

# Prehispanic Social and Cultural Changes at Tibes, Puerto Rico

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*We present here the initial results of the Proyecto Arqueológico del Centro Ceremonial de Tibes. The aim of the project is to study changes in the social, political, and economic systems at Tibes, the earliest civic and ceremonial center in the Caribbean. Tibes was founded as a village around A.D. 1, and sometime between A.D. 600 and A.D. 900 experienced major changes that eventually resulted in the development of a center with multiple ball courts and plazas. The ceramic, faunal, and radiometric evidence suggest that multiple factors were operating at different times during the transformation process. While some of these factors are found in other regions of Puerto Rico, others are evidently unique to Tibes. Traditional regional definitions of cultural periods and areas were not adequate units of analysis to study many of the local and short-term social and political processes that occurred.*

## Introduction

Prior to the arrival of Europeans at the end of the 15th century, native peoples of the Caribbean Islands were organized into some of the most elaborate “pre-state” societies in the New World (Feinman and Neitzel 1984). Until the 1970s, however, institutionalization and development of social stratification in the Greater Antilles was little studied by Caribbean archaeologists. Most archaeological research in the Caribbean has concentrated on reconstructing the culture history of the islands and on determining possible migratory routes for various human groups (e.g., Rouse 1964, 1986, 1992). While these efforts have created a relatively precise chronological and cultural sequence for the region, we have a long way to go before we understand the details of the social and political circumstances that led to the development of stratified societies.

Some studies addressing the issue of social stratification in the Caribbean have emphasized environmental and demographic factors (Chanlatte Baik 1990; López Sotomayor 1975; Veloz Maggiolo 1977–1978). More recent work (Curet 1992, 1993) intended to test such models, howev-

er, has found little evidence for monocausal environmental and demographic explanations. Other models have focused on social and political factors such as competition for status, wealth, and/or resources (Curet 1992, 1993; Keegan 1997; Keegan and Maclachlan 1989), offering additional perspectives and insights. These models are based on political-economic factors and help to advance our understanding of the development and growth of social stratification in the Greater Antilles by clarifying the internal mechanisms used by emerging elites to acquire and maintain power and to institutionalize stratification (Curet 1996; Curet and Oliver 1998; Keegan 1997; Keegan and Maclachlan 1989; Oliver 1998; Siegel 1996, 1999). Nevertheless, as in other regions, archaeological models developed for the Caribbean rely on data spanning large geographic areas and long periods of time. As a result, they have tended to treat the issue of social stratification using large units of analysis. Although these units of analysis are useful for examining broad-scale patterns and change, they are insufficient to explore cultural processes, such as the origins of social stratification, operating at local levels (Curet 2003).

The Proyecto Arqueológico del Centro Ceremonial In-

dígena de Tibes was designed to contribute to the understanding of social stratification in the Caribbean by examining details and changes at the local level, so as to provide a background for comparative research. Here we summarize the results of our project at the site of Tibes and discuss our preliminary interpretations. Tibes is the earliest known civic-ceremonial center in the Greater Antilles and may represent an early political and economic center of institutionalized stratification in Puerto Rico. Deposits associated with very early kinship-based social organization and a later stratified sociopolitical structure make Tibes ideal for the study of how this transition is manifested in the archaeological record. Our project has generated new data concerning the transformation of this settlement from a simple village to a civic-ceremonial center. We assume that the transformation of the physical layout of the settlement reflects changes in intangible social, cultural, and political institutions.

### Historical Background

The Taíno people of the Greater Antilles were composed of various indigenous groups belonging linguistically to the Arawakan family (Rouse 1986, 1992). They occupied the islands from the Virgin Islands to eastern Cuba, including the Bahamas and Jamaica. Part of their subsistence depended on the production of grains, fruits, and root crops, particularly manioc, along with the gathering and/or maintenance of wild resources, especially fruit-bearing trees (Newsom and Wing 2004). Hunting, fishing, shellfish-gathering, and rearing of captive animals such as small mammals and birds complemented their diets (Newsom and Wing 2004).

According to early European writings, many indigenous groups were organized sociopolitically in *cacicazgos*, stratified societies similar to those commonly termed chiefdoms. Although the Spaniards differentiated very little between groups from different islands, an analysis of early chronicles reveals some dissimilarity amongst peoples (Curet 2002; McGinnis 2001; Tavares María 1996; Wilson 1990, 1993, 2001a, 2001b). One of the main differences was the wide spectrum of social-political organization among the islands (and even within islands), ranging from the highly stratified paramount chiefdoms of La Hispaniola to the less elaborate societies of the Bahamas (Fernández de Oviedo 1959; Las Casas 1951, 1967; McGinnis 2001; Tavares María 1996; Wilson 1990, 1993, 2001a, 2001b).

The highly elaborate sociopolitical organization of the indigenous groups (at least in Hispaniola) was accompanied by an intricate religious system controlled by the chiefs or *caciques*, including ball games in elaborately con-

structed courts (Alegria 1983; Oliver 1998), inter- and intra-communal feasting (Deagan 2004), and the *ceimi*, or animistic idols, cult. The ability of the chief or cacique to assemble labor for communal work or war, control the final social product, and accumulate wealth and staple products reflected the level of institutionalized social stratification of these groups (Curet 1993; Feinman and Neitzel 1984; Moscoso 1986; Wilson 1990).

### The Ceramic Sequence

Although scientific archaeology started in the Greater Antilles at the beginning of this century (e.g., Fewkes 1970 [1907]) it was not until the mid-1930s with the works of Rainey (1940), later expanded by Rouse (1952, 1964, 1982, 1986, 1992), that cultural groups were defined chronologically, mainly by means of ceramic attributes. Rouse (1986, 1992) used a hierarchical taxonomic system where styles were defined using ceramic modes that corresponded to a particular geographic region and chronological period. Styles related in space and/or time were grouped in subseries according to their similarities. Finally, subseries were grouped in series.

