JOURNAL OF THE VIRGIN ISLANDS ARCHÆOLOGICAL SOCIETY

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THE VIRGIN ISLANDS ARCHAEOLOGICAL SOCIETY

Founded and incorporated, January 1974, at St. Thomas, U.S. Virgin Islands as a non-profit, scientific organization.

The object for which this corporate society is formed is to bring together those persons having a serious interest in archaeology, history and related studies; to explore, excavate (under the aegis and direction of the appropriate authorities), chart and study the cultures of primitive peoples who once inhabited our Islands; to publish the Society's findings; to communicate with other archaeological and historical societies and disseminate knowledge acquired through such activities.

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BIOGRAPHICAL NOTES

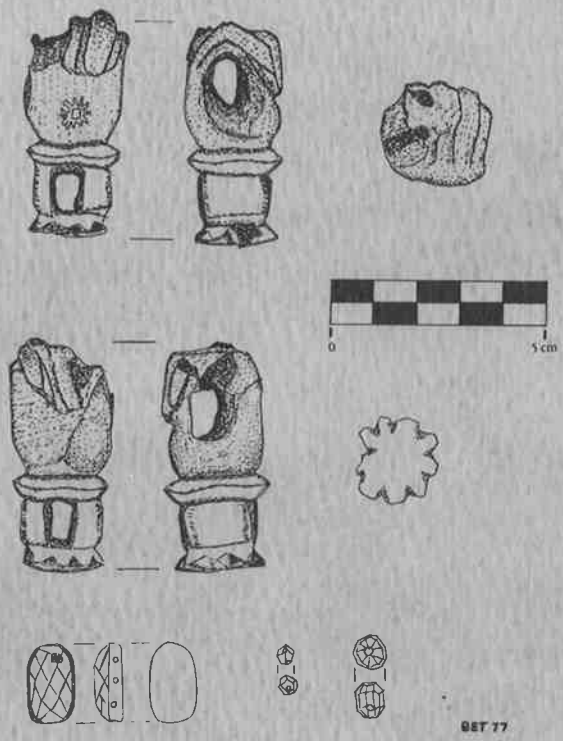
DOUGLAS VICTOR ARMSTRONG is a native of California. He graduated with a B.A. from Occidental College, and has earned his M.A. in archaeology from the University of California at Los Angeles, where he is enrolled now in the Ph.D. program in anthropology. Armstrong has done field work in California and Ghana, and around the Caribbean Basin. His professional interests include cultural ecology and the analysis of shell deposits in archaeology.

GLEN TURNER HANSON JR. was born in Eau Claire, Wisconsin. He graduated with a B.S. from Grand Valley State College, and received a M.A. in anthropology from Arizona State University, where he is a Ph.D. candidate. Having a substantial background in the prehistory of the U.S. Southwest, Hanson is employed currently by the Institute of Archeology and Anthropology of the University of South Carolina, where he is involved in a program of intensive research including the cultural ecology of the lower Piedmont region. Besides his expertise in the two areas mentioned, Hanson is interested in archaeological theory and lithic analysis. His M.A. thesis is entitled *An Appraisal of Archeological Nearest Neighbor Analysis.*

CYD HEYMANN is a native of Maryland. She received her B.A. in anthropology from Florida State University, and has done archaeological field work in Honduras and St. Kitts. Heymann co-authored (with R. Christopher Goodwin) 'St. Kitts Salvage Archeology', *Explorers Journal*, vol. 55 (1977), no. 1, pp. 20-23.

CHARLES ANDREW HOFFMAN JR. was born in Wildwood, New Jersey. He received a B.S.J. and a M.A. in anthropology from the University of Florida, and a Ph.D. from the University of Arizona. His doctoral dissertation is entitled *Bahama Prehistory: Cultural Adaptation to an Island Environment*. Currently Associate Professor of Anthropology at Northern Arizona University, Hoffman is a leading Caribbean archaeologist; he conducted significant research on Antigua, St. Kitts, and the Bahamas. Hoffman has done field work in Florida, and is engaged in a study combining historic site archaeology and ethnography in the Little Colorado River Valley of eastern Arizona.

For the biographical notes of Robert Christopher Goodwin *and* Desmond Vernon Nicholson *please see the inside back covers of issues* number 5 *and* number 3, *respectively.*



NEW FINDS FROM ST CROIX

Jet artifacts, of Spanish manufacture, found in the course of recent excavations at the 'Columbus Landing Site' (12VAm1-6) on Salt River Point, St.Croix: a fist-shaped amulet, or *figa,* and three beads, all of which may have been strung together originally as parts of a single necklace. They were recovered from a test pit dug inside the earthworks of a XVII Century fort, and were presumably deposited on the site sometime during the period of its occupation by the French (*c.* 1650-1695). For many centuries, artisans in northern Spain turned out jet objects of this sort for sale to tourists making their pilgrimage to the great shrine of Santiago de Compostela. The items found at Salt River Point were probably acquired in Spain itself by a French pilgrim who subsequently made a voyage to the Indies, eventually becoming involved in his country's colonial venture on St. Croix.

The excavations at Salt River Point are being undertaken by the staff of the Virgin Islands Office of Archaeological Services, assisted by members of the St.Croix Chapter of the Society. The specimens shown here were recovered in 1977 by a team headed by Bruce E. Tilden and Richard T. Gartley. A good many additional objects of a similar nature have been unearthed since then, in the course of further testing.

THE CERAMIC TYPOLOGY OF THE MILL REEF SITE, ANTIGUA, LEEWARD ISLANDS

By Charles A. Hoffman, Jr.

Introduction

During the summer of 1961 archaeological investigations were undertaken on the island of Antigua in the Leeward Islands, as part of my master's degree program at the University of Florida. All the research and laboratory work was conducted under the guidance of Professor John Mann Goggin. The purpose was to learn something about the prehistoric cultures of the island and their relationship to other islands of the West Indies. An earlier version of this paper was read before the Society for American Archaeology in 1963. The complete report was submitted to *American Antiquity* during the editorial tenure of Edwin Wilmsen. He felt that his journal was not an appropriate forum for the presentation of regional pottery typologies, and rejected publication. Since that date there has been a renewal of interest in the archaeology of the Caribbean. Furthermore, the *Journal of the Virgin Islands Archaeological Society* now provides a forum for the dissemination of this sort of information. What follows here, somewhat awkwardly (like a cart before a horse), is the ceramic data base from which I drew in deriving and presenting broader areal integrations and chronological implications (Hoffman 1963, 1970, 1972, 1973, 1974).

Excavations were carried out in a site of aboriginal occupation at the Mill Reef Colony on the southeastern coast of Antigua (Fig. 1). The materials recovered from the Mill Reef site provide the basis for the descriptions presented in this study. Further, surface surveys of Antigua were undertaken to determine the spread of the Mill Reef-like prehistoric culture.

The Mill Reef site (also referred to by the Antigua Archaeological Society as the Brook Site) is located about 200 m. inland from the sea on a ridge that drops down to the coast, separating two small embayments, Little Deep Bay (on the north) and Great Deep Bay. A reef protects the bays. The ocean can not be seen from the site, since the ridge makes a slight rise before dropping away to the sea. A road bisects the site, with the greater part of the occupation area lying to the east.

The majority of the ceramic specimens recovered from the midden at Mill Reef comprise a group of potsherds possessing many similarities which, taken as a whole, are defined in this report as the Mill Reef Series. The Series is characterized by several identifiable structural traits, plus one or another decorative variation. It accounts for 85% of more than 13,000 sherds found. No one level yielded a significantly different percentage.

Following the methods of classification succinctly presented by Willey

(1949:6), I would give types in this series the 'designant name' of 'Mill Reef' after the geographical area in which the material was found. The term *series* groups together a number of types which bear an obvious relationship to each other. Usually, companion types in the same series have about the same temporal and spatial distribution, although minor differences may exist. The series is named for one of the prominent types which composes it. It may be conceptualized as a collection of potsherds having certain conformities, in temper particularly, but also in vessel form, paste, hardness, surface treatment, thickness and method of manufacture. Names for Mill Reef types within the series indicate variations in decoration. Mill Reef Incised would be the above designant name with all its combined traits and appropriate vessel form, plus the decorative treatment of incising.

There are two sets of types within the Mill Reef Series: Mill Reef and Marmora. The first has been explained above. The second is set aside because of an important decorative technique, that of incising the pottery with broad, shallow lines. The ware characteristics, however, are the same as those of Mill Reef types. Inasmuch as they were both in the same level of the same trench, I feel there is no question but that these two types are closely related in spatial and temporal distribution.

In addition to the Mill Reef Series, three other series are tentatively proffered: Deep Bay, Yorkstead, and a residual category. The chief characteristics of Deep Bay types are the extremely fine and very hard paste, and the burnished surfaces. Yorkstead Series comprises only one type; all sherds are chalk-like in appearance, but are much harder than chalk. The residual category has been set up because some sherds are too small to assemble enough diagnostic traits. They are characterized by a sandy paste or temper. Such temper is usually much smaller than that found in Mill Reef type paste (perhaps less than a millimeter in diameter).

The most inclusive classificatory term in Willey's system is the 'complex'. A complex is synonymous with culture period in that it represents the group of pottery types or the various series of types that occur together in the same general area at the same time (Willey, 1949:6). Thus, we could appropriately say the Mill Reef Series is part of a culture complex, when taken into consideration with other series that may be found within the same general area from the same temporal periods. As I have said above, minor series types of pottery found at Mill Reef are not to be classified under the Mill Reef Series. They are sufficiently different to be placed logically within their own category. This gives us more than one series from Mill Reef. All of these series and their component types taken as a whole comprise the Mill Reef Complex. The Mill Reef Complex is outlined in Table 1. The definition of types follows.

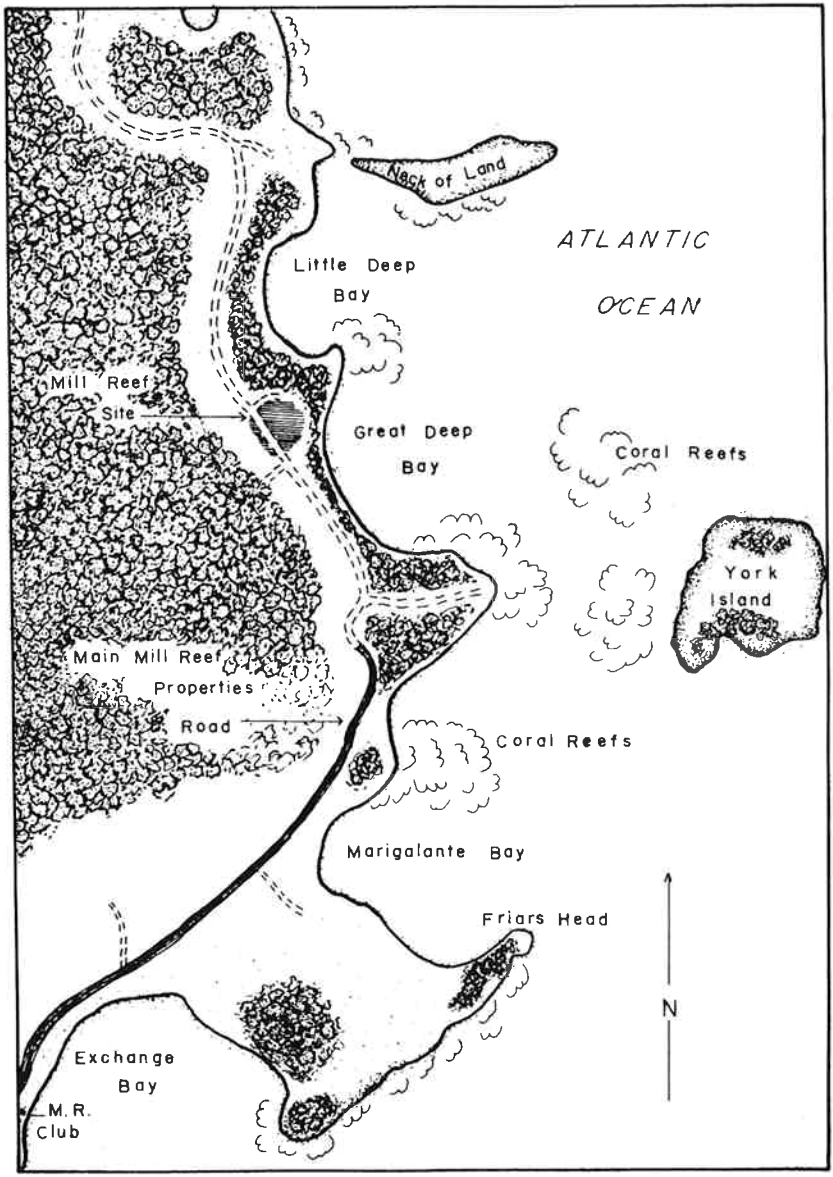


FIGURE 1
The Mill Reef site area. The Mill Reef Properties are on the eastern, windward side of the island.

TABLE 1

Mill Reef Series
- Mill Reef Plain
- Mill Reef Incised
- Mill Reef Red Incised
- Mill Reef White-on-Red
- Mill Reef Red-on-Buff
- Mill Reef Polychrome
- Mill Reef Brushed
- Mill Reef Zoned Red Incised
- Marmora Incised
- Marmora Red Incised
- Marmora Red Incised-Punctated
- Marmora Black-on-Red Incised

Deep Bay Series (Tentative)
- Deep Bay Plain (Tentative)
- Deep Bay Scored (Tentative)
- Deep Bay Incised (Tentative)

Yorkshire Series (Tentative)
- Yorkstead Plain (Tentative)

Unclassified Sandy Paste Series

Mill Reef Series

MILL REEF PLAIN. (Fig. 2).

Definition as a type: From Mill Reef, Antigua, West Indies; this paper.

Ware characteristics:

Method of manufacture: Coiled.

Temper: Perhaps the chief diagnostic. Large chunks of grit, usually 2 or 4 mm. in thickness, and on occasion 7 or 8 mm. across. Frequently chert flakes, calling for careful examination as they may look very much like shell fragments.

In addition to grit tempering, inclusions of unknown substance, perhaps charred fragments of bone, wood, leaves, skin, etc. (See section 'Unusual Inclusions', below.)

Variations in temper. In addition to large grit particles there may be shell, limestone, crushed sherd and even broken bits of coral. I am not ignoring the warning note sounded by Shepard (1956: 164) that when there is a lack of uniformity in temper the pottery should be re-examined to determine whether or not it is completely homogeneous in surface features and style. There is still a uniformity, even in the grit tempering. But often a single particle of crushed sherd, or shell, was found in otherwise ordinary grit tempered sherds. There were not, in these cases, any other variations in ceramic styling, beyond the limitations being established here. Different types should not be set up for random inclusions of temper. It does not seem at all unlikely that the aboriginal potter should once in a while decide to add a few crushed shells or sherds to a large quantity of paste, or, perhaps decide not to bother picking these items out during the preparation of the clay.

Paste texture and color: Granular. Some tendency toward lamination and contortion of paste, although this does not seem to relate to hardness or compact quality of the paste. Fractures are firm but granular.

Color varies from dark brown to deep grey, although occasionally bright orange. May have buff surfaces with grey core.

Surface texture and color: Surface color varies according to the firing. Usually grey or grey-black. Many have firing clouds. May have buff surface.

All Mill Reef Series have been smoothed, or brushed, although exposure and rough treatment may have removed some of the original surface. They are carefully finished and typically have a sleek appearance, although even when well finished, they are usually quite dull. Surfaces are not lumpy, despite large chunks of grit. There are frequent tooling marks. Finish would include the first and third of Shepard's main surface types: 'unslipped and unpolished; polished unslipped; and slipped' (Shepard 1956: 187).

Occasionally it may be difficult to distinguish truly brushed sherds from those having marks made when the vessel was smoothed or scraped, and thus to determine whether the marks were put there purposely or simply not completely removed.

Thickness: Vessel walls average 10 mm. Rims may be thickened, particularly on the inside of shallow vessels. Bases vary according to shape from 5 mm. for concave bases to 15-20 mm. for flat bases.

Form:

Total vessel: Includes shallow bowls (Fig. 2a), griddles with walled rims, some vessels at least partly cylindrical (Fig. 2c), and medium-deep hemispherical bowls. Very shallow bowls, or deep dishes (Fig. 4c), may be boat-shaped (Fig. 2a)

Rims: Lips may be thick and/or beveled on the inside (Fig. 2a; also Hoffman 1970: Fig. 3a), rarely on the outside. Flanges, or extensions of the vessel wall perpendicular to the rim, are rare. A diagnostic feature is the characteristic flaring of the rims of some vessels (Fig. 2b, f, g; 4d). Griddle rims are the walled-rim type, these frequently being triangular or S-shaped in profile.

Shoulder: May be concave (Fig. 2g) or slightly convex, the former being a characteristic trait. The term shoulder is used here because it is already in use in the Caribbean (Rouse 1952). It is the same as 'neck' as used by Shepard (1956).

Keel: Frequently present generally in association with concave shoulders, rarely with convex. The term 'keel' is used here because it is already in use in the Caribbean (Rouse, 1952). It is apparently the same as 'corner point' as used by Shepard (1956).

Base: Both concave and flat. Occasional annular base.

Geographical range of type: Numerous sites on Antigua, present on St. Kitts, one sherd observed from St. Lucia.

Chronological position of type: Probably A.D. 550-1000. See Rouse, Alegría and Stuivet (1963).

Relationships of type: Similar to Ostiones and Cuevas of Puerto Rico (Rouse, 1952); similar to Troumassée B of St. Lucia (McKusick 1960b); similar to Botany Series of Virgin Islands (Bullen 1962).

MILL REEF RED.

Definition as a type: From Mill Reef, Antigua, West Indies; this paper. Basically same as Mill Reef Plain, except as noted below. A high percentage of Mill Reef sherds are slipped or painted red. Some may actually be Mill Reef Red-on-Buff, but specimens are not always large enough to permit finer breakdown than the partially residual category of Mill Reef Red.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Surfaces of outside entirely covered with red slip or paint. Occasionally both sides are red. Outside may be entirely red, along with inside the lip. Color varies from bright red to light orange-red, though usually the former. Well smoothed or finished, but not polished.

Form: (See Mill Reef Plain). Red slipped sherds seem to tend more toward the characteristic thickened flaring rim and concave shoulder vessels.

MILL REEF INCISED.

Definition as a type: From Mill Reef, Antigua, West Indies, this paper. Basically same as Mill Reef Plain, except for differences noted below.

Ware characteristics: (See Mill Reef Plain.) Both size of temper and thickness of sherd may be smaller than Mill Reef Plain.

Decoration:

Technique: Combination of incised lines, of varying depths and widths, but not fine-line nor broad-line. Average incising about 2-3 mm. wide and 3 mm. deep, but somewhat box-shape in profile. Apparently made with a blunt instrument. Decorations all appear to have been made before firing.

Design: Frequently two parallel lines.

Distribution: Paralleling the rim, usually on inside bevel.

Form: Flaring rims and concave shoulders not as common as with Mill Reef Plain.

MILL REEF RED INCISED. (Hoffman 1970: Fig. 3c-d).

Definition as a type: From Mill Reef, Antigua, West Indies; this paper. Basically same as Mill Reef Plain and Mill Reef Incised, except for differences noted below.

Ware characteristics: (See Mill Reef Incised.)

Decoration: (See Mill Reef Red.) The lighter, orange-red accounts for larger percentage of these sherds than with the plain red type.

Technique: Very similar to Mill Reef Incised, incising being perhaps a millimeter or two wider in profile.

Design: Frequently two parallel lines, occasionally connected at ends to form rectangle.

Distribution: Paralleling rim, usually on the inside bevel.

MILL REEF WHITE-ON-RED (Figs. 2b, 4a, b).

Definition as a type: From Mill Reef, Antigua, West Indies; this paper. Basically same as Mill Reef Plain and Mill Reef Red, except for differences noted below.

Ware characteristics: (See Mill Reef Plain.)

Decoration: (See Mill Reef Red.) Designs painted in white on the red background.

Technique: May be applied after firing.

Design: May be large Xs (Fig. 2b), in stripes 12 mm. wide. May be line 5 mm. wide paralleling rim. Occasionally adjacent to and immediately below a bevel on the inside of a rim. May be negative in present appearance, that is, an area may be extensively covered with white paint, the unpainted spaces revealing the design. In any event, in this latter case, the design in basically curvilinear and flowery.

Distribution: Not limited to any particular portion of vessel. The thin lines are generally found on the inside or the outside, just below the rim, while Xs are always on the outside and not very small, but taking up a whole side of a vessel. Curvilinear negative designs on the outside.

MILL REEF RED-ON-BUFF. (Fig. 4c).

Definition as a type: From Mill Reef, Antigua, West Indies, this paper.
Basically same as Mill Reef Plain except for differences noted below.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Designs painted in red on buff or plain background (See Mill Reef Red).

Technique: Applied before firing.

Design: Usually simple bands, parallel if more than one.

Distribution: If not in bands about the body of the vessel, then confined to rim and lip, more frequently on the inside of the lip. On rims with inside bevel, the coloring may extend down below the bevel perhaps 20 mm. or so.

Form: Majority of the lips of this type are bevelled, with the thickening on the inside; characteristic of the flat, boat-shape vessel (Fig. 2a), and in these cases the decoration includes the simple lugs, if present.

MILL REEF POLYCHROME. (Fig. 2g).

Definition as a type: From Mill Reef, Antigua, West Indies; this paper.
Basically same as Mill Reef Plain except for differences noted below.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Designs, mostly linear, painted in white, buff or black, on red background. Usually involves at least white and red.

Technique: The red background is applied before firing, but this is not always the case with remaining colors. On some vessels white lines, 3-5 mm. wide, are applied after the surface is finished.

Design: Usually simple bands, paralleling the rim. White lines may be geometric.

Distribution: Varies, frequently on shoulder, just above keel. Narrow geometric lines over entire remainder of the vessel.

MILL REEF BRUSHED. (Fig. 4d).

Definition as a type: From Mill Reef, Antigua, West Indies; this paper.
Basically same as Mill Reef Plain except for differences noted below.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Brushing or scraping marks deliberately applied to unfired exterior of vessel.

Technique: Applied prior to firing with various objects, some sharp pointed, others blunt. Striations may be shallow and about 2-3 mm. in width.

Distribution: Random application.

MARMORA INCISED. (Fig. 2d, h, i, j).

Definition as a type: From Marmora Point, Antigua, West Indies; this paper.

