CROSSROADS ON THE COAST: A PRELIMINARY EXAMINATION OF BRIDGETOWN, ANTIGUA

A Thesis

by

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ABSTRACT

In 1675, the English government passed a law that established six "trade towns" on Antigua. The law required that all imports, exports, and intra-island trade be conducted in these towns to be assessed for taxes. Of the six original towns – St. John's, Parham, Falmouth, Carlisle Road, Bridgetown, and Bermudian Valley – all but two survive today: St. John's, Parham, and Falmouth exist as they were, and Carlisle Road is now called "Old Road." The remaining two towns were abandoned sometime in the past: Bermudian Valley's location has been lost, and Bridgetown was abandoned in the 19th century, its inhabitants moving up the hill and establishing the modern town of St. Philip's – the name of the church at Bridgetown.

In 2016 I conducted preliminary archaeological surveys at the Bridgetown site and elsewhere on the island, in cooperation with Antigua National Parks Authority, to begin documenting the deterioration of the town ruins, compared to previous assessments done between 1987 and 1996, assess offshore cultural resources in the associated harbour, and to begin to answer questions about the town's abandonment and assess the veracity of various local legends surrounding the site. This project serves as a pilot study towards a Ph.D. dissertation research project, which will aim at exploring the influence of Antigua's sugar economy within the world trade network in the Early Modern Period.

For my Grammie

Catherine B. Bord (1922-2018)

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My fieldwork could not have been completed without the assistance and guidance of Dr. Reg Murphy of National Parks Antigua. I was assisted in completing archaeological surveys in 2016 by Dr. Georgia Fox of California State University Chico, Dr. Christopher Waters of Syracuse University, Dr. Murphy, Nicola Murphy, and volunteers Victoria Ryan, and David Murphy. Additionally, Dr. Cory Look of Brooklyn College (CUNY) assisted me with the initial GIS projection of the 1987 survey maps noted in Chapter 4 and the Museum of Antigua and Barbuda Graciously allowed me access to their archive collection.

All other work conducted for the thesis was completed by myself independently.

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INTRODUCTION

Introduction

In 1675, the English government passed a law that established six "trade towns" on Antigua (Legislature of Antigua 1805). The law required that all imports, exports, and intra-island trade be conducted in these towns to be assessed for taxes. Of the six original towns – St. John's, Parham, Falmouth, Carlisle Road, Bridgetown, and Bermudian Valley – all but two survive today: St. John's, Parham, and Falmouth exist as they were, and Carlisle Road is now called "Old Road." The remaining two towns were abandoned sometime in the past: Bermudian Valley's location has been lost, and Bridgetown was abandoned sometime in the 19th century, its inhabitants moving up the hill and establishing the modern town of St. Philip's – the name of the church at Bridgetown.

This thesis will examine and explore the reasons for the abandonment of Bridgetown. It will utilize a holistic anthropological approach to data collection and analysis, relying on remote sensing data, historical records, and the archaeological record to recreate the island economy and transportation infrastructure during the Early Modern period.

Historical accounts of 18th-century Caribbean sugar production and slave trade have been previously examined (Amussen 2007; Green 1973; Meniketti 2006; Sheridan 1961; Sheridan 1994 [1974]; Stinchcombe 1995), but little anthropological research has been done concerning the movement of goods and services on Caribbean islands, nor how that movement related to global trade and commerce during the Early Modern period.

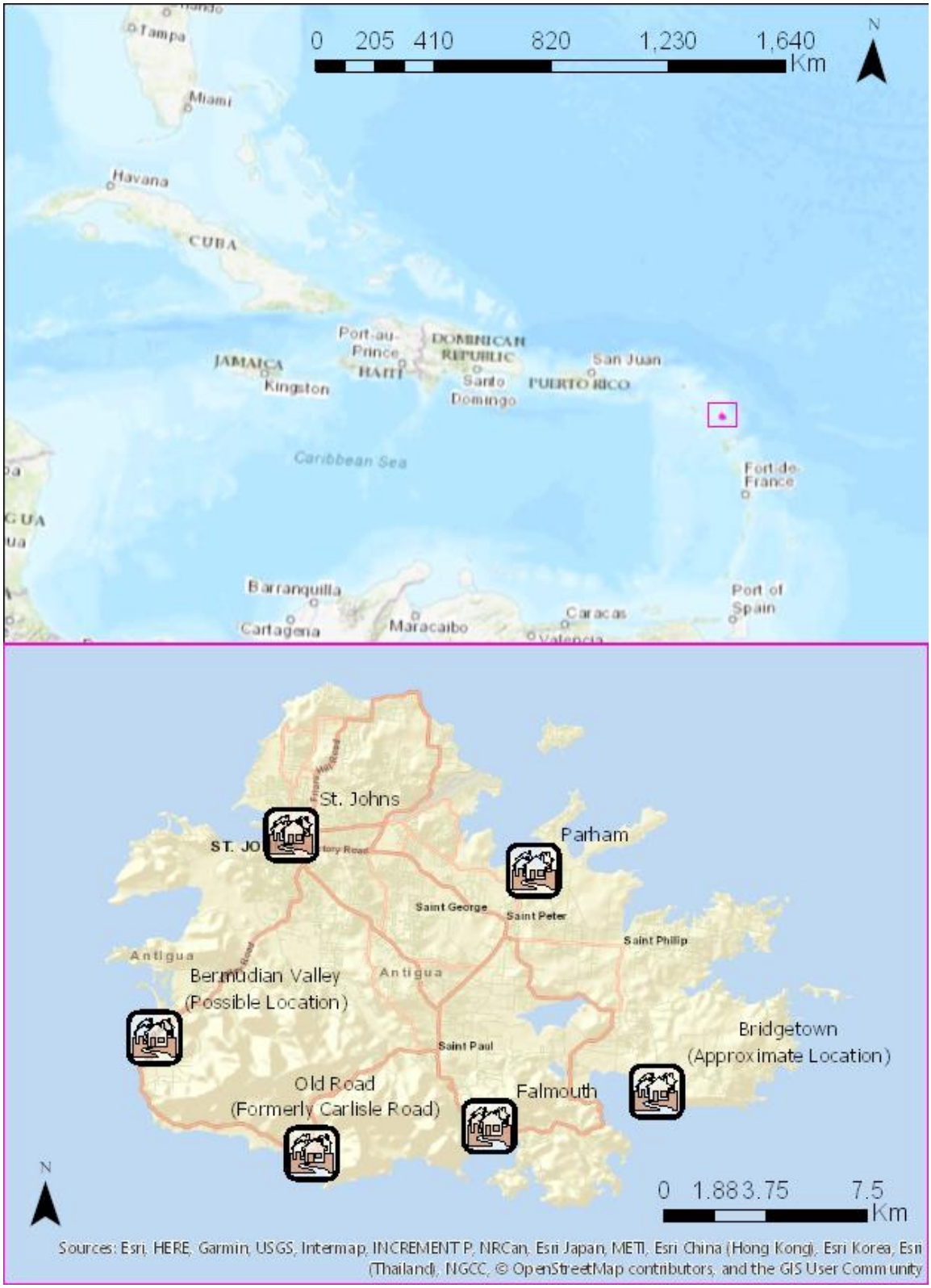

Figure 1 Location and Map of Antigua, W. I. showing locations of all trade towns listed in the 1675 law

The methodology for this study incorporated a Geographic Information System (GIS) and satellite imagery, in conjunction with rephotography (repeat photography: a technique to show how the passage of time affects a particular site by replicating the angle and perspective of a historical photograph or painting), pedestrian survey, and historical archival research, which included the careful analysis of plantation records, maps, personal correspondence, and iconography. Photogrammetry and 3D imagery were also utilized as complements for data analysis. Furthermore, the completion of this thesis laid the groundwork for a broader study involving Antigua's status and function within the global economy of the Early Modern period, including (but not limited to) intra-island and trans-Atlantic trade networks, and the movement of commodities (including slavery), supply lines, the role of other shipping ports and trade towns, port lifeways, economies and the role of capitalism. I expect that this larger project will serve as my Ph.D. dissertation research.

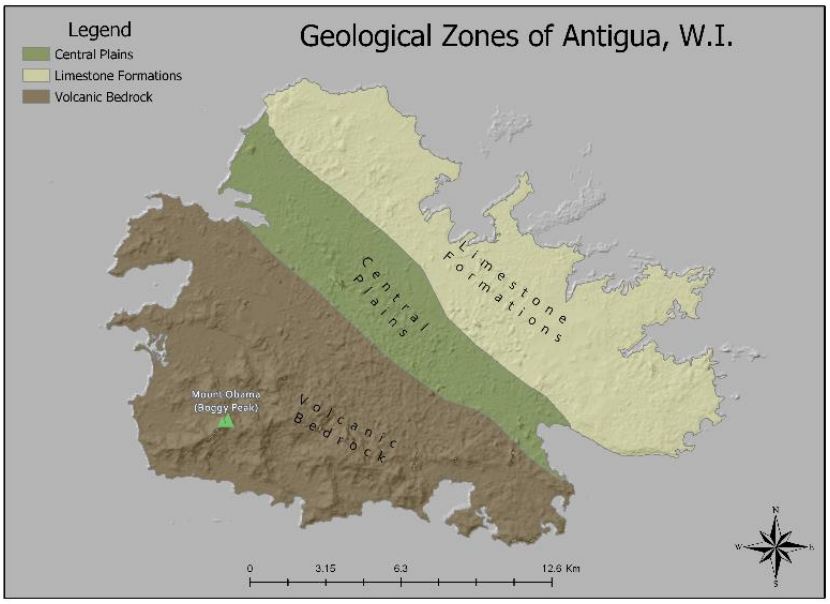

Figure 2 Geological Regions of Antigua (Modified and Digitized from (Donovan, et al. 2014)

Background

The island of Antigua has an area of approximately 108 square miles. Located as part of the eastern limestone arc of the Leeward Islands of the Lesser Antilles of the Caribbean island chain (Figure 1). Antigua's strategic position, with its many protected coves and harbours, served Britain as a key naval outpost and agricultural production area during the 17th, 18th and 19th centuries. Antigua is roughly oval in shape with a very irregular coastline, which comprises many bays, inlets, and harbours. It is said that there are 365 beaches on the island, one for every day of the year. Weather on the island is typical for a tropical maritime environment with little fluctuations during the year. The island is subject to hurricanes between July and October, and several major earthquakes have affected the Leeward island region in recorded history (see Chapter 4). The island encompasses three main geological zones: an area of volcanic bedrock in the southwest mountains, a central plains area consisting of volcanic sediments running northwest to southeast, and an area of limestone formations in the northeast (Look 2017; Figure 2). The volcanic bedrock area consists of the Shekerley Mountains, the highest peak of which is Mount Obama (formerly Boggy Peak) at an elevation of 1319 feet.

Beginning in 1689, Antigua served as the English seat of government in the Leeward Islands under Christopher Codrington II. As a result of Codrington's death in 1699, Christopher Codrington III assumed his father's position as Governor General until 1704 (Dyde 2000; Lanaghan and Flannigan 1844a). While sugar was produced on Antigua since the mid-17th century, it was under the Codrington dynasty that sugar and its byproducts became Antigua's premier export. By the 1720s large plantations with massive fields of sugar cane dominated the island's topography (Sheridan 1994 [1974]). Large plantations required a well-established transportation and supply infrastructure for incoming and outgoing supplies and commodities.

Present Status

Antigua remained a territory under the commonwealth of Britain until 1981, when it obtained its sovereignty and, along with two of its sister islands (Redonda and Barbuda), became the independent nation of Antigua and Barbuda. Like many former sugar colonies in the Caribbean (see Chapter 2), the introduction of cheaper beet sugar into international markets caused a shift towards tourism in the island's economy (Dyde 2000). Today, tourism accounts for approximately 60% of Antigua's GDP and 40% of the country's investments (CIA 2018).

Various archaeological projects on Antigua have been ongoing for at least two decades. The island's status as a large sugar producer during the 18th century, the former seat of English government for the Leeward Islands, and home to a recently included UNESCO World Heritage site: a strategic naval shipyard once under the command of Admiral Horatio Nelson, make the island historically significant, not only to British history but to world history as well. Completed or in-progress archaeological projects on the island encompass the study of prehistoric indigenous groups, as well as British colonial settlements through the early 20th century. All have added significantly to our understanding of the island and its importance in the history of the greater Caribbean region and how the English Empire gained world influence. Until recently, the historical significance of Antigua's contribution to the greater Caribbean economy has been overshadowed by sites like Port Royal, Jamaica and current sugar production sites such as those in Barbados. This situation has helped to preserve much of the archaeological material on the island. One needs to simply stroll among Antigua's many historical areas to view a plethora of potsherds, iron artifacts, and foundation walls, remnants of plantation buildings and infrastructure which once stood proud.

Historical Archaeology vs. History

This work is, above all, an ethnography. It may not be a "traditional" ethnography of an extant civilization, but the goals of this project are the same as any ethnographic or anthropological undertaking of a human social group: the understanding of human culture. Modern processual and post-processual archaeological practice largely treats the past as a static moment in time with little or no connection with contemporary society. Deetz advised caution when attempting to tie current social practices to past societies (Deetz 1977). However, there is growing recognition that archaeological deposits are part of a broader, living past which occupies many temporal and political realities simultaneously (Hamilakis 2011). When applied to historical archaeology, we can view material culture as the latent "memory" of a previous stage of cultural evolution. We therefore can establish a continuity between the colonial past and today. According to the 2011 census, approximately 87.3% of Antigua's population is of African ancestry, and presumably the vast majority of them are the descendants of former slaves (CIA 2018); if you look for it, you can see much of the continuity between past events and cultural practices, and contemporary Antiguan society, mostly in the form of local legends, rituals, and beliefs.

Although this is not a study of contemporary Antiguan society by including and investigating local legends concerning the disappearance of Bridgetown, I hope to bring continuity between the ethnographic past and contemporary perceptions of it. While I can't speak directly with my informants, they have left several sources though which they can speak to me. They speak through archival records and correspondence, they speak through the material culture they have left behind, and they speak through the aforementioned local legends, folklore, and oral histories that have managed to survive (in one form or another) into the present.

