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Development of a prehistoric interaction sphere in the northern Lesser Antilles

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DEVELOPMENT OF A PREHISTORIC INTERACTION SPHERE IN THE NORTHERN LESSER ANTILLES

INTRODUCTION

This paper identifies the development of a prehistoric interaction sphere among a specific cluster of northern Lesser Antillean islands, by examining physical geography, natural resources and archaeological remains. The islands used for this study are Anguilla, St. Martin-St. Maarten (hereafter to be referred to simply as St. Martin), Dog Island, St. Barts and their adjacent cays. It is suggested that the processes of divergent evolution and adaptive radiation increased the isolation of economic exploitation and social adaptations, thus allowing for the emergence of a cluster specific interaction sphere.

GEOGRAPHY AND NATURAL RESOURCES

In the northern Lesser Antilles we can identify certain characteristics of the physical geography that offer potential buffers between various segments of the area (see figure 1). Clarke (1968:252) had early noted the importance of ecological zonation in separating and isolating localized subculture strategies for adaptation.

Figure 1 illustrates potential area boundaries or buffers in the northern Lesser Antilles based on physical geography. Each of these Lesser Antillean island clusters contains only one site representing the “seed” or propagule colonization by the earliest Ceramic Age peoples who lived at inland, riverine locations (such as, Hope Estate, Cayon, St. Georges, Sorcé, Hacienda Grande, and Indian Creek). The Ceramic Age having been defined by Rouse and Allaire (1978) as

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FIGURE 1. The geography of the northern Caribbean

- = suggested buffer zones

* = earliest Ceramic Age inland riverine sites

O = earliest Ceramic Age coastal sites
FIGURE 2. Sketch map of the submarine contours in the northern Lesser Antilles at the 35m. and 180m. isobaths (after Wagenaar Hummelinck 1953:103)
the prehistoric period of technological development representing the beginning of ceramics manufacture to the contact with Europeans. One must keep in mind that these site distribution patterns are based on presently available data, and that still unrecorded sites may exist. Due to the different ecological conditions encountered within the larger landmasses and increased resource availability of the Greater Antilles, it is the focus of this paper to only deal with the smaller islands of the northern Lesser Antilles.

The four primary islands of this study area (St. Martin, Anguilla, St. Barts, Dog Island) are emergent features of a larger submerged landmass along the 35m. isobath (see figure 2), with St. Martin, Anguilla and Dog Island atop a higher platform along the 20m. isobath (see figure 3). This landmass became partially submerged in Holocene times, after having been exposed during Pleistocene periods of low sea level (Westermann 1949:49). With few archaeological materials available from St. Barts, and its geographic separation, this study focuses on the other three islands.

St. Martin (86 sq.Km.) belongs to the Antillean Islands Outer Arc formation and has no young volcanic formations; it is typically a mountainous build-up of ancient, hard volcanic rocks with porphyrite and quartz-diorite intrusions (Christman 1953; Veenenbos 1955). On the SW peninsula of St. Martin there is a unique formation of marine-sedentary marls and limestones called the Lowlands. The primary sand beaches of St. Martin are located around the Lowlands and connecting the Lowlands to the main body of the island; also, several ancient lagoons around the island have been enclosed by sand bars. The soil formations on St. Martin are mostly shallow, lithosolic Descalabrado clay-loam soils in the volcanic areas, with very different Aguilita soils and pockets of Sion soils on the soft limestone of the Lowlands (Veenenbos 1955:43). The Aguilita soils of the Lowlands, which are high in phosphate and potash, have supported sweet potato, yam, corn, pumpkin and cassava cultivation (Veenenbos 1955:46-49). The vegetation on the main body of St. Martin is mostly semi-deciduous seasonal forest and dry scrub woodland, whereas in the Lowlands there are mostly xerophytic plants (Veenenbos 1955:23). There is a strong probability that prehistoric St. Martin supported substantially larger trees at the higher elevations, as was noted in the 17th century (Coppier 1645:37). According to Wagenaar Hummelinck (1981:91-93) there are two major permanent, non-flowing ground water surface locations on St. Martin, at Devils Hole and near Puits des Terres Basses. He further indicates, however, that there are four large, flowing sources of ground water on St. Martin at Ravine Colombier, Ravine Careda, Cul de Sac (Dutch), and Ravine du Paradis (1981:83-86), as shown in figure 3.