Ware characteristics:

Method of manufacture: Coiled.

Temper: (See Mill Reef Plain.)

Paste texture and color: (See Mill Reef Plain.)

Surface texture and color: (See Mill Reef Plain.)

Thickness: Vessel walls average 10 mm. Rims rarely thickened. Bases concave, 5 mm. in thickness.

Decoration: The main diagnostic trait of this type is the broad, shallow line incised or pressed into the sides of the vessels before firing.

Technique: Lines are 5 to 7 mm. wide and 1-2 mm. deep. Method of application not certain, as raised edges along the incised lines (usually a result of incising in soft clay) are absent. Perhaps the lines were pressed into clay in plastic state.

Design: Series of rounded-corner rectangles or scroll motif (See Fig. 2d, h-j). Rectangles may have an unconnected line in the middle.

Distribution: Apparently limited to shoulder, paralleling the rim.

Form:

Total vessel: Uncertain. Reconstructed specimens indicate straight-shouldered hemispherical bowls.

Rims: Unthickened, may be flat on top, or slightly rounded.

Shoulder: Straight or slightly convex.

Base: Concave and thin, perhaps only 5 mm. thick.

Geographical range of type: Numerous sites on Antigua; present at several sites on St. Kitts; may be present on St. Lucia.

Chronological position of type: Uncertain, perhaps A.D. 900-1000. See Rouse, Alegría and Stuiver (1963).

MARMORA RED INCISED. (Fig. 2d, h).

Definition as a type: From Marmora Point, Antigua, West Indies; this paper.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Outside surfaces entirely covered with red slip or paint. Color varies from bright red to orange, although usually the former.

MARMORA RED INCISED-PUNCTATED. (Fig. 2i).

Definition as a type: From Marmora Point, Antigua, West Indies; this paper.

Ware characteristics: (See Mill Reef Plain.)

Decoration: Outside surfaces entirely covered with red slip or paint. Color varies from bright red to orange, although usually the former.

Has row or rows of crude punctations paralleling the rim. Punctations are roughly circular, about 5 mm. in diameter and with uneven surfaces as though made with the end of a jagged stick. They appear to have been smoothed over slightly.

Geographical range of type: Found only at Marmora Point, Antigua; surface collection.

Classification of Minor Series

Many of the ceramic specimens in the Mill Reef collection set themselves apart as distinct units that should be considered separately from the main group of grit-tempered, smoother-surface sherds. These sub-groups are obviously different, in paste, temper, decoration, etc., or a combination of these traits.

Some of the distinct sub-groups have not been reported from elsewhere in the Lesser Antilles. Since they occur at Mill Reef in rather limited quantities we cannot say they are typical of that site. Simply to assign them a permanent type name at this time, and later find that one of the sub-groups may dominate the ceramic content of a site elsewhere in the West Indies, will serve only to confuse future classification.

What seems best is to report these sub-groups, with full descriptions, as tentative types from Antigua. Thus a classification system has been set up that encompasses all the sub-groups, providing them with a nomenclature that is (for the time being) usable, but not binding them with type names that cannot be changed. When it is finally determined where the particular sub-group type site is, perhaps then a new type name can be assigned (if such is needed). It is obvious also that additional information regarding variations within each sub-group (which would normally be expected from such a type site) might serve to clarify or revise classificatory points for use in naming.

In summary, these sub-groups occur at Mill Reef in sufficient quantities to justify their being isolated into distinct categories. None is found in numbers sufficient to classify them permanently at this time.

Deep Bay Series (*Tentative*)

DEEP BAY PLAIN (*Tentative*).

Definition as a type: Tentatively; from Mill Reef, Antigua, West Indies; this paper.

Ware characteristics:

Method of manufacture: Coiled.

Temper: Usually temperless, rarely with tiny flakes of shell. May be shell-tempered, may have shell inclusions (probably accidental), such as half a land snail in one sherd.

Paste texture and color: Chief diagnostic trait for this type. Paste is very fine and usually very hard. Slight tendency, particularly with thicker sherds, toward lamination and distortion of paste. Color varies, usually black inside, cream surface. With coil breaks, the cream color may be found along the break, indicating poor construction and/or high firing temperature.

Thickness: Varies around 5 mm.

Form: Uncertain. Perhaps hemispherical bowl. Rim is rolled slightly on outside, flat on top.

Geographical range of type: Known only from Mill Reef site, Antigua. Pottery from other sites in the West Indies has been studied particularly to see if Deep Bay Series sherds may be found elsewhere. With a single exception this has been without success, so far. Recently I had an opportunity to examine some sherds reportedly from St. Lucia, in a collection owned by Dr. Fred Olsen. In this collection were the fragments of a single crude, U-shaped, flat-bottomed, smoothed-surfaced bowl. The exposed breaks of the sherds suggested a close relationship to the Deep Bay type, particularly the Deep Bay Scored (noted below). The St. Lucia specimens were not as free of tiny particles of grit, and were a bit more vesicular, or, conversely, the Deep Bay types are more compact and of purer clay. Bullen, Goggin, and Haag have all examined sherds of this Series and informed me that they had never seen others like them in their Caribbean investigations.

Chronological position of type: Uncertain. Probably A.D. 550-1000. See Rouse, Algería and Stuiver (1963).

Relationships of type: This particular type does not seem to be definitely related to anything else in the West Indies. (But see Deep Bay Scored 'Relationships', below.)

DEEP BAY SCORED (*Tentative*). (Fig. 2c).

Definition as a type: Tentatively; from Mill Reef, Antigua, West Indies; this paper.

Ware characteristics: (See Deep Bay Plain). Usually cream-colored surface; rarely black surface, usually black core. Usually considerably thicker than Deep Bay Plain; averaging 10-12 mm., particularly those with cylindrical shapes.

Form:

Total vessel: Usually cylindrical; may be hemispherical bowl. It is uncertain whether or not cylindrical form is that of a 'pot rest', *i.e.*, open at both ends, or part of a cylindrical vessel (Fig. 2c).

Rim: Lips usually thickened on outside, flaring out, flat on top. May be straight, unthickened rim.

Base: Uncertain. If these vessels include cylindrical pot rests, then basal portion is a duplicate of the top rim, perhaps a little more worn.

Decoration: Scoring or scraping marks deliberately applied to unfired exterior and interior of vessel, or only exterior.

Technique: Applied prior to firing, with various objects, usually sharp-pointed. Striations are 1 or 2 mm. in depth and width, frequently V-shaped in profile. Scoring may be smoothed over, presenting a scored surface, but with sleek overall appearance.

Design: There is no particular design, but distinct scrape marks that run in so many directions that they present a 'busy' appearance.

Distribution: Random application over entire surface.

Geographical range of type: (See Deep Bay Plain.) Known only from Mill Reef site, Antigua.

Relationships of type: Cylindrical form similar to other type styles on St. Lucia.

DEEP BAY INCISED (*Tentative*).

Definition as a type: Tentatively; from Mill Reef, Antigua, West Indies; this paper. Same as Deep Bay Plain, except as noted below.

Decoration: Curving or waving incised line applied prior to firing, with sharp, but not pointed instrument. Distribution probably limited to area roughly paralleling the rim. Incising is crude in appearance, perhaps being applied while clay was too wet.

Yorkstead Series (*Tentative*)

YORKSTEAD PLAIN (*Tentative*).

Definition as a type: Tentatively; from Mill Reef, Antigua, West Indies; this paper.

Ware characteristics:

Method of manufacture: Coiled (?).

Tempered: Temperless. A diagnostic trait.

Paste texture and color: Paste is chalky in appearance but hard, white in color throughout.

Surface texture, color and finish: Surface color is white, the texture is smooth. Vessels were well finished, and present a sleek appearance.

Thickness: Averages 8 to 13 mm.

Form:

Total vessel: Probably hemispherical bowls.

Rims: Both straight and unthickened, slightly convex and thickened inside. Flat on top.

Decoration: All sherds are plain white. No decoration known.

Geographical range of type: Only Mill Reef site, Antigua.

Chronological position of type: Uncertain. Perhaps A.D. 800-1000. See Rouse, Alegría and Stuiver (1963).

Unclassified Pottery

UNCLASSIFIED SANDY PASTE WARE.

Definition: Not as a type, but unclassified category.

Ware characteristics:

Method of manufacture: Coiled (?).

Temper: Sand tempered. Occasionally small grains of grit, less than a millimeter in diameter. Rarely a large chunk of grit several millimeters in diameter.

Paste texture and color: Paste is granular, uniform, compact. Cores usually buff.

Surface texture, color and finish: Surfaces may be buff or grey-black. Probably smoothed, although surfaces present a granular appearance.

Thickness: Varies from 5 to 12 mm.

Form:

Total vessel: Unknown. One specimen from Hawks Bill Bay is typical of Mill Reef keel profiles. All other sherds are too small to be indicative of overall shape.

Rims: Probably both straight, unthickened rims, rounded on top; and rims with lips bevelled on the inside.

Chronological position: Uncertain. Probably A.D. 550-1000,but heaviest in earlier part. See Rouse, Alegría and Stuiver (1963).

Relationships: This pottery is very similar to some shown to me by Bullen at the Florida State Museum. The latter was recovered in the Virgin Islands and is called 'Coral Series' pottery (Bullen 1962).

Sandy paste wares may also be decorated as follows: one or both surfaces covered with a red slip, frequently worn off around edges of sherd; white paint on red slip background; red paint on buff sherd background; shallow, thin incising, either on plain sherd or red slipped; and slightly larger paste grains, paste blacker in color, coil lines on outside of vessel not obliterated (one sherd in this category).

UNCLASSIFIED ZONED RED INCISED WARE.

Definition: Not as a type, but unclassified category.

Ware characteristics: Sherds are thinner than Mill Reef Series; temper is of slightly smaller grit, but of uniform size. No relatively large chunks of temper.

Decoration: Diagnostic. Very dull red confined within narrow incised lines.

Technique: Probably painted and incised prior to firing. Incising may be 2 mm. in width and 2 mm. deep, with V-shape profile.

Design: Zones of red outlined with fine, straight lines. Fragments are small and very little can be definitely stated about this ware. No sherds with curved lines were found.

Relationships of ware: Uncertain. Similar to design illustrated by Bullen (1962: Pl. XIV, d), found on pottery from the Virgin Islands.

Conclusions and Projections

Several other sites on Antigua bore sufficient ceramic similarity to the one at Mill Reef to conclude that they were part of the Mill Reef Complex. Probably all the sites reported, excepting Freeman Bay (Pa 1), were part of the Mill Reef Complex.

One more noticeable difference between the Mill Reef site and all the others is the absence of minor series pottery from the latter. At no other site on Antigua was a single specimen of Deep Bay Series of Yorkstead Series pottery found. This is, of course, negative evidence, and should be accepted accordingly. I feel, however, that sherds of the minor series will turn up eventually on Antigua, and are probably present in extant collections there.

A second noticeable contrast to the Mill Reef site was the relatively greater number of types with broad line incision scattered about the surface at Marmora Point and the Long Island sites. Proportionately, more of these types were found at either of these two locations than at Mill Reef.

The following sites most closely resembled Mill Reef: Marmora Point, Long Island 1, Long Island 2, Hawks Bill Bay, and Antigua Horizons. It was difficult to determine much about Friar Hill from the earthenware because it was so badly weathered and pitted. There is no reason to believe it was not part of the Mill Reef Complex.

As for settlement patterns, very little can be surmised. All but one of the sites visited were on or near the water, the exception being Friar Hill. Although the Mill Reef site is back from the water's edge a bit, the very similar site across the island at Hawks Bill Bay is right on the beach. The same is true for Marmora Point and Long Island. Extensive search inland failed to reveal a single camp, village or midden (or at least a collection of artifacts on the ground), other than at Friar Hill.

I was informed of several areas inland where artifacts had been observed by Islanders in years past, but except for Friar Hill, these places could not be found in the time I had available in 1961. It might be well to note that they included the general area around and slightly southeast of Parham; a hill a mile or so south of St. James Church; a hill known as Green Castle in the southwestern section; and Guana Island off the northern coast.

As stated above, this paper has been concerned with ceramic typology. A more complete description and exploration both of data and ideas is available elsewhere (Hoffman 1963, 1970, 1972, 1973, 1974). Since the time of the Mill Reef research, much work has been done in the Leeward Islands, *e.g.*, Olsen (1974a, 1974b), Nicholson (1976a, 1976b), Davis (1974), Goodwin (1978a, 1978b), Goodwin and Heymann (1977), and Rouse (1952, 1974, 1976). Perhaps it is time now to get away from small scale testing of sites, and instead begin to test hypotheses about social and cultural systems. I am thinking particularly of approaches involving total site archaeology including definition of activity areas, study of behaviors associated with artifacts, analysis of intra-and inter-insular networks, and, research into prehistoric cultural ecology. I hope that by presenting this baseline data, I have helped to facilitate studies such as these in the future.

Acknowledgements

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modations or with such abundant assistance in the field. It was Dr. Olsen who first reported the finding of aboriginal remains on that island. For my stay on Antigua, not only did Dr. Olsen generously provide his Mill Reef home, but the necessary crew to assist me, items of equipment, and (of tremendous importance) introduction to Mr. Lance Delisle. In the absence of Dr. Olsen from Mill Reef during the summer months, Mr. Delisle cheerfully assisted in countless, immeasurable ways.

I am indebted to R. Christopher Goodwin, the late John M. Goggin, the late Ripley P. Bullen, Irving Rouse, and William H. Sears for their assistance in the research for and preparation of this paper.

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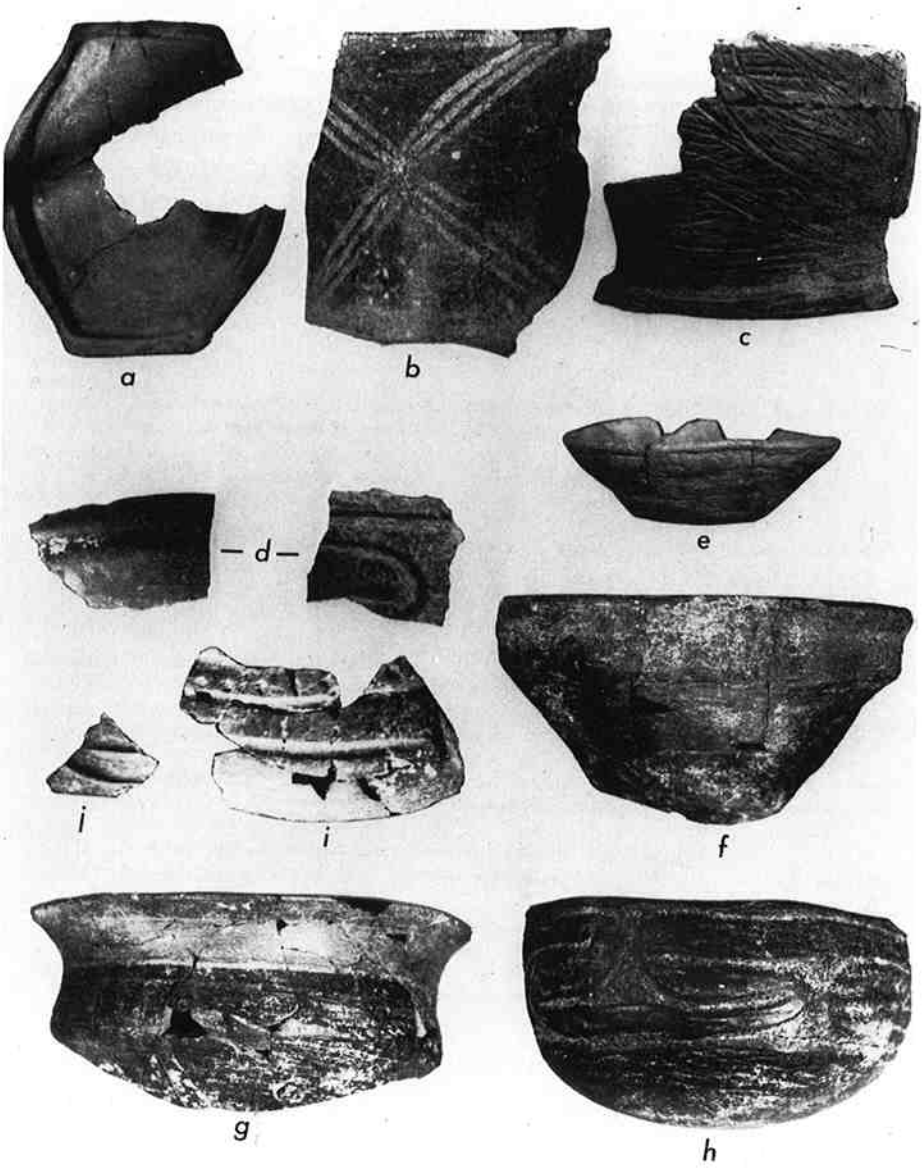

FIGURE 2
Mill Reef Pottery. a, Mill Reef Plain with bevel on outside of rim; b, Mill Reef White-on-Red; c, Deep Bay Scored; d, h, Marmora Red Incised; e, Unclassified Fannis-like bowl; f, Mill Reef Brushed; g, Mill Reef Polychrome, inverted bell shaped; i, Marmora Plain; j, Marmora Red Incised-Punctated.

FIGURE 3
Typical Rim Profiles from the Mill Reef Site.

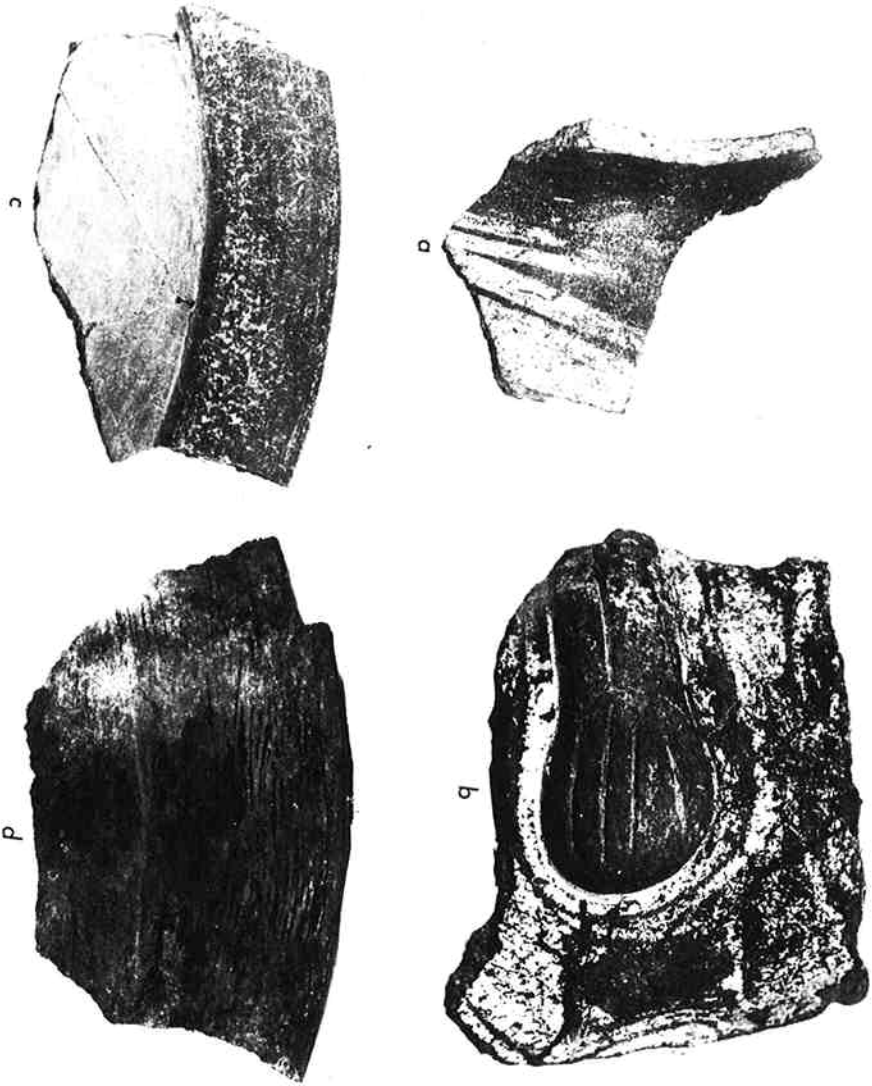

FIGURE 4
Mill Reef pottery from the lower levels of excavation. a-b, Mill Reef White-on-Red; c, Mill Reef Red-on-Buff platter or dish; d, Mill Reef Brushed with 'notched' rim and concave shoulder.

FIGURE 5
Ceramic spout and incised rim sherd.

THE DATING OF WEST INDIAN HISTORIC SITES BY THE ANALYSIS OF CERAMIC SHERDS

By Desmond V. Nicholson

The purposes of this paper are:

1. To demonstrate a method of finding approximate occupation dates of historic sites by ceramic analysis of surface collections.
2. To inform local archaeologists of the possibilities, so that we may be able to test together the validity of this interpretation on sites of known documented occupation in the West Indies.
3. To list the approximate ranges and describe the attributes of the most common types of ceramics found in Antiguan and West Indian sites, thus encouraging more local research.

Introduction

In 1972 a formula was developed for use with 18th and early 19th century British ceramics in South Carolina to arrive at an interpreted occupation date represented by any specific ceramic collection. (South 1972: 71; 1977: 201). This led us to apply this method to our historic sites in Antigua. The method uses presence-absence and frequency of various ceramic types.

Archaeologists usually use artifacts to date a site, but to test the accuracy of South's method in Antigua, we have chosen a few sites whose occupation dates are already documented and some where occupation dates are totally unknown. The range of the ceramic types given by South are for North America, so we have been able to check these ranges in the West Indies. The only changes we made were the commencing dates of the earliest types, to *c.* 1640, as Antigua was first settled by a small group of English in 1632.

The results given in the following pages proved to be accurate, certainly to within five years. In the last example, by knowing the date of the site, and not knowing the ranges of some of the later ceramic types (for South does not include the Whiteware types), we were able to estimate some of the ranges, so that in the future we may be able to extend the usefulness of the method up to about 1850.

British ceramics are the main types used, as in the 18th and 19th centuries, England's industrial revolution assured a great export of ceramics, especially to her colonies. Today there are many different British ceramic sherds in the soils of many countries in the world. In the West Indies, archaeologists are particularly lucky, as apparently the ceramics in our soils are even more plentiful and sophisticated than those found in North America. This is because of the

greater importance of the sugar islands in those times. Proof of this importance can be seen when one considers that governors of the North American colonies were actually promoted to the colonies of the West Indies.