So how do we operationalize this type of archeological ethnography and how does this differ from traditional historical narratives or archaeological discoveries? Historians and historical archaeologists may work with the same materials, but their paradigms and methods of study differ in some subtle but very significant manners. Historians treat archives and historical documents as "what happened" and use other sources (such as the archaeological record) to substantiate and "fill in the gaps" left by those records. Conversely, historical archaeologists look at the archaeological record for clues to what actually happened and use historical documents and archives to provide additional context and depth of understanding to what the material culture tells us. This difference seems subtle, and often the two approaches result in similar conclusions. But the distinction is significant in determining the motivations of past peoples and how their descendants came into modernity, as just as often the archaeological record contradicts what we've been told. Determining the nature and the source of historical contradictions allows us to truly understand the ethnographic context of historic periods. It's been said that "history is written by the winners," and that is the major crux of our problem. The majority of Caribbean history is written by and about rich white men (who are also the "winners"). Most people's stories are not represented in these records. Archaeology gives these people a voice. It allows us to glimpse into the daily lives of individuals and the vast majority of the population not represented or named in the history books.

Furthermore, taking a holistic (four-field) approach to anthropological study enables researchers to more fully understand the people they study. Antigua archaeology is very much a multidisciplinary field. Prehistoric Amerindian and historic sites exist side-by-side (and often intermixed) with modern developments. For instance, in 2006 an abandoned British Navy cemetery was found under the beach sands of a luxury resort (Edwards 2013). Excavations were

completed in 2016, revealing some prehistoric material among the Early Modern skeletal material and grave goods recovered from the site.

It should be noted that I have not personally been able to search the Antigua National Archives as of the time of this writing. This problem has been mitigated by my colleague Christopher Waters, who has sent me some photographs of various records pertaining to my research. I have, however, examined the archives and collections of The Museum of Antigua and Barbuda, including their extensive historical map and newspaper archives. I have secured an appointment to visit the national archive repository in my next field season; information gleaned from this planned visit will not be included in this preliminary thesis, but it will be incorporated into the greater dissertation project.

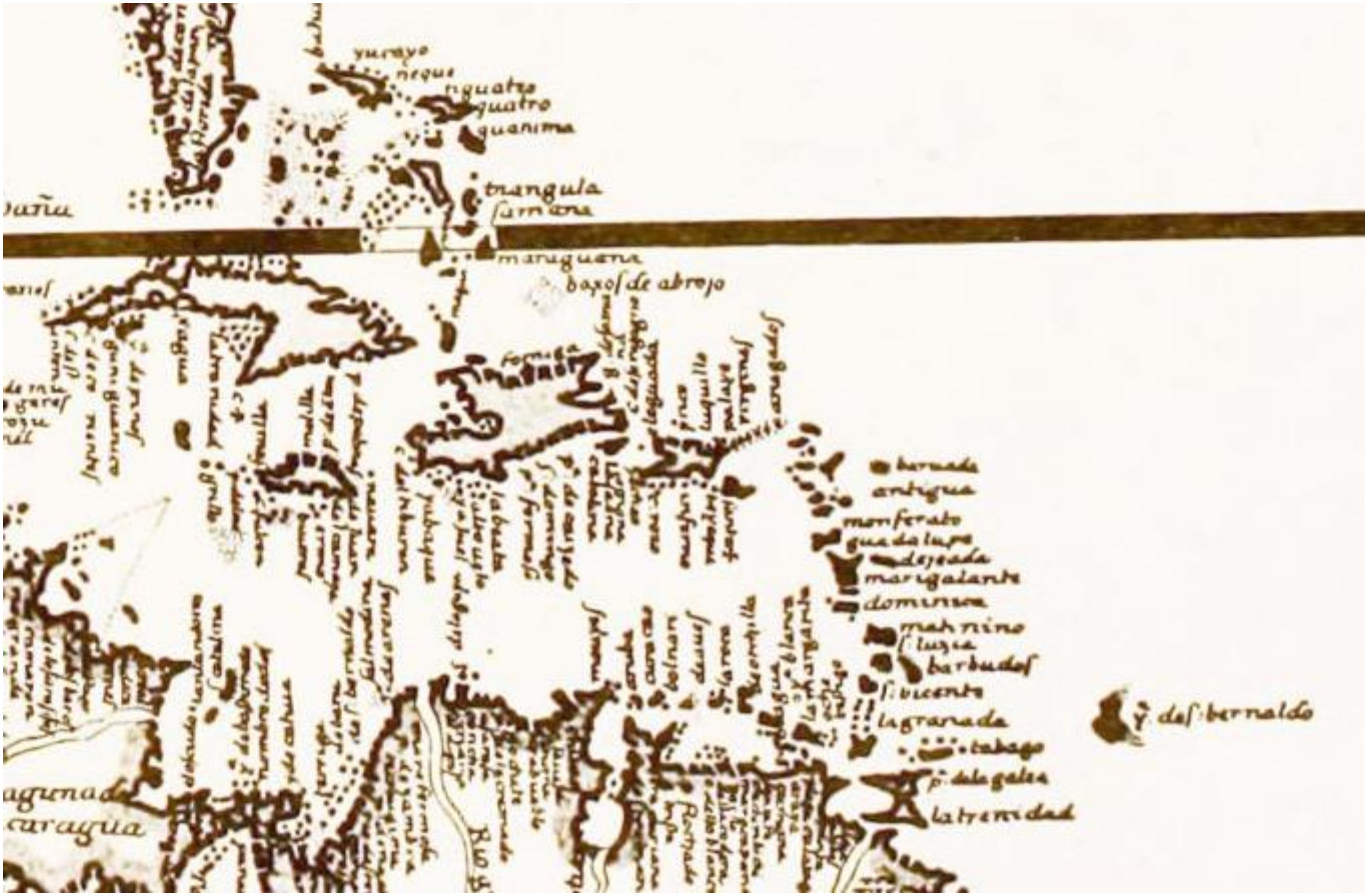

Figure 3 Portion of Coronado Expedition map ca. 1540 showing Antigua (Winship 2015 [1892]).

CHAPTER II

HISTORY*

Archaeological evidence indicates that despite the island's somewhat harsh conditions and lack of fresh water supply, Antigua was known to Amerindian groups prior to European arrival. However, the extent to which the island fit into the prehistoric cultural landscape of the Caribbean is still debated (Ohman 2014). Excavations at the site known as Indian Creek are seeking to reveal insight into the lives of its inhabitants during the site's 1500+ year continuous occupation. Major excavations at the site began in 2017, as part of a field school overseen by National Parks Antigua and administered by California State University, Chico (CSUC). Beginning in the 2018 field season, Farmingdale State College (SUNY) took over the major administrative responsibility for the field school from CSUC.

It is thought that the first European sighting of the island of Antigua was made in November 1493, during Columbus' second expedition. After a brief landfall at Dominica and nearly a week at anchor off Guadeloupe, the fleet of 17 vessels sailed Northwest, sighting Redonda island (called "Santa Maria Rotunda"), then "Santa Maria Martini" (modern Nevis) before reaching what they called "Santa Maria Antigua," which was probably the present-day island of St. Kitts. Nevertheless, Antigua's 108 square-mile footprint is clearly visible from all of these locations, so there is little doubt the island was spotted, even if no one from the expedition actually went there (Dyde 2000).

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After the brief mention in Columbus' log, very few references to Antigua appear before the 17th century. While Spain ostensibly claimed all of the islands of the greater Caribbean, they focused most of their colonization and economic interests in the Greater Antilles to the North, namely Cuba, Hispañola, and Puerto Rico, to a lesser extent (Higman 2011). Around 1520 Spanish settlers made an attempt to colonize Antigua, but this small island was abandoned for the large and richer territories of the Spanish New World (Figure 3).

After that the island seems to have remained unoccupied until 1627 when King Charles I issued a land patent to Sir James Hay, the Earl of Carlisle, for "all the Caribbees [sic], including St. Christopher's [St. Kitts], Grenada, St. Vincent, St. Lucia, Barbados, Mittalanea [Martinique], Dominico[a], Marigalante [Marie-Galante], Deseada [La Désirade], Todosantes [Îles des Saintes], Guadaloupe, Antigua, Montserrat, Redendo [Redonda], Barbuda, Nevis, Statia [Sint

Figure 4 Spanish map of Antigua dated 1780 (Lopez 1780). Map Courtesy of the John Carter Brown Library at Brown University.

Eustatius], St. Bartholomew [St. Barthelemy], St. Martin, Anguilla, Sembrera [Sombrero], Enegada [Anegada], and other islands." From 1627 onwards Antigua became a semi-regular entry in the historical record (Oliver 1894; Schreiber 1984). By this time the Spanish territories of the Caribbean were under siege by the culmination of efforts from the Dutch, French, and English, who all wanted a piece of the tremendous plethora of economic opportunities offered by the New World. Spanish territories in the region were vast and impossible to protect, and Spainish officials decided that the smaller islands of the south Caribbean were not worth defending. Spain concentrated its defense efforts in the Caribbean towards their established colonies in Hispañola, Jamaica, Puerto Rico, and Cuba, and relinquished control of the Lesser Antilles without much of a struggle (Higman 2011).

Still, England's colonization of the Caribbean proceeded somewhat slowly. Spanish efforts to remove Amerindian groups from the Greater Antilles had forced these populations south into the smaller islands. When Hay received his patent from the crown, only Barbados and Antigua remained unoccupied (Higman 2011). Probably because of Antigua's shortage of fresh water supply, Hay chose to focus his efforts toward settling Barbados (Lanaghan and Flannigan 1844a). Around 1629, a French privateer attempted to settle Antigua, but according to some accounts, English settlers had already established themselves near the only natural freshwater spring on the island near the present town of Old Road (Lanaghan and Flannigan 1844a; Figure 4).

Despite the lack of reliable primary records, the commonly used date for the first "official" colony on the island is believed to be 1632 or thereabouts, when General Sir Thomas Warner sent his son, Captain Edward Warner, with a group of families from St. Kitts to try to establish a permanent settlement at Antigua (Dyde 2000; Oliver 1894; Sheridan 1994 [1974]). This

settlement was likely also near the present town of Old Road, but many, if not all, of these settlers soon moved their colony east and established the village of Falmouth, which is known as the oldest permanent settlement on the island (Dyde 2000). Unfortunately, Captain Warner was not appointed as the first official governor of the Antigua colony. It seems, the island was not listed in the elder Warner's original appointment as governor of St. Kitts, Barbados, Nevis, and Montserrat, and so the General was likely stretching his authority by sending his son there. Nevertheless, Captain Warner's leadership saw the early colony through its most important first few years, until his death in 1644 (Dyde 2000; Lanaghan and Flannigan 1844a; Oliver 1894).

Lives for these early settlers would have been rough. While there was plenty of livestock roaming wild at the time, freshwater is a very scarce resource on the island. Especially in Falmouth, cisterns would have needed to be built almost immediately to capture enough rainwater for the settlers to survive, and shelter from the sun would have been paramount. Furthermore, the settlers always had to be on the alert for the frequent raids carried out by local Amerindian groups, likely originating from Guadeloupe, Marie-Galanté, Dominica, and other islands to the south (Dyde 2000):

> In these invasions, no mercy was shewn, no quarter given, to the unhappy people who fell in their power, and after a combat, numerous were the bodies left upon the field of battle. Armed with their massive clubs and sharp spears, at the end of which was inserted a fish-bone, dipped in the poisonous juice of the lianas or the manchineel, the Caribs were no mean foes. No sooner had they set fire to a cluster of houses, or destroyed a field of tobacco, the chief production of the island in those days, than (sic) they immediately flew to their canoes, which were so fast in sailing, that before the alarm had subsided in one part, they were burning and plundering in another. (Lanaghan and Flannigan 1844a).

Colonel Henry Ashton stands as the first "official" appointed governor of Antigua and maintained his position from Warner's death until 1650 (Dyde 2000). Appointed by the Second

Earl of Carlisle and having served as Thomas Warner's deputy in St. Kitts, Ashton was the epitome of the English aristocratic industrial colonization machine. His military rank was given to him by Carlisle without merit and he envisioned the Caribbean as nothing more than a financial opportunity, possessing no desire to change or establish cultural norms which were different than his own (regardless of how appropriate it might or might not be in the Caribbean) (Dyde 2000). Despite this, the small Antiguan colony endured and even managed to grow slightly. The English Civil War (1642-1651) brought an abrupt end to Ashton's reign. In 1650 he was arrested, relieved of his duties, and returned to England to face execution at the Tower of London.

In 1652, Christopher Keynell arrived on the island to fill the gap in leadership left by Ashton's untimely departure. Although the island's population was still small (less than 1000), the colony managed to eke out an existence despite the many droughts and other harsh conditions found in the Caribbean. Like many colonial governors of the time, Keynell's tenure as governor was tumultuous, to say the least. He sought to quell royalist sentiments and bring the rule of law to a colony that had grown accustomed to the vulgarity and raucousness that characterized early settlers under the previous regime (Dyde 2000). Eventually, he imprisoned a few of the more iniquitous members of the island's Assembly Council and pleaded with Lord Protector Oliver Cromwell (1653-1658) to allow free-trade between Antigua and nearby foreign entities (Oliver 1894). His marginal success actually did little to stimulate growth in the modest settlement, but he laid the groundwork which allowed Antigua to grow into the commercial juggernaut that it would soon become.

After the restoration of King Charles II in England (1660-1685), Keynell was replaced as governor by Colonel John Bunckley (Dyde 2000). Appointed by the new royalist Governor of

Barbados, Francis Willoughby (1663-1666), Bunckley was given new directives to adhere to. Willoughby enacted a law which imposed a 4 ½ % duty on all non-living commodities and declared all lands on the island forfeit if not developed within two years (Sheridan 1994 [1974]). Likewise, the law stated land owners must employ at least one white person for each acre of land they possessed. It appears that Willoughby used these provisions to his own benefit. He soon acquired a vast tract of land on the north side of the island and named it Parham (Oliver 1894). The town he founded there was mentioned in the 1675 trade towns law and is still a thriving community.

Antigua and the Sugar Revolution

Like most English colonies in the Americas, Antigua's first major cash crop was tobacco (Ohman 2014). Unfortunately, the amount of tobacco coming from Virginia, Maryland, and Bermuda already vastly exceeded the demand for the drug. The oversupply kept prices low, and the addition of more tobacco producing colonies like Barbados and Antigua only exacerbated the situation. Despite attempts by the crown to diversify crop production in the new world, by 1636, the tobacco market was already on the verge of collapse (Williamson 1926).

