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SYSTEMATIC SHOVEL TESTING AT THE MINNIS-WARD SITE (SS-3), SAN SALVADOR, BAHAMAS: ARCHAEOLOGICAL EVIDENCE FOR PRE-COLUMBIAN HOUSEHOLDS AND VILLAGE SPATIAL PATTERNING

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ABSTRACT

Systematic shovel testing at Minnis-Ward in May 2003 yielded interesting results, despite relatively limited testing within a 90 x 30 m area. While the site has been excavated off and on since 1960, it is clear from the present results that Minnis-Ward has more useful information to reveal. Minnis-Ward was inhabited between approximately A.D. 1000-1400, and appears not to have been occupied at the time of Columbus' landfall on the basis of prehistoric radiocarbon dates and the absence of Spanish artifacts. While originally considered a "food preparation" site, it is now clear that Minnis-Ward was a relatively dense pre-Columbian habitation site or "open village site." The hypothesized presence of some six prehistoric households in an area of 2700 m^2 further supports the interpretation of the site as a hamlet or village site. The 2700 m^2 area is about one-third the reported site size (ca. 8400 m^2); thus, we expect to find a total of ca. 18 houses at Minnis-Ward if the houses are distributed across the site as within the tested area. This number of houses corresponds well to Columbus's *Diario*, in which he reported about 12-15 houses in the largest Lucayan villages he encountered in the Bahamas. The orientation of the six household clusters detected in the shovel-testing program followed the crest of the dune in a general SW to NE direction. This arrangement of a settlement "along" or "atop a dune ridge" has been previously reported on San Salvador at sites such as Pigeon Creek and Long Bay, and appears to be a common Lucayan settlement pattern. The most significant contribution of the present research is analysis of the spatial distribution of artifacts using Surfer Version 8 contouring, gridding, and surface mapping software. Utilizing this spatial analytical technique and applying the household cluster model of Marcus Winter and Kent Flannery, we have been able to infer the locations of some six pre-Columbian houses and their associated activity areas. Activities tentatively identified include sweeping and cleaning of house floors and/or patio courtyards, disposal of household trash in middens or toss zones near the houses, cooking (hearths) and food preparation, shell working and bead making, and the possible spatial segregation of female and male activity areas.

INTRODUCTION

The Minnis-Ward site (SS-3) is located on the northwest coast of San Salvador island, Commonwealth of The Bahamas, approximately 1 km south of Rocky Point, some 200 m west (inland) from the ocean and some 100 m east of the inland lake named Triangle Pond (Winter, 1980; Figure 1). The site's coordinates are 24° 6' 2.22" N, 74° 31' 5.5" W (Winter, 1997). Site dimensions are approximately 100 x 100 m, covering an elongated elliptical area of approximately 8400 m^2 (Winter, 1997) along a southwest-northeast trending dune ridge.

VEGETATION, TOPOGRAPHY, AND SOILS

Minnis-Ward is situated in an area of near-shore vegetation characterized by coastal coppice that is dominated by *Coccothrinax*-shrub and blackland agricultural and disturbed areas (Shaklee, 1994:30, Figure 5). "*Coccothrinax* has a diverse vegetation mixture and is found in flat, open, sandy areas. Vegetation ranges in height from 1 to 1.5 meters and is often interspersed with

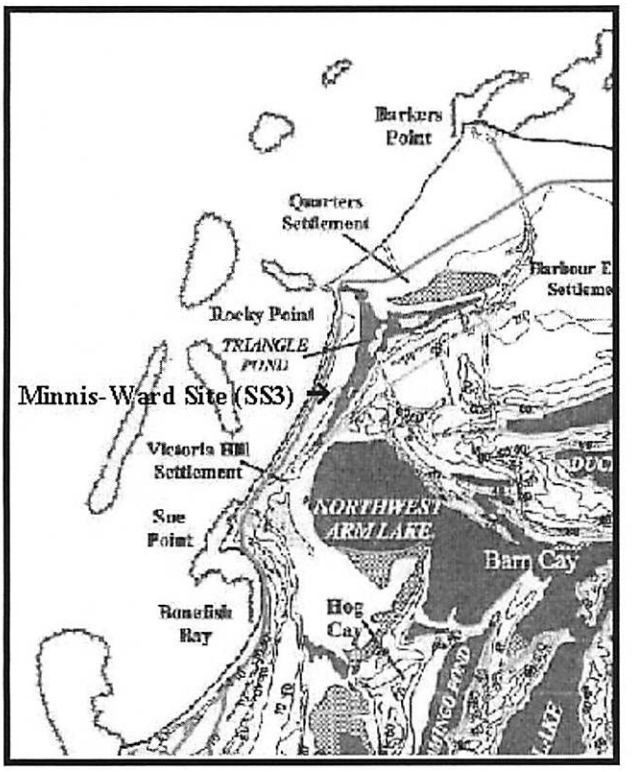

Figure 1. Map showing location of the Minnis-Ward site (SS-3) on the northwest corner of San Salvador, The Bahamas (from Robinson & Davis, 1999).