The first step in finding the interpreted occupation range of a site is to find its mean ceramic date. This is then applied to a bar graph of type ranges, on which the occupation brackets can be drawn.

Finding the Mean Ceramic Date of a Site

Each ceramic type found in a site has a median date of its temporal range in a territory. These median dates are listed together with the sherd frequency of that type. This frequency is then multiplied by the median date of the type to produce another column.

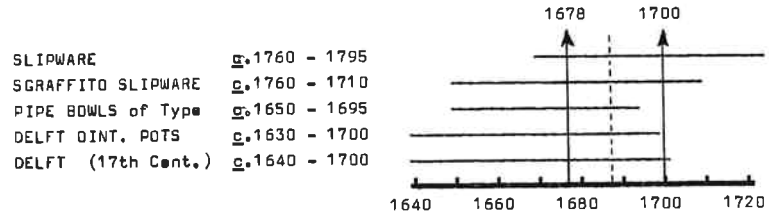

FIGURE 1
Bar Graph for Gateward Point

Mean ceramic date of the site = 86126 ÷ 51 = 1689

The total number of sherds in the sample are then divided into the sum of the new column to produce the average median date or ceramic mean of the example as a whole.

It would seem that this frequency adjusted median would have little to do with the occupation dates of a historic site, but South has already shown that there is a similarity between the median date and the historic mean of 18th century sites in South Carolina (South 1977).

In theory, the period in which a type was disposed of would approximate a type's mode, or period of maximum popularity. We do not know exactly when a type reached its mode, for a type could have been at its greatest value at either end of its range. South accepts a mode's graphical curve as being symmetrical, *i.e.*, with a median date. Although all types would not have had the same mode, I feel that out of a large sample of types, the averages of all, including multimodal curves, would produce a median result.

This is what South calls a mean ceramic date, and it is an interpretive value in determining the occupation dates. It could just as well be called a mean artifact date, as any artifact whose range in any territory is known can be used.

Finding The Occupation Brackets of a Site

Having worked out a mean date for a site, a bar graph is now drawn against a time line, and the ranges of various artifact types are drawn as horizontal bars. Next the calculated mean date for the site is entered and is represented by a vertical dotted line. On either side of this line equidistant from it, two vertical lines are drawn to represent the beginning and ending brackets of the interpreted occupation of the site. If we know either one or the other date from historic sources, then the entry of the other is simple. If we know neither as in the example below, then the date of the latest artifact, the *terminus post quem* (or the date after which an artifact found its way into the ground) can be used to arrive at an ending date represented by a ceramic sample. If there is no suitable *terminus post quem,* then the ending and beginning brackets should intersect at least 50% of the type bars.

Taking GATEWARD COTTAGE as an example again, the mean date of 1689, having been worked out and entered, the ending bracket was estimated at 1700, since no saltglaze white stoneware (which started *c.* 1715) was found and should intersect at least 50% of the type bars. Using the mean of 1689 as the middle date, the interpreted occupation date of the site is therefore 1678-1700.

The above occupation dates seem quite likely, as the building is immediately above Fort Charles on Blake Island, Antigua's first true fort (16 guns), built in 1672. Perhaps this house was in some way connected with the fort, possibly as an officer's residence. Falmouth had become Antigua's main town by 1676, but gave way to St. John's at the turn of the century. Before this ceramic study we had no idea of the date of this ruin.

Hungry Hill House

From a map of 1749, Hungry Hill, heirs of Dascent, is marked. There was no trouble finding the site, as ancient road cuttings to it could be traced through the bush. All ceramic sherds were collected. In the older sites there is no problem of how many pieces to collect, as there are so few left on the surface. Sixty-nine sherds produced a mean ceramic date of 1757.

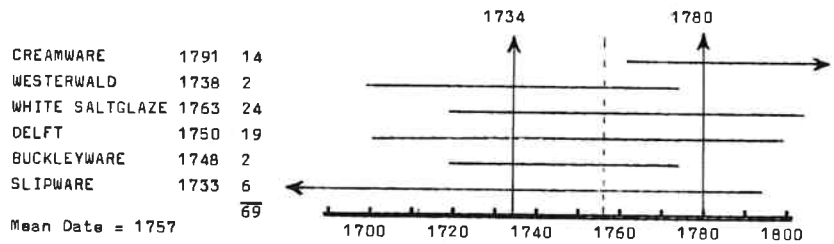

FIGURE 2
Bar Graph for Hungry Hill House

The ending bracket was placed at 1780, following the rule that at least half of the type bars should be intersected. The ending date could not have been later than about 1780, as there was no trace of pearlware, which came in at about that time. The starting bracket was added at 1734, using 1757 as the mean.

We have no historic evidence for testing this interpreted occupation, but it seems as though the house was built around 1734. Dascent died around 1749, but we therefore learn that the house was reoccupied up to about 1780. The highest percentage of sherds were of Chinese porcelain (37%), but these were not used for the ceramic mean, because of their long life thus producing unreliability for dating purposes. They do tell us that the inhabitants of the house were affluent people. This is true, as one member of the family held a government position in Nevis at the time.

Highland House, Barbuda, Bah 1

This house is not mentioned in any records, surprisingly enough, as so much is written about the Codringtons who leased Barbuda from 1685-1870.

Only 28 sherds were collected during a brief visit in March, 1977. The mean ceramic date worked out at 1760, which was plotted on a bar graph.

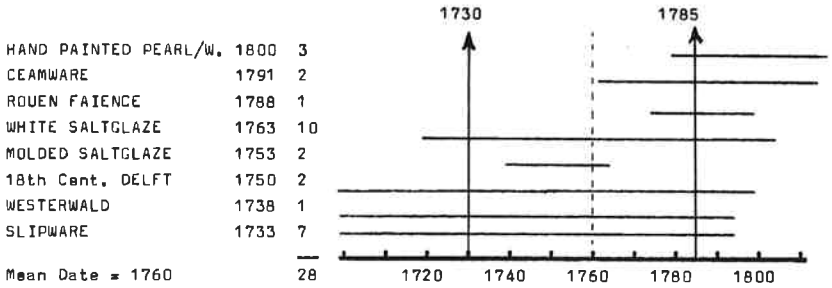

FIGURE 3
Bar Graph for Highland House

The ending bracket was placed at 1785, five years after the advent of pearlware about 1780, for only three or 8% were collected. The beginning bracket could have been either at 1720 or 1740, but it was decided to place it between the two, taking the ceramic mean as a guide.

The occupation of Highland House may have been *c.* 1730-1785. Col. William Codrington rebuilt the Castle in 1728 and according to the bar-graph, may have built Highland House in the same period. His son, William II, was born in 1719 and died in 1792. The house appears to have thrived in the lifetime of this son. Is it a coincidence, or has archaeology told us that this was his home?

of 9 guns, guarded Marmora Bay to prevent possible rear attack on English Harbour. It is documented first on a map of 1749. Today it is just a pile of rubble in the wilderness.

On the west side, 440 ceramic sherds were collected, representing a complete surface collection. On analysis, the mean ceramic date was 1766.

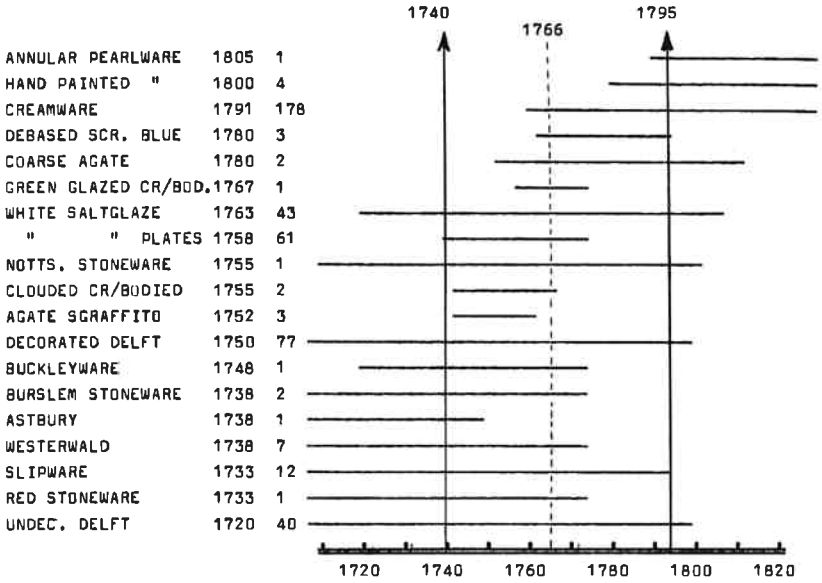

FIGURE 4
Bar Graph for Fort Christian

Since one piece of Annular Pearlware was found, an ending bracket of 1795 was drawn on the bar graph, allowing five years for this style of pearlware to have reached the site and to be dispersed. The beginning bracket was drawn, placing the mean ceramic date approximately half way and where it intersects just over half the bars. This gives an occupation date of this fort as about 1740-1795. Maps already indicate that it may have been built at about this time. 23 pieces of Chinese porcelain were collected on the north-east or wind-

ward and seaward side, which may denote the location of the officer's quarters.

Land Service Powder Magazine, Pah—28,

is a site located at the head of English Harbour, Ordnance Bay. There is no sign of a ruin, but we are certain we have the correct site, because of the great frequency of musket shot. Several sites of what must have been wooden houses have been found in the area, where there are concentrations of ceramic sherds and mollusc shells, a valuable method of locating former sites of wooden buildings for the historic inventory.

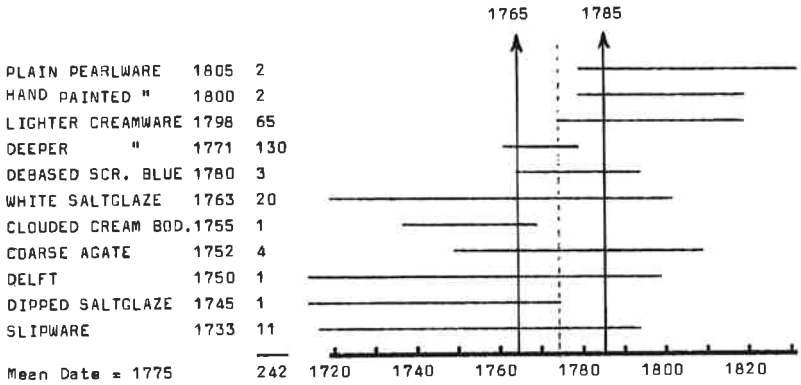

FIGURE 5
Bar Graph for the Powder Magazine

All 242 surface sherds from the magazine site were taken, and a mean ceramic date of 1775 was calculated.

Since only four pieces of 1780 pearlware were noted, the ending bracket was placed at 1785, and using the mean ceramic date as a median date, the starting bracket was drawn at 1765. The interpreted dates are then 1765-85.

A map in the English Harbour Museum, PRO 3071 (WO 78/1336) dated

1823 is a part of a report on the state of the buildings around English Harbour in that year. The key to the map is in the Public Record Office, London, where the entry for this site reads, 'A very old wooden building, formerly a powder magazine, built 1762, 40' x 20', now useless and vacant.'

The same source gives the date of the new magazine nearby, which presumably took the old one's place, as 1788. So, in this case, our dating method is extremely accurate.

Blockhouse Officers' Quarters

at Shirley Heights. In this example, several whiteware types have not yet been dated by the experts. It seems that very little work has been done on the early Victorian ceramics, so we will have to do it ourselves noting when various types appear and disappear in other sites.

In this example, several type ranges have been estimated from the limited local references and manipulated slightly after making a few trial runs.

A sample of 546 sherds was taken from an area vandalized by button and bottle hunters. Not every piece was collected, as there were too many sherds. An approximate representation was taken. Even by using one sample of each type (*i.e.*, using presence-absence alone without quantification) a deviation of ± 8 years on either side of the historic median was attained by South for sites of the 18th century in South Carolina. By using quantification, as we have in our examples, a deviation of ± 4 years is reported by South.

The starting and ending brackets for the site under discussion were placed where they intersect about half of the type bars each, with the mean date of 1833 falling half way between.

The interpreted range of 1810-1855 reflects the ending date of 1855 well, but this officers' quarters was built in 1790. The date of 1810 may possibly be the commencement of that part of the midden.

Future Research

More work will have to be done to test the ranges of whiteware types. For instance, finding and dating sites containing just a few sherds of types needing range dates will tell us when they first appeared in the West Indies. In this respect we can work together, for we need as many documented sites as possible.

It will be necessary for local archaeologists to be able to identify historic ceramic sherds before they can be encouraged to start in local research, so I now append a summary of archaeological types, together with brief descriptions.

This is not a complete list, South gives 26 others. Further relevant types can be added later, when we have had more experience identifying them and demonstrated their usefulness. Other artifacts, such as wine glass stems, could also be listed, as this method need not only be confined to ceramics.

At first glance it may appear an alarming task to learn the 42 types presented, but once the six basic kinds are grasped, the rest will be easy. The basic types are:

Ceramic Type	Approx. Range		Sherds
PLAIN WHITEWARE	c. 1820 - 1900	1860	41
TRANSFER PRINTED WHITEWARE	c. 1820 - 1900?	1860	88
SPONGED WHITEWARE	c. 1830 - 1880?	1855	2
DRAB WARE	c. 1835 - 1865?	1850	13
LUSTREWARE	c. 1810 - 1900?	1845	1
FLOWN BLUE	c. 1830 - 1880	1855	18
MOCHA & ANNULAR PEARLWARE & W/WARE	c. 1795 - 1890?	1843	33
STAMPED WARE	c. 1825 - 1860?	1842	118
MOLDED RIM, TRANSFER OR PAINTED	c. 1825 - 1855?	1837	1
FLORAL POLYCHROME WHITEWARE	c. 1820 - 1860?	1840	8
" " PEARLWARE	c. 1820 - 1840	1830	3
TRANSFER PRINTED PEARLWARE	c. 1795 - 1840	1818	50
EMBOSSED SHELL EDGE "	c. 1800 - 1820	1810	43
ENGINE-TURNED GREEN ANNULAR	c. 1790 - 1825	1807	15
UNDECORATED PEARLWARE	c. 1780 - 1830	1805	38
ANNULAR PEARLWARE	c. 1790 - 1820	1805	32
SHELL EDGE PEARLWARE	c. 1780 - 1830	1805	31
BLUE HAND PAINTED UNDERGLAZE	c. 1780 - 1820	1800	1
ANNULAR CREAMWARE	c. 1780 - 1815	1798	1
CREAMWARE	c. 1762 - 1829	1791	9
Mean Ceramic Date = 1833		Total =	546

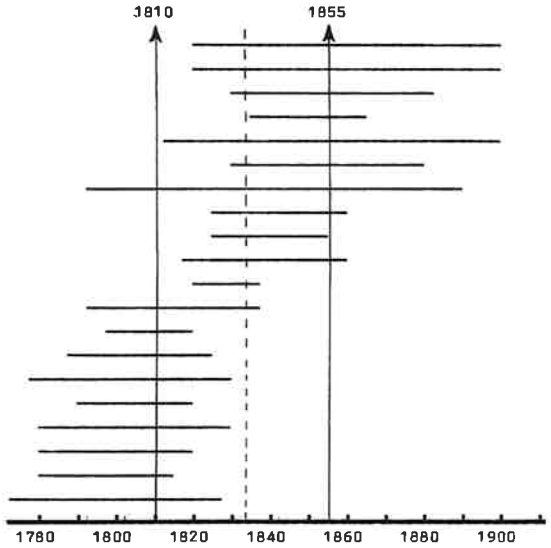

FIGURE 6
Bar Graph for Shirley Heights

Slipware —A slip mainly appearing yellow, usually on one side only.

Delft —Matt surface, takes pencil very well.

White stoneware —Dense white body, with leatherlike texture when held obliquely to the light.

Creamware —Cream coloured body and glaze, yellow-green glaze 'build-ups'.

Pearlware —Blue tinge to glaze, blue glaze 'build-ups'.

Whiteware —Pure white glaze, mostly no 'build-ups'.

A Summary of Historic Ceramic Types Found in Antigua and Brief Descriptions for Archaeological Purposes.

The best books on the subject are Hume 1968 and 1976, the latter including many other colonial artifacts. After the type name will be found the page in Hume (1976). The typology is from South (1977:210). The number preceding the type is the South type number, useful as a reference and for future computer work.

Slipware

The earliest sites in Antigua show a predominance of this ware. Slipware is most commonly found with a slip only on one side, but the mugs have both sides slipped.

56. LEAD GLAZED SLIPWARE (Combed Yellow) (134/6) A: 1-9, *c.* 1670-1795 (1733)

Buff to yellow bodied, cheap slipwares, decorated with white and brown slip in combed, dotted and marbleized patterns. A brown slip is sometimes trailed over a white ground and *vice-versa*, the lead glaze turning the white yellow. Pie-crust edges.

63. NORTH DEVON SGRAFFITO SLIPWARE *c.* 1650-1710 (104/5) A:10-13 (1680)

A red ware with a white slip overall through which geometric and floral patterns were incised. The white appears yellow and the incision brown through the glaze.

70. RED MARBLEIZED (North Italian) SLIPWARE (77 & 140) *c.* 1610 in N. America, 1640-1660 in Antigua (1650) A:14, 15

A red body with white and green marbleized decoration covered with a lead glaze. Sometimes the green is left out. Common in old sites.

Tin Enameled Ware

Faïënce in France, Majolica in Spain, delft in England and Delft in Holland. Just as some of our prehistoric pottery types were thought to have been made in Saladero, and so named, this type of earthenware was once centered around

Delft in Holland. It originated (14th cent.) in Spain and Italy. It is basically a buff, pale yellow and sometimes pink ware hidden by an opaque enamel. The enamel or lead glaze contains tin oxide, hence the generic name.

Pictorial or floral ornament of cobalt blue is most predominant and was painted on the receptive unfired surface. Sometimes other colors, red, purple, yellow and green are found. Delft is very easy to distinguish as sherds have a matt surface, having been in the soil a long time, taking a lead pencil very well. Edges have the enamel chipped off, and the soft buff body is distinctive.

49. DECORATED DELFTWARE (105/11) B: 1600 in N. Am. *c.* 1640 in Antigua—1802.

17th cent. delft 1640-1700 (1670). 18th cent. delft 1700-1802 (1750). For mean ceramic data calculations, in 17th century sites the median date of 1670 is used and for 18th century ones, 1750 is utilised.

65. PLAIN WHITE DELFTWARE (109) *c.* 1640-1800 (1720)

Also datable are:—ointment pots, apothecary jars, blue dash chargers, Mimosa pattern delft and chamberpots. Not common enough to warrant a description.

White Saltglazed Stoneware

This stoneware was made from a mixture of refined clay and flint and was fired to a high density in a very hot kiln. The body was whitened by the addition of china clay from the West Country. The resulting ware was extremely thin and graceful. When common salt (sodium chloride) was thrown into the kiln, its vapour settled on the wares, the sodium combining with the silicates to form a sodium silicate white glaze. The surface, when held obliquely to the light, has a texture like leather or the skin of citrus fruits. Sherds of this type are easy to identify by the white, dense and stonelike body with the textured white glaze.

40. WHITE SALT GLAZED STONEWARE (Excluding moulded and plates) (115/17) *c.* 1720-1805 (1763)

48. SLIP-DIPPED WHITE SALT GLAZED STONEWARE (114/115) C: 8, 9, *c.* 1715-1775 (1745)

This is a slightly older variety, but it carried on through the white salt-glazed temporal range. Cornwall's clay export market had not got under way yet. Its body having no white (pipe) clay in it, it is of a drab, gray color. Unfortunately the white glaze slipped away from rims to expose the gray body, so to make a virtue out of what was actually a mistake, the rims were dipped into a brown oxide slip. Vessels of this type were heavier and not as graceful as the white bodied type. These sherds are quite common in sites dating before 1750.

43. WHITE SALTGLAZED STONEWARE PLATES (115/7) C:1-7, 12. *c.* 1740-1775 (1758)

The most common rims are moulded with patterns known as 'Dot, basket & diaper', 'Barley' and 'Bead & Reel'.

Found in two sites of Antigua are 'King of Prussia' moulded rims, C: 5-7, 12. These were manufactured in the 1750's during the Seven Years War, when Britain was allied to Prussia. The full inscription around the rim reads: 'Success to the/King of Prussia/and his Forces'. Between the groups of words is a cannon, portrait of Frederick the Great, an Eagle and a Military Trophy.

16. MOULDED WHITE SALT GLAZED STONEWARE (115) C:10, 11. *c.* 1740-1765 (1753)

Tea pots, caddies, *etc.* were cast with an elaborate moulded relief decoration.

55. SCRATCH BROWN OR TRAILED WHITE SALT GLAZED (117) C:13 *c.* 1720-1730 (1725)

34. SCRATCH BLUE WHITE SALT GLAZED STONEWARE (117) C:14 *c.* 1744-1775 (1760)

White salt glazed stoneware was sometimes decorated with incised lines that were filled with a brown oxide or manganese (or cobalt blue later), then wiped off to leave the color in the incisions. Rarely found.

Scratch blue has been found in Antigua on chamberpot sherds of the later creamware and pearlware.

24. DEBASED SCRATCH BLUE WHITE SALT GLAZED STONEWARE (118) C:15, 16, 18 *c.* 1765-1795 (1780)

Similar to the last type but the blue was left in the vicinity of the incisions and not wiped off. Common as chamberpots, pitchers and mug sherds. This style was an attempt by English potters to recover the market from the Germans who held the monopoly of a strong grey stoneware export trade to England and her colonies. (See 'Westerwald'). Medallions of George III on their sides.

Other Saltglaze types not found in Antigua so far are:

Transfer Printed 1755-1765

Littler's Blue 1750-1765. Cobalt blue mixed with clay and frit to produce a lustrous blue. (Also found on Creamware and Porcelain).

Cream Colored Earthenware

In the 1740's two innovative potters, Whieldon, in partnership with a young man named Wedgwood (b. 1730), found that the refined mixture of refined clay and flint of white stoneware, when fired to a less intense temperature produced a cream colored earthenware.

