DIET AND RANK IN A CARIBBEAN MARITIME SOCIETY

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The investigation of social inequality in the Caribbean mainly has focused on the larger islands of the Greater Antilles where ethnohistoric records and monumental architecture form the basis for analysis of precolumbian complex societies. This paper presents evidence for status differentiation in the Lesser Antilles on the small island of Anguilla within a deposit at the Sandy Hill site and evaluates associated archaeofauna for evidence of rank-based differences in food consumption. When compared with three other sites, the higher density of status-related artifacts and higher densities of food remains at the Sandy Hill site are interpreted as the result of feasting. No evidence for inequality is observed in patterns of food consumption.

El estudio de la desigualdad social en el Caribe se ha enfocado principalmente en las islas más grandes de las Antillas Mayores donde los registros etnohistóricos y la arquitectura monumental constituyen la base para el análisis de las sociedades complejas precolombinas. Este artículo presenta evidencia de la diferencia de estatus en las Antillas Menores, en la pequeña isla de Anguila, dentro de un depósito en el sitio de Sandy Hill, y evalúa la arqueofauna asociada en busca de evidencia de diferencias basadas en el rango social en lo que se refiere al consumo de alimentos. Al compararse con otros tres sitios, la mayor densidad de artefactos relacionados con el estatus y las mayores densidades de restos de alimentos en el sitio de Sandy Hill se interpretan como el resultado de fiestas. No se observó evidencia de desigualdad en los patrones de consumo de comida.

This paper explores the association between social rank and diet in a maritime society in the northern Lesser Antilles. Standardized excavations at several large, contemporaneous, Late Ceramic Age (ca. A.D. 900–1500) village sites on the small island of Anguilla (Figure 1) provide an opportunity to investigate the potential association between material culture indicative of status and food remains. An uneven distribution of prestige goods between sites suggests the presence of a ranked society in Anguilla and the neighboring small islands during the centuries prior to European contact (Crock 2000; Crock and Petersen 2004; Haviser 1991). This paper investigates social differentiation in this region at the site level, first by identifying an elite deposit using relative proportions of status objects, then by evaluating the associated food remains for evidence that may reflect hierarchical patterns in food consumption.

Archaeological investigation of elite food consumption and control of food production depends on the identification of residential and ritual contexts associated with high-ranking social groups. For this reason, the zooarchaeology of elite foods is often restricted to obvious examples of social stratification and well-defined boundaries between elite and non-elite space (e.g., Bray 2003; Crabtree 1990; deFrance 2009; Jackson and Scott 2003; Kelly 2001; Knight 2004). In the Pacific Islands, ample archaeological, ethnohistoric, and ethnographic evidence attest to elite residences, activity areas, and differential access of elites to "luxury" foods, notably fish, among the complex chiefdoms of, for instance, Hawaii (e.g., Kirch 2001; Kirch and O'Day 2003). In less stratified Polynesian chiefdoms, such as in Tikopia, the identification of elite-controlled activities such as feasts is more elusive archaeologically, given that "feasting has little to distinguish it qualitatively from ordinary eating" (Kirch 2001:180). Clear indications of rank distinctions among such less stratified populations are noted ethnographically, however (Jones 2009;

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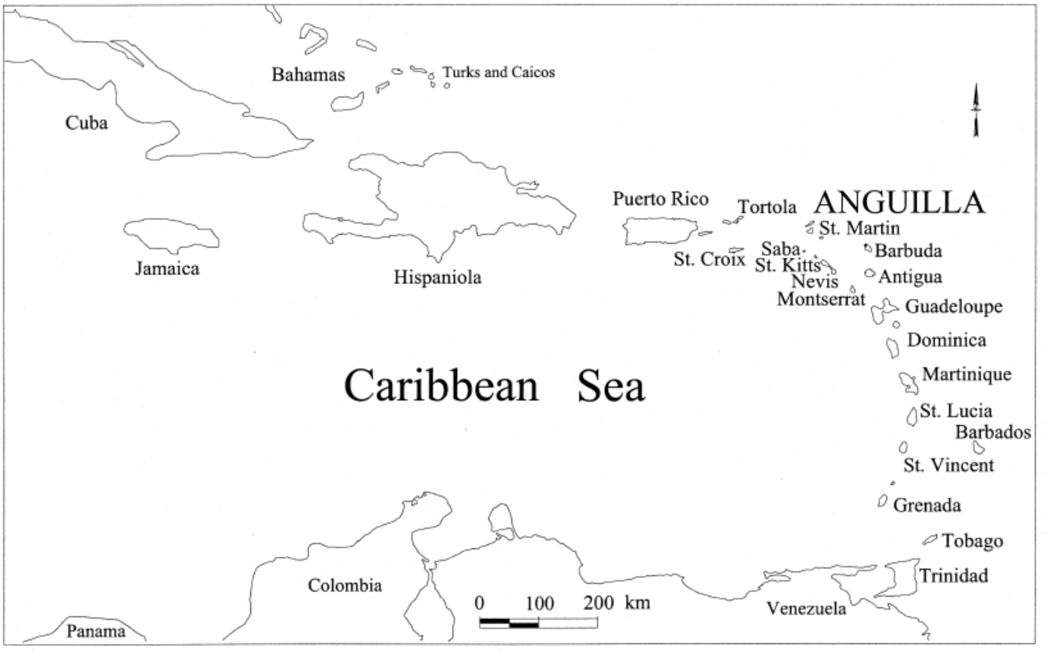

Figure 1. Map of the Caribbean showing the location of Anguilla.

Kirch 2001:172). Likewise, in the Caribbean Islands, ethnohistoric accounts document large polities where food played a significant role in elite hospitality, yet archaeological examples that elucidate the relationship between social ranking and food are rare, with few exceptions (e.g., Deagan 2004; deFrance 2010).

Elite Contexts in the Caribbean

The ethnohistoric record of the Caribbean is rich with detail of status differentiation within and between communities living in the Greater Antilles and Virgin Islands at the time of European contact (e.g., Dunn and Kelley 1989; Las Casas 1951; Pané 1999). Spanish chronicles provide evidence that Amerindian communities, including the Taíno, were led by both male and female chiefs (*caciques*) from elite lineages that controlled the distribution and display of prestige goods (e.g., Lovén 1935; Moscoso 1981; Rouse 1992; Wilson 1990). These items included raw materials such as cotton, finely made wooden stools and benches (*duhos*), gold (*guanine*), shell masks (*guaízas*), and the more powerful *cemí* idols in the form of textile dolls, wooden sculptures, and three-pointed stones (Helms 1987; Oliver 2009; Pané 1999). Contact period documents also illustrate the ability of chiefs to mobilize labor for public activities, agriculture and fishing (e.g., Las Casas 1951, II:144–145, 1958, IV:242; Sauer 1969:88–90; Wilson 1990:90–97).

Unfortunately, documentary accounts make little direct mention of the people living in the small islands of the eastern Caribbean, other than passing references to kinship connections between the Lesser and Greater Antilles (e.g., Sued Badillo 1995). As a result, questions addressing the scale of complexity and the socio-political relationship between the two regions rely mainly on archaeological data.

Material culture arguably related to elite status and elite activities is present at sites in the northern Lesser Antilles, including decorated ceramics, the above-mentioned objects such as idols and ornaments, and inlays once used to adorn wooden furniture. These artifacts, stylistically similar to those found at Late Ceramic Age sites in the Greater Antilles and analogous to objects referenced in Spanish chronicles, document the presence of a culturally related hierarchical society in the small islands in the centuries prior to European contact

(Crock 2000; Crock and Petersen 2004; Hoogland and Hofman 1994, 1999). Rouse (1992) classifies the people in the eastern Caribbean at the time of Columbus as "Eastern" Taíno and those in the Greater Antilles as "Classic" Taíno. While a cultural linkage is clear archaeologically, the degree to which societies in the northern Lesser Antilles were related to those in the Greater Antilles and whether or not they were comparable in terms of level of complexity remain open questions (e.g., Curet 2003; Oliver 2009:25).