silver thatch palm which can achieve heights of 3.5 meters" (Shaklee, 1994:31). Other vegetation in the area includes sabal palms up to 6 m in height, poisonwood, and various shrubs. The agricultural and historical occupation of the site has created a secondary growth of vegetation, including shrubs, trees, and haulback (a thorny shrub or tree) typical of settled areas that have been subjected to slash and burn agriculture (Shaklee, 1994:31-32), or "casual cultivation" as it is sometimes known in the Bahamas.

In pre-Columbian times, the site vegetation would have been somewhat different from that of today. Taxa to be found at the Minnis-Ward site would have included *Sabal palmetto*, white torch (*Amyris elemifera*), ramshorn (*Pithecelobium keyense*), red mangrove (*Rhizophora mangle*), buttonwood (*Conocarpus erectus*), false coca (*Erythoxylon*), and lignum vitae (*Guaicum*) (Byrne, 1972, in Winter, 1997). Analysis of wood charcoal from the Minnis-Ward site and other sites on the island suggests that the general climate of San Salvador (Shaklee, 1996) has not changed much since pre-Columbian times (Pearsall, 1989, in Winter, 1997; Berman, 1992), despite the fact that most trees are gone (Sealey, 1990) and that some 95-98% of the island's vegetation is non-indigenous today (Smith, 1982).

The Minnis-Ward site is located on the crest of a low dune that runs from the southwest to the northeast for a distance of some 300 m. The site runs along the dune ridge, roughly paralleling a 10 ft contour interval on the recent GIS map of San Salvador (Figure 1; see also Robinson & Davis, 1999). The 1972 topographic map of San Salvador (Bahamas Government, 1972) indicates that the site sits at approximately 12 ft (3.66 m) above sea level and illustrates the site's location as inland from the Queen's Highway, south of Rocky Point, approached by an unimproved road at the end of which is a single modern house, possibly the "Ward cabin" (Winter, 1980), which is no longer extant, but evidence for which was found in the archaeological deposits.

The soils at Minnis-Ward may be generally described as sandy with varying amounts of organic matter (Shaklee, 1994:31). More specifically, the soils at Minnis-Ward may be placed into two categories: organic soil (black soil) and sedimentary soil (Sealey, 1990:4; Fig. 1.4 diagram of Bahamian soils is a useful reference on this point.) Organic soil is described as "*black*...after its colour...typical of the forested areas of the northern and central Bahamas, and is essentially a mixture of partly rotted vegetation, humus, and pieces of limestone..." (Sealey, 1990:3). Sedimentary soil, on the other hand, "is really just a mixture of sand and humus found wherever there are sand dunes. Because it is easily tilled and has more depth than the other soils, it is popular among subsistence and cash-crop farmers, who call the dunes *whiteland*, and the soil *salt-and-pepper* after its appearance" (Sealey, 1990:4; see also Sealey, 1994:87, Fig. 8.2). Depth of cultural deposits at Minnis-Ward ranges between 45-60 cm and up to 1 m in depth, according to Winter (1997). The organic or black soil at Minnis-Ward appears to be a midden (prehistoric trash deposit) and is, therefore, likely an anthropogenic or human-created soil due to the

alteration of soil chemistry and content from human occupation, waste disposal, excretion, and other activities. It is clear that the soil at Minnis-Ward would have been more than adequate for cultivation of manioc and other crops in pre-Columbian times.

PREVIOUS WORK AT THE MINNIS-WARD SITE

The Minnis-Ward site (a.k.a. Ward site, Ward/Minnis site, etc.) was first reported by Ruth G. Durlacher-Wolper in the late 1950s and tested by John Goggin in 1960 (Hoffman, 1967; Winter, 1997). A small portion of the site was later excavated in 1980-81 when John Winter reopened investigations at Minnis-Ward in 1980 (Winter, 1997). Continuing excavations at the site were renewed in 1990 and continued every year up until about 1997 (Winter, 1997).

