CHANGING TIMES AT THE TUTU ARCHAEOLOGICAL VILLAGE SITE, ST. THOMAS, USVI.

Elizabeth Righter

ABSTRACT
The Tutu Archaeological Village site was settled by about A.D. 65 and abandoned ca. A.D. 1500. There is little evidence of human occupation between A.D. 950 and A.D. 1150. This paper provides an overview of village structure during early and late occupations. Such structure includes an identified central open space and burial precinct, architectural remains, burial distributions and evidence for division of exterior space around late Ostionoid period structures at Tutu. Major changes between the two occupations, identified from materials and spatial analyses, are discussed; with emphasis on changes in burial patterns, food resources and disease as reflective of environmental stress and socio-political change.

Résumé
Le site archéologique de Tutu fut établi aux environs de 65AD et abandonné par 1500 AD. Il y a peu d'évidence d'occupation humaine entre 950 AD et 1150 AD. Cet article fournit un coup d'œil sur la structure du village durant le début et la fin de son occupation. Cette composition comprend un espace central bien identifié et une enceinte pour les sepultures, ruines architecturales, distribution de sepultures et evidence de division pour l'espace extérieur, aux environs de la fin de la période Ostionoid à Tutu. Des changements importants entre les deux occupations identifiés d'après des matériaux et des analyse d'espace sont discutes avec accent sur le changement de style des sepultures, sources de nourriture et maladies, en tant que réflexion du changement socio-politique et, peut être, stress environnante.

INTRODUCTION
Presented herein is a very brief overview of observed differences in subsistence, diet, health, and burial patterns between an early occupation (ca. A.D. 65-950) and a late prehistoric occupation (ca. A.D. 11500-1500) at the Tutu Archaeological Village site in St. Thomas, USVI. This overview is based on analysis of floral and faunal remains, human skeletal bone and bone chemistry, soil chemistry; and feature distributions, including burials, domestic and other structures, and exterior divisions of space. Economic and socio-political changes between the two occupations at the site are inferred from these data.

SITE INFORMATION
The Tutu Archaeological Village site is situated on the eastern end of St. Thomas, US Virgin Islands, in an inland valley, a little more than a mile from the nearest seacoast (Figure 1). About three miles wide at its widest point, and 15 miles long, St. Thomas is uniquely positioned about 34 miles east of Puerto Rico, between the larger Greater Antillean islands to the west and the archipelago of smaller
Antillean islands to the east and southeast. The climate of St. Thomas is maritime tropical, with trade winds from the northeast, east and southeast throughout the year. Daytime temperature highs usually range between about 87 degrees Fahrenheit during summer months; and 80 degrees in the winter season. Temperatures rarely go below 67 degrees Fahrenheit at night. A central east-west trending ridge rises to about 1550 feet amsl at its highest point on the island, with numerous fast-descending spurs to sea level. Little level ground is present and soils of St. Thomas are mostly thin and rocky, particularly on the coast and steep ridge slopes (Pearsall 1977).

SITE INVESTIGATIONS

The Tutu site was discovered in September of 1990, one year prior to its destruction by construction of a shopping mall. When discovered by Tom Linnio, the archaeological site comprised about 2.20 hectares (5 acres) of predominantly flat pasture land at the base of an amphitheater-shaped hollow, surrounded by low hills (Figure 2A). A branch of Turpentine Run, an intermittent gut in 1990, extended along the western and southwestern boundaries of the site (Figure 2B). For the prehistoric inhabitants of the Tutu site, its location offered many advantages; including flat land; immediate access to fresh water; a continuously blowing trade wind; a protected defensible position; fertile soil; access to large trees for house and canoe building, and access to the coast via a major stream. In addition, the site was virtually hidden from view by land or sea.