Anguilla (91 sq.Km.) is a very low, flat island almost exclusively of limestone overlaying volcanic rocks equivalent to the formations on St. Martin (Watters
FIGURE 3. Geographic features and potential natural resources in the Anguilla-St. Martin-Dog Island area

- volcanic derivative surface soils
- limestone derivative surface soils
- primary flowing water source access
- primary standing water source access
- high potential reef use areas
- 20m. isobath (from Watters and Rouse 1989)
The primary sand beaches on Anguilla are along the north and south coasts on the western part of the island (Watters 1989:8). The soils on Anguilla appear to be similar to the Aguilita and Sion soils of the St. Martin Lowlands. Modern cultivation is presently concentrated in the central and western parts of the island (Harris 1965:40). The dominant vegetation of Anguilla is very degraded evergreen woodland (Harris 1965:41-42). The ground water sources of Anguilla are the most abundant of any of the islands covered in this study, with five open, permanent, non-flowing access locations (Forest Point, Bedneys Spring, Meads Bay Spring, and Badcox Pond) and one site associated with a cave at Fountain Cavern (Wagenaar Hummelinck 1981:90-91). Interestingly, there are no known large bodies of flowing ground water on Anguilla (Wagenaar Hummelinck 1981:83-86).

Dog Island is a very small island (± 2 sq.Km.) with geology similar to Anguilla, although proportionately more volcanic rocks are exposed at Dog Island. There are four sand beaches on the island, with a concentration in the south coast area (TAMS 1979). The vegetation of Dog Island is primarily xerophytic. Hummelinck reports one non-flowing ground water location near the north coast of Dog Island, and no flowing water locations (1981:90).

The primary reef areas around these islands are between western Anguilla and NW St. Martin, and a 15 km-long reef ridge extending from NE Anguilla to Dog Island (Watters 1989:6). There are various indigenous faunal groups on and around these islands (Wing and Rietz 1982:25). The 107 species of birds on St. Martin (Voous 1983:231) exceeds the number on the other two islands. The larger lagoon areas on St. Martin also have a greater quantity of estuary animals, such as marine molluscs, including 252 species of gastropods at St. Martin (Coomans 1963:85) and land crabs. The sand beaches on these islands would have been potential egg-laying sites for sea turtles, while the reefs offered primary fishing areas. It is important to note that Dog Island, with few natural resources other than marine resources, is located at one end of a 15 km-long reef extending to Anguilla.

The location of these three islands is such that Anguilla is centrally located, with Dog Island about to the northwest and St. Martin about 8-10 km. to the south (see figure 3).

Cultural Background

Archaic Age

The initial human inhabitation of the St. Martin-Anguilla area was probably during the Archaic Age. The Archaic Age is defined by Rouse and Allaire
(1978) as the prehistoric technological stage representing the beginning of ground stone/shell work to the introduction of ceramics. This is evidenced by two probable Archaic Age sites noted on the north and NE coasts of Anguilla, at Crocus Bay and the Ab-n-dam cave (Dick et al. 1980:36; Douglas 1991:3). Watters, however, is doubtful of a confirmed Archaic presence on Anguilla (personal communication 1989). Douglas (1991:3) recently reported a shell celt found at the Ab-n-dam cave that was radiocarbon dated to about 1300 B.C. Interestingly, no Archaic Age sites have as yet been confirmed on St. Martin (Haviser 1988:5). The Archaic peoples had a hunter-fisher-gatherer subsistence system and a Band level socio-cultural system (Service 1979:4). In the eastern and southern Caribbean, sites of the Archaic Age are consistently noted in association with the littoral zone, mangroves and at caves and rock shelters.

