve will transform into a simply linear one.

In the random walk model, which has been formulated and mathematically analysed by Pearson studying infiltration of a new species into a habitat, each exchange transaction is seen as a step. If these steps are assumed to be ordered randomly from a given centre point, a “coherent, quantifiable fall-off curve” will be produced that will follow a Gaussian distribution (Renfrew 1977: 80).

Mathematically, both exponential and Gaussian curves can be described by the following general equation:

$$I = m \cdot e^{-kx^a}$$

In this I stands for Interaction/Abundance, x for distance to the source, and a, m and k are constants. If a = 1 we obtain an exponential distribution (down-the-line model), and if a = 2 the distribution becomes Gaussian (Random walk).

As these cases assume transport or steps in one dimension, Renfrew also listed the distributions in case of two dimensions. Such a case would alter the curve belonging to a down-the-line mode of exchange from an exponential one into a Gaussian one, and in case of a linear curve (reduction is not proportional to quantity left) it would become a parabolic one. Any deficiencies from the law in general and these curves in particular may point to other means of exchanging the item. Notably, directional trade and central place pooling were considered to be responsible for different curves.

These two approaches to the study of exchange guided the outline of the second part of this research, which is focussed on the distribution of the particular stone materials and artefacts. As a result, this part was not only centred on the presence or absence of a stone artefact in the archaeological record, but also was aimed at understanding its production process. Therefore, to obtain a full overview of this process it was decided to look both at stone working activities at the source sites along with at settlement sites in the surrounding region.

For each of the sites a sample of lithic artefacts was studied using a pre-defined set of variables. The methodology of this analysis is discussed in Chapter 3. The results obtained from these analyses provided the necessary data to determine the presence of a specific stone type at a particular site, the form in which it had reached a site, how it was reduced on site, and what the aim of the production was. Chapter 4 discusses stone working at the flint source on Long Island and Chapter 5 presents an overview of stone working at settlement sites on the surrounding islands for each period within the Ceramic Age. This is followed by a description of regional patterns in Chapter 6. For each of the three materials, its distribution is outlined followed by a discussion of the exchange mechanism responsible for it. In conclusion the understanding of the type of exchange resulting from this analysis is discussed in light of current knowledge about socio-political organisation within the study (Chapter 7).