In 1980, Winter (1980) reported the excavation of a 2 m^2 plot that yielded potsherds, shell, bone, a shell bead, coral, and a carbon sample that was later dated to 1940 ± 175 B.P. (Winter, 1981). Cultural materials were reported to lie between 16-27 cm below the surface. The majority of the pottery (83.3%) was Palmetto Ware, the locally manufactured prehistoric pottery of the Bahamas, and consisted of mostly small fragments <5 cm wide (Winter, 1980). The shell artifacts were all from *Strombus gigas* (queen conch), whereas the bead was reported as manufactured from ground and polished *Diodon* (Winter, 1980). Winter (1980) also reported the majority of bone material as being turtle (*Caretta caretta*), with other bones, primarily head bones, of parrotfish and wrasses accompanied by small amounts of iguana and other unidentified bones. The coral artifacts were few, but a large percentage of them exhibited wear, which suggested to Winter their use as tools, specifically "rasps" (Winter, 1980) or graters for manioc. The 1980 artifact assemblage reported by Winter is similar to the 2003 artifacts excavated by the authors in the shovel-testing program (reported herein) on the north-northeastern portion of the site. Winter (1980:3) also reported three post molds (impressions of posts) in the "yellow-white coral sand" of the site at about 51-53 cm below the surface, perhaps indicative of a pre-Columbian structure at the site. Winter's interpretation of the site was that it functioned as a "food preparation site," based on the "abundance of bone, rock, and charcoal" (Winter, 1980:3).

The following year, Winter (1981) excavated three 2-m^2 plots and a 1 m^2 unit at Minnis-Ward, reporting cultural materials were found primarily within a level 18-28 cm below the surface. A "firepit" or possible cooking hearth was recorded as containing large quantities of charcoal and burnt turtle shell, along with some 30 staghorn coral "scrapers" or graters. Faunal remains included abundant fish bones, including jaws of parrotfish and wrasses, as well as the turtle (*C. caretta*) mentioned previously (Winter, 1981). Winter (1981:5) interpreted the locale as a food preparation area and the site as an "open village site." Ceramics from the site were reported as mostly Palmetto Ware, small in size (<5 cm) as in 1980, with a few apparently imported sherds with a grit temper possibly from the Greater Antilles (Winter, 1981; any non-carbonate material would have to originate from islands other than the Bahamas, which have carbonate geology—see Keegan, 1997:45). Shell beads were also reported from the 1981 investigation, including one perforated *Olivella* shell and five other shell beads (Winter, 1981). A series of carbon samples was submitted to the Geology Department at the University of Miami and revealed occupation of the site was primarily during the period A.D. 1000-1400. Winter (1981) concluded that the site was not likely occupied at the time of Columbus' landfall on San Salvador. The radiocarbon dates reported for the Minnis-Ward site (calibrated to ca. A.D. 1021-1426; see more details in Blick, 2003:7, Table 1) would appear to support Winter's position.

Based on the calibrated radiocarbon dates above, the Minnis-Ward site appears to have been occupied between approximately A.D. 1000-1400, with subsequent farming and other disturbances likely in the historic period up until the present day. Summary reports of previous findings at the Minnis-Ward site are available in Winter (1980, 1981), Winter & Stipp (1983), Winter & Wing (1995), Winter (1997), Blick (2003), Blick &

Bovee (2005), and Blick & Brinson (2005, this volume).

RESEARCH METHODS

The research method employed during May 2003 at the Minnis-Ward site involved a systematic shovel-testing program on the north-northeastern portion of the site north of the excavations conducted by Winter (1980, 1981). According to Dr. Donald T. Gerace, this portion of the site had not been previously tested and there has been some debate about the size of the site and whether or not it is part of, or connected to, the nearby Palmetto Grove site (SS-2; Hoffman, 1997) excavated by Charles Hoffman in the mid-1960s (Hoffman, 1967).

To conduct the systematic shovel-testing program, a series of north-oriented transect lines was laid out using John Winter's datum stake as a reference point (see Figure 2). In this manner, the May 2003 shovel tests have been tied into the previously-established datum point on the site created by Winter. Transect lines were run in a northerly direction oriented by compass, base line, and metric tape. Flags were placed in the ground at 5 m intervals along the north-oriented transect lines to mark shovel test locations. In this manner, seven transect lines were laid out with shovel tests every 5 m. Eventually, due to landform changes and artifact recovery rates, some 105 shovel tests were excavated, originating some 25 m south of Winter's original datum stake and continuing north for 65 m and running east some 30 m, for total coverage of an area of 90 x 30 m, or 2700 m^2 (about one-third of the total site area, based on Winter's 1997 estimate of 8400 m^2). Figure 2 illustrates the site shovel-test grid.