During initial preparation for the mall, topsoil had been scraped from the surface, with mechanical equipment and stored in several large soil mounds that obscured portions of the archaeological site (Figure 3). Artifact scatters and several features were exposed on the ground surface. Because of severe time constraints, the research approach to the site, was to archaeologically re-scrape previously scraped sections of the site to expose features; and to set aside and meticulously excavate in tact midden areas and exposed features.

During archaeological investigations, about 50% of the site was archaeologically re-scraped; 30% was set aside for data recovery excavations and sampling; and about 20% was covered by soil mounds. Eight trenches were mechanically opened and profiled (Figure 3); and 8 other exposed site profiles were recorded. Data-recovered units and features comprised about 300 square meters or 1.50% of the site's surface. Hand excavations included 41 excavation units, 13 test units, 21 shovel tests and 34 Site Features. Most hand-excavated units, either 1 or 2-m-sq units, tended to be less than 40 cm deep in northern portions of the site and up to 120 cm in depth in southwestern sections. In addition to 42 excavated and recorded skeletons, 1375 potential post hole stains were exposed and mapped. Of these, 904 were investigated and recorded; and 655 or 72% proved to be post holes. Two possible driplines; five associated stone hearths and one kiln also were excavated.

Ninety -two radiocarbon dates, including 27 AMS (Accelerated Mass Spectrometry) dates on human bone collagen were obtained. These indicate that the site was initially occupied about A.D. 65 and abandoned ca. A.D. 1500. There was a hiatus of about 200 years between ca. A.D. 950 and A.D. 1150, when the site appeared to have been abandoned or minimally occupied. The early occupation is better represented in middens, and the late Ostionoid period, in features.
FLORA AND FAUNA
Throughout the site's occupation, its inhabitants relied upon a mixed diet of plant foods and marine and terrestrial animals. According to Pearsall (1997), the inhabitants of Tutu utilized a broad array of food plants, including tree fruits; small-seeded annual plants, and root/tuber foods. Cotton was used; and corn was present, at least by the time of the late occupation. Phytolithic evidence suggests that a species of domesticated Cucurbita was grown at the site (Piperno 1977). The presence of seeds of cheno-ams, purslane, Talinum, mallow family, and the grass family suggests that the area around the site was fairly open and disturbed by human activities. Recognizing that differential preservation is a factor, Pearsall observes that endosperm fragments of smaller seeds dominate in the early period; while roots/tubers and tree fruits, especially Sapotaceae fruits, account for the majority of food remains in the late period. For wood types, Acacia and cf. Savia are abundantly represented in both time periods, with the late period characterized by a relatively high percentage of Cassine. A greater abundance of wood and evidence of increased burning activity in later deposits suggests more intensive use of the site in the later period (Pearsall 1977).

The majority of faunal species identified at the Tutu site were fishes and mollusks, supplemented by smaller numbers of mammals, birds, reptiles, crustaceans and echinoids. Wing, deFrance and Kozuch (1995) found that the relative abundance of land animals is greater in early deposits than in the later deposit and there are clear and consistent decreases in sizes of many of the animals caught by the later occupants at Tutu. In the later occupation, the numbers of crabs decline relative to the numbers of vertebrates and the numbers of reef omnivores and herbivores increase relative to reef carnivores. Gecarcinid crabs are smaller and West Indian topshells are only about half as large as in the earlier Saladoid deposits. The sizes of two predatory fishes, grouper and snapper, have a smaller mean size and range in the later deposits. Interpreting the evidence, the authors find that, in the late occupation, effort was put into intensifying fishing and gathering resources, but despite the greater diversification in fishing and gathering, new resources were not incorporated into the faunal food quest@ (Wing et al, 1995). The absence of domestic animals and the rarity of managed species, suggests exploitation of wild resources as opposed to management of captive and domestic animals. The authors opine that control of resources apparently was concerned more with cultivating plants than with nurturing animals.

