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A Spatial Analysis of Sugar Plantations on St Eustatius N.A

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A SPATIAL ANALYSIS OF SUGAR PLANTATIONS ON ST EUSTATIUS, N.A.

A Thesis

Presented to

The Faculty of the Department of Anthropology

In Partial Fulfillment

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by

James A. Delle

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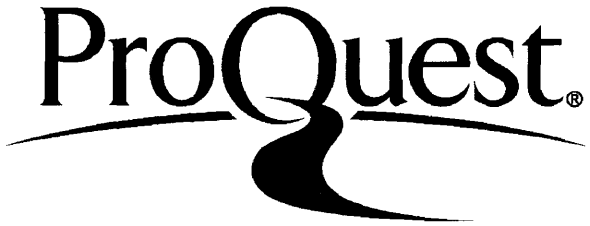

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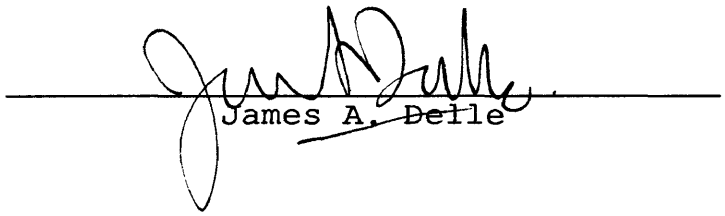

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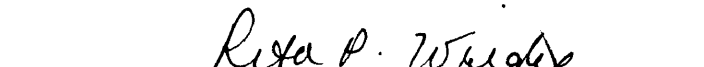

Rita P. Wright

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ABSTRACT

This paper analyzes the spatial effects of the early modern sugar economy on a particular island, St. Eustatius. In the processing of doing so, several theoretical approaches to the study of historical archaeology are discussed in the introductory chapter one. Chapter two presents a brief historical analysis of the development and expansion of the European economic order in the Atlantic, focusing on the Portuguese, Spanish, and Dutch contributions to the development of that economy in the fifteenth, sixteenth, and early seventeenth centuries. Chapter three discusses how the sugar economy manifested itself physically across St. Eustatius, by examining the settlement pattern of sugar plantations across the island as revealed by several historic maps as well a survey of the island conducted in 1988. Chapter three also examines the internal settlement pattern of a representative plantation, Fair Play. Chapter four is a

series of descriptions of potential plantation sites extant on St. Eustatius in 1988. The final chapter presents several conclusion about the effects of the sugar economy on St. Eustatius.

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A SPATIAL ANALYSIS OF SUGAR PLANTATIONS ON ST. EUSTATIUS, NETHERLANDS ANTILLES

CHAPTER ONE:

INTRODUCTION

This study concerns the physical manifestation of one element of the economy of early modern Europe, namely the sugar plantation. The analysis of this particular mode of production is critical to an understanding of the evolution of European culture in the western hemisphere, for as sugar cane can only be produced in tropical and semitropical climates, its cultivation required adaptation to climatic zones previously alien to Europeans as well as Africans. The sugar plantation was the tangible expression of this adaptation and its affects on the complex relationships among European markets, economic imperialism, and African slavery.

Because in many places the physical remains of the plantations are the best surviving historical resources, the methodology of historical archaeology is the most useful way to approach the study of these manifestations of the early European world economy. This study takes such an approach. Before examining the evidence, however, it is necessary to outline some of the more useful theoretical developments of the field which have influenced the methodology of this study.

Historical archaeology is by its nature an interdiscipline; as such it suffers from a sort of parental

neglect. Partisan historians generally disregard, ignore, misunderstand, or reject the results of historical archaeologists while prehistoric archaeologists often consider the work of historic archaeologists as naive, methodologically flawed, or outside the realm of archaeological investigation. Many historical archaeologists, especially those considered pioneers in the field, are painfully aware of this schism between the historic and the archaeological. Needing academic and financial support, they have turned to the unwilling parent more likely to understand their site reports and conclusions, pre-historic archaeology.

The development of this loyalty to pre-history has unfortunately stunted the growth of historical archaeology as an independent, truly interdisciplinary academic field. To take an influential example, in his exuberance not only for promoting historical archaeology, but for "contributing to method refinement and theory building in archaeology generally," Stanley South seeks to interpret "cultural processes from historic site patterns without dependence on historical controls." In doing so, South hopes to remove the "crutch" of documentary research which is in danger of "bastardizing the archaeological profession."[1] Although South's dedication to method and theory building may be admirable, his priorities are askew. While attempting to

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[1] South, Stanley. Method and Theory in Historical Archaeology. New York: Academic Press, 1977.

refine analytical methodology, he rejects historical methodology, and worse yet, fails to ask significant historical questions.

This failure is not one of ingenuity nor of integrity on the part of Stanley South. It does, however, demonstrate a lack of historical sophistication, a deficiency which South here is proselytizing. This is the unfortunate result of departmental polarity, for as Karamanski suggests, few historians have been trained in material culture studies, and few archaeologists have received training in the principles of historical research.[2] This isolation of disciplines has resulted in what James Lett considers as incommensurable paradigms between historians and archaeologists[3] and leads away from mutual enlightenment. Rather than engaging in profitable debate, archaeologists too often criticize historians for being historians, and historians condemn archaeologists for being anthropologists. At the core of this rift are the differing goals of the two disciplines: historians search for the particular while archaeologists search for the general. Historical archaeology, in its ideal position in the academic community, would promote the healing of this rift by a tangible synthesis of archaeology and

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[2]Karamanski, T.J. History and historical archaeology: A fur trade perspective. In A. Ward (ed) Forgotten Places and Things. Albuquerque: Center for Anthropological Studies, 1970.

[3]Lett, James W. The Human Enterprise: A Critical Introduction to Anthropological Theory. Boulder: Westview Press, 1983.

history, the particular with its context.

However, a full twenty years after Clyde Dollar called for the introduction of historical methodology into the field of historical archaeology,[4] James Deetz has found it necessary to make the same call.[5] Unfortunately Dollar's early call tended to be a bit too rhetorically extreme in leaning the case too far to the side of the historians, alienating the anthropological conscience of historical archaeology. In contrast, Deetz calls for a true synthesis of methodologies. In his 1988 article, Deetz makes several observations with implications crucial to such a synthesis. First among these is the simple statement that anthropologists and historians often ask different questions. In order to answer these different questions, historians and archaeologists turn to different data sets; the historians to the documents, the archaeologists to material culture. Rather than provoke academic fisticuffs with Southian rhetoric, Deetz offers the suggestion that historical archaeologists can--indeed must--analyze both data sets successfully in constructing viable interpretations.

Deetz' work at Flowerdew Hundred is an example of how

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[4]Dollar, Clyde. Some thoughts on theory and method in historical archaeology. In R. Schuyler (ed) Historical Archaeology: A guide to Substantive and Theoretical Contributions Farmingdale: Baywood Publishing, 1978.

[5]Deetz, James. American historical archaeology: Methods and results. Science 239:362-367 (1988).

documentary and material culture research can compliment each other. Using documentary and material sources, Deetz demonstrates the development of spatial relations between buildings and their occupants over an approximately eighty year period. The documents, in this case primarily probate inventories, suggest that large houses, which he defines as those with more than seven rooms, decreased in frequency of construction between 1680 and 1720, while the construction of intermediate sized houses, of four to seven rooms, increased in frequency. By creating the pattern of Colono ware occurrence, Deetz is able to suggest a spatial change contemporary with the trend towards smaller houses. As dwellings tended to be smaller, servants and black slaves tended to be quartered in separate dwellings. This interpretation demonstrates that a synthesis between documentary and archaeological research is indeed possible.

Dollar states[6] that all historical archaeology must be architectural in orientation and reconstructive in purpose, and although this statement is a bit too absolute, some of the best work in historical archaeology has indeed been so oriented. Beside Deetz' study at Flowerdew Hundred, Carson, Barka et al. have done enlightening work on the nature of earthfast architecture in the Chesapeake region. In this study, three historians and two archaeologists co-operated to

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[6]Dollar, 1968.

redefine the vernacular architecture of the early European Chesapeake. [7] Similarly, Fraser Neiman relied on primary and secondary documentary to complement his archaeological work at Clifts Plantation.[8] In each of these cases, the documents answered questions that archaeology could not, and the excavation of the earthfast buildings recognized significant variables that the documents could not reveal.

If there is to be a synthesis between archaeology and history, and if historical archaeology is to survive as a viable discipline, archaeologists must turn to historians, particularly historians of vernacular architecture, for support. The unfortunate truth of the matter is that too few historical archaeologists have been trained in historical methodology, and too few programs encourage such training. Until historical archaeologists are trained both as historians and as archaeologists, the field must not alienate historians by publishing ambiguous accounts in what are perceived by historians as obscure journals, as Whittenburg accuses[9] but rather must turn to sympathetic historians for help with

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[7]Carson et al. Impermanent architecture in the Southern American colonies. Winterthur Portfolio 16:135-196 (1981).

[8]Neiman, Fraser. Domestic architecture at the Clifts Plantation: The social context of early Virginia building. Northern Neck Historical Magazine 28:3096-3128 (1978).

[9]Whittenburg, James P. But what does it mean? A historian's view of historical archaeology. In Ward, A (ed) Forgotten Places and Things Albuquerque: CAS, 1983.

documentary research. As Dollar reminded us so long ago,[10] the bulk of historical archaeology involves buildings of some kind. This fact, coupled with the historical training and interest in material culture of many vernacular architecturalists makes work like Carson et al., and Neiman especially valuable to historical archaeology.

With this historical/architectural focus in mind, the question turns to the definition of the unit of study in a comprehensive project. Traditionally, historical archaeologists have considered this unit to be the household. However, this term, and therefore the unit, defies specific definition. By "household" does the archaeologist mean the total real estate controlled by the head of a family? Does it mean the family unit itself and the activities engaged by its several members both at a domestic site and away from it? According to the American sage Noah Webster, a household is "those who dwell as a family under the same roof." If we take this for the definition, then the scale of analysis would differ greatly between a wealthy but childless planter, and a poor but prolific yeoman. The definition obscures further with the consideration of slavery. Are slave families part of the planter's household, considered households of their own, a synthesis of both, or none of the above?

Although the definition of household remains obscure, it

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[10]Dollar 1968.

is evident that the smallest self contained unit of possible analysis is the most expedient and thus the most accessible, given the economy of contemporary archaeology. This is not necessarily incompatible with the study of social and economic networks, for these networks can be significantly studied through the analysis and comparison of distinguishable individual units. However, full excavation of numerous sites is painstakingly slow and prohibitively expensive. Although complete excavation by its nature provides the greatest amount of archaeological data, good comparative work can be done and preliminary conclusions may be developed without completely excavating numerous sites. For example, in Mrozowski's work which identifies the household as "part of larger kin networks that can mediate economic exchange,"[11] excavated material from select households suggest the role these individual units played in larger social and economic systems. The material culture goes beyond suggesting that matching sets of pearlware or porcelain demonstrate economic status differentiation; indeed this stratification can be reconstructed through the analysis of probate inventories, tax records, deeds, and other extent documents. In Mrozowski's model, the presence of mass produced Staffordshire wares in lower status sites reveals the changing consumption patterns in the eighteenth and nineteenth

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[11]Mrozowski, Stephen. Prospects and perspectives on an archaeology of the household. Man in the Northeast 27:31-49 (1984).

centuries, as products that were once restricted to higher economic strata became accessible to lower strata. Mrozowski indicates that in order to construct an understanding of economic networks, the analysis of a limited assemblage at a few sites provides enough archaeological data to complement the documentary evidence.

Riordan and Adams provide a more sophisticated analysis of individual units within an economic network (Riordan and Adams 1985).[12] Significantly, before discussing their data and results, the authors address several archaeological biases inherent in an economic analysis which deserve consideration. First among these is the question of what survives in an archaeological sample. Many commodities that would be useful in revealing economic networks do not survive in the archaeological record, such as cloth, food, and paper. In their study of nineteenth and twentieth century sites, the distinction between glass manufacturer and bottle filler is obscured by the widespread use of paper labels, which are outlived in the record by the bottles to which they once adhered. As bottle fillers often marked only the paper labels, any information about them will not appear archaeologically. Thus any analysis of bottle fillers must be limited to documentary sources[13].

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[12]Riordan, T.B. and W.H. Adams. Commodity flows and national market access. Historical Archaeology 19:2:5-18 (1985).

[13]Ibid.

Leedecker et al. further clarify the limitations of unit analysis when they assert "the socioeconomic character of the household and its ability to consume should be examined relative to the overall household structure, including the presence of lodgers and secondary wage earners and the stage of household development."[14] In this statement the authors raise several issues which must also be considered during any household level analysis. The authors believe that the presence of lodgers affects artifact assemblages disproportionately to the effect on the income of the household. Secondary wage earners will similarly distort assemblages, but presumably to a lesser extent than lodgers. Finally, the stage of household development may affect assemblages as a household accumulates (or loses) wealth as it ages.

The assertions made by Leedecker et al. and by Riordan and Adams suggest that an economic network analysis based on individual units of study must be considered in light of data set shortcomings. Before developing any conclusions based in part on the sugar plantation as unit of analysis, a specific set of difficulties must likewise be considered. First and foremost, plantations were at once producing as well as consuming units, thus artifacts will be found that reflect

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[14]Leedecker, Charles et al. Nineteenth-century households and consumer behavior in Wilmington, Delaware. In S. Spencer-Wood (ed) Consumer Choice in Historical Archaeology. New York: Planum Press, 1985.

consumption and production simultaneously; a prime example being the large copper pots in which sugar cane was reduced. Plantations will exhibit activity areas that are at once domestic, agricultural, and industrial. Unlike some other industrial sites, pottery factories for example, the primary products of the plantations, rum and sugar, are perishable, and therefore will not survive directly in the archaeological record. Finally, sugar plantations by their nature as a mode of production required a considerable labor force which was simultaneously transient and consistent, as indentured servants left at the conclusion of their indenture and slaves died and were replaced at phenomenal demographic rates. Despite this inherent complexity, the sugar plantation was, and is, a critical unit within a complex economic network. In order to better understand that network, the individual unit must be analyzed.

This work proposes to define individual units, plantations, on an individual island, St. Eustatius, by identifying diagnostic architectural features. Linda France has documented the nature of sugar processing thoroughly enough to suggest the types of features that can be considered diagnostic. They are: 1. wind or animal power mills to crush sugar cane; 2. boiling houses in which cane juice was reduced into solid form; 3. curing houses in which molasses was allowed to seep out of the solidified cane, further clarifying it into an exportable form. France also suggests several

peripheral features expected to be associated with plantations: 1. cisterns and/or wells; 2. animal pens; 3. dwellings; 4. associated outbuildings. The present work seeks to define extant plantation sites using these diagnostic and peripheral features as guide.

There is a final type of feature that should be briefly mentioned here: slave quarters. Although there is documentation that slaves were quartered in individual villages associated with plantations,[15] and a period sketch establishes the potential configuration of these houses (figure 1.1), no slave quarters have been positively identified to date. Excavation extensive enough to properly define these structures is beyond the scope of the present work.[16]

The following "Spatial Analysis of Sugar Plantations on St. Eustatius, Netherlands Antilles," will, as a piece of historical archaeological scholarship, be based on the analysis of documentary information, secondary source research, and archaeological data collected during the 1988 field season. This data results from a very basic Phase I

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[15]Zimmermann the elder writes in a seventeenth century correspondence: "On each plantation there is usually a village of thirty to forty little huts...where the [slaves] live."

[16]Norman F. Barka, personal communication.

survey of possible plantation sites on St. Eustatius; its analysis is primarily architectural in focus. The individual plantation is the unit of study, spatially, and in the context of the Atlantic sugar economy. Special attention is focused on the production and distribution of sugar and sugar products, and the cultural consequences which followed.

This thesis is divided into five chapters, this introduction serving as chapter one. Chapter two is a brief narrative focusing on the Atlantic economy which developed from the European economic order in the fifteenth and sixteenth centuries, and the role sugar played in the development of that economy. Chapter three is an examination of the settlement pattern of plantations on St. Eustatius, based on several historic maps which identify and locate the plantations. The internal settlement pattern of sugar plantations is discussed, using the plantation Fair Play as illustration. Chapter four is a presentation of the data accumulated during the 1988 field season, and includes plans of the potential sites identified by diagnostic and peripheral features.

FIGURE 1.1

Eighteenth century slave quarters on St. Eustatius (Zimmermann letter).

FIGURE 1.2

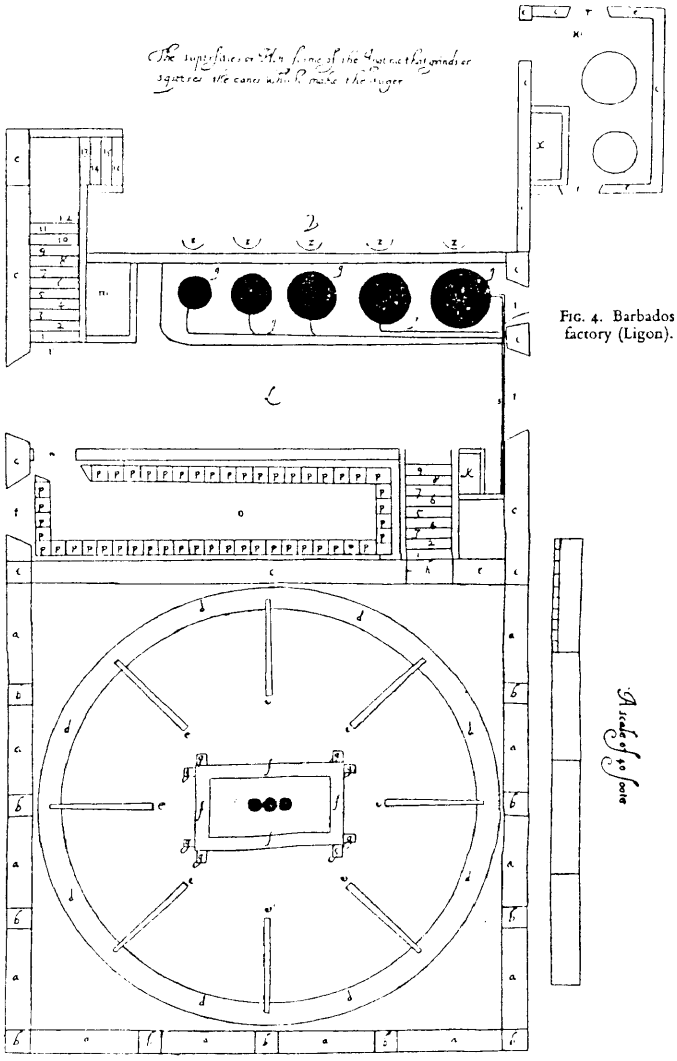
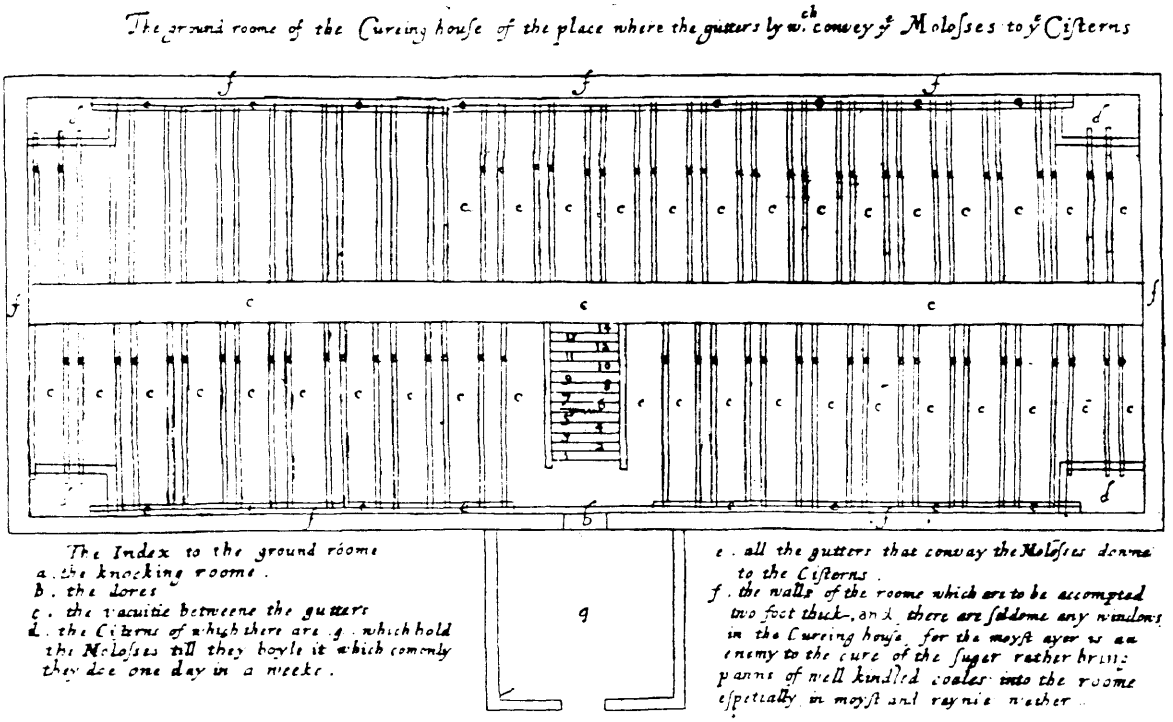


FIG. 4. Barbados factory (Ligon).

Eighteenth century boiling house, curing room, and animal mill. (From Deerr)

FIGURE 1.3



Eighteenth century curing house (From Deerr).

CHAPTER TWO:

SUGAR AND THE DEVELOPMENT OF THE EUROPEAN ECONOMIC ORDER

In order to understand the development of sugar plantations in the Dutch Caribbean, it is necessary to place their existence in historical context by first outlining the expansion of the European economy into the Atlantic, which began long before Columbus. The famous Caribbean landfall of Christopher Columbus was a result of the westward expansion of that economy which began as a western European search for wealth; it did not signal the beginning of an Atlantic economy nor did it represent the genesis of European long-distance trade. Rather, Columbus' achievement in 1492 was a corollary to an expanding Atlantic order which at the time was dominated not by the Castilians who sponsored his voyages, but by the Portuguese.

European long-distance trade itself had existed for centuries, dominated by extra-European agents who provided gold from sub-Saharan Africa, silks and gems from China, and spices from the Indonesian archipelago. In 1488 Bartholome Diaz returned triumphantly to Portugal, having successfully rounded the Cape of Good Hope, thereby opening a direct route, unmediated by extra-Europeans, to the sources of eastern wealth. In was in this context that Columbus sought an

alternative western route to Japan. The Portuguese, to whom Columbus first turned for sponsorship, had the ability to attempt the Indies by rounding the Cape of Good Hope, and knew Columbus greatly miscalculated the distance between Europe and Japan. In the belief that the search for wealth would be better focused to the south, the Portuguese crown rejected his proposal.[17]

Despite vast miscalculation, contemporary overshadowing by Diaz, and the failure to secure Portuguese support, Columbus' achievement was greater than that of his rival Diaz, not because it was more daring, nor because it was immediately more profitable, nor even because it led eventually to the influx of Mexican and Peruvian specie that momentarily propelled Spain into political dominance in Europe. The greatest significance of the 1492 landfall was that it provided Europeans with the opportunity to consciously create a new social, political, and economic system in a region that would in a very short span of years become completely dominated by that new order. In the Caribbean basin the agent for that new order was sugar.

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[17]Williams, Eric. From Columbus to Castro: the History of the Caribbean: 1492-1969. London: Andre Deutsch Ltd., 1970, pp. 13-17.

I:The Portuguese search for wealth.

The rise of the European Atlantic order began with Portuguese overseas expansion in the fifteenth century. The role played by the Portuguese in the early stages of European expansion was critical, for of all the rival Christian powers developing in the fifteenth century, it was Portugal that first expanded southwest into the Atlantic. The Portuguese were the first to round Cape Bojador, long the southern extent of European geographic knowledge. It was the Portuguese who first reconnoitered sub-Saharan Africa; it was the Portuguese who first rounded the Cape of Good Hope to establish direct maritime trade with Asia; and of great significance, it was the Portuguese who both introduced sugar cultivation to the Atlantic and who initiated direct European involvement in the African slave trade.

Interpretations of the pioneering role played by the Portuguese in Atlantic expansion have been variously based on geography, social stratification, technology, politics, and economics.[18] Although good arguments have been made in each of these interpretations, the two most significant contributions of the Portuguese were economic: the introduction of sugar

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[18]Diffie, B.W. and G.D. Winius. The Foundations of the Portuguese Empire:1415-1580 (2 vols.). Minneapolis: University of Minnesota Press, 1977, pp.xii-xvi. See also Davis, R. The Rise of the Atlantic Economies. Ithaca: Cornell Univ. Press, 1973, pp. 1-4; and Rawley, J.A. The Transatlantic Slave Trade. New York: Norton 1981, pp. 22-24.

cultivation to the Atlantic, and the transportation of black African slaves on European ships. The primary analytical focus of Portuguese expansion must therefore be economic.

The beginning of Portuguese expansion depended on the existence of a maritime merchant class and a significant shipbuilding industry. The development of both was encouraged in the fourteenth and fifteenth centuries by a shifting emphasis from corn production for internal use to the production of export commodities for northern Europe, specifically cork, wine, olive oil, fruit, honey, and wax. This economic shift had a dual impact on Portugal. From the mid-fourteenth century, Portugal was a grain importing country, whose main source for corn was Muslim Morocco. Secondly, the increase in Atlantic shipping, both in exporting commodities to the north and importing grain from the south, initiated an economic and political shift from the traditional landed nobility to the developing merchant class. In 1385 a power struggle between the commercial interest and the landed nobility culminated in a violent dynastic war. The merchant-backed Joao of Aviz prevailed over the nobility's candidate, Juan I of Castile; the merchant interests thereby secured an influential place in the new economic and political order, equal to, if not superior to, the old nobility.[19]

Actual Portuguese expansion began in 1415 with the

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[19]Davis (1973), pp. 2-4; Diffie & Winius, PP. 24-26.

capture of Ceuta, a city on the north coast of Africa (figure 2.1). Ceuta was a major center of the overland trans-Saharan trade, which brought commodities such as malaguette pepper, ivory, slaves, and gold from sub-Saharan Africa to the Mediterranean. Eric Wolf suggests this trade was so successful that in 1400 as much as two thirds of the Old World bullion supply had originated in sub-Saharan Africa.[20] By capturing Ceuta, a terminal on the caravan routes, the Portuguese hoped to wrest some control of this profitable trade from the Muslims. The conquest of Ceuta in itself was a marginal strategic victory. Although Ceuta fell in a single day, and immediate profit was made by looting the city, the Portuguese were unable to develop any significant role in the trans-Saharan trade. The existing complex trade networks allowed other North African cities, notably Tunis and Tlemcen, to absorb that part of the trade lost with Ceuta. The expedition was successful to the degree that it encouraged the Portuguese to seek an alternative strategy to secure profit from the Saharan trade: holding Ceuta while advancing along the Atlantic coast of Africa, circling around the Muslims to the source of sub-Saharan wealth.[21]

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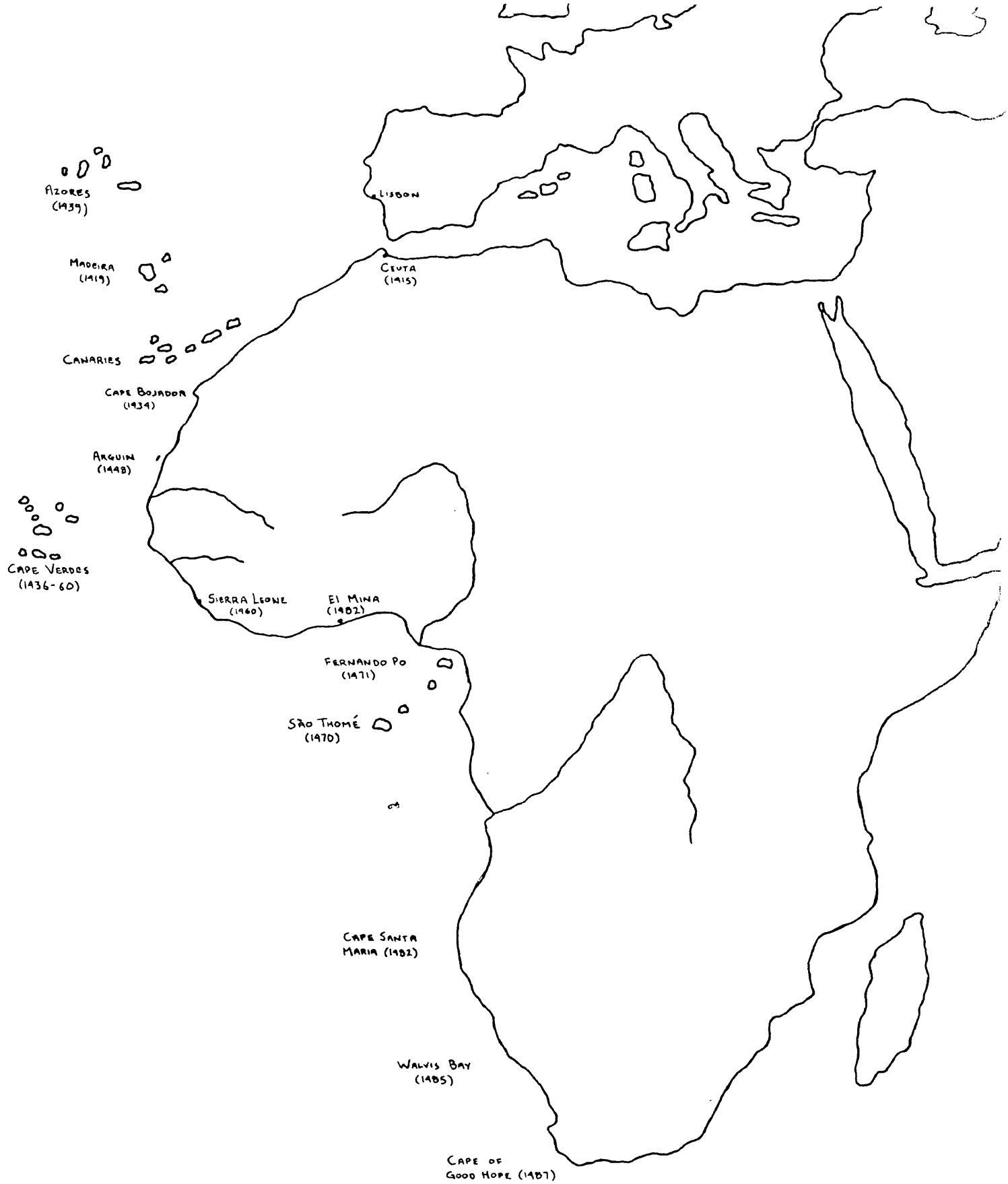
[20]Wolf, E.R. Europe and the People without History. Berkeley: Univ. of California Press, 1982, p. 38.

[21]Diffie & Winius, pp.46-50.

OVERLEAF: FIGURE 2.1: Portuguese expansion in West Africa.


AZORES
(1439)
MADEIRA
(1419)
CANARIES
CAPE BOJADOR
(1434)
ARGUIN
(1448)
CAPE VERDES
(1436-60)
LISBON
CEUTA
(1415)
SIERRA LEONE
(1460)
EL MINA
(1482)
FERNANDO PO
(1471)
SÃO THOMÉ
(1470)
CAPE SANTA
MARIA (1982)
WALVIS BAY
(1485)
CAPE OF
GOOD HOPE (1487)

It was this goal, this search for wealth south of the great desert, that led the Portuguese into the Atlantic. The years following the capture of Ceuta saw a series of Portuguese geographical advances, which signified the beginning of European expansion into previously unfamiliar territory. As the nature of European expansion depended on the Portuguese model for example, it is necessary to briefly outline the chronology of the Portuguese Atlantic conquests.[22]

Portuguese expansion into the Atlantic itself began with the occupation of the uninhabited Madeira Islands between 1418 and 1425.[23] In 1424-25, the Portuguese attempted a conquest of Grand Canary, failing partially from strong political pressure from Castile, which had already claimed the Canaries, but primarily from fierce resistance from the Canary Islanders themselves. Cartographic evidence suggests that by 1427 the Portuguese had detailed knowledge of the Azores, but it is unclear whether they had established a foothold on the islands by this date.[24] It is clear, however, that by 1430, a permanent Portuguese settlement had been established in the

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[22]For a visual summary of Portuguese expansion, see figure 2.1.

[23]Although Madeira was uninhabited during the course of Portuguese colonization, Diffie and Winius suggest that a group of Castilians may have used these islands as a stopover after Castile's initial occupation of the Canaries, perhaps as early as 1402 (Diffie & Winius 1977, pp. 47-48).

[24]Davis (1973), pp. 5-7; Diffie & Winius, pp. 57-63; Rawley, pp. 22-24.