In Puerto Rico, the earliest period is characterized by the Cedrosan Saladoid subseries (300 B.C.–A.D. 600), generally equated with the first horticultural and ceramic producing groups to migrate to Puerto Rico from the South American continent (TABLE 1). The Cedrosan Saladoid in Puerto Rico has three typical styles, Hacienda Grande (300 B.C.–A.D. 400), La Hueca (300 B.C.–A.D. 250), and Cuevas (A.D. 400–600), although there is some debate about the origin of the La Hueca style (Oliver 1999). The Saladoid series is characterized by high quality ceramics and the use of paint as the main decoration. Based on the lack of evidence of social stratification in burials and household deposits, most Caribbean researchers consider the Saladoid groups to have been relatively egalitarian or tribal in nature (e.g., Boomert 2001; Curet 1996; Curet and Oliver 1998; López Sotomayor 1975: 103; Keegan 2000; Moscoso 1986: 307; Rouse 1992: 33; Siegel 1996, 1999).

The Cedrosan Saladoid was followed by the Ostionoid series (A.D. 600–1500, TABLE 1). The transition to this series seems to be the result of development by local groups in Puerto Rico rather than by migrants. In the earlier portion of this series, Puerto Rico saw two spatially distinct cultural and stylistic divisions, the Elenan and Ostionan subseries (A.D. 600–1200). The Elenan subseries of the Ostionoid is associated with both the Monserrate (A.D. 600–900) and Santa Elena (A.D. 900–1200) styles of eastern Puerto Rico. The Ostionan subseries is divided into the Pure (A.D. 600–900) and Modified (A.D. 900–1200) Ostiones styles (Rouse 1982), which are found on the west-

Table 1. Ceramic sequences of Eastern and Western Puerto Rico.

<i>Eastern Puerto Rico</i>				<i>Western Puerto Rico</i>			
<i>Series</i>	<i>Subseries</i>	<i>Style</i>	<i>Date</i>	<i>Series</i>	<i>Subseries</i>	<i>Style</i>	<i>Date</i>
Saladoid	Cedrosan	Hacienda Grande	300 B.C.–A.D. 400	Saladoid	Cedrosan	Hacienda Grande	300 B.C.–A.D. 400
Saladoid	Cedrosan	La Hueca	300 B.C.–A.D. 250	Saladoid	Cedrosan	La Hueca	300 B.C.–A.D. 250
Saladoid	Cedrosan	Cuevas	A.D. 400–600	Saladoid	Cedrosan	Cuevas	A.D. 400–600
Ostionoid	Elenan	Monserate	A.D. 600–900	Ostionoid	Ostionan	Pure	A.D. 600–900
Ostionoid	Elenan	Santa Elena	A.D. 900–1200	Ostionoid	Ostionan	Modified	A.D. 900–1200
Ostionoid	Chican	Esperanza	A.D. 1200–1500	Ostionoid	Chican	Capá	A.D. 1200–1500

ern side of the island. During the period of the Elenan and Ostionan subseries, Puerto Rico saw dramatic changes including a sharp increase in the number of sites, the development of ball courts, plazas, and ceremonial centers, shifts in mortuary practices, and a decrease in house size. The intensity and nature of these changes led Moscoso (1986: 301) and Veloz Maggiolo (1977–1978: 59) to argue that they are strongly related to sociopolitical changes from which institutionalized social stratification emerged.

The last subseries (A.D. 1200–1500) of the Ostionoid series is the Chican (TABLE 1). The Chican Ostionoid is considered to be the archaeological expression of the Taíno groups that were encountered by Europeans at the period of contact. As in the case of the earlier Ostionoid, this subseries has regional ceramic style variations. In western Puerto Rico, the Capá style predominates, while in the eastern area the Esperanza style is dominant. Although both styles are characterized by the use of incisions and combinations of incised lines and punctuation, the Capá style tends to have more complex or elaborate designs than the Esperanza style. The groups producing the Chican Ostionoid subseries ceramics continued many of the practices that began in the early part of the Ostionoid series, although on a larger scale and to a greater degree. These included the construction of ball courts, plazas, ceremonial centers, and better craftsmanship of high status objects and religious paraphernalia. Thus, artifactual and settlement pattern data suggest that the Taíno Indians had a more elaborate social and religious system than earlier groups.

### Research Questions

The Caribbean islands have an underused potential to contribute to the understanding of cultural and social developments in human history. While an early emphasis on culture history (e.g., Rouse 1986, 1992), and recently on environmental and subsistence dynamics (e.g., Newsom and Wing 2004), has provided much of the basic information required to interpret some of the underlying or initial details of human settlement patterns and subsistence change in the region, less attention has been paid to social and cultural institutions and processes. These studies have

by necessity employed coarsely defined “cultures” and subregions as their primary units of analysis resulting in a broad regional and temporal perspective on the human inhabitants, their behavioral ecology, and social and cultural change. It is important to point out, however, that this large-scale analysis is due primarily to the paucity of research and the lack of appropriate fine-scale recovery and analytical procedures in excavations. Despite many deficiencies in the data, many Caribbean archaeologists (Curet 1996; Curet and Oliver 1998; Newsom and Wing 2004; Oliver 1998; Siegel 1996) have used it to generate models and arguments to better understand the development of stratified societies in the Caribbean. In order to understand the dynamics underlying these processes, we must now focus our studies on more local activities. The use of “culture” as the main unit of analysis creates a homogenized view of prehistoric groups, but often these “cultures” are made up of complex and different attributes (Curet 2002; McGinnis 1997, 2001; Wilson 1993, 2001a, 2001b). We believe that various combinations of political, economic, and ideological strategies were used by different local polities even within the same island (Curet, Torres, and Rodríguez 2004; Siegel 2004).