When a clear lead glaze was developed, which could be applied as a liquid dip to evenly coat this cream body, the following types appeared:—

36. CLOUDED, TORTOISESHELL, MOTTLED GLAZED CREAM COLORED WARE (123) D:12. *c.* 1740-1770 (1755)

The Whieldon-Wedgwood partnership, which lasted up to 1759, produced much experimentation with the new glaze and ware by applying a variety of colors under the glaze producing tortoiseshell, clouded and mottled effects,

'Barley pattern' moulded plates continue in this ware, often clouded on top in gray and combinations of yellow-brown, blue and purple on top, while the backs were stippled manganese tortoiseshell. Look out for green and deep orange-yellow moulded sherds of teapots imitating pineapples and cauliflowers. D: 8, 9.

33. GREEN GLAZED CREAM BODIED WARE (124/5) D: 3, 4, 5. *c.* 1759-1775 (1767)

In 1759 Wedgwood set up his own business at Burslem and initially produced a new green glaze. This must not be confused with an engine turned green glaze of the early 19th century. Wedgwood's was a richer, yellower and darker green. It is often moulded; for example, the 'Barley pattern' from saltglaze is used.

Creamware

Wedgwood, having set up his own pottery in 1759, had by 1762 perfected his creamware, sherds of which are now so common in the West Indies. This was a further refinement of the cream colored ware, it has a cream colored body with a cream colored clear glaze.

22. CREAMWARE (125/6) E:1, 7. *c.* 1762-1820 (1791)

It is possible to classify two different shades of the cream color; generally speaking the deeper is the older.

25. DEEPER YELLOW CREAMWARE (126/8) *c.* 1762-1780 (1771)

15. LIGHTER YELLOW CREAMWARE *c.* 1775-1820 (1798)

14. 'ANNULAR WARES' CREAMWARE (131) E:14. *c.* 1780-1815 (1798)

This has banded, usually narrow, decoration in several colors.

18. OVERGLAZE ENAMELLED HAND PAINTED CREAMWARE. E:9, 10. *c.* 1765-1810 (1788)

23. TRANSFER PRINTED CREAMWARE. E:12. *c.* 1765-1815 (1771)

The last three are rather rare in middens; care must be taken not to let them pass as pearlware.

8. 'FINGER PAINTED' WARES (polychrome slip on creamware & pearlware) A ''swirled slip'' in several colors. *c.* 1790-1820 (1805)

Pearlware

In the early 1770's Wedgwood experimented in whitening the body of creamware, by adding Derby chert. Just as washer ladies add blue to their laundry to whiten it, Wedgwood added cobalt blue to the glaze of his creamware to negate the natural yellow tint. By 1779 Wedgwood called his new ware 'pearl white'. Archaeologically then, we find a large range of pearlware dating from

about 1780. Up to now decoration or patterns have not played such an important part in the typology, but from now on, they will be very important.

23. UNDECORATED PEARLWARE *c.* 1780-1830 (1805)

Pearlware is characterised by a bluish tinge to the glaze. Sometimes this is very difficult to distinguish, but often 'build-ups' or 'puddles' of glaze on rims, in crevices of handles and footrims show the blue more easily. Light colored creamware will show a yellow or greenish tinge, whereas a later type 'Whiteware' will show a greyish tinge or none at all. The first pearlware was plain except the following type:—

19. BLUE & GREEN (SHELL) EDGED PEARLWARE (131), F:2, 3. *c.* 1780-1830 (1805)

These are perhaps one of the most common archaeological sherds found in the West Indies. They were from plates with 'shell edge' cockled rims in green or blue and sometimes red or wine colored. These last are very rare, only one having been found in over a year's study. Archaeologically, however, they are not important. After *c.* 1800, as the market for this pattern became great, the craftsmen were not as careful with their inward strokes of the brush, but quickly brushed laterally, to produce a mere stripe, F:3. Also, from *c.* 1800, painted rims were embossed with featherlike devices, fish scales, floral garlands and even human and animal figures, producing:

9. EMBOSSED FEATHERS, FISH SCALES, *etc.* ON PEARLWARE F:4, 5 *c.* 1800-1820 (1810)

17. UNDERGLAZE BLUE HAND PAINTED PEARLWARE (128/9) F:1 *c.* 1780-1820 (1800)

Various blue hand painted designs have been collected but the most common is the 'Chinese House & Fence' design. This design had also been used earlier on creamware. The English were continually trying to emulate the Chinese, for their porcelain was the best. Another name given the new pearlware was 'China Glazed Ware'.

A common sherd in sites of 1790-1810.

13. ANNULAR PEARLWARE (131) F:14, 15. c. 1790-1820 (1805)

Bowls, jugs and mugs were decorated in horizontal bands of light brown and blue, green, black, etc. These bands were sometimes used to fill grooves, and 'broken' grooves and various patterns which were produced by engine turning. Another type which occurs with annular rings is known as:

8. 'FINGER PAINTED' and has the same date bracket, so archaeologically they may be lumped together. This decoration occurs in zones of cloudlike swirling lines, mostly in black, white, blue and grey. F:17 Collectors call this snailing, worming or finger trails. Yet another decoration is

MARBLED SLIP, F:16, a polychrome slip, which is included in this type. It is

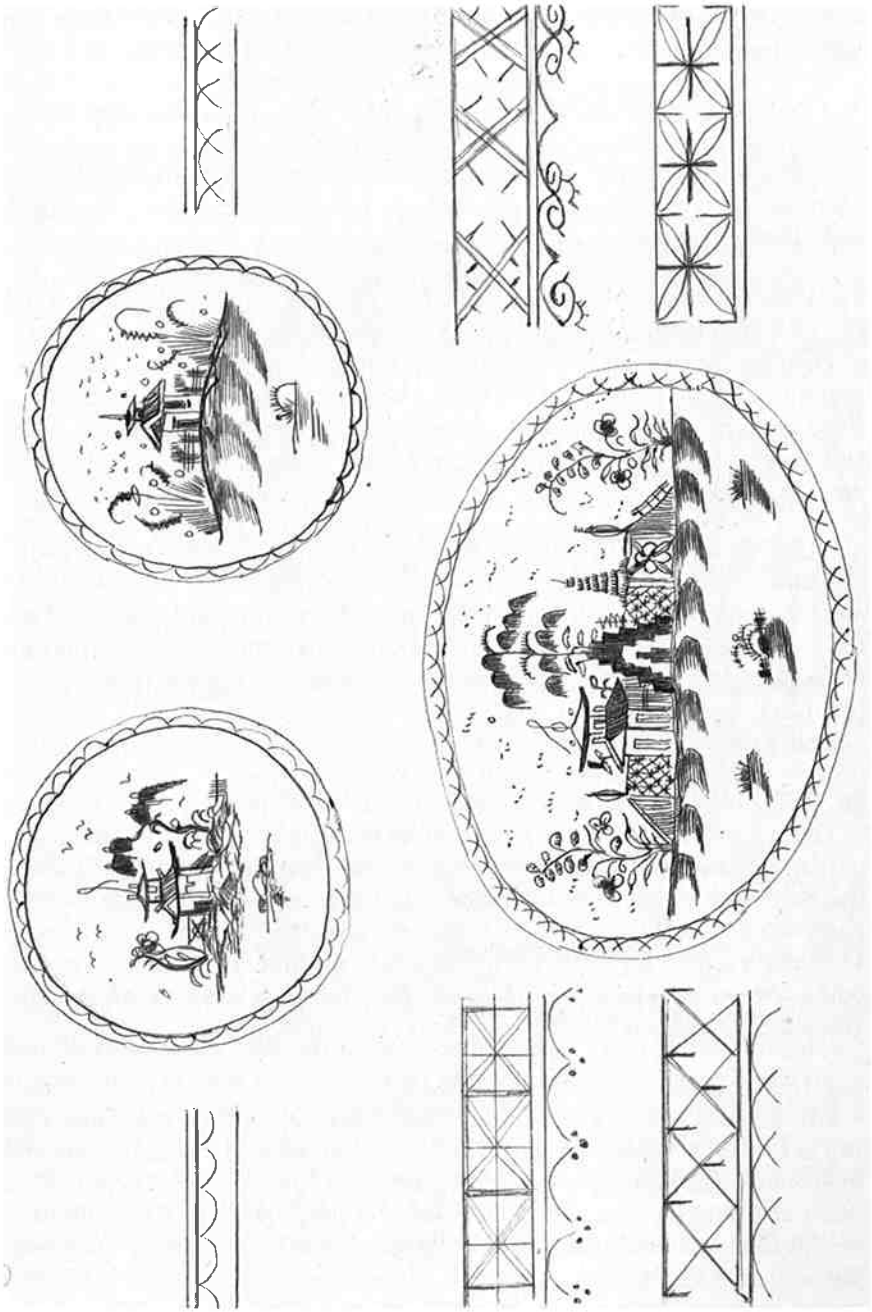

FIGURE 7

created by the swirling together of different colored slips, mainly green and light brown, but this is not as common as the others of this type.

4. UNDERGLAZE POLYCHROME PEARLWARE (129). F:6, 7 & G. *c.* 1795-1815 (1805)

A delicately decorated type of good taste, generally executed in floral or geometric designs using pastel colors of orange ochre, pale yellow, blue, black and olive green.

12. UNDERGLAZE POLYCHROME FLORAL PATTERNS IN BRIGHTER COLORS (129) F:11, 12, 13 *c.* 1820-1840 (1830)

This type seems to have evolved from the foregoing. As brighter colors were found that could withstand a hot kiln, taste became more garish. Symmetrical floral patterns were common; the colors used were bright blue, orange, green and pinkish-red, and the flowers were bold. Do not confuse with the same decoration on Whitewares.

11. TRANSFER-PRINTED PEARLWARE (128/30) F:8 *c.* 1795-1840 (1818)

Transfer printing on earthenware was probably first used as far back as 1753 on creamware, but rarely found on that ware. However, towards the end of the century it became very popular. It is one of the most common sherds in the soils of the West Indies. The most common color is blue, but it is also found in purple, black, brown, rose.

Under the same date bracket, comes the

10. WILLOW TRANSFER PATTERN ON PEARLWARE. F:9, 10.

This is a pseudo-Chinese design, another example of the English potters imitating the Oriental style. It is supposed to have been conceived by Minton at Caughley about 1780. It was then sent to China to be copied onto Chinese Porcelain destined for the English market. The first consignment arrived in 1792 and it started on pearlware at about the same time. It provides a *terminus post quem* for us (a date after which an object found its way into the ground). The pattern has been used without break, up to the present.

6. MOCHA (131). F:18. *c.* 1795-1890 (1843)

This decoration is found on inexpensive mugs, jugs, bowls, vases and cups, and is a moss or fernlike ornament. It appears on otherwise annular ware and was formed by dropping 'mocha tea' on the wet unfired ware. The acidic tea consisted of black coloring mixed with tobacco juice and urine. One drop on a wet alkaline surface diffused into a shrublike image, by capillary attraction. The ware had a long range. Mocha on a brown ground tends to be older than mocha on blue. Mocha is also found on creamware and whiteware and is the same type for archaeological purposes.

Whiteware

By 1820 pearlware was on its way out, with various forms of Ironstone china, hard whitewares and European common porcelains taking its place.

2. WHITEWARE. (130/1) *c.* 1830-1900+ (1860)

This is distinguished by its hardness, whiteness of glaze and body and no color in the glaze buildups; actually, some types have no buildups at all.

Whiteware archaeologically includes Ironstone and Granite china. They are usually a harder ware but not always so. Their range started about 1813 and continued on up to about 1900, thus similar to whiteware. For these reasons it is usual to consider all these as one type.

There are many variations of decoration in Whiteware, many of the pearlware styles continuing. Generally they are of a 'Victorian' taste which today, would be rated poor. This ceramic era is not as well researched as the former, so no range dates are given below on the Whiteware types. For a guide, refer to the ceramic analysis for Blockhouse, which we used to some success. We must work together in determining whiteware temporal ranges in the West Indies, so that we will be able to date 19th century sites.

Various varieties of whiteware may be listed as follows:—(Based on South 1974: fig. 62)

PLAIN & EMBOSSED

POLYCHROME PAINTED H: 1, 2
(Similar to the later pearlware type, bold flowers).

BLUE PAINTED

ANNULAR & MOCHA H: 14

EDGE DECORATED, Blue & Green, etc.

EDGE DECORATED, Embossed.

SPONGED in Blue, Green & Red H: 11, 12

LUSTERWARE in Copper, Silver & Pink, *c.* 1790-1840. H: 13

STAMPED WARE. H: 2, 3

TRANSER PRINTED, Blue, Green, Brown & Purple H: 8, 9

TRANSFER PRINTED with overglaze enamel

TRANSFER PRINTED Willow Pattern

TRANSFER PRINTED FLOWN BLUE H: 10

FLOWN BLUE was evolved by the Wedgwood firm about 1830 and was popular until about 1880. A special glaze was used which gave a rich flowing appearance. The blue flowed into the surrounding glaze, with an effect suggesting a halo. Apparently a manufacturing mistake was made, and a spoiled shipment was sent away to America, where it became very popular. We have now listed the main ceramic types, but there are a few others of lesser importance which are nonetheless useful in dating a site.

37. RED STONEWARE, UNGLAZED, SPRIGGED. (120/1) D:10
c. 1690-1775 (1733)

A hard dry bodied redware, usually with thin molded sprigged rococo motifs. Common as teapots, copying silver forms.

28. ENGINE TURNED UNGLAZED RED STONEWARE (121) D:11
c. 1763-1775 (1769)

The same ware as above, but with engine turned decoration introduced by Wedgwood in 1763.

27. BLACK BASALTES (121/2) D:12. c. 1750-1820 (1785)

Another hard dry bodied ware, but in black. Made famous by Wedgwood about 1750. Sometimes the interiors were glazed black. Teapots commonest. After 1763, engine turned designs were made. The ware lasted in fashion a longer time than red stoneware as it was often used in times of mourning.

29. JACKFIELDWARE (123) D:13. *c.* 1740-1780 (1760)

A thin red, purple or gray ware with a deep black glaze used for tea ware and pitchers.

51. ASTBURY, WHITE SPRIGGED AND TRAILED (123). D:14, 15.
c. 1725-1750 (1738)

A lead glazed type with a ginger or light chocolate-brown surface on a hard red body often with sprig molded decorations of flowers, royal arms, birds, etc. in white pipe clay. Only white trailed examples have been found in Antigua. *Not* common. Do not confuse with slipware.

35. COARSE AGATE (132). D:16, 17. *c.* 1750-1810 (1780)

Coarse agateware was the result of mixing pale yellow and pink firing clays, which created decorative veins on the surfaces. The lead glaze changed the pale yellow & pink colors to dark yellow and red brown, and the rims of bowls and dishes were often decorated with yellow rouletted bands. A variant is
AGATE SGRAFFITO. D:18, 19. *c.* 1740-1765

in which a white slip was pared away to form checkered patterns to expose the agate-like body beneath. Fairly common in mid 18th century sites. Scrub the sherds well to detect the two colors in the body of the two of the following agate types.

47. BUCKLEY WARE (132/3) *c.* 20-1775 (1748)

The mixing of two clays was not always done for ornament, but also for making a poor clay workable. In Buckley, North Wales, coarse kitchen wares were made by the blending of yellow and red clays producing a red to purple body, which was covered with a thick black glaze. The walls of these vessels are sometimes horizontally ribbed.

Non-British Ceramics Found In West Indian Sites.

66. DETERIORATED BELLARMINE FACE BOTTLES (56/7) I:1, 2, 3.
c. 1620
in North America c. 1640-1700 (1670)

A Bellarmine is a brown mottled stoneware bottle, having a handle behind the neck and usually a mold-face in front and a meaningless medallion below. The Bellarmines of the above date have deteriorated quality moldings. The

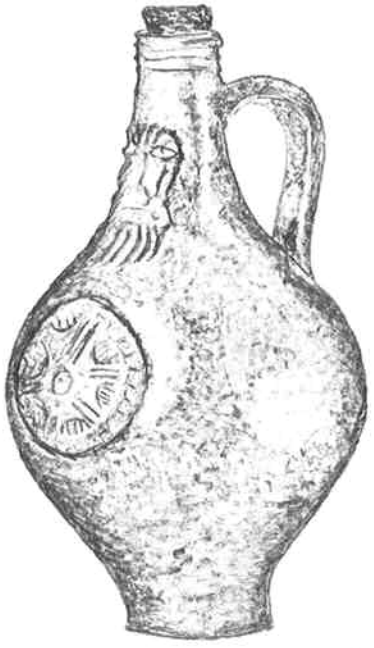

FIGURE 8
Bellarmine
***c.* 1650-1670**

iron oxide mottle has erroneously given them the popular name of tigerware. We have collected several pieces of medallion and one piece of molded face from several of the oldest sites in Antigua. They were originally made in Rhineland, but it has now been discovered that the bottles were imitated in England.

58. SPRIG MOLDING, COMBED LINES, BLUE & MANGANESE DECORATED RHENISH STONEWARE (280/1). I:9-12. *c.* 1650-1725 (1668)

This gray stoneware is quite common in the older sites. Manganese purple decoration is earlier, and would place the sherd as 17th century.

44. WESTERWALD, STAMPED BLUE FLORAL DEVICES, GEOMETRIC DESIGNS (284/5) I:4-8. *c.* 1700-1775 (1738)

A gray saltglazed stoneware with the above blue purple designs. The Germans held a monopoly in making strong barrack room and tavern ware in the 18th century and many beer mugs, jugs, storage jars and chamber-pots found their way to the colonies. To help hold this market, the Germans incorporated the British king's initials into the design. To combat this market, the English potters produced debased scratch blue saltglaze, also complete with the King's medallion (*q.v.*). A high percentage of Westerwalk sherds in a site might indicate that it may have been a tavern or barrack room, although it was universally used.

21. DEBASED ROUEN FAIENCE (141/2). I:13, 14. c. 1775-1800 (1782)

This became common in colonial sites when the Navigation Act was lifted in 1775. A heavy red bodied tin enamelled ware, often brown glazed on the exteriors and white on the interiors. Dishes were decorated with simple baskets of flowers in the middle and bands of hatched and dotted zones divided by sprays of short radiating lines around the rims. The white glaze on sherds does not become as matt as delft does after years in the ground. Common in late 18th century sites.

Chinese Porcelain

Apparently the Chinese invented the art of making porcelain somewhere around 900 A.D., when prehistoric peoples were still roaming the West Indies. It was not until the 1740's that Europeans started to manufacture it in quantity, though they had been trying to crack the Chinese secret for a long time. Not being able to make the body, at least the English potters imitated the Chinese designs. Chinese rim and other patterns are often encountered on English delft, the Chinese House and Fence and Willow patterns on pearlware.

Although Chinese porcelain is very common in the West Indies, I do not use it for the ceramic mean as it has a long range and I find the different types difficult to identify, though there is an admirable chapter in Hume (1976). Chinese Porcelain must be more common in the Virgin Islands, as in the 1780's it is known that St. Croix supplied the American colonies. Then, as a Danish West Indian island, it may have traded in porcelain received from the Spanish and Dutch.

It was an expensive ware; one can judge the affluence of the people that lived in a site by the quantity of porcelain sherds in it. It is distinguishable by being translucent, with the glaze being fused to the white body.

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FIGURE A

1, 2, 5, Combed Iron Oxide Stripes; 4, Trailed White Slip appearing Yellow, *c.* 1750; 3 and 9, Dot Decoration; 7, Green, Lt. Yellow, Brick Red Marbled; 6, Brown and Yellow Marbled; 8, Bat Molded; 10-13, Sgraffito Slipware; 14 and 15, Red Marbleized Red (North Italian) Slipware (14 with Green splashes).

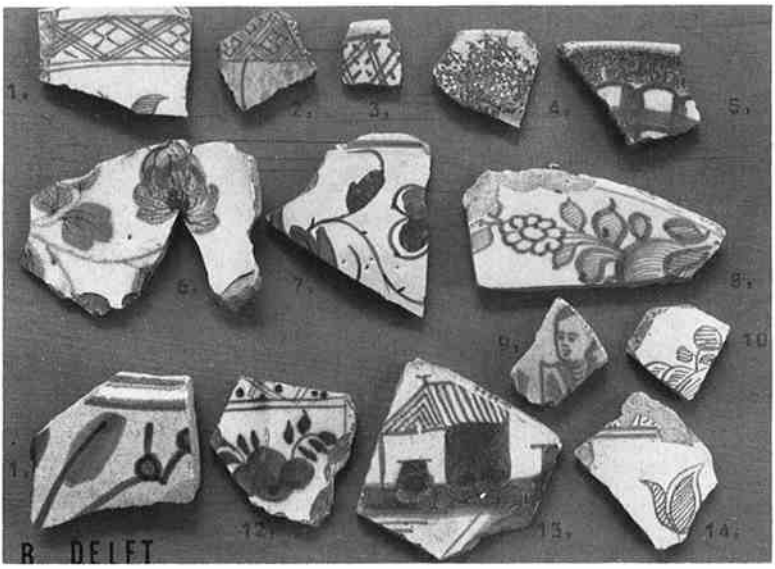

FIGURE B

Decorated delft. B:1, 2, 3, 12 and 13. In imitation of Chinese Porcelain; 4 and 5, Powdered Manganese Purple; 6, Fazackerly Colours, Yellow, Magenta, Lt. Green, 1750-65; 17, Blue Red, Green, *c.* 1720; 11. Early Context *c.* 1680, Blue Decorated (black coated without tin, to conserve; characteristic of 17th century); 10, Red Decorated.

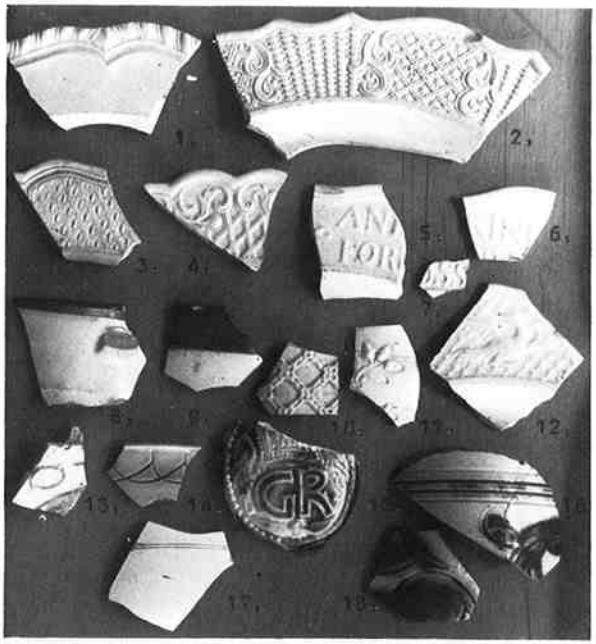

FIGURE C

White Saltglaze Stoneware. 1-7 and 12, Molded Plates (1, Bead and Reel; 2, Dot, Diaper and Basket; 3, Barley; 5-7, and 12, King of Prussia Plates); 8 and 9, Slipped Dipped, (note dark body at break of handle); 10 and 11, Molded; 13, Scratch Brown; 14, Scratch Blue; 15, 16 and 18, Debased Scratch Blue; 17, Plain Sherd.