Even with the clues provided by ethnohistory, the archaeological identification of elite contexts in the Caribbean is challenging due to the perishable nature of many materials used by Amerindians to communicate social status and the difficulty in matching midden residues or other deposits to elite households or activities presided over by elites. Exceptions include civic-ceremonial ball court sites argued to be emblematic of elite power and stages for elite-controlled activities (Alegría 1983; Curet and Stringer 2009; Oliver 1998, 2005) and the Contact era Taíno village of En Bas Saline in Haiti, thought to be the main town within the chiefdom of Guacanagarí, and the location of the first Spanish settlement (Deagan 2004). These contexts provide rare opportunities to study the presence, or absence, of patterns of elite food consumption. For example, at En Bas Saline, notable differences are apparent in both the distribution of ornaments and ritual items and correlated patterns of food consumption (Deagan 2004). Deagan (2004:616–618) found that elites consumed more mammals and larger, less bony, fish compared to non-elites. In contrast, at the site of Tibes, a ball court complex in Puerto Rico, little appears to differentiate animal use across the site or through time (deFrance 2010).

Environmental Setting

Terrestrial and marine resources are highly variable within and between Caribbean islands. Local environments, whether island- or site-specific, are particularly influential in structuring subsistence practices (Wing and Reitz 1982). The island of Anguilla is a small, flat limestone island of approximately 91 km^2 and a maximum elevation of 65 m. Local environments on Anguilla differ in physical and biotic features, variability in density and distribution of food resources, and ease of access to food resources. Anguilla is part of the Anguillan Bank, one of the most extensive and productive reef systems in the Caribbean, ranging from 20 to 40 m deep and covering 4,660 km^2 (Jackson 1981).

Anguilla's coastline consists of coral sand beaches, low rock outcrops, and limestone cliffs. Extensive inshore patch and fringe reefs and a broad barrier reef are located along the island's northwestern coast, and substantial shallow fringe reefs occur along the northeastern and southern coasts. A small area in the north has rocky cliffs with a rocky-bottom shore. There is no surface fresh water on the island although there are underground springs, aquifers, and natural subsurface limestone cisterns. Land suitable for farming is limited by the island's rocky limestone substrate, low elevation, and low rainfall. Approximately 13 percent of Anguilla is cultivable today. Although the potential for cultivation may have been greater in the past prior to extensive deforestation and soil erosion, arable land has always been limited by shallow soils with an underlying and/or exposed limestone pavement.

Subsistence remains from sites in Anguilla reveal an intense maritime adaptation with archaeofaunal assemblages comprised of greater than 95 percent fishes (Carder and Crock 2007), and high densities of invertebrates (Clark and Crock 2011). High volumes of interisland trade and exchange represented by high proportions of non-local stone and ceramic raw materials support the strong maritime focus (Crock et al. 2008; Crock and Petersen 2004; Knippenberg 2006).

Archaeological Sites Studied

The site samples studied were collected during 18 months of fieldwork from 1996 to 1997 (Crock 2000). Systematic excavations undertaken at four contemporaneous Late Ceramic Age habitation sites in Anguilla—Sandy Hill, Sandy Ground, Barnes Bay and Shoal Bay East—produced large samples of artifacts and well preserved faunal assemblages (Figure 2). A total of 13 calibrated (two sigma) ^{14}C dates from the deposits studied provide a maximum age range of A.D. 775–1410. A tighter range of A.D. 900–1200 is suggested based on actual date intercepts and temporal assessments of ceramic style. At all four sites, historic cultivation, modern construction, and natural erosion of

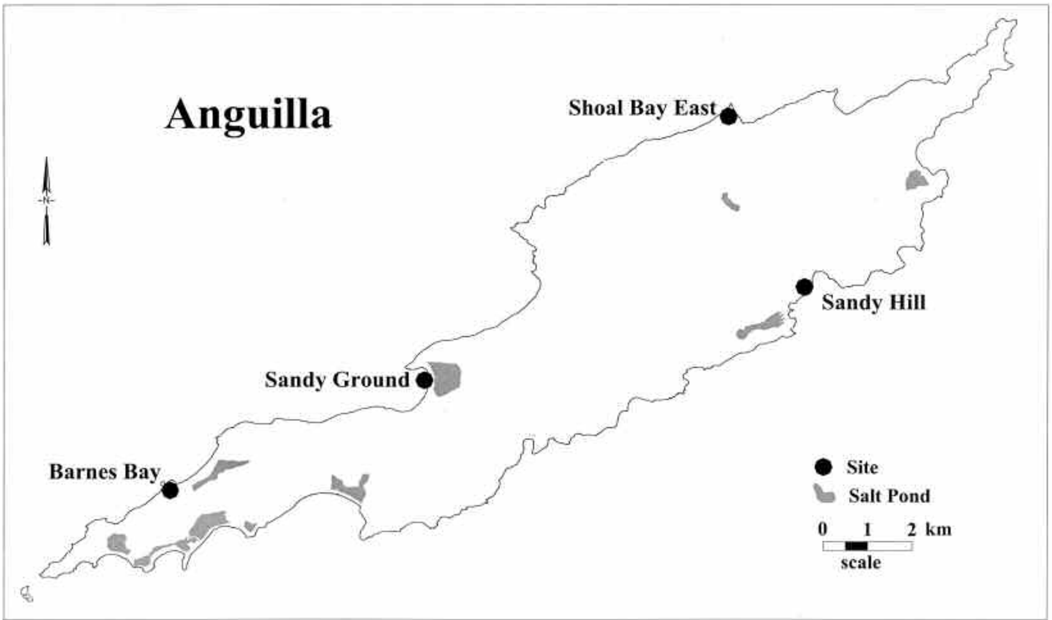

Figure 2. Map of Anguilla showing the location of sites discussed.

the shoreline have negatively impacted overall site integrity. Despite these challenges, commonplace in the Lesser Antilles, we have obtained meaningful data to compare sites and intra-site patterning.

A similar testing program was undertaken at each site, consisting of shovel testing at 25 m and 50 m intervals and excavation of larger units (1.0 x 2.0, 1.0 x 3.0, and 2.0 x 2.0 m units) in core (midden) areas of each site. In each case, larger test units were placed in areas of high artifact density to address hypotheses related to the development of social complexity on the island and within the northern Lesser Antilles (Crock 2000; Crock and Petersen 2004). At all sites, individual 1.0 m x 1.0 m units were excavated in arbitrary 10 cm levels within natural strata. Each unit level was separated into four 50 cm x 50 cm quadrants. Fill from three quadrants of each excavated unit was screened through 6.4 mm (¼-inch) mesh, and one quadrant was screened through 3.2 mm (⅛-inch) mesh. For the analysis of the material culture and food remains discussed below, we combined samples from the two mesh sizes for each 10 cm level. Samples finer than 3.2 mm mesh were not collected. In all cases, the uppermost strata were not included in the analysis due to cultivation and landscaping disturbance.

The archaeological assemblages from the four sites offer an opportunity to present evidence of an elite deposit and evaluate potential rank-based differences in food consumption during a portion of the Late Ceramic Age, ca. A.D. 900–1200. This period represents the height of Amerindian occupation of the island and the period during which complexity developed in the northern Lesser Antilles (Crock and Petersen 2004; Haviser 1991).

The Sandy Hill site is located in the east-central portion of Anguilla's south coast, on the western side of the bay (see Figure 2). Sandy Hill Bay is shallow with patches of reef close to the shoreline. The archaeological site lies on the southeast side of Sandy Hill, the highest point on the south coast of the island (30 m amsl). The site extends inland from an elevation of about 2 m amsl, at its eastern edge, 20 m amsl. at the western margin. Based on positive test pits (n = 28) and surface artifacts, the original site size is estimated to be 4.0 ha (Crock and Petersen 1999). Diagnostic ceramics and ^{14}C dates indicate that the Sandy Hill site was a large village occupied from as early as A.D. 900 and continuously to A.D. 1200–1500 (Crock

2000:96–103). A 1.0 m x 2.0 m test unit excavated in the central portion of the site generated the artifact and zooarchaeological assemblages discussed below. Three calibrated dates for the specific midden deposits studied (20–50 cm below ground suface [bgs]; arbitrary levels 39–43), have an overlapping range between cal A.D. 980 and A.D. 1390 (Crock 2000:101–102) (calibrated at 2σ with the program CALIB 5.0.1 [Stuiver and Reimer 1993].).