To address these issues we aimed to precisely define the processes and changes involved in the development of institutionalized social inequality at the household and community levels and to gather and accumulate basic information on community and household economy and decision-making processes. Specifically, we used archaeological data to address the following questions. Apart from their characterization simply as egalitarian and emerging chiefdoms, what types of socio-political organizations were present at Tibes? How did the different forms of power (economic, ideological, and coercive) interact in each period, and what were their roles during the changes registered from one period to another? How were economic, symbolic, and status resources manipulated, and at what level (household, kinship group, community)? Although we are not yet prepared to answer all of these questions, our research allows us to identify some social and cultural trends and to develop working hypotheses to focus and guide future research.

Figure 1. Map of Puerto Rico showing the location of the civic-ceremonial center of Tibes. Inset shows the location of Puerto Rico in the Caribbean. Map by Jill Seagard.

## History of Research

Tibes is located near the south-central coast of Puerto Rico, just north of the modern city of Ponce and approximately 8 km from the shore (FIG. 1). The site was established on the alluvial terraces of the Portugués River in a biogeographic and geological transitional zone between the southern coastal plains and the southern semiarid piedmont of the Cordillera Central (Ewel and Whitmore 1973; Picó 1950). The site lies between the sedimentary limestone rocks of the coastal plains and the volcanic formations of the central mountains (Krushenky and Monroe 1975; Pessagno 1960). This prehistoric pattern of settling in transitional or ecotonal areas has also been observed in other regions of Puerto Rico, including the civic-ceremonial center of Caguana (Carbone 1980; Oliver 1998), and may have been preferred by indigenous peoples to ensure access to the resources available from two or more distinctive geological, geographical, or ecological zones.

Tibes (FIG. 2) was first excavated during the late 1970s and early 1980s by the Sociedad Guaynía de Arqueología e Historia, a local avocational organization. This group was responsible for unearthing and restoring most of the monumental architecture, as well as for convincing the city of Ponce to purchase the land and establish an archaeological park (internet home page is currently available online

at <http://ponce.inter.edu/tibes/tibes.html>). The original archaeological work was directed toward evaluating the site, discovering most of the monumental architecture, and mapping the surface features. Partial reports of the results of these investigations are presented in two unpublished masters theses by local archaeologists Pedro Alvarado Zayas (1981) and Juan González Colón (1984).

In terms of culture history, Tibes has two macro-cultural components or subseries as defined by Rouse (1992) and described above: the Cedrosan Saladoid subseries (ca. 300 B.C.–A.D. 600) and the Elenan Ostionoid subseries (ca. A.D. 600–1200). The settlement is composed of a variety of highly distinctive archaeological features, including several discrete cultural deposits, such as middens, and 12 monumental stone structures including ball courts, plazas, and causeways (FIGS. 3, 4). Of these 12 structures, only nine were restored in conjunction with the archaeological park (FIG. 2). According to González Colón (1984), most monumental structures belong to the late phase of the site (the Santa Elena style of the Elenan Ostionoid subseries, A.D. 900–1200), although some of them may belong to the early part of that subseries (Monserrate style, A.D. 600–900). No strong evidence has been presented, however, that unequivocally dates any of the structures within the Elenan Ostionoid period. In addition to the stone structures, the first excavations uncovered two clusters of burials

(González Colón 1984; Curet 2005): the first one located under Structure 6, the central, quadrangular plaza of the site, and the second 50 m sw of Structure 6, under Ball Court 3 (FIG. 2). According to González Colón (1984), both clusters belong to the late Cedrosan Saladoid subseries (Cuevas style, A.D. 400–600), and are older than the overlying stone structures. Other burials associated with the Elenan Ostionoid subseries were found dispersed over the site, in most cases in domestic contexts (refuse middens or possible house floors). Although the only structures visible on the surface are the ball courts and plazas, midden deposits encountered through shovel probes and excavation (below) suggest the presence of a full range of domestic deposits in conjunction with a complex history of space use and community patterning.

### Research Design

In 1995, the Proyecto Arqueológico del Centro Ceremonial Indígena de Tibes implemented a multistage research design to investigate the transition from an egalitarian to hierarchical society at the site. The site was first probed to discern evidence of the distribution of obvious features (e.g., trash middens) across the settlement. Subsequent stages consisted of locating and excavating possible household structures and related deposits. Here we limit our discussion to the initial stage of the project because the excavations and analysis of areas at the site that we believe represent domestic activities are not yet completed. We include, however, a series of radiometric dates, and, where relevant, provide important details from later seasons of excavation.

Probing the site consisted of two phases. The first involved shovel tests every 20 m to detect the presence and position of archaeological deposits (i.e., trash middens), and to determine the boundaries of the site (Curet, Newsom, and Welch 2003). All of the sediments from the shovel tests were screened to segregate and collect archaeological materials, including artifacts, faunal remains, and large carbonized plant specimens. The counts and weights of these items were used to plot spatial distributions and relative densities across the site. Once archaeological concentrations were defined, one test unit (1 × 1 m) was excavated in each of a series of midden deposits. The purpose of these excavations was to determine the nature of the deposits (e.g., domestic vs. ceremonial vs. special activity), their age, and their cultural affiliation(s). All artifactual material from the excavations was recovered in 1/4-inch (6.35 mm) mesh screens, and bulk 10-liter samples of soil from each 10-cm excavation level were reserved for archaeobotanical and archaeofaunal analyses. Large-sized botanical (i.e., charcoal) and faunal specimens were also collected.

Figure 2. Topographic map of the ceremonial center of Tibes showing the locations of the main monumental architecture. Map by Jill Seagard.

Identification of plant and animal remains from these initial tests gave us our first impression of the richness and diversity of biological remains at the site. The discussion that follows combines the results of the original research conducted by the Sociedad Guaynía, particularly their burial data, and the results obtained from our initial subsurface probing and test units.