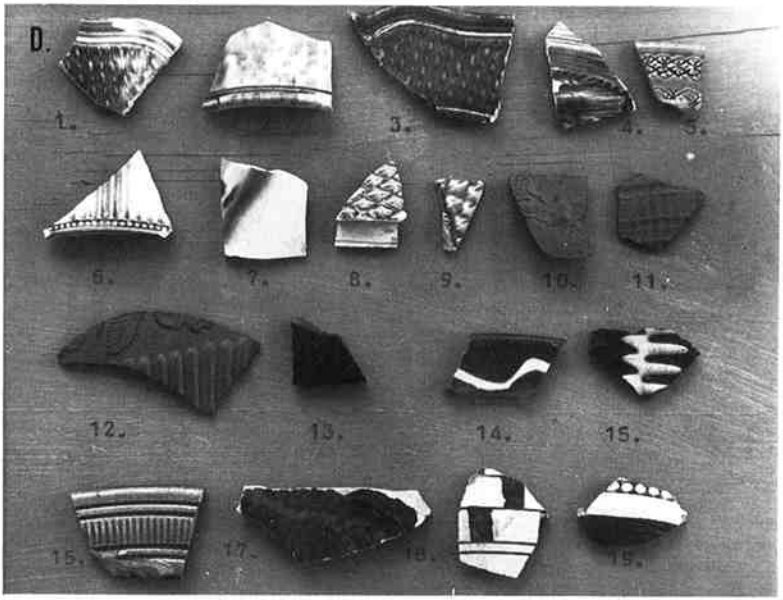

FIGURE D

1, Barley Pattern molded rim of Whieldon type plate (clouded glaze in gray, green, yellow and brown with tortoise-shell stipple on the reverse); 2, Cream colored earthenware tortoise-shell stipple; 3, 4, 5, Green-Glazed; 6 and 7 Cream colored ware 1765-1780; 8 and 9, Cream colored ware molded pineapple decoration in green with a deep orange yellow; 10, Sprig molded red stoneware; 11, Engine turned red stoneware; 12, Black Basaltes stoneware; 13, Jackfield; 14 and 15, Astbury ware; 16 and 17, Coarse Agate; 18 and 19, Sgraffito coarse agate.

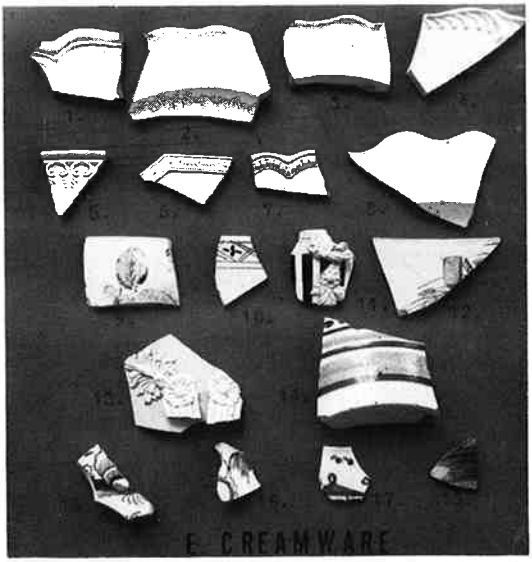

FIGURE E

Creamware. 1, Queen's shape plate; 2, Royal pattern; 4, Feather edge; 5-7, Typical creamware rims; 8, Shell edge (paint has disappeared); 9 and 10, Overglaze enamelled hand painted (9, Blousy Rose in Green, Yellow and Red, c. 1775-7785); 12, Transfer decorated; 14, Annular ware; 15-16, Chinese House-and-Fence design on creamware.

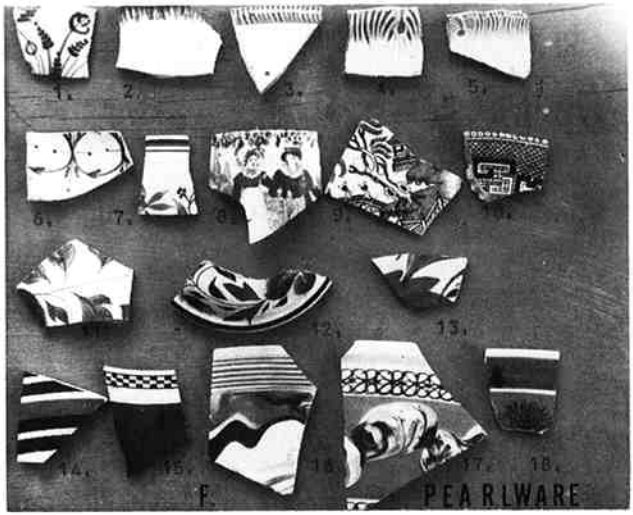

FIGURE F

Pearlware. 1, Chinese House-and-Fence Design; 2 and 3, Shell Edged; 4 and 5, Embossed Shell Edged; 6 and 7, Underglaze polychrome; 8-10, Transfer pattern (9 and 10, Willow pattern); 11-13, Underglaze polychrome, bold flowers and colors; 14 and 15 Annular ware; 16 Marbled slip; 17, 'Finger painted'; 18, Mocha.

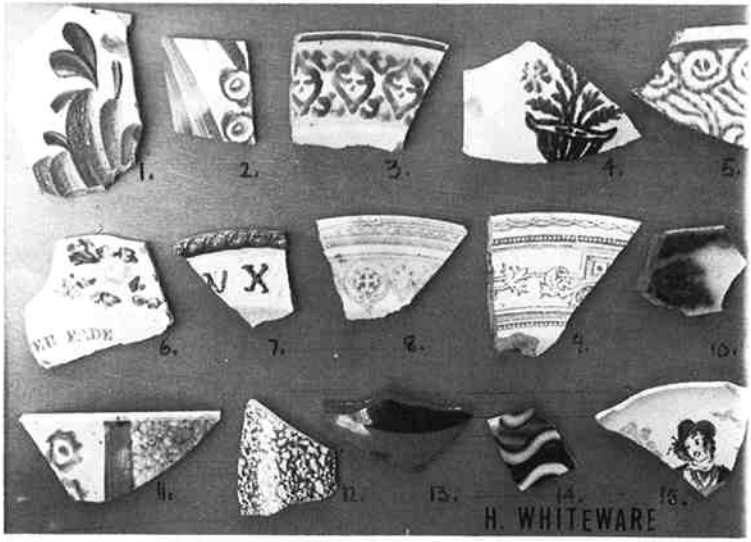

FIGURE H

Whiteware. 1, Polychrome painted; 2-5, 'Cork' Stamped; 6 and 7, Molded Rim with hand painting; 6, Transfer decorated 'Old Soldiers Never Fade'; 8 and 9, Transfer printed; 10, Flown Blue; 11 and 12, Sponged; 13, Lustreware; 14, Annular.

FIGURE I

1-3, Deteriorated Bellarmine, (medallion and face); 4-8, Westerwald grey stoneware; 9-12, Rhenish Stoneware; 9, Manganese decorated; 12, Combed lines.

[*Editor's Note:* There is no Figure G in this article.]

ARCHAEOLOGICAL SAMPLING ON UTILA, BAY ISLANDS, HONDURAS

By R. Christopher Goodwin, Cyd Heymann, and Glen T. Hanson

The Setting

The Island of Utila (Fig. 1) is the smallest and westernmost of the Bay Islands group in the Gulf of Honduras. Utila, the two larger islands of Guanaja and Roatán, three minor islands, sixty-three cays, and two small ancillary cays (Cayos Cochinos) form the Department of the Bay Islands, one of seventeen political districts of the Republic of Honduras.

The three major islands represent peaks of submerged east-west geologic basement and associated coral reefs. They were formed by relatively recent tectonic activity along the southern escarpment of the Bartlett Trough (McBirney and Bass 1969:230). In contrast to Guanaja and Roatán, Utila is comparatively low. The island, which is 8.4 miles long and 2.9 miles wide at its extreme limits, is divisible into two geologic zones. The largest of these, seventy-five per cent of the land mass, consists of alluvium and organic swamp sediments. All of the island west of East Harbor and the area southeast of the Harbor (Fig. 1) is low and swampy. As Lord (1975:47) has noted, the underlying limestone formation in these low areas serves as a catchment for rain, which percolates through sand and gravel. The net result is a shallow water table, usually from ten to twenty feet below surface. This is especially significant, since there is no surface water on the island. Most potable water on Utila comes from shallow, hand-dug wells. As a concomitant, the supply of water is reduced substantially during the dry season. Since tides accelerate the percolation of swamp water, protracted periods of reduced tides also affect the water level. In the low areas mangroves are the dominant form of vegetation. That mangroves have been important in building up marine sediments and cumulose soils is reasonably certain (Davis 1940:383). Red mangroves *(Rhizophora)* fringe the *manglar,* and extend into the interior; black mangroves *(Avicennia)* are common in the interior; white mangroves *(Laguncularia)* occur in small communities throughout the *manglar* though, as Davis (1940:336) has noted for Florida, nowhere are they the dominant species. Bark from the red mangrove sometimes is used to produce dye for staining leather; however, the principal use of mangroves on Utila today is for making charcoal.

The second major geologic zone on Utila consists of alkaline-olivine basalt lavas and tuffs; this zone contains the only known exposed quaternary volcanic rock in this part of the Caribbean (McBirney and Bass 1969:239). This formation is limited to the eastern portion of the island, excluding the *manglar* southeast of East Harbor. Pumpkin Hill on the northeast coast is the highest

point on the island (elev. 290 ft.); it is the remnant of a wave-battered pyroclastic cone built on a base of coralline limestone (*ibid.*). Stuart Hill, just northwest of the town of Utila, comprises the only other major natural rise in elevation (169 ft.). According to McBirney and Bass, it is

> an arcuate ridge composed of basaltic tuff breccia and abundant blocks and small fragments of coral, limestone, and metamorphic debris. A series of disconnected hills and smaller ridges on the northeast completes what seems to have been the rim of a central crater from which the fragmented materials erupted. Large, ropy bombs of olivine-augite basalt are common, and in places radially outward-clipping layers of palagonitic tuff breccia contain large blocks of vesicular basalt up to 1 M across (1969:238).

While in general this interpretation is undoubtedly correct, two points need to be made. First, Stuart Hill is located on the perimeter of the area known locally as 'The Bamboo'. The Bamboo contains the 80-Acre Site described by Strong (1935), and preliminary archaeological survey indicates that this site extends well beyond the area Strong surveyed (see Fig. 1). This area is punctuated with rubble-filled mounds dating from the period of aboriginal habitation, although this may be difficult to discern given the dense overgrowth. It is possible that some of the disconnected hills and small ridges to which McBirney refers are man-made. Second, Rose (1904) and Strong (1935:140) suggest that Stuart Hill is the point of convergence of four cobbled causeways, presumably of aboriginal origin. However, these features seem to be consistent with McBirney's description of the geomorphology of the area. Arthur Bronlow (personal communication) believes the 'causeways' to be natural, rather than man-made. Nevertheless, it is clear that the area known as The Bamboo was in fact the primary locus of pre-Columbian habitation on Utila.

The topology of Utila follows a gradual west-to-east incline. Major elevational differences are contained in the volcanic eastern portion. In addition, this area contains three caves, all containing fresh water, and all having evidence of aboriginal utilization (Strong 1935:33-34). Of the 24.36 square miles total landmass, the six that are suitable for agriculture are primarily located in The Bamboo (Lord 1975:57). This savanna area takes its name from the several species of 'bamboo grass' that are prevalent here, including *Asclepias curassavica,* and *Palicourea* sp. It is possible that much of this represents secondary growth due to years of cultivation, although, with the exception of scattered small garden plots, this area is not utilized in agriculture today. Craig (1967:71) suggested a long period of intensive clearings for 'provision ground' type of cultivation on Guanaja. Nevertheless, in historic times Utilan agriculture has focused on such cash crops as coconut and plantain. The former grows in areas adjacent to the coast; the latter is a late introduction as well. Lord (1975:54) is of the opinion that most food plants grown in house gardens on Utila were imported to the island from the 1830's onward. This is clearly the case for breadfruit *(Artocarpus altilis),* banana *(Musa* spp.), and the various citrus fruits. However, some cultigens are undoubtedly of considerable

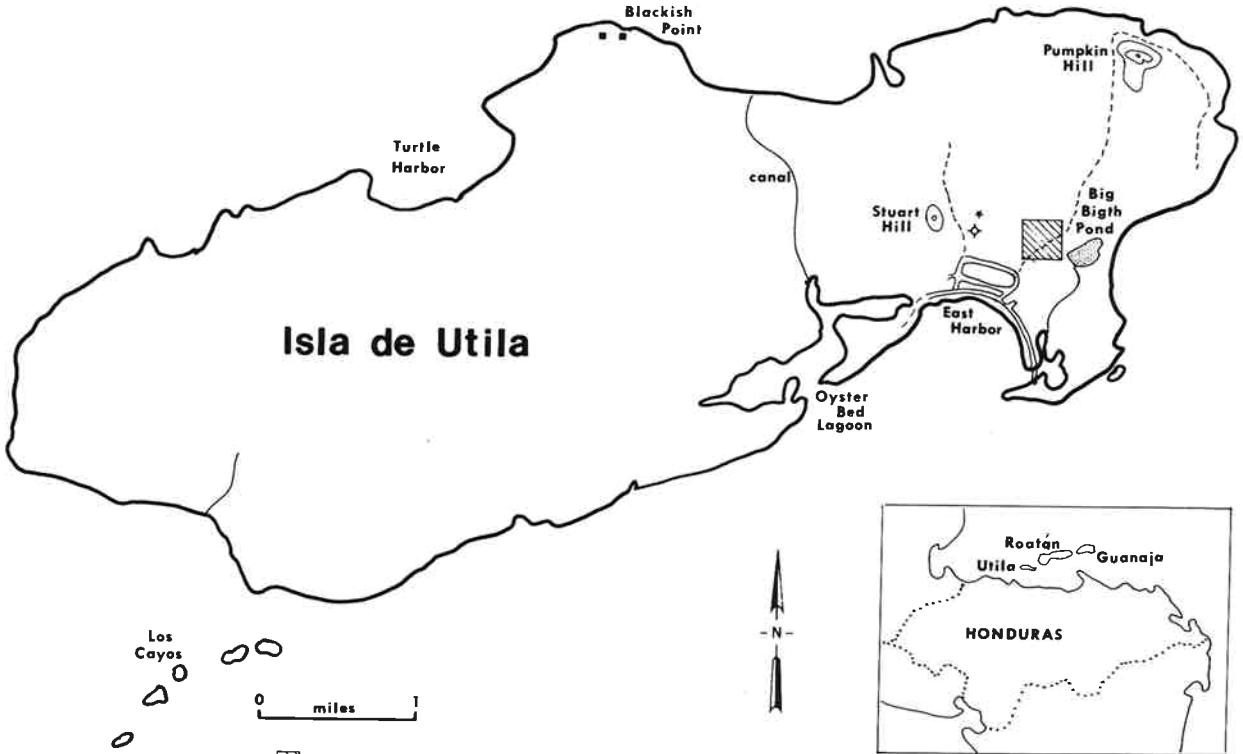

FIGURE 1
Map of Utila

antiquity, including mamey *(Mammea americana)*, guava *(Psidium guajava)*, the curcubits, and manioc *(Manihot esculenta)*. Strong (1935:14), citing an unnamed historical source, states that the Bay Islands supplied Cortez' settlement at Trujillo with both maize and manioc. The other aforementioned food plants have a pan-Caribbean distribution (Howard 1973). Other indirect evidence recovered to date (*e.g.* the number of metates from archaeological contexts) as well as the strategic location of the Bamboo Mounds *vis-à-vis* agricultural lands, suggests that farming was important prehistorically. Lord (1975: *passim*) has argued convincingly that the geologic structure of the island inhibits attempts at mechanized agriculture, thus preadapting the island's modern inhabitants to a system of remittance rather than subsistence economy. There is no reason to suppose that this obtained prehistorically, given the nature of *milpa* agriculture and of *conuco* horticulture. Craig's suggestion (1966:111) that the aboriginal inhabitants of the Bay Islands were non-agricultural appears to be a subjective judgement based on the bias of a fishing geographer, rather than on archaeological data.

Besides food plants, Utila has a component of other useful flora. Lord (in preparation) has documented the use of a variety of medicinal plants by contemporary islanders, *e.g.*, circe *(Monordica charantia)*, ramgoat *(Vinca rosea)*, and stinking toe (*Cassia* sp.) are used as blood builders. The proliferation of medicinal plants among today's islanders is consistent with Columbus' description of Honduras as replete with medicines (Strong 1935:13). One of us (R.C.G.) has been treated somewhat successfully for ciguatera poisoning with a tea brewed from 'fever grass' *(Cymbopagon)* and sap from a wild fig tree *(Ficus* sp.). The latter is particularly interesting in view of Thompson's (1970) suggestion that Maya bark cloth was made from *Ficus* trees, and further, that this tree is limited in distribution to the tropical lowlands. Bark beaters were found in archaeological context on Utila in 1973; they were also found by Strong at the Dixon Site on Roatán (1935: Pl. 16, k-1), and at the H-CN-12 Rio Claro site, Departamento de Colón, by Healy (personal communication), where they date from the Cocal Period. Sea grape *(Coccoloba uvifera)* is present on Utila, especially along the north coast. This is the classic component of strand areas in the Antilles (Howard 1973:7). Wild cotton is also present on Utila *(Gossypium hirsutum)*. Fibrous bark from the mahoe tree *(Paritum elatum)* provides the poor man's rope which is used by contemporary Utilans (Lord 1975:55).

Because of Utila's insular character, Utilans tend to view their weather in terms of prevailing winds. Seasonal patterns of rainfall, temperature, and of destructive storms all correlate with easterlies and nor'westers; both of these can effectively blockade the island. Winter (October through January) is the rainy season; it is the time of the nor'westers that carry the bulk of the year's rainfall. March is a hot, still month, with characteristically low visibility due to fog; towards Easter this weather is called 'Good Friday Weather' (Lord 1975:51).

This signals the beginning of summer, when rainfall averages about five inches per month, and which lasts until the nor'westers resume. Average yearly rainfall on Utila is about 100 inches; the average temperature is 80.06° F, with a range from about 65° to 91°.

Utila's insular character is also reflected in its fauna. Indeed, other than domesticates, terrestrial fauna is limited today to *Iguana* spp. (some of which attain six feet in length—Lord 1975:56), 'Wishiwillies'—an unidentified species of lizard, possibly *Ctenosaura* sp., and 'Waulas'—small boa constrictors. Both crocodiles and caimans were apparently known historically; both are now extinct on the island. Determination of additional fauna that were present prehistorically will have to await future research. Although the avifaunal assemblage includes ground doves and hummingbirds, most Utilan birds exploit the littoral and marine environments. Pelicans, seagulls, herons, and egrets are all plentiful. The only land animal found in sufficient quantity to merit the attention of the 1974 expedition to the island was the scorpion, probably *Centruroides margaritatus* (H.L. Stahnke, personal communication).

Most of Utila's coast is comprised of extensive foreshore flats, with depths up to ten fathoms. In this area *Thalassia* sp. predominates. This is the turtle grass that provides feeding grounds for the green *(Chelonia mydas)* and hawksbill *(Eretnochelys imbricata)* turtles. This is also the habitat of the conchs: *Strombus gigas, Cassis madagascariensis,* and *Fasciolaria gigantea.* Of these, *S. gigas* is most important economically today. Craig (1966:108) believes the conch *Cassis madagascariensis* to have 'no utilitarian value'; however, it is present in archaeological contexts on Utila, and apparently was eaten in prehistoric times throughout the Caribbean (Goodwin and Walker 1975:31). Craig (1966:103) notes that conch is not found to any considerable extent along the north coast of Honduras, due to extensive silting from the various rivers. He suggested later that the presence of conch in the Bay Islands, especially of the 'Bay Islands Broad Leaf' variety of *S. gigas,* was an important inducement for aboriginal settlement (1967:74).

Reefs are present off Turtle Harbor, Blackish Point, and Rock Harbor on Utila's north shore. The largest reef complex lies off the west end of the island, and extends past the cays as much as two miles into the Caribbean. Wing (1974) has demonstrated the sort of inferences that can be made about aboriginal utilization of reef environments, *e.g.,* requisite technology, species lists, etc. Unfortunately, no systematic sampling either of archaeological fauna or of contemporary fish populations has yet been conducted for Utila. More important fishing grounds than the reefs are known for Utila. According to David Lord,

> Fishing banks two to sixteen miles distant are important in providing fish for market and local consumption alike. More than a dozen banks were identified by informants, some only a few yards square in area, others as large as two and a half miles long by a mile wide and ranging in depth from nine to 180 fathoms (1975:45).

Of particular importance are the Pumpkin Hill Bank and a large fishing ground north-northeast of Utila (see Craig 1966: Map 19, p. 76). In the former porgies *(Sparidae),* wahoo *(Acanthocybium),* red snapper *(Lutjanus buccanella),* and hogfish *(Lachnolaimus maximus)* are taken. In the larger fishing ground bonito *(Katsuwonus pelawus)* and albacore *(Thunnus atlanticus)* are plentiful. Craig (1966:84) has observed that these fish, in large schools, follow the circular surface currents, returning repeatedly to an area midway between Utila and Glovers Reef. It will be interesting to determine if these fishing grounds were utilized prehistorically. They have been fished in historic times from small doreys; Craig (1966:31) believes that the structural form of the doreys is 'of certain aboriginal design'.

One final feature of Utila's littoral zone merits attention. The Utilan shoreline is broken by entrances to two large lagoons: the Upper Lagoon and the Lower Lagoon. The former is the larger: it lies just west of East Harbor, and from it runs the man-made canal (Fig. 1) that traverses the island. Especially here large oyster beds are found, though these are not generally exploited by Utilans. However, the examination of archaeological sites on Utila in 1973 and 1974 suggests that oysters were an important resource prehistorically. Richards and Boekelman (1937:167) noted the presence of oysters in association with a burial at Río Hok Skum near Corozal in British Honduras (now Belize), and they even suggested that Utila was the source, albeit they did so on the basis of incomplete distributional data. Oysters have also been recovered from votive caches at San José, Uaxactún, Copán, and Santa Rita. If Richards and Boekelman overstated their case in equating the ceremonial significance of oysters and that of *Spondylus princeps* of the Pacific, it is clear, nevertheless, that oysters had some ceremonial significance in addition to their economic importance. Oysters are also found in the Lower Lagoon.