The Sandy Ground site is on the west-central portion of Anguilla's northern coast (see Figure 2). The site is adjacent to Road Bay, the only natural deep harbor on Anguilla. The site and modern village lie about 2–3 m amsl. on a thin strip of barrier beach separating Road Bay from a large salt pond. The salt pond covers about 40 ha, and small areas of mangrove swamp, likely more extensive at the time of Amerindian occupation, exist along its inland margins. Sandy Island and Prickly Pear Island, part of the Seal Bay barrier reef system parallel to the coast, are located approximately 3–7 km offshore. The near shore patch and fringe reefs are characterized by extensive areas of hard and soft corals, ledges, cliffs, and caverns. Based on test pits (n = 21) and the extent of artifacts on the surface of the site, Crock and Petersen (1999) estimate the original site covered at least 7.5 ha. The Sandy Ground site was a large village occupied as early as A.D. 350, and continuously from A.D. 650 through A.D. 1200 and potentially until A.D. 1500, making it one of the first and longest occupied sites on the island (Crock 2000:59–68). Crock and Petersen excavated a series of larger test units in the core of the site; a 1.0 m x 3.0 m unit generated the artifactual and zooarchaeological assemblages discussed in this article. One date for the deeper of the two specific Late Ceramic Age midden levels studied (30–40 cm bgs; arbitrary level 16), has a range of cal A.D. 775–1015 (Crock 2000:66) (calibrated at 2σ with the program CALIB 5.0.1 [Stuiver and Reimer 1993].).

The Barnes Bay site is located approximately 6 km west of Sandy Ground (see Figure 2). The site lies above the shoreline at the top of a small slope approximately 3–6 m amsl. The coastline at Barnes Bay forms a small rocky promontory, open to the north, with limited near-shore reef protection. The Seal Bay barrier reef is located 5 to 10 km offshore. Close to shore, patch and reef banks are structurally complex with extensive areas of soft and hard corals, steep reef edges, and boulder-strewn sandy bottoms. A large salt pond, areas of mangrove, and a freshwater spring are located within one kilometer of the site. Based on test pits (n = 40) and the extent of artifacts visible on the surface, Crock and Petersen (1999) estimate the original covered at least 2.3 ha, although this is probably an underestimate as beach erosion has impacted the northwestern portion of the site. Analysis of ceramics and calibrated radiocarbon dating indicate Barnes Bay was a large village site occupied as early as A.D. 775 through at least A.D. 1200–1400 (Crock 2000:129–133). Crock excavated two 2.0 m x 2.0 m test units in the central portion of the site where the highest artifact densities were recorded. One of these two units generated the artifact and zooarchaeological assemblages discussed. Four calibrated dates (two on charcoal and two on shell) for the three levels studied (30–55 cm bgs; arbitrary levels 18, 19, and 20) have overlapping ranges between cal A.D. 775 and 1320 (calibrated at 2σ with the program CALIB 5.0.1 [Stuiver and Reimer 1993].).

The Shoal Bay East site is a large habitation site located on the eastern end of Anguilla's north coast, approximately 15 km northeast of Barnes Bay (see Figure 2). The Shoal Bay East site is located on a broad flat area adjacent to the modern beach at an elevation of approximately 1–2 m amsl. Like the Barnes Bay site, beach erosion has affected Shoal Bay East and therefore, the original site may have been larger. The marine environment adjacent to the Shoal Bay East site differs from the Barnes Bay and Sandy Ground sites in that an extensive area of patch reefs and reef flats immediately offshore. The near-shore reef environment is more comparable to that of Sandy Hill Bay. The reefs near Shoal Bay East are protected by a large barrier reef located about 300 m further offshore. Based on test pits (*n* = 33) and the extent of artifacts on the surface of the site, Crock and Petersen (1999) estimate the original site covered at least 5.6 ha. Corrected radiocarbon dates indicate Shoal Bay East was occupied as early as A.D. 665–890 with the main occupation dated to ca. A.D. 1000–1400 or later (Crock 2000:165–169). Crock excavated the artifact and zooarchaeological samples discussed from a 1.0 x 2.0 m unit and an adjacent 50 cm x 50 cm test pit, placed in a portion of the site near the modern beach. Two dates obtained for the seven levels studied (75–140 cm bgs; arbitrary levels 17–23), have overlapping ranges between cal A.D. 1005 and 1410 (calibrated at 2σ with the program CALIB 5.0.1 [Stuiver and Reimer 1993].)

Evaluating the Evidence for an Elite Deposit

To compare the relative proportions of prestige goods between sites, densities were calculated by cubic volume of site excavated, based on counts within the same aggregated levels that yielded the Late Ceramic Age archaeofaunal remains discussed below. Four categories of artifacts were used to create a cumulative index of prestige goods per cubic meter of midden. These include decorated ceramics, stone beads, three-pointed stone cemí idols and shell beads and ornaments.

Within post-Saladoid or Late Ceramic Age assemblages throughout the Caribbean, a low percentage of vessels are decorated, and pottery generally is more coarse and less finely made compared to earlier styles (e.g., Hofman 1993; Petersen et al. 2004; Rouse 1992:95). Decorative attributes include broad line incision, modeled *adornos*, and pierced lugs. Within Anguillian assemblages, ceramic decoration is very rare, occurring on only .2 percent of ceramic sherds. By virtue of their rarity, the use of decorated forms was more restricted than that of undecorated vessels and may have coincided with specific events or rituals related to displays of rank.

The second category of status artifacts used in the comparison is stone beads. Like decorated ceramics, stone beads occur in much lower frequencies in Late Ceramic Age sites, compared to Early Ceramic Age sites. Stone beads are present in Anguillian assemblages, mainly manufactured from locally obtained calcite crystals. Their rarity and the ethnohistoric association between stone beads and Taíno caciques (e.g., Lovén 1935:478) justify their use as an archaeological correlate of status and elite lineage. At the site of En Bas Saline in Haiti, Deagan (2004:619) found that stone beads were twice as common proportionally in elite-associated ritual contexts (feast pits and burials) compared to secular residential contexts.

The third category of status artifacts is three-pointed stone cemí idols. Three-pointed cemís of various sizes were manufactured in Anguilla from various local and imported materials, including calcirudite from neighboring St. Martin (Crock 2000; Knippenberg 2006). Ethnohistoric records indicate that three-pointed stones served Amerindians in various capacities, with larger, more elaborate idols controlled by elites and competed for (Oliver 2009; Pané 1999; Stevens-Arroyo 1988). Oliver's (2009) research shows that, in addition to their ritual use, more elaborate three-pointed idols embodied ancestor spirits and had genealogies that were central to the objects' power, which was manipulated by elites.

The fourth category of status objects is shell beads and ornaments. The low frequency of these items and ethnohistoric references to their use suggests restricted use potentially linked to displays of rank. These artifacts include a range of manufactured personal adornments including beads made from cut and shaped bivalve and gastropod shells as well as more finely made incised inlays and sculpted shells. Some of the finest examples found in Anguilla are highly stylized shell masks (*guaízas*) and mask fragments closely linked to status displays and elite exchange among the Taíno (Oliver 2009; Pané 1999).

For the specific test unit levels that produced the zooarchaeological assemblages studied from the four sites, the Sandy Hill unit ranked highest in density of various "status" artifacts (Table 1). The Sandy Hill test unit excavation area has a significantly higher density per cubic meter in decorated ceramics, stone beads, shell beads and ornaments (Figure 3), and three-pointed idols (Figure 4) compared to the test-pit sample from across the site ($d.f. = 27$; $t = 3.725$; $p < .001$). At the 99.9 percent confidence level, the density of decorated ceramics in the test unit deposit is five times the highest probable density site wide (error range $ER = 1.34$), the density of stone beads is more than five times higher ($ER = .99$), shell beads and ornaments nearly four times higher ($ER = 5.2$), and stone three pointers twice as high ($ER = .31$).

These data strongly suggest that the test unit sample is an elite deposit within the Sandy Hill site. The overall densities of status artifacts within the Sandy Hill unit levels also rank highest when compared to test pit and test unit samples from the other three sites (Table 1). Only densities of three-pointed idols within unit levels at the Sandy Ground site and the Barnes Bay site outrank the densities recorded within the Sandy Hill unit levels.

In addition to systematic excavation results, the

Table 1. Density of Status Artifacts by Site and Subsurface Sample.