Shovel tests were approximately 30 x 30 x 45 cm (depth) in dimension and were excavated through the "black soil," the dark gray artifact-bearing layer to the light-colored tan sand or hardened sand that Winter identified as the sterile subsoil in previous excavations. Each shovel test that was excavated had its contents passed through a ¼" (6 mm) mesh screen to aid in artifact recovery from the shovel tests (¼" or 6 mm mesh being the standard size used for shovel tests in ordinary

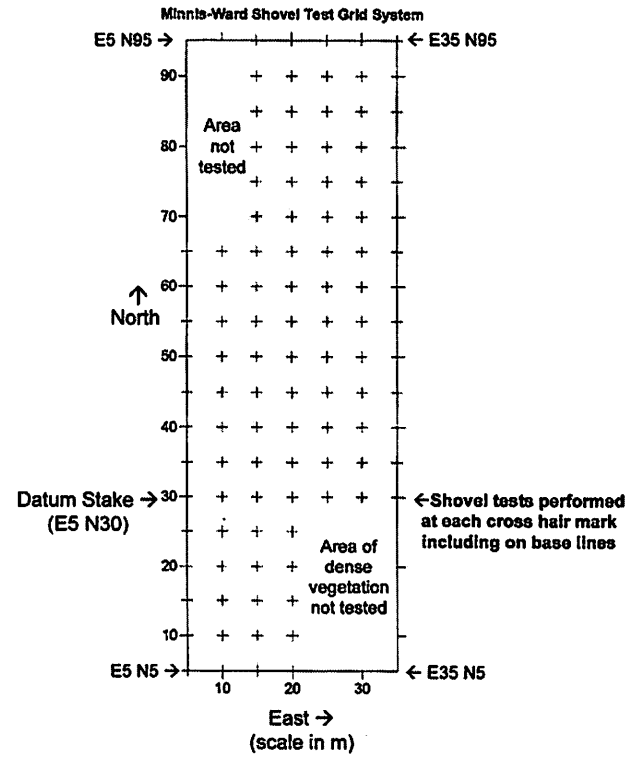

Figure 2. Shovel test grid map for the Minnis-Ward site showing locations of transects and shovel tests.

archaeological operations). In the future, all excavated soils (shovel tests included) will be passed through 1/16" mesh (2 mm) screen to facilitate recovery of additional small animal bones, beads, etc. The level of care in artifact recovery performed using the ¼" mesh screen yielded two pre-Columbian shell beads, so artifact recovery appeared to be fully satisfactory.

Each shovel test was assigned a simple field catalog number (ST1, ST2, etc.), was keyed to the site transect map, and was assigned a grid number so that artifact provenience (location) was maintained. All artifacts recovered were washed, dried, bagged, cataloged, and stored at the Gerace Research Center Archaeological Repository on San Salvador. Artifacts were stored in labeled and tagged plastic bags with their corresponding field catalog numbers. Artifact bags were then placed in plastic storage bins for future study and analysis.

A preliminary counting and sorting of all recovered artifacts was performed by the primary author to quantify and type the materials for preliminary analysis and mapping of artifact distributions across the tested area of the site. A full inventory of archaeological artifacts (total per category) can be found in Blick (2003:9-10 and Appendix 1). A list of vertebrate and invertebrate fauna identified to date can be found in Blick (2003:10), Blick (2005), and Blick & Brinson (2005, this volume); some of the faunal identifications are still in progress at the time of this writing (in 2005).

ANALYSIS OF ARTIFACT SPATIAL DISTRIBUTIONS

Artifact types, quantities, and distributions can tell us a great deal about the activities and the spatial distributions of activities performed by prehistoric peoples. Based on the "household cluster" (a.k.a. "household unit") model of Flannery and associates (Winter, 1974, 1976; Flannery, 1976; Flannery & Marcus, 1983), it has been possible to locate the positions of pre-Columbian household clusters and discern the activities carried out in each household through an analysis of the spatial distribution of artifacts in archaeological deposits. This technique was utilized by the primary author in the Valle de la Plata, Colombia, with successful results (Blick, 1993), and has now been applied to the Minnis-Ward site on San Salvador. To the best of the authors' knowledge, this may represent the first time this analytical technique has been applied to an archaeological site on San Salvador or perhaps in the Bahamas.

The general spatial distribution of artifacts that is suggestive of the presence of a pre-Columbian household cluster was the presence of a low-density artifact area surrounded by, or adjacent to, a higher-density artifact cluster or clusters (i.e., activity areas). The phenomenon that produces this pattern is the tendency for pre-Columbian occupants of the households to sweep the floors of their houses or otherwise keep the immediate walking surface free of artifacts (see discussion in Blick, 1993). Based on this general pattern, it has been possible to locate the positions of approximately six (hypothetical) pre-Columbian household clusters in the area shovel-tested recently at the Minnis-Ward site.