### Results

Our discussion concentrates on four aspects of the assemblages documented from Tibes: ceramics, use of space, vertebrate fauna, and radiocarbon dates and the timing of monumental construction. It is important to note that in this context we use the categories (i.e., styles, subseries, and series) that Rouse (1986, 1992) developed for eastern Puerto Rico, not so much as cultural units, but as chronological units. In other words, these categories are used to

Figure 3. The main plaza (Structure 6) of Tibes facing NE. Photograph by L. Antonio Curet.

set the discussion in a chronological framework, and not to identify and characterize cultures and culture areas, *per se*, as they are traditionally used. By using these cultural units merely as chronological units we are not implying that the processes discussed and patterns described for Tibes necessarily are applicable to the rest of eastern Puerto Rico.

### *Ceramics*

The trends in the ceramics from Tibes follow, more or less, the patterns identified for eastern Puerto Rico by Rouse (1964, 1982) and summarized by Rodríguez (1992) and Curet (1992, 1996; Curet, Torres, and Rodríguez 2004). The typology used here for Tibes is based on a modified version of the modal analysis developed by Curet (1992). This analysis includes variables and attributes that take into consideration different aspects of decoration, rim form and type, vessel form, temper, and paste characteristics.

The earliest ceramics in Tibes belong to the Hacienda Grande and Cuevas styles of the Cedrosan Saladoid sub-

series (above). These ceramics are characterized mainly by white-on-red pottery and composite vessel forms. There is a tendency towards simplification of the pottery in the transition from the Hacienda Grande to the Cuevas style. In addition to the white-on-red painted ceramics, the Hacienda Grande style includes polychrome pottery, zoned-incised crosshatching designs, effigy vessels, and naturalistic designs. The Cuevas style is associated with a gradual decrease in the use of paints and incisions, and designs became more geometric. By the end of the Cuevas style, painted decoration was almost absent, although red slips and some complex vessel forms were still common. Strap and lug handles or *adornos* representing zoomorphic and anthropomorphic figures are also present in both styles.

The changes evident during Cuevas times continued into the Monserrate style of the early Elenan Ostionoid sub-series. The shift from one style to the other was so gradual, however, that by the end of the former and the beginning of the latter, both overlapped stylistically. This makes assigning assemblages to one style or the other difficult. In

Figure 4. Ball Court 2 (Structure 2) of Tibes facing east. Photograph by L. Antonio Curet.

the Montserrate, the white-on-red paint characteristic of the Saladoid series was completely absent, although red wares were still present in considerable numbers. Vessel forms were considerably simpler than in the Hacienda Grande and Cuevas styles, most of them being hemispherical in profile, although boat-shaped forms were also common. Strap and lug handles were still present, although the zoomorphic and anthropomorphic figures seem to have been represented by more abstract figures (traditionally identified as heads of bats). In general, the trend in Tibes and eastern Puerto Rico was towards simplification of the ceramic assemblage with a gradual abandonment of paints and slips leading to the Santa Elena style of the Elenan Ostionoid subseries. In this style, paints and slips are almost absent during this last period of human habitation at Tibes. Most of the decoration is in the form of parallel-incised lines perpendicular to the vessel rim and “bat head” modeled lugs.

In addition to the general trend in simplification of the pottery assemblage from the Hacienda Grande to the Santa Elena styles there was also a decrease in quality. Saladoid ceramics tend to have finer paste and are thinner-walled than Elenan Ostionoid ceramics, and the general appearance of the former is more refined relative to the latter. Thus, the tendency in ceramics is of “degradation” of the workmanship and a reduction in the use of symbolic decoration in the form of designs. These gradual, but radical changes have been described as a “de-evolution” by Roe (1989), and the later ceramic styles as the “Dark Ages” of the Greater Antilles by Rouse (1982).

### *The Use of Space at Tibes*

We used data from the shovel tests and the test units to elucidate the settlement organization of Tibes through time. The weights or counts of the ceramic and other materials from the shovel tests were used to create concentra-

Figure 5. Ceramic concentration map of Tibes. The contour lines represent 100-gram intervals. Map by Jill Seagard.

tion and distribution maps to guide the identification of archaeological deposits at the site. In addition, we used our analyses of the materials and samples recovered from the larger test units to determine the cultural and chronological affiliations of the deposits.

The distribution of ceramics allows us to draw two preliminary conclusions. First, at least eight archaeological deposits can be clearly identified (FIG. 5: A–H). Second, the arrangement of these deposits seems to form a circle or semi-circle around Structures 6 and 7. This pattern at Tibes is further supported by the relative distributions of lithic artifacts, shell, and bone (Curet and Rodríguez Gracia 1999). A concentric pattern has been reported for other Saladoid and Ostionoid sites (Chanlatte Baik and Narganes Stordres 1983; Rodríguez 1991; Rouse 1952, 1992; Siegel 1989, 1996; Watters 1994) and is comparable to the layout of ethnohistorically and ethnographically described indigenous communities from South America (Heckenberger 1996; Heckenberger et al. 2003).

Our investigations determined that deposits A, B, C, E, and F (FIG. 5) are domestic trash middens. Deposits D and G, consisting of large quantities of rocks, cobbles, and pebbles mixed with archaeological materials, are possible areas where overburdens from the construction of the monumental structures were placed. This admixture in D and G suggests that earlier archaeological deposits may have been destroyed in the construction of the stone structures. Based on the presence of a hardened, compacted dirt floor/surface and of postmolds (one including a carbonized fragment of a post), deposit H was identified as a living area associated with a building made of perishable materials. Subsequent excavations in this deposit indicated that this structure might have been domestic in nature, but not necessarily a house (e.g., roofed working area or kitchen). Furthermore, some evidence (sherds standing on their sides, and a cultural stratum with mixed materials) suggests that the area of deposit H may have been artificially leveled, probably by using remains from older refuse deposits.