The first indication of sugar production on Antigua dates to about 1655. With the decline of the tobacco market, settlers needed a new cash crop to produce enough money to remain profitable, considering the harsh growing conditions present on the island. When ginger and indigo crops produced only minimal success, the small but determined group of Antiguan colonists turned to the crop which was already thriving on Barbados and St. Kitts; the production of this crop would come to dominate the Caribbean economy, shape the global trade infrastructure for the next two

centuries, and is now known as The Sugar Revolution (Dyde 2000; Higman 2000; Sheridan 1994 [1974]).

Sugar was much more labour-intensive than other crops, and given Antigua's frequent droughts and generally harsh conditions, building the infrastructure to support a massive sugar crop happened slower than on other islands. Nevertheless, Antigua began importing slaves from Africa around 1674, and by 1678 there were nearly as many African slaves as whites on the island (Dunn 2000). Sugar became so important to the island's commerce that it was often used as the primary form of currency throughout the Caribbean (Ohman 2014).

Figure 5 French Map of Antigua (ca. 1763). Courtesy of the Museum of Antigua and Barbuda.

War with France

Since the early days of colonization English and French settlers had always found camaraderie (or at the very least, collegiality) with their respective nations' expansions into the Caribbean (Higham 1921). On multiple occasions they allied themselves against the Spanish and Amerindian raiders. On the co-settled island of St. Kitts (St. Christopher), a treaty of neutrality and cooperation was continually renewed by the local governors even as tensions were building their respective nations in Europe (Dunn 2000). By January 1666, when war was all but inevitable, the signed treaty included a clause stipulating that 72 hours' notice would be given if and when an order to invade reached either party (Higham 1921).

That order came less than a month after the treaty was again ratified on 17 March 1666. Upon receiving the king's declaration, the English Governor William Watts (1666-1671) immediately informed his French counterpart Charles de Sales (1660-1666) and began reinforcing his troops and planning his attack. Seeing the arrivals of reinforcements and knowing he was vastly outnumbered, de Sales decided not to wait for the English invasion; He led a surprise attack on the night of 10 April 1666, quickly taking advantage and forcing the English to surrender (Dunn 2000). England was already at war with the Dutch off the west coast of Africa and thus, their forces were spread somewhat thin (Higham 1921). When Lord Francis Willoughby (1663-1666) and his fleet were lost in a hurricane on their way to retake St. Kitts in July, France was left with nearly complete control of the Caribbean Sea and decided to press its advantage, turning its attention to other Leeward islands (Higham 1921; Winthrop 1882).

On either 25 October or 4 November 1666[1] French forces landed at Five Islands Harbour, Antigua (Oliver 1909;Figure 5). Using much the same tactics they used in St. Kitts, French forces quickly advanced to St. Johns setting fire to everything in their path (Winthrop 1882). An ultimatum was given after three days of fighting: "y^{t} in wthin 2 dayes y^{e} island should not be surrendered to y^{e} obedience of y^{e} French king they would destroy it by fire & sword, & giue no quarter" (Winthrop 1882 sic.). The English were unable to put up much of a fight, partly because they were outnumbered, and partly because the French attack coincided with an Amerindian raid on the other side of the island (very likely at the urging of the French, who had better relations with Amerindians than anyone else in the region) (Higham 1921). Having secured surrender from the island's inhabitants and relieving them of their slaves and most of their sugar equipment, the French fleet departed Antigua on 4 November with the promise to return to oversee the details of the transition (Winthrop 1882).

The Treaty of Breda was signed on 31 July 1667 ending the war between England, France, and Holland and returning Montserrat, Antigua, and St. Kitts to their prewar states "and any other Iflands, Countries, Forts, and Colonies, which may have been gotten… before [the beginning of] the War with the States General (to which War this Treaty doth put an end.)" (Tyler 1667). During the occupation many of Antigua's citizens had fled to Nevis, the only Leeward island to remain untouched by French troops (Dunn 2000). But with the promise of new prosperity brought about by the peace, William Lord Willoughby (1666-1673, brother, heir, and successor

[1] a reliable French account states 4 November while the official English report and a letter from an eyewitness gives the October date, although it is possible that both of the English accounts were written by the same person. The discrepancy could be a result of the French having adopted the Gregorian calendar in 1582, while the English used the Julian calendar until 1752. The difference between the two calendars at that time would be around ten or eleven days (Donny Hamilton, pers com; Blackburn and Holford-Stevens 1999).

to Francis Willoughby) decided to take advantage of the situation. Having lost his property in Surinam, he convinced the Assembly of Antigua to pass "An Act for Indemnity, and declaring all old Titles to Land void and lost, by Reason of the French King's Conquest," (Legislature of Antigua 1805; Burns 1954). This act passed on 10 April 1668 and enabled Willoughby to take control of several plantations on Antigua to distribute as he saw fit (Sheridan 1994 [1974]).

The Codrington Dynasty

Probably the most prominent victim of the 1668 law was Joan Keynell, widow of former Antigua governor Christopher Keynell. The estate Mrs. Keynell inherited from her late husband and former governor was named *Betty's Hope*. It was one of the largest plantations on the island, and once wrested from Mrs. Keynell, Willoughby granted it to one of his cronies, Christopher Codrington II, son of Cristopher Codrington I from Barbados. *Betty's Hope* would remain in the possession of the Codrington family until it was sold in 1944. Prior to arriving in Antigua, the Codrington family had amassed a sugar empire on Barbados; Codrington took possession of *Betty's Hope* and began to expand his business empire (Fox 2016).

Additionally, Christopher Codrington II was appointed governor of Antigua and the whole of the English Leeward Islands in 1689 (Sheridan 1994 [1974]). It must be stated here that, while Codrington was not the first to cultivate sugar on Antigua, it was under his tenure as governor (and that of his son, Christopher Codrington III) that sugar became the dominant cash crop produced on the island (Dyde 2000; Fox 2016). His knowledge of Barbadian sugar production methods ensured a ramp-up in the establishment of the infrastructure necessary for large scale sugar production to be possible on the small desert island. Likewise, Antigua's slave population

exploded under Codrington's tenure. Sugar is a labour-intensive crop, which means labourers needed to be brought to the island in large numbers to support the production pipeline.

Antigua was able to become one of the largest sugar producers in the British West Indies despite its frequent droughts and lack of permanent springs or fresh water sources. Island cultivators compensated for this by importing a large labour force of slaves to develop rain-catchment systems and other infrastructure necessary for a major agricultural enterprise (Dunn 2000). Despite efforts by the government to limit slave populations in the West Indies, or at least maintain a nominal white to African ratio, the number of African slaves imported to the Caribbean increased at a nearly exponential rate during the second half of the 17th century, and throughout 18th century (Dunn 2000; Dyde 2000; Sheridan 1994 [1974]).

Additionally, a law enacted in 1675, required all inter and intra island trade to be conducted in one of six "trade-towns" so taxes could be properly assessed and commerce accounted for (Legislature of Antigua 1805). This law would provide a foundation for the full-scale sugar economy which was brewing. Likewise, the need for reliable infrastructure on Antigua was necessary to support the ever-increasing sugar production. To that end, a request was made by the Antiguan Assembly to Her Majesty's Council in 1694, asking that slaves employed at Monk's Hill and other military outposts on the island be assigned to "opening a cartable path from Falmouth to St. Johns and from Parham to the same the continuing purpose we think it absolutely necessary that the masons be at liberty for the common benefit," (Antigua House of Assembly 1694). Unfortunately, the Council denied this request, claiming that "[building roads] is a work particular to the inhabitants of each respective division." The implications of this denial are that Antigua's original road network, much of which is still in use today, was planned and built by each individual estate. Given the small population on the island, even as late at 1700,

this would have been no small feat, and an incredible amount of logistical planning and cooperation occurred among the various sized plantations on the island.

Bridgetown

Bridgetown is one of the two trade towns mentioned in the 1675 law that is no longer in existence (for a full description, see Chapter 4), having been abandoned sometime during the first half of the 19th century. The town was located on the east bank of Willoughby Bay, adjacent to the Crossroads Treatment Center, founded by musician Eric Clapton, CBE, and the town of St. Philip, whose significance will be addressed later.

The mouth of Willoughby Bay is quite wide, but it is almost entirely enclosed by Horseshoe reef, which ensures that the interior waters of the bay are calm and protected. There is a narrow but deep natural channel along the west side of the bay, which would allow ships to enter for loading and offloading of cargo.

Documented sources are unclear, but it is believed that the town was originally settled by migrants from Barbados, who borrowed the name from that island's major shipping port. It appears that a number of land patents were issued in the vicinity of Willoughby Bay as early as 1649, though most of these records have been lost (Oliver 1899). Assessment surveys from 1675 list two tracts of land (3 and 3 ½ acres, respectively) "near Willoughby Bay" were divided into 24 parcels (each measuring 40 x 50 feet) "for a town." The same assessment scrolls list the parcels' location as "Bridge Town" (Oliver 1899).

The meagre popularity of Bridgetown did not last. Despite the number of plots surveyed in the 1675 assessor's scrolls, an early 19th-century historical account implies that all that was left of the town was the church and its outbuildings:

> "for no stranger would ever discover that it was a town unless the fact were pointed out to him…. I am sure the person who huddled the three or four houses together, which constitutes Bridgetown, had need to have put upon a giant-like placard, "This is a town!" unless, indeed, a rather good-looking Methodist chapel, a small mission-house, a stone dwelling-house, with school-room attached, and a few of my four-cornered friends, stuck nine here and there, like the dots in a landscape of some country painter… be sufficient to merit for it that lofty title…. As for the population of this town….With the exception of the very kind-hearted superintendant [sic] of the Wesleyan schools, Mr. Charles Thwaites, and his equally amiable wife, their very pretty little boy, one or two domestics, and their scholars of every shade, the only inhabitants I saw were flocks of black-headed gulls, busily employed in following their piscatory avocations; a few half-starved looking sheep, vainly endeavouring to screen themselves from the fiery beams of the sun beneath the leafless branches of some blighted shrubs; and three or four long-necked, screaming birds, known in this part of the world as gorlings, and which derive their subsistence from the same source as their neighbours, the gulls." (Lanaghan and Flannigan 1844a) (emphasis removed).

Shortly after this visit, an estimated 8.3 to 8.6 magnitude earthquake sealed the fate of Bridgetown. "The old Church at Willoughby Bay was thrown down by the earthquake in 1842, and the present one was built on the top of the hill in 1850." (Oliver 1899). Indeed, by 1856 a report lists "Willoughby Bay [Bridgetown] is sinking into ruin" (Horsford 1856).

Emancipation, Tourism, and Independence

The road to modernity was long for Antigua. Despite the entire slave population being granted immediate emancipation at 12:01 am on 1 August 1834, life did not change much for the now former slave population (Dyde 2000; Rebovich 2011). A provision called the Contract Act required that they continue to work for their former masters for a period of one year (Ohman

2014). Prior to emancipation, plantation owners and managers typically set aside land for their slaves to grow their own crops and other foodstuffs to sell in the local markets. Now, many saw no need to provide these provisions and began to charge rent (typically rents were commensurate or perhaps more than the wages being paid, ensuring that former slaves were perpetually in debt to their former masters). Slowly, however, workers gained more equality as the legislature passed stricter rent-control and wage laws and people of colour became socially more accepted as free people (Rebovich 2011).

The Dockyard at English Harbour, once of major strategic importance and a key piece of British military might in defense of Brittan's economic and political interests during the 18th and 19th centuries, was all but abandoned in 1854. For the next 30 years it was reduced to little more than a storehouse and coaling station until it was officially decommissioned in 1889 and was left to deteriorate for another 60 years (Dyde 2000; Handy 2016). In the 1950s, restorations began of the renamed Nelson's Dockyard (after Admiral Horatio Nelson, who was stationed at the dockyard in command of the H.M.S. Boreas from 1784-1787) (National Parks Antigua 2018). The fully restored Dockyard was placed on the UNESCO World Heritage Site list in 2016 and is once again of major "strategic" importance to Antiguan economic interests.

Throughout the majority of Antiguan history sugar was king… until it wasn't. In 1874, while spurred by the free trade movement, Britain. abolished all import duties and tariffs on sugar. This led to a sudden collapse of sugar prices worldwide and refineries in the U.K. shifting to cheaper (and highly subsidized) beet sugar from mainland Europe (Higman 2011). Attempts were made repeatedly until World War II by the Antigua legislature to revitalize Antiguan sugar imports to the U.K., but little success was made despite the modernization of Antigua's sugar infrastructure which utilized steam power and consolidating all sugar production into one cooperative company

for the island and shifting exports to Canada and the U.S. (Dyde 2000; Higman 2011). Antigua persisted with cultivating sugar even up until the early 1960s, when the sugar cane grew so tall over the roads of the island to block out the sun and create the appearance of a canopy while driving (Nicki Murphy, pers com). Ultimately, however, sugar died and many public works projects throughout the 1960s and 70s helped shift the island economy towards tourism, resort travel, and pleasure cruises (Dyde 2000).

Antigua's transition to modernity had one final step: It needed to be free of colonial Britain. Like most other Leeward islands, Antigua (linked with the nearby islands of Barbuda and Redonda) gained state status within the West Indies Associated States of the United Kingdom (Higman 2011). As an Associated State, Antigua had internal self-government relied on Britain for defense and foreign relations (Bulletin 1982). Under the provisions of the West Indies Act (U.K. Public General Acts 1967) Antigua requested full independence, and at midnight on October 31, 1981, in the presence of the Queen's sister, Princess Margaret, the Prime Minister of Jamaica,

Figure 6 The Flag of Antigua and Barbuda was designed in 1966 by Mr. Reginald Samuel (Government of Antigua and Barbuda 2018)

the Canadian Secretary of State, and a 14 member delegation from the United states, the Union Jack was ceremoniously lowered from the flagpole of the St. John's Recreation Ground and the red, black, yellow, blue, and white flag of Antigua was raised (Figure 6). The independent nation of Antigua and Barbuda was born (Leavy 1982).

CHAPTER III

CLARK ILLUSTRATION AND MORRIS BAY*

Deep in the bowels of many museums and library archive collections across England and the U.S. are copies of a book that has had an enormous influence on our understanding of sugar production methods of the early modern period. Originally marketed as a children's book, *Ten Views in the Island of Antigua in which are Represented the Process of Sugar Making, and the Employment of the Negroes in the Field, Boiling-House, and Distillery* (Clark 1823) has become a go-to resource for modern researchers seeking illustrations depicting life on pre-emancipation sugar plantations in the West Indies and the production of sugar in general throughout the Early-Modern period. However, despite how popular the illustrations in this book are, little research has been performed to determine how it came to be or the accuracy of its illustrations.