Ceramic Age

The initial ceramic-producing, horticultural peoples in this area are of the earliest known for the Lesser Antilles, and began to occupy St. Martin about 560 B.C. There is a single site, Hope Estate on St. Martin, which represents the early Ceramic Age from about 560-300 B.C. (Haviser 1991). This same site continued to be inhabited during the entire Early Saladoid period from about 300 B.C. to 300 A.D., and into the Late Saladoid period from about 300-600 A.D. The Saladoid period is a specific, archaeologically defined, prehistoric culture group in the Caribbean, recognized by an assemblage of distinctive ceramic traits called the Saladoid Series. It is not the subject of this paper to discuss the origin of the earliest Ceramic Age peoples and their possible distinction from the Early Saladoid peoples, only to note that for this study these two initial groups are referred to together as “Early Saladoid”. For this study, the Early Saladoid represents a time period from about 560 B.C. to 300 A.D., whereas the Late Saladoid is considered from about 300-600 A.D.

During the Early Saladoid period, the subsistence system focused heavily on terrestrial faunal resources such as land crabs, birds, and rodents. The few marine resources exploited during this period were fish, together with a limited use of sea turtles and littoral molluscs. Manioc was apparently the primary horticultural product.

The distribution of major settlements belonging to the Early Saladoid, albeit rare in the Caribbean, is quite consistent in location placement. Sites like those at Hope Estate (Haviser 1991), Sorcé (Chanlatte-Baik 1983), St. Georges (Faber Morse 1989), Cayon (Goodwin 1979), Hacienda Grande (Roe 1985), and Indian Creek (Rouse 1974) are all situated on elevated terraces, inland from the coast and adjacent to flowing water sources. This settlement pattern is quite distinctive from that of the Late Saladoid period, when sites were located in coastal settings.
on lower elevation plains, and associated with both seasonal flowing and standing water sources. Such sites as Sugar Factory Pier (Goodwin 1980), Pearls (Bullen 1964), Golden Rock (Versteeg and Effert 1989), Hichmans (Wilson 1989) and Prosperity (Faber Morse 1989) are a few examples. The Late Saladoid subsistence systems also exhibit a shift towards a more marine-oriented focus on fish, shellfish and turtles. The exploitation of land crabs was minimal, while some limited bird and rodent capture was still practiced. Manioc was still the predominant horticultural product. Siegel (1991) has pointed out the potential for ancestor cults and socio-political complexity emerging in the Antilles during the Late Saladoid period.

In the St. Martin-Anguilla area, as mentioned above, Late Saladoid occupation at Hope Estate (St. Martin) represents a continuum of the Early Saladoid one (see figure 4). There are also two sites on the SW coast of Anguilla where Late Saladoid artifacts have been reported, as surface evidence at Maundays’ Bay (Dick et al. 1980:36) and in the deepest stratigraphic context at Rendezvous Bay (Douglas 1991:8). For this study, these sites are being treated as having a Late Saladoid component, even though Watters (personal communication 1989) considers Rendezvous Bay to have been only of limited use during this period. He does agree, however, that this site is the best candidate for a Saladoid presence on Anguilla. It is interesting to note the convergence into paired sites on Anguilla at this period. Keegan has noted paired sites in the Bahamas and suggested they may represent a change from matrilocal to avunculocal residence patterns, as an initial stage of chiefdom development (Keegan 1990:8).

Following the Saladoid initial migrations and settlement in the Caribbean, there followed localized development of cultural patterns, as a result of divergent evolution (Flannery and Marcus 1983). These localized groups were adapting to specific regional resources, which in turn created systems of interaction which were also more strongly localized among themselves than with their neighbors further away (Rouse 1989:392). In the area from eastern Puerto Rico, west and south to about Guadeloupe, one such regional group is called the Elenan-Ostionoid (Rouse 1987:10). This paper identifies a more specific localized subgroup in the St. Martin-Anguilla island cluster, within the greater Elenan-Ostionoid area. The period is called the Post-Saladoid, and refers to a time range from about 600 A.D. until contact with the Europeans.