The analytical technique used to produce artifact distribution maps was to assign each shovel test a coordinate in a Cartesian grid system (x = east, y = north) and to enter the quantity (or weight, or some other measure) of the artifacts recovered in each particular shovel test location (z = artifact quantity or other measure in the third dimension of the Cartesian grid system). Utilizing Surfer Version 8, a contouring, gridding, and surface mapping software (Golden Software, Inc., 2003), artifact density distribution maps were created for each artifact type of interest. For example, in this study, artifact distribution maps were created for pottery, bone, shell, coral, rock, fire-cracked rock, and several other artifact types based on the quantities recovered in each of the shovel tests excavated. On the artifact distribution maps, high-density artifact clusters are indicated by tight concentrations of isolines and low-density areas are generally indicated by widely-spaced isolines (see, for example, Figures 3 and 4).

The distribution of pottery (N = 616) in the shovel tests at Minnis-Ward is illustrated in Figure 3. The reasoning for the hypothesized locations of Households 1-6 in Figure 3 is based on the locations of low-density artifact areas (swept or cleaned floors or patio/courtyards) and the proximity of relatively high-density areas (concentrations) of pottery. Each hypothesized household cluster (to be archaeologically verified by the presence of post-mold patterns in a future investigation) was associated with a low-density zone of pottery (the hypothetical center of the house or courtyard) and a nearby high-density zone of pottery (the midden, toss zone, or activity area).

Other artifact distribution patterns were compared to the distribution of pottery in Figure 3 and the same general pattern held for the other artifact types, i.e., the house floor or patio occurred in an area of low-artifact density, while the associated middens or activity areas (high-artifact density areas) occurred adjacent to the house. Of the pottery recovered in the shovel tests at Minnis-Ward, only some six rim sherds (0.97% of the pottery), three decorated sherds (0.49% of the

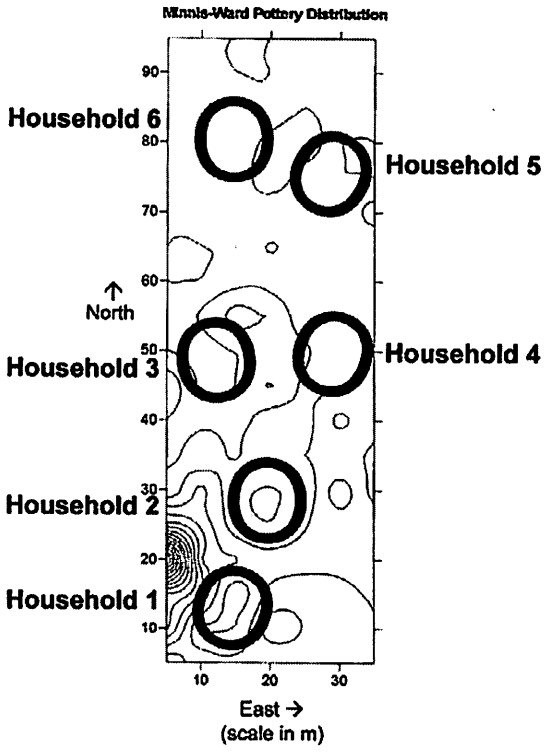

Figure 3. Pottery distribution map based on the counts of pottery in each of the 105 shovel tests excavated at the Minnis-Ward site.

pottery, all of which were rim sherds), and two possibly imported sherds (0.32% of the pottery) were identified. More detailed analysis may increase these numbers slightly.

The distribution of bone (N = 2034) at the Minnis-Ward site indicated that each hypothesized household cluster was spatially associated with a low-density area of bone located at or near the center of the house, while nearby was a high-density cluster of bone artifacts which probably represented a midden area or refuse zone associated with that particular household. It is logical to assume that each household would have its own nearby toss zone or midden for the disposal of household debris.

The distribution of burned bone (N = 364) (Figure 4) is probably a somewhat more accurate depiction of food preparation and/or disposal activities, and once again the general pattern was observed that each house was associated with a low-density zone of burned bone, often near the center of the hypothesized house (with the possible exception of Household 3). It is also obvious from analyzing Figure 4 that each of the six household clusters was immediately adjacent to a high-density zone of burned bone, which likely represented a midden or food preparation area in close proximity to the house (the spatial distributions of fire-cracked rocks and coral graters provide additional support to this interpretation; see Blick, 2003). Of the total bone recovered from the site, some 17.90% was clearly burned.

The distribution of fish remains, such as fish jaws (N = 167), fish molars (N = 124), and fish vertebrae (N = 432), also indicated that the hypothesized center of each house was associated with a low-density zone of fish remains adjacent to a zone of high-density fish remains, likely representing the middens of each individual household. Of all the bone recovered at Minnis-Ward, some 83% was composed of fish bone, 14.31% consisted of fish head/mouth parts, and 21.24% consisted of fish vertebrae (these numbers may change somewhat as identifications are firmed up in the near future). See Berman (1994) for some very interesting observations about Lucayan fish processing for comestible purposes.