Interpreting Historical Art and Iconography

A major consideration must be taken into account when we try to interpret scenes depicted in illustrations or any form of iconography. We must always be aware that the piece of art was created by an artist and that the piece of art is merely a representation of the object or scene, and not the thing itself (Wachsmann 1989). The representation was therefore created after being "filtered" through the artist's mind, and by extension, their cultural "template" of norms, perceptions, and reality (Barrett 1994). With this in mind, it is always prudent to anticipate that certain aspects or shapes in the scene may be exaggerated or diminished based on the artist's

* Some Images in this chapter are reprinted or modified from their original source. Reprinted images from Clark (1823) and Baker (1749) are courtesy of the John Carter Brown Library at Brown University under a Creative Commons License (CC BY-SA 4.0). Figure 12 is reprinted with permission from Chris Waters.

perceptions. Therefore, caution and common sense must be used to mitigate what we see in the depiction vs. what the scene actually was (Phillips, et al. 1987).

Interpreting a work of art requires understanding the context in which it was created (Cooper 2010). Though normal interpretation doesn't necessarily require the artist's intention be taken into account (Barrett 1994), in this instance the artist's intent adds to the context of the scene and how it should be interpreted. I am not interpreting Clark's illustrations as an art critic, but rather as an anthropologist investigating a depiction of a historical event.

That said, understanding the makeup of the cultural "lens" through which Clark saw and recreated the events in *Ten Views* is crucial to understanding the accuracy of the events depicted. Based on the accompanying descriptions, Clark's illustrations could either be a "snapshot" of a real-life event that he witnessed himself or a conglomeration of several similar (somewhat mundane) events over the course of his stay on Antigua. Learning more about the author, the reason he was in Antigua, his socio-economic status, and the circumstances which led him to write and publish *Ten Views* will help to reveal these motivations.

Thomas Clay

Getting inside the head and historical and cultural context of the author would be a difficult task under the best of circumstances. I thought learning about the publisher could reveal more into Clark's identity, his socio-economic status, and how *Ten Views* came to be. Thomas Clay was located at 18 Ludgate Hill in London. He was known to have helped many independent and struggling artists to publish their work. He mostly published smaller works with limited print runs like *Ten Views*. Although not all the books, prints, and illustrations consisted of single-authored works, the majority of them were printed in color (Ballinger 1908).

William Clark

The author and illustrator of the book, William Clark, seems to be somewhat of a mystery. The book notes that his illustrations were produced "during a residence of three years in the West Indies, upon the estates of Admiral Tallemach" (Clark 1823). Presumably, he is referring to Vice Admiral John Richard Delap-Halliday Tollemache, who owned many plantation estates on the island (Oliver 1896). Most museums and libraries note that he was probably a caretaker or manager of one of John Tollemache's estates, but none seem to know for sure. If he was a plantation manager or otherwise there in some official capacity for Lord John Tollemache, his name should be listed on an employment roll or other records. However, despite much correspondence with various archive repositories in the UK, I have not been able to locate any plantation records for the Tollemache estates in Antigua as of the time of this writing. It is hoped that clues to Mr. Clark's identity will be found buried in the Antigua National Archives, which are still being catalogued by the new archivist but are still somewhat in disarray following years of neglect under the previous regime.

John Richard Delap-Halliday (later, John Richard Tollemache)

In 1771, a year after John Delap Halliday abandoned his planned wedding to the daughter of Commodore Byron and eloped to Gretna Green, Scotland, with Lady Jane Tollemache, the couple had their first child, John Richard Delap Halliday (Halliday 1980). In 1794, at the age of 23, John Richard inherited the Halliday fortune, land, and holdings in London, St. Kitts, and Antigua. Two years later, he gained control of the Weatherill plantation in Antigua after the death of his uncle, Francis. Later, in 1821, his maternal uncle Wilbraham died, leaving John Richard as the sole heir to the Tollemache estates in Cheshire, Northamptonshire, and Suffolk.

Per his uncle's will, he assumed his mother's name and the Royal Coat of Arms of Tollemache. John Richard Joined the Royal Navy and advanced quickly, presumably due to his skill and aptitude for seamanship and the mentorship from his mother's family. While the Halliday family had strong ties and influence with the army, the Tollemache name was well known within the admiralty. In 1820, then John Richard Halliday was promoted to the rank of Vice-Admiral of the Blue, only a year after he was made an admiral (Halliday 1980). His final promotion came in 1837, when he became Vice-Admiral of the Red.

In 1829, six years after William Clark published *Ten Views,* Admiral John Richard Delap Halliday Tollemache's holdings on the island of Antigua included the Glanville's, Delaps, Thomas', Boons', Weatherill's, and Gambles plantations (Nicholson n.d.). All of these estates are possible locations where Clark may have lived during his three-year stay on the island.

The Book

As I stated before, *Ten Views* was originally marketed as a children's book. The illustrations and accompanying captions describe in detail the sugar-making pipeline on Antigua from planting to shipping (Figure 7). The first illustration shows the courthouse in St. John's, which is still standing and is now the home of the Museum of Antigua and Barbuda. The accompanying caption describes the building and that rum was a common form of currency with which to pay fines, etc. Also, the narrative states that there is a sort of "farmer's market" nearby which is operated by the slave community (Clark 1823).

The next three illustrations and their accompanying text describes the cultivation of sugar cane from clearing the land, planting, and harvest. The illustrations are said to depict Weatherill's, Bodkin's, and Delaps Estates (respectively). In the background of the Bodkin's Estate drawing,

Fort George on Monk's Hill is depicted with crenellations atop its massive fortification walls (Clark 1823).

After the cane is harvested in the field it is taken to the windmill. In a composite illustration, Clark (1823) depicts the Gamble's Estate mill along with elements from other estates to show a cornucopia of bustling activity: Teams of cattle or oxen are bringing bundles of cane to the mill, some people are loading bundles into the mill so the mill-workers can place it between the rollers. Others are collecting the spent cane to set it drying in the sun, as the spent cane was used to fuel the boilers. Milling cane was an incredibly dangerous job. Fairly often, a slave would get

Figure 7 Mosaic of the illustrations from Clark (1823) not otherwise shown in this chapter. More rephotography will be attempted of these scenes in the coming seasons: A) The first image is the original courthouse building on Long Street in St. John's. The building is now used as the Museum of Antigua and Barbuda; B) Illustration number two is titled "Holeing a Cane-Piece, on Weatherells Estate, Antigua"; C) The fourth illustration depicts the cutting of the cane at Delaps Estate; D). Images reprinted from Clark (1823) courtesy of the John Carter Brown Library at Brown University.

Figure 7 Continued After the cane is cut, it proceeds to the mill yard, this scene is said to be at Gambles Estate; E and F) depict the boiling houses at Delaps and Weatherills Estates, respectively; and G and H) show the distillery buildings at Weatherills and Delaps, respectively. Images reprinted from Clark (1823) courtesy of the John Carter Brown Library at Brown University.

his hand caught between the rollers of the mill. There was usually an axe located inside the mill and the doctor's station was always nearby for those instances (Lanaghan and Flannigan 1844a).

Following the milling process, the extracted juice is transported to the boiling house. To describe the boiling process, Clark (1823) uses two illustrations: interior and exterior shots of the boiling houses of Delaps and Weatherill's Estates, respectively. Boiling is a several-part process where the cane juice is concentrated and purified, then crystalized into raw sugar. Spent cane from milling is dried and used to fuel the copper boilers.

Likewise, the next two illustrations show the exterior and interior of the Weatherill's and Delaps Estates' respective stillhouses. After the sugar is boiled and crystalized, it goes to the curehouse where the molasses is allowed to drain. The molasses is mixed with brackish water and fermented, then distilled into rum (Clark 1823). The book also unveils the reality that Antigua has no natural source of fresh water, so every plantation is dependent on collected rain water for personnel and processing.

The last illustration in *Ten Views* (Clark 1823) is entitled "Shipping Sugar, Willoughby Bay, Antigua" (Figure 8). It depicts a scene of hogsheads of sugar being loaded onto ship's longboats for transport to ships anchored out in the bay. The accompanying text of the illustration reads:

> The want of wharfs on the shores of the island, has rendered it necessary to resort to an awkward and hazardous method of getting sugars on board.
>
> The small vessels used to convey the Hogsheads to the shipping in the harbour of St. John's, or English harbour, are called Drogers, of from twenty to thirty tons burthen, having boats provided with timbers on which the Hogshead may rest.
>
> The boats are brought to the proper depth of water and are forced down on one side; two spars or skids are then extended from the gunwales to the shore, on which the hogsheads are rolled into the boat, at the recoil of the wave; much dexterity is necessary to accomplish this without shipping water with the sugar.
>
> Many estates, remotely situated from places of shipment, are provided with store-houses upon the beach, in which Sugar and Rum are occasionally deposited, in readiness to be received on board the small craft, to be forwarded to the King's Beam, at St. John's, where the duty is ascertained ; the Sugar is then shipped for England, a voyage of uncertain duration, usually made in four weeks ; but too often occupying two months, from the Captains being compelled to cross the Atlantic under the disadvantages of varying winds.
>
> This scene is in Willoughby Bay. (Clark 1823); Figure 8).

Figure 8 Illustration of hogsheads of sugar being loaded, supposedly at Willoughby Bay (Bridgetown) from Clark (1823). Image reprinted from Clark (1823) courtesy of the John Carter Brown Library at Brown University**.**

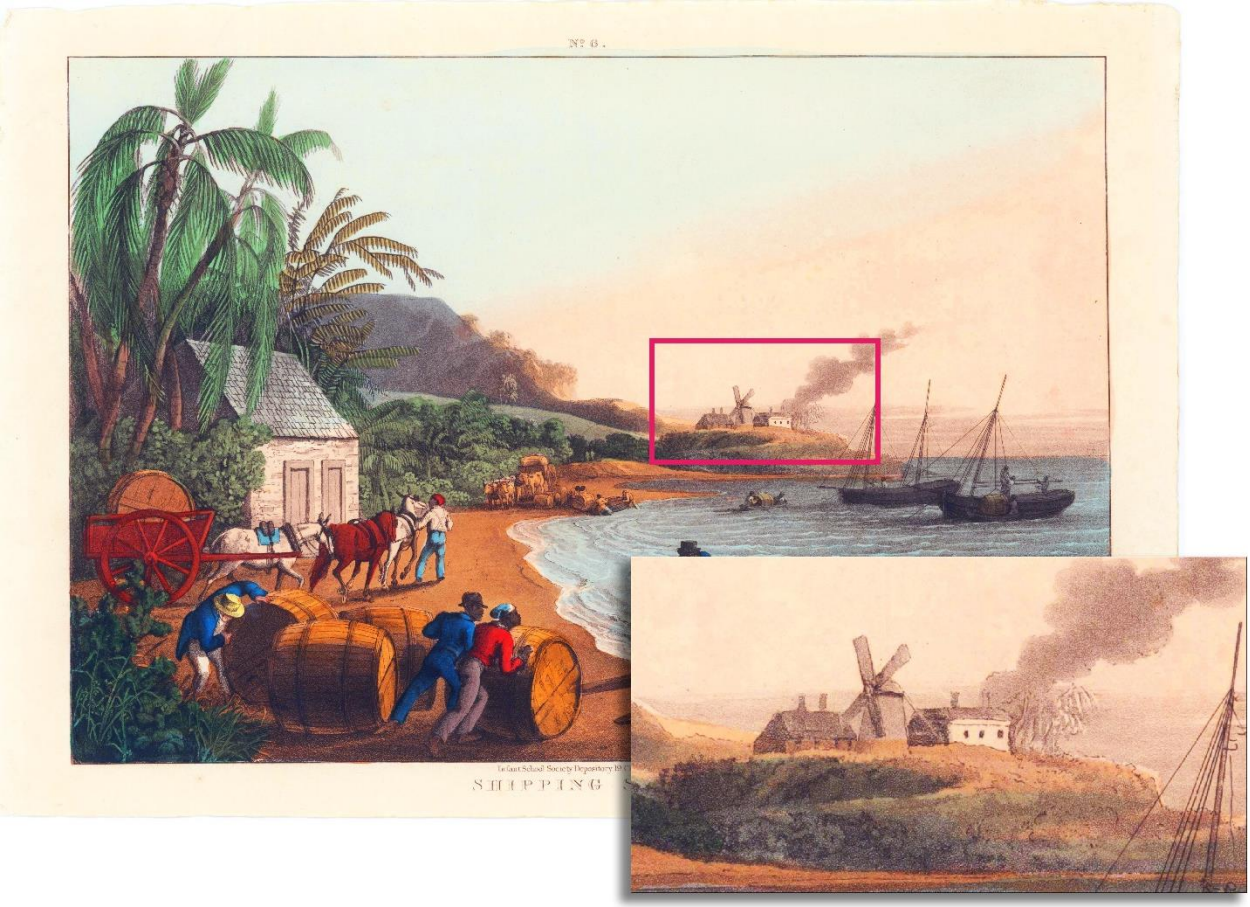

Figure 9 Blow up of windmill and outbuildings depicted in Clark (1823) illustration "Shipping Sugar." There are no windmills or plantations with this configuration in Willoughby Bay. Image modified from Clark (1823) courtesy of the John Carter Brown Library at Brown University.

In most of the history books from the area, "Willoughby Bay" is used synonymously with "Bridgetown" (Dyde 2000; Lanaghan and Flannigan 1844a; Lanaghan and Flannigan 1844b; Oliver 1894; Oliver 1896; Oliver 1899). Indeed, nearly every book using Clark's illustration captions it as Bridgetown (Dyde 2000; Lawrence 2008). Unfortunately, the scene depicted doesn't match the Bridgetown landscape. Especially problematic is the windmill and boiling house seen in the background of the illustration (Figure 9).

Figure 10 Map of windmill locations and Plantation names around Willoughby Bay and Bridgetown. This map was created by using Baker (1749), Nicholson (n.d.), and Thomson (1817) as a reference and then digitizing the locations manually using ESRI ArcPro and satellite imagery from Google Earth.