These results suggest that several of the middens are not primary deposits; materials in them seem to have been displaced from their original locations by Prehispanic people. Nevertheless, considering that ethnoarchaeological studies (e.g., Hayden and Cannon 1983) have shown that people do not travel far to dispose of their trash, and that most of these deposits are next to one or more structures, it is our contention that these secondary deposits are located in the general vicinity of their original locations. Considering their wide distribution and size, the deposits are a representative sample of the occupational history of the settlement, and consequently, can be used to infer some aspects of the spatial and social dynamics involved. In other words, these deposits can provide at least a general view of the history of the use of space in the settlement.

Even though a circular pattern is clear, we cannot ignore the fact that Tibes is a multicomponent site in which various functions and activities occurred through time, and we cannot assume that the middens are contemporaneous. Artifactual data from the test units were used to clarify the nature of the deposits and their chronological positions. Use of space through time was determined through a series of ceramic distribution maps (FIG. 6).

Most of the material belonging to the late part of the early Cedrosan Saladoid series (or late Hacienda Grande style) and late Cedrosan Saladoid (or early Cuevas style) is located in the northern and some of the eastern deposits (B, C, and E) (FIG. 6A). The two clusters of burials appear to have been present throughout this time.

Late Cuevas and Monserrate style materials (the latter entering into the Ostionoid series) were collected from the northern, eastern, and western deposits (A, B, C, E, and F)



Figure 6. Distribution of ceramic styles and clusters of burials at Tibes. Contour lines represent 100-gram intervals. A) Hacienda Grande and early Cuevas styles; B) Late Cuevas and Monserrate styles; C) Santa Elena style. Map by Jill Seagard.

(FIG. 6B) almost forming a circle around the center of the site. The two burial areas continued to be used during at least a portion of this period. We do not know exactly when these locations ceased to be used for the disposal of the dead, but it is possible that burials in these areas ceased at the beginning of the Monserrate period. It is also possible that some of the stone-lined structures were built during this time, but chronological evidence to date them securely is not available.

Finally, materials belonging to the Santa Elena style, traditionally associated with the development of social inequality (Curet 1992; Moscoso 1986; Siegel 1992), were located mostly in the eastern, western, and southern sectors of the site (deposits A, D, E, F, G, and H) (FIG. 6C). At this time the areas where the two clusters of burials were located evidently ceased to be used as burial grounds, and Structures 3 and 6 were built over them. Based on the radiocarbon dates, most of the remaining structures were likely built during this time.

The funerary patterns observed at Tibes probably represent a generalized trend in mortuary practices identified by Curet and Oliver (1998). Although recognizing that a variety of mortuary practices potentially existed through time and space, these authors noted that in some Cedrosan Saladoid sites in eastern Puerto Rico a relatively large proportion of burials were located in the central clearings of the sites. Furthermore, many burials belonging to later periods

tended to be located within the household clusters (under house floors or in domestic middens), as seems to have been the case at Tibes. Two unique features of Tibes, however, are the presence of more than one cluster of burials, and once the practice of burying the dead in clusters ceased, the covering of these areas with ceremonial structures, e.g., stone-lined ball courts, characterized by clearly defined boundaries. Thus, in addition to changes in mortuary practices, there seems to have been a significant shift in the use of public space, from a multifunctional space that was used for both profane and sacred activities, to one with a clear boundary that distinguished it from the surrounding areas.

### *Vertebrate Fauna*

The faunal remains from Tibes indicate distinct temporal trends in animal use, possibly related to economic and sociopolitical changes. The information used for the following discussion comes from six of the 1 × 1 m test units in the domestic deposits identified by the shovel testing program. Because of the secondary nature of some of the deposits, only arbitrary excavation unit/levels with large ceramic samples and faunal collections were examined in order to ensure a representative faunal sample that could be reliably dated or assigned to a cultural period using ceramic chronology. The different unit/levels of the deposits were assigned to one cultural period or style based on the ceramic variables and attributes included in the modal

Table 2. Averages of Number of Identified Specimens (NISP), Minimum Number of Individuals (MNI), and weight of rodents (*Isobolodon portoricensis*, *Cavia porcellus*, and unidentified rodents) per unit/level for each period, and average of guinea pigs (*Cavia porcellus*) MNI per unit/level for each period.

Cultural affiliation	Unit/level	Average of rodents NISP	Average of rodents MNI	Average of rodents weight (g)	Average of guinea pigs MNI
Saladoid (Cuevas)	8	0.125	0.125	0.025	—
Monserate	4	34.750	4.250	17.2	1
Santa Elena	6	8	1.5	3.48	0.333

analysis developed by Curet (1992). All of the arbitrary unit/levels were the same depth (10 cm), making the results of each unit/level roughly comparable to the others.

The faunal collection contains the remains of at least 30 vertebrate taxa, with four taxa of mammals, two taxa of birds, at least one taxon of marine turtle, one lizard, two taxa of cartilaginous fish, and 22 taxa of bony fish. Based on both Minimum Number of Individuals (MNI) and Number of Identified Specimens (NISP), terrestrial mammals and marine fish are consistently found in great quantities in the site deposits. The marine fish show some consistency throughout the sequence, but the terrestrial fauna exhibit chronological shifts that suggest greater social differentiation through time.