Azores.[25]

The Atlantic island colonies were first exploited as sources for raw materials, specifically timber and dyewood. After 1430, the islands, most notably Madeira, were transformed into corn producing colonies in the attempt to relieve Portugal's dependence on grain imported from Muslim Morocco. To provide labor for this enterprise, the Portuguese resorted to slavery, first raiding the unconquered Canary Islands, and after 1434, acquiring slaves from the coast of West Africa.[26]

Gil Eannes' expedition of 1434 was one of two crucial events in the mid-1430s that directed the further course of Portuguese expansion. In that year, the mariner, sponsored by Prince Henry of Aviz, sailed a caravel around Cape Bojador, and safely returned to Portugal. This successful voyage broke a significant psychological barrier, as the Europeans had long considered Cape Bojador the southernmost point of safe navigation. To the south lay an unknown expanse of desert, as well as contrary winds which threatened the safe return of square rigged European vessels. It was not until Eannes, navigating a lateen rigged caravel, returned to Lisbon that this psychological barrier was broken. This was a hard won achievement, for in the previous twelve years, fourteen

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[25]Davis (1973), pp. 4-5.

[26]Ibid., pp. 6-8.

similar expeditions, all sponsored by Prince Henry, had failed.[27]

The second critical event of the 1430's was the failed attempt to capture the north African city of Tangier. Believing that Tangier would fall as easily as Ceuta had earlier, Prince Henry led a weakly supported attack on the city in 1437. The Muslims were well prepared to meet the Portuguese, however, and the expedition ended in disaster. While the Portuguese failed to capture the city, the defenders were able to capture Henry's brother Fernando, who was held in Tangier for the return of Ceuta, dying a prisoner in 1448.[28] The failure to capture Tangier together with the success of Gil Eannes, focused Portuguese energies further away from expansion in North Africa, and further southward past Cape Bojador.

In 1441, Antao Goncalves returned from an expedition south of Cape Bojador with a cargo destined for Prince Henry. Chief among this cargo were ten black Africans, captured as slaves. Although this small group of captive people did not signal the beginning of black slavery in fifteenth century Europe (black slaves could be bought from the Muslims in North Africa), it did represent the beginning of transportation of black slave cargos on European ships to European markets. In

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[27]Diffie & Winius, pp. 67-73; Davis (1973), pp.5-6; Rawley, pp.9-10.

[28]Diffie & Winius, pp. 70-73.

1443, a Portuguese expedition returned from Arguim Bay with another modest cargo of slaves, fourteen in all. The following year, however, a more ambitious expedition returned with a cargo of 235 slaves. The European Atlantic slave trade had begun.[29]

In the first half of the fifteenth century, the direction of Portuguese imperialism had been established. Unable to make significant gain in North Africa after the capture of Ceuta, the Portuguese turned southwest. In doing so, they established themselves in the Atlantic islands of Madeira and the Azores, initiating the cultivation of commodities to be exported back to Europe. To provide labor for their agricultural enterprises, as well as to establish a profitable trade in the Mediterranean markets, the Portuguese launched the Atlantic slave trade.

II:Portugal, sugar, and slavery.

In the second half of the fifteenth century, the Portuguese introduced large scale production of sugar to the Atlantic. Thus several decades before Columbus set off on his western adventure the emphasis of European expansion shifted from the search for wealth to the production of wealth. At the heart of this enterprise was sugar cultivation. The

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[29]Diffie & Winius, p.75ff.

Portuguese introduced the crop from the Mediterranean, where plantations existed on Sicily and Cyprus, as well as Valencia, on the Iberian Peninsula.[30] Sugar cultivation as developed in the Mediterranean was labor intensive; in the Atlantic island colonies, the source of that labor became African slavery.

It is unknown exactly when sugar production began in the Portuguese Atlantic colonies. Linda France asserts that the Portuguese were cultivating sugar cane on Madeira and in the Canaries as early as 1425; Ralph Davis suggests that some sugar was indeed cultivated on the Atlantic islands at this early date, but significant production did not commence until an influx Genoese capital was introduced in the 1460s.[31] Diffie and Winius contend that the first sugar mill was installed on Madeira in 1452.[32] Although it is difficult to date precisely the introduction of sugar cane to the Portuguese Atlantic islands, it is clear that by the 1460s, primary production on the islands had shifted from corn to sugar. In the 1460s, Madeira ceased exportation of grain to Portugal and by the 1680s began importing for internal use. Sugar exported from Madeira could be purchased in England and

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[30]Diffie & Winius, PP. 306-308.

[31]France, Linda Gail, 1982. Sugar Manufacturing in the West Indies: a Study of Innovation and Variation. M.A. thesis, College of William and Mary. Davis (1973), pp. 9-10.

[32]Diffie & Winius, p. 306.

Flanders in 1468.[33] At mid-century, the primary motivation for further Atlantic expansion was the support of sugar production and the related slave trade.

In order to encourage the growth of the sugar industry, the Portuguese needed to secure three essential elements. First as sugar cane can only be grown in a tropical or semi-tropical climate, the Portuguese needed to secure additional territory which would allow for its cultivation. Secondly, as sugar production was (and is) a labor intensive enterprise, a reliable means for procuring sufficient labor was necessary. Finally, as slavery was considered an applicable mode of labor, the Portuguese required capital enough to provide a sufficient slave population, the physical plant to support that population, and the facilities to reduce the cane into a stable transportable form.

In 1499, the year of Fernando's death, the Portuguese reinforced their presence on the coast of west Africa by establishing a feitoria (interpreted as "factory") on Arguim island. From this outpost, the Portuguese exported approximately 1000 slaves annually. Between 1456 and 1460, the uninhabited Cape Verde islands were claimed by the Portuguese. Although unimportant as an area of production in the fifteenth century, the Cape Verdes provided the Portuguese with an abundance of a type of seashell used on the African

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[33]Davis (1973), pp.9-11.

continent as currency. The Portuguese were able to trade these shells, as well as other commodities, to West Africans for slaves[34]. In 1471, the islands of Principe, Fernando Po, and Sao Thome were settled by the Portuguese, and soon became sugar producing colonies. Indeed, after 1475, Sao Thome became Europe's leading supplier of sugar and remained so until overtaken by Brazil in the sixteenth century.[35] A decade later, in 1482, a royal governor and garrison was established at the fortress of El Mina, the mine, on the Gold Coast. It was at this outpost that the Portuguese crown established the Casa des Escravos, the slave house, from which it regulated the African trade in slaves, gold, and sugar; the trade in gold alone was so lucrative that it reportedly brought five to one profit.[36] It was only a few years later, in 1488, that Diaz completed the Portuguese exploration of the west coast of Africa by rounding the Cape of Good Hope.

The Portuguese thus successfully attained their three goals by establishing sugar plantations on Sao Thome, Principe, and Fernando Po; by initiating a slave trade from Arguim and the Cape Verdes; and by establishing a trading stronghold at El Mina where vast profits in the slave, sugar, and gold trades were made, regulated, and taxed by the crown,

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[34]Diffie & Winius, pp. 308-310.

[35]Davis (1973), pp.9-10.

[36]Rawley, pp. 22-24; Davis (1973), pp. 9-15.

providing capital to invest in further expansion.

By the end of the fifteenth century, the Portuguese had established the course of the Atlantic economic order. Sugar production and the slave trade dominated the Portuguese Atlantic. In 1494 Madeira alone produced more than 2.5 million pounds of sugar[37], while Portuguese slave imports by the end of the century numbered at least 33,500 souls.[38] Despite the ascendancy of sugar, however, the pursuit of gold still guided the European imagination. It was this pursuit that dominated Atlantic expansion in the following century and it was in accumulating specie that Spain became the principal power in the sixteenth century Atlantic.

III: The sixteenth century: Spain, specie, and slaves.

The economy of the late fifteenth-century Castile that sponsored Columbus' exploits was becoming increasingly dependent on a single enterprise: wool production. The dynamics of the wool trade and its effects on the Spanish economy were crucial elements in the course of Spanish Caribbean expansion.

The most powerful segment of the fifteenth-century Spanish economy was the Mesta, an organization of sheep

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[37]Diffie & Winius p. 307.

[38]Rawley, p.25; Curtin, Philip. The Atlantic Slave Trade. Madison: University of Wisconsin Press, 1969, p.116.

raising nobility. The Mesta was successful in persuading the Crown and Cortes of Spain to enact a series of laws encouraging the husbandry of sheep at the expense of grain cultivation. The first such law, enacted by royal cedula in 1480, called for the evacuation of enclosures on communal lands in order to provide more accessible grazing land. In 1489, the Crown authorized an expansion of the sheepwalks used by migratory flocks, allowing the Mesta livestock access to previously cultivated lands. Two laws of 1491 furthered the Mesta's interest by banning all enclosures in the southern province of Granada and authorizing shepherds to cut down smaller trees in the winter to feed the sheep at times when good pasture was scarce. The latter law resulted in massive deforestation. In 1501 a land lease law allowed the Mesta the right to extend any lease it held on grazing land indefinitely while allowing the sheep owners the right to take possession of any land it had occupied for a matter of months without the landowner's knowledge.[39]

The result of the monopolistic power used by the Mesta to increase wool production was the further impoverishment of a peasantry already dependent on marginally arable land. Grain production steadily decreased. Bad harvests in 1502-08 amplified the grain shortage and forced Spain to begin the

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[39]Vinces Vives, Jaime. An Economic History of Spain. Princeton: Princeton University Press, 1969, pp. 302-303. Davis (1973) pp. 58ff.

importation of grain after 1506.[40] As Spain traditionally traded in the Levant, and as wheat could only be purchased in the Mediterranean with specie, the Spanish demand for gold and silver increased.[41] The motivation to acquire specie defined the nature of sixteenth century Spanish colonization. Rather than secure land and a labor force to produce commodities as the Portuguese had done, the Spanish sought the means to extract metallic wealth, first by conquering and plundering the existing states in Mexico and Peru, and later by extracting precious metals directly from the earth.

Like the Portuguese before them, the Spanish eventually resorted to black slavery as a source of labor, yet not for the plantations but for the mines. Three major developments encouraged the Spanish to support African slavery: the sixteenth-century demographic crisis of the American aboriginal population; strong resistance from the crown and the church against enslavement of aboriginal populations; 3. the relative independence of existing aboriginal institutions.

The decimation of the aboriginal populations of Spanish America is well documented.[42] Both Rawley and Vinces Vives estimate that the population of Mexico fell from 25 million

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[40]Vinces Vives, p.304.

[41]Braudel, Fernand. The Mediterranean (2 vols.), transl. by Sian Reynolds, NY: Harper and Row, 1973, pp. 461-74, 478.

[42]See for example Crosby, Alfred The Columbian Exchange. Westport, Ct.: Greenwood Publishing Company 1972; Ecological Imperialism. Cambridge: Cambridge University Press, 1986.

to 1 million between 1514 and 1605, representing a 90% decrease in population,[43] while Rawley estimates that the population of Hispaniola decreased from hundreds of thousands in 1492 to hundreds in 1570.[44] At the heart of this crisis were Old World diseases, mainly smallpox, measles, typhus, and influenza, to which the aboriginal population has no biological resistance. African populations had built up resistance to these Old World diseases, and were therefore better able to survive in the new ecology than the native peoples themselves.[45]

When the first conquistadors began to settle the lands and exploit the resources of the crumbling Aztec and Inca empires, they found themselves masters of an overwhelming aboriginal labor supply. Their first response was to enslave the people. However, the demographic crisis of the sixteenth century as well as the conquered peoples' status as subjects of the King of Spain, provoked resistance against aboriginal slavery from the church. As early as 1503, enslavement of aborigines was forbidden by the crown. In the place of de jure slavery, the Spanish established a system of encomiendas, which gave a Spanish lord the ownership of a certain number of people's labor, although not possession of the people

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[43]Rawley, Chapter 3, Vinces Vives p. 386.

[44]Rawley, Chapter 3.

[45]Ibid

themselves as chattel. Although this system was long lived, it never infused landlords with the economic interest or moral compunction to keep slaves alive, and accelerated the demographic crisis. Once again, African slavery proved to be a more reliable source of labor.[46]

The final consideration that led the Spanish to African slavery was the strength, albeit tenuous, of aboriginal institutions. For example, Stern describes the system at the silver mines of Potosi, in highland Peru, by which coerced Indian laborers owned the silver they mined, a holdover from the Inca system of Mita. The laborers were required to hand over a portion of their silver to the Spanish, who until the later sixteenth century had no way to smelt the ore into bullion. The Spanish therefore had to sell the ore to native smelters, who would then sell it back to the Spanish as silver. By replacing the Mita laborers with African slaves, the Spanish were better able to control production, while preventing the laborers access to significant proportions of the mined ore.[47]

Thus the power of demographics, pressure from home, and existing institutions led to the establishment of African slavery on the Spanish mainland. Although aboriginal slavery

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[46]Davis (1973), pp.43-44.

[47]Stern, Steven. Feudalism, Capitalism, and the World System in the perspective of Latin America and the Caribbean. American Historical Review 93:4 (1988).

was officially banned, it was not fully abolished in the sixteenth century. Despite the persistence of illegal Indian slavery, black slavery was the preferred labor form. In Mexico in 1540 an African slave sold for 200-300 pesos, while a comparable Indian slave sold for 20 pesos.[48]
African slavery was firmly established.

IV. The Dutch enter the transatlantic economy

It has been argued that in the sixteenth century the Hapsburg dynasty in the person of the Emperor Charles V came closer to political control of the European Continent than anyone in modern European history. In 1530 Charles had political control over the Hapsburg dynastic lands and, as Holy Roman Emperor, most of central Europe, including the Netherlands. As King of Spain he controlled the entire Iberian peninsula save Portugal. Charles also claimed nominal control of the entire western hemisphere, save the Portuguese possessions in Brazil. His aunt, Catherine of Aragon, was married to the king of England, and as Hapsburg troops occupied the Papal States, the pope's permission to allow Henry VIII a divorce seemed unlikely. As Catherine had borne Henry no sons, a descendant of Charles V would make a likely candidate for the English succession. Coupled with this

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[48]Rawley, Chapter 3.

expansive political power were great economic resources. Vast amounts of specie were pouring into the emperor's hands from his American possessions, and the richest and most powerful banking house in Europe, the Fuggers, were his personal financiers. And yet despite all this not Charles, nor Spain, nor the Hapsburgs were able to emerge from the sixteenth century in control of the European economy. By the end of that century the Hapsburgs were secondary economic forces behind "a spit of mud and sand left over from the Ice Age,"[49] the United Provinces of the Netherlands.

The failure of the Hapsburgs, especially the Spanish branch of the family, to control the European economy can be explained by a complex focusing on three developments: 1. the persistence of the Spaniards to seek metallic wealth in the Atlantic at the expense of developing commercial agriculture; 2. the inability of the Spanish to develop a textile industry on the Iberian Peninsula to finish cloth from domestic wool; 3. the loss of political and economic control of the Netherlands in the Eighty Years War.

The economic power of any entity is determined by its ability to create and control wealth. The Spanish, by concentrating on the exploitation of plundered and mined metals, chose to create wealth through a non-renewable medium with a value directly proportionate to it scarcity. By doing

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[49]Wallerstein, Immanuel. The Modern World System II. New York: Academic Press, 1980, p. 38 for quote.

so, they ensured a limit to their ability to create wealth, not simply because the gold and silver supplies eventually ran dry, but because the value of the specie decreased as more was introduced into the European economy. Furthermore, the Spanish strategy for transporting this limited wealth stunted the development of a significant carrying trade beyond the treasure fleets. In concentrating the treasure into one annual, ostensibly easily protected fleet, the Spanish inadvertently stunted the development of a significant carrying trade, while creating the opportunity for economic disasters like those in 1628 when Piet Heyn of Holland captured the treasure fleet, and 1657 when Blake destroyed the fleet of that year.

While concentrating their naval strength in protecting the treasure fleet, the Spanish simultaneously prohibited foreign merchants from trading in Spanish America. However, as the domestic Iberian economy did not produce sufficient quantity and variety of goods, and as the Mesta continually advanced the production of raw wool for export to Antwerp at the expense of domestic textile industries, what effectively was established was a monopoly of supply, but not of production.[50] This regulation led to serious shortages among the Spanish colonies, some of which would see a supply ship once every one or two years, encouraging foreign interlopers

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[50]Williams, p.50ff.

to illegally supply the colonists. The slave trade was similarly regulated; however, as the Spanish renounced any claim to the west coast of Africa in 1494, African slaves were supplied by foreign merchants granted a Spanish crown license known as an asiento. Through interloping and the asiento system, foreign merchants slowly were able to gain a commercial foothold in the western hemisphere. Among the leading interlopers were merchants from the Netherlands.[51]

The Netherlands, part of the Spanish Hapsburg possessions, developed in marked contrast to the imperial core. While the Spanish economy depended heavily on two commodities, silver and raw wool, the economic strength of the Netherlands was based in the transportation and processing of raw materials, notably Spanish wool and Baltic grain and lumber. Antwerp became the leading textile market and entrepot on the continent, while Amsterdam dominated the shipbuilding industry in sheer tonnage, as well as in shipbuilding technology. The Netherlands served as the financial and logistical base for Charles V's dynastic wars in central Europe, a circumstance which syphoned a great deal of American silver to the low countries, and further stimulated the growth of a munitions industry in Holland. Thus Spain became increasingly dependent on the Netherlands, most especially on the city of Antwerp, to support a

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[51]Rawley, chapter three.

stagnating domestic economy.

The relative decline of Spain as an economic power culminated in the Eighty Years War for Dutch Independence. The war resulted from a growing animosity between Philip II of Spain, who succeeded his father Charles V to the throne in 1556, and restless subjects in the Netherlands. Three bones of contention were at the foundation of the conflict, one religious and two economic. Philip II, a very pious Catholic, became increasingly intolerant of Protestantism. Although the Netherlands were not predominantly Protestant in the sixteenth century, Philip's Counter-reformatory zeal alienated a number of his Dutch subjects. Anti-Spanish tensions were intensified by what was perceived as a constant drain of Dutch resources to fund Hapsburg dynastic wars which had very little to do with Dutch interests.[52] The final source of trouble was the persistence of the Spanish policy of Mare Clausum which prohibited anyone but Castilians from trading with the Spanish American colonies. As Dutch shipping and overseas commerce were the basis of the Netherlands' economic viability, and as it was becoming clear that the Spanish economy depended on the viability of the Netherlands, this policy was particularly exasperating to the Dutch.

The Eighty Years War broke out when Philip sent his emissary, the Duke of Alva, to quell Protestantism in the

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[52]Davis (1973), pp. 177-193.

Netherlands. In 1568, the Netherlanders staged an armed revolt against what they perceived as a foreign invasion, but were thoroughly defeated by Alva's forces. What followed was eighty years of intermittent warfare which resulted in the independence of the United Provinces of the Netherlands in 1648.[53] Several developments during the war contributed to the growth of the Atlantic economy. A brief chronology of the more important events of the war therefore follows.

The defeat of the first revolt in 1568 resulted in a period of uneasy calm that was again broken in 1572 by a group of Dutch privateers known as the Sea Beggars. The revolt of 1572 intensified the conflict in the Netherlands; Philip responded by introducing more troops. As Antwerp remained the center of the Dutch economy, Spanish troops were concentrating in and around this city. In 1576, as a result of a Spanish crown bankruptcy, the soldiers in Antwerp were not paid. The soldiers mutinied, thoroughly sacking the city. The uncontrolled looting, burning, and pillaging succeeded in crippling the city, thereby adversely affecting the Spanish ability to process and distribute textiles, weakening its own economic base. In 1579, the Union of Utrecht established the Seven United Provinces of the Netherlands--Holland, Zeeland, Utrecht, Guelderland, Overijssel, Groningen, and Friesland. The union henceforth fought not to expel the Spanish from the

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[53]Boxer, Charles. The Dutch Seaborn Empire. London: Hutchinson, 1965, Chapter One.

Netherlands, but to establish a new political and economic entity centered at Amsterdam. This entity declared its independence when the Prince of Orange, William the Silent, renounced allegiance to Philip in 1581.

Meanwhile, Philip had by dynastic accident, ascended to the throne of Portugal. As a result, the United Provinces targeted Portuguese settlements in an internecine commercial war. After the sack of Antwerp, the European spice market had transferred from that unfortunate entrepot to Amsterdam.[54] The Portuguese spice islands in the East Indies therefore seemed a likely target. The Dutch sent a mission to the East Indies in 1592 and a trading voyage to Java in 1595.[55] The success of these ventures led to the dispatching of fourteen private trading fleets to the East Indies between 1598 and 1602. In that year, the Dutch East India Company was chartered with an initial capital of 6.5 million florins.[56] The East India trade soon became the single most successful Dutch commercial enterprise, constituting about one quarter of Dutch trade.

The success of the Dutch East India Company led to the chartering of the Dutch West India Company in 1621. In that same year, Dutch fleets conquered eastern Brazil, concentrating sugar cultivation there, and introducing new

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[54]Wallerstein (1980), Chapter Two.

[55]Ibid, Davis, p. 185.

[56]Dunn, Richard. The Age of Religious Wars: 1559-1715. New York: Norton, 1979, p. 118.

technologies, especially wind-powered mills, for reducing cane to juice.[57] The Dutch also secured footholds in Africa, taking El Mina in 1637 and occupying Angola in 1641.[58] Several Caribbean islands fell to Dutch settlement: Curacao in 1634, Saba in 1626, St. Maarten in 1630, and St. Eustatius in 1624. Despite the loss of Angola and Brazil back to the newly independent Portuguese in 1649 and 1654 respectively, the Dutch West India Company remained in control of Surinam, the Caribbean islands and El Mina, and thus remained a significant force in the transatlantic economy.

Although not as commercially successful as the East India Company, the West India Company established overt Dutch presence in the transatlantic economy. After the Spanish recognition of the independence of the United Provinces in 1648, the Dutch were an autonomous force in the Caribbean economy. They had established sugar plantations on the South American mainland and on various islands. The trading ports of Curacao and St. Eustatius thrived, as did an active interest in the transatlantic slave trade, the Dutch transporting an average 3398 slaves annually for use on both

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[57]Wallerstein (1980), Chapter Two.

[58]Davis, pp. 185ff.

Dutch plantations and for sale to other European settlers.[59] By the seventeenth century the western hemisphere was no longer solely colonized by Iberians, but like the Portuguese before them, and in contrast to the Spanish, the northern Europeans, in this case the Dutch, created wealth by the cultivation and sale of sugar cane.

Having thus outlined the development of the European Atlantic economy in the fifteenth, sixteenth and into the seventeenth centuries, analysis now turns to the physical remains of sugar plantations as they exist in the Dutch Caribbean.

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[59]Postma, Johannes. The origin of African slaves: The Dutch activities on the Guinea coast. In Engermann and Genovese (eds) Race and Slavery in the Western Hemisphere: Quantitative Studies. Princeton: University Press, 1975, pp. 33-49.

CHAPTER THREE:

SETTLEMENT PATTERN OF SUGAR PLANTATIONS ON ST. EUSTATIUS

In a recent article appearing in the American Historical Review, the historian Steven Stern suggests that the standard Eurocentric interpretations of Latin American and Caribbean history fail to adequately define the dynamics of the regional economy.[60] His article concludes by challenging scholars to define colonial modes of production distinct from the classic Marxian definitions, for neither the concepts of feudalism nor capitalism as traditionally understood serve to explain the structure and dynamics of colonial industrial and agricultural forms in place in the seventeenth and eighteenth centuries.[61]

The development of sugar plantations in the Dutch Winward Antilles clarifies the deficiencies of the world-system model in which a periphery produces cash-crops or raw materials from which a core receives a surplus. The plantation served not only as a unit of agricultural production, which would fit the peripheral definition asserted by Wallerstein[62], but as sugar

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[60]Stern, 1988.

[61]See for example Mintz, Sidney: Was the plantation slave a proletarian? Review 2:1:81-98 (1978) and Stern's discussion of mitayos as sharecroppers in Stern, 1988.

[62]Wallerstein, I. The Modern World System I: New York: Academic Press 1974; Wallerstein, 1980.

requires processing within hours of harvest, the plantation was an industrial unit as well. In order to understand the dynamics of plantation production, the sugar plantation in the Dutch Caribbean must be defined as a specific colonial mode of production.

This chapter analyzes that mode of production by looking at the settlement pattern of an individual island, establishing some conception of how the development of a specific colonial mode of production dominated land use and created a commercial planter elite. By analyzing the internal settlement pattern of a representative plantation, the dynamics of colonial production can be better understood. Given the expanse of its relatively undisturbed archaeological record, the island of St. Eustatius serves as an exceptional example.

The economic history of St. Eustatius has been analyzed by several historians who agree that the island economy was dominated by its role as a distribution center for the Caribbean slave trade, contraband, and smuggled commodities.[63] Although the importance of St. Eustatius as a commercial center cannot be disputed, evidence indicates that the island has wrongly been neglected as a sugar-producing area. Two

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[63]Attema, Y. St. Eustatius: A Short History of the Island and its Monuments. Holland: De Walburg Pers Zutphen, 1976. Goslinga, C. Ch. The Dutch in the Caribbean and on the Wild Coast 1580-1680. Gainesville: Univ. of Fla. Press, 1971. Hartog, J. History of St. Eustatius. Aruba: Central U.S.A. Bicentennial Committee of the Netherlands Antilles, 1976.

eighteenth-century maps, dated 1742 and 1775 respectively, identify numerous plantations by location and proprietor. Although it is feasible that some of these plantations produced cotton, an eighteenth century letter from a visitor to St. Eustatius back to Europe states:

There are many sugar plantations here. I visited a good number of them, most of the friends to whom I've been recommended are plantation owners, through whom I've had the good fortune to examine everything minutely...[64]

The visitor describes the houses he visits as well as the slave quarters he sees, but does not mention cotton or tobacco production. Although negative evidence cannot be claimed as conclusive, this letter asserts a dominance of sugar production over other plantation staples.

I. Geographic zones.

St. Eustatius, an island of eleven square miles, can be divided into three geographic zones.[65] The northern approximate third of the island has been for the purposes of this study designated Zone 1. This area is dominated by an

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[64]Zimmermann letter.

[65]Attema, p.14.

ancient volcano which has long since collapsed, creating a rugged, hilly zone, known as "the Hills" or "the Little Mountains." The central third of the island, designated Zone 2, is a flat plain, known as the Culture Vlatke, or cultivation plain. This area enjoys rich volcanic soil, the residue of ancient volcanic action. It stretches between the mountainous Zones 1 and 3. Zone 3, the southern third of the island, is dominated by an extinct volcano known as "the Quill," 600 meters above sea level at its highest point. The slopes of the Quill rise steeply to a fertile crater, within which is the only rain forest area on the island. There is little potable ground water available in any of the three geographic zones of St. Eustatius; the traditional source of water being rain stored in cisterns.

II. Plantations identified by geographic zone.

By transcribing the location of plantation sites from the historic maps to a modern topographic map some idea of the synchronic and diachonic settlement patterns can be deduced.

The 1742 map of St. Eustatius identifies seventy-six plantation owners, locating eighty-eight individual plantation sites across the island. Fourteen of these eighty-eight plantations lie within Zone 1, including one site atop the highest peak in the northern zone, Boven Hill. All but one of these plantations is within five hundred meters of either

the western Caribbean coast or the eastern Atlantic coast.

Zone 2 was the most densely populated section of the island according to this map, containing the only urban settlement, Oranjestad, located on the western coast. The map locates forty-seven of the eighty-eight plantations within Zone 2. As is the case with the plantations in Zone 1, those in Zone 2 are clustered near the two coasts, all but two being within a kilometer of the coast, the zone itself running 3 km east-west, and 1.5 km north-south.

The remaining twenty-seven plantations lie within the southernmost Zone 3. The sites in this zone encircle the bottom third of the Quill, all but three of these lying below two hundred meters elevation. Once again, the sites cluster near the two coasts.

The 1775 map also identifies seventy-six plantation owners, but locates only eighty-one plantation sites. Of these eighty-one sites, fourteen are located within Zone 1, thirty-three in Zone 2 and thirty-four within Zone 3. This may indicate a shift from the densely populated Zone 2 to arable plots within Zone 3. However, Patti Kandle has suggested in a recent work that there are several inaccuracies.[66] Whether the disappearance of fourteen plantations from Zone 2 and the appearance of seven in Zone

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[66]Kandle, P.L. St. Eustatius: Acculturation in a Dutch Caribbean Colony. Unpublished Masters Thesis, College of William and Mary, 1984.

3 can be attributed to such a population shift or can be written off as inaccuracy is still a matter of debate.

The basic Zone 1 settlement pattern discerned from the 1742 map remains consistent given the 1775 data; the only differences being the addition of a single plantation in the mountainous center of the region and the disappearance of a single plantation from the Caribbean coast. The Zone 2 coastal clustering apparent in the 1742 map is somewhat reduced in the 1775 map, which reflects a more evenly dispersed plantation landscape. The pattern of Zone 3 remains consistent, with the thirty-four identified plantations spaced at regular intervals around the base of the Quill.

An 1830 map of St. Eustatius was reportedly viewed by Dorothy and John Keur in 1960.[67]2 Thirty-eight plantations were identified by this map. Although this map is currently unavailable, the disappearance of more than one half of the island's sugar plantations seems consistent with the demographic data. The available statistics indicate a significant decrease in population during the first half of the nineteenth century. The total population of the island in 1779, four years after the 1775 map identified eighty-one plantations, was 3056. Eleven years later, the population peaked at 8154. In 1850, the population had decreased to

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[67]Keur, John Y, and Dorothy L. Keur. Windward Children: A study in the Human Ecology of the Three Dutch Windward Islands in the Caribbean. Assen: Royal Vandorcum Ltd, 1960.

1932, less than one quarter of the peak total sixty years previous.[68]

A fourth historical map, dated 1847, further reflects this demographic change. This map identifies only ten sugar plantations. Of these ten, two are located in Zone 1; none appear in Zone 3. The remaining eight are located on the Culture Vlatke in Zone 2. Seven of these are located at regular one kilometer intervals across the zone; the eighth located on the western coast south of Oranjestad, near the periphery of Zone 3.

Through the summer of 1988, sixteen extant plantation sites were identified on St. Eustatius. Archaeological information accumulated from these sites corroborates the island settlement pattern constructed from the documentary sources. Only one of the sixteen sites is located within Zone 1. Designated P8816, this site lies atop Boven Hill, the highest point on the island north of the Quill. This site was identified as the Boven Plantation of the 1742 and 1775 maps by Jerry Hartley and Karen Fisher in 1986.

The highest concentration of sites was found in Zone 2. Twelve plantation sites have been identified in this zone, clustered in four groups of three. The first cluster lies to

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[68]van den Bor, Wout. Island Adrift: The Social Organization of a Small Caribbean Community: The Case of St. Eustatius. The Hague: Smits Drukkers-Uitgevers, 1981.

TABLE 3.1: Plantation Sites by Zone

Date	Zone 1	Zone 2	Zone 3	Total
1742	14	47	27	88
1775	14	33	34	81
1830	--	--	--	30
1847	2	8	0	10
1988*	1	12	3	16

*1988 data based on survey of potential sites; 1830 data quoted in France, 1982. All other data from cartographic sources.