Site	Sample (m^2)	Vol. (m^3)	Decorated Sherds /m^3	Stone Beads /m^3	3-pointed Cemís /m^3	Shell Beads & Ornam. /m^3	Total Index
Sandy Hill							
Test-pits (n = 28)	7.0	3.93	.51	1.02	.26	2.55	4.34
Test Unit	1.75	.875	9.14	11.43	1.14	28.57	50.28
Sandy Ground							
Test-pits (n = 21)	5.25	4.62	2.38	1.52	0	5.63	9.53
Test Unit	2.75	.55	5.45	5.45	1.82	14.55	27.24
Barnes Bay							
Test-pits (n = 40)	10.0	3.12	2.05	2.05	.77	4.87	9.74
Test Unit	8.0	2.4	5.41	3.75	2.50	25.83	37.49
Shoal Bay East							
Test-pits (n = 33)	8.25	6.85	.88	1.46	.58	2.19	5.11
Test Unit	2.0	1.4	1.43	2.14	0	2.14	5.71

Anguilla Archaeological and Historical Society (AAHS) collected a number of status-related artifacts from the immediate area around the test unit during construction in the mid 1980s. Notably, these prestige goods include a complete shell mask (*guaíza*) and a fragment from a second (see Figure 3). Oliver (2009:154) notes that these objects "personified the political-religious potency and power of their original holder" (Oliver 2009:154). The AAHS collection also includes fragments of zoomorphic stone cemís, which are among the most elaborate found in the northern Lesser Antilles, and a high concentration of decorated pottery (Figure 5) (Crock and Petersen 1999, 2004; Douglas 1991). In addition, the AAHS recovered religious paraphernalia associated with consumption of the hallucinogen cohoba, likely controlled by caciques or shamans (*behiques*) (Oliver 2009:83–86; Pané 1999:25–26). A zoomorphic inhaler, carved in the form of a shark from bone, exhibits two holes on its dorsal surface connected to a single hole on the ventral surface (Figure 6). This artifact, and an incised, bird-bone, inhaling tube recovered during the systematic excavation, are indicative of ritual behavior likely directed by higher ranking individuals. A shell inlay recovered from the test unit also may be indicative of elite-controlled activities, if it was originally part of a composite wooden duho or statue (see Figure 3). The high density of prestige goods in the central portion of the site may be related to an elite household or, alternatively, deposits associated with displays of rank in the context of public feasts or ceremonies (e.g., Hayden 2001:40).

To evaluate other potential feasting evidence in the ceramic assemblage, we compare the relative density of ceramic griddle sherds, related to the preparation of plant food staples such as manioc (Newsom and Wing 2004:48–49). Unusual numbers of preparation vessels are an archaeological signature of feasts (Hayden 2001:40) or higher engagement in food preparation by certain households (Turkon 2004). Within the test unit (.875 m^2), the density of griddle sherds (18.29/m^2) is significantly higher ($df = 27$; $t = 3.725$; $p < .001$), occurring at nearly three times the highest probable density site wide ($\mu = 3.28/ m^2$; $ER = 3.28$). The higher density of griddle sherds parallels a significantly higher density of all ceramic sherds within the test unit ($\mu = 1{,}889/ m^2$), which is three times the highest probable mean density site wide ($\mu = 501/ m^2$; $ER = 87$; $df = 27$; $t = 3.725$; $p < .001$). Though the density of ceramics in the Sandy Hill unit levels is high for Anguillian sites, higher densities were recorded during sampling of the Sandy Ground site (Crock 2000).

Unusual numbers of serving vessels are also a potential signature of feasting activity (DeBoer 2001:223–229; Hayden 2001:40; Rosenswig 2007:17–18). Interestingly, dishes and bowls make up the majority of vessel forms identified by Hofman (1993:154) in the AAHS sample of ceramics recovered from the central portion of the site, very close to our unit level sample. While the Sandy Hill sample Hofman studied has not been compared to the material excavated from the test unit or the site wide sample, she notes (1993:215) its similarity to deposits at the Bottom on Saba and suggests the

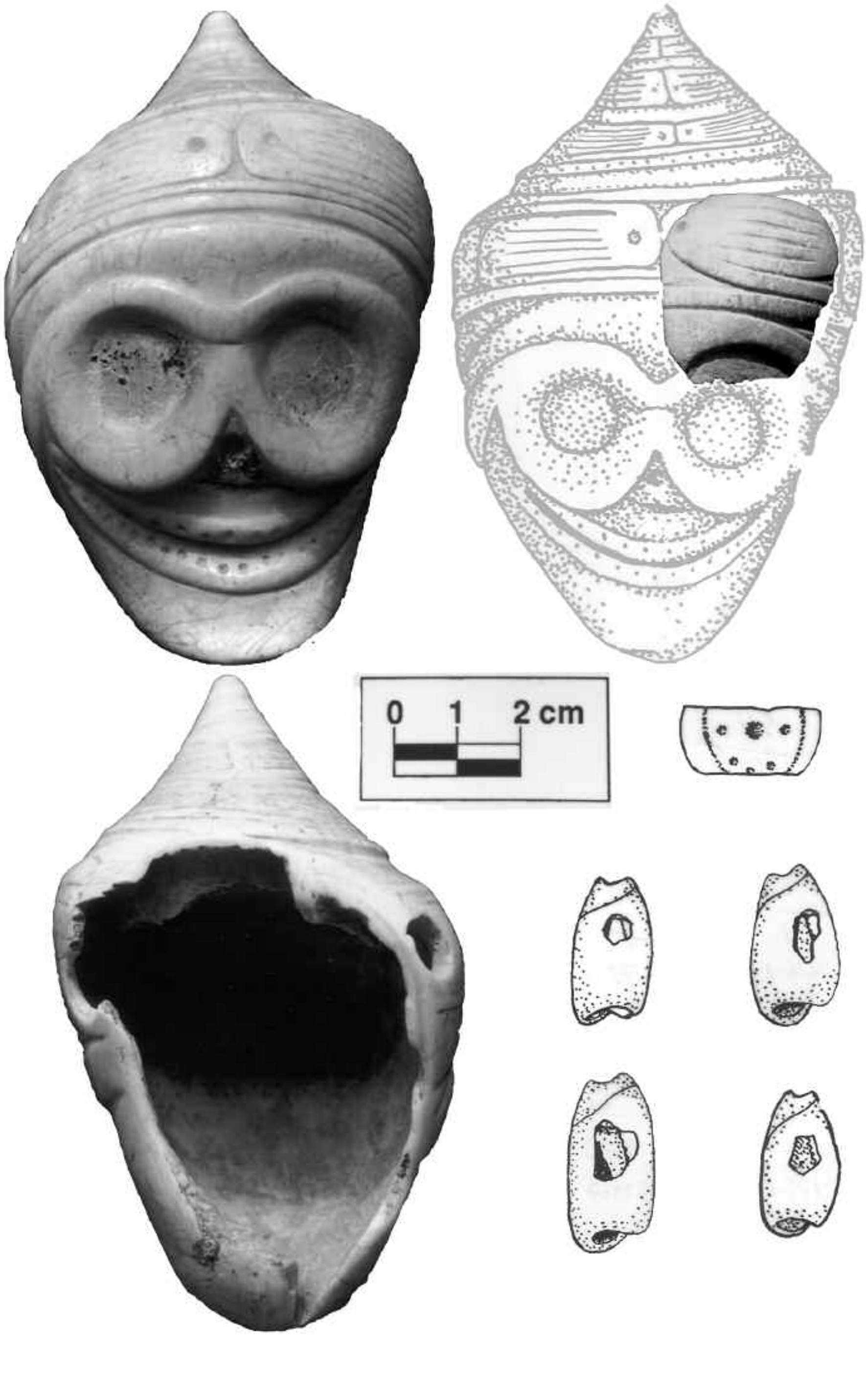

Figure 3. Shell mask (*guaíza*), front (top) and back (below) from the Sandy Hill site, recovered by the Anguilla Archaeological and Historical Society from the same area as the test unit excavation. At right, a fragment of a second *guaíza* from the Sandy Hill site superimposed over an illustration of the first. Lower right shell inlay and shell beads recovered from the test unit excavation.