The Post-Saladoid peoples of the Lesser Antilles had a primarily marine-oriented subsistence, supplemented by manioc and possibly maize cultivation, quite similar to that of the Late Saladoid in character, but populations had apparently increased. There are indications of developed socio-religious systems during this period, which were manifested in the manufacture of Zemis and in more complex socio-political organization and chiefdoms, such as seen among
the Taino of the Greater Antilles (Siegel 1989; Wilson 1990). Zemis were the deities of the Saladoid and Post-Saladoid peoples represented as carved amulets and statues. The distribution of Zemis was noted by Rouse (1989:383) as a method for chiefs to gain political power, which had its origins in the Saladoid

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**FIGURE 4.** Early Saladoid, Late Saladoid and Post-Saladoid development and interaction spheres between St. Martin-Anguilla-Dog Island

- 🌟 = Early Saladoid and Late Saladoid component site
- ⭐ = Late Saladoid and Post-Saladoid component sites
- ■ = Post-Saladoid primary settlements
- ▣ = Post-Saladoid shrine cavern sites
- △ = probable Archaic Age sites
- ⋍ = Late Saladoid settlements, interaction sphere
- ⋍ = localized Post-Saladoid settlements, interaction sphere
- ⋍ = regional Post-Saladoid interactive extensions
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Another aspect of the developed religious systems of this period seems to have been the creation of shrine caverns decorated with carved statues and petroglyphs, as noted on Anguilla at the Fountain Cavern (Watters 1987) and supposedly at the Maho cavern, St. Martin (Dubelaar 1985).

The distribution of Post-Saladoid sites in the Lesser Antilles consists most often of large villages, regularly spaced along the coastline near major reefs, and often associated with standing water sources (Goodwin 1979; Wilson 1989; Watters 1980). In the St. Martin-Anguilla area there are 19 primary Post-Saladoid sites, all in regularly-spaced coastal settings. There are five sites on St. Martin, four of which are clustered together in the western Lowlands (Haviser 1988). There is one primary site each on Ile Tintemarre (Haviser 1988), and Scrub Island (Douglas 1986), and a large site on Dog Island (TAMS 1979). Anguilla has the most abundant and largest Post-Saladoid sites in the area, with 11 primary sites, of which seven are clustered on the western half of the island (Dick et al. 1980, AAHS 1986). Figure 4 displays the distribution of these Post-Saladoid sites in relation to their geographic position and other period sites in the St. Martin-Anguilla area. Figure 5 illustrates the spatial and temporal position of the largest Ceramic Age sites in this study area. At this time there are but two prehistoric sites reported for St. Barts, a small site at the airport (Bullen 1973:82) and a large site at Saline Bay (Douglas 1986:51). Both are suggested to be of the Post-Saladoid period.

At the time of European colonization of St. Martin, no Amerindians were living on the island (Laet 1630:38). For St Barts and Anguilla there is mention of a raid, by Carib peoples, to these islands in 1656 (Southey 1968). All of the houses on Anguilla were burned and female slaves taken; it is unclear if this included Amerindian women and houses.

An important direction for future research will be to investigate several other island clusters in the Lesser Antilles where possibly similar local developments occurred, such as at St. Kitts-Nevis-Statia-Saba (see figure 5), and Antigua-Barbuda. Watters and Rouse (1989) have suggested a possible interaction among those islands. In figure 6, the settlement history progress of these island clusters is shown, with the contours being different periods of settlement expansion.