Location of "Shipping Sugar"

As said previously, any work of art, regardless of its medium or purported accuracy, is a product of the artist's mind and cultural perceptions. Therefore, an analyst should be cautious in their interpretation and take the literalness of the iconography with a grain of salt. However, even after taking those considerations into account, the placement of Clark's illustration at Willoughby Bay remains particularly puzzling because the landmarks in the illustration don't match with any of the topography of Bridgetown (or anywhere else in the bay). Namely, the windmill and outbuildings on the point in the background of the illustration do not exist anywhere in Willoughby Bay. Figure 10 shows the locations of windmills in the vicinity of Willoughby Bay and the plantations that were associated with those mills. The closest mill locations to

Bridgetown are the ones associated with the Lynch, Montpelier, and Lyon estates, respectively, but none are located near enough to shore or in any position to illicit the scene Clark depicts.

Various explanations to Clark modifying the scene are possible based on the problems associated with iconography interpretation. The most likely explanation to such an anomaly is that "stylization" or "author's privilege" was used. In other words, Clark may have inserted objects into the drawing which were not actually present in the actual landscape to make the scene look more serene. Stylization is a common gimmick used by artists, and Clark uses the practice elsewhere in *Ten Views*: In the background of the third illustration he depicts Fort George atop Monk's Hill (Figure 11). The top of the fort wall in the illustration is crenelated with gun ports. Excavations of Fort George in 2016 revealed much of the fortification

Figure 11 "Planting the Sugar Cane" The third illustration in Clark (1823) depicts the cane being planted. Note the crenellations on the walls of Fort George on the top of the hill and the photograph of the actual fort wall (Figure **12**). Image reprinted from Clark (1823) courtesy of the John Carter Brown Library at Brown University.

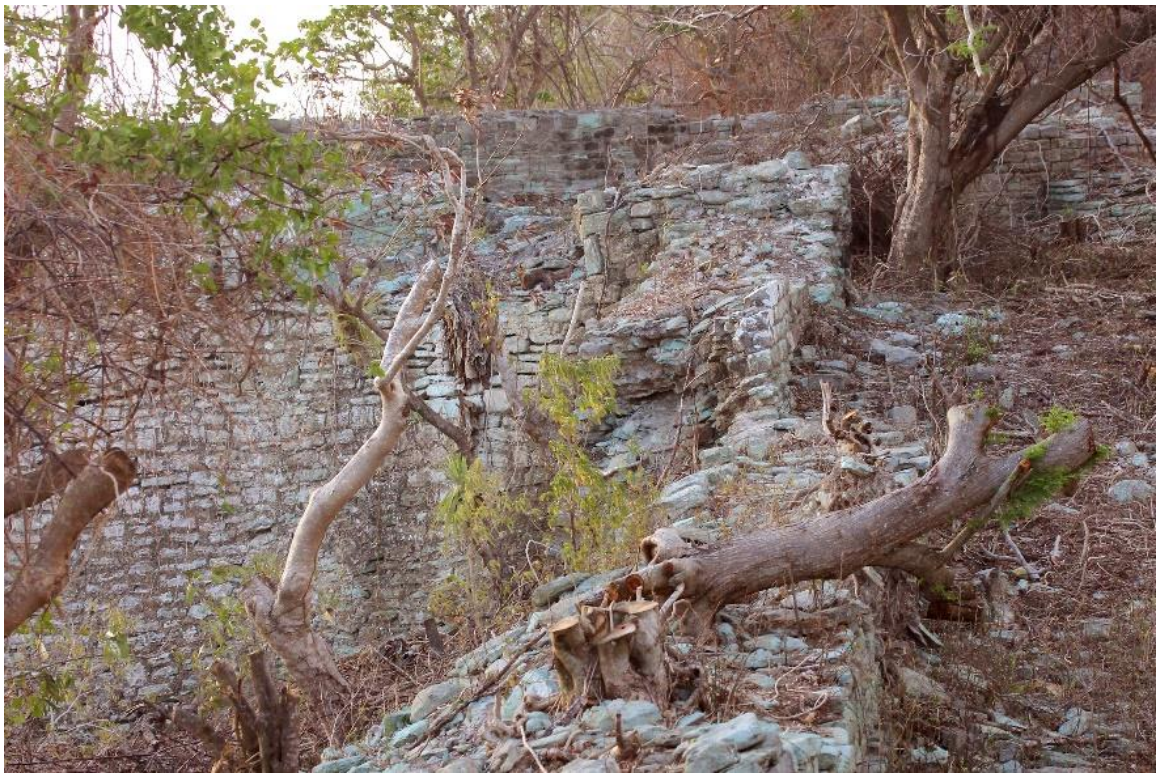

Figure 12 Fortification wall at Fort George on Monk's Hill. Note the lack of crenellations. Photo reprinted with permission from Chris Waters.

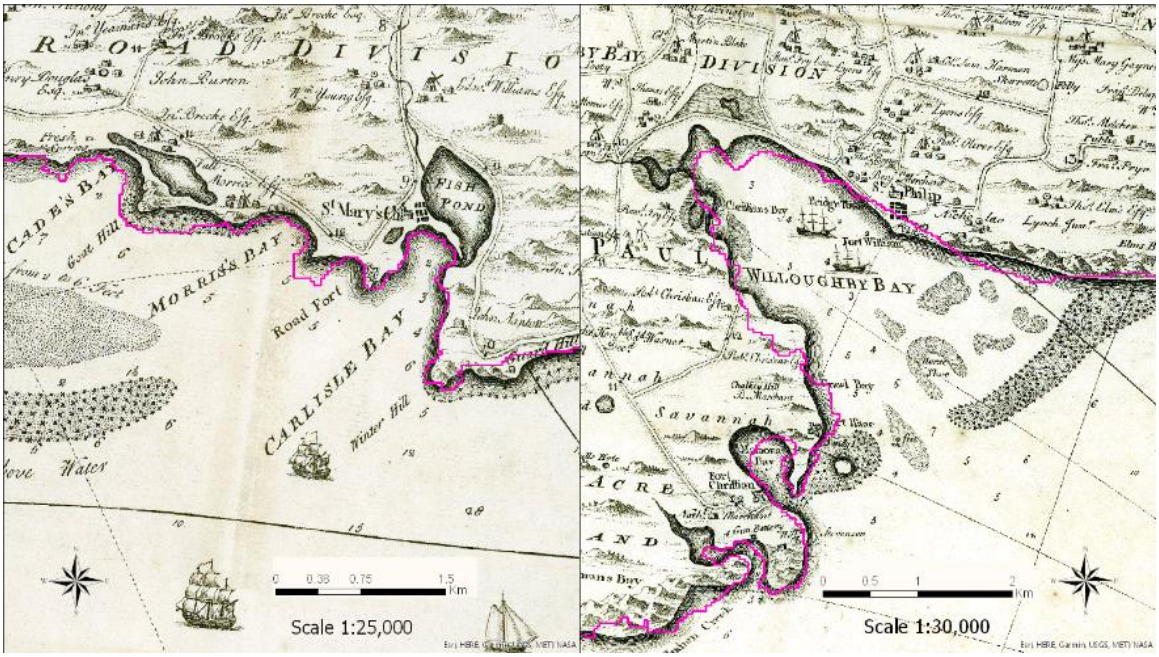

Figure 13 Areas of Willoughby and Morris Bays from Baker (1749) projected in Esri ArcPro and with current coastline overlaid in magenta. Map modified from Baker (1749) courtesy of the John Carter Brown Library at Brown University.

walls intact, however crenellations were not present (Figure 12). Stylization in the Willoughby Bay drawing could mean that he inserted the windmill and boiling house seen in the background.

Likewise, the shape of the shoreline contains a distinct arc, delineated by a sandbar, creating two small shallow inlets. As seen from Figure 13, the shoreline at the Bridgetown site is relatively straight. Various georeferenced historical maps indicate very little shift of the shoreline since the 17th century. Again, the drawing may have been stylized to reflect the curve in the shoreline, if the intended view was from the Bridgetown site, a stylization such as this would exaggerate the outcropping at the entrance to the bay and enhance the view of the windmill and plantation buildings.

Figure 14 Photograph taken during Morris Bay Survey on 3 July 2016 (with the hill area blown up, showing the windmill). Photograph is taken facing east along shoreline.

Rephotography

Toward the end of the 2016 field season, I was asked to assist with a preliminary cultural resource assessment survey in Morris Bay, near the town of Old Road, because one of the resorts along the bay wished to expand onto the Morris Plantation site. The survey crew consisted of Dr. Reg Murphy, Head of Heritage Resources for Antigua National Parks, Mrs. Nicola "Nicki" Murphy, myself, and Mr. Chris Waters, a Ph.D. candidate at Syracuse University, NY. After arriving at the site, Chris and Nicki went inland to assess the condition of the windmill and the remains of the sugar processing outbuildings while Dr. Murphy and I surveyed along the shoreline.

Figure 15 Final overlay of Morris Bay photograph and illustration from Clark (1823). Note the shoreline, windmill atop the hill, and the rock outcropping on the point. Image modified from Clark (1823) courtesy of the John Carter Brown Library at Brown University.

As we made our way up the beach, Dr. Murphy noted the position of the windmill and boiling house remains on the horizon and said it looked like the drawing of Bridgetown made by Clark. I agreed that it looked remarkably similar (Figure 14). I took a picture of the scene for further comparison.

Upon returning from the field in 2016, I uploaded the picture I took of Morris Bay into Adobe Photoshop CC 2015.4, along with a scanned image of the relevant page from Clark (1823). By reducing the picture's transparency and matching the scale, I was able to overlay the picture onto the painting. To my astonishment, when I lined up the windmill, outbuildings and rock outcropping of the shoreline in the picture to their corresponding representation on the painting, a nearly identical match was achieved (Figure 15).

Figure 16 Overlay of photograph with illustration from Clark (1823) with enlargement of hill area and windmill. Image modified from Clark (1823) Courtesy of the John Carter Brown Library at Brown University.

As can be seen in Figure 13, Figure 14, and Figure 16, the major morphological features of the shore are nearly identical in both the painting and the photograph overlay. It should be noted that the location of the waterline itself is slightly changed. The cause of this is likely because the Morris bay survey was conducted in the morning during low tide, while historically, ships would have been loaded during high tide to compensate for the increasing displacement of the cargo. However, we cannot completely rule out other factors which may have contributed to the discrepancy, such as the migration of sand and silting due to wave and storm action over the past 150 years, etc. The continued presence of the large sandbar and the general shape of the bay, however, leads me to believe the major reason why the waterline has changed is the state of the tide at the time of the depictions.

Additionally, Basalt cobbles were found littering the beaches of both Morris Bay and near the Bridgetown site (see Chapter IV). These cobbles are not consistent with the geological composition of the natural bedrock in either location, and so must have been deposited from elsewhere by natural or artificial means. Other items of note discovered during the shore survey were faint hints of buried building foundation walls and a scatter of flint cobbles and flakes. The flint was likely sourced from Long Island, one of Antigua's offshore islands.

Discussion

Placing the location of the Willoughby Bay illustration at the Morris plantation answers several questions while raising several others. Probably the most obvious question answered is the accuracy and credibility of the drawings vs. how much artistic license Mr. Clark took when describing the scenes of *Ten Views*. It's clear that the scene itself is fairly accurate, albeit in the wrong location.

Of course, one of the questions that arises is why Clark would caption the illustration as Bridgetown. While we may never know for certain, several explanations are possible. One possible explanation is since the Morris estate was never a part of Adm. Tollemache's holdings on Antigua, it is possible that Clark used mild subterfuge with the location of the drawing to obscure the possibility he was on a property where he wasn't supposed to be.

Another possibility is that the illustration was chosen out of a larger portfolio by Mr. Clay, Mr. Clark, or both as the best picture to show the loading process and the location of Willoughby Bay was listed because Morris Bay was not a legal shipping port for export, as dictated in the 1675 *Act for the settling and appointing of several Towns within this Island for the better Encouragement of Trade* (Legislature of Antigua 1805). This did not mean that the picture is depicting an illegal event. Most roads on the island were narrow and intra-island travel was typically much easier by sea than by land routes (Dyde 2000). Therefore, it was common practice for sugar plantations on the island to have private or semi-private ports where they loaded shipments on smaller coastal vessels for transport to trade towns. At the trading ports the hogsheads of sugar (and/or rum) would be offloaded, assessed for taxes, then reloaded onto transoceanic vessels for export (Clark 1823).

Further Research

Over the next several seasons I will attempt to discover more of William Clark, the history of *Ten Views*, and continue attempting rephotography of the other illustrations in this book. I hope that access to the Antigua national archives will reveal Admiral Tollemache's plantation records and personnel rolls, allowing the discovery of clues to Clark's identity, the exact dates of his tenure, and his occupation on the island.

CHAPTER IV

PRELIMINARY SURVEYS AT BRIDGETOWN*

> The fearful earthquake of 1843-which destroyed property in Antigua to an immense amount, ruined the beautiful cathedral, and shook the new Wesleyan chapel in St. John's to its base, deprived Mr. Thwaites of his house at Willoughby Bay. He then removed to Parham, from which place he was able conveniently to visit his schools. (Horsford 1856)

Abandonment of Bridgetown

As stated previously (see Chapter II), based on historical accounts and cartographic evidence, the wholesale abandonment of Bridgetown probably occurred ca. 1843-50, when the Wesleyan Church of St. Phillips was relocated to its current location in the village which bears its name. Some local legends indicate the destruction of the church was due to secondary seismic events like a tsunami (Reg Murphy, pers com), even though historical records place the destruction of the church as a result of the earthquake itself (Oliver 1899). Regardless, the large earthquake centered off the coast of Guadeloupe in February 1843 seems to have been the catalyst of the town's demise (or at least the final straw which began its rapid spiral to oblivion). Most of the current research estimates the quake's magnitude at 8.3, however, Hough (2013) estimates a much larger quake of at least 8.6. Archival reports and historical accounts indicate the quake was felt as far north as New York (Hough 2013).

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Newspaper accounts of the event in Antigua reported St. Philip's church to be "cracked from top to bottom, and rendered unsafe, and the school-house was levelled with the ground" (Lanaghan and Flannigan 1844b). Of the 172 sugar mills on the island, 35 were completely leveled, 82 were irreparably damaged, and the other 55 were still in need of "extensive repairs" before they could be operational. Furthermore, "the [sugar] works, the dwelling-houses, and labourers' cottages

attached to these mills have shared their fate in equal proportion." At the time of the earthquake most of the sugar cane on the island was "nearly ripe for harvest" (Antigua Register 28 February 1843). The cane itself was unscathed during the earthquake but could not be harvested or processed due to the extensive damage to equipment and infrastructure caused by the quake.