DIETARY RECONSTRUCTION AND HEALTH
Using another approach to dietary reconstruction, Sandford and Farnum (1999) conducted neutron activation analysis on 22 human femoral bone samples, and 61 soil samples from the Tutu site. All techniques applied indicated that Barium (Ba) and Strontium (Sr) concentrations were not significantly altered by diagenetic (or post-mortem) activity; and, therefore, should reflect biogenic processes including dietary intakes. Significantly higher human bone Sr and lower Ba concentrations in samples from the more recent or Ostionoid time period at Tutu suggest a mixed terrestrial and marine diet during the early occupation, with a shift toward a greater reliance on marine based fauna in the later period. This shift, however, still falls well within Burton and Price’s (1990:547-557) range for mixed terrestrial and marine consumption.
Changes in health can be observed from dental remains and skeletal pathology. Studies by Larsen (1995) indicate that oral health was relatively poor in the Tutu population; and a reliance on plant carbohydrates (manioc) probably resulted in tooth decay. There was a slight reduction in dental caries between the early and late periods, however, which may be linked to a proposed increased reliance on marine foods during the later occupation.

Sandford, Bogdan & Kissling (1997) found, widespread in the Tutu population, lesions consistent in their characteristics and patterning with treponemal infections produced by the genus, Treponema. Such bacterial infections include modern venereal syphilis, yaws and endemic syphilis. The condition of most lesions suggests chronicity; but analysis by Sandford et al indicates that the late occupation skeletons at Tutu were more commonly and severely affected by treponemal syndrome. Ostionoid adult individuals had a greater number of affected bones and a greater variety of skeletal signs. For example, among the Saladoid skeletons, the number of affected bones averaged 2.8 per individual, while there was an average of 5.3 affected bones per individual during Ostionoid times (Sandford, Righter and Farnum 1999).

VILLAGE STRUCTURE
During the early occupation, the Tutu village consisted of structures dispersed in a horse-shoe-shaped pattern on a flat knoll top surrounding a large swale that descended to Turpentine Run. There was a central open space, which also functioned as a cemetery (Figure 4A). Discontinuous early occupation midden remnants fringed the site, outside the habitation area. The late or Ostionoid village plan was generally circular (Figure 4B), and there is some evidence that the site expanded to the north and northeast. Concomitantly, the northern boundary of the central plaza may have migrated northward. The Tutu village plan was not static; and was ever-changing within the skin of its general form.

BURIAL CUSTOMS AND SPATIAL DISTRIBUTIONS
Between early and late occupations at the Tutu site, there is evident continuity in burial customs and distributions, but changes in the relative frequencies and modes of expression of these patterns are dramatic. Such change is interpreted to be related to socio-political changes in the society (Curet and Oliver 1998; Hofman et al 2001; Kingsley 1985; Righter in press; Siegel 1989).

All early occupation skeletons dated to between AD 450 and 640 (2 sigma) were accompanied by one or more complete or partial ceramic vessels. Two of these were foetuses or stillborns interred in complete ceramic bowls. Burials did not appear to be clustered in family groups, but the small size of the sample, makes this determination indefinite. Of the admittedly small sample of 14 dated early occupation burials, five or 36% were in a central burial area or precinct, and the remaining nine were dispersed on the site in areas where post hole configurations indicated habitation (Figure 4A). One double subadult burial (Burial 28a28b) and Burial 41, which consisted of the teeth of a subadult, also were present in the central area and were not dated.

Change in burial custom and a change in one aspect of spatial distribution is first evident in late Saladoid Burials 16, 23A and 23B, two adult females and a subadult dated to between cal A.D. 640 and A.D. 870 (Beta 73392, 8300, 2 sigma). These graves are clustered in close proximity to each other.
and are the first instance of an apparent family grouping, probably a grandparent, grand aunt and infant grandchild; suggesting an extended family. Only one skeleton, an adult female next to the infant, is accompanied by a ceramic pot; and, for the first time, also, an infant is not accompanied by ceramic goods.