The History of Bay Islands Archaeology

The presence of a large aboriginal population on the Bay Islands has been known since July 30, 1502, when Columbus encountered an Indian trading canoe near Guanaja. Fourteen years later over 400 Indians were relocated from the Bay Islands to serve as slaves in the Greater Antilles, after Diego Velásquez, the Governor of Cuba, sanctioned slave raids in the Western Caribbean in 1516. According to Strong (1935) the aboriginal islanders supplied Cortez' settlement at Trujillo with fish, maize, and manioc. And yet this region has remained virtually unknown archaeologically.

Although the first record of excavation on Utila was in 1897, when treasure hunters recovered a large, decorated ceramic vessel, coral beads, and clay figurines (Rose 1904), anthropological interest in the Bay Islands did not surface until 1928. In that year Conzemius (1928) published his 'On the Aborigines of the Bay Islands', a brief review of the ethnohistoric literature.

This publication marked the beginning of speculation about the cultural affinities of prehistoric Bay Islanders, a question that is still open to some contention. In June and July, 1931, the Boekelman Shell Heap Expedition of the American Museum of Natural History excavated a number of test pits on Utila, primarily on the north shore. Junius Bird was staff archaeologist. Shortly thereafter (April and May, 1933), the Smithsonian Institution sponsored an archaeological reconnaissance of the Bay Islands. Together these two expeditions spent a total of 48 days on the Bay Islands (Strong 1935:1-2). Results from these two expeditions are contained in Strong's monograph (1935), the only major extant publication on the archaeology of the Bay Islands. Writing of Utila, Strong noted that:

> the island is obviously an extremely promising place for extensive archaeological research. Habitation, ceremonial, and burial sites are all present. Only one or two have been seriously sampled. The island as a whole has not been examined—even for surface indications . . . (1935:35).

The same could be said for the other islands of the group. In 1940 Feachem contributed a brief, personalistic account of his visit to the islands. Feachem saw differences in the ceramic components of Utila and Roatán: he reiterated Strong's (1935) contention that Utilan ceramics showed affinities to Central America, rather than with Mexico or Yucatan, and he attributed the greater number of polychrome sherds on Roatán to influences from the Ulúa Valley (1940:187). He noted the prehistoric presence of imports, notably obsidian, which is not naturally occurring on the islands. In 1950 Kidder, Ekholm, and Stromsvik visited the 80-Acre Site on Utila that had been described by Strong (1935). The ceramic collection that they made was utilized by Epstein (1957, 1959) in the establishment of a tentative chronology for the region. This study was the first to attempt a systematic integration of Bay Islands' ceramics with those from the mainland, and the sequence that resulted is clearly the best to date.

Craig (1966, 1967) conducted a brief examination of archaeological sites on Guanaja as a corollary to his study of the fishing geography of the region. His observations on the marine ecology of the area (1966) are useful, although some of his interpretations of archaeological remains are clearly preposterous. He suggests that prehistoric inhabitants of Guanaja had Carib affinities (1967:70), even though the resettlement of the Black Caribs from St. Vincent to British Honduras took place in 1797; furthermore, as Allaire has pointed out (1976), there is little archaeological evidence for prehistoric Carib occupations even in the Lesser Antilles, the supposed homeland of the Island Carib.

More recently Healy, Veliz, and Willey (1975) have attempted a preliminary classification of pottery from Roatán, using the type-variety method. These authors have suggested a population increase during the Post-Classic, and have postulated that the apparent shift in settlement patterns to include hilltop sites may be correlated with a need for defense (1975:8). Utilizing Epstein's

chronology, they suggest that while Selín (Late Classic) ceramics from the Bay Islands show affinities with the Maya-influenced Ulúa River Valley, the preponderance of cultural influence during the succeeding Cocal (Post Classic) period was from lower Central America (1975:9-10). This interpretation is consistent with that of Strong (1935) and of Epstein (1957). In addition, Healy *et al.* (1975:10) noted the presence of Tohil Plumbate trade sherds on Roatán in Cocal contexts, evidence that relations with Mesoamerica were not totally estranged during the Post-Classic.

Taken together, then, all of these contributions to the prehistory of the region point to a complex situation during the Late Classic and Post Classic periods. Earlier periods of occupation are unknown for the Bay Islands. Healy has recently characterized the Bay Islands, and Northern Honduras in general, as a major frontier (1974, 1975). A number of sources of cultural influence have been suggested, Maya to the north and west, Chibchan-related tribes to the south (Strong 1935; Epstein 1957, 1959; Healy 1974, 1975). The importance of the area in pre-Columbian trade networks has been suggested (*e.g.*, Thompson 1970; Henderson 1975); certainly this is indicated in historical sources. A tentative ceramic chronology has been advanced (Epstein 1957, Healy *et al.* 1975). Hypotheses have been forwarded about warfare and changes in settlement patterns *(ibid.)*. In short, there are hopeful signs that the archaeology of the region is coming out of its Thermidorian phase. However, in order to elucidate the larger questions of process, what is needed is basic archaeological footwork. The following sections present some tentative results of, and suggest hypotheses derived from, two brief field seasons on the Island of Utila.

Procedures

For one month in each of the summers of 1973 and 1974 preliminary archaeological research was conducted on the island of Utila, under the sponsorship of the Explorers Club, and under the direction of the senior author. The 1973 study was carried out as an adjunct to a larger project on the ecology of the island.

In 1973 one three-meter square test pit was excavated in a large mound adjacent to the 80-Acre Site (Strong 1935), in order to discern the nature of the mound construction and to elucidate the sequence of aboriginal habitation at that locale. It should be noted, however, that the Bamboo Mounds area is considerably more extensive than Strong (1935) reported; one small test will not reveal the sequence of habitation for the whole site, and it is possible, though not probable, that the findings presented here are not representative of the site in general. Nevertheless, the ceramic component encountered during the 1973 excavation closely resembles the Kidder, Ekholm, and Stromsvik collection utilized by Epstein in his pioneer study (1957), and agrees well with results derived from similar test pits on Roatán (Healy, Veliz, and Willey 1975). In ad-

dition, profiles cleaned in a number of pot hunters' pits on the site would tend to confirm impressions gained from the test pit with regard to stratigraphy and to the nature of mound construction at the site.

Arbitrary 30 cm. macro-levels were used in the test excavation; the pit was excavated to a depth of 150 cm. Briefly, the mound was of the rubble-filled type described by Stone (1942) as 'usual' for the Sula-Ulúa region. The bulk of the mound fill was composed of potsherds, although fragmentary metates, bark beaters, obsidian blades, and a number of marine gastropods and pelecypods were present. No complete artifacts were recovered. The bulk of the mound fill was separated from the surface by a thin humus zone. A small break in the continuity of the deposit was recognized between levels II and III; also, a number of significant changes in the composition of the fill were noted in level III. Here the percentage of large, comparatively thick everted rims declined; the frequency of slipped and bichrome sherds increased, though not substantially; the number of fish spines decreased, and there was a vast increase in the number of marine shells comprising the fill. Potsherds were the major component throughout. Fragments of serpentine pendants were recovered from level III.

Between 120 and 128 cm. below surface a floor composed of coralline limestone blocks was uncovered; these were placed side by side. Surfaces were characteristically rough, and there was little evidence that these blocks were reshaped for their use in construction. If these blocks indeed constituted a floor, then they were probably covered with a plaster or with mud. The zone beneath the coral floor was sterile, with the exception of decomposed shell seen as specks in the brown-red clay matrix. It is possible that the coral floor was merely part of the mound fill, rather than an earlier living floor. Stone (1942) has documented the use of unworked stone in mounds of the Sula-Ulúa region as a support, protecting the mound from erosion during the rainy season.

The majority of ceramics from the test pit seem to derive from the Cocal Period (Post-Classic) defined by Epstein (1957). Two Bay Islands Polychrome sherds were encountered in the basal portion of Level III. These are probably from the Cocal I phase (Epstein 1959). Incision was the most frequent decorative mode; this characteristically took the form of the incised punctate ware described by Healy *et al.* (1975). However, the combination of incision and punctation occurred most frequently on cazuela-shaped vessels, while simple horizontal incision was limited mainly to outlines on rims of semi-constricted, lipped ollas. On the cazuelas decoration was confined to the area above the keel. While the range of sherd thickness varied from 3-10 mm., thickness averaged between 5 and 7.5 mm. This is thinner than the 7-10 mm. average reported by Healy *et al.* for their ceramic collection from Roatán (1975), but thicker than that they reported for 'Chiriquí Armadillo Ware' and Sandy Plain Ware. It is interesting that Healy *et al.* did not report the presence

of the cazuela shape; this form was common in all levels in the test pit on Utila.

In general temper size tended to vary proportionately with sherd thickness. Rolled quartz and crushed shell and possibly coral were utilized as tempering agents; a few sherds contained angular quartz and mica temper, suggesting that these vessels were trade goods. The coarsest temper was contained in large, thick sherds with segmented, wormlike appliqué bands (Healy's Grooved Appliqué Ware). This mode of decoration was not common. As Epstein has noted (1959:126), the monochrome appliqué tradition is thought to have its source in Nicaragua and Costa Rica (Strong's North Coast Appliqué Style). Epstein dates it as Post-Classic but pre-plumbate.

The conformity of pot shapes from throughout the test unit suggests that utilization of the mound was confined to the Cocal Period. The exception is that the frequency of ollas declined in the lower two levels, although this class was present throughout. Epstein (1957) reported that *all* ollas from the 80-Acre Site were contained within the Cocal Horizon; the trend towards increasing usage of this form suggests that construction of the mound began in early Cocal times (Cocal I), and continued through the later phase (Cocal II) which is assumed to have ended just prior to the Conquest. Similarly, flare-walled bowls are thought to have been more popular in Cocal times (Epstein 1957; Healy *et al.* 1975); a variety of these forms were recovered from the various levels.

In general, then, the foregoing discussion is necessarily sketchy. One salient point of limited test excavation is that it raises more questions than it solves. While it is interesting to speculate on broader issues on the basis of minor testing, in reality the utility of these speculations is only that they provide a framework for future testing. In this regard a number of hypotheses can be advanced. First, Healy, Veliz, and Willey (1975) have already suggested a dramatic population increase for the Bay Islands during the Post-Classic. An explicit sampling program to test the number and size of sites, as well as their composition, for each of the succeeding phases is now needed to determine if the apparent population increase is real. Another critical area for future testing is trade. A number of authors have characterized the region containing the Bay Islands as a frontier. Relationships both north and south are becoming evident. Historical sources indicate the presence of a trade network that connected coastal Honduras and the Yucatan at contact. The presence of a large trade center at nearby Naco has been documented (Henderson 1975). And, on Utila a number of goods not indigenous to the island can be discerned. These include the angular quartz and mica tempered pottery, and certain types of rocks (*e.g.*, mica schists, qui-granular granitics). Obsidian is present in tool form, but no exhausted cores or debittage were found. Some basalt, legged metates are made from an alien rock; one striking example has a grotesque zoömorphic head (Fig. 2).

Conversely, trees of the genus *Ficus,* from which bark cloth was made, are

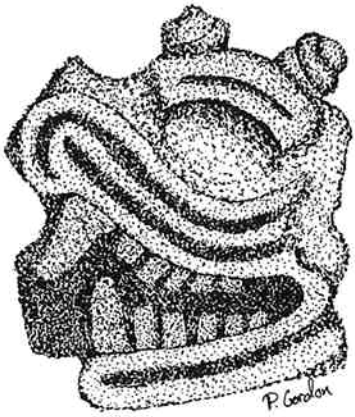

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FIGURE 2

present on the island, as are bark beaters from archaeological contexts that appear to have been made from indigenous limestone. The *S. gigas* conch is common in *Thalassia* beds off the islands, while it is not particularly common in mainland coastal waters due to the discharge of alluvial effluents from the various rivers. And, the Bay Islands Broad Leaf variety of conch is distinguishable. Clearly there are ample avenues for the study of trade. Again, what is needed is systematic testing programs.

The Surface Collection

In 1974 an attenuated walking survey of the island was conducted. A number of sites, primarily bordering the mangrove thicket along the south shore, were located that have not been noted in the literature. During this brief field season an intensive examination of the surface of a small mound fifty meters south of the mound that had been tested previously was conducted. This involved the mapping of artifact classes from a fifty per cent sample of the mound surface. Because previous testing indicated the presence of a distinct humus zone separating the bulk of the mound fill from the surface in one case, and because of the documented use of rubble for mound fill in the area, it was postulated that an intensive examination of a horizontal surface of one of the mounds might provide an associational record of human behavior not otherwise available. Research objectives were to (1) isolate areas of specific behaviors where possible, and (2) to compile a profile (synchronic) of the utilization of the mound by its inhabitants. It should be stressed that while the possibility of encountering primary refuse (that discarded or abandoned at its location of use, after Schiffer 1972) was recognized, it was not assumed *a priori* that this was the case. Indeed, while certain patterns in the spatial arrangement have become evident, the date on the nature of the deposition are still inconclusive. The

following discussion suggests hypotheses about mound utilization as if the patterns discerned for classes of artifacts represent primary refuse. In order to demonstrate that this is in fact the case, it will be necessary to correlate these findings with those from other, as yet unstudied mounds.

For the surface collection, an eighty foot grid was established over the mound surface. This grid also encompassed the southeast portion of an adjacent mound. Grid units were ten feet square. Students working on this project designated the mound 'Scorpion Mound' because of the pervasive presence of the small scorpion *Centruroides margaritatus* (Marinkelle and Stahnke 1965). Six teams of two individuals, selected so that capabilities were matched, conducted the survey. The typological scheme utilized was tailored to permit the inference of specific activity areas. Artifacts were grouped into eleven classes. These are: plain body sherds, rim sherds, decorated sherds, obsidian blades, fire-cracked rocks, other stone tools, pumice balls, coral, faunal remains (excluding shellfish), shells, and metates. These will be referred to as V2-V12 sequentially in the discussion that follows (*e.g.*, plain body sherds = V2, etc.). Although a probability sampling strategy would have been statistically valid (Redman and Watson 1970), it was reasoned that a fifty per cent sample would yield valuable distributional data that otherwise would be lacking. A checkerboard sampling procedure was used to provide optimal recovery of over 50% sample over the mound surface (Fig. 15). It was thought that such a procedure would permit better control over elevational differentials that would a non-aligned sample. Proveniences for all artifact classes in each grid unit were recorded on a scale map in the field from reference points established at two foot intervals along the perimeters of the grid units. These segmental charts were transferred to a master map in the field laboratory (Fig. 15). Speed was sacrificed to efficiency: given the density of artifactual materials, it took almost a full day for a two person team to complete one square.

Analytical Procedures

Besides the overall density map that was prepared in the laboratory to permit the inductive examination of artifact clusters, a number of other analytical devices have been applied to the data. However, one assumption permitting these types of analysis needs to be made explicit: that is, the assumption of contemporaneity. Two factors suggest that this was in fact the case. First, extrapolating from the test unit the presence of a humus zone separating the mound fill from the surface deposits suggests that surface materials were deposited later than the secondary refuse (after Schiffer 1972) in the mound fill. Second the examination of the ceramic artifacts after the fact would place the deposition of surface materials within the Cocal II phase (Epstein 1957; Healy *et al.* 1975). No artifacts of an earlier period were discerned.

TABLE 1

Correlation Coefficients for Ceramic Artifacts

Variable	Pearson's r	$(r^2)100$
V2/V3	.68879	47%
V2/V4	.62569	39%
V3/V4	.74188	55%

Raw counts for each of the artifact groups per grid unit were utilized in the computation of Pearson's Product-Moment Correlation Coefficient (r), in order to test the covariance of the eleven variables over the entire mound surface. As Redman and Watson (1970:290) have noted, the strength of association displayed by the coefficient should be regarded as a relative measure only, rather than as a precise one with exact levels of significance. The Pearson's Correlation Coefficient statistic, unlike the method devised by Whallon (1974), measures artifactual association rather than areal association. As one of us (Hanson 1975) has noted, this statistic provides an assessment of the strength of relationships among different pairwise comparisons, thus enabling statement of the relative strength of association for all pairs of tool types. While none of these scores approached perfect positive correlations, a number of results are significant.

First, as seen in Table 1, the various ceramic artifacts tend to covary. Among these classes the strongest correlation was between rim sherds (V3) and decorated sherds (V4). The discrepancy between this figure and that for rim sherds and plain body sherds (V2) might suggest that decorated vessels tend to be smaller; this seems reasonable in view of the fact that sherds from large ollas tended to be undecorated. Plain body sherds (V2) and coral (V9) yield a coefficient of .78984 (62%); as will be seen, this was due to overlapping primary clusters atop the mound. It is possible that this association indicates the use of coral in food preparation, *e.g.,* in shredding manioc, etc. It is also possible that coral was used in cooking, perhaps for its heat retaining qualities (analogous to boiling stones or to the probative function attributed to Poverty Point objects). Decorated sherds and coral (V4/V9) had a slightly lower correlation coefficient of .77113 (59.5%); this was similar to the coefficient expressed by decorated sherds and shell (.76633, or 58%). Rim sherds and faunal remains (V3/V10) had a correlation coefficient of .67233 (45%). Again, this seems to be due to the overlap of primary clusters, and it may well suggest a functional relationship. While none of the aforementioned correlations is particularly striking, the pattern of negative correlations is more so. In fact, the coefficients for all of the variables (V2-V11) with metates (V12) were negative. As will be seen, metates formed a significant spatial isolate on the mound surface.

While correlation coefficients have provided a useful relative measure of association, they did not elucidate patterns that were recognized after an inductive examination of the density map. This is probably due to a number of factors. First, this statistic is influenced by sample size. Second, clusters of the indicative artifacts frequently crosscut the arbitrary grid units. Finally, the gross nature of the classes utilized precludes perfect positive correlations. For example, the plain body sherds category (V2) contains griddle sherds, those from ollas, sherds from flare-walled bowls, etc. In short, the artifact typology has necessarily influenced the results.

For this reason it was determined to utilize computer graphics in mapping the densities of artifact classes, in order to facilitate the delineation of patterns not readily discernible either in the density map or in the statistical analysis. For this the SYMAP program was selected. SYMAP prints a darker symbol for higher values, thus producing contour maps based on the assumption of a continuous distribution of the value of a variable between two data points (Redman and Watson 1970:289; *cf.,* Cerny 1972). By selecting Option 11 in this package, raw frequency scores are printed within the various contours on the maps. Five shading gradients were used, each with an absolute total value range of twenty per cent.

The first map created by the SYMAP program shows the elevation of Scorpion Mound (Fig. 3). In general this map seems accurate, although some distortion is present in the northeast quadrant where continuity is spuriously expressed between the highest elevation of the mound surface and that of the adjoining mound. Also, gradients are standardized in the map, obviating the examination of minor elevational differentials. This map, then, can be used as a key for interpreting the artifact density SYMAPs; it represents the trend surface of the mound, rather than an exact picture.

In addition to clarifying the nature of the statistical relationship expressed in the Pearson's Correlation Coefficient between pairs of artifact classes, SYMAP has permitted the delineation of secondary and tertiary artifact clusters that may indicate functionally specific areas of the mound. In a number of cases the associations already expressed between pairs of artifact classes appears to be due to dense (primary) clusters of the pairs on the top of the mound surface, the area of greatest overall artifact density. This appears to be true for the pairs V2/V4, V4/V9, and V4/V11, as seen in Figs. 4-6. Because of the dense concentration of a variety of materials atop the mound, it is difficult to know what functional relationships are present. However, through an examination of distributions of artifact classes over the entire mound surface some hypotheses can be developed.

First, as previously noted, correlation coefficients for all eleven variables with metates were negative. While this is in fact due to the frequency of metates ($n = 3$), SYMAP has delineated the areal distribution of these metates in a por-

tion of the grid that is devoid of primary, secondary, and tertiary clusters of all other artifact classes (Fig. 7). Note that because of the small number of metates, every grid unit containing one was scored at the highest gradient. All three metates were clustered within a fairly small radius in the northeast portion of the grid; this section of the mound is relatively flat. They are close enough together so that all metates might have been used by a single person, sequentially, in food processing. If this is so, then it would be expected that wear patterns on the metates would be different. This has yet to be tested. Again it should be stressed that this cluster is in an area without evidence of other activities; the only significant frequency of other artifact classes is that of plain body sherds, though this frequency is comparatively low. Of course, the presence of pottery is not incompatible with the processing of grains.

A similar cluster is contained in the northwest portion of the grid, an area referenced in the field notes as a possible hearth. Within this section primary clusters of fire-cracked rocks, undifferentiated stone tools, and of pumice balls were located. Indeed, the only primary clusters of these three classes were located in this area. Again, this is particularly significant in view of the absence of primary clusters of these classes in the area of greatest overall density atop the mound. If these distributions are functionally related, as they appear to be, then it can be hypothesized that this cluster represents, for example, an area for the recycling or manufacture of stone tools. Pumice could have been used for sharpening; the fire-cracked rocks might suggest a testable probative inference that some stone tools were heat-treated. The distributions of these three artifact classes is charted in Figs. 8-10.

Rathje (1972) has suggested that obsidian, though not generally available in the lowlands, was viewed as a necessity by lowland peoples, requiring the existence of complex trade networks. As previously noted, all obsidian recovered on Utila was in the form of finished artifacts, especially prismatic blades. The distribution of obsidian on the surface of Scorpion Mound is interesting, in that the largest primary cluster (Fig. 11) is located adjacent to the densest distribution of faunal remains. These clusters, located on low-lying ground in the southeast quadrant, would seem to indicate a functional relationship. It seems reasonable that obsidian blades were used in butchering; the difference in the distribution suggests the probative inference that butchering was conducted in a single area, and that refuse was redeposited simply by throwing it out of reach. As an alternative, a butchering area might have been just removed from the area of food preparation; the presence of secondary distributions of plain body sherds and of rim sherds with faunal remains argues for this latter interpretation, as does the overlap with a secondary cluster of shells. The distributions of these classes is charted in Figs. 11-12. In addition, a secondary cluster of faunal remains overlaps almost perfectly with a tertiary cluster of coral. The abrasive nature of some corals would make it a useful tool in scaling fish (Good-

win and Walker 1975); indeed, field notes demarcate this particular faunal cluster as comprised almost entirely of fish spines. These data, then, suggest the probative inference that coral was used to scale fish, and, further, that this activity was at least in part localized in the east central portion of the mound (Fig. 13).