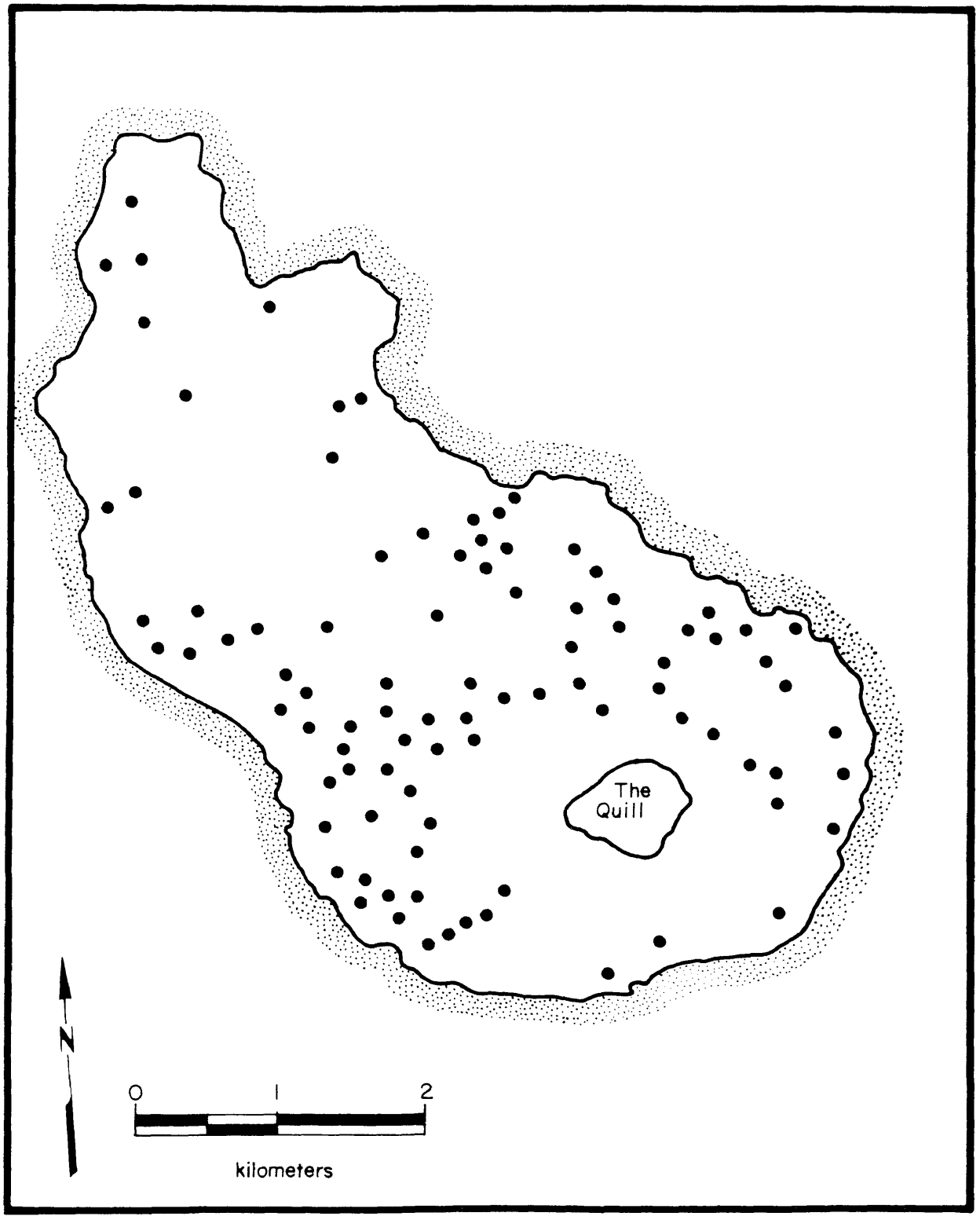
the north of Oranjestad on the Caribbean coast. The three plantations were identified in 1988 as Plantations Golden Rock, Benners, and Schoetsenhoek, respectively designated P8801, P8802, and P8803. A second cluster lies to the south of Oranjestad, and includes a site known as Crooks Castle (P8806), and two sites identified but unnamed by the historic maps. They have been designated P8809 and P8810. The third cluster lies about a small hill called, appropriately, Round Hill. The sites have been identified as Plantations Upper Round Hill, Lodi, and Princess, designated P8807, P8808, and P8814. Excavation in 1987 dispelled a popular myth that one of these plantation sites, Princess, was the site of a Jewish Mikveh.[69] The fourth cluster lies close to the Atlantic coast,

[69]Barka, Norman. Archaeological Investigation of the Princess Estate: An Interim Report. Williamsburg: College of William and Mary, 1987.

and includes two of the best preserved plantations on the island, Fair Play (P8804) and English Quarter (P8813), as well as poorly preserved site, designated P8805.

Three sites have so far been identified in Zone 3. Two of these lie near the base of the Quill, southwest of the crater. The first has been identified as White Hook (P8811). The second, P8812, is unnamed by the historic maps. The third plantation, identified as Garden Gilheads, was analyzed in conjuncture with the Princess excavation of 1987. Lying to the southeast of Oranjestad, this site is located near the base of the Quill, at the periphery of Zones 3 and 2. Whether these sixteen sites are the only plantations surviving on St. Eustatius is a matter for future investigation. Approximately one half of Zone 1 and one fifth of Zone 3 have yet to be surveyed.

OVERLEAF: FIGURE 3.1: Plantation sites according to 1742 map.


The
Quill
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0
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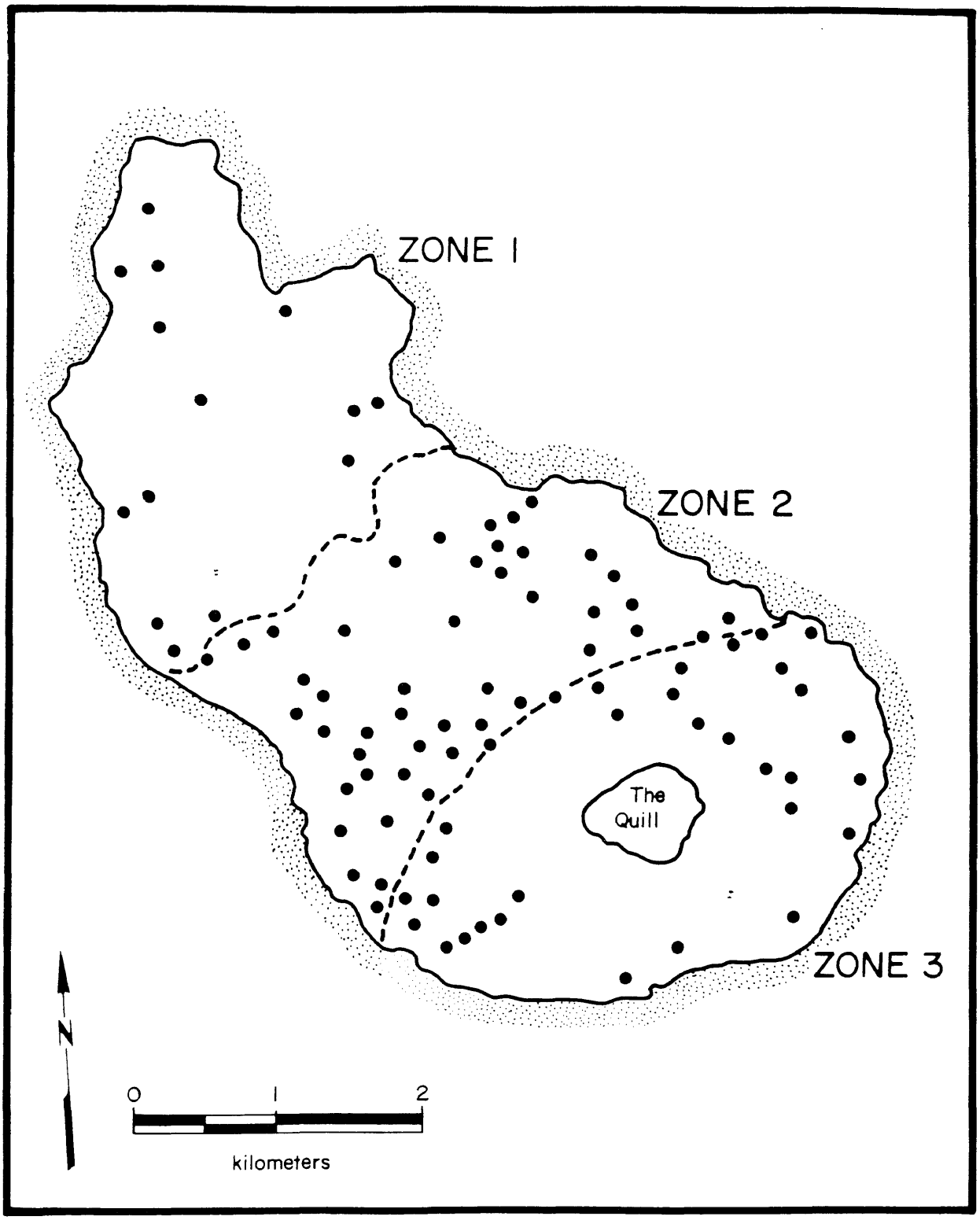
OVERLEAF:FIGURE 3.2: Plantation sites according to 1742 map, by zone.


ZONE 1
ZONE 2
ZONE 3
The Quill
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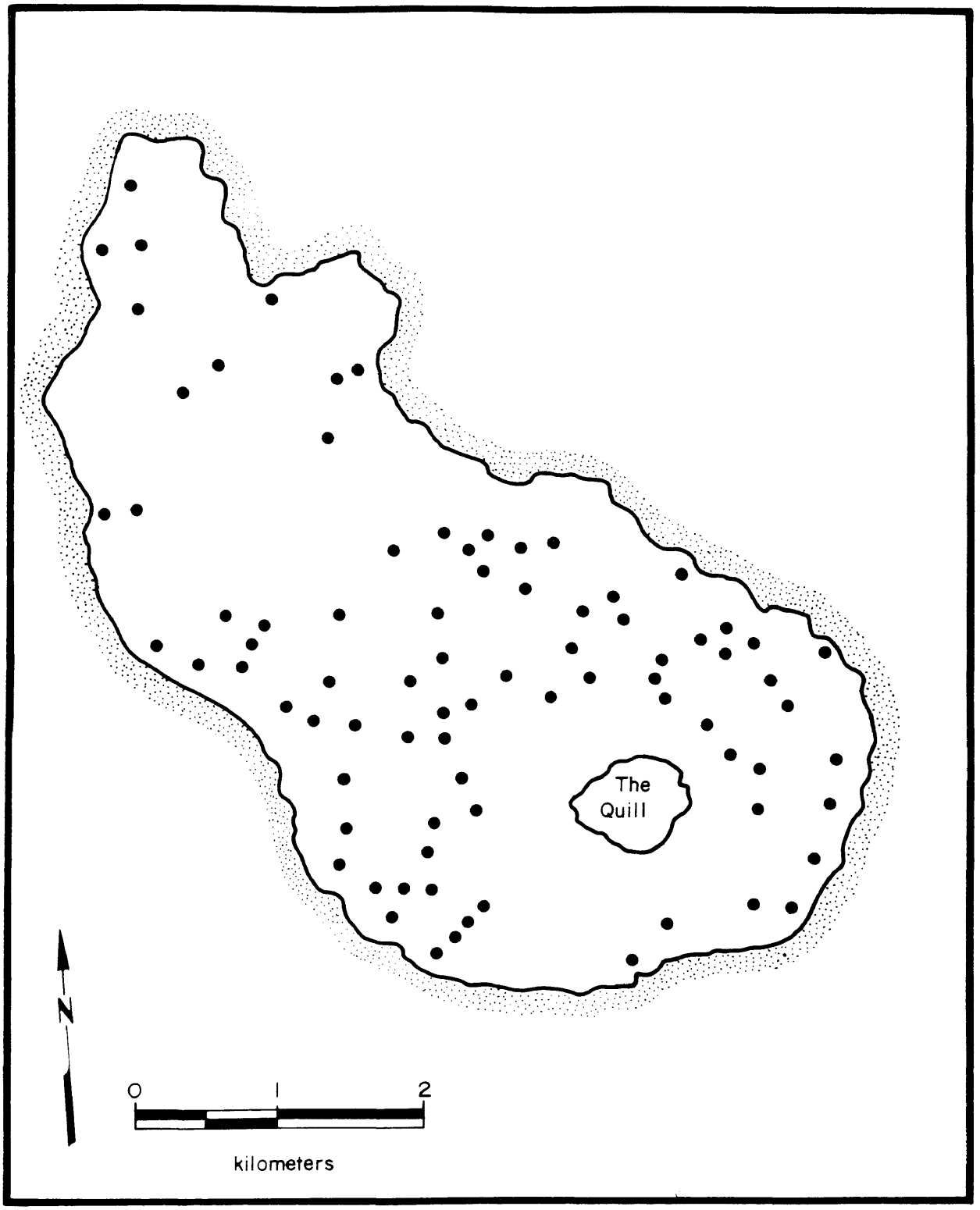
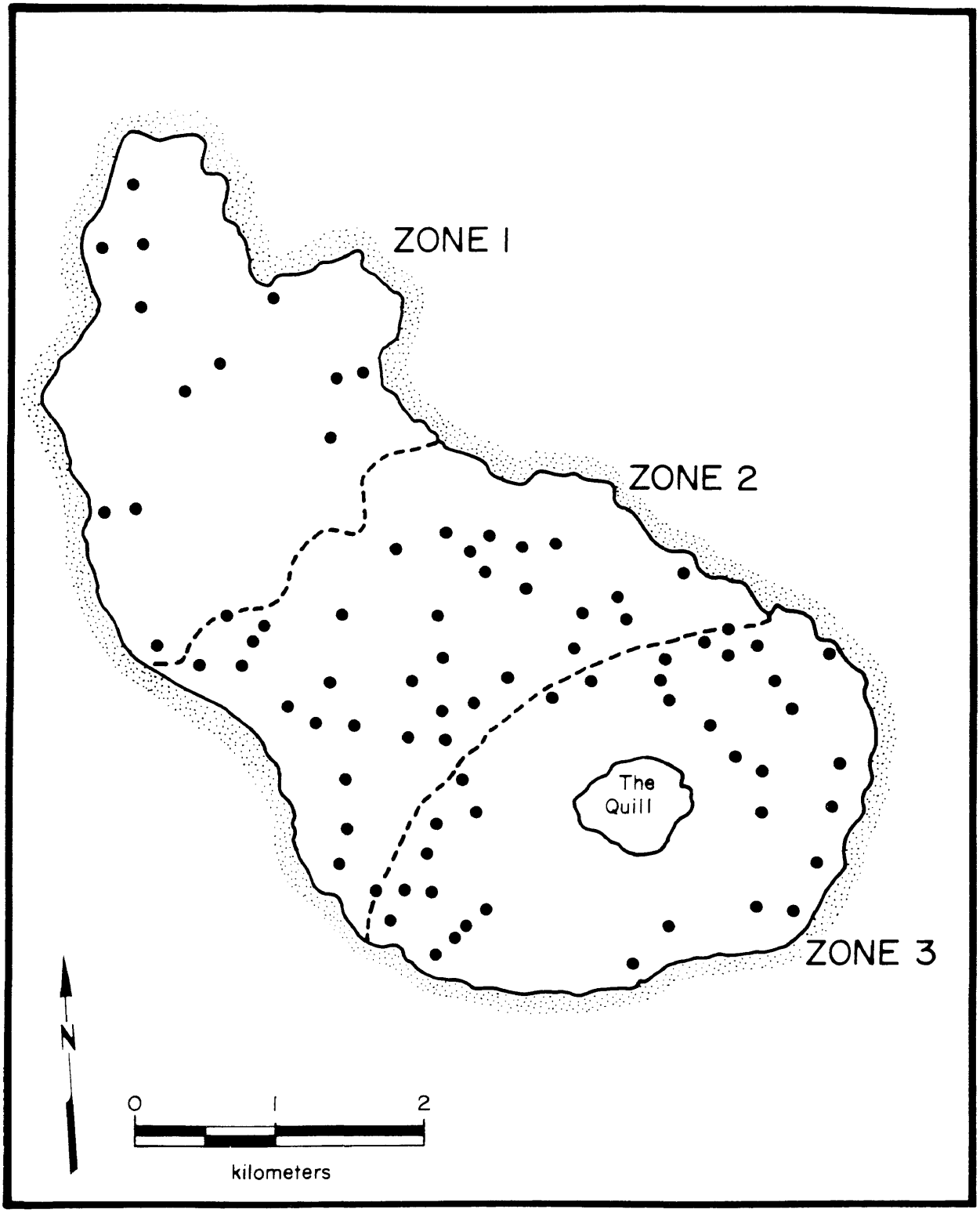
0
1
2
kilometers

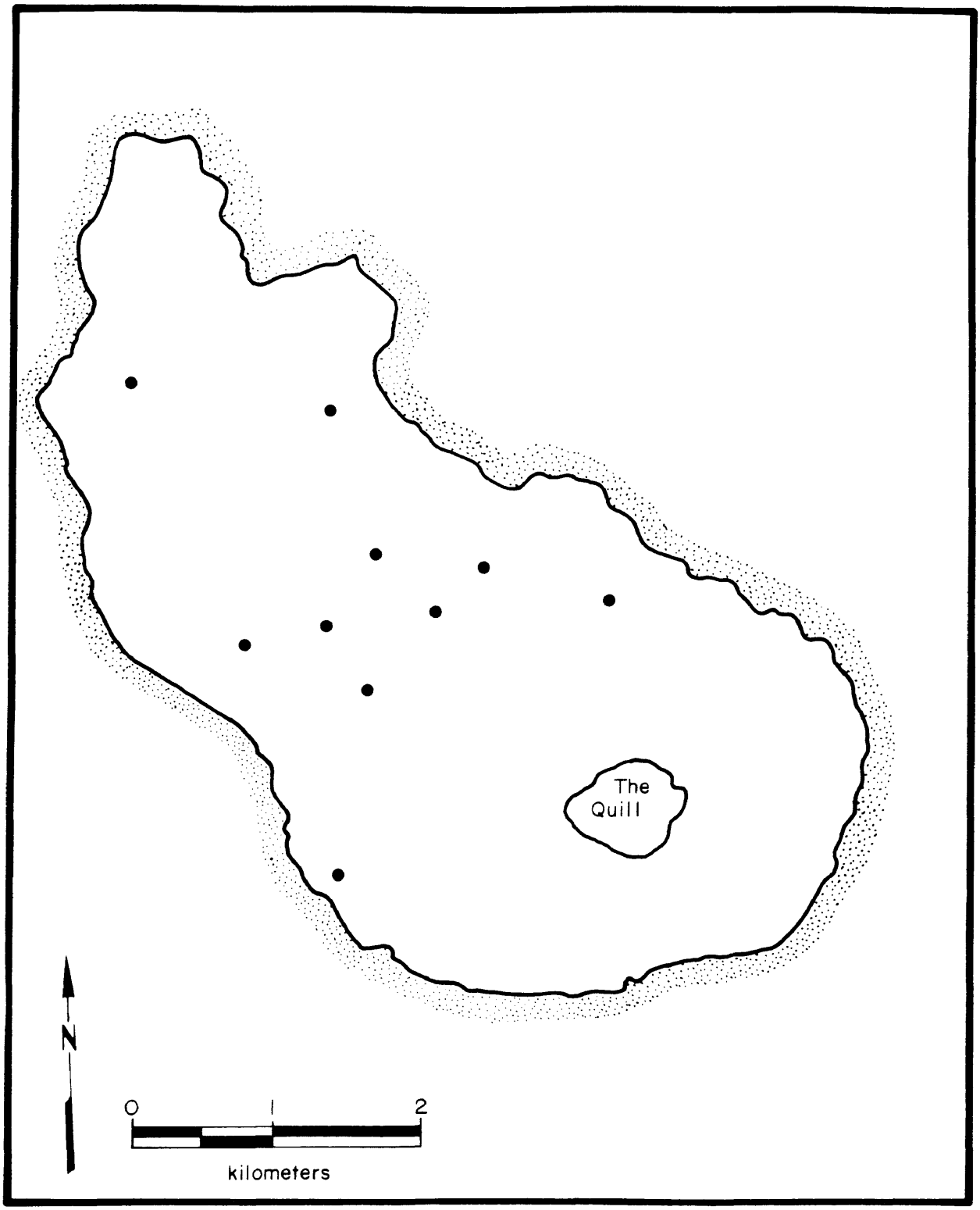
OVERLEAF: FIGURE 3.3: Plantation sites according to 1775 map.


The
Quill
N
0
1
2
kilometers

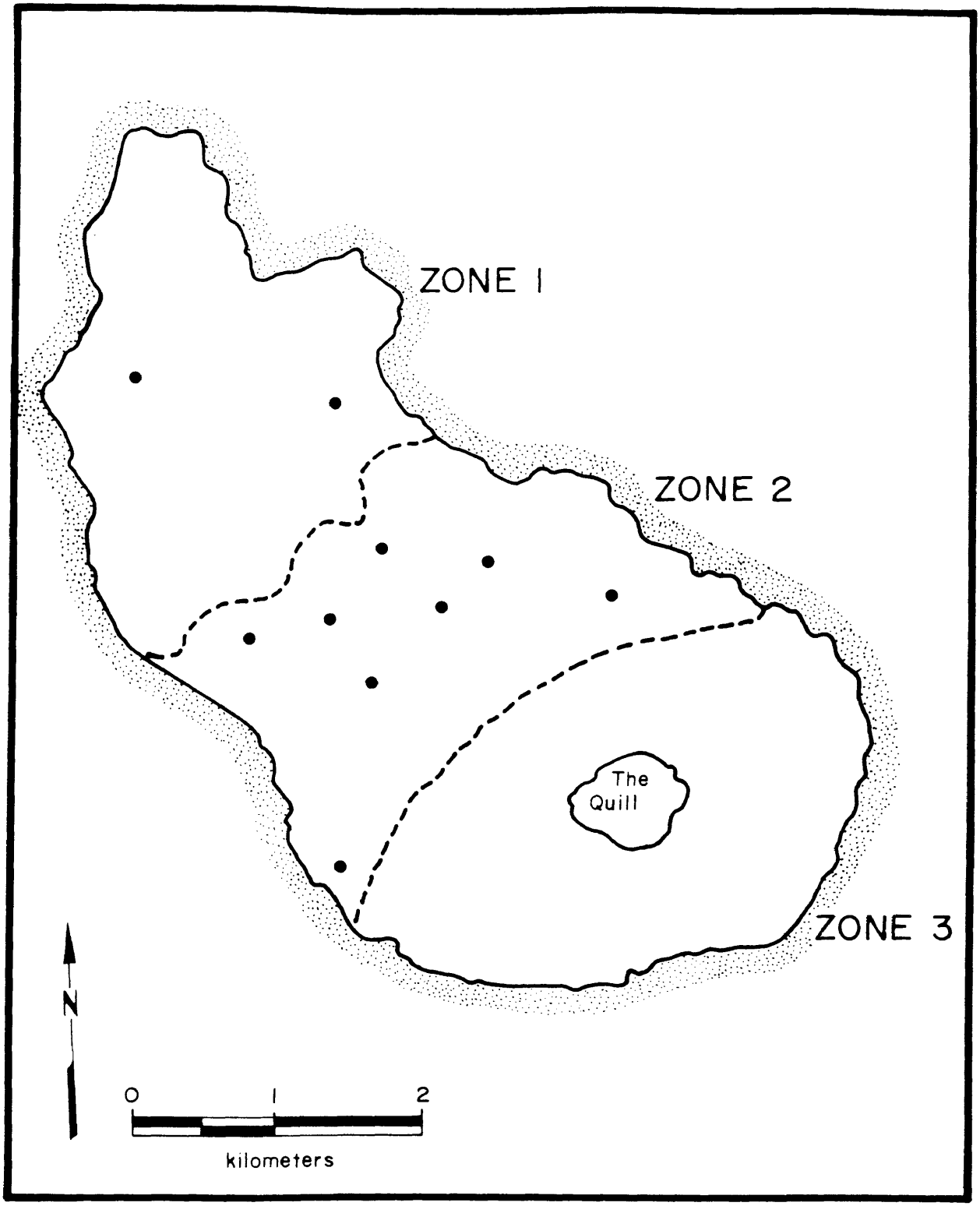
OVERLEAF: FIGURE 3.4: Plantation sites according to 1775 map, by zone.


ZONE 1
ZONE 2
ZONE 3
The Quill
N
0
1
2
kilometers

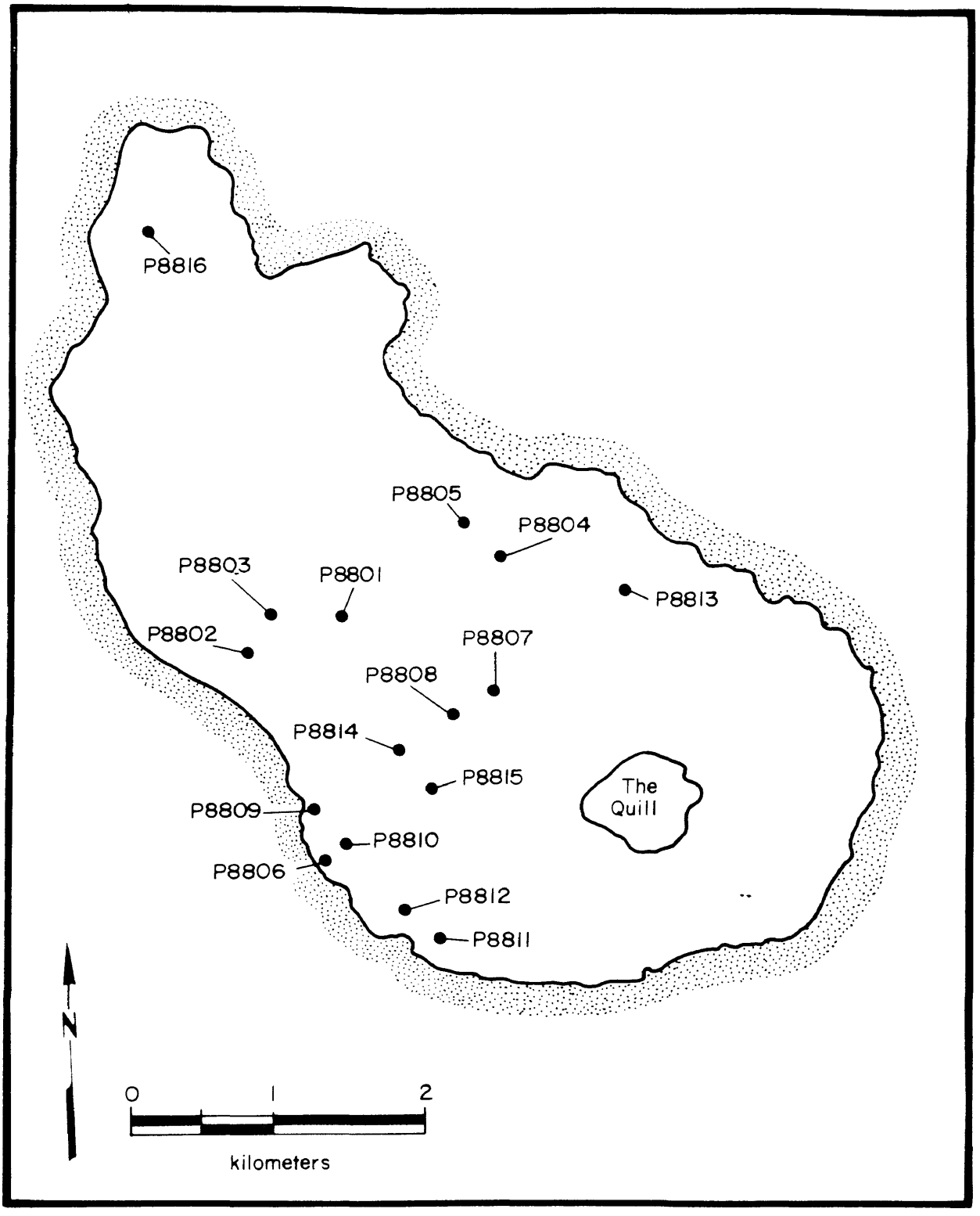
OVERLEAF: FIGURE 3.5: Plantation sites according to 1847 map.


The
Quill
N
0
1
2
kilometers

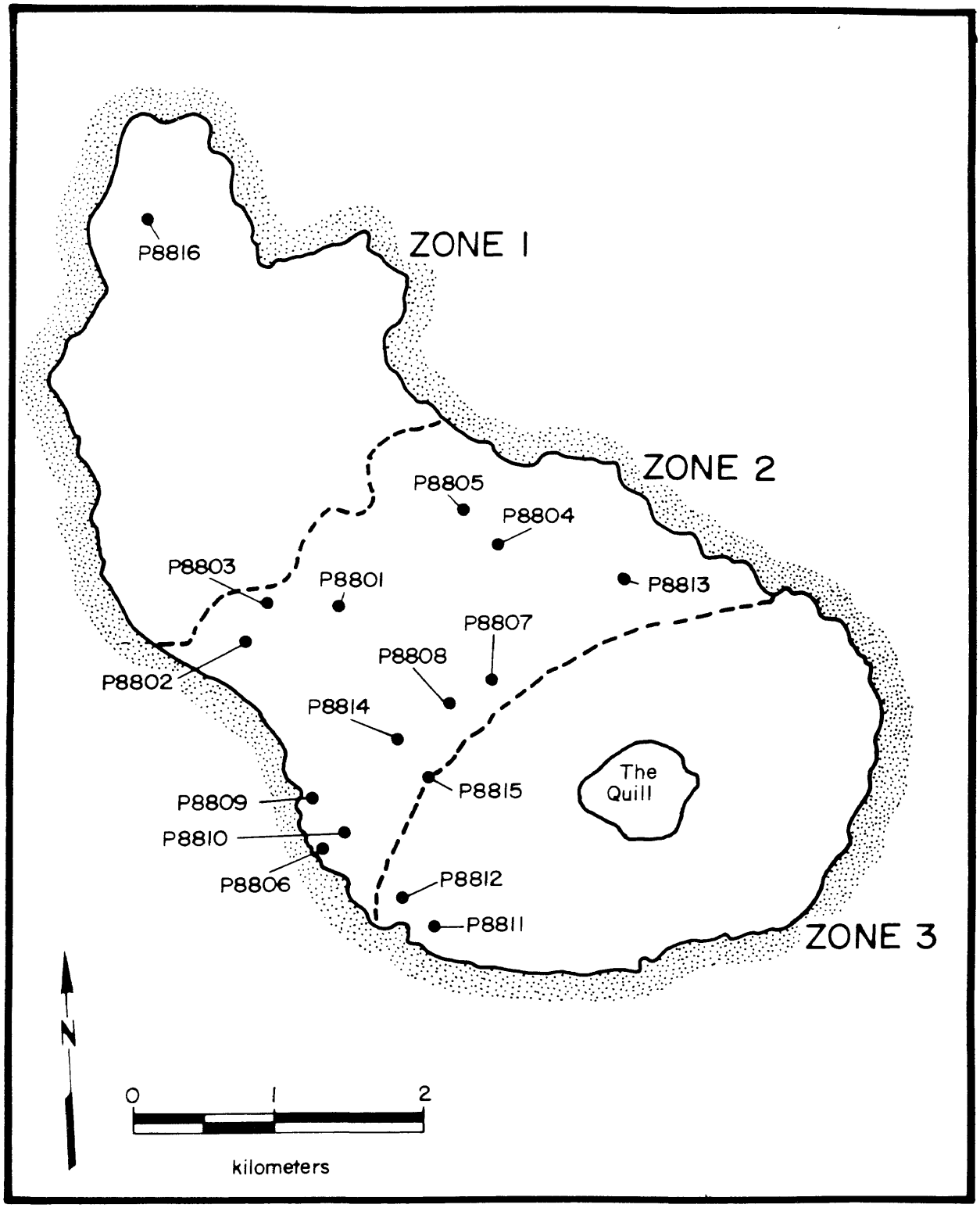
OVERLEAF: FIGURE 3.6: Plantation sites according to 1847 map, by zone.


ZONE 1
ZONE 2
ZONE 3
The Quill
N
0
1
2
kilometers

OVERLEAF: FIGURE 3.7: Extant plantation sites identified through 1988.


P8816
P8805
P8804
P8803
P8801
P8813
P8802
P8807
P8808
P8814
P8815
The Quill
P8809
P8810
P8806
P8812
P8811
N
0
1
2
kilometers

OVERLEAF: FIGURE 3.8: Extant plantation sites by zone.


ZONE 1
ZONE 2
ZONE 3
P8816
P8805
P8804
P8803
P8801
P8813
P8807
P8808
P8802
P8814
The Quill
P8815
P8809
P8810
P8806
P8812
P8811
N
0
1
2
kilometers

III. The Internal Settlement Pattern of Fair Play Plantation.

Although none of the sixteen sites surveyed to date still produce sugar, several of them have surviving structures that exist in various stages of preservation. One of the best preserved sites is Fair Play Plantation (P8804). By examining the internal settlement pattern of this site, some understanding of the dynamics of individual plantations can be gained.

As of August 1988 there were nine distinct features extant at Fair Play. Two of these features have been identified as sources of motive power needed to extract liquid from sugar cane. The more dramatic of the two is a windmill, 25' in diameter, and some 25' high. A series of niches seven feet above the floor level suggest joists once supported a second floor. Two sets of two larger niches suggest heavier timbers, possibly to support the iron mill machinery, which lies nearby. A large archway in the western quadrant of the windmill is the likely portal through which the extracted juice was transported to the boiling house.

The second source of power at Fair Play is an animal mill, a raised mound of earth around which beasts of burden would tread

turning mill machinery on calm days when the windmill would

be inoperative. It measures 46' in diameter.

The boiling house, lying southwest of the windmill and west of the animal mill is built on a "T" shaped plan, the stem of the T running north-south, with the cross of the T running east-west on the southern side of the stem. The northern "stem" part of the building measures 38'x 24'. There are three entrances piercing the east elevation, one piercing the north, here obscured by vegetation. The west elevation features four stoke holes, with a fifth stoke hole evident through the extreme north facade. To the south of this series of stoke holes rises a cut stone chimney, 6.5' square at its base, which has at the base, a sixth stoke hole.

The interior of the northern part of the structure features a single room. 36' by 20'. It exhibits the remains of a firetrain, along which sugar would be boiled through a series of at least four kettles of diminishing size. The firetrain ruin is five feet wide and runs 30' from the north interior wall along the west wall. The remains of three kettle impressions, lined with plaster, can still be distinguished.

A seventh stoke hole pierces the eastern wall in the southeast corner of the room. Given its distance from the firetrain, it is apparent that this stoke hole was used for a purpose beyond reducing sugar cane. It is likely that this stoke hole fed a separate firebox that was used for distilling rum.