By comparison, during the late occupation, between ca. A.D. 1200 and ca. A.D. 1500, of 24 burials, only 2 (or 8%) of the skeletons, both infants, were each accompanied by a single ceramic vessel. During the late occupation of the site, although there is consistency in locations selected for burial (either a central open space or in the house area), the relative frequency of cemetery burials to house-related burial changes dramatically. During the late occupation, all but one of the 24 dated burials, 96%, were directly related to domiciles and a single dated burial, 4%, was buried in the central open area which had significantly declined in use as a burial precinct. Burials were either in family groups, frequently members of two generations; clustered in exterior areas adjacent to structures; single, sometimes aligned with exterior house posts; or double. Double burials were infants or subadults.

AGE AT DEATH
Differences in age at death were also observed between the early and late occupations at Tutu (Sandford et al 1997). Of the 14 dated early occupation skeletons, one was unidentified as to age at death; five or 36% were infants less than two years old; one (or 7%) was between 18 and 25 years of age, and eight (or 57%) died at between 35 and 55 years of age.

Of the 24 identified late occupation burials, subadult deaths numbered 12 or 50%, a substantial increase over the early period. In this group, individuals between the ages of two and nine years numbered 6; or 50% of subadults and 25% of the total number of late occupation deaths. Two subadults and one adult (13% of total late occupation burials) were aged between 15 and 21 years. Eleven individuals, or 46%, a substantially smaller percentage than in the early occupation, lived to be between 35 and 55 years of age.

STRUCTURES
A single early occupation structure, Structure 5, differed in construction from the late Ostionoid structures. It was round in shape, about 7 m in diameter, with deeper post holes on the outer circle, and shallow post holes in the interior. Radiocarbon dates indicate that adjacent Burial 20 was not associated with the structure.

Six Ostionoid structures were either oval in shape with interior post holes that were shallower than exterior post holes, round without interior post holes, or round with central post holes significantly deeper than those of exterior posts. Diameters of round structures ranged between 3.10 m and 6.75 m. Oval structures ranged in size between 6 m x 8.60 m; and 9.25 m x 12.25 m. A seventh structure, Structure 7, had deep central post holes and was incomplete. It may have been either round with a diameter of 8.69 m, or oval with a width of 10.75 m. From openings in the outer walls of four structures, both round and oval, (Structures 1, 3, 8, 2) short post hole alignments projected; suggesting attached sheltering fences or porticos. Openings on Structures 1, 3, and 8 (presumed entrances) (Figure
4B) faced the plaza; but a fourth, on Structure 2, faced a burial area to the north of the structure and was opposite the structure’s entrance onto the plaza. Second openings also were observed in Structures 3 and 8. These were located in northwest walls, opposite entrances.

Associations between burials and structures were inferred based on radiocarbon dates and proximity to structures. Groupings of burials were identified by clustering and radiocarbon dates. Family connection was inferred from ages at death; clusters that included both male and female adults with infants and subadults; and subadults buried adjacent to each other or in the same grave. Neither spatial separation based on age or gender; nor location of a burial by status was observed. Burial pits of Skeletons 8A/8B, 11 and 38, associated with Structures 7 and 8, however, had thick subsoil caps as if to protect or hide the contents, and graves of Burials 8, 8A and 38 exhibited hollowed-out niches for heads and feet. These treatments suggest that the interred may have had special status.