Likewise, each household cluster was associated with a low-density area of shell (N = 3389), *Strombus* (N = 2107), and *Codakia* (N = 76) typically located at or near the center of the hypothesized house, immediately adjacent to a higher-density region of shell fragments. This pattern may be one of the more illustrative, as shell fragments would clearly be sharp, or at least uncomfortable to step on, and thus very likely to have been swept away from house floors, patios, or other areas commonly used for walking (see Blick, 2003:40-42, Figures 12-14). The pattern of shell distribution may also be indicative of consumption and other activities, as shell remains are an archaeological signal of either or both diet and tool manufacture. The majority of the total shell remains was made up of *Strombus* (62.17%), with a small proportion composed of *Codakia* (2.24%).

The spatial patterning of coral (N = 211), like that of shell, is also likely to reflect pre-Columbian patterns of house floor cleaning or

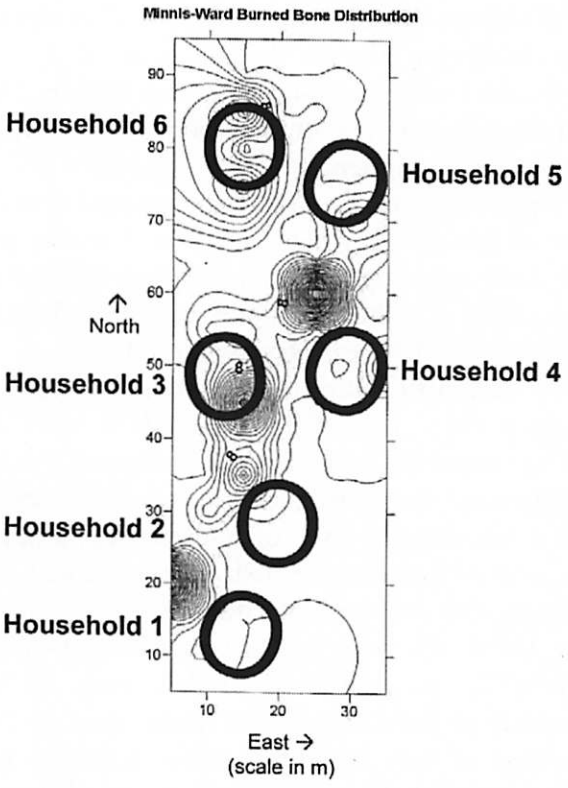

Figure 4. Burned bone distribution map based on the counts of thermally-altered bone in each of the 105 shovel tests excavated at the Minnis-Ward site.

other activities, as coral is likely to have been swept away from walking areas and may have been used as tools, such as manioc graters. The distribution of coral at Minnis-Ward is such that each house (with the possible exception of Household 4) is associated with a low-density zone at the center of the hypothesized house and adjacent to a relatively high-density area of coral.

The distribution of *Cerion* (peanut snail) and other small gastropods (N = 3199) indicates the typical pattern of low-density areas located at or near the center of the hypothesized household cluster location with higher-density areas immediately adjacent to the house. It was originally hypothesized that the *Cerion* and small gastropods recovered from Minnis-Ward were likely not part of the diet, but were rather intrusive into the archaeological deposits as a result of their modern presence on vegetation at the site. Thus, it was expected, based on this reasoning, that the distribution of *Cerion* and other gastropods would be more random and certainly not associated with the spatial distribution of pre-Columbian household remains. However, based on the apparent nonrandom distribution of *Cerion* and other gastropods and the similarity to other artifact distributions, the hypothesis of *Cerion* as essentially non-artifactual may have to be reevaluated.

Likewise, the distribution of the crab remains at Minnis-Ward (N = 162) was thought to simply reflect the presence of modern crabs and crab burrows at the site (see Winter, 1980, 1981). However, it is clear that the distribution of crab was similar to that of the other artifacts, i.e., each household cluster appeared to be associated with a low-density zone of crab remains (with the possible exception of Household 4) and adjacent to a higher-density zone of crab. The original hypothesis that the crab was a modern intrusion into the site deposits, and therefore non-artifactual in nature, may have to be reevaluated. Radiocarbon dating of crab remains will be necessary to settle this question.

A large quantity of rock (N = 4535) was recovered in the shovel tests at Minnis-Ward, and its distribution was hypothesized to be random based on the idea that most rock at the site was non-artifactual. However, the association of each house center with a low-density zone of rock adjacent to a higher-density zone resembles the spatial patterning of the other artifacts and appears to suggest the nonrandom spatial distribution of rock at the site. Rock, like shell and other debris, would be likely to be swept away from house floors, patios, and other common walking areas, thus providing a possible explanation for the spatial distribution of rock at Minnis-Ward.