The southern part of the structure, the cross of the T, features two distinct bays, each 20' square. There is strong evidence that this part of the structure had at least two stories. Charlie Arnold, a Statian some eighty-eight years old, recalled attending parties on the second floor of this structure as a youth. The modern surface level of this part of the building lies eight feet below the surface level of the northern part of the building. The most conclusive evidence is the presence of two series of mortices, 7' above the modern surface level, running parallel, one each in the northern and southern interior walls, suggesting the presence of joists. According to the descriptions of sugar processing given by Linda France and Noel Deerr[70], after initial processing, sugar was placed in hogsheads to cure. Often these hogsheads were placed on a second story, allowing molasses to seep down to the first story, eventually to be distilled into rum. This is the likely function of this part of the structure. Attached to the western elevation of the curing room are two open cisterns, each measuring 12' by 5' by 8' deep. These cisterns were used to hold cane juice after milling, but before boiling.

One hundred feet to the southwest of the boiling house is a third stone structure, a rectangular building measuring 32' north-south by 22' east-west. It has yet to be determined

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[70]France, 1982; Deerr, Noel. A History of Sugar (2 vols). London: Chapman and Hall, 1949- 1950.

whether this structure served as an outbuilding associated with the plantation complex, a dwelling for the plantation owner, or whether it served some other function.

Seventy-five to the northwest of this structure is a sunken area, 72' square. Unlike the other structures on the site, the walls of this feature are of dry stone construction. The top of the western wall features a series of stones, points extended in the air, suggesting a fence rather than a wall. Given the size of the feature and the fence like qualities of its walls, this area has been interpreted as being an animal pen, perhaps for the draught animals used for powering the animal mill.

One hundred forty-four feet north of this animal pen is a group of three structures. The southernmost of the three measures 80' by 18', its longer dimension running west-northwest to east-southeast. Although this structure has obviously been altered in the twentieth century, a section of the northern elevation reveals the original coursed stone construction, indicating that this structure may actually be contemporary with the other coursed stone structures on the site.

Perpendicular to the north elevation are the remains of two other narrow rectangular buildings. The western structure measures fifty-two feet by nineteen feet. The existing fragment of the eastern structure's foundation suggests that the structure was eighteen feet wide by a length indeterminate

without excavation. Although the function of these three structures cannot be irrefutably determined without excavation, the dimensions of the surviving two suggest that they were warehouses.

One hundred forty-four feet from the center of this three-building complex is the final surviving structure at Fair Play. A surviving foundation wall suggests that this structure originally measured thirty feet square. A stone wall five feet thick extends twenty-five feet from the approximate center of this original structure. Later alterations included reducing the size of the structure to its current dimensions of thirty feet by nine feet, the closing of a window and a door, and the plastering of the interior of the newer, smaller structure. The function of this building has yet to be determined, although the plastered walls suggest some kind of storage facility.

The spatial arrangement of these nine features, indicates that the boiling house was the industrial, physical, and spatial center of the plantation. The other eight structures radiate around the boiling house as if it were a hub. An imaginary axis radiating east and west from the structure it transects the heart of the windmill one hundred forty-four feet east, and the center of the large animal pen one hundred forty-four feet west. A similar axis north and south from the

TABLE 3.2: Extant Features at Fair Play

Feature Designation	Feature Identification
One:	Windmill
Two:	Animal Mill
Three:	Boiling House
Four:	Possible Dwelling
Five:	Animal Pen
Six:	Warehouse
Seven:	Warehouse
Eight:	Outbuilding

boiling house connects the center of the warehouse complex one hundred forty-four feet to the north with an open area one hundred forty-four feet to the south. This open area features several retaining walls, suggesting that it may have been a terraced cane field. A third axis transects the altered thirty by thirty foot building to the northeast, again one hundred forty-four feet away, with the smaller stone structure, the possible dwelling, one hundred feet to the southwest. It is clear that the industrial activities of the boiling house were physically and economically at the center of plantation life on St. Eustatius.

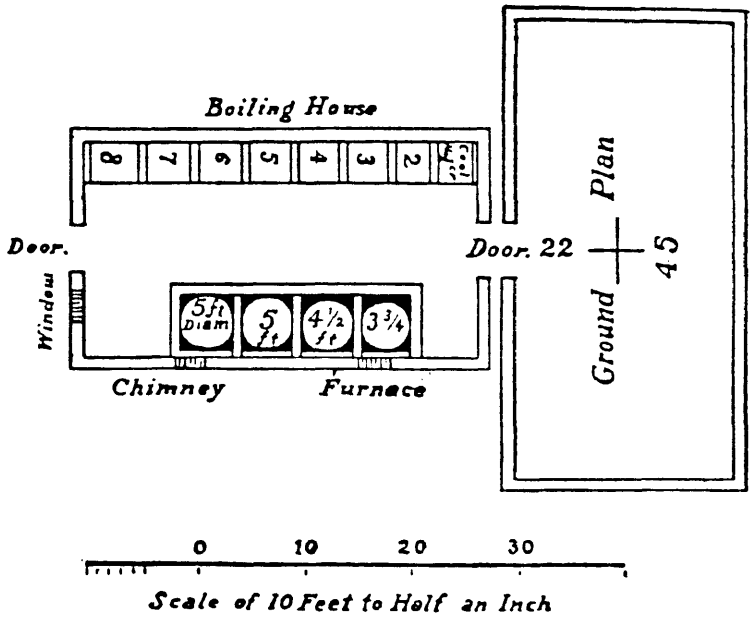
IV. Conclusion

This spatial analysis of sugar plantations on St. Eustatius does not attempt to define in detail the concept of the sugar plantation as a colonial mode of production. Rather it presents evidence as to how that mode of production physically manifested itself on a particular island. In sum, it analyzes the arrangement of some part of the capital necessary for the production of sugar in the eighteenth century Caribbean. The archaeological record of St. Eustatius has yet to reveal much about labor systems on the island. A future synthesis of capital analysis with labor analysis could further define the plantation as a specific colonial mode of production.

FIGURE 3.9

Windmill similar in configuration to the one at Fair Play.

FIGURE 3.10



1816 boiling house. The boiling house at Fair Play is built on a similar floor plan.

OVERLEAF: FIGURE 3.11: Fair Play site plan.

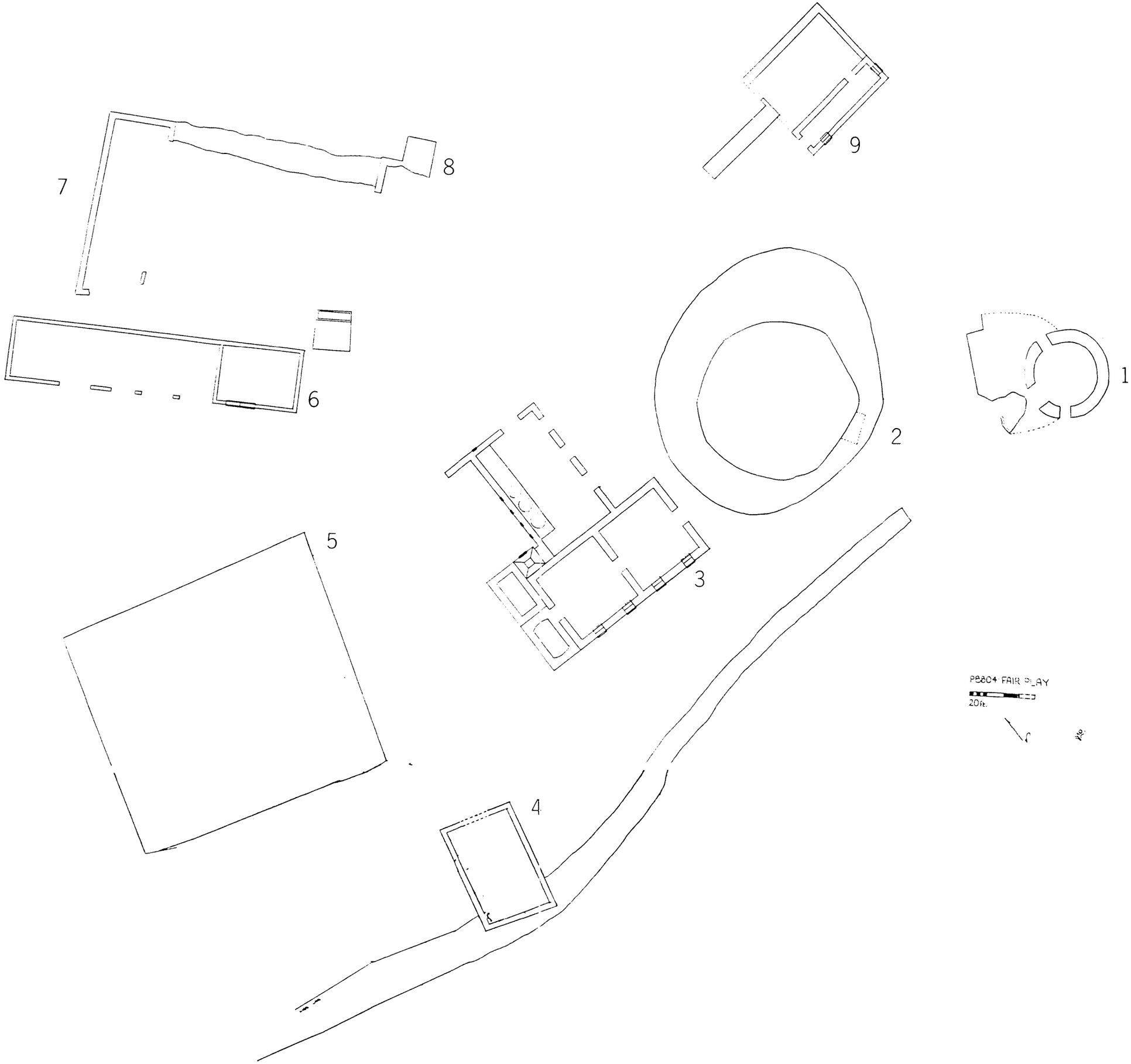
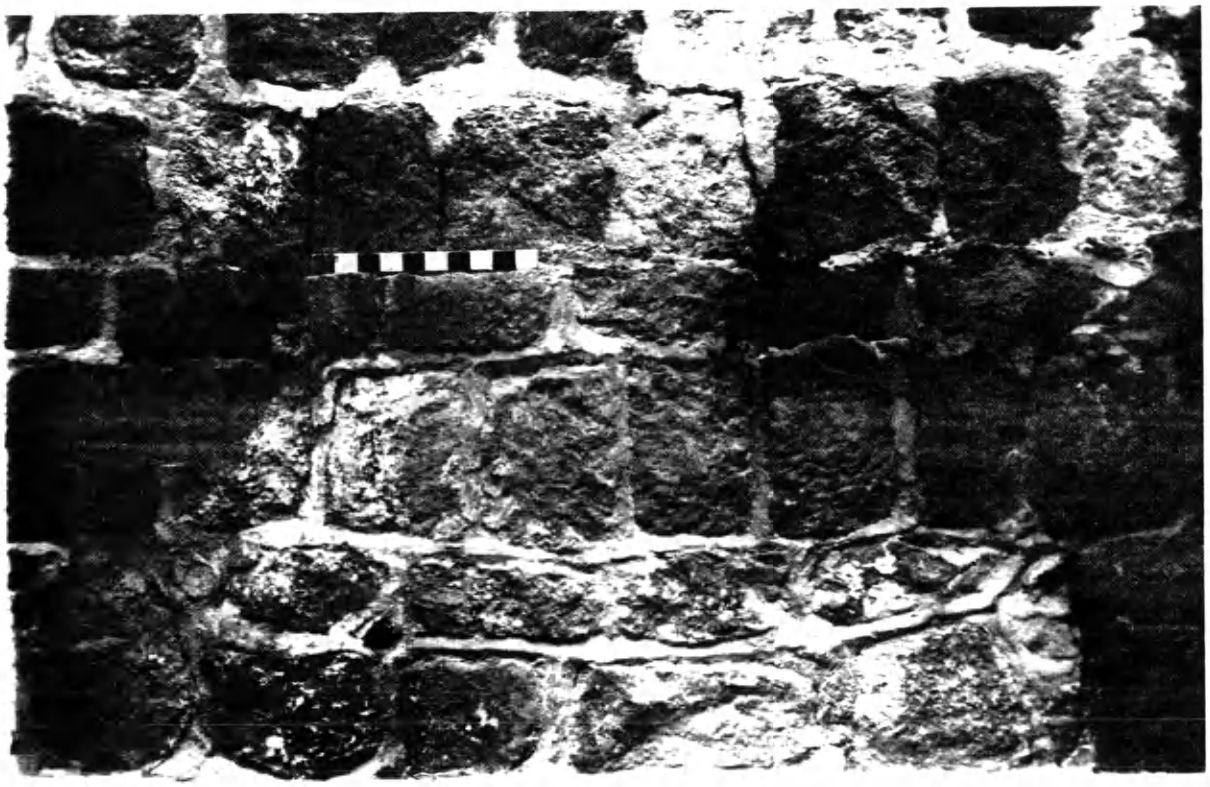

1
2
3
4
5
6
7
8
9
PB804 FAIR PLAY
20ft.

PLATE 3.1

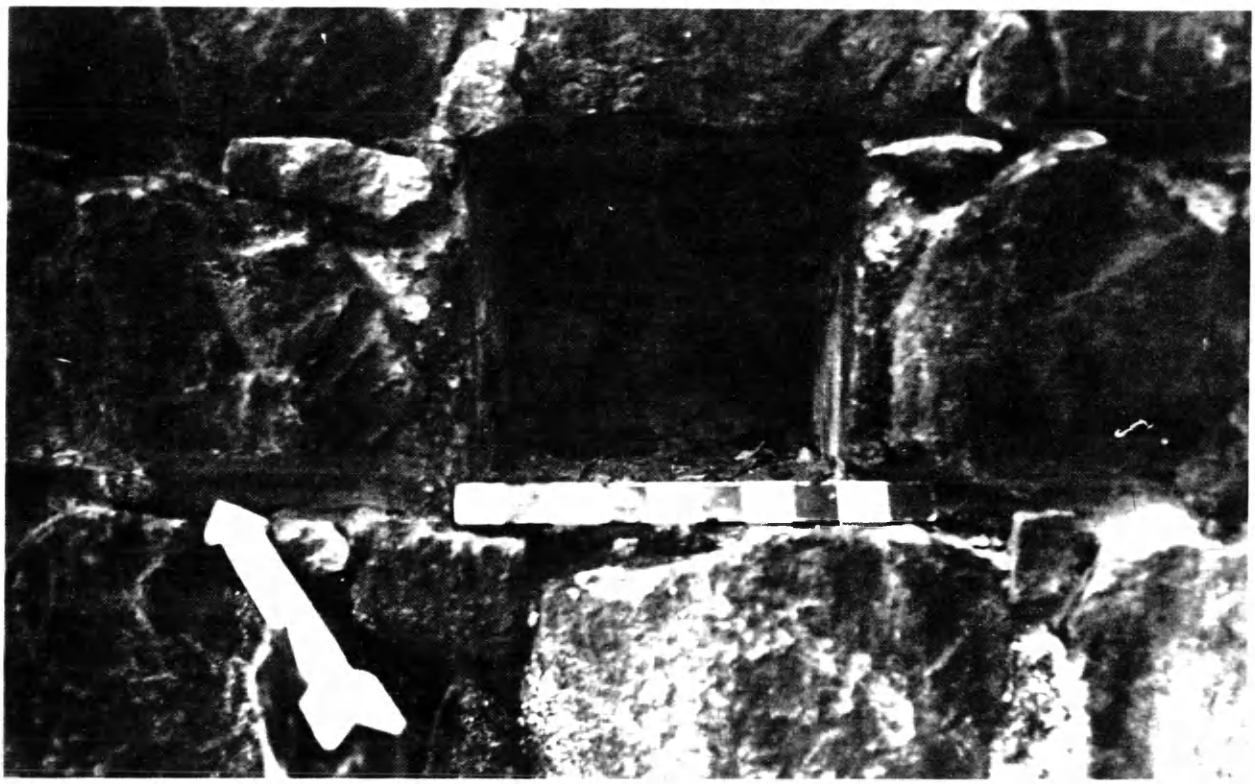
Windmill, Feature 1, at Fair Play.

PLATE 3.2



Windmill interior detail, showing joist mortices.

PLATE 3.3



Windmill mortice detail.

PLATE 3.4

Windmill, western entranceway. Keystone dates to 1831.

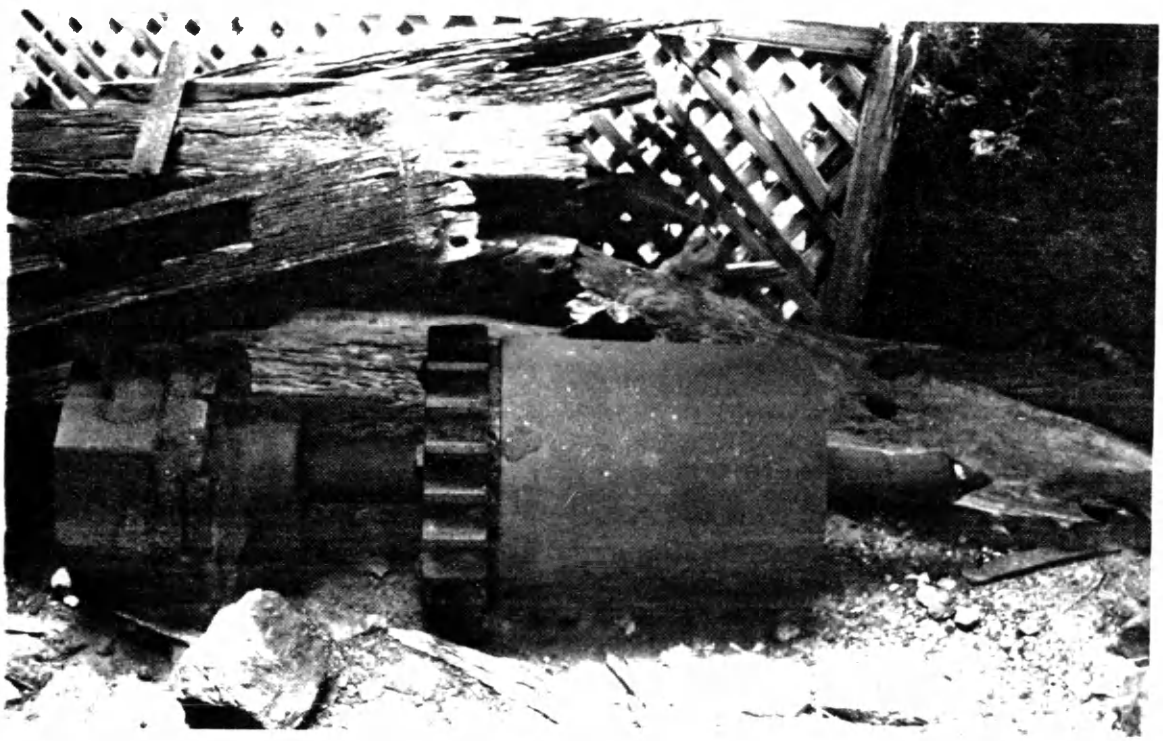
PLATE 3.5

Windmill exterior construction detail with hornets' nests.

PLATE 3.6

Cane rollers outside windmill. Juice was extracted by crushing cane between a set of three such rollers.

PLATE 3.7



The third roller, located inside windmill. An hexagonal timber placed inside the fitting at left once connected the mill's sails to the machinery.

PLATE 3.8

Boiling house, Feature 3. West exterior showing stokeholes through which the firetrain furnace was fed.

PLATE 3.9

Boiling house interior. Two impressions for kettles are visible. It was in these kettles that the water content of cane juice would be evaporated.

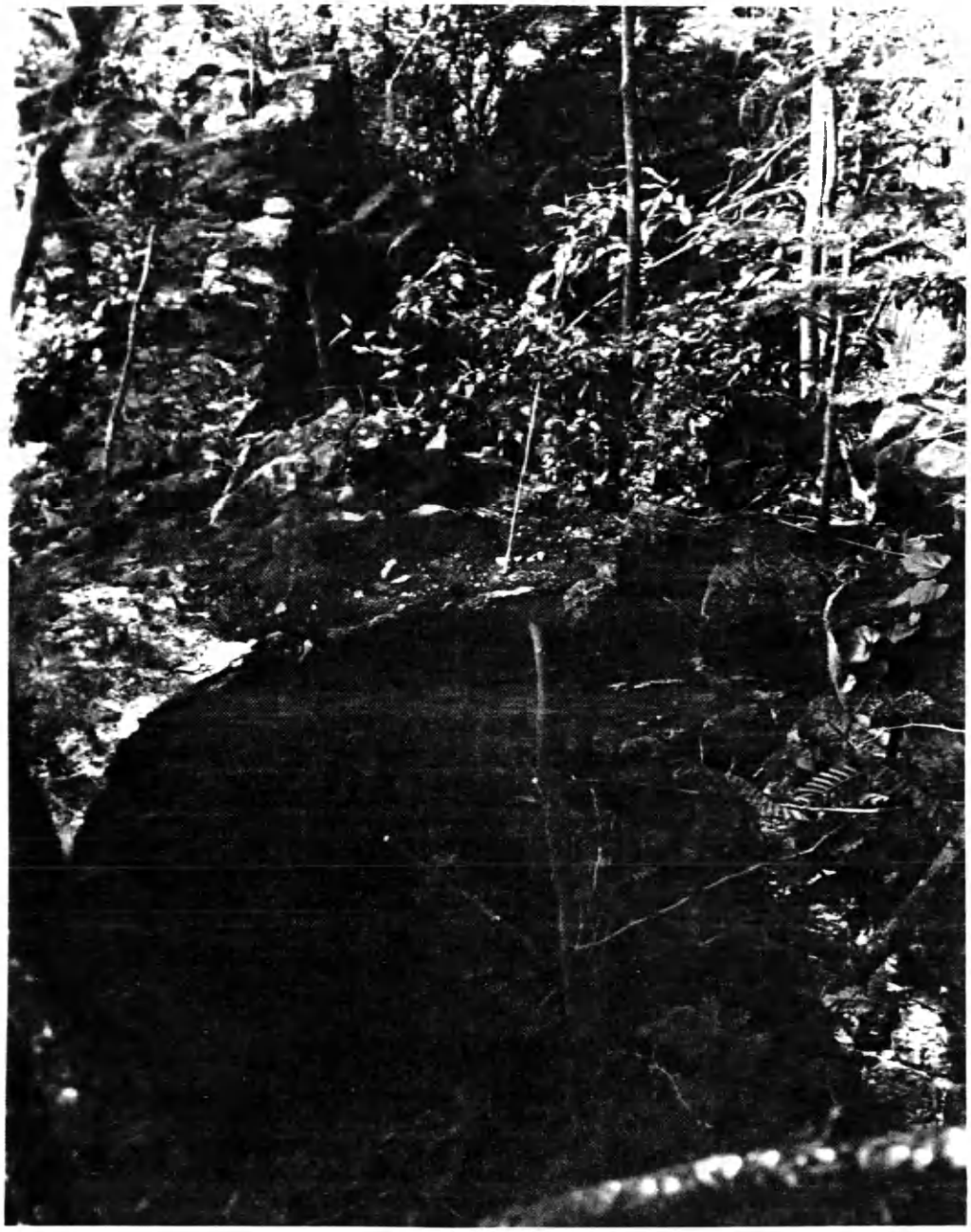
PLATE 3.10

Boiling house interior, showing firetrain.

PLATE 3.11

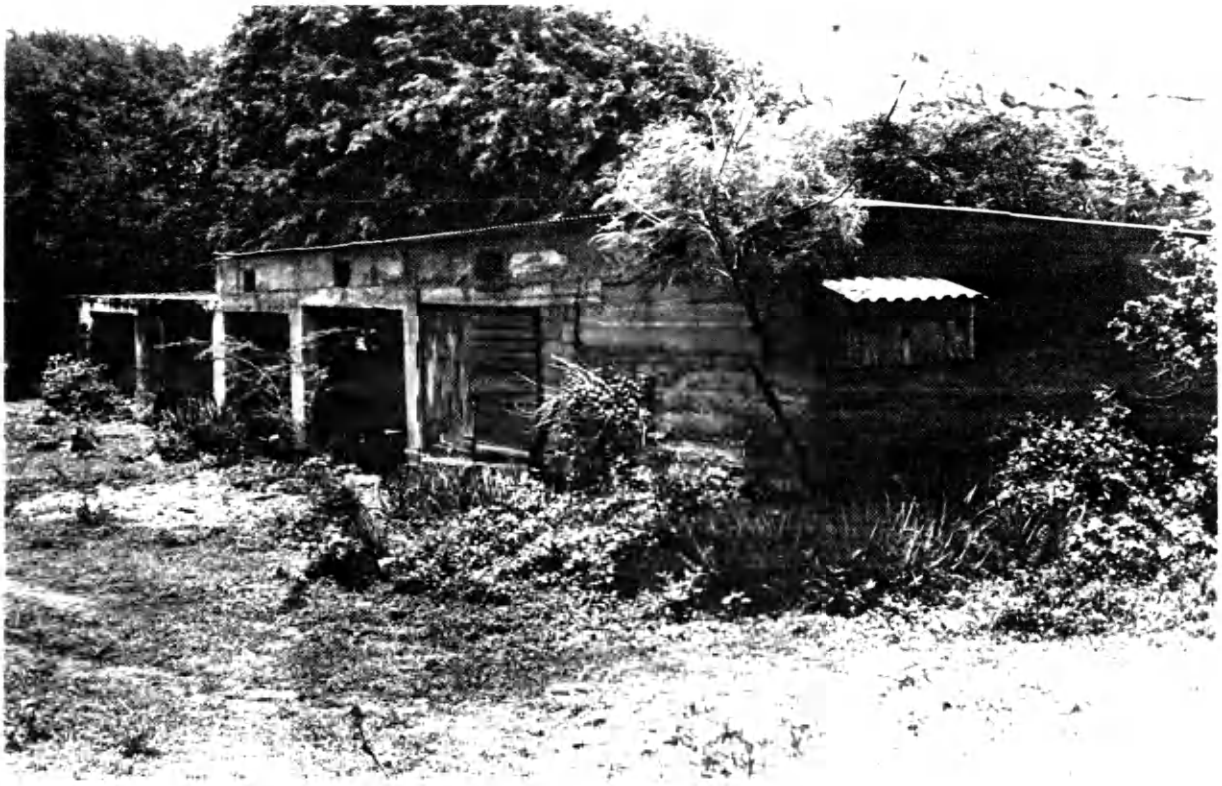
Boiling house interior, showing curing room.

PLATE 3.12



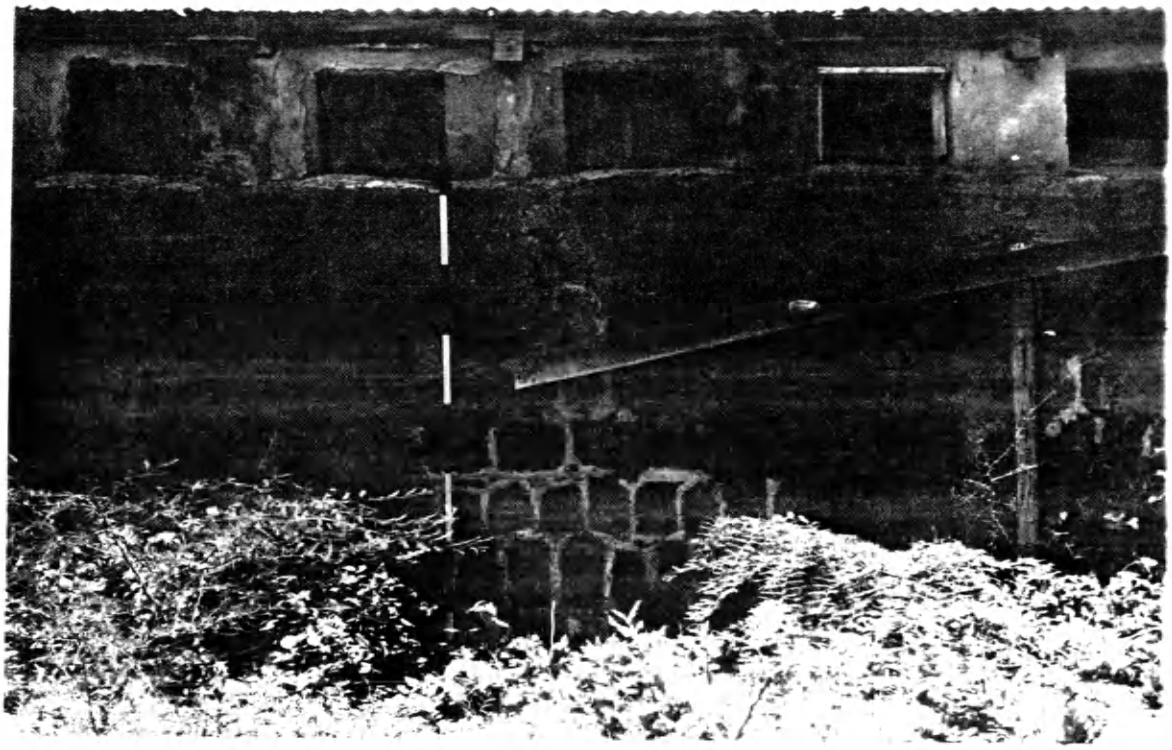
Boiling house: exterior cane juice cisterns.

PLATE 3.13



Warehouse, Feature 6. This structure has been modified into a garage.

PLATE 3.14



Feature 6 construction detail.

PLATE 3.15

Warehouse, Feature 7, exterior.

PLATE 3.16

Feature 9, exterior.

CHAPTER FOUR:

THE RESULTS OF A SURVEY CONDUCTED IN 1988

During the 1988 field season, three weeks were spent surveying potential plantation sites identified by the three historic maps discussed in chapter three. The results are both intriguing and discouraging, for the constraints of time prevented in-depth study of any site save Fair Play, P8804. There is a great deal of work yet to be done in documenting plantation sites on St. Eustatius.

What follows is a series of brief descriptions of those sites identified in 1988, accompanied by sketch maps and photographs. These maps were composed using a standard 100' tape and folding rule. The locations of features within individual sites are therefore not as accurate as if drawn with the use of a transit or alledade and plane table. Given the nature of this methodology, the following results should be considered preliminary, and not without some degree of inaccuracy. However, every attempt has been made to make the following descriptions and site plans as accurate as a single researcher with these basic tools could hope.

A total of twelve sites were examined during the 1988 season. Following the descriptions of these dozen sites is a list of those plantations sites examined in previous

seasons, as well as a quick note listing the sources in which descriptions of those sites may be found.

P8801: GOLDEN ROCK

This site has been identified as plantation Golden Rock by its geographical location relative to the historic maps of 1742, 1775, and 1840. This evidence is corroborated not only by the modern government housing project at this site, which also bears the name Golden Rock, but by oral evidence from the eighty-eight-year-old Charlie Arnold, who recalled that in his lifetime, this site was owned by a certain Mr. Moore, who lived on the estate. According to Mr. Arnold, a windmill once existed on this site, which was used to crush sugar cane. He reported that a large chimney also existed at this site.

There are four extant features associated with P8801:

FEATURE ONE: Feature one is the remains of a circular stone windmill; from two to nine courses of cut stone survive around approximately 2/3 of the original circumfrance. The exterior diameter is approximately 45'; the walls are 4.5' thick, of cut coursed stone both interior and exterior. The interior and exterior courses are each 1' thick with a layer of rubble between the two.

Three vertical cane rollers survive among rubble debris within the interior circumfrance. In the northeast extent of the circular wall, a stone pillar, 3' square and approximately 5' high, may indicate the location of an original door. An irregularly shaped raised platform of coursed stone and earth construction, 14' by 8' at its greatest length and width, lies in the approximate center of the mill. Although function cannot be firmly established without excavation, it is likely that this platform served as a pedestal on which the cane rollers rested.

A modern road cuts through what would be the northeast 1/3 of the mill. Across the road to the northeast is scattered rubble which may be debris from the destruction of the mill. The debris lies on and about a hillock, which may have been associated with the complex. Again, only excavation could establish function.

FEATURE TWO: Directly to the south of feature one, feature two can be confidently identified as a sugar boiling house. Although no chimney survives, a rectangular element of cut stone, 7.5' x 5' is probably the foundation for a chimney.

Associated with this rectangular element is firetrain, running 28.0' north-south, and 8.0' east-west, in a moderate state of

preservation. Two stoke holes are visible above the modern ground level, each 1.5' thick and piercing the western wall of the firetrain, which is of coursed stone construction and is 2.0' thick. The southern stoke hole is 2.0' from the southern extent of the firetrain; the northern hole is an additional 5.5' away. Just over half of a southernmost kettle impression survives. The impression is constructed so that a 4.5' diameter kettle could be supported. The circumfrance is defined by three remaining cut stones, above which is a course of yellow and red brick, angled to support the kettle as is the course of stone. Some plaster survives on the course of brick; no kettle survives on site.

To the north of the first impression is a similar impression for a second kettle. Although there is not enough of the circumfrance intact for an accurate measurement, it is clear that this northern impression is somewhat smaller in diameter than the southern. This impression is plastered over as well; however no coursed stone or brick is visible under the plaster.

Directly to the south of the larger impression, a hollow platform, 3.5'N-S x 4.0'E-W x 2.5' deep, runs against the western and southern walls of the firetrain. The interior of the element has a vaulted ceiling of yellow brick--its three walls, south, east, and west, are of coursed stone. The

northern extreme of the hollow appears to have been defined by the southern kettle itself. This element is apparently part of the firetrain flue.