DEMOGRAPHY

In relation to the temporal and spatial distribution of settlements within this study area, human population growth and expansion are critical factors. Hassan’s (1981) general principle that settlement density (reflected by site surface area) can be used to calculate population density is used here. Two regionally-
FIGURE 5. Spatial and temporal development of settlements during the Ceramic Age in the northern Lesser Antilles.

- Early Saladoid (± 500 B.C. to ± 300 A.D.)
- Late Saladoid (± 300 A.D. to ± 600 A.D.)
- Post-Saladoid (± 600 A.D. to ± 1400 A.D.)
FIGURE 6. Periods of settlement expansion by localized Ceramic Age peoples in the northern Lesser Antilles. Contours relate to Early Saladoid, Late Saladoid, and Post-Saladoid localized interaction spheres.

* = Early Saladoid sites

* = Late Saladoid sites
developed population-estimate models have been applied to the primary settlements of different temporal periods in this study. The first is based on Roosevelt’s (1980:217-25) investigation of prehistoric settlements along the Orinoco River, and subsequent calculation of 75 persons per hectare of site-surface area. The other model was developed by Keegan (1985:250-54) for the Bahamas, and implies that site surface area can be converted into house numbers which can then be multiplied by an average number of persons per house. Keegan used site length as his control variable and calculated that .03 houses per meter of site length was consistent with the Bahama evidence. By using Guarch’s (1973) conservative estimate of 20 persons for each household, Keegan established that .06 persons (20 persons/house × .03 house/meter length) times the metric length of the site surface would result in a population estimate. These house/persons estimates also generally fit the house size identified at the Golden Rock site on St. Eustatius (Versteeg 1987:32), where Siegel (1989:211) has suggested about 30 persons in residence at the largest structure.

The site surface area measurements for St. Martin, Anguilla, and Dog Island were conducted by different researchers, which may have influenced comparative accuracy; it is the authors’ opinion, however, that these discrepancies are minimal. Other factors which effect population estimates are the possibility of intermittent site occupation, and site omissions due to natural or artificial destruction. Thus, these population estimates are presented merely as a reference to be used in a general context, and not to be accepted as precise demographic statistics.

Table 1 presents the site surface areas of the primary Post-Saladoid, Late Saladoid, and Early Saladoid settlements on Anguilla, Dog Island, and St. Martin. These data have been applied to both the Roosevelt and Keegan models for population estimation. Due to the areal rather than linear nature of the raw data, a minimum potential site-length maximum was calculated for the Keegan model and thus those numbers are consistently smaller than the Roosevelt estimates.

For the Early Saladoid period, only a single inland site at Hope Estate (St. Martin) is representative of this initial colonization in the area. Based on these data, there was an estimated population of about 40-50 people living in two houses at that site during this period.