While plain rock was thought to be randomly distributed across the Minnis-Ward site, the spatial distribution of the small amount of fire-cracked rock (FCR; N = 35) was much more revealing. The miniscule quantity of FCR recorded at Minnis-Ward may be based on the primary author's inability to recognize fire-cracked or "thermally altered" carbonate rock on San Salvador, as opposed to the readily recognizable pattern of fire-cracking and thermal alteration of noncar-

bonate rock in eastern North America. Nevertheless, although the amount of FCR at Minnis-Ward appears small, its spatial patterning is interesting. Each household cluster was associated with a low-density zone of FCR at its center and was proximate to a relatively higher zone of FCR just outside the house (see Blick, 2003:47, Figure 19). This pattern would be expected, as each household would likely have its own hearth and cooking/food preparation area. Fire-cracked rock would also be likely swept off of living or walking surfaces, and it is also likely that fires and hearths would have been kept away from, and outside of, the houses in order to avoid accidental house fires. Smokey fires may have been used as forms of insect repellent, and it is also likely that hearths may have been placed on the downwind side of houses to avoid accidental spread of sparks and smoke inhalation. Further study of prevailing winds at the site and the spatial distribution of clearly defined hearths in relation to post-mold patterns of houses would be revealing to test these hypotheses.

Just as each household appears to have had its own hearth for cooking, it also appears, based on the distribution of coral graters (N = 7; hypothesized to have been used in manioc processing), that each household was responsible for its own food preparation. Four of the six households (excluding Households 3 and 6) were spatially associated with at least one staghorn coral (*Acropora cervicornis*) grater fragment. Several of the graters occurred in association with fire-cracked rock, thus strengthening the case for the graters being used in food preparation. These coral grater fragments exhibit unusual wear or smoothing that is likely to be due to their use as a tool, specifically for grating manioc (or other foodstuffs) into manioc flour. Manioc was the staple terrestrial food crop (although recent work by Berman and Pearsall, pers. comm., appears to have thrown some doubt on this assumption) and requires a great deal of processing, including grating into manioc flour in order to make manioc or cassava bread. The use of staghorn coral as a woodworking tool has also been hypothesized, and its spatial distribution may be indicative of activity areas adjacent to houses.

In regard to special activity areas, the distribution of worked shell (N = 1) and beads (N = 2) is suggestive. It appears that at least two of the six households (Households 3 and 5) were engaged in the manufacture of shell beads (evidence from the 2004 excavation near Household 1 also suggests that this household was involved in bead manufacture). In addition, Household 5 was adjacent to a *Strombus* outer lip fragment that appeared to have been smoothed or worked, perhaps in the process of tool or ornament manufacture. The importance of craft manufacturing regarding the nature of social stratification is such that, in an egalitarian society, one would expect tool or ornament manufacture to occur in each individual household. On the other hand, in a ranked or stratified society, one might expect to find tool or ornament manufacture limited to fewer households. Although the small sample size of worked shell and beads recovered in the shovel tests (N = 3) limits what can be said about the nature of craft specialization and social stratification at the Minnis-Ward site, the association of worked shell and beads with a limited number of households raises the possibility of social stratification, or some other form of household differentiation, at Minnis-Ward. It should be noted that Taíno society was recorded as being ranked or stratified (Rouse, 1992; Keegan, 1997), so evidence of social stratification would not be surprising in household archaeological deposits.

It is interesting to note that use of coral graters (food preparation) was very likely a female task (Murphy & Murphy, 1985), whereas the manufacture of shell beads and ornaments was quite probably a male task (Carlson, 1993). Spatial distributions of coral manioc graters and shell beads (see Blick, 2003:48-49, Figures 20 and 21) reveal some degree of spatial separation between coral graters and worked shell (especially for Household 5 and perhaps also for Households 4 and 3). This pattern, while admittedly based on a small amount of data, is possibly indicative of female and male work areas. It is a known ethnographic fact that male and female spaces and activities are highly segregated in many tropical forest societies (Harner, 1972; Chagnon, 1983; Murphy & Murphy, 1985). Further investigation and

larger sample sizes will likely yield additional useful data toward the spatial analysis of female and male activity areas (for example, see Blick, 1993).

Finally, the few historic artifacts at the site (N = 77) generally clustered near the northern end of the shovel-test transects and represented a recent house, perhaps the old Ward cabin or one of the other structures shown on the 1972 topographic map (Bahamas Government, 1972). Historic artifacts included various fragments of rusted metal, modern wire nails, three fragments of wall plaster, and what was perhaps a crude awl or tool made from a fish dorsal spine. Historic remains on the ground surface included bottle glass, ceramic pipe, an old plastic cooler, and the remnants of a possible rope swing or hammock in a nearby tree. Most of the historic artifacts come from two shovel tests near the rope-bearing tree.