Both cartilaginous and bony fish were recovered from various deposits throughout the whole sequence at Tibes. Remains of marine fish, in particular, are present in relatively high frequencies and show a diversity of species. Cartilaginous fishes are represented by remains assigned to one shark family (the requiem sharks, *Carcharhinidae*) and the spotted eagle ray (*Aetobatus narinari*). As mentioned above, bony fish are represented by at least 22 taxa. Taken as a whole, the fish assemblage suggests that sandy shallow waters or estuaries were more intensively exploited than open-water reef habitats, which require different fishing technologies. The snook (*Centropomus* sp.), mullet (*Mugil* sp.), and big-mouth sleepers (*Gobiomorus dormitor*) are indicative of shallow grassbeds or other near-shore habitats (Randall 1968). The sleepers may also have been caught in the Portugués River as they were common in the river prior to modern alteration of that waterway (Beverly Yoshioko, personal communication 2003). In addition, several species of reef fish are present, including herbivorous species such as parrotfish (both *Scarus* sp. and *Sparisoma* sp.), grunts (*Haemulon* sp.), and black durgon (*Melichthys niger*), as well as carnivorous fishes such as jacks (*Caranx* sp.), groupers (*Epinephalus* sp., *Mycteroperca* sp.), and snappers (*Lutjanus* sp., *Ocyurus chrysurus*). Although they may vary quantitatively from one period to another, most of these taxa are present throughout the occupational sequence of Tibes. We were unable to discern any meaning-

ful patterns of change in the distribution of particular fish taxa through time and space, suggesting that these fish were widely procured by site inhabitants during all periods of occupation.

The terrestrial mammals include both the West Indian hutia (*Isobolodon portoricensis*) and the guinea pig or *guimo* (*Cavia porcellus*). Neither of these animals is indigenous to Puerto Rico. The hutia was probably introduced from Hispaniola while the guinea pig is a native domesticate of the Central Andean region. It is uncertain when the hutia was introduced to Puerto Rico, but Narganes Stordes (1993) has suggested that it was already present by the arrival of early Saladoid (300 B.C.–A.D. 400) groups to the island. However, Newsom and Wing (2004) report that hutias have been recognized thus far only from Saladoid or later deposits and not in the Archaic assemblages that have been analyzed to date. Ethnohistorical sources report that by the Contact period in Puerto Rico, hutia were widely hunted by local populations (Fernández de Oviedo 1959), but Newsom and Wing (2004) have suggested that they may have been tended in captivity by indigenous groups. The guinea pig remains suggest these animals were transported from South America (directly or down-the-line) and husbanded at some sites, presumably for food. Guinea pigs may also have been used for ceremonial purposes as they are today and were in the past, particularly in the Andean region (Rofes 2000; Sandweiss and Wing 1997), but thus far, the archaeological and ethnohistorical evidence for such practices in the Caribbean is lacking (Newsom and Wing 2004: 205).

Guinea pig remains have been identified from three units at Tibes, and are represented by well-preserved and diagnostic cranial and post-cranial elements ( $n = 7$ , MNI = 5). Guinea pigs have an irregular distribution and are generally very rare at Caribbean sites (Newsom and Wing 2004; Wing 2001). The greatest quantity of guinea pig remains previously identified on Puerto Rico ( $n = 98$ , MNI = 20) is associated with the Chican Ostionoid deposits at the Finca Valencia (NCS-1) site located in northern Puerto Rico (Newsom and Wing 2004). Guinea pig remains were not recovered in contexts that can be definitely iden-

Table 3. Radiocarbon dates obtained from four different deposits at Tibes.

Sample no.	Description	Deposit	Beta-Analytic no.	Radiocarbon years (B.P.)	Calibrated intercept*	Calibrated 2 sigmas*
					A.D.	A.D.
96-1	Unit 8, post mold	H	103329	880 ± 50	1180	1030–1265
97-1	Unit 3, Level 5	C	109679	890 ± 40	1175	1035–1245
97-2	Unit 1, Level 6	A	109680	1270 ± 40	770	670–875
97-3	Unit 1, Level 3	A	110631	900 ± 60	1170	1015–1265
99-1	N93.95/E98.05, Level 3	H	136324	950 ± 40	1040	1005–1085
99-2	N93.95/E98.05, Level 4	H	136325	1040 ± 50	1050	895–1040
99-3	N94.05/E98.05, Level 3	H	136326	1080 ± 60	980	855–1035
99-4	N94.05/E98.05, Level 4	H	136327	1010 ± 40	1015	980–1040
99-5	Op. 19E, Feature 5, Level 3	N/A	136328	930 ± 40	1050, 1095, 1140	1015–1205
03-1744b	N215/E70, Level 4	N/A	198876	750 ± 40	1270	1220–1300
03-Feature 2	N184/E55, Level 6, Feature 03-2	H	198877	990 ± 40	1020	990–1160

\*All calibrations were conducted by Beta-Analytic, Inc.

tified as ceremonial. Because of their exotic origin and overall scarcity, however, it can be hypothesized that access to guinea pigs was restricted and that they were associated with higher-status households or individuals.

Vertebrate data provide some potential indications of at least two diachronic patterns in the distribution of small terrestrial vertebrates. The first pattern is that the MNI of hutias increased through time, especially between the Cuevas and Monserrate periods (TABLE 2). Some small differences in faunal use between the Monserrate and Santa Elena periods are also present, but not on the order of the Cuevas–Montserrate change. Only one Cuevas level contained remains of one MNI of an unidentified small terrestrial mammal, possibly also a rodent.

The second pattern is the sudden appearance of guinea pigs during the Monserrate Period. Their relatively limited abundance and the continued use of marine fish through time suggest that the presence of guinea pig remains in the late assemblages is not indicative of a major change in dietary practices, and may not represent a significantly greater cultural investment in managed protein sources for food. Instead, the introduction of guinea pigs may have focused specifically on the animal as an exotic resource associated with the development of status differentiation. The guinea pig may have been used in status and prestige displays (as a food item restricted to elite members of the group), or in communal settings of ritual or ceremonial purpose.

In summary, the patterns based on the preliminary data suggest interesting trends in some aspects of subsistence resources. Two main changes are detectable. First, there was evidently an increase in the exploitation of hutias, or at least hutia remains become more numerous among the deposits during the span of occupation. Second, the appearance of guinea pigs coincides with the hypothesized development of social stratification and political regionalization.