For the Late Saladoid period, we see evidence of a regular, exponential population increase and subsequent fissioning of the population, with half of the group remaining at Hope Estate and half leaving to establish new settlements at Rendezvous Bay and Maundays Bay in SW Anguilla. Due to Watters’ reservations as to the intensity of use of Anguilla during the Saladoid period, I have been cautious to apply only 25% of the site area for the Saladoid component calculation. Based on these calculations, the total Late Saladoid
| Site                  | approx. ha. | approx. m. | RM* | KM*  |
|-----------------------|-------------|------------|-----|------|
|                       | site area   | site length| pop.| pop./houses |
| **EARLY SALADOID**    |             |            |     |      |
| St. Martin:           |             |            |     |      |
| Hope Estate           | .70 (100%)  | 70         | 53  | 42/2 |
| **LATE SALADOID**     |             |            |     |      |
| Anguilla:             |             |            |     |      |
| 25% totals            |             | (50%)      |     |      |
| Rendezvous Bay        | .51         | 50         | 38  | 30/2 |
| Maundays Bay          | .20         | 20         | 15  | 12/1 |
| St. Martin:           |             | (50%)      |     |      |
| Hope Estate           | .70         | 70         | 53  | 42/2 |
| **LATE SALADOID TOTALS** |   |            |     |      |
| Anguilla:             |             |            |     |      |
| 1.41 (100%)           |             | 106        |     | 84/5 |
| **POST-SALADOID**     |             |            |     |      |
| Anguilla:             |             |            |     |      |
| Sandy Hill Bay        | 2.42+       | 240        | 182 | 144/7 |
| Rendezvous Bay        | 2.02        | 200        | 152 | 120/6 |
| Shoal Bay East        | 2.02        | 200        | 152 | 120/6 |
| Forest North          | 1.21        | 120        | 90  | 75/4 |
| Sandy Ground          | 1.00+       | 100        | 75  | 60/3 |
| Maundays Bay          | .81         | 80         | 61  | 50/2.5 |
| Meads Bay             | .81         | 80         | 61  | 50/2.5 |
| Barnes Bay            | .81         | 80         | 61  | 50/2.5 |
| Lockrum Bay           | .81         | 80         | 61  | 50/2.5 |
| Island Harbour Pt     | .40         | 40         | 30  | 25/1 |
| Scrub Island          |             | 744/37     |     |      |
| 12.31 (72%)           |             | 925        |     |      |
| **Dog Island**        | 2.40 (14%)  | 240        | 181 | 144/7 |
| St. Martin:           |             |            |     |      |
| Cupecoy Bay           | .60         | 60         | 45  | 35/2 |
| Red Bay               | .60         | 60         | 45  | 35/2 |
| Pt Terres Basses      | .60         | 60         | 45  | 35/2 |
| Plum Bay              | .30         | 30         | 23  | 20/1 |
| Great Bay             |             |            |     |      |
| Ile Tintemarre        | .30         | 30         | 23  | 20/1 |
| 2.40 (14%)            |             | 181        |     | 145/7 |
| **POST-SALADOID TOTALS** | 17.13      | 1281       |     | 1028/51 |
|                       | 100%        |            |     |      |

RM* - Roosevelt Model for population estimate, 75 persons/ha.
KM* - Keegan Model for population estimates, .6 times site length
Sources: Anguilla areas, Douglas et al. 1986, with + revised 1988.
St. Martin areas, Haviser 1988. Dog Island areas, TAMS 1979.
population is estimated to have reached about 80-100 persons, almost equally split between the islands, with probably three houses on Anguilla and two on St. Martin.

It was during the Post-Saladoid period that an apparent population explosion occurred. The distribution of primary settlements during this period exhibits a regular, equal spacing from each other all in coastal settings; however, there is an extremely unequal distribution among the islands. As can be seen in table 1, Anguilla resulted in 72% of the total Post-Saladoid sites surface area, which equates with a similar population ratio, whereas the very different resource potentials of St. Martin and smaller Dog Island have equal estimated populations at 14% each for this period. From these estimates it would seem that there were probably about 37 houses and 750-950 people on Anguilla, and about 7 houses and 140-180 people on St. Martin and Dog Island, respectively.

Due to the variable densities and discriminant distribution of these settlements, the Post-Saladoid period offers the greatest potential for a developed interaction sphere between St. Martin, Anguilla, and Dog Island. This data will now be examined together with the geographic area, resource distribution, and cultural aspects previously mentioned.

INTERPRETATION

The physical evidence noted here relates to both ecological conditions and archaeological remains found in the St. Martin-Anguilla-Dog Island cluster. The configuration of these islands is such that western Anguilla is the central location, and following the principle of Least-Cost Theory (Fritz and Plog 1970) thus offers the best location for utilization of the entire area.

Soils in this area are basically separated into two categories: those on volcanic rocks, where forests can be found, as on the main part of St. Martin; and those soils on limestone formations where agriculture can be better conducted, as on most of Anguilla, the St. Martin Lowlands, and Dog Island. The lithic sources can also be separated into the same two locations, with St. Martin having the only deposits of porphyrite and quartz-diorite among the islands, as well as the majority of basalts in the area. The Lowlands, Anguilla, and Dog Island have mostly limestone sources.