Some of the more bizarre reports of the earthquake on the island include a signalman's building at the edge of the cliffs of Shirley Heights (across the bay overlooking Nelson's Dockyard) "fell at the commencement of the shock, burying beneath its ruins a baby of four months old, but which was afterwards extricated and restored to its distressed parents unhurt, with the exception of a trifling scratch" (Lanaghan and Flannigan 1844b), near Monk's hill "a huge rock was lifted up by the oscillations of the earth, from the place where it had reposed for centuries, and hurled to the opposite side of the road" (p292), and "A deep well in St. John's was found to be chocked up and nearly filled with white sand, which have been forced up from the bottom" (Antigua Register 28 February 1843).

Earthquake

The estimated 8.3+ magnitude earthquake originated on February 8, 1843 at Pointe a-pitre, Guadeloupe. The shock seems to have been caused by a deep rupture in the North America/Caribbean plate subduction zone, resulting in a megathrust event (Feuillet 2011; Figure

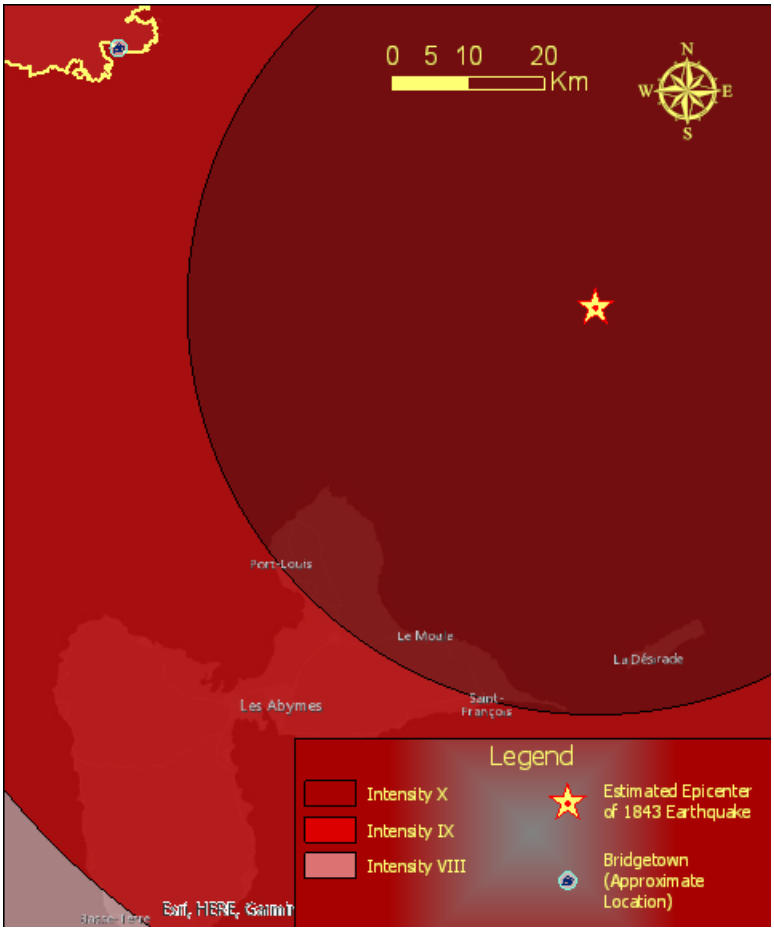

Figure 17 Map showing relative positions of Guadeloupe, Antigua, and the epicenter and intensities of the 1843 earthquake. Map modified from Feuillet (2011).

17 **Map showing relative positions of Guadeloupe, Antigua, and the epicenter and intensities of the 1843 earthquake. Map modified from Feuillet (2011).**). Near the center of the tremor on Guadalupe, the town of Pointe-a-Pitre was completely destroyed with a death toll of between 1500 and 4000, with some 600 wounded between the collapse of buildings and the resulting fire that levelled the town (Feuillet 2011; Lanaghan and Flannigan 1844b). In contrast, Antigua's population suffered very minimal loss of life (death toll is reported as "8 to 40" (Bernard and Lambert 1988)) despite the tremendous damage to infrastructure, churches, military forts, and other buildings.

Tsunami

As stated, some local legends purport the abandonment of Bridgetown to a tsunami. On a clear day, Guadeloupe is visible from the Bridgetown, so a wave generated by such a large seismic event would indeed strike the shore at that location in full force. Two eyewitness accounts of the wave accompanying the quake are known. Both accounts discuss English Harbour, which is very near to Willoughby bay and Bridgetown. One of the accounts list the wave as being 3 meters in height, the other at barely 1 meter. Waves of this magnitude, while much larger than normal, are typical for a severe storm surge and would not likely cause the panic required for the rapid departure of Bridgetown (Chris Waters, pers com). Indeed, Antigua's

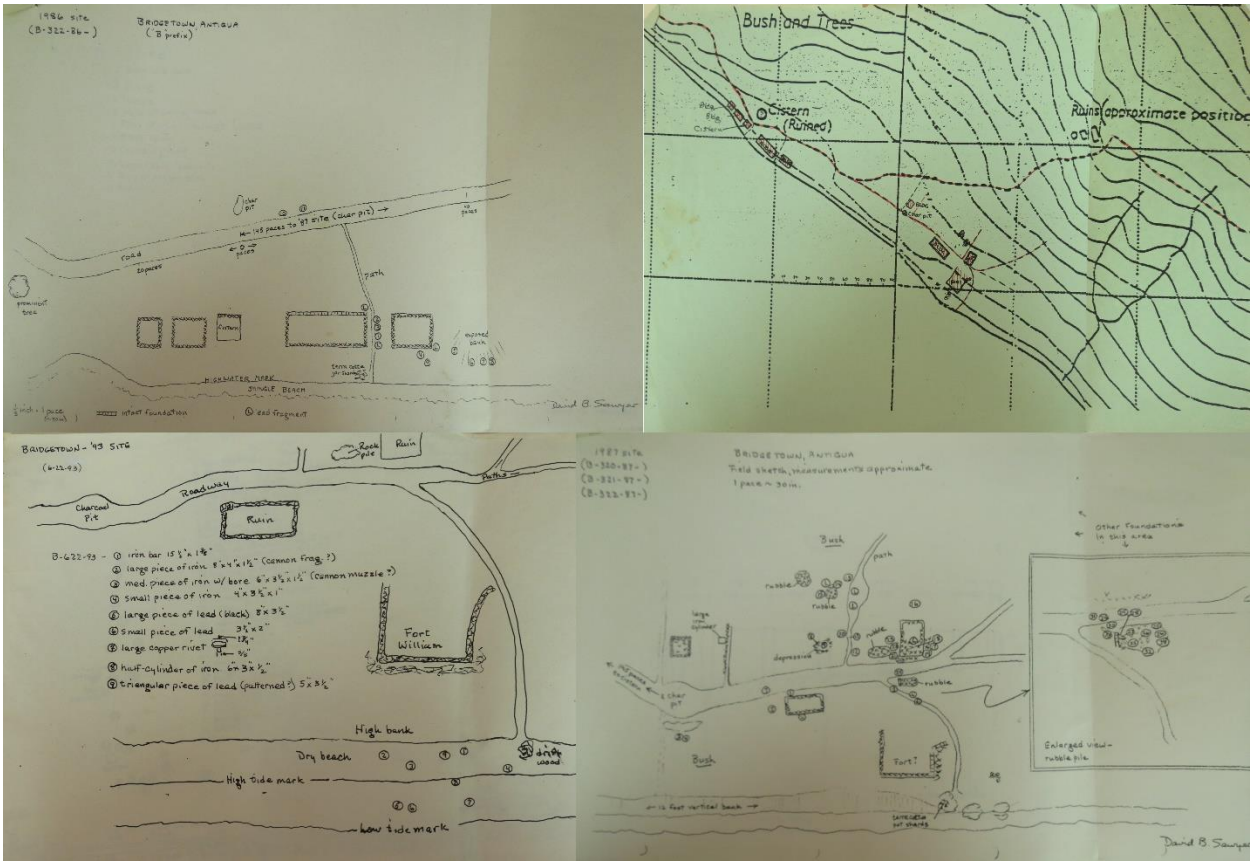

Figure 18 Sitemaps of Bridgetown created by Sawyer (1987) between 1986 and '93. I used these maps to create the reference points seen in Figure 20 in Esri ArcMap 10.5. with the help of Dr. Cory Look. Images reprinted with permission from the Museum of Antigua and Barbuda.

sister island of Barbuda received storm surges of approximately 2 meters when it was receiving the full force of hurricane Irma in September, 2017 (Cangialosi, et al. 2017).

Previous Research at Bridgetown Site

Between 1987 and 1995, a series of metal detector surveys of Bridgetown and the adjacent Fort William was completed by David Sawyer, a geology teacher from Suffield, CT in cooperation with the founder of the Antigua Historical and Archaeological Society, Desmond Nicholson (Figure 18). The survey report, while crude, identified relatively intact foundation walls of several buildings and the defensive wall of Fort William, along with transcriptions of some cemetery headstones from the original St. Philip churchyard. Several badly corroded metal artifacts and potsherds were collected as surface finds, which are now housed at the Museum of Antigua and Barbuda in the capitol of St. John's in badly deteriorated condition.

Pipe Stems Found at the Bridgetown Site

Among the Bridgetown artifacts housed in the Museum of Antigua and Barbuda are 54 pipe stem fragments. The bore diameters of these stem fragments were measured using standard imperial Society of Automotive Engineers (SAE) diameter drill bits in accordance with Harrington (Schuyler 1978). Unfortunately, the drill bit set used to measure the bore diameters was missing it's 5/64 diameter bit. Measurements of 5/64 were then presumed when 6/64 would not fit and 4/64 was exceptionally loose. Of the stems measured, one was broken longitudinally. The bore measurement of this fragment was excluded from the calculations. Likewise, one stem bore measured <4/64". This specimen was also excluded, as the lowest diameter available on the Harrington scale is 4/64".

The stem diameters were analyzed using Binford's regression formula of

$$Y = 1931.85 - 38.26X$$

where X is the numerator of the fraction that expresses the mean bore diameter of the sample in X/64ths, and Y is the mean sample date (McMillan 2016). After excluding the two outliers noted above, the mean bore diameter of the remaining 52 fragments was calculated as 4.71/64". Thus, $Y = 1931.85 - 38.26(4.71)$ results in a mean sample date of 1751.59. This is earlier than the estimated final occupation of Bridgetown but would be consistent with the height of popularity of Bridgetown as a shipping harbour. A full catalogue of the pipe stems and analysis can be found in Appendix A.

2016 Surveys

Using GIS, my colleague, Dr. Cory Look from Brooklyn College digitized the major points indicated on Mr. Sawyer's maps (Figure 18; Figure 19) for me to use as a reference for the planned survey of the Bridgetown ruins during the 2016 field season. However logistical complications, dense overgrowth, and the inaccuracy of the map projections[2] precluded finding the location of the town as planned. The remains of Fort William, which is located along the shoreline, immediately seaward of the expected location of the town ruins, was reached; its condition markedly deteriorated and nearly 160 meters from where it was drawn on the 1987 sitemap.

[2] After I returned from the field, I discovered that the topographic maps from which Sawyer based his site maps used the Antigua 1943 British West Indies grid projection and my original geolocations were based on WGS 1984 UTM 20N. This could partly account for the discrepancies found in the original projection. Using the correct projected grid and observations made in the field, I reprojected and corrected the features noted by Sawyer (See Figure 19)

Figure 20 Original projections by Dr. Cory Look based on Sawyer (1987) and corrected locations based on survey observations and corrected map projection information.

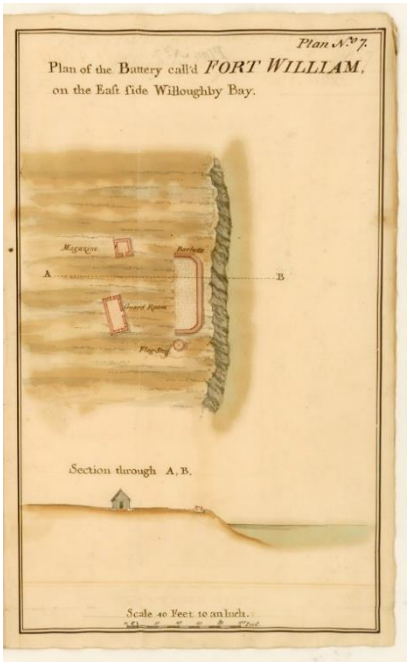

Figure 19 1752 Map of Fort William from the British Naval Archives (Horneck 1752). Map reprinted from Horneck (1752), courtesy of the John Carter Brown Library at Brown University.