### *Monumental Construction and Associated Radiocarbon Dates*

A final but related issue is the chronological and cultural affiliation of the Tibes monumental structures. The dating of ball courts and plazas in the Caribbean has been a matter of debate (Alegría 1983; González Colón 1984; Oliver 1998; Siegel 1999) due to the difficulty of dating structures that were kept clean and tended to contain very few diagnostic artifacts or charcoal (González Colón 1984). Our excavations in deposits near the ball courts and plazas shed some light on the broader issue of temporal changes in the use of space.

We obtained 11 radiocarbon dates (all calibrations were performed by Beta-Analytic, Inc.) from charcoal from different test units and levels at Tibes (TABLE 3, FIG. 7). Two of the dates come from different levels of deposit A, one from deposit C, six from deposit H (one from a postmold [96-1], one from a charred fragment of a post [03-Feature 2], and four from the cultural layer), one from a unit close to the NW entrance of Structure 6 [03-1744b], and one in a cooking area east of Structure 6 [99-5].

The dates include an intercept date of CAL A.D. 770 obtained from a Monserrate deposit, a late intercept date of CAL A.D. 1270 associated with late Elenan or early Chican pottery, and another intercept date of CAL A.D. 980 from an Early Elenan context. Eight other intercept dates fall very close to each other, between ca. CAL A.D. 1000–1200. One of the eight dates (TABLE 3: 97-1) comes from a mixed level that contains mostly late Saladoid material, strongly suggesting that this date is from a secondary deposit.

Two dates are related to structural elements (i.e., charcoal from a postmold and post wood) in deposit H that are located close to two of the stone structures (Structures 3 and 6). The postmold (TABLE 3: 96-1) was filled with dark soils containing a mix of some artifacts and charcoal, giv-

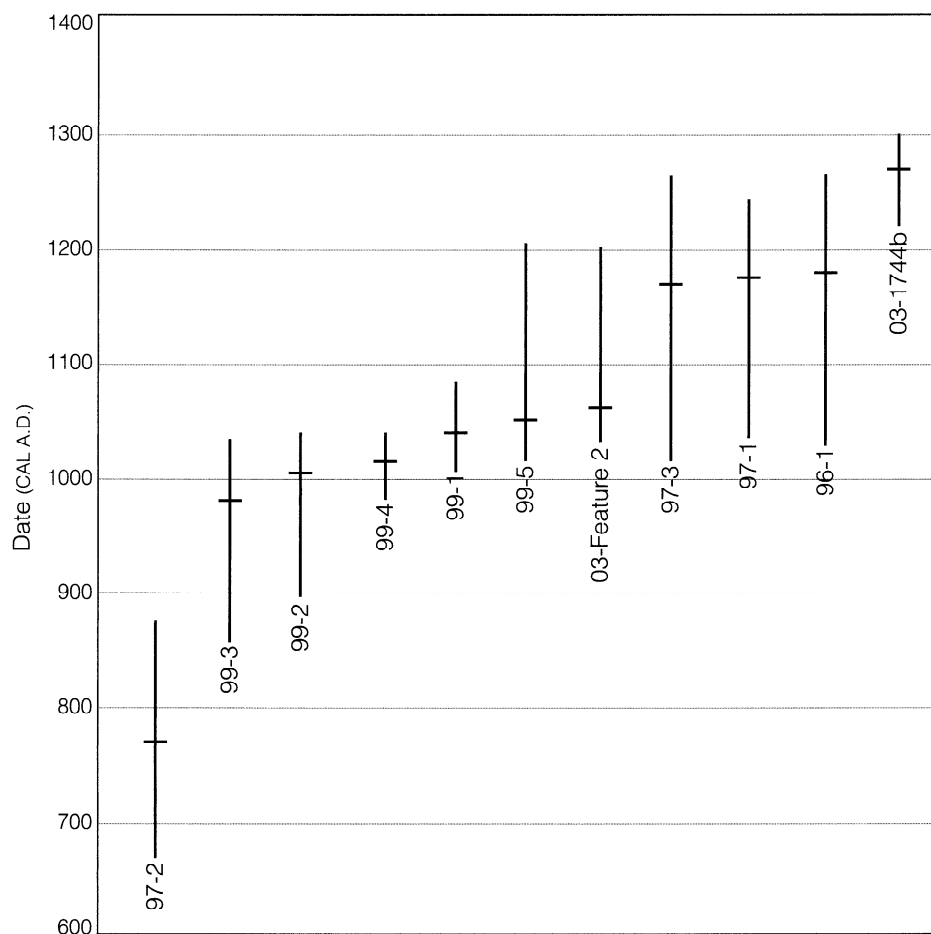


Figure 7. Calibrated radiocarbon dates for Tibes.

ing the impression that the post was removed and the hole filled with dirt and trash. The charcoal used for dating the postmold was obtained from this filling. The post wood (TABLE 3: 03-FEATURE 2) was part of a donut-shaped fragment of the bottom part of a charred post.

The clustering of intercept dates around A.D. 1000–1200 suggests that a major phase of spatial rearrangement of the site may have occurred during this period of time. The fact that at least one of the dates came from a secondary (earlier, redeposited) context and another from trash accumulated in a postmold suggests that rearrangement may have included removal of older buildings, the construction of new buildings from stone and perishable materials, and the mixing and redistribution of existing deposits. The agreement in the chronometric dates across the site implies that this spatial rearrangement occurred in a short period of time and was accomplished in 100 to 150 years or less before abandonment of the site. These data suggest that the site experienced rapid growth and the subsequent collapse of the socio-political system.