Of some significance is the unequal distribution of, and access to, flowing and non-flowing water among these islands. St. Martin, with higher elevations, has the only flowing ground water sources in the area, yet only two major non-flowing sources both in the Lowlands. Anguilla and Dog Island have only non-flowing water source access, but larger quantities of water are available in central and western Anguilla then on any of the other islands.
The primary subsistence resources for this area can be related to several different ecological niches. Marine resources such as fish are most abundant among the reef areas. The large reef areas are located between western Anguilla and St. Martin, and as a 15 km reef ridge stretching from north-central Anguilla to Dog Island. Sea turtles could have been captured at sea, or more easily at sand beaches during their egg-laying periods. The major sand beaches of Anguilla are all around the western half of the island, whereas on St. Martin the more abundant beaches are those connecting the main body to the Lowlands and around the Lowlands themselves. There are also sand beaches on Dog Island, mostly on the southern coast. It should be pointed out here that sand beaches also offer the best canoe-landing locations for these islands. The lagoon-estuary systems on these islands can provide substantial food resources, such as land crabs, shellfish, fish, and birds, and there are natural salt deposits as well. The largest and most plentiful lagoon-estuary systems in this area are found on St. Martin, particularly Simpson Lagoon of the Lowlands. The number of terrestrial animals among these islands is small but relatively similar.

The Archaic Age sites in this study area are very poorly represented with only two sites reported, both in north NE Anguilla and associated with caves. It is of some interest to note the position of these sites as well away from the primary Ceramic Age settlements.

The Ceramic Age settlements agglomeration in this study area follows closely the three stage Hudson Theory (1969), with an initial colonization at an individual site, then population increase necessitating only short distance movement, and finally increased density and regularity of settlement spacing. In this area, the earliest Ceramic Age peoples moved into an inland setting near flowing water access, depending on consumption of land crabs, terrestrial fauna, and manioc, in a distinguished pattern from that of all other periods. The earliest site (Hope Estate) was located in the higher elevations of St. Martin; later peoples, of the Saladoid period, either stayed at Hope Estate or moved to the coastal settings of Rendezvous Bay/Maudays Bay on Anguilla. This locational shift as an adaptive strategy may have been influenced to some extent by new immigrants moving northward.

The Post-Saladoid peoples experienced a substantial population increase. This may well relate to new cultigens such as maize added to the diet; the physical data are, however, yet inconclusive. The distribution of settlements is such that the majority of the population appears to have lived on Anguilla, and primarily in regularly-spaced coastal settlements in the western half of the island. The primary Post-Saladoid sites on St. Martin are located as regularly-spaced coastal settlements in the Lowlands. Only one primary Post-Saladoid site was noted on Dog Island. There have been two primary ceremonial caverns noted on these
islands, both from the Post-Saladoid period. One of these caverns is at the Lowlands of St. Martin (Maho) and the other on Anguilla (Fountain Cavern). Of some interest is the fact that on St. Martin, petroglyphs are also noted at Hope Estate, and at another flowing water source at Moho valley. The largest early Post-Saladoid site in the entire study area is found at Rondezvous Bay, Anguilla.

When looking to the macro-environmental aspects of the northern Lesser Antilles, we can refer to the processes of adaptive radiation (Sahlins and Service 1960:51); to the importance of ecological factors in determining boundaries (Barth 1969:18); to the importance of zones between the edges of territorial units (Kimes, Hasselgrove & Hodder 1982:128); and to the importance of frontiers to alleviate tensions between neighbors (Chagnon 1973:136), such that the lack of a frontier creates the need to select larger local groups and more elaborate alliance patterns among neighbors. All of these factors combined can provide us with a seaward perspective of Lesser Antillean island clusters as distinctive interaction spheres.