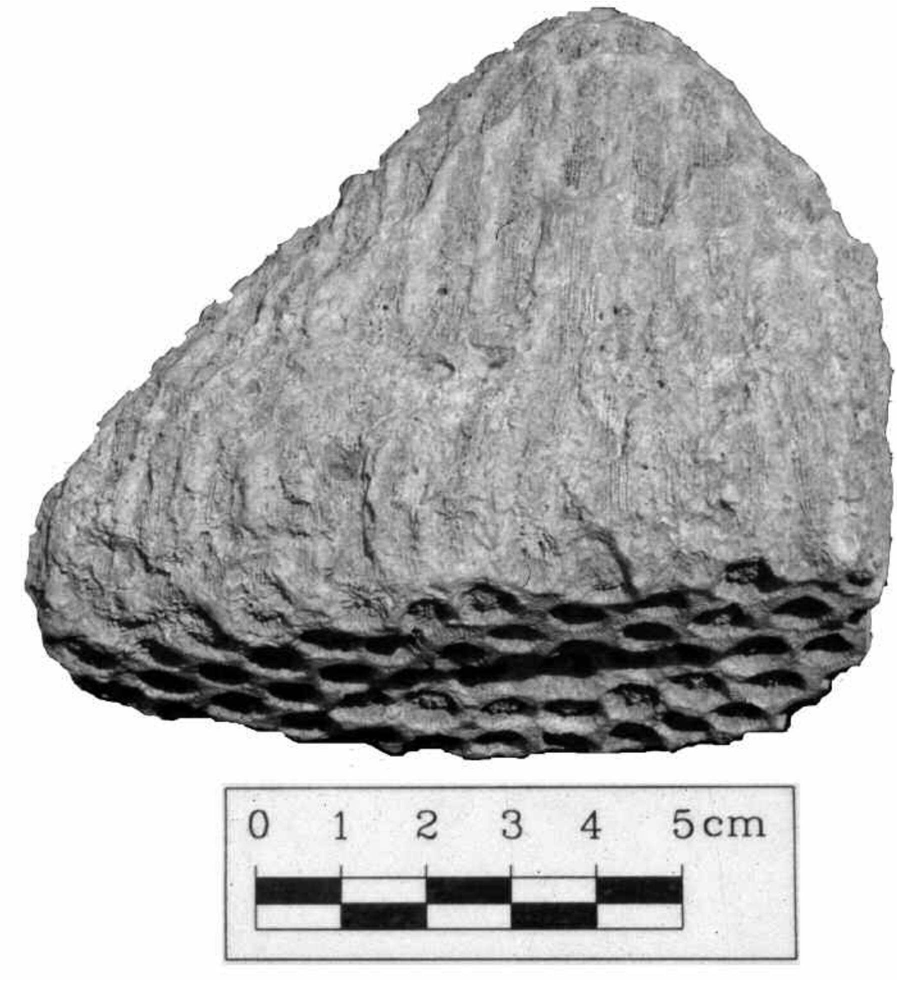

Figure 4. Coral three-pointed cemí idol recovered from the test unit excavation at the Sandy Hill site, Anguilla.

assemblages are comparable and may result from ceremonies or sociopolitical events.

Within- and between-site comparisons of the distribution of status artifacts support the characterization of the Sandy Hill deposits as related to an elite residence or elite activity area. These data, in conjunction with a higher density of ceramics related to food preparation and the complementary evidence for a high percentage of both decorated and serving-type vessels, suggest that this elite deposit may represent feasting activities.

Next, we evaluate whether or not the food remains within this elite deposit contain evidence of rank-based differences in food consumption. If elites in Anguilla controlled access to certain food resources, or the activities they presided over included the consumption of special foods, or elites were provisioned differently from non-elites, evidence of this behavior should be visible within the faunal assemblage.

Zooarchaeological Methods

As in all archaeological samples, taphonomic factors and excavation methodologies influence zooarchaeological results. This study is constrained by recovery technique. Specifically, recovery with coarse-mesh screen (3.2–6.4 mm) exaggerates the importance of large specimens, and small-bodied fishes are likely underrepresented in the assemblages. However, recovery technique is a consistent bias in all sites discussed and should not affect

Figure 5. Decorated ceramics recovered by the Anguilla Archaeological and Historical Society from the same area as the test unit excavation at the Sandy Hill site.

comparisons except at the lower end of each size range. Data for each 10-cm level were examined separately. For analysis, we combine data from all levels associated with the late Ceramic Age into one larger analytical unit, which represents refuse from an archaeologically discrete period.

Carder examined vertebrate materials from all sites using standard zooarchaeological methods (Reitz and Wing 2008), and the comparative skeletal collection of the Zooarchaeology Laboratory, Georgia Museum of Natural History, University of Georgia. Identifications were made to a taxonomic level consistent with accuracy given the elements represented, quality of preservation, and breakage patterns in each sample. We provide specimen weight of each taxon, number of identified specimens (NISP), minimum number of individuals (MNI), and estimates of biomass in the Sandy Hill taxonomic list (Table 2). Taxonomic lists of the other three assemblages are reported elsewhere (see Carder 2005; Carder et al. 2007). Each archaeological collection studied contains bird fragments. Because the taxonomic identification of bird specimens is not complete, we include birds only in examining density of faunal debris excavated from each archaeological site. Undoubtedly, birds are an important aspect of analysis and will provide additional insights when complete.

As a quantitative measure, NISP has limited value for assessing dietary contribution due to differing degrees of fragmentation of the recovered vertebrate remains. MNI, a common estimate in zooarchaeological analyses, is a simple measure whereby all individuals are considered equal in terms of dietary contribution. While MNI is informative, we include estimates of sample biomass and live weight because of variation in size and dietary contribution of recovered individuals, especially fishes. Sample biomass refers to the quantity of tissue weight that a specified taxon might supply as human food and is estimated from specimen weight. Live weight refers to the total live weight

Figure 6. Zoomorphic bone inhaler recovered by the Anguilla Archaeological and Historical Society from the same area as the test unit excavation at the Sandy Hill site. Top obverse, bottom reverse.

of the individual fish predicted from the greatest anterior width of the atlas vertebra. Where preservation allowed, the greatest anterior width of fish atlases (first anterior cervical vertebra) were measured following Reitz and Wing (2008:187). Biomass and live weight estimates are based on the allometric principle that proportions of body mass, skeletal mass, and skeletal dimensions change with increasing body size in a logarithmic fashion. The standard zooarchaeological quantification methods and formulae used for estimating sample biomass and live weight are described in Reitz and Wing (2008:235–239). We combine specimen weights for each taxon from the individual levels and use the combined weight to estimate sample biomass. This method results in a lower biomass estimate than if biomass is calculated for each taxon in each level and then summed (Reitz and Wing 2008:239).

We calculate taxonomic diversity and equitability of the site assemblages. These estimates permit discussion of subsistence strategies in terms of the variety of animals used at the site (diversity) and the evenness (equitability) with which those taxa were used. We use the Shannon Wiener Index for calculating diversity (Shannon and Weaver 1949:14) and the Sheldon Index (Sheldon 1969) for equitability. Formulae are found in Reitz and Wing (2008:111–112). In this study, sample richness refers to the number of taxa for which MNI is estimated. In many zooarchaeological vertebrate analyses from sites in the West Indies, more individuals are estimated if all specimens identified to the taxonomic level of family are analyzed together, rather than if specimens identified to a lower taxonomic category are considered separately. For this reason we estimate diversity at the family level by MNI and biomass. Only biomass estimates for those taxa for which MNI is estimated are included in the family level analysis.

We estimate mean trophic level (*TL*) by combining the most recent 2010 trophic level assignments from the fishbase database for Caribbean fishes (Froese and Pauley 2004) with allometric estimates of biomass in the zooarchaeological assemblages for the same taxa (following Reitz 2004). Where identifications in the vertebrate remains are not to species, the trophic level for the closest taxonomic category is used. In this analy-

Table 2. Vertebrate Remains from the Sandy Hill Site.

	NISP (#)	%NISP (%)	MNI (#)	MNI (%)	wt(g) (g)	Biomass (kg)	Biomass (%)
Vertebrata					48.11		
Oryzomyini Rice Rats	28	.15	2	.43	2.55	.061	.18
Testudines							
Cheloniidae Sea Turtles	104	.57	2	.43	71.99	.558	1.63
Alsophis spp. Racer	3	.02	1	.21	.15	.002	.01
UID Actinopterygii Ray-finned Fishes	14933	81.33			2362.12	15.936	46.62
Albulidae Bonefishes	37	.20	2	.43	.45	.003	.01
Exocoetidae Flyingfishes	1	.01	1	.21	.01	.001	.00
Belonidae Needlefishes	14	.08	2	.43	2.90	.070	.20
Holocentridae Squirrelfishes	16	.09	4	.86	1.98	.054	.16
Scorpaenidae Scorpionfishes	6	.03	6	1.29	.01	.001	.00
Cephalopholis fulvus Coney	8	.04			4.73	.099	.29
Cephalopholis cruentatus Graysby	2	.01			.50	.009	.03
Cephalopholis spp. Coney/Graysby	16	.09			3.82	.079	.23
Epinephelus adscensionis Rock Hind	8	.04			5.01	.106	.31
Epinephelus guttatus Red Hind	20	.11			8.83	.195	.57
Epinephelus morio Red Grouper	3	.02			7.96	.174	.51
Epinephelus striatus Nassau Grouper	4	.02			2.21	.044	.13
Epinephelus spp. Groupers	63	.34			75.90	1.998	5.85
Mycteroperca bonaci Black Grouper	2	.01			5.92	.127	.37
Mycteroperca spp. Groupers	20	.11			8.15	.179	.53
Serranidae Sea Basses/Groupers	136	.74	26	5.59	84.71	2.250	6.58
Caranx crysos Blue Runner	2	.01			.39	.013	.04
Caranx latus Horse-eye Jack	7	.04			4.98	.105	.31
Carangoides ruber Bar Jack	88	.48			23.91	.384	1.12
Carangidae Jacks	191	1.04	44	9.46	34.46	.520	1.52
Lutjanus analis Mutton Snapper	19	.10			4.18	.091	.27
Lutjanus apodus Schoolmaster	2	.01			.15	.006	.02
Lutjanus buccanella Black Snapper	2	.01			.40	.013	.04

Table 2 (continued). Vertebrate Remains from the Sandy Hill Site.