Along with an association between burials and structures during the late occupation, around some structures, divisions of exterior space, especially burial areas and work spaces, could be recognized. The greatest number of spatial segregations could be identified around Structure 8. Here, a row of post holes extended from the northwest end of the structure, separating a work space to the south and a burial area to the north (Figure 4). The work space contained a kiln and a hearth. South of the work space was a burial area and to the south of this space was an open unoccupied space southwest of the entrance. From each end of the entrance opening, post hole alignments projected. Another open or formal space was located southeast of the entrance; and, north of the structure, an area of burials contemporaneous with the structure was present. The separately grouped burials were interpreted as members of two or more families that occupied the structure. Clean fill in burial pits, as opposed to the refuse-filled post holes of the structure, suggested that either burial pits were back-filled intentionally with clean fill; or burial pits were excavated into relatively clean subsoil in areas that were kept clean of topsoil; and were maintained by the inhabitants of the structure during its life. The latter scenario seems the most plausible and is consistent with the fact that none of the late occupation burials was disturbed. In order to bury family members close to each other without accidentally intercepting earlier burials, burial locations must have been known. In this sense, burial areas were similar to family cemetery plots.

Fewer activity areas and divisions of exterior space were identified around Structures 1, 3, 4 and 7. Projecting from the southern and southwestern edges of Structures 1 and 4, respectively, were identical alignments of seven post holes, of which two were paired to form a corridor (Figure 3). No burials were associated with Structure 1 and its appendage may have separated an activity area to the west from an unoccupied, possibly formal, space south of the entrance. The appendage of Structure 4 appeared to separate a burial area from the structure. It is possible that the alignments themselves had special functions in relation to these two round structures. Structure 3 also had an open or formal space south of the entrance, and a single row of post holes projected from its northwest wall, marking the northern limit of a burial area. Northeast of Structure 7, a hearth, Feature 72H, probably indicated an activity area for the structure’s inhabitants.

No appendages were identified at the two structures which had large central posts (Structures 2 and 7). Interior space of Structure 2 appears to have been divided, and, north of the structure, a bur-
ial area was delineated by a detached fence. No appendages were identified with oval Structure 6; and house-related burials north and south of the structure (Figure 4) suggested occupancy by two families. On the site in general, myriad post holes and stains of episodes of construction and repair during the prehistoric past, prevented identification of the full extent of exterior space allocations among structures.

**SOCIAL CHANGE**

In his survey of 115 ethnographic groups, Kingsley (1985) found mortuary patterns that were regular and redundant and reflective of social behavior (Bindford, 1971) and could be identified archaeologically. Kingsley focused on group or horizontal symboling that, with a high probability, could be discerned from the archaeological record (Kingsley, 1985). Group symboling, when it occurred, was most often spatial and the group most often symboled was a uni-lineal descent group, either a clan or lineage. All members of the group were treated in the same manner. Kingsley found that 50% of tribal groups symboled a group in a disposal area or cemetery and 50% had house-related or no pattern burials.

In his sample, Kingsley did not find any instances where both cemetery and house-related burial occurred in the same settlement. To explain the presence of such a pattern, at Maisabel, Puerto Rico, which mirrors that at Tutu, Siegel (1989) employs the concept of complex tribe (Hoopes, 1988). Curet and Oliver (1998:229) explain the pattern by suggesting that two or more social statuses might be present and one group was outside the normal realm of the community. Neither of these explanations is considered by their proponents to be incompatible with characterization of Saladoid villages as egalitarian and communal.

The burial distribution at Tutu, however, is not a matter of inside the cemetery (the norm) and anywhere outside (outside the norm), but is a clear pattern of both disposal area (group symboling) and house-related burial (no symboling) distribution. Such a pattern suggests internal differentiation in the settlement, in which one group had higher status than the rest of the villagers. Since burials in the central precinct included adults, subadults and infants, ascribed, rather than achieved status is indicated. If this were the case, it suggests a more complex level of social organization than has been generally assigned to so-called egalitarian Saladoid villages.

During the Saladoid occupation at Tutu, religious items such as greenstone idol insets and shell zemis; and valuable personal items, such as stone beads, shell beads, shell pendants, and shell gorgets were recovered from midden deposits associated with houses, as well as from midden deposits adjacent to the central open space or burial precinct. These items appear to be evidence of ritual disposal (Siegel, 1989, 1992), related to ancestor worship which included burial ceremonies and feasts that took place in houses and in the central open space. Since there was no evidence of differential control over dietary resources during either occupation at Tutu (Norr, in press), it is likely that the higher status group had control over symbolic resources including important religious paraphernalia, such as zemis, and ability to demonstrate descendancy from, and access to, the most important ancestors of the group.