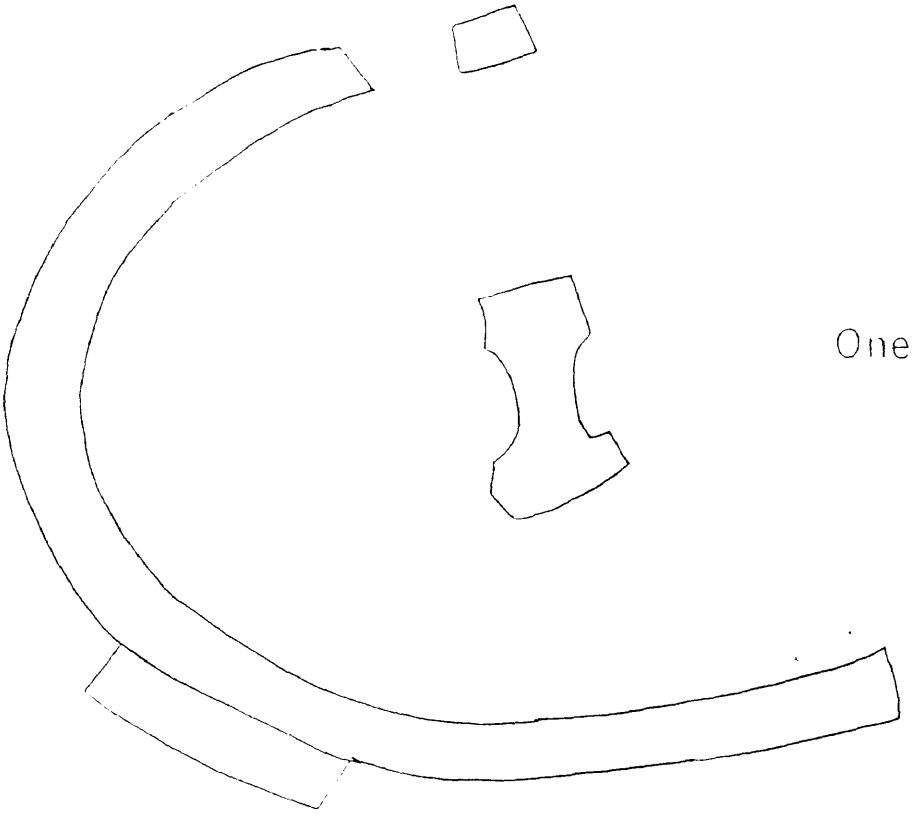
Abutting the southern wall of the firetrain is a cane juice cistern. It is constructed of cut coursed stone, nine courses above the modern ground level. Its four walls, running 20.0'N-S x 8.5'E-W, are 2.5' thick. The cistern is uncapped, and is 6.0' high at its highest point. At its widest points, the dimensions of the oval interior wall are 15.0' x 5.0'. The bottom of the cistern is filled with stagnant water and modern debris, making its depth impossible to determine. The rim is slightly angled and is plastered, as are the interior walls.

To the east of the cistern exists an L shaped fragment of wall, two feet thick. The east-west element runs 18.5'; the north-south element 6.5'. It is constructed of coursed stone. The longer element aligns with the southern extent of the firetrain; its western extent is 4.5' east of the southeastern corner of the firetrain. This element appears to define the southern extreme of the boiling house complex; the gap between the firetrain and this wall identifies a doorway into the structure.

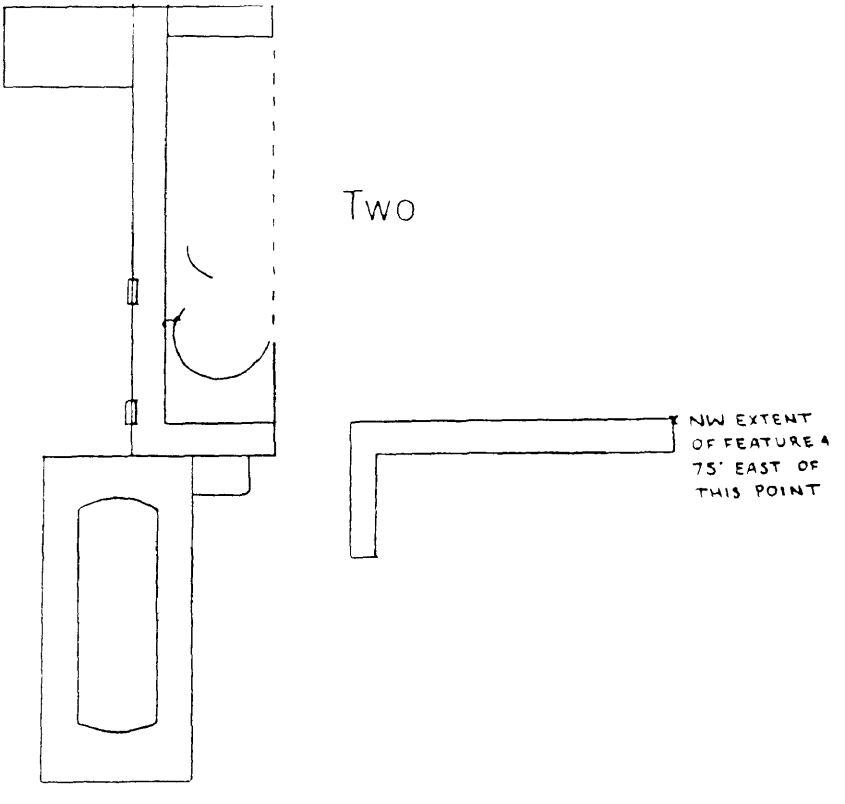
TABLE 4.1: Extant Features at P8801

Feature Designation	Feature Identification
One:	Coursed Stone Windmill
Two:	Boiling House
Three:	Undefined
Four:	Curing House

OVERLEAF: FIGURE 4.1: Golden Rock, P8801.



One



Two

P 8801: GOLDEN ROCK

N

10 ft

FEATURE THREE: Feature three is a horseshoe shaped mound of earth directly west of the cistern associated with feature two. Identification of function and association with the plantation complex are indeterminate without excavation.

FEATURE FOUR: Across the modern road, 70' directly to the east of feature three is a fragment of a stone foundation, part of which is obliterated by a modern building. Although this may have been either a dwelling or a curing house associated with the plantation, insufficient survival precludes positive identification without excavation.

P8802: BENNERS

P8802 has been identified as the Benners Plantation due to its geographic location in relation to the historic maps, which is corroborated by the Benners family plantation, which is associated with this complex. The cemetery itself has been mapped by Jerry Hartley; the original of this map is on file in the anthropology department of the College of William and Mary.

Seven features have been identified in association with the Benners Plantation:

FEATURE 1: Feature one is the Benners family cemetery. There are some fourteen identifiable graves in the main portion of the cemetery, which lies to the north of a modern road. South of the road are three additional graves, all unmarked children's graves. Of the fourteen identifiable graves in the main cemetery, nine are marked.

TABLE 4.2: Benners Cemetery

1. Rull van Lynen	Dec. 12, 1733
2. Unnamed	June 27, 1773
3. Hon. Johannes Salomons Gibbes, Esq. ex-Governor of St. Maarten	May 22, 1735-Apr. 21, 1802
4. Jan Jacobs Creutzer	Sep. 27, 1715-Nov. 26, 1730
5. Joseph Desayoutsey	Oct. 1738
6. Johannes Heyliger	Apr. 1736
7. Abraham Heyliger	Apr. 1736
8. Johannes Benners	1729
9. Verhan Benners	Dec. 1732

FEATURE 2: To the south of the three unmarked children's graves is the ruin of a cistern. The cistern is of coursed stone construction. An angled lip of red brick covered with

plaster runs along the interior perimeter of the feature. This element as well as several yellow bricks remaining in the southern wall and yellow brick ghost marks on the western interior wall suggest that this cistern was once capped with a yellow brick vaulted ceiling. The remaining yellow bricks do not survive, indicating material robbery. The exterior wall of the cistern measures 26.5'E-W x 9.0'N-S, with walls 1.5' thick. It is 4.0' deep, measuring below the modern surface level.

FEATURE 3: To the west of the children's graves, near the southern edge of the modern road, is a well, which has apparently run dry. It is 8.0' in diameter, constructed of cut coursed stone. The well is uncapped; its bottom is visible beneath accumulated debris. The well itself is approximately 20' deep.

FEATURE 4: To the north of the road, some 200' west of the main cemetery, is the principal sugar complex associated with this plantation. Feature four is a structure that has elements of both a boiling and curing house, and appears actually to be two structures abutting one another.

The northern element of structure is the boiling house, which measures 57.0'N-S x 26.0'E-W, with walls 2.0' thick. In the northwest corner is a roughly square (8.0'N-S x 6.0'E-W)

platform of earth and rubble. The northern wall extends an additional 18' east, there terminating. This platform is likely the foundation for a chimney, as it lies just to the north of a firetrain. The firetrain itself measures 6.0' x 23.0', running south of the chimney foundation along the western wall. A single kettle impression is visible, 2.5' from the southern extent of the firetrain. The impression is 4.5' in diameter, of red and yellow brick. The remainder of the firetrain is in ruins of red and yellow brick rubble. The western wall of the structure is pierced by five stoke holes, measuring between 1.0' to 1.5' wide and all 1.0' high. The stoke holes are spaced between 2.0' and 3.5' apart. The northernmost hole is 10.5' south of the northwest corner of the structure.

10.0' to the south of the firetrain is a collapsed interior wall, which runs from the western wall 24.0' to a distinct corner with an eastern wall, which runs 16.0' south, terminating with the southern wall of feature four. These walls define a separate room within the boiling house; as the walls are each two feet thick, this room measures 22.0'E-W x 12.0'N-S.

The eastern wall aligns with the terminus of the northern wall, suggesting a two room structure 57.0' x 24.0'. It is unclear whether the northern wall and the eastern wall were

originally connected, or whether the boiling room had no eastern wall but rather was left open. No roof survives.

To the southeast of the boiling house are the remains of a cane cistern. The cistern, like the larger structure, is constructed of coursed stone; it measures 18'N-S x 10.0'E-W. The walls are 1.5' thick. Approximately 4.5' of the eastern extreme of the southern wall does not survive. The interior walls of the cistern are plastered, and are rounded at the corners. The cistern is built above ground, and is 4.5' deep to the modern ground level. It shares a common wall with feature five.

FEATURE 5: Feature five is an additional room constructed to the south of feature four, sharing a common wall with the cane cistern. The exterior of the feature measures 18.0'N-S x 26.0'E-W. The current bottom of the feature lies 4.5' below the level of feature 4, suggesting two floors for this feature, which would allow the seepage of molasses to a lower floor while the processed sugar cured. A second element, a small independent firebox abutting the exterior of the eastern wall of this feature, suggests that rum was distilled in feature five, further supporting the functional theory of a curing room.

The firebox itself measures 3.0' square. It is built as a set

of three steps, each 1.0' high and deep, by 3.0' long. It is pierced on the north and south by two stoke holes, each 1.5' square, centered on each respective face. Evidence indicates that this feature was a later addition to feature four. Although the eastern walls of the respective features run along the same plane, there is a visible seem where they meet. The original interior wall of feature five has collapsed, save for the very western and eastern extremes, revealing that this wall was constructed over the original exterior wall of feature four. This feature also appears to post-date the cane cistern, for although the two elements share a common wall, another seam indicates that feature five was built onto the cistern. If this analysis is correct, it would appear that either rum distillation began sometime after sugar was first processed at Benners Plantation, or that the distillation facility was relocated from another area of the plantation.

FEATURE 6: Directly to the north of feature four is a circular hillock, approximately 45' in diameter. It is likely that this was an animal mill, which would provide the motive power to crush the sugar cane, extracting the juice for reduction into sugar.

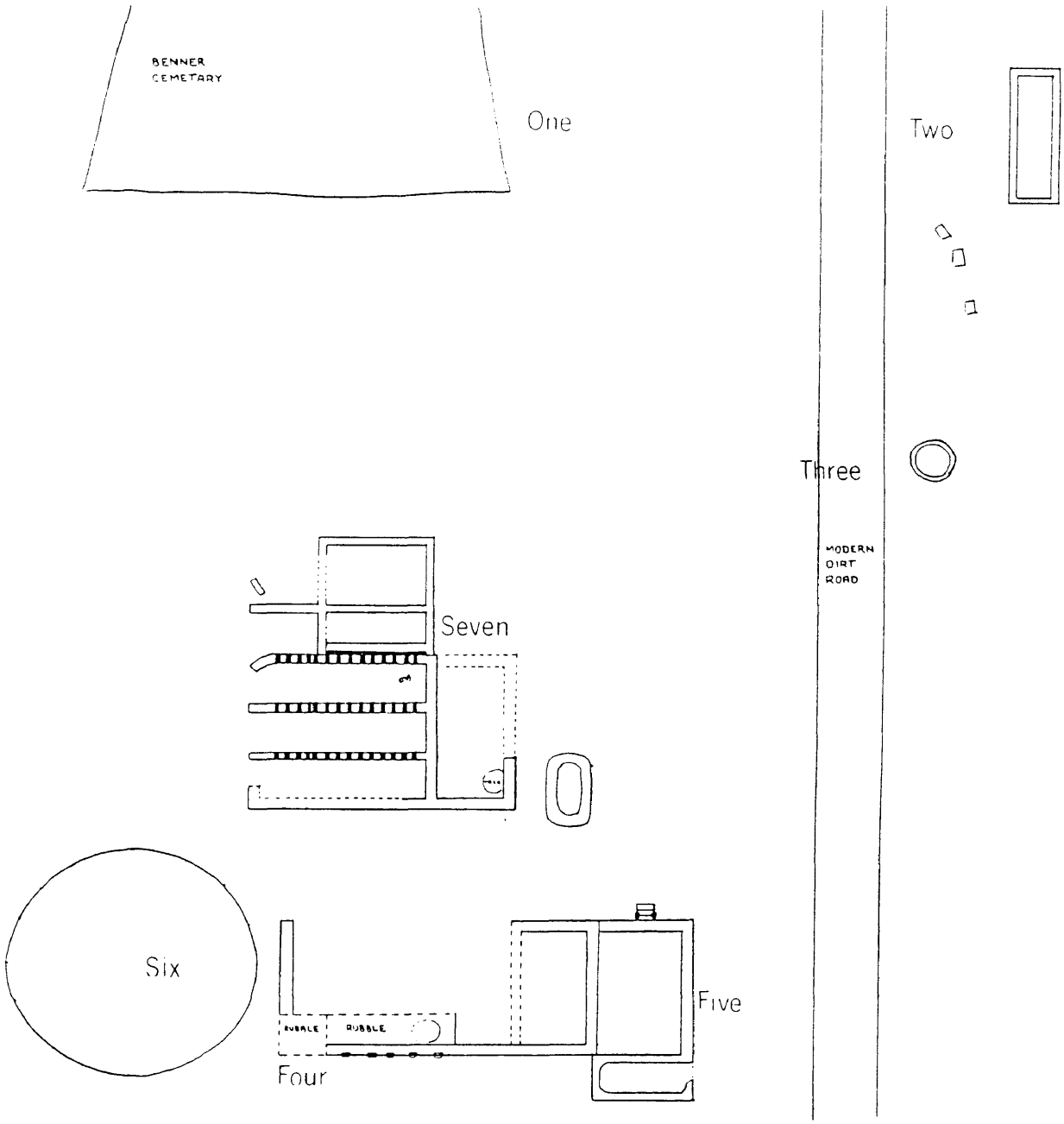
FEATURE 7: Feature seven is an enigmatic structure. About all that can be said about this structure with certainty is that it sustained two episodes of construction. The original

structure measure 48.0'N-S x 29.0'E-W. Once again of coursed stone construction, its exterior walls are 2.0' thick. The southern 1/3 is identifiable as a room with interior dimensions of 12.0'N-S x 26.0'E-W. The entire eastern wall of this room, and all but the western most 10.0' of the southern wall have collapsed above the modern surface level, but lower courses can be seen protruding from below. A large tree in the southwestern corner of the structure continues to damage this feature.

The northern two thirds of the original structure consist of three bays, each 32.0'N-S x 7.5'E-W. The western and the central bay are separated by a short wall, 1.0' high and 1.5' thick. The central and eastern bay are similarly divided by a 1.0' high wall which is 2.0' thick. These two short walls, as well as a third wall which defines the western limit of the original structure, exhibit a series of small E-W slots, each .5' wide spanning the width of the three small walls. The slots are regularly spaced at 1.5' intervals, except at 10.0' from the northern extreme, where the fourth and fifth slots from the north are spaced .7' apart. All of the slots, fourteen in each wall save the western, which has collapsed in several places, are plastered. The northern extreme of the eastern wall curves slightly to the northwest.

Although the function of this part of the structure has not been confidently determined, it may have served as an

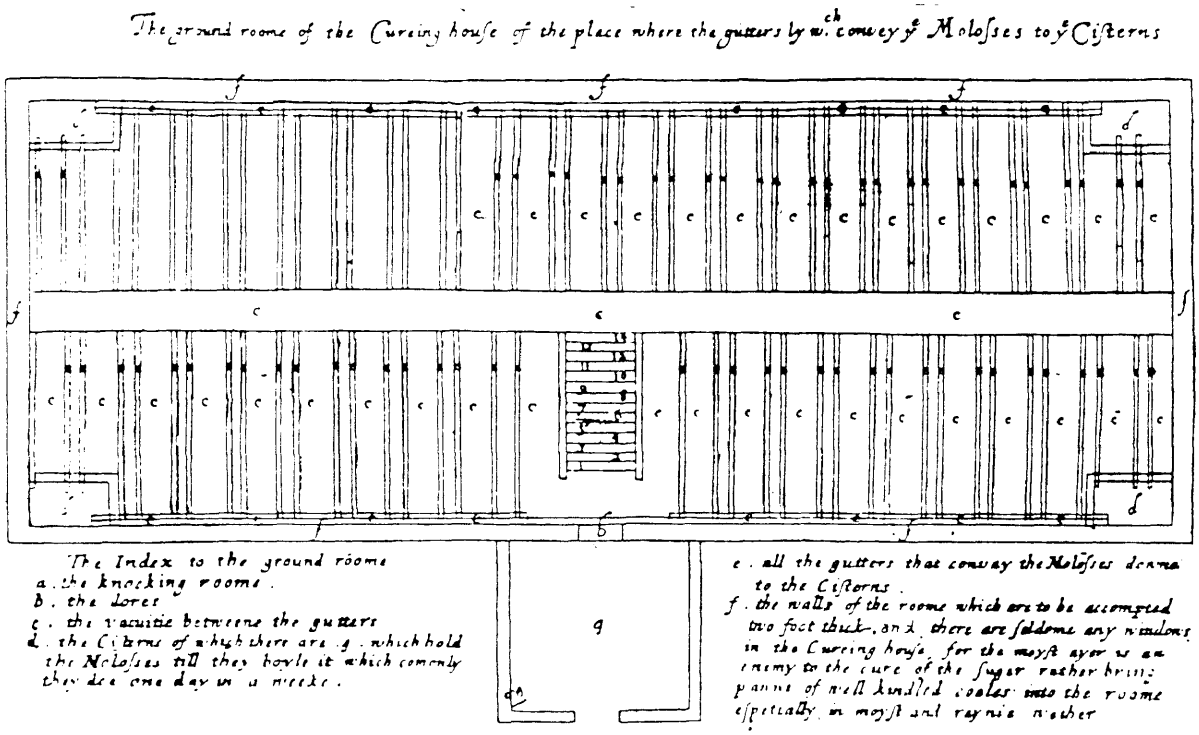
OVERLEAF: FIGURE 4.2: Benners, P8802.



P8802: BENNERS

20 ft.

FIGURE 4.3



Eighteenth-century curing house showing rows of gutters.

Compare this rendition with P8802 Feature Seven.

additional curing house. This structure compares in dimension with an eighteenth century curing house from Barbados illustrated in Noel Deerr's History of Sugar. A period description accompanying the illustration reveals that a series of gutters run the breadth of the structure, allowing seeped molasses to run to a series of cisterns. These plastered slots may have been notches into which such gutters were mortared. (See Figure 4.3)

Whatever the function of this structure, an addition was constructed some time after the original structure. The wall separating the three bays from the single distinguishable room was extended 24.0' east; two more distinguishable elements share this wall in common. The first is a fourth 32.0' x 7.5' bay, directly to the east of the original three. The second element is a smaller room to the east of the fourth bay, with interior dimensions of 18.0'N-S x 12.0' E-W.

There is a final element associated with feature seven. 6.0' to the south of the original structure is an oval structure of coursed stone. It measures 9.0'N-S x 12.0'E-W. It is constructed similarly to a cane cistern, with a wall measuring 2.0' thick and a plastered interior surface, but is only 1.5' deep. This may have served as a cistern for storing seeped molasses prior to its distillation into rum.

TABLE 4.3: Extant Features at P8802

Feature Designation	Feature Identification
One:	Cemetery
Two:	Coursed Stone Cistern
Three:	Coursed Stone Well
Four:	Boiling House
Five:	Attached Curing House
Six:	Animal Mill
Seven:	Free Standing Curing House

P8803: SCHOTSENHOEK

P8803, like P8802, has been identified by an associated cemetery. In this case, one of those interred, Lucas D. Groebe, is identified as the proprietor of Schotsenhoek Plantation by the 1746 map.

Ten distinct features have been identified in association with P8803:

FEATURE ONE: Feature one is the remains of a boiling house.

It has been recently renovated and now serves as a garage and storage area for the owner of the property, Statia Terminals, N.V. Although the original structure is constructed of coursed stone, the interior floor is of poured concrete. All four walls, which are 2.0' thick, have been stabilized with poured concrete caps. The structure is covered with a corrugated metal roof.

The west elevation of the structure reveals the remains of a firetrain. All that is currently visible are the exteriors of five stoke holes--four along the west elevation, a fifth stoke hole in the south elevation. The northernmost stoke hole pierces a rectangular element in the northwest corner of the boiling house, which measures 8.0'N-S x 6.0'E-W. The stoke hole itself measures 1.5' square. It appears that this rectangular element is the chimney foundation for the boiling house. The element itself extends 6.0' further west of the primary plane of the elevation. The west elevation is pierced by three additional stoke holes. The next northernmost stoke hole is 1.2' square, piercing the wall 2.5' above the modern surface level. 1.2' south is the third stoke hole, which is located at the modern ground level. Unlike the two more northern holes, this one is semi-circular in shape, measuring 1.5' at the diameter. 2.2' further south is the fourth stoke hole, which is identical to the third, being semi-circular and measuring 1.5' at the diameter. The northern and southern

walls extend 8.5' beyond the west elevation. 5.0' above surface level, both extensions angle 45 degrees to the roof, suggesting that the west elevation may have once been covered by a partial roof, or indeed may have been the interior wall of a leanto extension.

A fifth stoke hole pierces the southern elevation. The hole is 3.0' above the ground level, and is 1.0' square. The hole itself is framed by bermuda stone; the stone frame angles in, affectively depressing the stoke hole into the south elevation. The frame measures 3.0' square.

A cane cistern extends off the southern elevation, measuring 19.5'N-S x 10.0'E-W. Constructed of coursed stone, the cistern is capped with corrugated metal, so depth and interior treatment are impossible to determine. Further original details have been obscured or obliterated by the twentieth century construction, notably a modern concrete ramp extending from the south elevation.

FEATURE TWO: Feature two is a wooden shingle, one-and-a-half story house with a corrugated sheet-metal-covered hipped roof. The south facade has seven bays, three on either side of a central entrance, which has double board and batten doors, each door of two vertical planks, with exterior strap hinges. The western most piercing is also a door which by virtue of

window framing visible on the exterior, appears to originally have been a window. All other piercings are windows.

The central doorway is 4.0' wide. 3.0 feet away on either side of the door are six-pane casement windows, each 2.5' wide. Another 3.0' beyond these are two more identical windows; 4.5' beyond these are the final piercings of this elevation, the 2.5' wide door mentioned above, and a final identical window. The elevation measures 48.0'.

The structure is built on a stone foundation, and appears to have been constructed on the site of an earlier structure. The original foundation extends an additional 20.0' south of the present facade; this section of the foundation has been modified into a patio. The space between the southern extent of the original foundation and the structure has been filled with concrete. A series of seven cut stone steps rises from the ground to the top of the original foundation wall, and may have led directly into the original house. The steps are in a fan shape, each successive step incrementally smaller from 7.8' to 5.5', giving the impression of going from a wider space into a narrower. From the top step to the door range a set a diamond shaped marble flagstones, 1.3' square. The first diamond is cut directly into the originally foundation wall, from which one must step down to cross the final nine diamonds to a single granite step which leads up into the

central entrance.

The east elevation of the structure features five roughly symmetrical bays, all six-pane casement windows. However, the central and southernmost bays each have a single granite step below them at the foundation level, suggesting that at one time each of these bays was a door. The windows on this elevation each feature a pair of three-board shutters. Each window is again 2.5' wide; however the distances between the windows are 7.5', 6.0', 7.0', and 4.0', running from south to north. 3.5' north from the central window, the height of the foundation wall doubles. The northern two windows, which are both beyond this point, are on a plane higher than the southern three piercings, suggesting that this section of the structure may have been added at a later date. Indeed, above these two windows the plane of the roof line changes from east-west to north-south, and a seam is visible on the exterior, further reinforcing this theory.

A rubble constructed wing, measuring 10.0'N-S x 9.5'E-W, extends from the west elevation. Again, this element appears to be built on the earlier foundation. The function of this element is impossible to determine from the exterior. It may be part of the original construction or an addition.

The original foundation extends beyond this small wing,

creating a rectangular element measuring 16.0'N-S by 34.0'E-W. This area has been filled in by sod, making it a sort of grassy patio. A set of three stone steps, each measuring 3.0' x 1.0' x .7' high, ascends to the top of the southern foundation wall, 15.0' from the west elevation. 2.5' from the southwestern corner of this element a 1.5' stoke hole, with a yellow brick vaulted ceiling, indicates that this area may have been used either as an exterior (or attached) kitchen, or possibly for rum distillation.

The western elevation itself features two windows, again 2.5' six-pane casement windows, one 3.5' from the northwest corner of the structure, the other 3.8' north of the stone wing feature.

The north elevation is dominated by two twentieth-century features. The first of these is a modern bathroom which measures 10.0'N-S x 7.0'E-W. The second is a poured concrete addition which extends from the bathroom, measuring 24.0'N-S x 10.0'E-W.

FEATURE THREE: Feature three is the family cemetery, located to the southeast of feature two. There are at least eleven people interred at this cemetery. Five graves are marked.

The rest are unidentified and include three, possibly four,

TABLE 4.4: Schotsenhoek Cemetery

1. Tac Sico Smit	1965
2. Lucas Doeke Groebe	1750 @ 69y
3. A.M. Heyliger Widow of L.D. Groebe	1795 @ 92y
4. Pieter Cornhis Groebe	1770 @ 42y
5. I.G.	N.D.

children's graves. In addition, two grave markers were located ex situ east of feature two.

FEATURE FOUR: To the north of feature one, halfway between it and feature three, is a pen for small animals. Given the visible animal demography of this particular plantation site, feature four is probably the home of a number of goats. Three sides are constructed of rubble; the west elevation is a chain link fence. The feature measures 48.0'N-S x 10.0'E-W x 6.0' high.

FEATURE FIVE: Feature five is a poorly defined raised mound of earth, just northeast of feature four. It is uphill of feature one, and may have been the plantation's animal mill.

FEATURE SIX: Feature six is a modern windmill complex consisting of the windmill itself, a well, cistern, and electric pump. Several feet to the south of this structure

is a smaller capped well.

FEATURE SEVEN: Five feet to the north of the grassy patio area associated with feature two is an underground cistern. The cistern itself is constructed of red and yellow brick, and is capped with an above-ground element of cut stone, which serves as a trough. The above-ground element measures approximately 3.5'N-S x 6.0'E-W.

TABLE 4.5: Extant Features at P8803

Feature Designation	Feature Identification
One:	Boiling House
Two:	Dwelling
Three:	Cemetery
Four:	Animal Pen
Five:	Possible Animal Mill
Six:	Modern Windmill
Seven:	Brick Cistern
Eight:	Outbuilding
Nine:	Cut Stone Gateway
Ten:	Modern Privy

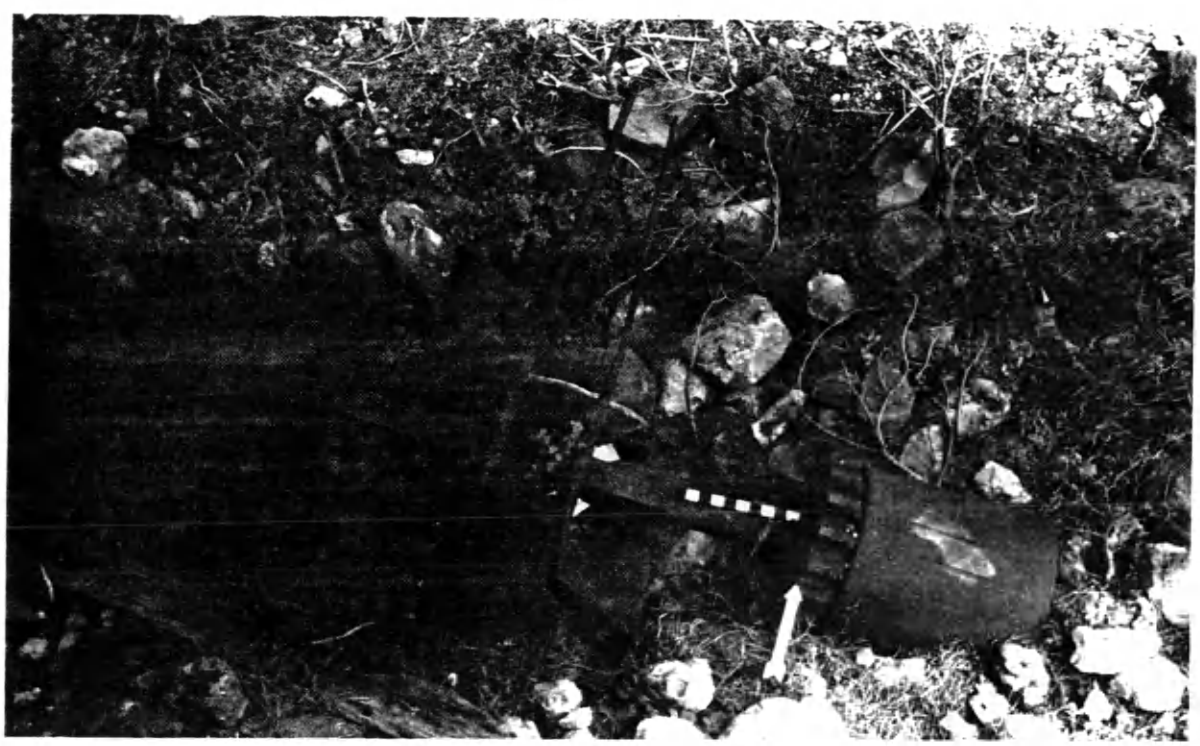
FEATURE EIGHT: Feature eight, located approximately 15' east of feature two, is a storage shed of coursed stone

construction. It measures 20.5'N-S x 40.0'E-W. It is covered with a corrugated metal roof. The roof line is slightly angled, and the structure is built into a hillside; thus the northern elevation measures 3.5' from the roofline to the modern surface level while the southern elevation measures 8.5'.

FEATURE NINE: Two stone pillars, each 2.0' square x 5.0' high mark the entrance into the plantation complex. An iron pintle in the east pillar suggests that this feature was once part of a gate.

FEATURE TEN: Feature ten is a modern outhouse located to the west of feature one. It is a two-seater of poured concrete construction.

PLATE 4.1



Cane Rollers located within the limits of windmill P8801, feature one.