	NISP (#)	%NISP (%)	MNI (#)	MNI (%)	wt(g) (g)	Biomass (kg)	Biomass (%)
Lutjanus griseus Gray Snapper	12	.07			3.78	.083	.24
Lutjanus synagris Lane Snapper	10	.05			1.89	.047	.14
Ocyurus chrysurus Yellowtail Snapper	89	.48			13.38	.237	.69
Etelis oculatus Queen Snapper	3	.02			.65	.019	.06
Lutjanidae Snappers	193	1.05	55	11.83	44.90	.648	1.89
Anisotremus spp. Grunts	6	.03			1.11	.028	.08
Haemulon album Margate	7	.04			2.68	.063	.18
Haemulon aurolineatum Tomtate	2	.01			1.21	.032	.09
Haemulon bonarense Black Grunt	1	.01			.39	.013	.04
Haemulon flavolineatum French Grunt	5	.03			.38	.013	.04
Haemulon plumieri White Grunt	12	.07			1.41	.036	.11
Haemulon sciurus Bluestriped Grunt	7	.04			.95	.026	.08
Seriola spp. Grunts	2	.01			.52	.015	.05
Haemulidae Grunts	87	.47	19	4.08	18.19	.306	.90
Calamus bajonado Jolthead Porgy	4	.02			2.21	.033	.10
Calamus calamus Saucereye Porgy	3	.02			1.48	.023	.07
Calamus spp. Porgies	12	.07			8.11	.109	.32
Sparidae Porgies	6	.03	4	.86	1.50	.023	.07
Bodianus spp. Wrasses	5	.03			4.57	.098	.29
Lachnolaimus spp. Hogfishes	2	.01			1.35	.035	.10
Halichoeres radiatus Puddingwife	9	.05			6.12	.124	.36
Halichoeres spp. Wrasses	17	.09			10.91	.200	.59
Labridae Wrasses	66	.36	12	2.58	23.02	.372	1.09
Scarus taeniopterus Princess Parrotfish	6	.03			.70	.020	.06
Scarus vetula Queen Parrotfish	15	.08			5.89	.120	.35
Scarus spp. Parrotfishes	101	.55			45.03	.649	1.90
Sparisoma aurofrenatum Redband Parrotfish	12	.07			2.39	.057	.17
Sparisoma chrysopterum Redtail Parrotfish	11	.06			3.31	.074	.22

Table 2 (continued). Vertebrate Remains from the Sandy Hill Site.

	NISP (#)	%NISP (%)	MNI (#)	MNI (%)	wt(g) (g)	Biomass (kg)	Biomass (%)
Sparisoma viride Stoplight Parrotfish	173	.94			162.92	1.888	5.52
Sparisoma spp. Parrotfishes	282	1.54			105.22	1.313	3.84
Scaridae Parrotfishes	454	2.47	101	21.72	110.38	1.367	4.00
Acanthurus bahianus Ocean Surgeon	12	.07			.50	.015	.05
Acanthurus coeruleus Blue Tang	2	.01			.10	.004	.01
Acanthuridae Surgeonfishes	666	3.63	158	33.98	69.39	.930	2.72
Sphyraena spp. Barracudas	21	.11	4	.86	55.79	.776	2.27
Euthynnus alletteratus Little Tunny	1	.01			.61	.018	.05
Scombridae Tunas and Mackerels	42	.23	14	3.01	11.79	.214	.63
Balistes vetula Queen Triggerfish	8	.04			8.32	.164	.48
Balistidae Triggerfishes	31	.17	3	.64	7.90	.157	.46
Ostraciidae Boxfishes	17	.09	1	.21	1.11	.032	.09
Tetraodontiformes Puffers	25	.14	2	.43	8.29	.164	.48
Diodon hystrix Porcupinefish	2	.01			29.88	.463	1.35
Diodon sp. Ballonfish/Porcupinefish	1	.01			1.90	.050	.15
Diodontidae Burrfishes/Porcupinefishes	9	.05	2	.43	1.75	.046	.14
Total	18186		465		3550.36	34.179	

Note: Totals do not include birds.

sis, estimates of *TL* are based on the estimated biomass contribution for fishes only.

The Sandy Hill Faunal Assemblage: Results and Inferences

We present the results of the Sandy Hill vertebrate assemblage here for the first time; results from the three other Anguillian sites discussed are reported elsewhere (Carder 2005; Carder et al. 2007). The NISP for the four assemblages combined totals 42,119 and contains the remains of a minimum of 1,160 individuals. Combined, the collections weigh 8.8 kg (Table 3). These totals and those for the individual sites presented below do not include the relatively small sample of bird remains recovered (NISP = 452) that has yet to be fully analyzed.

The NISP in the analyzed Sandy Hill vertebrate assemblage is 18,186 and the assemblage weighs 3.6 kg (Table 3). The Sandy Hill collection contains an estimated minimum of 465 individuals. Fishes contribute 99 percent of the vertebrate MNI and 97 percent of the estimated total biomass. Sea turtles contribute less than 1 percent MNI and 2 percent biomass while reptiles (other than turtles) and mammals each contribute less than one percent of the assemblage MNI and biomass. Five fish families dominate the taxonomic list: Acanthuridae (doctorfishes), Scaridae (parrotfishes), Lutjanidae (snappers), Carangidae (jacks), and Serranidae (groupers). Preservation was good. Four percent of the fragments are burned.

To evaluate whether or not the elite deposit at the Sandy Hill site contains evidence of rank-

Table 3. Total Vertebrate Remains by Site, Weight, NISP and MNI.

	Sandy Hill	Sandy Ground	Barnes Bay	Shoal Bay East
WT(kg)	3.55	2.87	1.00	1.38
NISP	18,186	9245	3231	11,457
MNI	465	243	166	286

Note: Totals do not include birds.

based patterns in food consumption, we compare the faunal remains from the Sandy Hill deposit to assemblages from the three other sites. Following the work of others (deFrance 2009: 124–126; Hayden 2001:40–41; Reitz and Wing 2008:285), if status differences exist in the diet of elites responsible for the deposit studied, we expect the assemblage will display one or more of the following characteristics:

1. contain higher quantities of food residue than non-elite residences which are not explained by preservation;
2. exhibit an unusual distribution among animal classes;
3. exhibit unusual taxonomic diversity, equitability or richness;
4. exhibit atypical trophic levels;
5. contain animals which satisfy appetite in terms of fat content, or calories;
6. contain animals which involve risk of capture or personal injury;and
7. exhibit unusual size of fishes.

Large Quantities of Food Residue

Because the zooarchaeological assemblages reported here cover the same span of time, we calculate the total quantity of food debris excavated from the four sites by weight of food debris per cubic meter of excavated midden. The excavated volume of vertebrates (including birds) and invertebrates differs in each deposit (Table 4). The sample from Sandy Hill contains four times the greatest density of total food remains at any other site. The sample from Shoal Bay East contains the lowest density of faunal remains. Invertebrates comprise the bulk of the sample weights from all sites. The Sandy Hill and Barnes Bay assemblages contain the greatest relative proportion of invertebrates by volume of excavated midden. The greater relative contribution of invertebrates in the two samples may be related to site location. Today, the Sandy Hill and Barnes Bay sites are located in close proximity to rocky shore splash zones where most of the recovered invertebrates are found. While this may explain the differences in proportion of invertebrates to vertebrates, it does not explain the difference in overall density of faunal remains in the samples.