Some more specific details of the St. Martin-Anguilla area can be noted with respect to the unique inland settlement and subsistence pattern of the earliest colonizers, as distinct from the coastal adaptations of the later inhabitants. Numerous authors have theorized as to the cause of this shift (Rainey 1940; Carbone 1980; Goodwin 1980; Keegan 1985; Jones 1985; deFrance 1989). Due to the presence of a single propagule colony in each of the proposed island cluster areas, which also contain distinctive artifact characteristics (Haviser 1991), these early settlement patterns are suggested as relating to the initial influences of the earliest Ceramic Age peoples as distinctive within the Saladoid, and possibly even different from the Saladoid. An interesting note is that the Saladoid only added land crabs to their diet after reaching the northern Lesser Antilles (Watters and Rouse 1989:136). As well, Lathrap (1973:192) notes the more ancient branches of Macro-Arawakan tend to be near river headwaters, while the later Maipuran-Arawakan are more on broad, large streams. This could be a significant association reflecting the differential preference for elevated situations near flowing water at early sites (St. Martin), and lower elevation settlement near standing water for the later periods (Anguilla). The greater availability of water on Anguilla would certainly have given that island some priority, not only for the drinking needs of an increasing population but also for increased crop production. The proportional abundance of soils suitable for manioc and maize cultivation on Anguilla would complement greater access to water.

As noted earlier, the settlement on Dog Island seems to have had a specialized use as a fishing outpost associated with a large reef ridge. The Post-
Saladoid sites on St. Martin also suggest an outpost-like specialized use of the Lowlands, with regularly-spaced, smaller settlements having access to beaches, reefs, and lagoon-estuary systems, as well as available to large trees at the higher elevations and volcanic lithic sources on the island. The Lowlands of St. Martin offered the greatest potential area of St. Martin for a consistent Post-Saladoid settlement pattern trend as noted on Anguilla, with the addition of some unique resources. As Hodder (1979:446) has pointed out, the greater the competition between groups for resources, the greater the likelihood that material culture will play a part in the maintenance of internal cohesion. This point should be considered with respect to the evidence that almost all Anguillan Zemies are made of a lithic material distinctive of St. Martin (porphyrite), and that there was a shift from the earliest occupation on St. Martin to Late-/Post-Saladoid on Anguilla, at a period when Siegel has identified ancestor cult worship via Zemies. This geographic shift is coupled with paired settlements on Anguilla, which Keegan suggested may indicate changing social structure and evolving chiefdoms. As well, Allaire (1990) notes that there may have been affiliations between the Taino chiefdoms of the Greater Antilles and possible lesser chiefdoms in the Lesser Antilles.

Sypkens-Smit and Versteeg (1988:287) and Haviser have noted the use of stone tools on Anguilla made of stone from St. Martin (including radiolarian limestone). Watters has also observed that the presence of volcanic temper in ceramic sherds from largely volcanic-free Anguilla and totally volcanic-free Barbuda demands that some form of interaction occurred with volcanic islands, most likely (although as yet unproven) with St. Martin and Antigua respectively (personal communication, 1989). From this data, we can suggest that there was a localized interaction sphere in which St. Martin was identified as the ancestral source island. This sphere involved establishment of political authority at Anguilla via the local manufacture and distribution of porphyrite Zemies, and the exchange of other commodity items made of St. Martin raw materials. This suggestion is supported by a sparcity of similar porphyrite Zemies and radiolarian limestone tools outside the St. Martin-Anguilla area.

It is suggested that there was a specific localized interaction sphere, representing a Post-Saladoid lesser chiefdom, in the St. Martin-Anguilla area. This is manifested by regularly-spaced villages and hamlets on Anguilla, and specialized hamlets on St. Martin and Dog Island. The shrine caverns in the Lowlands and at Fountain Cavern, and the early petroglyph at Hope Estate, along with an abundance of locally manufactured Zemies, are suggestive of a religious hierarchy. The control of political authority appears to have been directed from the physical center of the interaction sphere at western Anguilla.
NOTE

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