Fort William was built as part of Antigua's extensive coastal protection system to protect Willoughby Bay and Bridgetown. The site is located adjacent to Bridgetown and consisted of a magazine, barracks, cistern, and fortification wall, as indicated by a 1752 map from the Navy archives (Figure 20). A survey of Fort William and St. Philip was conducted on 2 July 2016 by Christopher Waters from Syracuse University, "Tori" Ryan, David Murphy, and myself. The first thing we noticed about the Fort William site was that most of the fortification wall had eroded into the bay. On the day there was an unusually low tide, and four large chunks of the wall could be seen approximately 10-12 meters from the fort. The cistern at Fort William was largely intact and appeared to be at least partially full. However, only piles of rubble marked the locations of the Fort's magazine and barracks, along with a cornerstone and traces of wall

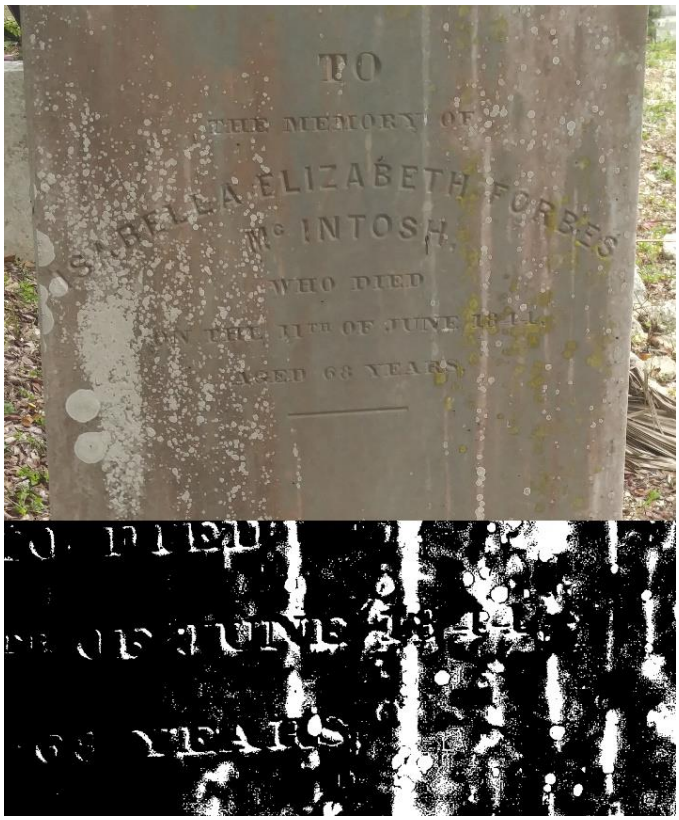

Figure 21 Headstone from cemetery at St. Philips Church which appears to be dated 1814. Using the threshold tool in Adobe Photoshop, I discovered the date to actually read 1844.

foundations, which outlined their perimeter. As noted by Deetz (1977), headstones are a handy and quick method of determining dates of sites, as there is usually a date of death engraved into them. It occurred to me that an easy way of checking the validity of the establishment of the current St. Philips church would be to inventory its attached cemetery. After the survey of Ft. William on 2 July, 2016, the survey crew drove the short distance to the village of St. Philips. Upon arrival at the church, we gained permission from a member of the cleaning staff to access the cemetery and tour the grounds. In the cemetery I noted at least three headstones dated prior to 1840, the earliest having a date of 1805, although some were difficult to read due to weathering. Furthermore, while touring the grounds, I noticed above the archway of a side entrance to the church a stone engraved with the date "1830 AD." These observations seemed to contradict the date established by Oliver (1899).

I took photographs of the headstones I believed to be marked "1805" and "1814." I uploaded the photos into Adobe Photoshop CC 2017. After the pictures were loaded, I used the threshold filter within photoshop and was able to illuminate details and topography of the stones which were not

Figure 22 Headstone from cemetery at St. Philips Church which appears to be dated 1809. Using the threshold tool in Adobe Photoshop, I discovered the date to actually read 1859.

visible in the field. Through this method, I discovered that the headstone marked “1814” was actually engraved “1844.” Additionally, the stone marked “1809” was revealed to be “1859,” and the keystone marked “1830” looked to be stylized in a way that could be read as “1850” (Figure 21; Figure 22; Figure 23, respectively). It appears that someone repainted the stone on the archway with the incorrect date at some point. It was later discovered that the prison on the island was also wrongly dated in a similar manner to read 1735, when in actuality, it was built in 1755 (Chris Waters, pers com).

A further preliminary survey was completed along the waterfront near the Bridgetown site. Four transects were walked, approximately 5 meters apart, beginning at the Crossroads facility fence and following the shoreline southeast approximately 500 meters. The survey covered an area from the high-water line to an area about 20 meters offshore, and to a water depth of about .7 meters. During the final transect, a few probes were made out to approximately 50 meters from the shoreline to evaluate the bottom or inspect various phenomena observed while conducting

Figure 23 Keystone above a side entrance of St. Philips Church painted “1830.” Using the threshold tool in Adobe Photoshop I discovered that at some point the date was changed. The original date was “1850.”

the shallower transect. The total depth of water reached during these excursions were approximately 1 meter. I was assisted in the survey on the morning of 27 June 2016 by Dr. Georgia Fox from California State University, Chico.

The survey area was littered with basalt cobbles similar to those found at Morris Bay (see Ch. 3). Since the natural geology of the east Willoughby Bay shoreline is limestone, the basalt must have been deposited sometime in the past. It is possible that these cobbles were ships' ballast stones which were discarded along the beach when the area was used as a port, but it is equally possible that the stones were deposited naturally from storm or volcanic activity further out at sea. One of the cobbles was taken for sourcing (SCB-1), but chemical analysis has not been completed as of the time of this writing due to budget constraints.

Several concretions and anomalies were located in the survey area, hinting at more information left to reveal. Additionally, when we were returning to the car after the survey, a prehistoric shell midden was seen through the fence and about 10 meters inside the Crossroads facility property. Associated with this midden mound was what appeared to be a nicely preserved, edge-modified conch shell tool on the surface.

Dr. Fox and I planned to continue the survey to North of the Crossroads facility (survey on Crossroads property was not possible), but the shore was inaccessible from the service road due to topographical restrictions. While the shoreline was not directly surveyed, various ceramic sherds were observed along the service road. The sherds consisted of mostly whiteware, but a flow-ware sherd was collected (SCB-5).

Assuming the method of loading ships at Bridgetown is consistent with the Clark painting (see Ch. 3), I am fairly confident that the survey area covered the main boat ramp where hogsheads of

sugar were loaded onto longboats for transport to anchored ships in the harbour. It is expected that further survey on the north side of the Crossroads facility will reveal a jetty of some sort, as remnants of a sea wall or similar structure has been seen by Dr. Reg Murphy and his spouse in that area during an unusually low tide several years ago (pers comm).

Full survey maps can be seen in Figure 24, Figure 25, and Figure 26, and a catalogue of artifacts collected is in Appendix B.

Figure 24 Location of 2016 survey area.

Figure 25 Map of survey area on upper portion of bay. The crossroads facility can be seen on the right of the image.

Figure 26 Complete map 2016 survey of lower section of Willoughby Bay. The prehistoric shell midden site on the left is located approximately 10 meters inside of the Crossroads facility property and can be seen through the fence.

CHAPTER V

CONCLUSIONS AND FUTURE RESEARCH

Despite the discoveries discussed in this thesis, the story of Bridgetown, Antigua remains largely a mystery. Little remains of the town's legacy other than the 1675 law, a few local legends, and accounts of St. Philip's church at Willoughby Bay. I'm curious if Bridgetown would even be known today if it weren't for the 1675 law. Indeed, one of the only direct, first-person, accounts of the town is reticent to call it a town at all:

> Here, again, I have the task of describing, what is almost a nondescript, for no stranger would ever discover that it was a town unless the fact were pointed out to him. If the man who painted a lion was obliged to write under it, " This is a lion," I am sure the person who huddled the three or four houses together, which constitutes Bridgetown, had need to have put upon a giant-like placard, " This is a town!" unless, indeed, a rather good-looking Methodist chapel, a small mission-house, a stone dwelling-house, with school-room attached, and a few of my four-cornered friends, stuck in here and there, like the dots in a landscape of some country painter, to represent crows, be sufficient to merit for it that lofty title, which Dr. Johnson, or some other lexicographer of equal renown, leads us to suppose signifies "a large collection of houses." (Lanaghan and Flannigan 1844a).

Nevertheless, the project is ongoing. Over the next several archaeological seasons, surveys at Bridgetown and Willoughby Bay will continue and an archaeological map will be completed of the Willoughby Bay harbour. Coastal survey areas will be expanded deeper into the harbour, further toward the mouth of Willoughby Bay, and to the north side of the Crossroads facility. Permission to survey on the Crossroads compound will continue to be sought, but thus far has not been obtained. Additionally, it is hoped that terrestrial surveys to locate areas indicated by Sawyer's maps from the 80s and 90s can occur, depending on seasonal density of the surrounding bush, funding, and time constraints. Future survey areas being considered also include other Trade Towns named in the 1675 legislation. Parham, Falmouth, and Old Road

(Carlisle Road) are likely locations as well as the still-operating harbour of St. John's, once permission is obtained from local port authorities. A search for the lost Bermudian Valley would be nice, but previous surveys in the area indicate success will be unlikely. Ideally, high resolution (sub-meter) LIDAR bathymetric and terrestrial data can be obtained to produce a Digital Elevation Model (DEM) of the entire island and nearby waters. This data can be used with traditional pedestrian and swimming surveys to determine the extent and condition of archaeological material at the various sites. The surrounding bush at Bridgetown needs to be penetrated to determine the extent of the degradation compared to the 1987 survey maps and photos. More samples of the basaltic cobbles at Morris and Willoughby Bays need to be collected for petrographic analysis and sourcing to determine if they are indeed ballast stones or merely an ecofact placed via natural processes. Ideally, the church cemetery at Bridgetown can be located and mapped using GIS (the 1987 survey included transcriptions of the visible tombstones at the cemetery (Sawyer 1987)).

Also, recent personnel and policy changes at the national archive repository on the island have enabled better access for researchers. Study of plantation records, maps, correspondence, and other data located in Antigua's national archives, as well as repositories in London, Bristol, and other major UK ports will undoubtedly reveal more about Antigua's economic history and the lives of those who supported Antigua's worldwide trade system within the British Empire.

Furthermore, the ongoing project will endeavor to explore the extent to which Antigua's port towns influenced British world trade as a whole, including not only the sugar trade in the West Indies, but also the slave trade in Africa and the East Indian spice trade network. Further research in the archives will hopefully reveal population trends and the extent of commerce held in this town between the 1675 law and its abandonment and eventual demise. Additionally, further

research into Admiral Tollemache's holdings on the island may reveal clues about William Clark's position on the island, and how he gained access to Morris Bay.

Additionally, plans for future surveys will incorporate newer technologies to assist in visualization. In addition to GIS and Remote Sensing data, I would like to develop low-cost techniques and equipment for data-gathering. One such device will be the construction of a small ROV equipped with a GPS, two or three cameras for navigation and the creation of photogrammetric models, a "fish-finder" or side-scan sonar, and magnetometry/metal detecting devices. Together, these ROV packages will hopefully reduce the time needed to record the underwater landscape and visualize local bathymetry (and therefore reduce the costs of the research). The planned ROV will likely be based on the OpenROV platform (https://www.openrov.com/) for its budget-friendly components and customizability, but a bespoke, custom, system has not been ruled out at the time of this writing. Likewise, I would like the ROV unit to include a surface unit which utilizes solar power. The Caribbean is nearly always in direct sunlight, and solar power continuously recharging ROV batteries and equipment will eliminate many runtime problems associated with smaller, inexpensive, ROVs relying on local batteries with a limited charge.

Regardless, until the ROV or a similar system is acquired/constructed, photogrammetric bathymetry will be collected of Willoughby Bay using swimming surveys and underwater digital action camera equipment. Video will be taken of the seafloor and stills extracted from the video utilizing Adobe Creative Cloud software. The still photos can then be uploaded to photogrammetry software such as Photoscan to create a 3D model of the sea floor and all visible artifacts or anomalies which may require closer examinations. Ideally and eventually, models can

be added to/created daily to provide up-to-date analysis in the field of areas of concern or significance to minimize the time in the field (and the expense for researchers).

Funding of Future Research

A major opportunity has arisen to assist me in acquiring funding for future research in this larger project. In 2016, UNESCO added Nelson's Dockyard in English Harbour to its World Heritage Site List as the only extant example of a Georgian English shipyard and its historical and military significance in the Early Modern Period Caribbean. While UNESCO doesn't fund projects directly, having a World Heritage Site just minutes away from Willoughby Bay makes the significance of Bridgetown and Antigua ports in general more attenable to potential grantors. Furthermore, the Dockyard was located on Antigua because of the island's strategic location in the Caribbean to protect England's sugar interests (it was located in English Harbour specifically because of the bay's narrow inlet and the protection the location provided both strategically and against natural forces such as hurricanes). Funding sources are currently being sought and applied for.

Implications and Directions of Future Research Goals

As stated in the introduction (Chapter I), the ongoing project will serve as my future dissertation research. One of the major questions yet to be addressed is why Bridgetown and Bermudian Valley disappeared while the other towns remained and, in the case of St. Johns and Parham, even thrived. As an example: Bridgetown and Falmouth would have been very similar. Both were named in the 1675 law, both would have had similar populations during the mid-18th century, both towns were located on large, relatively protected harbours, and were guarded by only a minor outpost (the previously discussed Fort William at Bridgetown and a similarly sized

Fort Charles at Falmouth). Why did Falmouth survive until today while Bridgetown did not? Also, what of Bermudian Valley? Was it simply a trading post or was it a village of similar size to Bridgetown, Falmouth, Old Road, or Parham? What happened to it? Where exactly was it located? Many of these questions will be addressed by future research.

Additionally, after a quarter century of archaeological field schools and research under Dr. Reg Murphy, it is now possible to glean a holistic picture of the island during the historical period. A portion of my future dissertation project will include a summary and synthesis of all previous archaeological work completed on the island and what implications that work has had to our overall knowledge of island commerce, lifeways, demographics, disease, and other cultural phenomena associated with the people who lived, worked, and died here.

Concluding Remarks

Much about Bridgetown remains a mystery. How busy was the port at the height of its use as a trade town? How long were the towns in the 1675 law actually used as trade towns? Did anything ever ship directly from Bridgetown, or was St. John's always the ultimate port of Departure? Hopefully the archaeological and archival records can shed some light on answers to these questions in order to recreate the economic and cultural landscape of this island and its strategic and influential place in the globalized sugar economy of the Early Modern Period.