Unusual Distribution among Vertebrate Classes

Given the near shore site locations and previous analyses (Carder 2005; Carder and Crock 2007; Carder et al 2007), we expect marine fishes to dominate all analyzed vertebrate remains from the Anguilla sites. As Table 5 shows, fishes account for 94 to 97 percent of the total estimated vertebrate biomass and 93 to 99 percent of the MNI for each archaeological site. The only notable difference in the assemblages is the greater relative abundance of mammals in the Shoal Bay East assemblage. Greater mammal relative abundance at Shoal Bay East is due to a minimum of 25 Oryzomyini (rice rats) in the collection. Some rice rat fragments have cut marks indicating they were part of the diet.

Unusual Taxonomic Diversity, Equitability or Richness

Using the Shannon-Wiener Index for sample diversity, values usually fall between 1.5 and 3.5 (Calow 1998:198). Each of the Anguillian archaeofaunal

Table 4. Volume (kg/m^3) of Invertebrates and Vertebrates by Site.

	Invertebrates kg/m^3	Vertebrates kg/m^3	Total kg/m^3
Sandy Hill	340.361	.004	340.365
Sandy Ground	48.072	.005	48.077
Barnes Bay	78.882	.001	78.883
Shoal Bay East	2.091	.001	2.091

Table 5. Relative Abundance of Vertebrate Assemblages by Biomass and MNI.

	Sandy Hill (%)	Sandy Ground (%)	Barnes Bay (%)	Shoal Bay East (%)
Biomass				
Fishes	96.9	95.5	96.1	93.8
Turtles	1.6	4.4	3.4	3.7
Mammals	.2	trace	.2	2.0
MNI				
Fishes	99.1	98.8	96.6	92.8
Turtles	.4	.8	1.1	.5
Mammals	.4	.4	2.3	6.7

Note: Totals do not include birds.

Table 6. Diversity and Equitability by Biomass and MNI Family Level.

	Sandy Hill	Sandy Ground	Barnes Bay	Shoal Bay East
Biomass				
# taxa	22	17	20	21
Diversity	2.06	1.80	1.67	1.99
Equitability	.67	.64	.56	.65
MNI				
# taxa	22	18	21	22
Diversity	2.06	1.77	1.91	1.95
Equitability	.67	.61	.63	.63

assemblages displays a similarly diverse number of families among identified taxa (Table 6). The diversity of each assemblage is moderately low and the equitability moderately high indicating a few taxa are dominant while others are either equally or near equally abundant.

The Sandy Hill assemblage does display higher diversity values that may indicate access to a greater variety of food (in this case fishes), or ability to acquire a variety through efforts of others. However, the difference is modest and may reflect the greater equitability or even use of taxa within the Sandy Hill assemblage.

Atypical Trophic Levels

When we consider estimated mean trophic levels by estimated biomass at the four sites, only Shoal Bay East shows a noticeable difference, with the lowest mean *TL* (TL = 2.6). The Shoal Bay East collection contains a larger proportion of low trophic level fishes, specifically herbivorous doctorfishes, than the other sites resulting in a lower mean *TL*. The mean *TL* of captured fishes is higher from Barnes Bay (TL = 3.0) and highest at Sandy Hill (TL = 3.2) and Sandy Ground (TL = 3.2).

If we look at relative abundance of captured fishes in the four assemblages that feed within specific trophic levels, there are differences. Of the estimated biomass of identified fishes in the Sandy Hill and Sandy Ground assemblages, 48 percent feed at a trophic level of 3.6 or greater. Fish communities with mean trophic levels of 3.6 or higher have a greater proportion of higher level predators, which are less abundant in tropical reef marine environments than lower trophic level fishes and typically require more energy, skill, and risk to capture (Reitz and Wing 2008:280). High trophic level fishes in the assemblages include barracuda and many species of groupers, jacks, snappers, and Scombridae (tunas and mackerels).

While almost half of the captured fish biomass from Sandy Hill and Sandy Ground are from high trophic level fishes, Sandy Ground contains almost twice as much biomass from fishes representing trophic levels greater than 4.0. Specifically, scombrids (tunas and mackerels), which typically feed at trophic levels greater than 4.0, comprise 45 percent of the Sandy Ground collection's higher trophic level biomass. The Sandy Hill collection contains only 3 percent scombrid biomass. Instead, groupers comprise over 50 percent of the high trophic level fishes in the Sandy Hill assemblage.

Fat Content, or Calories

Another potentially meaningful measure is the caloric density of the foods consumed. Two high caloric or fatty vertebrates identified in the archaeological assemblages are scombrids and sea turtles. The large contribution of scombrids in the Sandy Ground collection relative to other sites is noted above.

The near reef associated with a deep water bay immediately adjacent to the Sandy Ground site is a suitable habitat for smaller schooling scombrids. Fishermen report that, in the past, small scombrids were an important part of the Sandy Ground catch. Using allometric estimates, a sample of 17 scombrid atlases from the Sandy Ground sample indicates estimated mean live weight of the captured individuals is 1.2 kg; the standard deviation in atlas size is .97 mm reflecting a small variation in size relative to the mean (7.4 mm).

Sea turtles are a highly desirable food package providing meat, fat, and oil. Sea turtles are not prominent in any of the assemblages. The relative abundance of turtle in all the assemblages range from .4 to 1 percent MNI and 2 to 4 percent estimated biomass. Based on fragment size, most turtles from all the assemblages represent sub-adults and were likely captured within shallow waters while feeding in turtle grass beds, or while nesting. The Sandy Hill assemblage contains the least relative abundance of turtle biomass and turtle MNI of all assemblages. However, based on specimen size, the Sandy Hill assemblage contains what is likely the largest turtle from the four sites studied. Overall, the Sandy Hill assemblage contains the fewest animals with higher fat content or caloric value as measured by both MNI and biomass.

Contain Animals that involve Risk of Capture or Personal Injury

Many taxa in the assemblages may be dangerous to capture. We look at fishes that contain toxins that may cause acute physiological distress and/or are life threatening. Some fishes can inject toxins through physical contact with a spine. Some batoids (sawfish, skates, and rays), particularly the stingrays, are able to inflict a painful and potentially fatal wound with a venomous serrated spine. The caudal spine of the Atlantic Acanthuridae (doctorfishes and surgeonfishes) may cause physical pain but lack the toxicity to cause humans other distress. Scorpionfishes have spines that can cause pain, shock, edema, and respiratory distress (Haddad et al. 2003). Modern Anguillian fishermen informed Carder that the danger of this species is commonly known. The perception of danger among Amerindian fishers may have been a factor if such species were specifically selected for provisioning elites or elite controlled events or rituals.

Poisoning may occur by eating a toxic fish. Tetradoxin is a powerful neurotoxin found primarily in the liver and ovaries of some Tetradontiformes (pufferfishes and porcupinefishes). Symptoms of tetrodont poisoning occur within minutes of ingestion and hypotension and bradycardia occur in severe cases (Kim 1999:175; Tunik and Goldfrank 1998). Ciguatera fish poisoning (CFP) is a food-borne illness endemic to tropical waters where numerous benthic and pelagic fishes accumulate dinoflagellate toxins in their flesh and viscera. In the Caribbean, carnivorous fishes are more frequently associated with CFP than herbivorous fishes, and barracudas are notoriously ciguatoxic fishes (Pottier et al. 2001). This effect is more likely in areas with dead coral and algae blooms and, therefore, probably presented a less frequent risk in prehistory.

We look at the contribution of toxic or venomous fishes in terms of MNI rather than estimates of biomass as risky fishes are caught as individuals, not as biomass. In terms of MNI, the Sandy Hill collection contains the greatest number of dangerous or toxic fishes compared to the other sites but is similar to the Barnes Bay collection in terms of relative abundance (Table 7).

Atypical Size of Fishes

The four assemblages contain 216 fish atlas vertebrae. When measures of the greatest anterior widths of all fish atlases are compared, the Sandy Ground assemblage contains the greatest mean followed by those atlases in the Sandy Hill collection. Mean atlas size is smaller in the Barnes Bay and Shoal Bay East samples (Table 8). The largest individual fish from all four sites is a *Sphyraena barracuda* (great barracuda) identified in the Sandy Hill

Table 7. Total and Percent MNI of Dangerous or Toxic Fishes by Site.