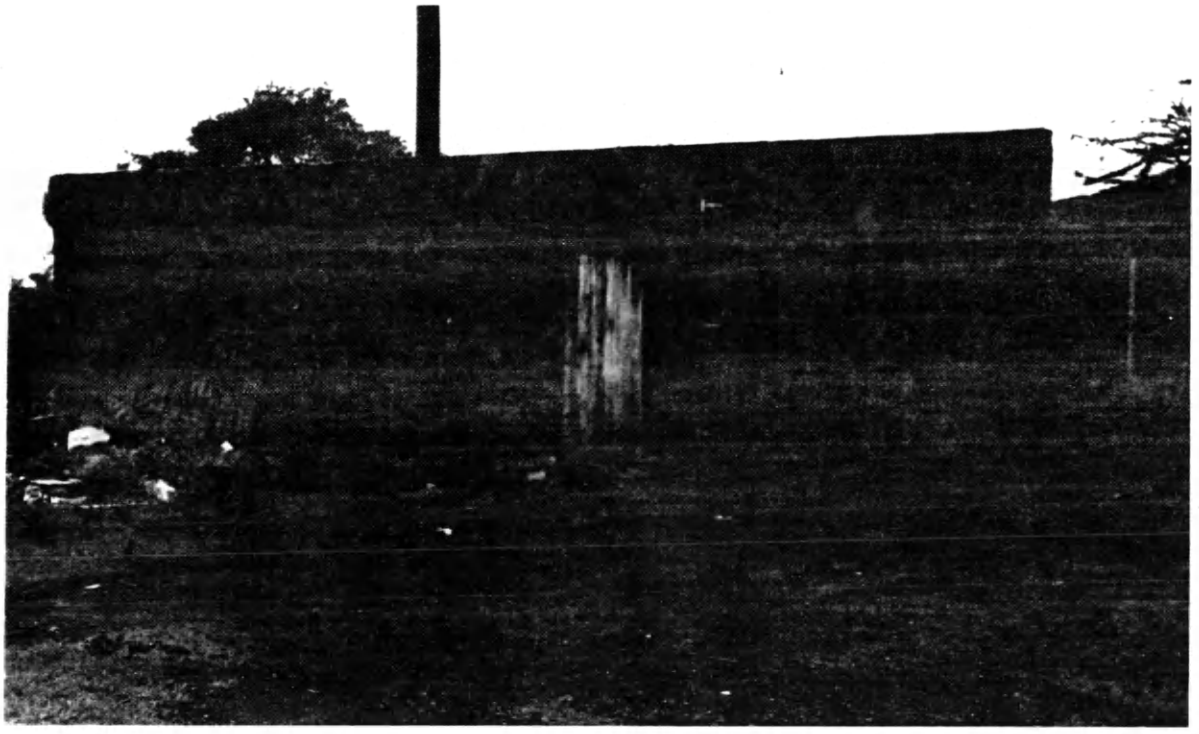
PLATE 4.2

Interior firetrain located within the boiling house, P8801, feature two.

PLATE 4.3

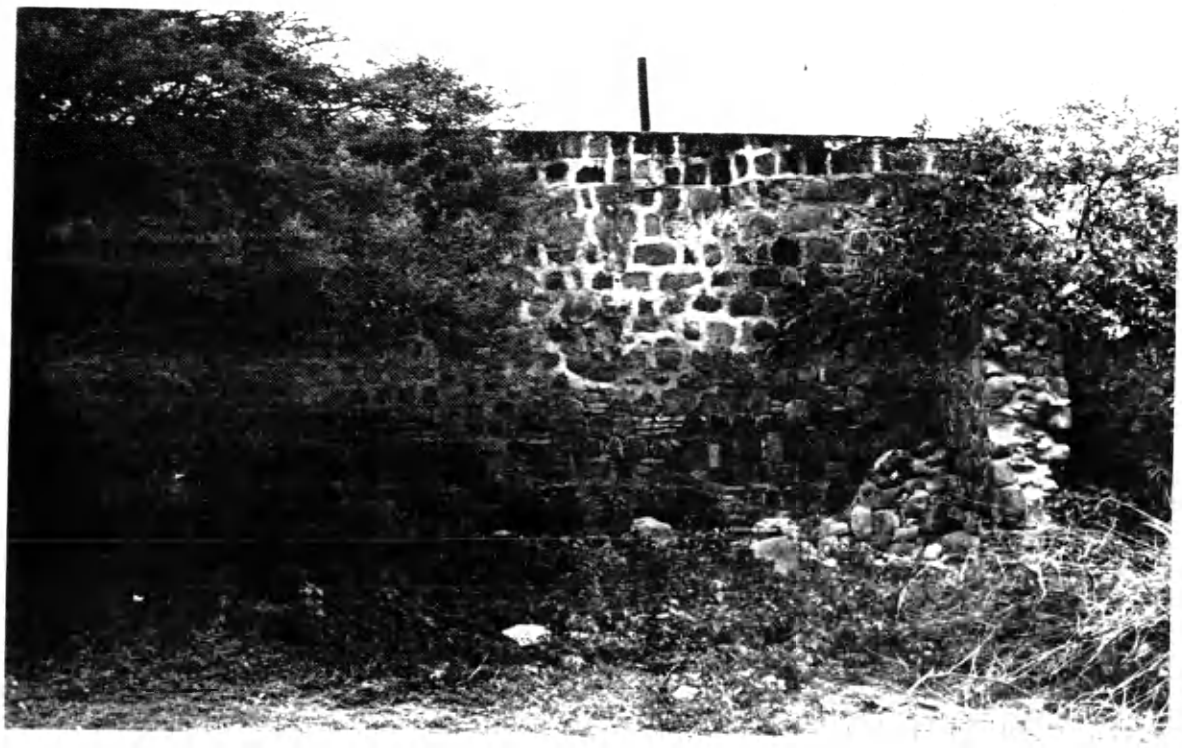
Detail of firetrain showing kettle impression. P8801, feature two.

PLATE 4.4



Boiling house north elevation. P8803, feature one.

PLATE 4.5

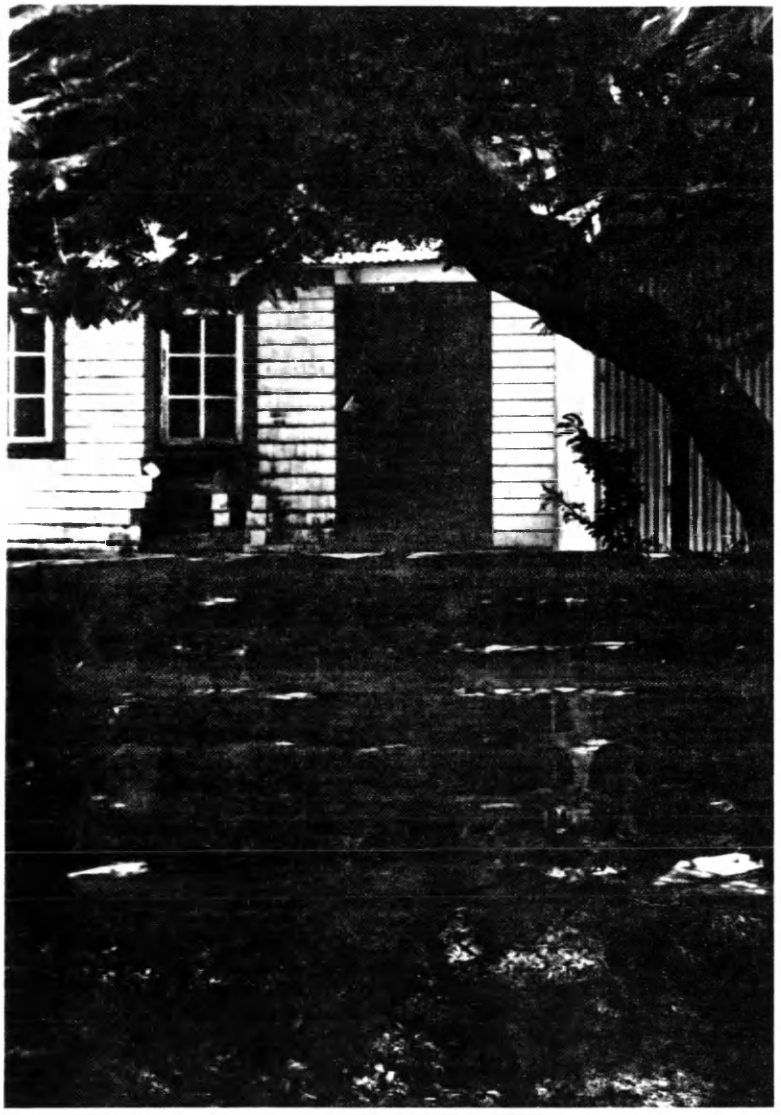


Boiling house west elevation. P8803, feature one.

PLATE 4.6

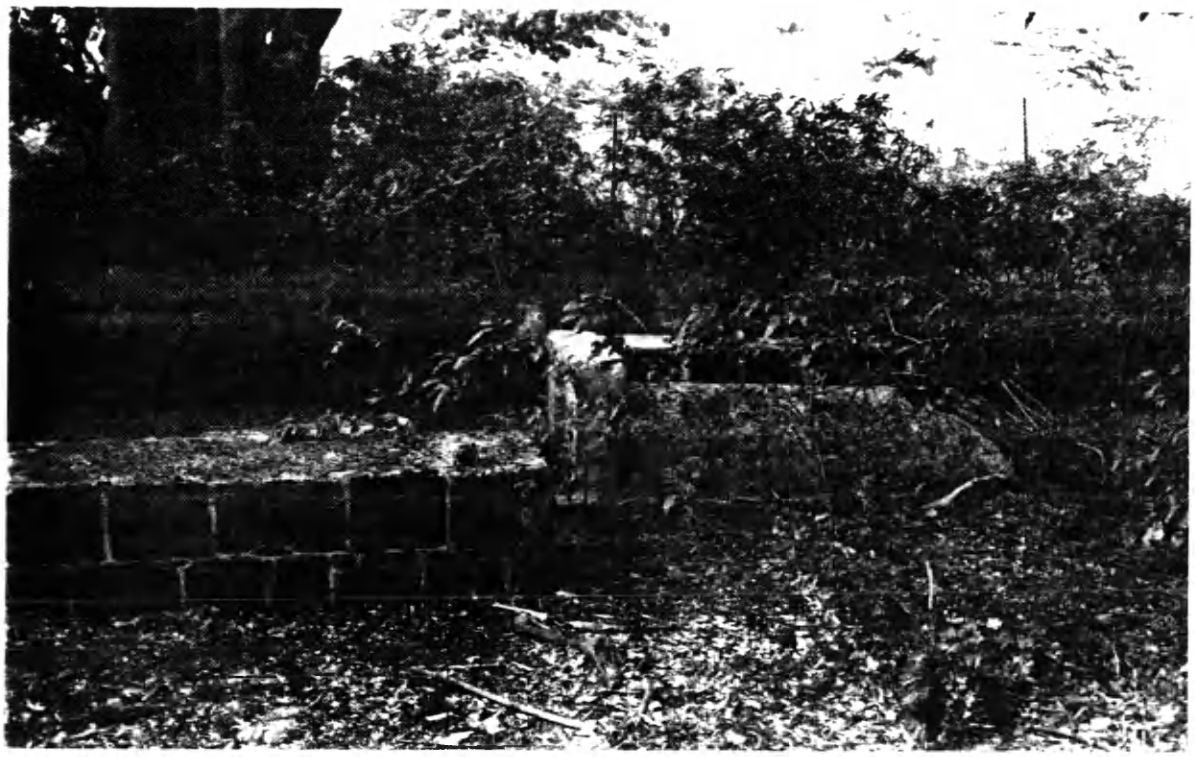
Dwelling south elevation. P8803, feature two.

PLATE 4.7



Stair detail, south elevation, P8803 feature two.

PLATE 4.8

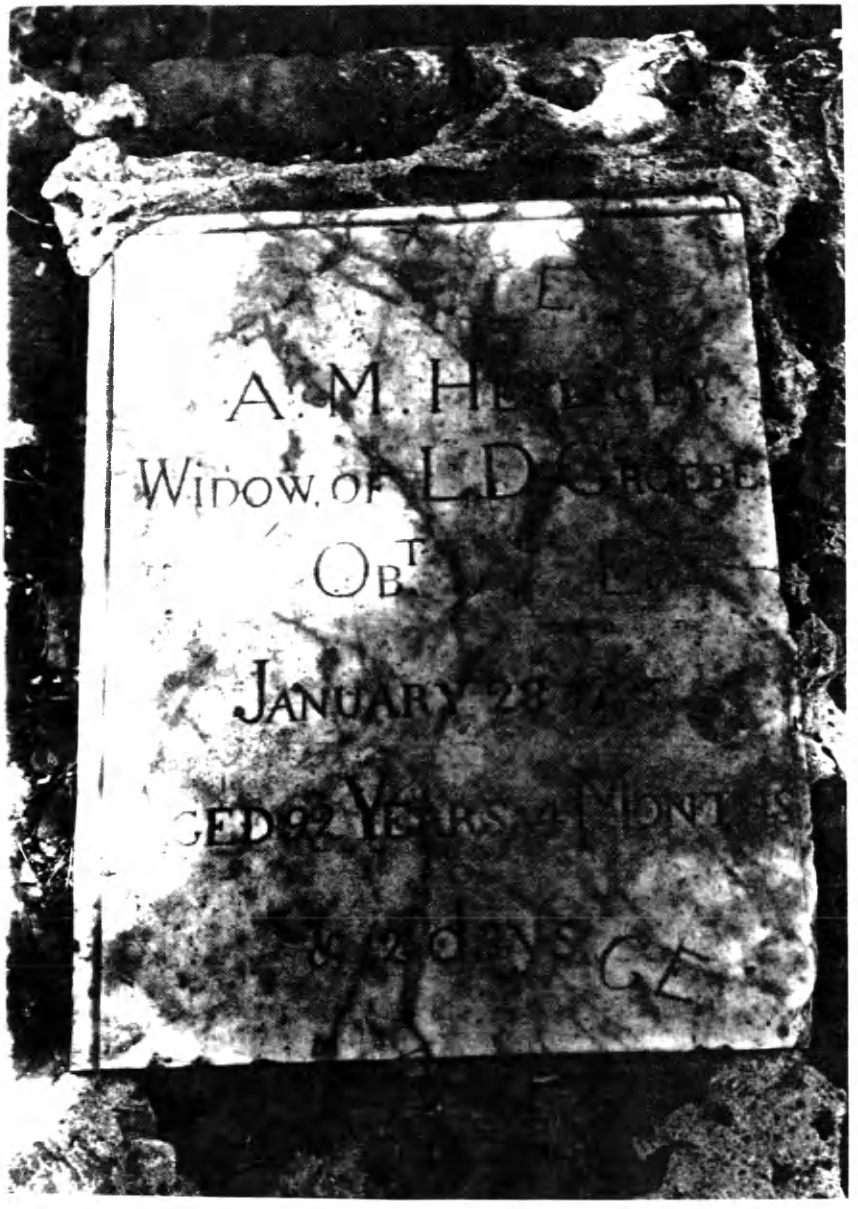


Several graves located within the cemetery at P8803, feature three.

PLATE 4.9

The proprietor of P8803 in the 1740s.

PLATE 4.10

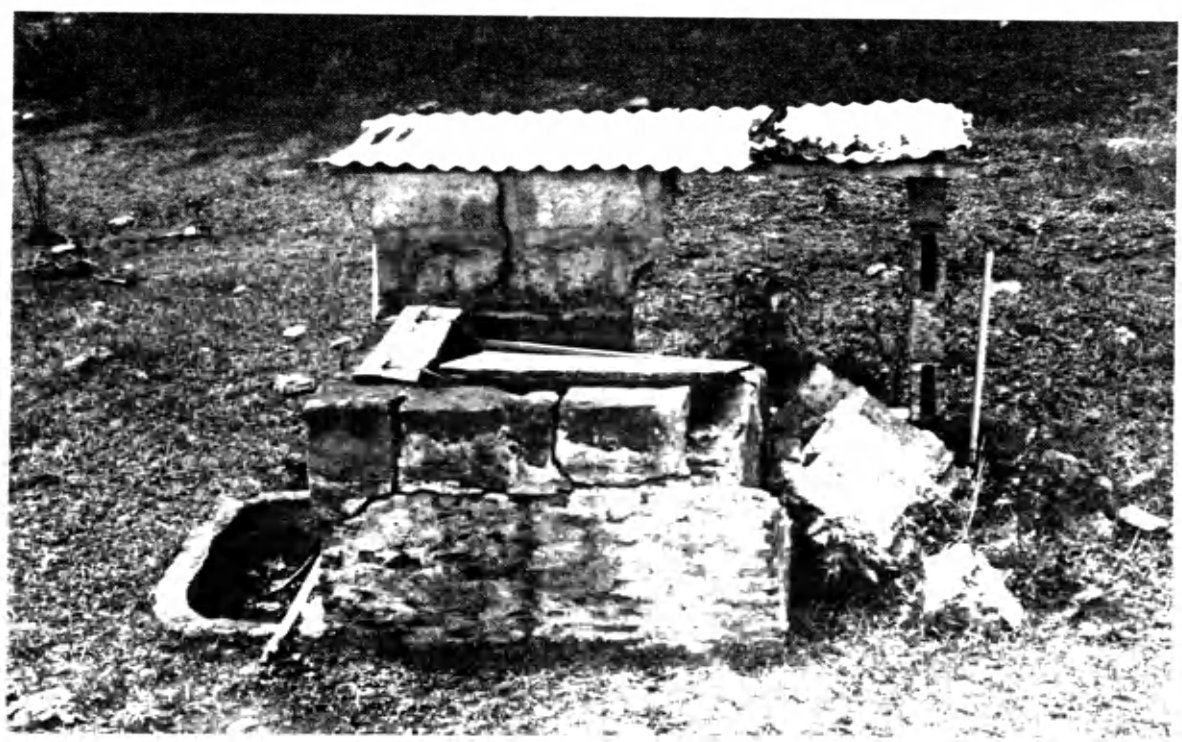


Another resident of P8803 feature three. Note her advanced age at time of death.

PLATE 4.11

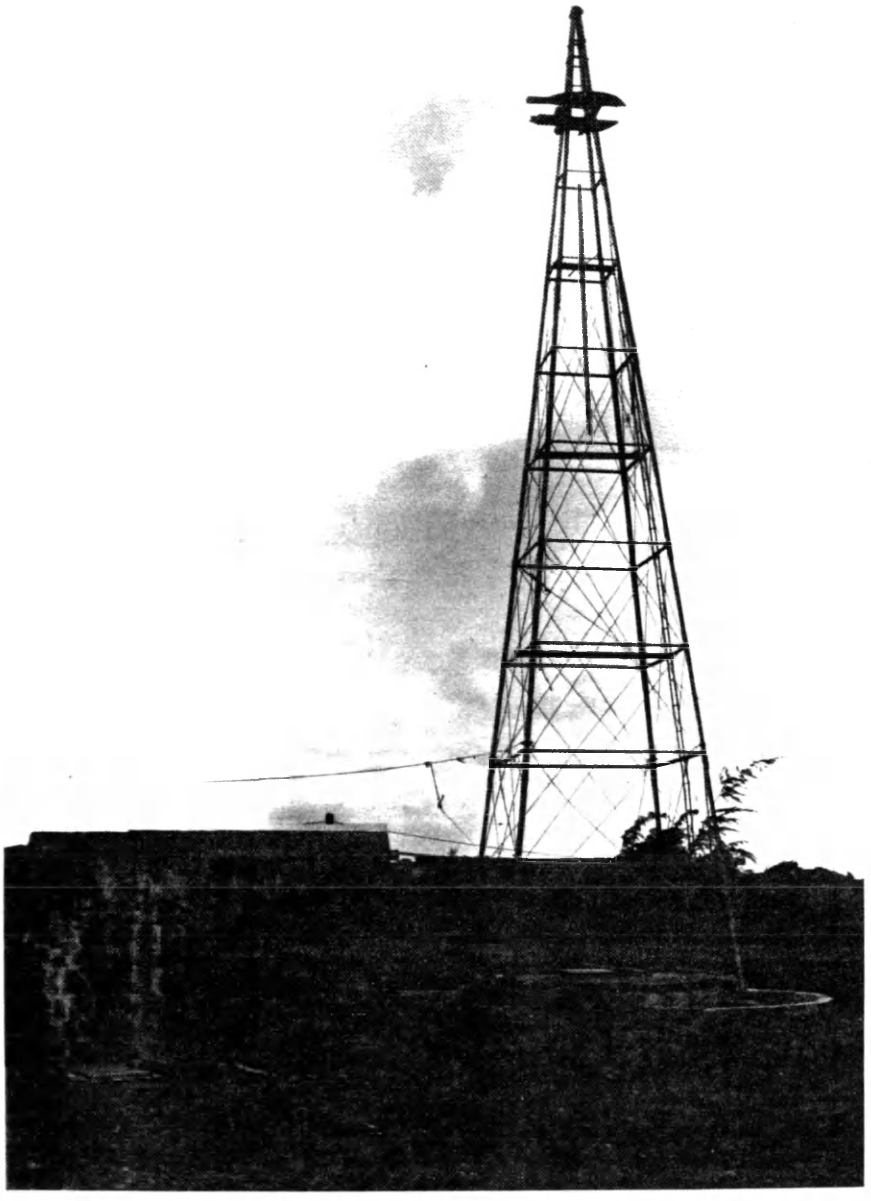
Animal pen, P8803 feature four.

PLATE 4.12



Above-ground element of underground cistern, P8803 feature seven.

PLATE 4.13

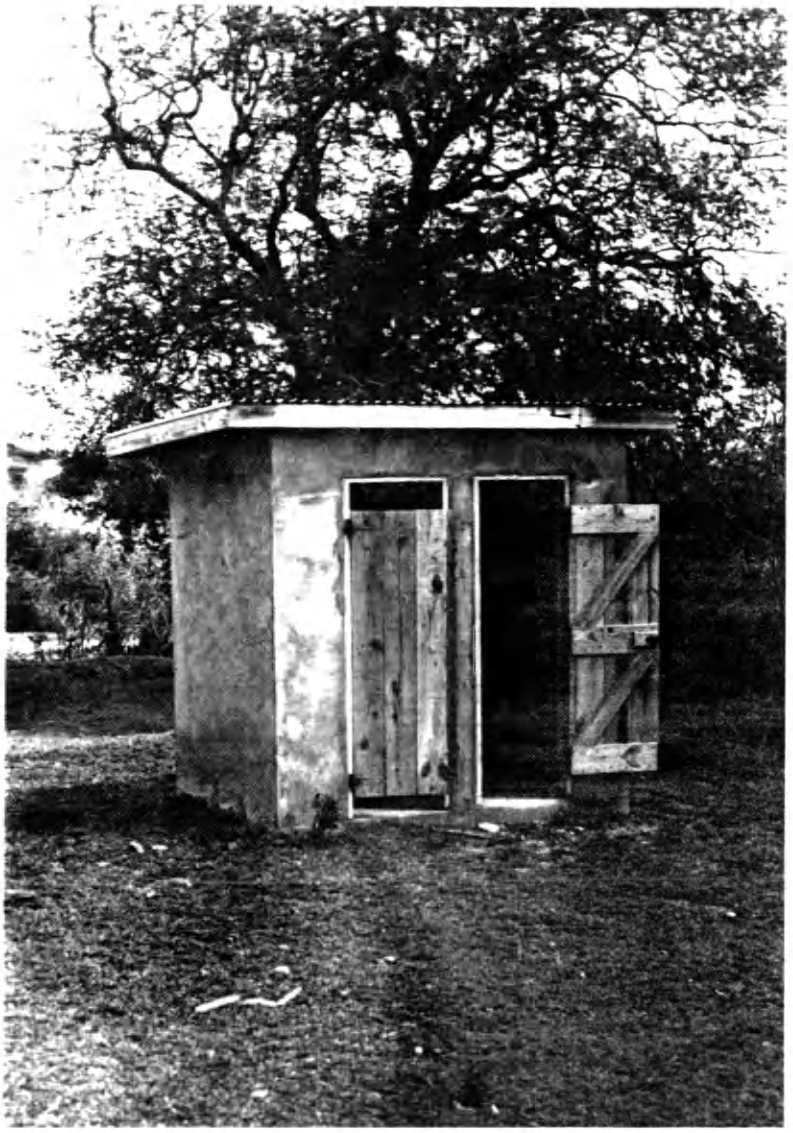


Modern windmill complex, P8803 feature six.

PLATE 4.14

Cut stone gateway, P8803 feature nine.

PLATE 4.15



Outhouse, P8803 feature ten.

P8804: FAIR PLAY

For a complete description of the features extant at Fair Play as of August 1988, see chapter three.

P8805: ROOTS

This site has been tentatively identified by its geographic location in relation to the modern topographic map, which identifies this particular location as "Roots." This site is in severe condition; only three features can be tentatively identified from the surface.

FEATURE ONE: A roughly circular hillock, 45' in diameter is visible. In the northeast quadrant of the feature is a series of seven flat stones, outlining a portion of the circumference of the feature. Although it may be a natural feature, its association with the other two features on this site suggests otherwise. Positive definition of feature one requires excavation.

FEATURE TWO: Feature two is a rectangular uncapped cistern, of coursed stone and yellow brick construction. A small portion of the catch basin, which would channel rain water into the cistern, still survives. The catch basin fragment measures 25.5'east-west x 4.0'north-south. A fragment of a

plastered brick lip, .5' wide, outlines the eastern extent of the feature and runs 16.0' from northeastern corner of the basin along its northern perimeter. The cistern itself measures 25.5'x 10.0'x 6.0' deep. At 3.0' deep, the rectangular cistern slopes down to an oval bottom. The interior of the feature as well as its rectangular rim, 1.5' wide around the cistern, are plastered. This feature lies 12' the southeast of feature one.

FEATURE THREE: Eighteen feet to the north of feature two lies several fragments of a coursed stone foundation. Although the configuration of the ruined walls resembles the dimensions of the extant firetrains at better preserved sites, a large tree has severely damaged the structure, and prohibited much detailed analysis. One indentation which may be the remains of a kettle depression is visible. The north-south dimensions of this structure cannot be determined from the surface; however, two surviving corners suggest that the east-west dimension measured 25.5' long.

TABLE 4.6: Extant features at P8805

Feature Designation	Feature Identification
One:	Animal Mill
Two:	Brick/Stone Cistern
Three:	Boiling House

P8806: CROOKS CASTLE

This particular site, known today as "Crooks Castle," is unique among the sugar plantation sites on St. Eustatius given its size and complexity. It can confidently be identified as a sugar factory; however whether there were once any cane fields associated with the site or whether the complex was used to process sugar grown at other locations on the island is a matter of conjecture.

As the site has been treated by several graduate students in unpublished papers available through Dr. Norman Barka, no detailed analysis nor measurements are presented here, but rather some brief observations on the identification and possible functions of the nine discernable features.

FEATURES ONE AND TWO: These two features are both cisterns, feature one constructed above ground, feature two below. They

are by far the largest cisterns surviving on St. Eustatius. The size and proximity of the two cisterns have caused some confusion in analysis in the past. Why construct such large cisterns so close together?

A tentative hypothesis suggests that feature one, the underground cistern, was constructed first. As the site is located directly on the Caribbean coastline, construction of an underground cistern placed its floor below sea level. It is possible that seepage of brine into the cistern would have contaminated the water supply and led to the construction of a second, above ground cistern which could be fed from the roofs of associated buildings.

FEATURE THREE: This feature is a well constructed of coursed stone. A trough is associated with this feature, suggesting that livestock were kept nearby.

FEATURE FOUR: This is a complex of at least two, and possibly three sugar tanks which held the cane juice between milling and boiling.

FEATURE FIVE: This feature has been identified as a boiling house by the presence of two extant kettle depressions defining a firetrain. An associated element, a rectangular area of coursed cut stone, provides a base for a chimney foundation. One stokehole survives in the better defined of

the two kettle depressions.

FEATURE SIX: Attached to the west extent of the firetrain is a stone foundation, defining an area which may have been a curing room.

FEATURE SEVEN: Approximately twenty feet west of feature seven is a structure identified as a rum distillery. Associated with this feature are a surviving stoke hole, a holding tank for molasses, and an external chimney.

FEATURE EIGHT: Attached to the northern wall of feature seven is a long structure which is oriented parallel to the coastline. The dimensions of the structure suggest that it served as a warehouse. The waves of the Caribbean Sea currently break against a rubble element which runs the length of the structure. This element may have served as a breakwater or as a pier for loading sugar onto boats. Further excavation of this structure is necessary to determine the function of this particular element. Feature two is attached to the northern extreme of this feature.

FEATURE NINE: Attached to the northern extreme of feature two, feature nine is a coursed stone foundation wall. Feature nine probably served as additional warehouse space.

TABLE 4.7: Extant Features at P8806

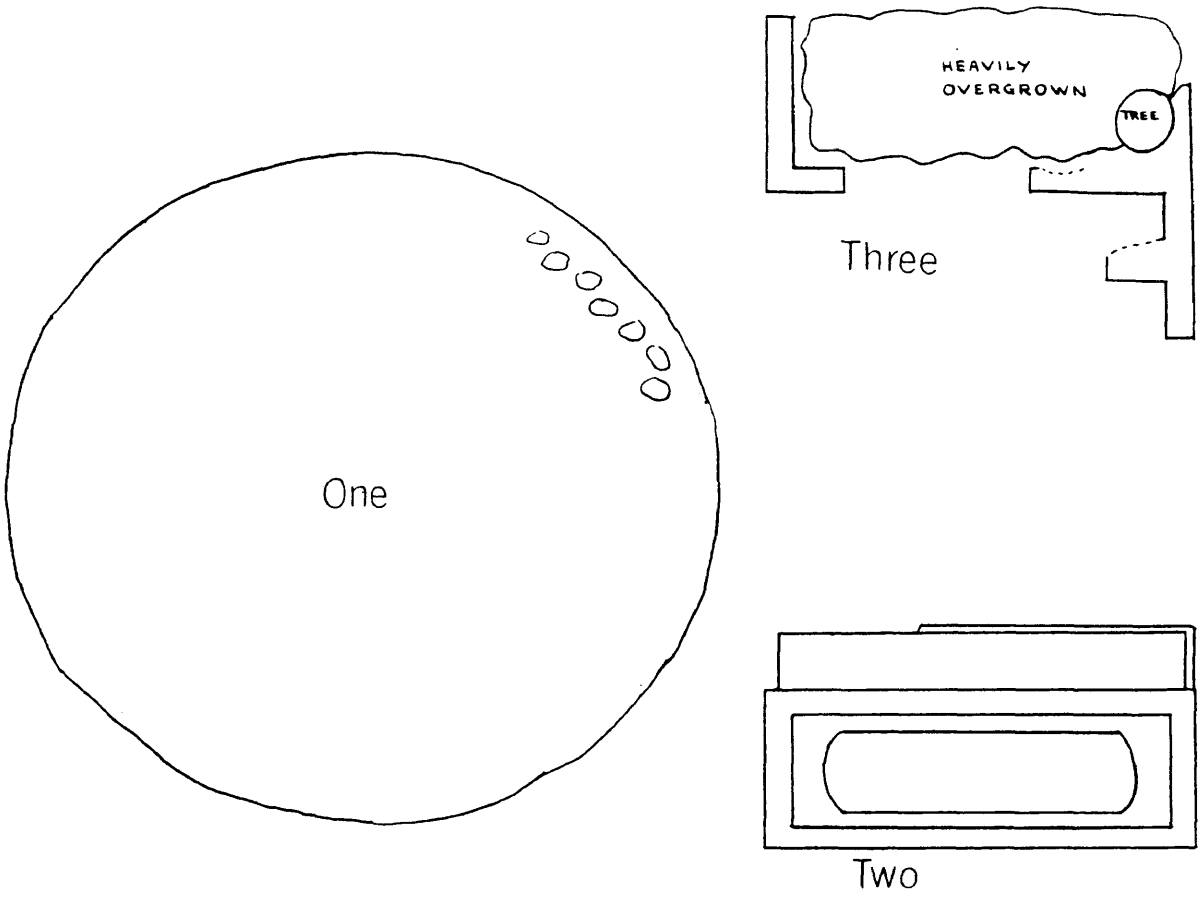
Feature Designation	Feature Identification
One:	Above Ground Cistern
Two:	Underground Cistern
Three:	Coursed Stone Well
Four:	Sugar Holding Tanks
Five:	Boiling House
Six	Possible Curing Room
Seven:	Rum Distillery
Eight:	Warehouse
Nine:	Warehouse

P8807: UPPER ROUND HILL

This site has been identified according to its location on the modern topographic map. The site lies entirely on private property; thus only a single feature which lies on the perimeter of the property and can be examined through a chain link fence has been studied.

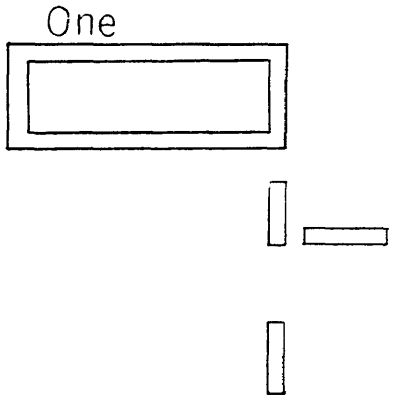
FEATURE ONE: A rectangular uncapped cistern measuring 16.5' east-west x 6.5' north-south lies near the edge of the property.

OVERLEAF: FIGURE 4.4: P8805 and P8807.



P8805: ROOTS (?)

N



P8807: UPPER ROUND HILL

N

10ft.

Probing indicates that the feature is deeper that 7.0'. Stagnant water in the feature is deeper than 6.0'. The feature is of rubble and mortar construction and stands 2.5' above the modern surface level at its highest point. A 1.0' lip surrounds the cistern. Surviving plaster is visible from 1.0' below the lip to an indeterminate depth. Fragments of a foundation originating 2.5' from the southeast corner of the feature suggest a catch basin.

A small rectangular coursed stone feature, some 100' to the south of feature one may be the remains of a firetrain. However, due to its location on private property, this feature is currently inaccessible. Identification of this feature must therefore remain conjectural.

TABLE 4.8: Extant Features at P8807

Feature Designation	Feature Identification
One:	Stone Cistern

P8808: LODI

This site is identified by the twentieth-century topographic

map as "Lodi." It is either number fifty-seven or fifty-nine as identified by the two eighteenth-century maps.