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APPENDIX A

ANALYSIS OF BRIDGETOWN PIPE STEMS LOCATED IN THE MUSEUM OF ANTIGUA AND BARBUDA COLLECTIONS

Stem #	Inscription	Photo #'s (Folder 103_628)	Measurements (cm) L x Ext dia @ each end			Bore	Date Range	Comments	x/64
1	"Glasgo"	19-22	5.8	1	0.9	1/16	1750-1800		4
2		23-26	3	1.1	0.9	1/16	1750-1800		4
3		27-31	2.7	1.2	1.2	3/32	1680-1720		6
4		32-36	4.8	1.6	0.9	1/16	1750-1800		4
5		37-42	3.5	0.9	1	5/64	1720-1750		5
6		43-49	4.7	0.9	1	5/64	1720-1750		5
7		50-57	3.2	0.9	1.3	1/16	1750-1800		4
8		58-62	4.8	0.9	0.6	7/64	1650-1680		7
9		63-66	4.3	1	0.8	1/16	1750-1800		4
10		67-71	6.2	1.3	0.7	1/16	1750-1800		4
11		72-75	2.7	0.6	0.6	1/16	1750-1800		4
12		76-79	2.3	0.8	0.8	1/16	1750-1800		4
13		80-84	2.4	0.6	0.5	5/64	1720-1750		5
14		85-88	3.3	0.8	0.7	1/16	1750-1800		4
15	"1776"	89-92 and 271	4.8	1	0.7	1/16	1750-1800		4
16		93-96	2.3	0.8	0.8	3/32	1680-1720		6
17		97-101	1.8	0.6	0.7	1/16	1750-1800		4
18		102-105	2	0.6	0.6	1/16	1750-1800		4
19		106-109	3.3	1	0.8	5/64	1720-1750		5
20		110-113	3.4	1	0.9	1/16	1750-1800		4
21		114-117	3.2	0.9	0.8	1/16	1750-1800		4
22		118-121	3.3	0.6	0.6	5/64	1720-1750		5
23		122-125	2.4	0.9	0.9	1/16	1750-1800		4
24		126-129	4.8	0.9	0.8	7/64	1650-1680		7
25	"Glasgo"	130-133	7.3	0.9	0.8	1/16	1750-1800		4

Stem #	Inscription	Photo #'s (Folder 103_628)	Measurements (cm) L x Ext dia @ each end			Bore	Date Range	Comments	x/64
26		134-137 and 272	3.8	0.8	0.7	<4/64		Less than 4/64 (late)	
27		138-141	2	0.7	0.6	1/16	1750-1800		4
28		142-145	3.5	0.7	0.6	5/64	1720-1750		5
29		146-149	2.9	0.8	0.6	1/16	1750-1800		4
30		450-153	2.3	0.8	0.8	1/16	1750-1800		4
31		154-157	1.8	0.9	0.9	5/64	1720-1750		5
32		158-161	3.6	1.6	1	1/16	1750-1800		4
33		162-165	5.1	0.8	0.8	5/64	1720-1750		5
34		166-169	3.3	0.7	0.6	1/16	1750-1800		4
35		170-173	2.7	0.8	0.6	7/64	1650-1680		7
36		174-177	4.1	1.1	0.9	1/16	1750-1800		4
37		178-183	2.9	1.5	1	5/64	1720-1750		5
38		184-189	3.6	0.8	0.7	5/64	1720-1750		5
39		190-193	3.7	0.7	0.7	5/64	1720-1750		5
40		194-197	2.7	0.6	0.5	3/32	1680-1720		6
41		198-201	3.8	1.8	0.9	1/16	1750-1800		4
42		202-206	1.5	0.7	0.7	3/32	1680-1720		6
43		207-210	1.8	0.7	0.7	1/16	1750-1800		4
44		211-215	2.9	0.8	0.7	1/16	1750-1800		4
45		216-221	3.2	0.9	0.8	1/16	1750-1800		4
46		222-226	4	0.9	0.9	7/64	1650-1680		7
47		227-230	3.1	1.3	0.9	5/64	1720-1750		5
48		231-235	3.5	0.6	0.6	1/16	1750-1800		4
49		236-240	2.8	0.8	0.8	5/64	1720-1750		5
50		241-244	3.1	1	0.9	1/16	1750-1800		4
51		245-249	1.6	0.7	0.6	7/64	1650-1680		7
52		250-255	1.9	0.7	0.7	5/64	1720-1750		5
53		256-262	2.8	1	0.9	1/16	1750-1800		4

Stem #	Inscription	Photo #'s (Folder 103_628)	Measurements (cm) L x Ext dia @ each end			Bore	Date Range	Comments	x/64
54		263-270	2	1	0.9	1/8		Fragment, unmeasurable	

mean 4.71

Binford Regression 1751.59

$$Y = 1931.85 - 38.26(4.71)$$


STEM # 01
BORE: 4/64


STEM # 02
BORE: 4/64


STEM# 03
BORE: 6/64


Stem # 4
Bore: 4/64


Stem # 05
Bore: 5/64


Stem # 06
Bore: 5/64


STEM # 07
BORE: 4/64


STEM # 08
BORE: 7/64


STEM # 09
BORE: 4/64


Stem # 10
Bore: 4/64


Stem # 11
Bore: 4/64


Stem # 12
Bore: 4/64

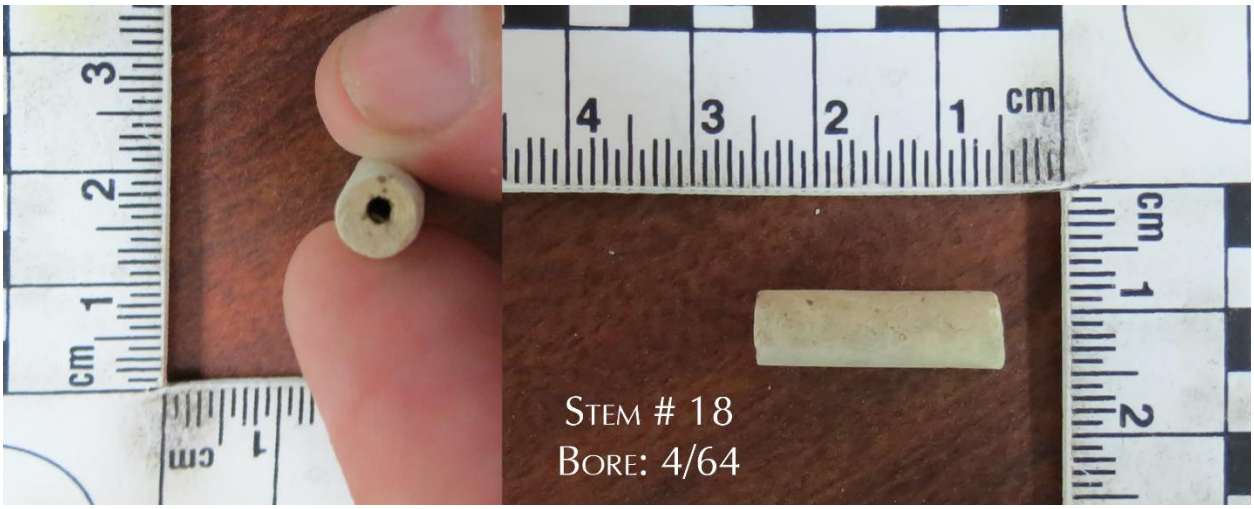

Stem # 13
Bore: 5/64


Stem # 14
Bore: 4/64

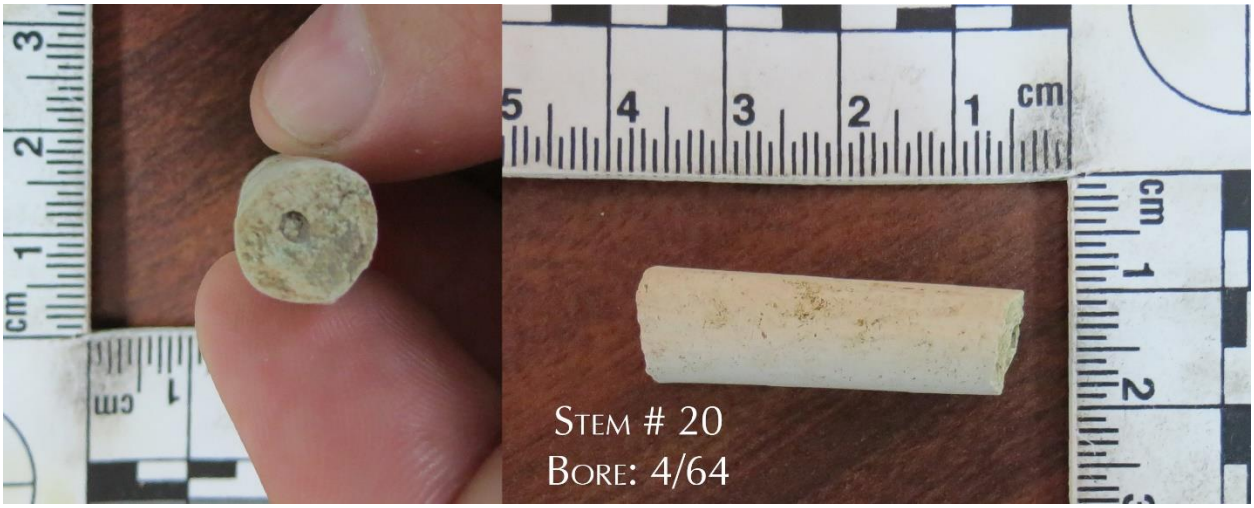

Stem # 15
Bore: 4/64


STEM # 16
BORE: 6/64


STEM # 17
BORE: 4/64


STEM # 18
BORE: 4/64


STEM # 19
BORE: 5/64


STEM # 20
BORE: 4/64


STEM # 21
BORE: 4/64


Stem # 22
Bore: 5/64


Stem # 23
Bore: 4/64


Stem # 24
Bore: 7/64


STEM # 25
BORE: 4/64


STEM # 26
BORE: < 4/64


STEM # 27
BORE: 4/64


STEM # 28
BORE: 5/64


STEM # 29
BORE: 4/64


STEM # 30
BORE: 4/64


STEM # 31
BORE: 5/64


STEM # 32
BORE: 4/64


STEM # 33
BORE: 5/64


STEM # 34
BORE: 4/64


STEM # 35
BORE: 7/64


STEM # 36
BORE: 4/64


STEM # 37
BORE: 5/64


STEM # 38
BORE: 5/64


STEM # 39
BORE: 5/64


STEM # 40
BORE: 6/64


STEM # 41
BORE: 4/64


STEM # 42
BORE: 6/64


Stem # 43
Bore: 4/64


Stem # 44
Bore: 4/64


Stem # 45
Bore: 4/64


STEM # 46
BORE: 7/64


STEM # 47
BORE: 5/64


STEM # 48
BORE: 4/64


Stem # 49
Bore: 5/64


Stem # 50
Bore: 4/64


Stem # 51
Bore: 7/64


STEM # 52
BORE: 5/64


STEM # 53
BORE: 4/64


STEM # 54
BORE: ?

APPENDIX B

ARTIFACT CATALOGUE AND PHOTOGRAPHS

No.	Artifact Number	Date Collected	Site	Description-General	GPS Used	GPS Datum	GPS-Northing	GPS-Easting	Photograph Numbers
1	**SC-B-01**	17-Jun-2016	Bridgetown	Surface Collection - Basalt Cobble/Possible Ballast Stone	Garmin Oregon 650t	WGS-1984	18.84172	63.5803	104_629: 1-9
2	**SC-B-02**	17-Jun-2016	Bridgetown	Surface Collection - Sugar Pot fragment	Garmin Oregon 650t	WGS-1984	18.84174	63.5803	104_629: 10-17
3	**SC-B-03**	17-Jun-2016	Bridgetown	Surface Collection - Salt Glazed Stoneware	Garmin Oregon 650t	WGS-1984	18.84178	63.5802	104_629: 18-26
4	**SC-B-04**	27-Jun-2016	Bridgetown	Surface Collection - Coarse Earthenware/ sugar pot	none	none	none	none	104_629: 27-34
5	**SC-B-05**	27-Jun-2016	Bridgetown	Surface Collection - Flow-ware from North of Crossroads service road	Garmin Oregon 650t	WGS-1984	18.84459	63.5444	104_629: 42-49
6									
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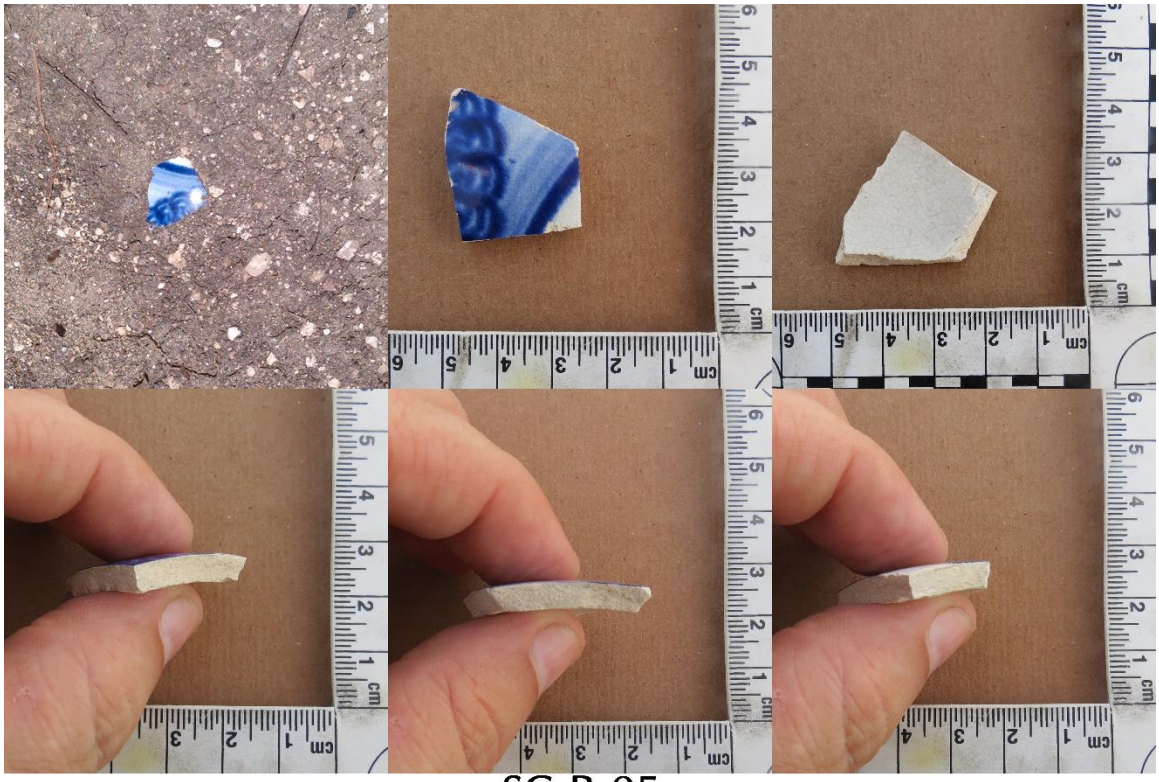
18									
19									

SC-B-01

SC-B-02

SC-B-03

SC-B-04



SC-B-05