The evaluation of these dates does not discount the possibility of monumental structures being built in earlier times (e.g., during the Monserrate period), but it suggests that the final plan of Tibes may have been designed and implemented later than once thought. Based on the data available, we have tentatively assigned all of the existing structures to the second half of the Elenan Ostionoid period (Santa Elena style). Furthermore, the dates and the possible massive rearrangement of space support the hypothesis that the movement towards social inequality started much earlier than A.D. 1000, as many Caribbean archaeologists now believe, and even included the construction of single monumental structures. If so, around A.D. 1000–1200 the movement intensified, with a quick episode of construction that may reflect some consolidation of power in the process of political centralization, culminating in a short-lived powerful or influential polity that collapsed around A.D. 1200. This reconstruction is similar to the process of cycling suggested by Anderson (1994; cf. Steponaitis 1991) for the Savannah River chiefdoms,

where some polities seem to have quickly arisen under certain historical and social conditions or under the leadership of a charismatic and politically astute leader. Once the social or physical environment changed to less favorable conditions, or the leader passed away, the polity suffered a marked decrease in scale and structural integrity. Hypothetically, this can occur relatively quickly, perhaps in one or two generations. Another explanation is that sometime around A.D. 1000–1200, Tibes underwent a major rearrangement in the organization and the use of space because of a change in the meaning of the different spatial units of the site.

### Conclusions

The archaeological record for eastern Puerto Rico indicates major changes in ceramic assemblages, settlement, and mortuary patterns between A.D. 600–900 that are interpreted as a reflection of significant social and cultural changes (Siegel 2005). With few exceptions, Caribbean archaeology has dealt with these changes (including the development of social stratification) from the perspective of large cultures and culture areas, and long periods of time. The evidence presented here—using Tibes as a microcosm of the greater universe of Puerto Rican and Caribbean archaeology—is interpreted from a more local perspective, and shows that in the case of Tibes, these social and cultural shifts involved many spatial and temporal variables. Thus, large spatial and chronological units are not necessarily appropriate starting points to study these social and cultural processes.

Some of the changes in mortuary practices and use of space as observed at Tibes have not been reported for any other site on Puerto Rico or in the Caribbean. Although some clusters of burials have been reported for other Saladoid sites (e.g., Punta Candelero and Maisabel), the replacement of such “ancestral ground” with monumental structures such as plazas and ball courts is, as far as we know, unique to Tibes. This shift in mortuary practices and the conception of space there suggests three trends. First, it suggests a change in social and economic relations. From the perspective of changes in mortuary practice, Curet and Oliver (1998) argued that the social organization changed from lineal descent groups that acted as economic corporate groups during the Saladoid period to one where these kinds of groups were de-emphasized and smaller household units were accentuated. Second, there is some evidence of a major reorganization of the use of space and the general landscape of the site, indicating that the basic relationship between different sectors within the community may have changed. Third, because the activities that shaped the final spatial layout of Tibes apparently occurred be-

tween A.D. 1000 and 1200, this indicates that many of the dynamics and processes that began between A.D. 600 and 900 continued in later periods at a more accelerated pace. These social and political processes may not have corresponded to changes in other cultural or chronological indices such as ceramic sequences.

The increase through time in the consumption of hutias and the appearance of guinea pigs in the faunal assemblage around A.D. 900 also point to an accelerated pace of cultural change. The heightened use of small terrestrial mammals may be interpreted as an increased reliance on animal husbandry and potentially signifies the intensification of food production by a growing population. The breeding and maintenance of rodents, especially hutias, may represent a social investment in the intensification of food/protein resources, specifically making use of captive, readily bred, and well-maintained small mammals. Alternatively, hutia populations may have adapted very quickly to the island setting as they lacked natural predators. People may have been able to encourage reproduction with very little direct control. Another possible interpretation is that this increase in hutia is related to an increase in ceremonialism, rituals, and feasting as Tibes evolved into a ceremonial center. Whether this intensification was for dietary purposes or for social and ritual use needs to be investigated with larger samples from different areas of the site that have clearer contexts and functions.

In the case of guinea pigs, their exotic status may be related to an increase in communal and ritual ceremonies associated with the development of social hierarchy and regional polities. Information recorded by European chroniclers indicates that for later times the meat of several terrestrial mammals, including guinea pigs, was highly valued by the populations of Hispaniola and was served in welcoming banquets to the Spaniards (Las Casas 1967). Although some of these ceremonies may have been present at Tibes since its foundation, changes in the social, political, and economic dynamics may have produced a stronger social need for group unity that was possibly fulfilled through these types of activities that involved larger numbers of people and that were conducted relatively frequently. Furthermore, communal or ritual ceremonies and feasting within this context may have required a change in food etiquette where more culturally valued (and perhaps exotic) meat such as the guinea pig was necessary for the display of status among the emerging elite.

The Proyecto Arqueológico del Centro Ceremonial Indígena de Tibes is beginning to produce results that show the complexity of local social and cultural processes in ancient Puerto Rico. By using local units of analysis, the results indicate that socio-cultural change was not uniform

within the culture area of eastern Puerto Rico. On the contrary, the data suggest that, while some island-wide trends such as changes in ceramic styles and the construction of monumental structures are observable at Tibes, the strategies followed by local groups were neither homogenous nor uniform across the culture area. Furthermore, these results indicate that the variables involved in the social and cultural processes observed between A.D. 600 and 1200 extend well beyond shifts in ceramic modes or general settlement patterns. They comprised multiple dimensions related to the ideological, subsistence, and social structures of the local community and, perhaps, the larger region. It is clear that Caribbean archaeology has to study many sociopolitical processes, not as part of the major cultural units defined from a normative perspective, but by using smaller and more localized units of analyses (e.g., shorter periods of time, households, and communities). In other words, studies must address Prehispanic social and cultural issues not from top (culture) to bottom (local social and cultural units) as is traditionally done in the region, but from bottom to top, where the analysis of site data at the local level elucidates the idiosyncrasies of social and political units as part of the larger culture area. This approach enhances our ability to observe the complexities of human social dynamics and to better understand how they change over time.

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