With few exceptions primary clusters of the various artifact classes tended to be localized on the mound surface. While undoubtedly some redeposition of the individual artifacts has occurred due to natural factors, *e.g.*, wind and rain, it is unlikely that the patterns that have been described resulted from this redeposition. If it is assumed that lateral displacement of primary refuse ensued from non-cultural causes, then it would be expected that a relatively more diffuse distributional pattern would be present, especially along the slopes of the mound. In fact, this does not appear to have been the case.

When the overlapping, adjacent, and in some cases mutually exclusive clusters of indicative artifacts are combined, it is tempting to relate the pattern that results to a structure that presumably topped the mound. This, too, is in fact a hypothesis that needs independent verification. But, the data would seem to indicate an isolated work area for the grinding of corn in the flat below the corner of the mound; it can be supposed that this area was used by a single person, presumably female. Conversely, the flat on the northwest perimeter of the mound would seem to have been utilized in the manufacture and/or recycling of stone tools, a task attributable to a male(s). Coral may have been utilized for scaling fish along the east-central portion of the mound surface. Similarly, obsidian appears to have been used in butchering; this was done adjacent to the area where the food was subjected to secondary preparation on the flat southeast of the mound. It is interesting that a dense secondary concentration of rim sherds (V3) also was found in this area (Fig. 14). The correlation coefficients for rim sherds and faunal remains (V3/V10) and for rim sherds and plain body sherds (V3/V2) are approximately equal. This might suggest the possibility that processed animal foods were placed in relatively small containers, such as flare-walled bowls.

That an equal number of rim sherds was found both in the cluster atop the mound and in the probative food preparation area is particularly noteworthy given the much greater density of plain body sherds in the former area. It may be postulated that a house structure topped the mound; because of the lack of surface water on the island, water was stored in large ollas in the house, hence the differential ratios. It is also likely that butchering and the preparation of smelly food animals were not carried out in the house; this could account for the location of these probative work areas adjacent to the higher elevations of the mound surface. Finally, the dense concentration of a number of artifact classes atop the mound would be consistent with the practice of storing goods either within or just adjacent to the house structure. A secondary con-

centration of fire-cracked rocks (Fig. 8) on this highest surface suggests the probative inference that there was a small cooking fire in or by the house structure.

Although the preceding discussion has been both simplistic and highly speculative, the patterns described are certainly provocative. And, the potential of these data is not exhausted. Clearly a number of other interpretations are conceivable. For example, debris located below the mound may represent secondary refuse (after Schiffer 1972), due to the practice of discarding garbage down the sides of the hill atop of which was a residence. This is an aboriginal pattern that persists in much of Latin America (Goodwin and Walker 1975:22). Resolution of this issue will have to await future research. Again, the point is that a framework has been provided from which the archaeological record can be tested. Traditionally the archaeology of the Southern frontier of Mesoamerica has been concerned with comparative, diachronic issues. Virtually no attention has been given to the reconstruction of the way of life of the pre-Columbian inhabitants. Before many questions of process can be answered satisfactorily, it will be necessary to obtain a better grasp of the synchronic aspects of aboriginal cultures in the Bay Islands. It is hoped that the foregoing discussion will contribute in this regard.

Acknowledgements

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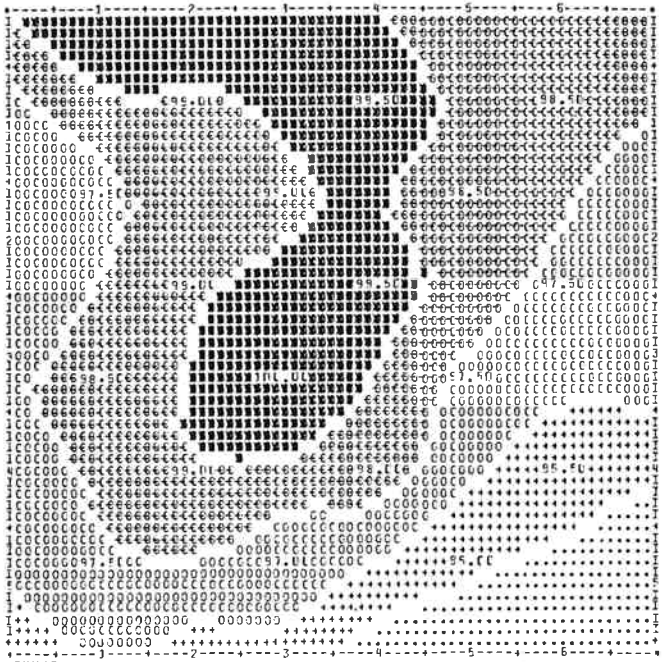


FIGURE 3
Trend-surface elevation of Scorpion Mound.

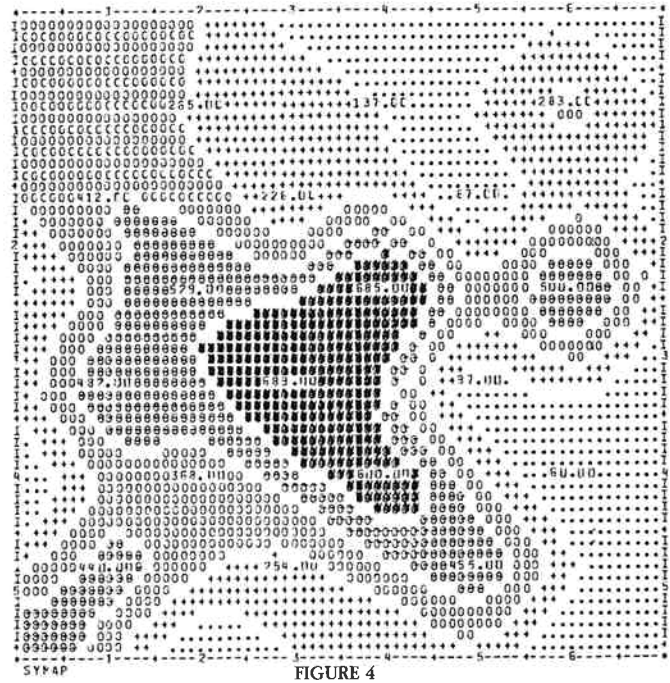


FIGURE 4

Distribution of plain body sherds (V2).

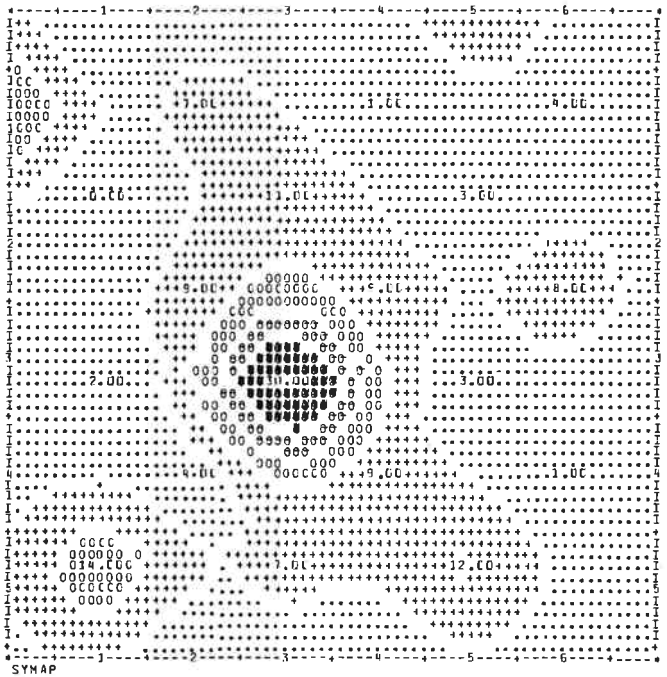


FIGURE 5
Distribution of decorated sherds (V4).

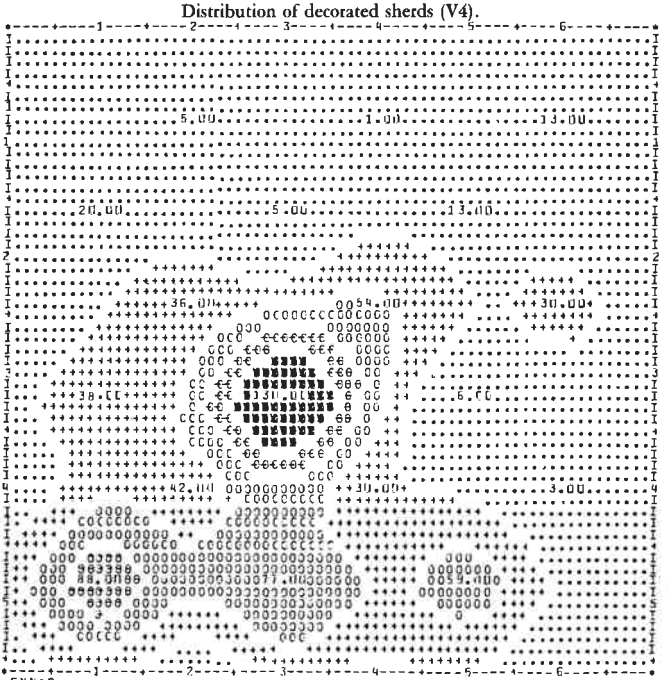


FIGURE 6
Distribution of shells (V11).

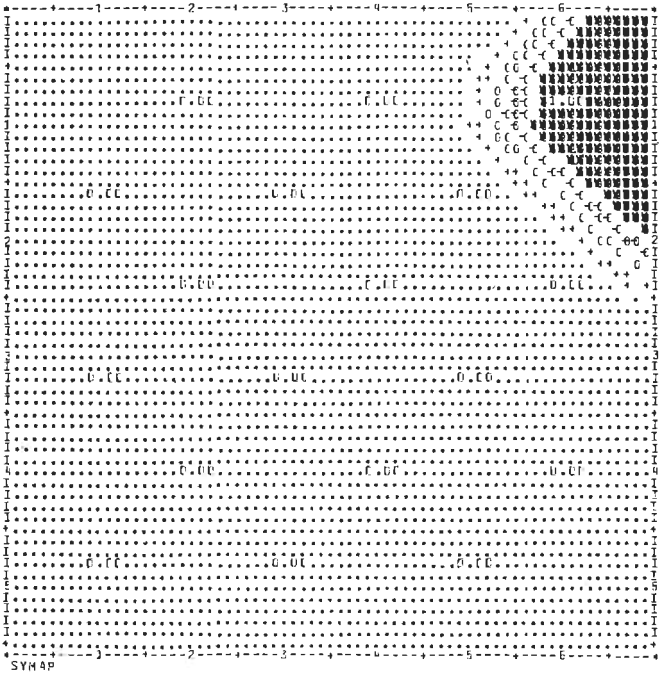


FIGURE 7
Distribution of metates.

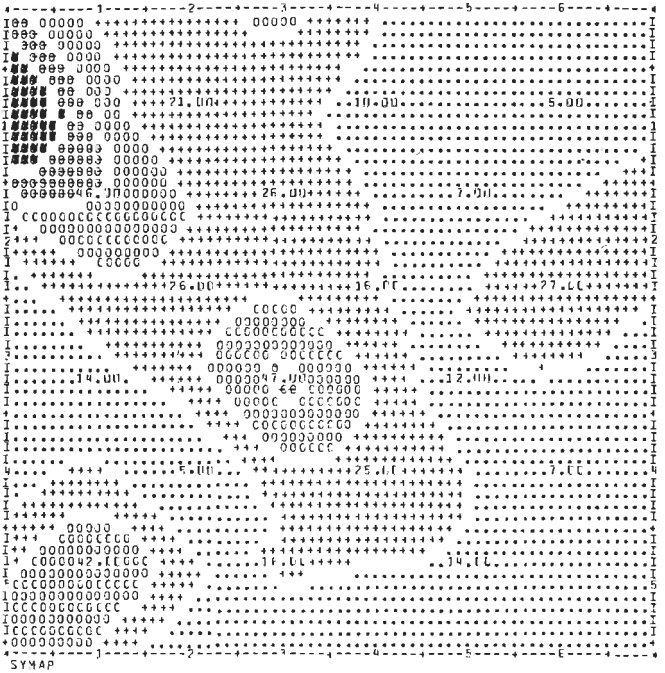


FIGURE 8
Distribution of fire-cracked rocks (V6).

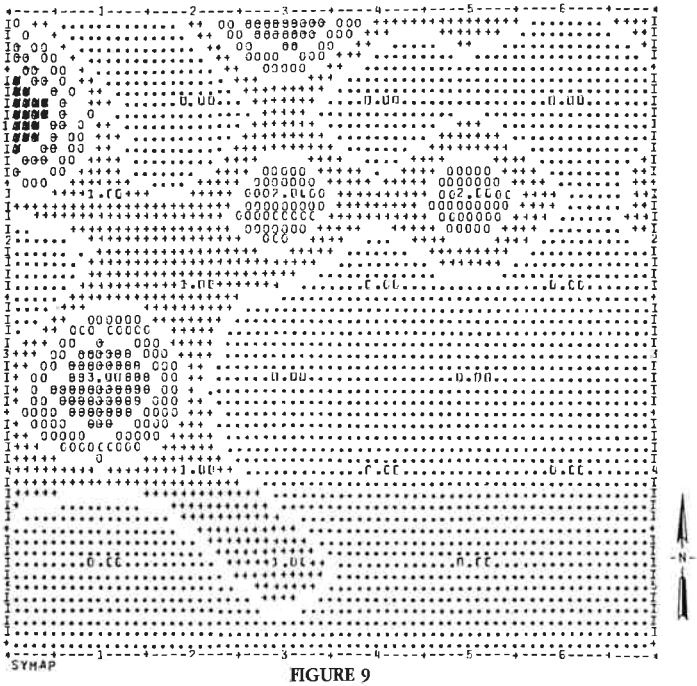


FIGURE 9

Distribution of stone tools (V7). Note the small n, and the absence of stone tools over most of the mound surface.

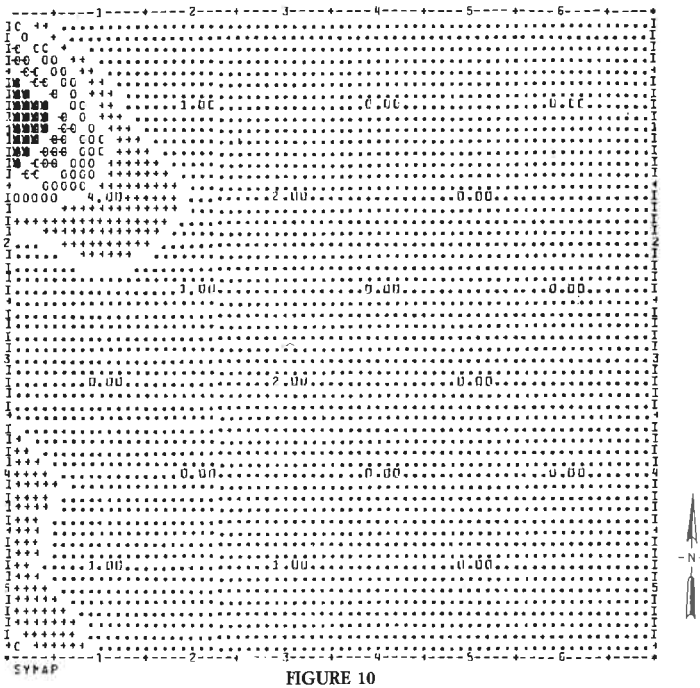


FIGURE 10

Distribution of pumice (V8). Note the small n, and the absence of pumice over most of the mound surface.

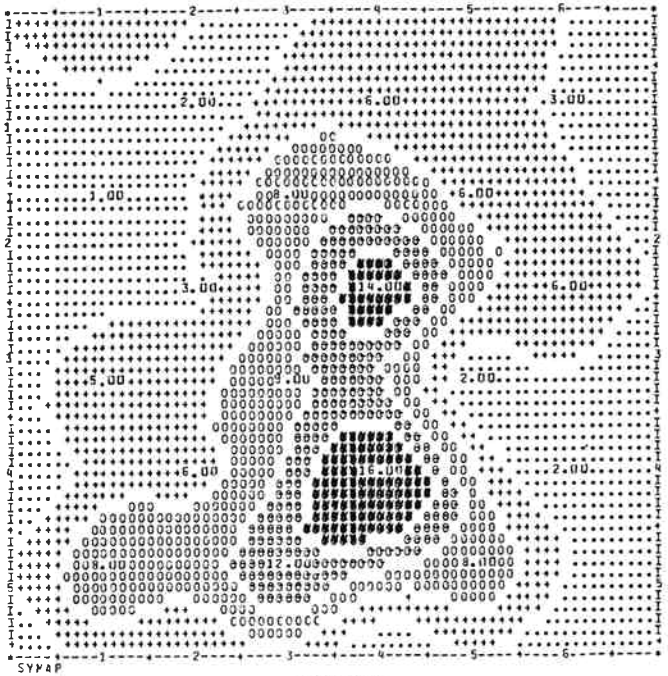


FIGURE 11
Distribution of obsidian (V5).

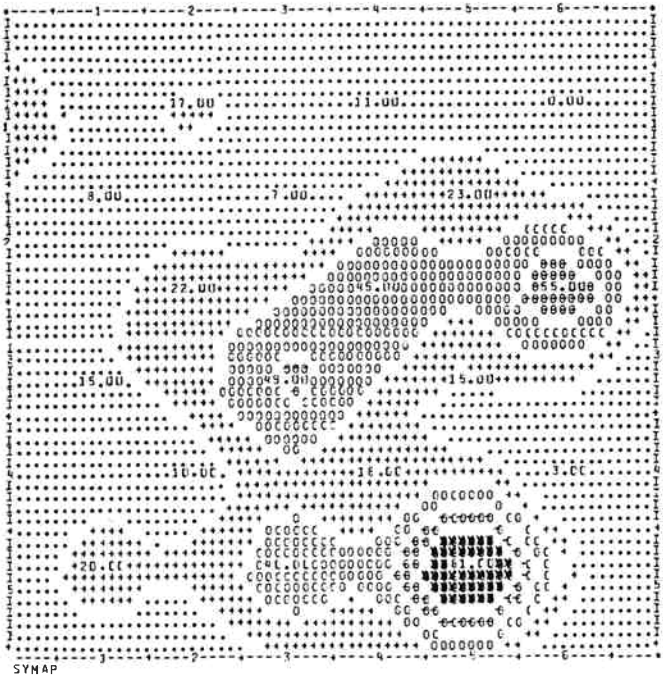


FIGURE 12
Distribution of faunal remains (V10).

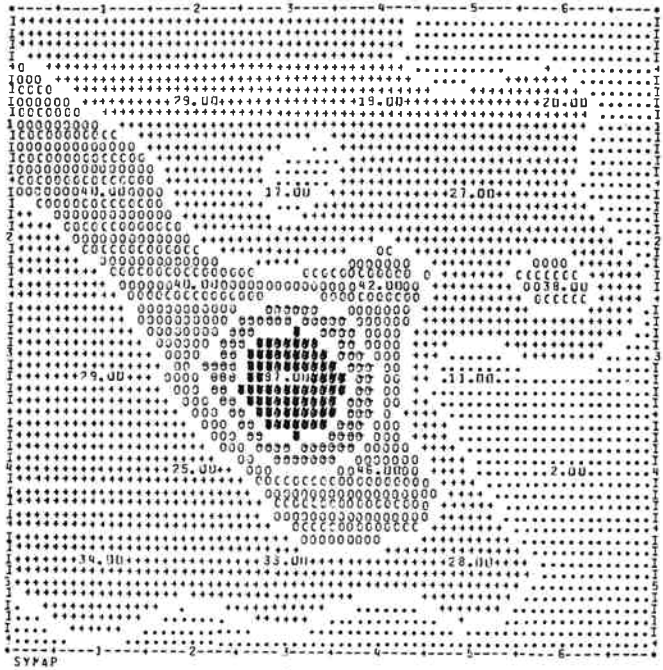


FIGURE 13
Distribution of coral (V9).

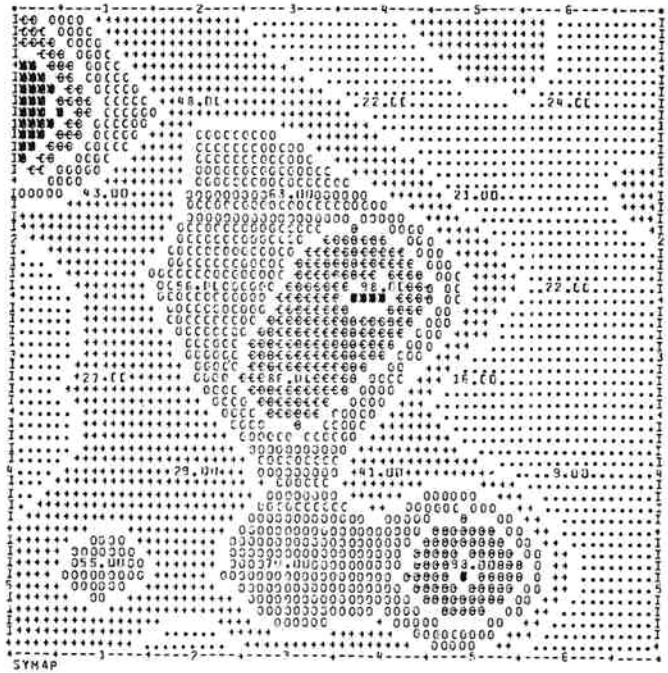


FIGURE 14
Distribution of rim sherds (V3).