	Sandy Hill	Sandy Ground	Barnes Bay	Shoal Bay East
Rays			1	
Scorpionfishes	6		2	1
Tetradonts	4	1	1	1
Total	10	1	4	2
Percent MNI	2.2	.4	2.4	70

Table 8. Atlas Size (mm) by Site of all Groupers, Jacks and Snappers.

	Sandy Hill	Sandy Ground	Barnes Bay	Shoal Bay East
Mean	6.04	6.45	5.41	5.02
St Dev	3.64	1.90	1.53	1.61
Variance	13.27	3.59	2.36	2.61
Range	27.10	8.10	7.10	9.50
Minimum	2.80	2.40	2.10	2.10
Maximum	29.90	10.50	9.20	11.60
Count	64	37	36	79

assemblage. Based on atlas size, the barracuda had an estimated live weight of 15.2 kg.

We examined three higher trophic level fish families (groupers, jacks, and snappers) to see if there are significant statistical differences in sizes of fishes captured at the four sites. There is a statistically significant difference in the mean size of groupers from the four sites ($df = 3$, $F = 4.18$, $p = .01$). The mean size of grouper atlases is largest in the Sandy Hill and Sandy Ground assemblages. A pairwise comparison of grouper atlases in the two assemblages indicates there is no statistically significant difference in mean size; the mean size of groupers in the Sandy Hill collection is similar to those in the Sandy Ground assemblage ($df = 10$, $t = .21$, $p = .83$). The largest grouper from Sandy Hill has a predicted live weight of 3.5 kg and the largest from Sandy Ground is 1.3 kg.

Only three sites contained atlases of jacks: Sandy Hill, Sandy Ground, and Shoal Bay East. There is no statistically significant difference in the mean size of jacks from the three sites ($df = 2$, $F = 2.02$, $p = .15$). Based on atlas measurements, the Sandy Hill assemblage contains the remains of the largest jack with an estimated live weight of 691 g.

The atlas width of the snappers from the four sites are not statistically homogeneous ($df = 3$, $F = 4.89$, $p = .003$). However, the only significant difference in a pairwise comparison of the four assemblages is the smaller mean atlas size from the Barnes Bay site compared to the other three sites. The Sandy Ground sample contains the remains of the largest snapper from all sites with an estimated live weight of 681 g.

Discussion

The higher density of prestige goods and religious paraphernalia within the Sandy Hill test unit, compared to the densities recorded elsewhere within the site and at the three other sites, indicates the Sandy Hill deposit is markedly different and elite-related. These quantitative data are supported by the qualitative information provided by the AAHS salvage excavations and collections from the nearby area. The concentration of materials associated with higher ranking individuals may relate to a centrally located elite household occupied over generations, or a specialized activity area maintained within the site. By necessity, our interpretations apply a multigenerational scale of analysis to evaluate elite-associated food remains archaeologically, because identifying individual events is rarely possible in the archaeological record (Rosenswig 2007). Intrasite spatial continuity spanning generations, as suggested here for the Sandy Hill site, was, broadly speaking, a hallmark of Caribbean societies from the early Ceramic Age (Petersen 1996) to the late Ceramic Age (Samson 2010).

The four zooarchaeological assemblages discussed contain a similar suite of vertebrate fauna with no significant differences between animal classes exploited. The Sandy Hill collection does contain more taxonomic categories, or higher richness, and slightly higher diversity and equitability values than the other vertebrate assemblages. While the differences in diversity values are modest, in the context of a single island with access to much of the same foods, small differences may be significant. Higher richness and diversity values may signal greater status or wealth through greater access to a wider variety of food (in this case fishes), or the ability to acquire a variety through efforts of others. Alternatively, differences in sample size may have produced the same results. The Sandy Hill assemblage was the largest sample, which may have resulted in a higher species richness value. The higher species richness from Sandy Hill may, in turn, inflate diversity and equitability values.

The Sandy Hill and Sandy Ground assemblages both contain more estimated individuals and biomass of fishes that feed at high trophic levels. Higher trophic level fishes, often larger and more costly to acquire in terms of time and effort, may also indicate status (Reitz and Wing 2008:280). A predominance of high trophic level fishes could be due to selective provisioning of elites, or elite-controlled events or rituals where higher trophic level fishes were consumed. However, as Keegan (2009) notes, it is important to recognize the limitations of using trophic levels to interpret human behavior and the limitations of trophic analysis itself. A specific trophic level for a particular organism requires knowing many factors, including age and season of capture. Trophic levels of species also vary in different environments and food webs. In addition, food webs and local environments may have been different from today, and most of the fish remains from the collections cannot be identified to genus or species, much less age or season of capture. Consequently, we interpret small differences in trophic levels with prudence and suggest the only noticeable difference between the sites in the trophic level of captured fishes studied is the smaller mean trophic level of fishes from Shoal Bay East. This is not surprising given the site's proximity to extensive near-shore reefs providing optimal habitat for herbivores. Given the similarity of Sandy Hill Bay to Shoal Bay East in terms of the proximity and extent of near shore reefs, and the abundance of herbivores in the Sandy Hill collection, the higher mean trophic level from Sandy Hill compared to the Shoal Bay East collection is unexpected.

The Sandy Hill site does not stand out with respect to the expectation that an elite deposit would be more likely to contain animals with higher fat content or caloric value than non-elite deposits. Rather, by this criterion, the Sandy Ground assemblage has a higher density of fattier fishes and turtles. The higher Sandy Ground values in this category may be due to differences in local environments. Sandy Ground is adjacent to Road Bay, which may have provided a better habitat and capture opportunities for both scombrids and turtles.

The Sandy Hill assemblage contains atlases of the largest individual jack, grouper, and barracuda. The mean size of grouper atlases is largest in the Sandy Hill and Sandy Ground assemblages, but they do not statistically differ. There is no statistically significant difference in the mean size of jacks from the sites, and the only significant difference in snappers is the smaller mean atlas size from the Barnes Bay site. While the Sandy Hill assemblage may contain the largest individual fishes and the largest turtle, we do not see an atypical distribution of fish size for the three most targeted families.

The only compelling result of the zooarchaeological comparisons among sites is volume of animal debris recovered from the archaeological sites. The Sandy Hill deposit contains four times the density (weight per cubic meter of excavated sediment) of total animal debris as compared to any other site collection studied. High quantities of food remains fit expectations of a special purpose or ritual deposit resulting from activities such as feasting (Hayden 2001:40). While the density values are potentially related to vagaries of the limited sampling conducted, the comparisons are between test units that were purposefully placed in high density midden areas as defined by prior shovel testing. These results also are supported by a higher density of ceramic vessels.

Conclusions

The Sandy Hill site deposit and associated materials document the presence of social differentiation in Anguilla, while not discounting the possibility of variation in the level of complexity present in the small islands of the Eastern Caribbean during the Late Ceramic Age (Curet 2003; Oliver

2009:25). The associated food remains, although not associated with monumental architecture or other archaeologically obvious examples of elite space, nonetheless can be linked to elite behavior within this small island society. As such, the evidence for social ranking without any visible distinction in the type, size, or variety of foods consumed by elites or during elite activities is particularly revealing. In this sense, the data obtained for Anguilla and Sandy Hill are comparable to the Tikopia case (Kirch 2001) where rank differences, though present, do not extend to patterns of food consumption, or at least to those that can be reconstructed archaeologically.

If the deposits represent the cumulative residues of feasting activities, their co-occurrence with higher densities of prestige goods may be indicative of "diacritical" feasts (Dietler 1996:98–99; Hayden 1996:129) where rank differences were displayed, maintained, and competed for. Displays of rank, power, and access to the supernatural are well-documented features of elite behavior in the Greater Antilles ethnohistorically, and the presence of idols and ritual paraphernalia in the Sandy Hill deposit justify the use of these accounts to inform the Anguilla case.

Along with control of religious ideology, the control of interisland interaction is proposed as a factor in the creation and maintenance of elite power in the small islands of the Lesser Antilles (Crock 2000). Ownership of larger oceangoing canoes by elites as recorded ethnohistorically in the Greater Antilles (Lamarche 1993; Lovén 1935:514) may have pertained in Anguilla and may have helped support a multi-island polity that appears to have been centered in Anguilla, based on the larger size of sites in Anguilla and the presence of a ceremonial cave site (Crock and Petersen 2004; Haviser 1991). If elites were able to exert control over the import of lithic materials and ceramics into Anguilla and the export of finished stone axes and three-pointed idols (Crock 2000; Crock and Petersen 2004; Knippenberg 2006), such control does not seem to have translated into restricted access to marine resources.

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