CONCLUSIONS

The systematic shovel-testing program initiated at the Minnis-Ward site in May of 2003 has yielded some very interesting results, even though the nature of the testing program was somewhat limited (105 shovel tests). Although the Minnis-Ward site has been excavated off and on since about 1960, it is clear from the results presented here that Minnis-Ward has much more useful information to reveal. The Minnis-Ward site, based on the radiocarbon dates reviewed for this report, was apparently inhabited between approximately A.D. 1000-1400, and appears likely not to have been occupied at the time of Columbus' landfall (Winter, 1981), based on the prehistoric radiocarbon dates and the absence of early Spanish colonial artifacts. It also appears likely that the Minnis-Ward site is not a part of, nor is it connected to, the nearby Palmetto Grove site (SS-2), as hypothesized by Hoffman (1997), based on the relatively rapid decline in prehistoric artifacts to the north and east within the shovel test grid.

Artifact density at Minnis-Ward was relatively high, with a total of 14,223 prehistoric and historic artifacts recovered in 105 shovel tests. Each shovel test was approximately 0.0405 m^3 in volume and yielded approximately 135.46 artifacts per shovel test. Calculated in another way, some 4.253 m^3 of volume was excavated in the shovel-testing program (0.0405 m^3 x 105 shovel tests), yielding some 3344.23 artifacts per cubic meter. Whereas Winter (1980) originally stated that the Minnis-Ward site "was utilized for food preparation," it later became clear that Minnis-Ward was a relatively dense pre-Columbian habitation site or "open village site" (Winter, 1981:5).

The hypothesized presence of some six prehistoric households in an area of 2700 m^2 further supports the interpretation of the Minnis-Ward site as a hamlet or village site. It should be noted that 2700 m^2 is about one-third the reported size of the site (8400 m^2; Winter, 1997); thus, we might expect to find a total of about 18 houses at Minnis-Ward if the houses are similarly distributed across the site as in the shovel-tested area. This number of houses corresponds quite well to Columbus' 1492 log, in which he reported about 12-15 houses in the largest of the Lucayan villages he encountered in the Bahamas (Fuson, 1987:86).

On the other hand, Keegan's (1992:71, Table 4.2) classification of Lucayan site types based on length of site would place the Minnis-Ward site among the hamlet sites. Additional work to confirm the exact length of the Minnis-Ward site may help to better define the full size and nature of the site. According to Keegan (1992:72), "These habitation sites have scatters containing pottery, marine mollusc shells, fish bones, small limestone (fire-cracked) rocks, and other materials. They are located on lee-shore sand beaches or windward tidal creeks, and their soil exhibits evidence of organic enrichment... The kinds of remains found in these sites indicate that they were places at which people lived for extended periods of time. Size differences are viewed as reflecting the number of people who lived at a site." This description is clearly applicable to the Minnis-Ward site. It is also interesting to note that the orientation of the six hypothetical household clusters detected in the shovel-testing program at Minnis-Ward appears to follow the crest of the dune ridge in a generally southwest-to-northeast trending direction. This arrangement of a settlement "along" or "atop a dune ridge" has

been previously reported on San Salvador at sites such as Pigeon Creek and Long Bay (Gerace *et al.*, 1983:6, 9, 13) and appears to be a relatively common Lucayan settlement pattern (Keegan, 1997).

Regarding the nature of artifacts recovered in the shovel-testing program at Minnis-Ward, it is clear that the quantity and density of ceramics was relatively low (N = 616 or 5.87 sherds per shovel test/144.84 sherds per m^3). Based on this fact, at least two possibilities emerge: 1) the site was not occupied for very long, thus, the density of ceramics is low (the radiocarbon dates would seem to deny this, despite Winter's 1997 argument for short duration occupation); 2) the material culture inventory of the Lucayan inhabitants of Minnis-Ward was dominated by perishable goods, such as cotton, basketry, and wood (very much like that of other tropical forest cultures; for an interesting discussion of the use of wood among the Lucayans, see Berman, 2000). Furthermore, the small size of most ceramic fragments would seem to suggest the trampling of potsherds in a village or midden context; the small size of the animal bones recovered might be due to trampling in a midden zone as well (Stahl & Zeidler, 1988, 1990).

Finally, the most significant contribution of the present research is that of the analysis of the spatial distribution of artifacts using the Surfer Version 8 contouring, gridding, and surface mapping software. Utilizing this spatial analytical technique and applying the household cluster model of Flannery and associates (Winter, 1974, 1976; Flannery, 1976; Flannery & Marcus, 1983), it has been possible to identify the locations of approximately six hypothetical pre-Columbian households and their associated activity areas. According to the information available to the present authors, this is the first time this particular analytical technique has been applied to an archaeological site in the Bahamas.

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