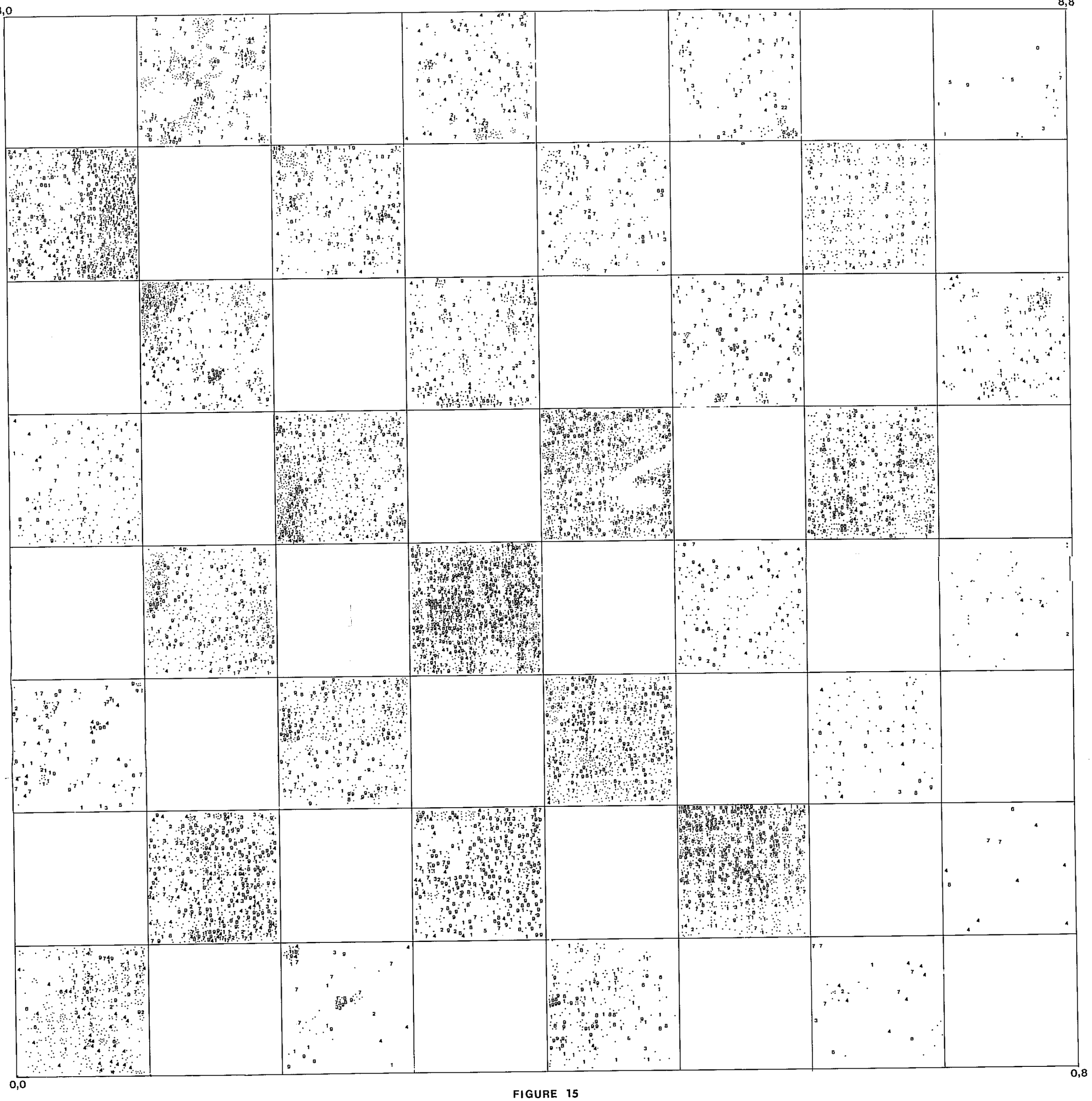
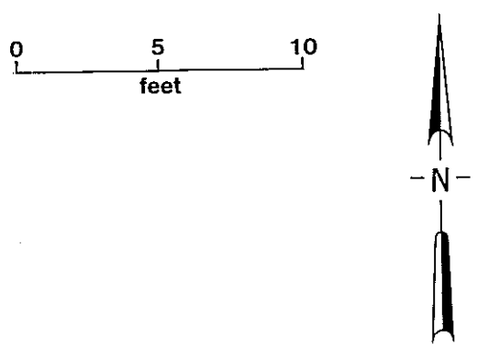


FIGURE 15



DISTRIBUTION OF SURFACE MATERIALS

SCORPION MOUND, UTILA ISLAND, HONDURAS, C. A.

⁘ - plain body sherds
1 - rim sherds
2 - decorated sherds
3 - obsidian blade
4 - rock .. unmodified
5 - stone tool
6 - pumice ball
7 - coral
8 - animal bone
9 - shell
0 - metate

'SCRAP' OR TOOLS: A CLOSER LOOK AT *STROMBUS GIGAS* COLUMELLA ARTIFACTS

By Douglas V. Armstrong

Introduction

There has been some question whether the *Strombus gigas* columella[1] fragments frequently found in archaeological middens in the Caribbean are tools or merely shellfish refuse, scrap, or casually deposited, water-washed shell. Archaeological data from the Sugar Factory Pier Archaic middens on St. Kitts (Goodwin 1978a; Armstrong 1978), along with studies by Hoffman (1963, 1970), Goodwin and Walker (1975), Figueredo (1976), Tilden (1976), support the hypothesis that gouge-like columellae found in prehistoric middens are probably tools. Furthermore, this seems to be the case regardless of the presence or absence of obvious grinding or manufacturing marks. The archaeological data are supported by documentation of conch shell breakage patterns (Hoffman 1963; Armstrong 1978), by frequency counts from modern *Strombus gigas* middens (Armstrong 1978), and ethnoarchaeological observation of conchs being smashed by conch gatherers at Dieppe Bay, St. Kitts (Armstrong 1978: 45-46).

Classification

The typological classification of columella artifacts in the Caribbean is bound by restrictive use of the term 'gouge'. As used by Rouse (1960: 10-11) gouges are diagnostic markers for local chronological units or complexes (*cf.* Rouse and Allaire 1978: 347-348). The meaning of the term is also limited because of the presence of bifacial beveling on *Strombus gigas* artifacts specific to the Manicuaroid Series of the northern Venezuelan Coast (Rouse and Allaire 1978: 452-455), and of unifacial beveling on artifacts from the Redondoid Series of Cuba (*id.* 472). Because recently documented *Strombus* columella tools from other areas in the Caribbean do not meet the morphological criteria of the type site artifacts, they have been relegated to a 'modified shell' classification (Rouse 1960: 15), or, alternatively, they have been described as 'gouge-like' (Hoffman 1970: *passim*), even though behaviorally they may have served as gouges.

As more detailed data on aspects of the archaeological record in the Caribbean (besides pottery) become available, it is clear that *Strombus gigas* columella artifacts are ubiquitous. Furthermore, they are present in ceramic, as well as preceramic period middens (Hoffman 1970: Pl. 4, m-r; Goodwin and Walker 1975:47, Pl. 9e). Typological classification of these artifacts (which is

[1]The thickened axes of conch shells about which the whorls are developed (after Abbott 1974:9)

tied to local chronological units) has led to confusion in describing common artifacts. Demonstrating the presence of these artifacts in much of the Caribbean area is hampered by current classifications. Since the term 'gouge' has such specific connotations, to avoid further confusion it is suggested that gouge-like artifacts be classified morphologically first as columella artifacts, with typological subclassifications developed to permit explicit description of form or function. At present I suggest '*Strombus* columella tools' as a cover term for artifacts made from the inner whorl, columella, and tip (a somewhat overlapping terminology). Included under this rubric would be tools which vary from the bifacially beveled tools of Manicuare, Cubagua Island (Rouse and Allaire 1978: 454-455), to the shell tips, picks, and drills of the Virgin Islands (Figueredo 1976; Tilden 1976). Future studies should develop a flexible classification scheme to enable distinguishing the variability in these artifacts.

The Archaeological Data Base

Among the artifacts comprising the tool kit of the more recent Archaic midden at the Sugar Factory Pier site (dated 2175 ± 60 B.P.) were several ground columella artifacts of *Strombus gigas*. These occurred in a variety of forms, including one with little or no signs of manufacture (Fig. 2c). Five of these were clustered in a feature within a 2m.^{2} excavation unit (Fig. 2a-e). The majority of these columella artifacts have two ground working surfaces (Figs. 2a, b; 3; 4). They are ground to a point at the tip of the columella and have ground and beveled edges on the labial face at the other end. Hoffman (1970:11) indicates that gouge-like artifacts at the Palmetto grove site, Bahamas, have similar working surfaces. The broad beveled end may have been used much like an adze, while the tip could have been used for picking or drilling. A.E. Figueredo (personal communication) has indicated that the tips of some of the columella artifacts from the Virgin Islands exhibit wear marks suggesting use in gouging. Similar artifacts have been interpreted as evidence for woodworking and canoe building (Nicholson 1976: 264). The products of such activities have long since decomposed leaving a gap in the archaeological record. The identification of tools which were probably used in the canoe building process is an important step in reconstructing the behavioral patterns of these little-known peoples.

'Nevertheless, some Caribbean archaeologists have been hesitant to consider columella fragments from prehistoric Indian sites artifacts. This is probably due to the fact that often they do not exhibit obvious manufacture or use patterns which unquestionably would indicate their use. Most recently, Sears and Sullivan (1978:17) have questioned the classification of some shell 'scrapers, gouges, or spoons,' by MacLaury (1970: 35-36) and by Hoffman (1970: 11). Examining these artifacts under 10 to 40x magnification they found no signs of wear and suggested that these fragments appeared to be 'scrap' from the manufacture of celts (Sears and Sullivan 1978: 17).

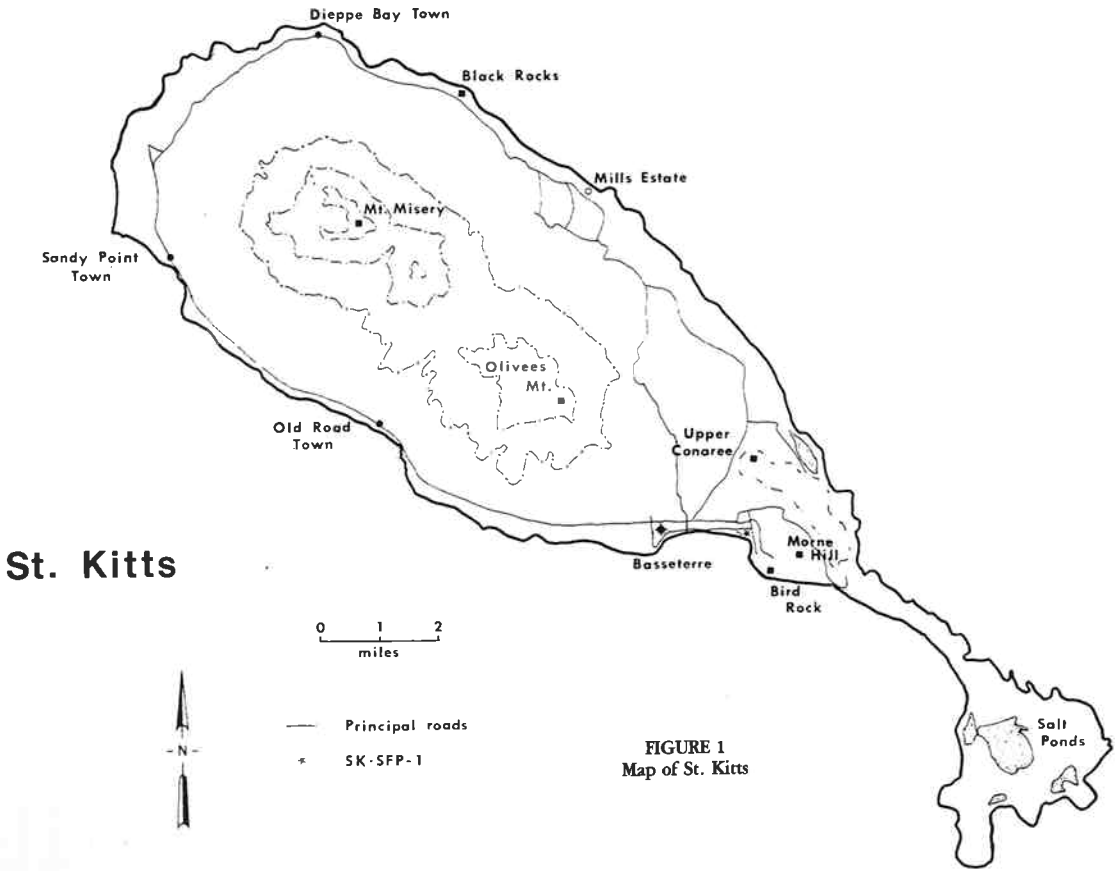


FIGURE 1
Map of St. Kitts

Sears and Sullivan approach the problem from a *typological* point of view. However, the *context* of Archaic middens indicates a very high probability that *Strombus* columella fragments were used as tools. Frequency data suggest that columella fragments are more common than other *Strombus gigas* fragments in middens. Tilden (1976) presents frequency data from the Arboretum site, St. Thomas, indicating a non-random association of 'pick-like' fragments in the midden. Those illustrated by Tilden appear not to be modified, yet their frequency in relationship to other fragments strongly suggests their probable use as tools. Figueredo (1976: 613) notes a similar high frequency of columella artifacts at Krum Bay by stating

> Los picos de concha no siempre han sido considerados artefactos en otros lugares, pero por su preponderancia numérica dentro de los restos de gasterópodos exhumados, así los consideramos.

The *Strombus* columella implements found in the St. Kitts Archaic middens also occur in greater frequency than other portions of the *Strombus* shell. One in four *Strombus gigas* fragments was a columella fragment. Unlike those from St. Thomas, the St. Kitts columellae were undoubtedly ground (Armstrong 1978: 43), and as previously noted five of the Kittitian specimens were found clustered within the same small feature indicating a behavioral association in the use of a variety of forms of *Strombus* columella fragments.

Modern Conch Middens

While participating in an ongoing archaeological survey of St. Kitts in the summer of 1978 (Goodwin, 1978b), several contemporary conch shell middens were observed by the author. The shells in these middens are usually dumped in piles on the beach. However, at Dieppe Bay and Cockleshell Bay modern middens were found where the shells had been smashed open (Fig. 5a, b). These modern middens were seen as presenting an excellent opportunity to test the nature and frequency of *Strombus gigas* columella fragments in contemporary middens.

By counting the smashed shell debris in the two small middens at Dieppe Bay it was found that 1 in 21 fragments was a conch columella (Fig. 3). Shell fragments resulting from smashed conchs have a characteristic splintered pattern and rough edges, unlike the smooth surfaces found on the St. Kitts artifacts. This supports the inclusion of the latter as artifacts, regardless of their frequency. However, typology aside, the ratio of columellae to other conch fragments is noteworthy. The ratio of columellae to other fragments is in sharp contrast to that found in the Archaic middens at the Sugar Factory Pier site, where 1 in 4 conch fragments were from columellae. Such high frequency of occurrence in middens of Archaic context on St. Kitts, and at both the Arboretum site (Tilden 1976), and Krum Bay (Figueredo 1976) on St. Thomas strongly suggests that they were selected and served as tools, both in modified

and unmodified form. The fact that shell is not ground does not eliminate its usefulness as a tool.

With the coöperation of local conch gatherers at Dieppe Bay the author observed several conch shells being smashed (Fig. 5b). This was done to discern the fracture patterns of individual conch shells. The result was a duplication of the splintery, rough-edged fragments observed also in the modern middens. For these shells the ratio was one columella in 23 fragments. This supports the hypothesis that columella fragments are located non-randomly in Archaic middens; therefore, they are probably tools.

The survey of Cockleshell Beach provided some additional information on water-washing patterns on shell fragments. While several water-washed conch fragments on the beach looked vaguely gouge-like, they had relatively thick rounded edges rather than the tapered, ground edges found on gouges in the Archaic middens on St. Kitts.

Since Sears and Sullivan (1978: 17) have suggested that columella fragments represent 'refuse' from the manufacture of *Strombus* celts, some additional observations are warranted. The first pertains simply to the technique for manufacturing shell celts. These tools are shaped from the entire outer lip or wing of the conch, which is a component of the exoskeleton and may be shattered or fractured inadvertently if the shell is smashed. To prevent this from occurring, and to enable celt manufacture, the outer lip generally is cut directly from the corpus; in this form it constitutes a celt blank (R.C. Goodwin, personal communication). Contrary to the contention of Sears and Sullivan, then, this process yields no shell 'scrap' approximating the form of the afore-mentioned columella implements. Hoffman (1963: 87) has described shell celt blanks as crude and unsmoothed, 'representing stages in the production of the shell tools.' They are common in sites throughout the area. The point is that identification of 'scrap' from celt manufacture presupposes an understanding of the technique of manufacture, and this requires both replication by experiment and recognition of like contexts *in situ*, not *a priori* typology.

Summary

Recent archaeological studies in the Caribbean area show that *Strombus* columella artifacts are found throughout the area. Archaeological data from St. Kitts support the hypothesis that since *Strombus gigas* columella fragments occur in greater frequency than expected from the normal breakage of *Strombus* shell, they were probably used as tools. These data are substantiated by documentation of breakage patterns in modern conch middens and by observations of shell breakage characteristics. Problems encountered due to the specificity of the term 'gouge' are discussed, and the term '*Strombus* columella' is suggested as a cover term for the variety of gouge-like conch shell artifacts encountered in middens from a variety of time periods throughout the

Antilles. Finally, it is pointed out that viewing material remains as 'scrap' without a baseline of empirical observations may result in the destruction of behaviorally significant archaeological data. In this vein, there is clearly a need for future replication studies.

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FIGURE 2
Gouge-like artifacts from the columella of *Strombus gigas*.
These artifacts were found clustered in unit III (feature 17-602, artifact numbers 17-5074a-e).

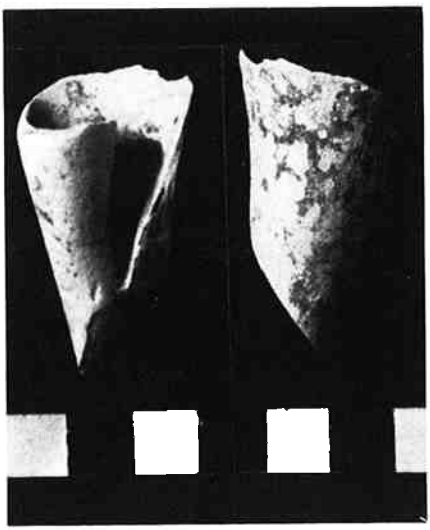

FIGURE 3
Columella artifact
(17-5074b).

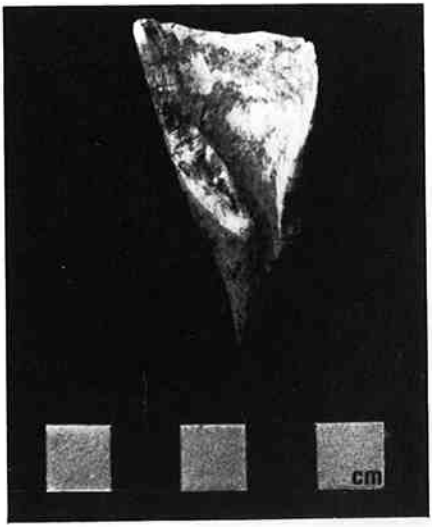

FIGURE 4
Columella artifact
(18-5030).

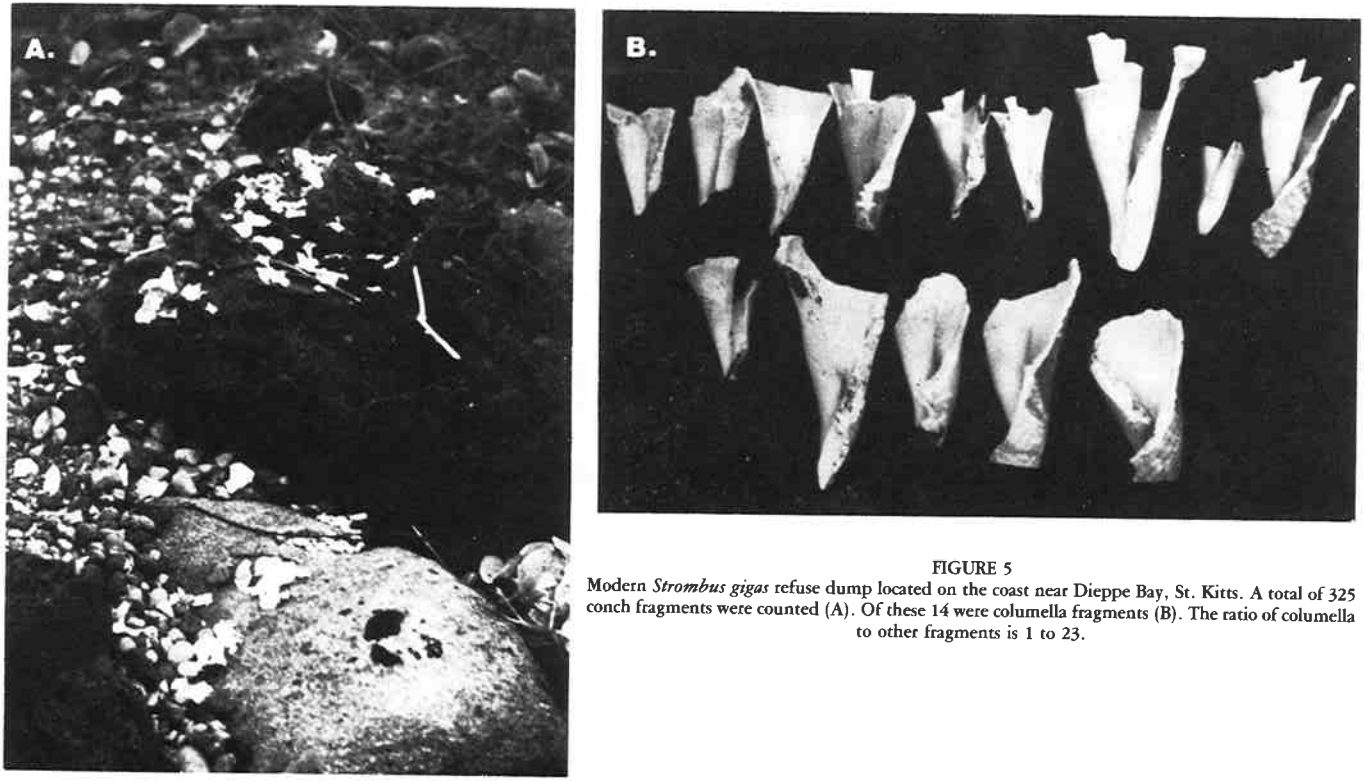

FIGURE 5
Modern *Strombus gigas* refuse dump located on the coast near Dieppe Bay, St. Kitts. A total of 325 conch fragments were counted (A). Of these 14 were columella fragments (B). The ratio of columella to other fragments is 1 to 23.