In Kingsley’s ethnographic sample, as social complexity increases, there is a break down in the
political power of uni-lineal descent groups. With the exception of the chiefly lineage, uni-lineal descent groups lose their importance and are replaced by the power and authority of elite individuals or households (Curet and Oliver, 1998:231; Kingsley, 1985). Houses and house compounds may contain families from many different uni-lineal descent groups (Kingsley, 1985:159) and villages are overseen by a cacique in whom hereditary power and authority are vested. Mortuary distributions at Tutu reflect this shift from a kin-based village to one with increasing emphasis on individual household units, and emergence of social inequality and stratification. This evidence and the presence of objects related to Taino lifeways, suggest that the Tutu village was affiliated with Taino chiefdoms in eastern Puerto Rico, and a part of the Taino socio-political system.

SUMMARY

In summary, differences between Saladoid and Ostionoid occupations at the Tutu site document economic and socio-political changes between the two periods. The number of identified structures of the late occupation, along with an increase in burned wood remains, grasses, and cheno-ams suggests a settled, well-populated, busy site. A greater breadth in the quest for animals of generally smaller size suggests exploitation pressure on certain resources. Maintenance of the village population apparently became increasingly difficult with resulting stress for its human occupants. An evident failure to exploit additional faunal food resources may indicate socio-political constraints from neighboring villages, that prevented the Tutu inhabitants from expanding their range of exploitation zones. Socio-political change within the village is indicated by changes in burial patterns from symboling of a dominant lineage in a central cemetery (Kingsley, 1985), to a majority of house-related burials; indicating an emphasis on the individual family unit, social stratification and control of resources by a small elite group. These socio-political changes are comparable to those recognized by Curet and Oliver (1998) in eastern Puerto Rico. More research is needed in order to correlate settled village life, over-exploitation of certain resources, and a changing socio-political system with increased severity of treponemal infections, a higher mortality rate among subadults more than two years old, and socio-psychological stress which affected the health and well being of the population.

Acknowledgments

Many thanks to Monique Purguy for her French translation of the Abstract for this paper; to Robert Kingsley for his patience with all of my questions regarding his thesis, and to Antonio Curet for sending me a copy of his and Oliver’s paper more than once.

Literature Cited


Sandford, Mary K., Georgieann G. Bogdan, G. & Grace E. Kissling, 1997. *A view to the past: investigations of the bioarchaeology and paleopathology at the Tutu site, St. Thomas, United States Virgin Islands.* Unpublished manuscript. Charlotte Amalie: Division for Archaeology and Historic Preservation, St. Thomas, USVI.


Wing, Elizabeth S., Susan S. deFrance & Laura L. Kozuch, 1995. Faunal remains from the Tutu Archaeological Village, St. Thomas, USVI. Manuscript on file at the Division for Archaeology and Historic Preservation, Charlotte Amalie, St. Thomas, USVI.
Figure 1. Location of the Tutu Archaeological Village Site in the Caribbean archipelago.
Figure 2A

Location of the Tutu site in an inland valley of St. Thomas, USVI. View South over the site (shown by an arrow) toward the south coast of St. Thomas (in the background).

Figure 2B

The position of the Tutu Archaeological Village site vis a vis Turpentine Run, and the northern limit of navigable waters.
Figure 4A
4A. Schematic overview of village structure and features dated to between ca. A.D. 64 and 960, Tutu Archaeological Village Site, St. Thomas, USVI.
Figure 4B

4B. Schematic overview of village structure and features dated to between ca. A.D. 1150 and 1500. Tutu Archaeological Village Site, St. Thomas, USVI.