Four features can be identified:

FEATURE ONE: A large cistern constructed of coursed stone vaulted with yellow brick. It measures 8.5'east-west x 33.5' north-south. Its depth is indeterminate. A coursed stone wall 1.0' thick, runs east-west, bisecting the feature into two unequal sections. The northern section measures 18.0' from the wall; the southern 14.5'. Attached to the southern extreme of the cistern is a plastered oval trough, 8.5' east-west x 4.0' north-south x 2.0' deep. The roof of the cistern is plastered and is pierced by two catchments, each measuring 4.0' x 4.0'. Both are capped with corrugated metal, one each near the northern and southern extremes of the feature. The southern catchment is constructed of red tile, the northern of yellow brick.

FEATURE TWO: Feature two is a rectangular foundation of coursed stone construction, measuring 24.0'east-west x 36.0' north-south. This feature is located 17.0' to the north of feature one; the bisecting wall of that feature extends to become the northern wall of feature two, where it expands from 1.0' to 2.5' thick, equaling the thickness of the other walls

of the feature. The southern wall of the feature is pierced by a doorway, 3.5' wide. A wall 1.0' thick abuts the east wall of the structure, running as an extension of the northern wall, 24.0' east from the northeast corner of the structure.

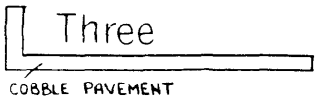
FEATURE THREE: Feature three is a second cistern, considerably smaller than feature one, located 100' to the southwest of the larger cistern. Constructed of coursed stone, the feature is uncapped. It measures 9.0' east-west x 19.0' north-south by an indeterminate depth. The interior walls are oval and are plastered. Attached to the southern wall of the cistern is an oval trough measuring 9.0' east-west x 3.5' north-south x 2.0' deep. Its interior is also plastered. Associated with feature three is a plastered catch basin, ranging 30.0' to the east of the cistern. The edges of the catch basin angle slightly to the north and the south. Like the cistern itself, its highest point is 4.5 ' above the surface level on the north side. The south side is almost flush with the ground.

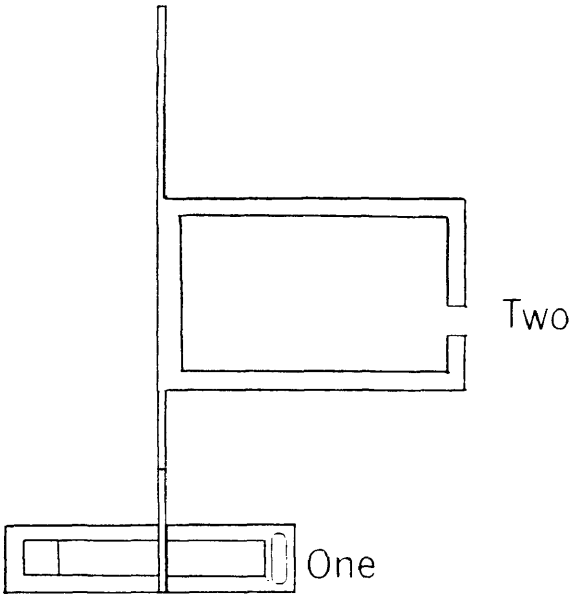
FEATURE FOUR: Approximately 20' to the east of the terminal point of the extending wall of feature two is a cobble pavement. The northern terminus of the pavement is on the same plane as the northern wall of feature two. The cobbles run from this point 36.0' south, parallel to the eastern wall of feature two. The pavement is 2.0' wide. The northern extreme of the feature extends 3.0' east, again along the same

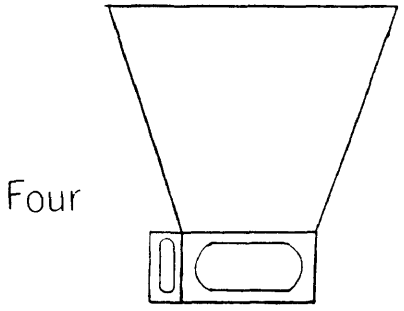
plane as the northern wall of feature two. The dimensions and orientation of this feature suggests an association with feature two. What this association is has yet to be determined.

Although the location of this site coincides with one of several plantations identified by the seventeenth-century maps, there is no surviving diagnostic feature which positively identifies this site as a sugar plantation.

OVERLEAF: FIGURE 4.5: P8808.





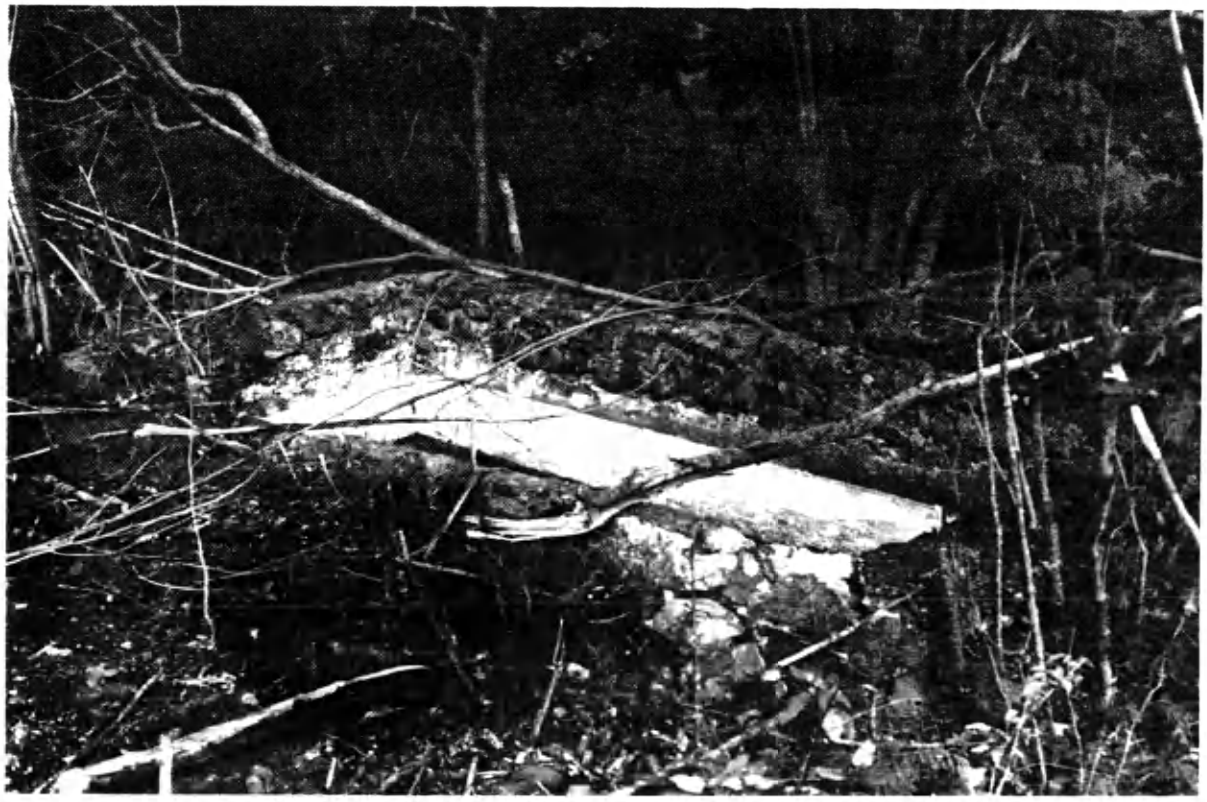


P8808: LOD1(?)

PLATE 4.16

Stonework detail on animal mill, P8805 feature one.

PLATE 4.17



Uncapped cistern, P8805 feature two.

PLATE 4.18

Boiling kettle surviving at P8806.

PLATE 4.19

Stone and brick cistern, P8808 feature one.

PLATE 4.20

Coursed stone cistern, P8808 feature three.

PLATE 4.21

Cobble pavement, P8808 feature four.

TABLE 4.9: Extant Features at P8808

Feature Designation	Feature Identification
One:	Stone and Brick Cistern
Two:	Unidentified Structure
Three:	Coursed Stone Cistern
Four:	Cobble Pavement

P8809: ?

This site is located but unnamed by the historic maps. It is approximately 100 meters to the south of a structure known as the Sisal Factory, and may actually be associated with this structure. Only one feature can be positively identified at this site.

FEATURE ONE: Feature one is a cistern constructed of rubble and mortar. It measures 7.5' east-west x 14.0' north-south x an indeterminate depth. The cistern is built above the ground, its highest points measuring 3.7' 6.5' and 5.2' above the modern surface level on the north, west, and south elevations respectively. The cistern is capped; the flat roof is plastered. The north elevation features a set of stairs of

coursed stone and red brick construction. The bottom step measures 3.1' east-west x 1.5' north-south x 2.3' high. The second step measures 3.1' x 2.3' x 2.3' high; a third top step is detached and lies several feet to the north; a faint ghost mark on the north elevation of the cistern indicates its previous location. The stairs lead up to a raised catchment which pierces the roof of the feature. The lip of the catchment is of yellow brick, measuring 3.1' square. The lip is .6' thick and .6', two courses, high. The catchment hole itself measures 1.9' square. A depression .2' deep lies in the geometric center of the cistern's roof. A hole in the bottom of the depression pierces the roof. The depression measures 1.5' in diameter; the hole measures .7' in diameter.

Random rubble, red brick, and yellow brick lay scattered on the ground about the cistern. No other features survive. However, the area around feature one had been bulldozed for government housing some weeks before the site was surveyed on August 5, 1988.

TABLE 4.10: Extant Features at P8809

Feature Designation	Feature Identification
One:	Stone Cistern

P8810: ?

Like P8809, this site is identified but unnamed by the eighteenth century maps. It is located on a modern working farm and consists of four extant features.

FEATURE ONE: A large vaulted cistern, measuring 30.0' north-south by 7.5' east-west. Its depth is indeterminate; it is presently used an irrigation source for the farm within which it is located. The exterior of the yellow brick vault is plastered. The north and south elevations are constructed of cut coursed stone. Two small catchment holes, each measuring .5' square, pierce the structure at its base, 14.5' from the north, one each through the east and west elevations. A larger raised catchment pierces the roof of the cistern 2.0' from the southern elevation. The 2.0' square catchment is framed by a course of cut bermuda stone. A set of eight cut stone stairs rises from the modern surface level to this catchment. Each individual stair measures 2.2' wide (east-west) by .9' long by .9' deep. The bottom stair remains only in fragment. Each cut stone stair is built on a course of yellow brick risers.

Stretching along the south elevation east from the stairs is

a pair of yellow brick troughs. The pair measures 2.5' north-south by 7.1' east-west. A common wall measuring .3', one brick width, separates the two. The interiors of the individual troughs measure 3.0' by 2.0' and are plastered. The walls of the troughs are .3' thick, including the north wall, which abuts the south elevation of the cistern. The element measures 2.0' from the modern surface level to its rim.

A plaster catch basin 20.0' east from the length of the east elevation. The north extent of this element is defined by a rubble wall, 1.2' wide, running the full 20.0'. The east extreme is defined by a raised plastered lip .6' wide. A large section of the catch basin has broken off at its southeastern corner. The section that remains is defined by a similar lip.

A second catch basin extends 6.4' west from the length of the west elevation. This element is constructed of rubble covered with plaster. A rubble wall 1.0' wide defines the entire perimeter of this element.

A modern pump and lengths of PVC pipe are present near the cistern.

FEATURE TWO: 7.0' from the disturbed southeast corner of

feature one is a small rectangular structure measuring 12.0' east-west by 22.0' north-south. The feature is constructed of coursed rubble construction, with some red brick evident especially in the southeast corner. The structure is oriented to the west, this elevation being pierced by a door 6.5' from the south and a window 3.7' from the north. The south elevation is pierced by two windows, each 3.7' from the exterior corners of the structure. The north and south elevations are each pierced once, the former by a door in the center of the elevation, the later by a window, also piercing the center of the elevation.

The plastered interior walls measure 7.1' from a poured concrete floor to their exposed top. No roofing is evident, save several lengths of rebar extending from the tops of the walls, suggesting either twentieth century construction or renovation. The walls are capped in several places with concrete blocks, giving credence to the latter interpretation.

FEATURE THREE: Approximately 50' to the south of feature two is a modern animal pen constructed of concrete blocks. Because of the obvious late construction date, this feature has not been measured.

FEATURE FOUR: Approximately 100' to the west of feature three are the remains of a boiling house. This feature is heavily

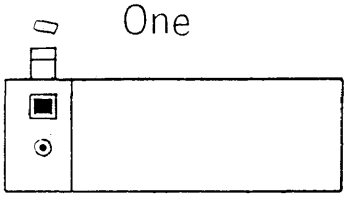
overgrown by acacia trees, prohibiting complete examination, however several diagnostic elements are accessible. The most telling element is the ruin of a firetrain, measuring 6.0' east-west by 18.0' north-south by 4.5' high. Three stoke holes pierce the west elevation, each 1.5' square. Three kettle impressions can be distinguished, the northernmost measuring 3.8' in diameter. The other two are too overgrown to accurately measure.

Running south from the firetrain is a wall, measuring between 5.0' and 7.0' above the modern surface. The wall is in two contiguous sections, indicated by a visible seam. Each section measures 8.0' north-south. The northern section of this wall, 2.0' thick, is curved; the top is plastered. The southern section extends to a corner which turns west, extending 3.0' feet in this direction. Any additional information remains concealed by the heavy acacia growth.

TABLE 4.11: Extant Features at P8810

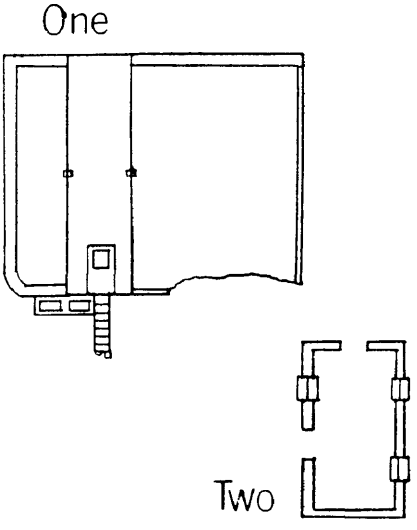
Feature Designation	Feature Identification
One:	Brick Cistern
Two:	Unidentified Structure
Three:	Modern Animal Pen
Four:	Boiling House

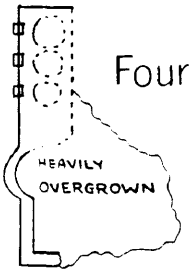
OVERLEAF: FIGURE 4.6: P8809 and P8810.



P8809: ?

20ft N





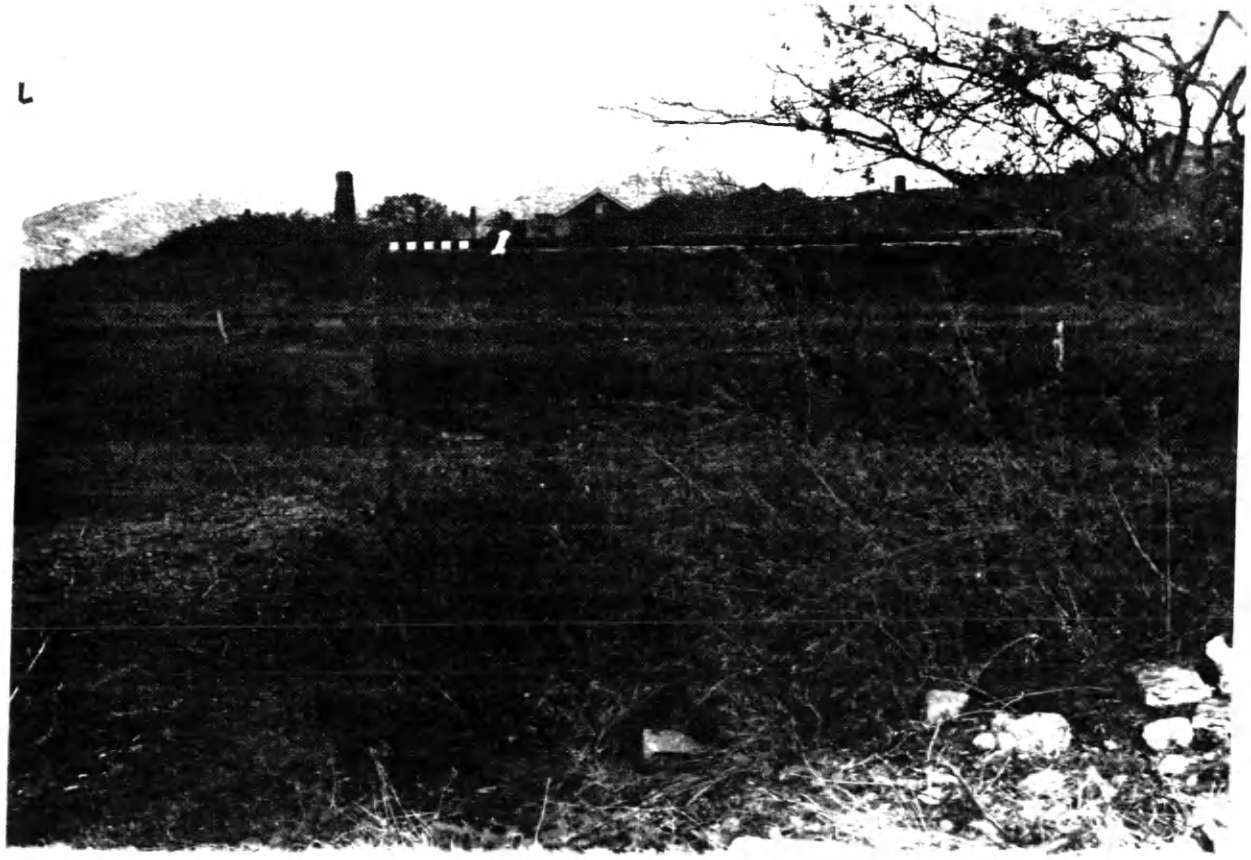
P8810: ?

20ft N

PLATE 4.22

West elevation, cistern, P8809 feature one.

PLATE 4.23



South elevation, cistern, P8809 feature one.

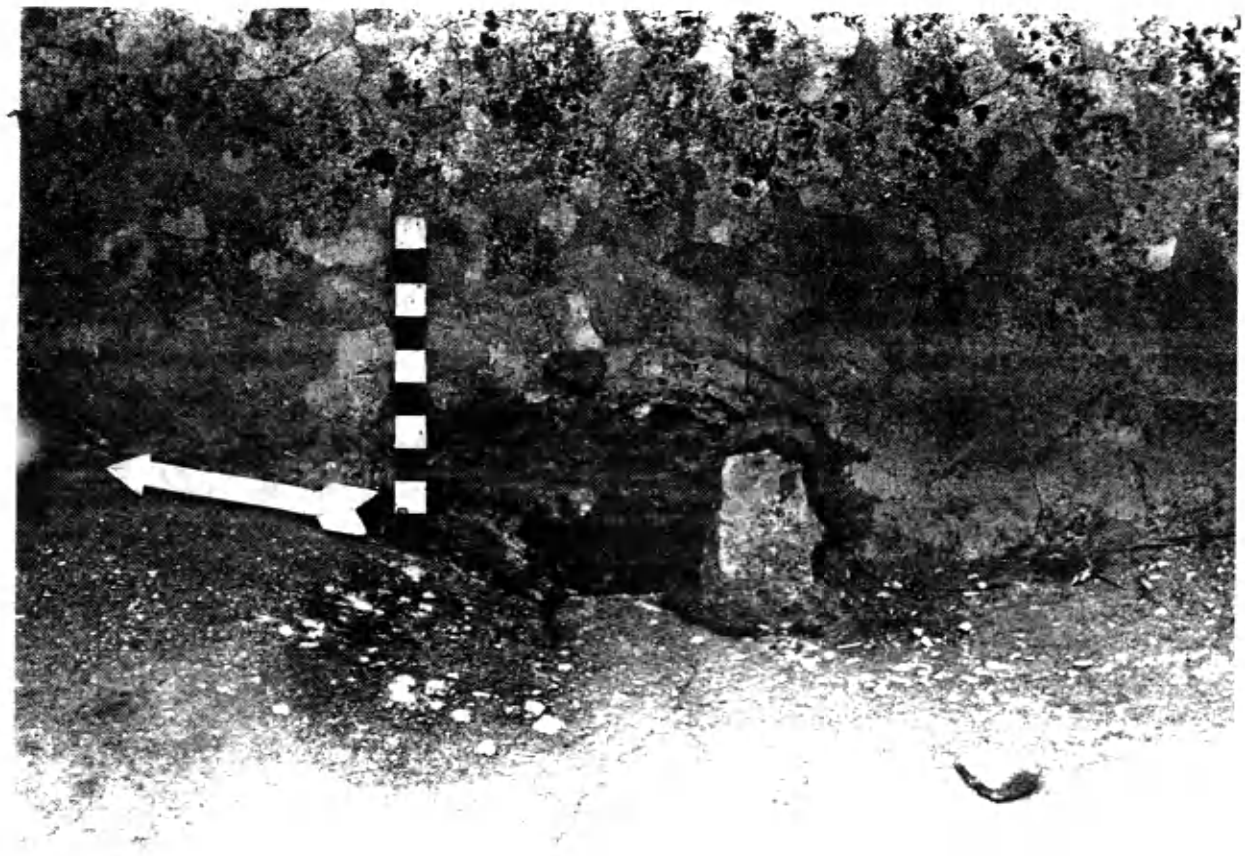
PLATE 4.24

P8810.

PLATE 4.25

Cistern, P8810 feature one.

PLATE 4.26

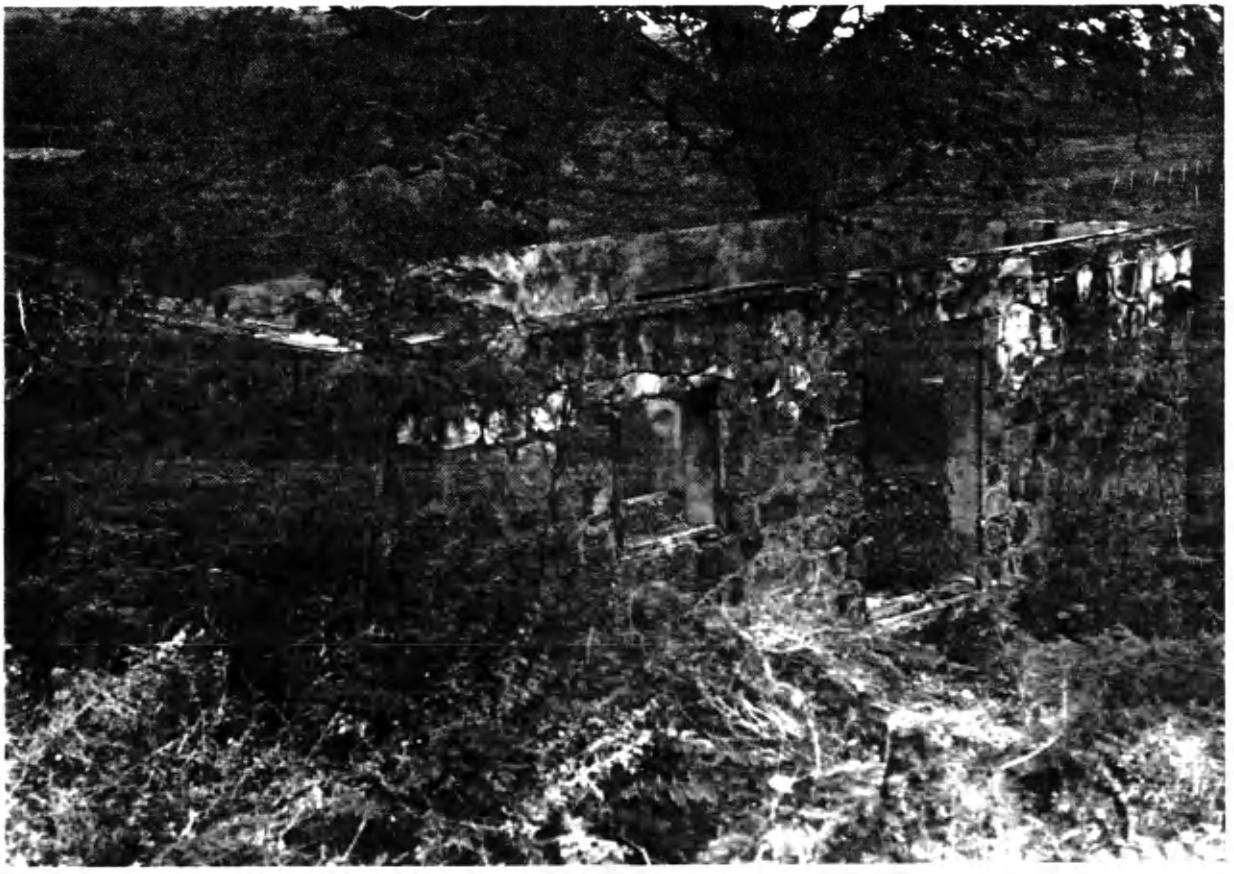


Catchment detail, cistern, P8810 feature one.

PLATE 4.27

South elevation, cistern, P8810 feature one.

PLATE 4.28



P8810, feature two.

P8811: WHITE HOOK

Although there are no diagnostic features at this site to provide conclusive identification as a sugar plantation, the site is identified as a site by the eighteenth century maps as a potential plantation site. The modern topographic map identifies this location as "White Hook."

There are three features associated with this site:

FEATURE ONE: Feature one is double cistern measuring 18.0' east-west by 15.0' north-south. The western section is vaulted while the eastern section is uncapped, save by a sheet of corrugated metal. They are separated by a plastered concave section, 15.0' by 4.0', which acts as a large gutter between the two. All three sections are constructed of coursed cut stone.

The western section measures 5.5' east-west by 15.0' north-south. A plastered gutter, 1.2' wide, runs the length of the west elevation. A small catchment hole, .4' square, pierces the center of the west elevation, allowing water to run from the gutter into the cistern. The vault is pierced by a catchment 2.0' square, framed by bermuda stone .5' thick. The south elevation is also pierced by a hole measuring .4'

square, which in this case feeds a semi-circular trough which extends 4.0' from the length of this elevation. The interior and rim of this trough are plastered. The north and south elevations are constructed of coursed cut stone; the vault is constructed of plastered yellow brick.

The eastern section is similarly built of cut coursed stone. It measures 7.0' east-west by 13.0' north-south. The north elevation is flush with that of the western section and the central gutter, while the south elevation abuts a 2.0' wide gutter which connects the central gutter with a plastered catch basin extending east of the smaller cistern. The catch basin runs the length of the eastern elevation, extending an additional 5.0' further north. This element measures 20.0' square.

FEATURE TWO: .2' north of the northwest corner of the catch basin associated with feature one stands a small rectangular structure, measuring 12.0' north-south by 22.0' east-west. The east, west, and south elevations of the building were standing as of August 1988. All that remains of the north elevation is a foundation wall, and evidence of a wall tumble to the north of the structure. No roof survives. The three surviving walls are 1.0' thick.

The south elevation is pierced twice. A doorway pierces the

elevation 4.0' from the southwest corner; a window pierces 4.0' from the southeast corner of the structure. The centers of the east and west elevations are each pierced by a single window.

The interior walls are plastered and measure 7.1' from the modern ground surface to the top.

FEATURE THREE: 10.0' from feature three stands the ruin of a small structure, measuring 7.5' square. The north elevation is on the same plane as the north elevation of feature two. Like feature two, this small structure is constructed of coursed cut stone on the interior and exterior, with a layer of rubble and mortar between the two series of courses. The west elevation rises to a point, suggesting that the structure once had a gable roof. No other evidence of roofing survives.

TABLE 4.12: Extant Features at P8811

Feature Designation	Feature Identification
One:	Double Cistern
Two:	Unidentified Structure
Three:	Unidentified Structure

The structure is pierced by windows through the centers of the

north and west elevations. The north window is treated with red and yellow brick. The east elevation shows evidence of a door, but is so damaged as to prevent accurate measurement. The interior walls measure 5.3' from the ground surface, which is covered with rubble, to the tops of the walls. The peak of the gable of the west elevation is 6.5' above this surface.

Approximately 150' to the north of features two and three is rubble wall which has not yet been measured.

P8812: ?

The area immediately surrounding the two extant features at this site had recently been bulldozed when discovered in August 1988. Once again, identification as a plantation is based on the geographic location relative to the eighteenth century maps. No diagnostic features have yet been discovered at this site.

FEATURE ONE: Feature one is a thoroughly overgrown cistern. It is constructed of coursed stone, with a plastered yellow brick vault. This feature measures 9.0' east-west by 18.0' north-south. The south and west elevations rise 6.0' from the modern surface level; the east elevation rises 4.5' and the north elevation rises 5.5' from the surface level. The center

of the north elevation is pierced by a hole, .5' square, 2.0' above the modern surface level. The west elevation is similarly pierced 3.0' above the surface level. Each hole is framed by yellow brick treatment. The vault is pierced by a catchment 1.6' square. The catchment is framed by cut stone, .8' wide, which itself lies on a course of yellow brick. A large pile of rubble extends from the east elevation of the cistern.

TABLE 4.13: Extant Features at P8812

Feature Designation	Feature Identification
One:	Coursed Stone Cistern
Two:	Destroyed Structure

FEATURE TWO: The second feature at this site is indistinguishable as a structure. It consists of four detached foundation walls, each 1.0' thick. A west, north and south wall, measuring 5.0', 4.6' and 3.8' respectively, roughly outline what may have been a small structure resembling feature three of P8811. A fourth wall lies bulldozed several feet to the north of the feature. All four walls are constructed of coursed stone; the west wall is treated with a single red tile. All four reach 2.0' above the modern surface level.

CONCLUSION

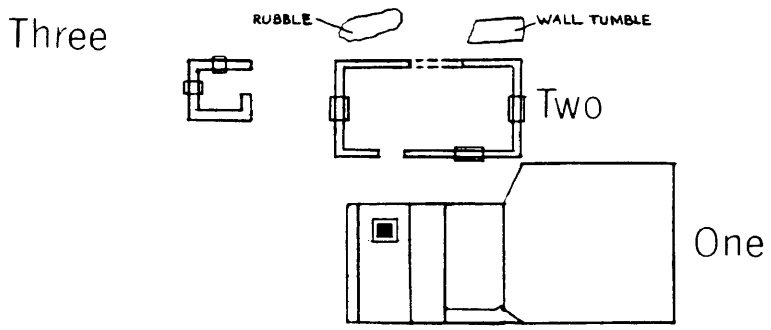
In addition to the twelve sites discussed above, four plantation sites have been examined in previous field seasons. These are English Quarter, Princess Estate, Garden Gilheads, and Boven. For the purposes of this paper, these sites have been designated P8813, P8814, P8815, and P8816. Although I had the opportunity to briefly visit each of these sites, time did not allow new descriptions and plans of these sites to be made. However, each of these sites has been previously documented by students affiliated with William and Mary.

English Quarter, perhaps the best preserved of these four sites, has been thoroughly treated by Linda France in her 1982 Master's thesis, Sugar Manufacturing in the West Indies: A Study of Innovation and Variation, available through the department of Anthropology at the College of William and Mary. The Princess Estate site is discussed by Norman Barka in his Excavations at the Princess Estate: An Interim Report. This report describes the site as it stood in 1987, as well as discusses the popular folklore which identified this site as a mikveh, or Jewish ceremonial bath. This report is also available through the department of Anthropology at the College of William and Mary. Garden Gilheads, a plantation located very close to the Princess Estate, was also examined

in 1987. Patricia Kandle is currently compiling the information on this site into a detailed map and report, which should soon be available. The final plantation site, Boven, is the subject of ongoing research by Jerry Hartley, currently of Ohio University in Athens, Ohio. He has co-authored a preliminary report on the site with Karen Fisher. This report is unpublished, but is available either from Jerry Hartley or Norman Barka of the Anthropology department of the College of William and Mary.

Of these sixteen potential plantation sites, nine can be confidently identified as plantations by associated diagnostic features. They are: P8801, P8802, P8803, P8804, P8805, P8810, P8813, P8814, and P8815. The remaining seven--P8806, P8807, P8808, P8809, P8811, P8812, and P8816--cannot be identified by diagnostic features, and must therefore remain only conjecturally identified as plantation sites. Whether these sixteen are the only potential plantation sites extant on St. Eustatius is a matter for future research.

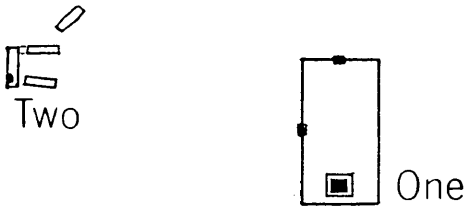
OVERLEAF: FIGURE 4.7: P8811 and P8812.



P8811: WHITE HOOK

20ft

N



P8812: ?

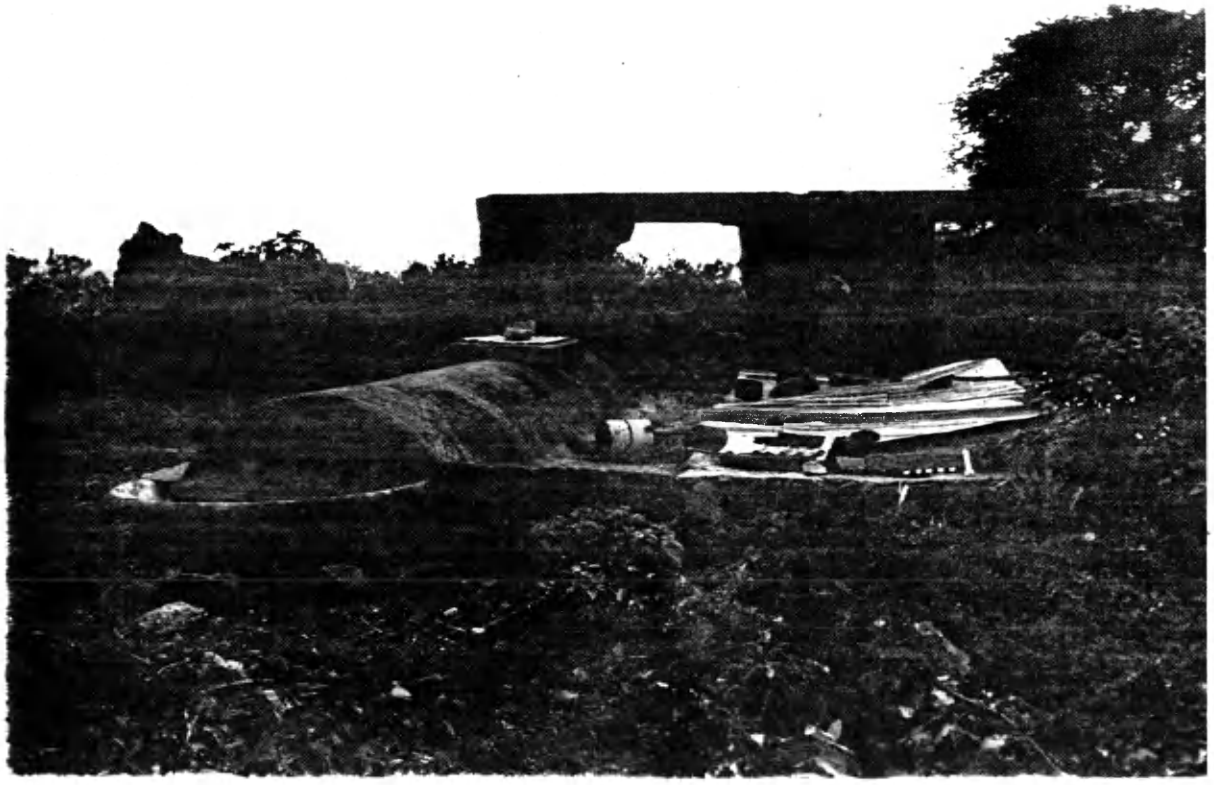
20ft

N

PLATE 4.29

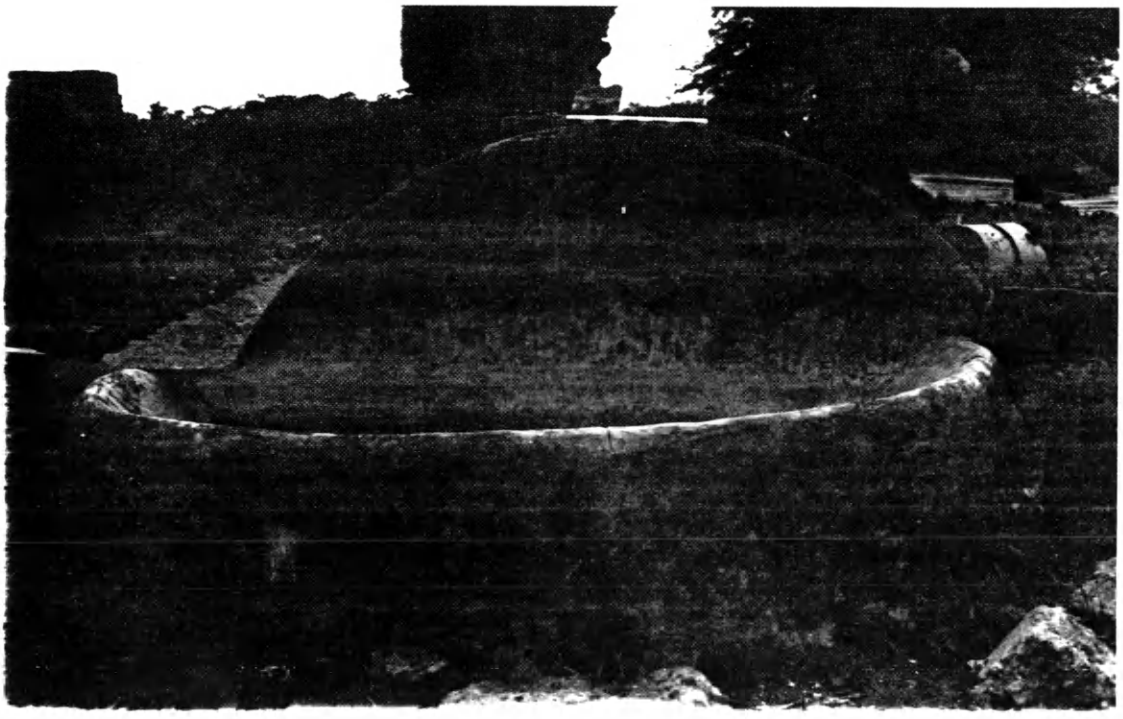
P8811.

PLATE 4.30



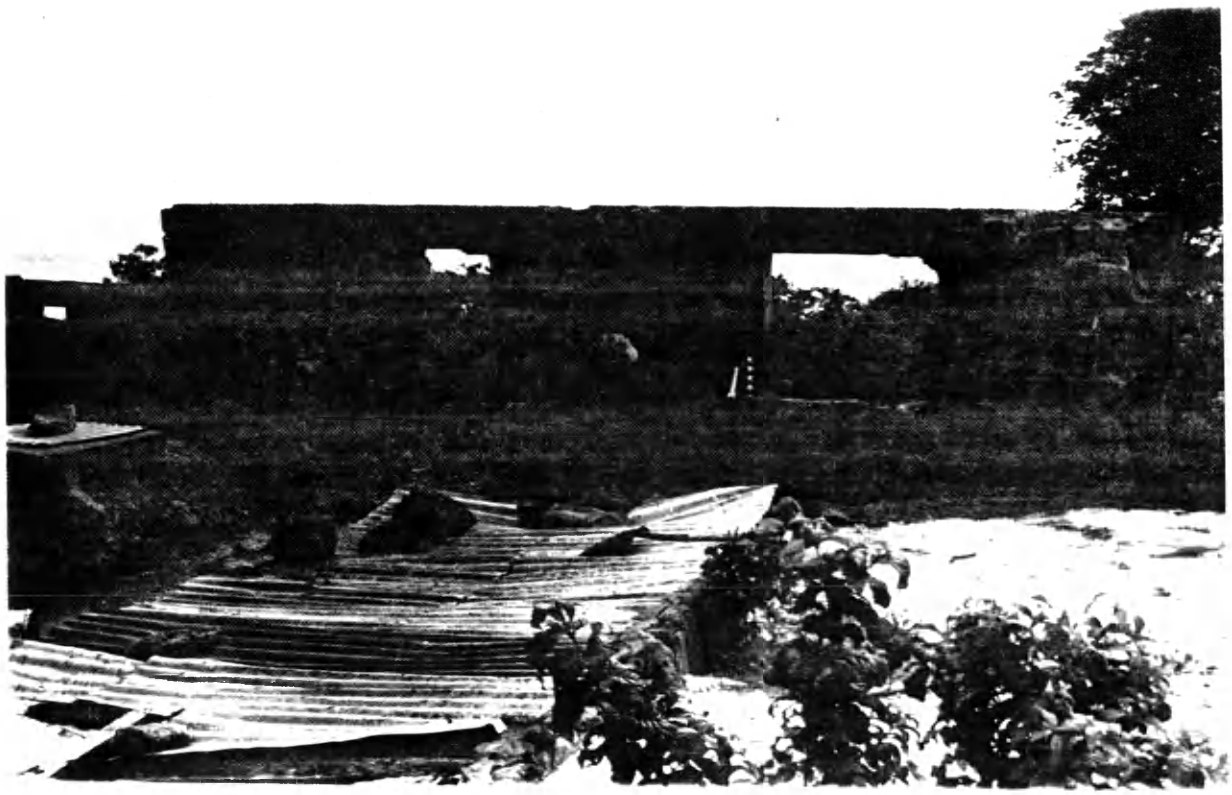
Double cistern, P8811 feature one.

PLATE 4.31



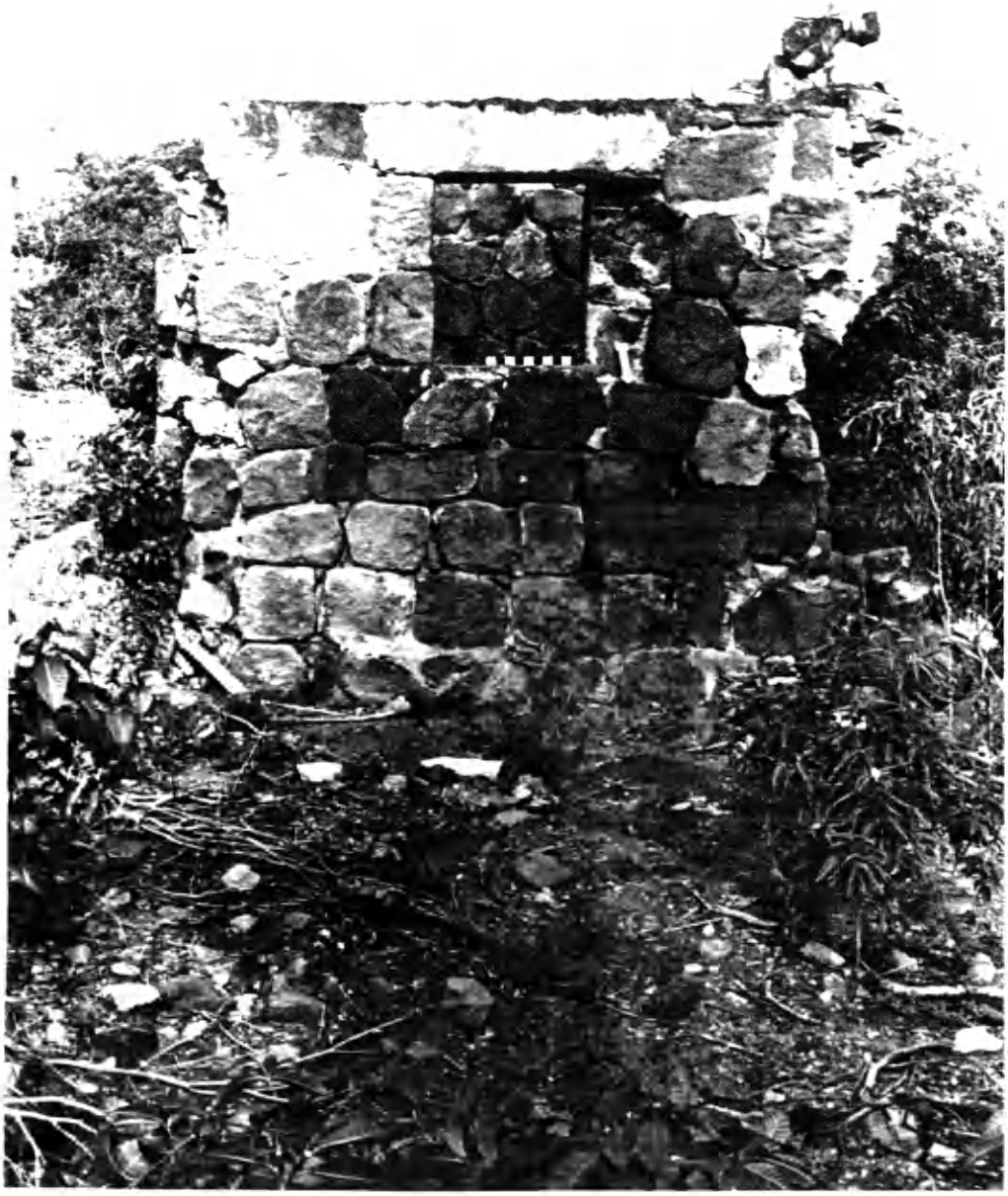
Detail of cistern, P8811 feature one.

PLATE 4.32



P8811 feature two.

PLATE 4.33



P8811, feature three.

PLATE 4.34

Overgrown cistern, P8812 feature one.

PLATE 4.35

Destroyed structure, P8812 feature two.

CHAPTER FIVE:

CONCLUSION

If we can agree with Deetz' assertion that "historical archaeology is the archaeology of the spread of European culture throughout the world and its impact on indigenous peoples" (Deetz 1977; 1988), then it follows that one of the primary concerns of the discipline should be the definition of the mechanism of that cultural spread. This thesis has so far described the physical remains of one such mechanism. This concluding chapter briefly discusses the nature of the European settlement pattern on St. Eustatius as a cosmopolitan frontier, and how the changing world sugar market affected that frontier settlement pattern.

Donald Hardesty is a leading theoretician of the archaeology of the frontier whose frame of reference sometimes borders on sociobiology. In a 1980 article (Hardesty 1980-81), he asserts that the frontier "be conceptualized as an ecological community under transformation because of internal...and external forces." The questions Hardesty believes should be addressed are the "identification, documentation, and explanation of key processes of transformation, the environmental or internal changes that set

the processes in motion, and the impact of the processes upon social and habitual relations" (Ibid.).

The key processes under examination in the case of St. Eustatius are the dynamics of sugar as a commodity produced in and distributed from the Caribbean. The European market for sugar has fluctuated significantly since its widespread introduction in the fifteenth century; as market fluctuation can be considered "a key process of transformation," it can be expected to have had some impact on social and habitual relations. As settlement patterns reflect habitational behavior, which is both social and habitual, one would expect that changes in the European world sugar market would have some distinguishable affect on the settlement pattern of St. Eustatius.

Sidney Mintz has spent a good part of his distinguished career documenting the development of trends in the consumption

patterns of sugar, concentrating on northern Europe, specifically Great Britain. According to Mintz, when the Portuguese began to import sugar from their newly acquired territory in the Atlantic islands, it was a costly luxury enjoyed only by the very wealthy. Once production began in the Caribbean, consumption accelerated dramatically, increasing four-fold between 1660 and 1700 and trebling again between 1700 and 1740. This great modification in European behavior should be reflected in the settlement pattern of the

production and distribution colonies in the Caribbean; in the case of St. Eustatius such a change is indeed clearly indicated.

The earliest reference made to St. Eustatian sugar production in the secondary record is made by Noel Deerr. According to his account, the English sought to destroy the Dutch presence in the Antilles in 1666. In the process of this attempt, English privateers destroyed "six good sugar-works in St. Eustatius and eighteen in Tobago."[71] It is unclear whether these six sugar-works were the only ones on St. Eustatius in 1666, however, this statement does indicate that the Dutch were producing sugar there as early as the mid-seventeenth century. The fact that only six plantations were reported destroyed on St. Eustatius while eighteen were destroyed on Tobago, suggests that sugar production was not developed on as large a scale as on other islands.

As consumption and with it demand increased over the next seventy years, the number of sugar plantations increased to the eighty-one discussed in chapter three. Mintz indicates that between 1741 and 1775, European sugar consumption doubled again, increasing to an estimated thirteen pounds per capita per annum by the close of the eighteenth century.[72] This increase in demand is reflected in the cartographic data,

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[71]Deerr, p. 212.

[72]Mintz, Sidney. Time, sugar, and sweetness. Marxist Perspectives 8:56-72 (1979).

which indicate an expanding density of plantation settlements during this time.

Superficially, it seems anomalous that increased demand for sugar would precipitate the long term decline in sugar production on St, Eustatius, and yet if the changing plantation settlement pattern is any indicator, just this seems to be the case. Mintz asserts that sugar was introduced to the working classes in northern Europe near the end of the eighteenth century. It quickly transformed from its traditional definition as a luxury sweetener to a source of cheap, non-nutritional calories. In exploiting this new and expanding market, sugar producers incurred a 30% drop in prices between 1840 and 1850 and an additional 25% drop during the following twenty years.[73] The cartographic evidence indicates that by 1847, the plantation settlement pattern had collapsed into the Culture Vlatke, the most fertile area of St. Eustatius, with only ten plantations surviving. Sugar was no longer a luxury good with a high value that could offset expensive transportation and the productive inefficiency of small plantations on marginal land. The scattered small plantations of the eighteenth century could not survive.

It is probable, however, that some of the more efficient plantations continued production into the nineteenth century. Recall that the keystone on the Fair Play windmill dates some

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[73]Mintz, Sidney: Sweetness and Power. New York : Viking, 1986, p.212ff.

improvement of the plantation in 1831. Investing in the construction of such an expensive structure at such a late date seems to be the act of someone determined to make a profit from sugar production.

The internal settlement pattern of Fair Play corroborates such a determination through a conscious effort to maximize efficiency. The regular 144' intervals between the central boiling house and the associated plantation structures are the physical manifestation of an imposed order--imposed at Fair Play to ensure order and efficiency in production to offset the declining value per pound of the commodity.

This conclusion poses several intriguing questions which must be addressed. Was the symmetrical placement of structures at the plantation and the symmetrical settlement pattern apparent in 1847 newly imposed? If so, why was such a symmetry not apparent in the eighteenth century? The answer to these questions lies in the effect that the occupation of the island by Admiral George Bridges Rodney in 1781 had on the economy of the island. Chapter three briefly touched on the dominance of commerce over production on St. Eustatius; Rodney's actions reinforce this conclusion. In 1781, in retribution for supplying war materials to the rebellious North American colonists, Rodney sacked the island, confiscating the stores of some six hundred warehouses, destroying the emptied structures in his wake. The entire Jewish population of the island was stripped of their

belongings and deported, penniless. In his meticulous seizure and accounting of the islands wealth, Rodney made a list of all those considered to be merchants. The comparison of this 1781 list to the names identified as plantation owners by the 1775 map suggests the nature of at least some of the sugar plantations in the eighteenth century.

The owners of thirty-nine of the seventy-six plantations identified by the map appear on Rodney's merchant list. An additional thirteen plantations were the property of the widows and heirs of male plantation owners. The 1781 list identifies individuals with the same name as the deceased in four of these thirteen cases, suggesting the possibility of some family continuity. In only eleven of the seventy-six cases do neither the specific owner or apparent heirs appear on the merchant list.

This correlation indicates that the majority of plantation owners were significantly involved in commerce, and presents the possibility that a proportion of the plantations may actually have been a secondary source of income, or perhaps even a front to feign production while the "plantation owner" engaged in other activities, notably honest commerce, smuggling English sugar in St. Eustatian packaging to avoid duties imposed on the exportation of English sugar, or the supply of contraband to the rebelling mainland colonies. A letter by Rodney himself to Philip Stephens dated March 6, 1781, introduces this last possibility. "The very few

respectable men in this Island were those who owned Sugar Plantations: few of them were concerned in the pernicious Commerce which proved so detrimental to Great-Britain." If few of the plantation owners were involved in the "pernicious Commerce," by which Rodney means war materials, then some were undoubtedly involved. As Rodney was ostensibly primarily concerned with curtailing the munitions supply to the mainland, he makes no further indication of who among the plantations owners were involved in any trade agreeable to his English sensibilities. It seems likely that if some of these individuals were indeed involved in such a dangerous commerce, other plantation owners would likely be involved in other trades. Taking this possibility into account, the collapse of St. Eustatius as a major Caribbean port following Rodney's occupation may well have contributed to the declining population of the island, as well as to the changing settlement pattern.

Sugar was a commodity that dictated the nature of settlements and as it responded to international markets, it changed the nature of those settlements. In the seventeenth, eighteenth, and into the nineteenth centuries, the Caribbean basin was a frontier region whose cultural forms were dependent on the production and distribution of that commodity. This thesis has outlined the effects that

dependence had on the landscape of a particular island, focusing on the change in the landscape that resulted from a fluctuating world market. As the taste for sugar changed, so did the plantation, its mode of production, in itself and across the landscape.

BIBLIOGRAPHY

Andrews, K.R.
1978 The Spanish Caribbean. New Haven: Yale University Press.

1984 Trade, Plunder and Settlement. Cambridge: Cambridge University Press.

Anonymous
1752 An Essay on Sugar. London: E. Comyns.

1777 An Essay on Tea, Sugar, White Bread...and Other Modern Luxuries. Salisbury, England: J. Hodson.

Artschwager, E. and E.W. Brandes
1958 Sugar Cane: Origin, Classification Characteristics, and Descriptions of Representative Clones. U.S. Dept. of Agriculture Handbook No. 122. D.C.: Govt. Printing office.

Akroyd, W.R.
1974 Sweet Malefactor. London: Heinemann.

Benaji, J.
1979 Modes of production in a materialist conception of history. Capital and Class 7:1-44.

Bannister, R.
1890 Sugar, coffee, tea, and cocoa: their origin, preparation, and uses. Journal of the Society of Arts 38:972-1052.

Barnes, A.C.
1974 The Sugar Cane. New York: J. Wiley.

Beer, G.L.
1948 [1893] The Commercial Policy of England toward the American Colonies. Columbia Univ. Studies in History, Economics, and Public Laws 3:2. New York: Peter Smith.

Cantor, S. and M. Cantor.
1977 Socioeconomic factors in fat and sugar consumption. In M. Kare (ed) The Chemical Senses and Nutrition, pp. 429-46. New York: Academic Press.

Curtin, P.
1969 The Atlantic Slave Trade. Madison: Univ. of Wisc. Press.

Davies, K.G.
1974 The North Atlantic World in the Seventeenth Century. Europe and the world in the age of expansion. Vol. 4 ed. B.C. Shafer. Minneapolis: Univ. of Minn. Press.

Davies, R.
1954 English foreign trade, 1660-1700. Economic History Review &:150-66.

1973 The Rise of the Atlantic Economies. Ithaca: Cornell Univ. Press.

1979 The Industrial Revolution and British Overseas Trade. Leicester, England: Leicester Univ. Press.

Deerr, N.
1949-50 The History of Sugar (two vols). London: Chapman and Hall.

DeVries, J.
1976 Economy of Europe in an Age of Crisis, 1600-1750. Cambridge: Cambridge Univ. Press.

Dunn, R.S.
1972 Sugar and Slaves. Chapel Hill: UNC Press.

Firth, R.
1937 We, the Tikopia. London: George Allen and Unwin.

Galloway, J.H.
1977 The Mediterranean sugar industry. Geographical Review 67(2):177-92.

Genovese, E.D.
1965 The Political Economy of Slavery. New York: Pantheon.

1971 The World the Slaveholders Made: Two Essays in Interpretation. New York: Pantheon.

1974 Roll, Jordan, Roll: The World the Slaves Made. New York: Pantheon.

Greenfield, S.
1979 Plantations, sugar cane and slavery. In M. Craton (ed) Roots and Branches. Toronto: Pergamon.

Hagelberg, G.B.
1974 The Caribbean Sugar Industries: Constraints and Opportunities. Antilles Research Program, Yale Univ., Occassional Papers 3. New Haven: Antilles Research Program.

Mintz, S.W.
1959 The plantation as a sociocultural type. In Plantation Systems of the New World. Social Science Monographs 7, pp. 42-50. D.C.: Pan American Union.

1977 The so-called world system: local initiative and local response. Dialectical Anthropology 2:253-70.

1979 Slavery and the rise of the peasantry. Historical Reflections 6(1):215-42.

1985 Sweetness and Power: The Place of Sugar in Modern History. New York: Penguin.

Ragatz, L. J.
1928 The Fall of the Planter Class in the British Caribbean, 1763-1833. New York: Century.

Ratekin, M.
1954 The early sugar industry in Espanola. Hispanic American Historical Review 34:1-19.

Sheridan, R.
1974 Sugar and Slavery. Lodge Hill, Barbados: Caribbean Universities Press.

Thomas, R.P.
1968 The Sugar colonies of the old empire: profit or loss for Great Britain? Economic History Review 21(1):30-45.

Thomas, R.P. and D. McCloskey
1981 overseas trade and empire, 1700-1860. In R. Floud and D. McCloskey (eds) The Economic History of Britain since 1700. Cambridge: Cambridge University Press.

Wallerstein, I.
1974 The Modern World-System: Capitalist Agriculture and the Origins of the World Economy in the Sixteenth Century. New York: Academic Press.

1980 The Modern World-System: Mercantilism and the Consolidation of the European World Economy, 1600-1750. New York: Academic Press.

Wolf, E.R.
1982 Europe and the People without History. Berkeley: Univ. of California Press.

On Sugar, Slave, and Plantation Sources
(With great appreciation of help from Ken Kelley, Archaeologist):

Barrett, Ward
1970 Sugar Hacienda of the Marqueses del Valle. Minneapolis: Univ. Of minn. Press. (esp. chapter 6.)

Beachey, R.W.
1978 The British West Indies Sugar Industry in the Late 19th Century. Westport, Ct.: Greenwood Press.

Beckford, William
1790 A Descriptive Account of the Island of Jamaica: with remarks upon the Cultivation of the Sugar Cane, throughout the Different Seasons of the Year. (n.p.)

Pares, Richard
1968 A West India Fortune. Hamden, Ct.: Anchor Books.

Scarano, Francisco A.
1984 Economic Analysis of Antebellum Sugar Plantations in Louisiana. New York: Arno Press.

More on Caribbean Plantations:

Craton, Michael
1978 Searching for the Invisible Man: Slaves and Plantation Life in Jamaica. Cambridge: Harvard Univ. Press.

Craton, Michael and James Walvin
1970 Jamaica Plantation: The History of Worthy Park, 1670-1970. Toronto: Univ. of Toronto Press.

Goveia, Elsa V.
1965 Slave society in the British Leeward Islands at the end of the 18th Century. New Haven: Yale Unv. Press.

Singleton, Theresa A.
1985 The Archaeology of Slavery and Plantation Life. Orlando: Academic Press.

Waller, J. A.
1820 Voyage in the West Indies: Containing Various Observations Made During a Residence in Barbados, and Several of the Leeward Islands. London: R. Phillips.

Journal Articles:

Higman, Barry W.
1974 A report on excavations at Montpelier and Roehampton. Jamaica Journal 8(1-2):40-45.

Lewis, K.E.
1979 Excavating a colonial rice plantation. Early Man Autumn 1979.

Pendergast, David M.
1982 The 19th century sugar mill at Indian Church, Belize. Journal of the Society for Industrial Archaeology 8(1):57-66.

Pulsiper, Lydia and Conrad Goodwin
1982 A sugar and boiling house at Galways: An Irish sugar plantation in Montserrat, W.I. Post Medieval Archaeology 16:21-27.

On the Archaeology of Slavery:

Armstrong, Douglas V.
1981 A preliminary report on the Drax Hall slave settlement. Archaeology at UCLA. Institute of Archaeology, UCLA.

1983 The Drax Hall slave settlement: site selection procedures. Proceedings of the 9th International Congress for the Study of the Precolumbian Cultures of the Lesser Antilles: 431-442.

1985 An Afro-Jamaican slave settlement: archaeological investigations at Drax Hall. in T.A. Singleton (ed) The Archaeology of Slave and Plantation Life. New York: Academic Press.

Craton, Michael
1970 Searching for the Invisible Man: Slaves and Plantation Life in Jamaica. Cambridge: Harvard Univ. Press.

Dethlefsen, Edwin
1982 The historical archaeology of St. Eustatius. Journal of New World Archaeology 5(2):73-86.

Dethlefsen, Barka et al.
1982 Archaeology on St. Eustatius: the Pompeii of the New World. Archaeology.

France, Linda Gail
1984 Sugar Manufacturing in the West Indies: a Study of Innovation and Variation. M.A. Thesis, Dept. of Anthro., College of Wm. and Mary.

Goodwin, Conrad M.
1987 Sugar, Time and Englishmen: A Study of Management Strategies on Caribbean Plantations. Unpublished PhD dissertation, Boston Univ. 199pp.

Grieb, Kenneth
1985 Research Guide to Central America and the Caribbean. Univ. of Wisc. Press.

Handler, Jerome S.
1972 An archaeological investigation of the domestic life of plantation slaves in Barbados. The Journal of the Barbados Museum and Historical Society 34(2):64-72.

1981 A Ghanian pipe from a slave cemetery in Barbados, West Indies. West African Journal of Archaeology 11:93-99.

Handler, J.S. and Frederick Lange
1978 Plantation Slavery in Barbados: an Archaeological and Historical Investigation. Cambridge: Harvard Univ. Press.

1979 Plantation slavery on Barbados, West Indies. Archaeology 32(4):45-52.

Heath, Barbara
1988 Afro-Caribbean Ware: a Study of Ethnicity on St. Eustatius. PhD dissertation, Dept. of Am. Civ., UPenn.

Jordan, Alma
1984 The English Speaking Caribbean: a Bibliography of Bibliographies. Boston: G.K. Hall.

Kandle, Patricia L.
1985 St. Eustatius: Acculturation in a Dutch Caribbean Colony. M.A. Thesis: Dept. of Anthro. College of Wm. and Mary.

Kelley, Kenneth G.
1988 A Bibliography of Caribbean Archaeology. In press: Dept. of Anthro., College of Wm. and Mary.

Lange, Frederick W. and J.S. Handler
1985 The ethnohistorical approach to slavery. In T.A. Singleton (ed): The Archaeology of Slavery and Plantation Life. New York: Academic Press.

Mann, Robert et al.
1987 Description of skeletal remains from a black slave cemetery from Montserrat, West Indies. Annals of Carnegie Museum 56(19):319-36.

Mathewson, R.D.
1973 Archaeological analysis of material culture as a reflection of sub-cultural differentiation in 18th century Jamaica. Jamaica Journal 7(1-2):25-29.

Nicholson, D.V.
1979 The dating of West Indian historical sites by the analysis of ceramic sherds. Journal of the Virgin Islands Archaeological Society 3:19-23.

Rechtman, Robert
1982 Clay pipes: a study of artifacts from the slave settlement at Drax Hall, Jamaica. MS on file, UCLA Archaeological survey, Los Angeles.

Rouse, Irving B.
1956 Settlement patterns in the Caribbean area. G. Willey (ed): Prehistoric Settlement Patterns in the New World. New York: Wenner-Gren Foundation for Anthropological Research. Viking Fund Publications in Anthropology. 23:1165-1172.

Smith, Roger et al.
1982 Sevilla la Nueva: a site survey and historical assessment of Jamaica's first European town. Project Report, Institute of Nautical Archaeology, Texas A&M Univ. (College Station).

Thall P.F. and R.C. Goodwin
1980 Seriation and clustering of archaeological excavation units from potsherd frequencies: the case of the St. Kitts sugar factory pier site. Proceedings of the 8th International Congress for the Study of the Precolumbian Cultures of the Lesser Antilles:4-7.

Thompson, E.T.
1983 The Plantation: an International Bibliography. Boston: G.K. Hall & Co.

Vescelius, G.S.
1980 Archaeology of the Virgin Islands, 1: changing patterns of resource utilization. Paper presented at the 8th annual Int. Cong. for the Study of Pre-Colum. cultures of the Lesser Antilles.

Willis, Roy
1984 Empire and Architecture at 16th Century Puerto Real, Hispaniola: an Archaeological Perspective. PhD dissertation, Dept. of Anthro. UFla, Gainsville.

On settlement patterns and economic/social history:

Abler, R., J. Adams and S. Gould
1971 Spatial Organization. Englewood Cliffs: Prentice Hall.

Adams, W.H.
1976 Trade networks and interaction spheres: a view from silcott. Historical Archaeology 10:99-111.

Anderson, J.
1978 Geography, political economy and the state. Antipode 10:87-93.

Berreman, G.D. (ed)
1981a Social Inequality. New York: Academic Press.

1981b Social inequality: a cross-cultural analysis. In Berreman (ed) Social Inequality, pp. 3-40. New York: Academic Press.

Berry, B.J.L.
1967 Geography of Market Centers and retail Distribution. Englewood Cliffs: Prentice Hall.

1976 The Geography of economic systems. Englewood Cliffs: Prentice Hall.

Bloch, M. (ed)
1975 Marxist Analyses in Social Anthropology. London: Malaby Press.

Brenner, R.
1977 The origin of capitalist development: A critique of Neo-Smithian Marxism. New Left Review 104:25-92.

Chang, K.C.
1972 Settlement patterns in archaeology. Addison-Wesley Module in Anthropology No. 24. Reading, Mass.

Chisholm, M.
1975 Human Geography. Baltimore: Penguin.

Copans, J. and D. Seddon
1978 Marxism and anthropology: a preliminary survey. In Seddon (ed): Relations of Production pp. 1-46. London: Frank Cass.

Diamond, S. (ed)
1979 Toward a Marxist Anthropology. The Hague: Mouton.

Friedman, J. and M.J. Rowlands
1978 The Evolution of Social Systems. London: Duckworth.

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