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The Forgotten Stone: A History and Analysis of Bermuda Stone in Charleston, South Carolina

Justin M. Schwebler
Clemson University

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THE FORGOTTEN STONE: A HISTORY AND ANALYSIS OF BERMUDA STONE IN CHARLESTON, SOUTH CAROLINA.

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
Historic Preservation

by
Justin M. Schwebler
May 2015

Accepted by:
Amalia Leifeste, Committee Chair
R. Grant Gilmore III, PhD
Katherine Saunders Pemberton
Richard Marks
Throughout the historic streets of Charleston, South Carolina there is a forgotten and overlooked stone. It is in the narrow gaps between houses, along carriageway walls, underfoot on garden paths, and in foundations of many historic buildings. The forgotten stone of Charleston is Bermuda stone. This thesis provides the history of Bermuda stone in Charleston, South Carolina. This history was written answering the following research questions. How and why was Bermuda stone imported to Charleston? Who were the people bringing Bermuda stone to Charleston and who were the people using it as a building material? When was the period of significance for Bermuda stone importation to Charleston? What are the different uses for Bermuda stone in Charleston, and can a relative value be placed on Bermuda stone as compared to other building materials in the way it was used? What are the basic material properties for Bermuda stone that allow it to be identified in the field?

An introduction informs the reader about the material properties of Bermuda stone. These properties were identified by comparison of known Bermuda stone samples from Bermuda to samples of the stone found throughout Charleston. Detailed photography, material definitions, and locations of Bermuda stone in Charleston serve as the field identification guide for future researchers.

The aforementioned research questions were answered through exhaustive research in Charleston’s libraries and archives. This information was used to construct the
history of Bermuda stone in Charleston. The results of this research and material study indicate that Bermuda stone was first used in Charleston by Bermudian immigrants and traders in the late 17th and early 18th centuries and it was imported in great numbers throughout the 18th century. By the 19th century, changing economic ties between Charleston and Bermuda, as well as cheaper locally sourced material like lumber and brick made the importation of Bermuda stone obsolete. Bermuda stone has a long and important history in Charleston. It merits further research and conservation of this material.
DEDICATION

For those who have gone before me.

Quo Fata Ferunt.
ACKNOWLEDGMENTS

It is impossible for me to overstate my deep gratitude for the many people who have helped me throughout the long process of completing this thesis. I must first begin with my Advisory Committee. The Chairwoman of my committee, Amalia Leifeste, you were an unrelenting source of feedback, ideas, and inspiration to keep writing. I could not have done it without your leadership and guidance. Katherine Pemberton, your knowledge and interest in Bermuda stone is what led me to write this thesis. You introduced me to this unique and fascinating material that has such a vibrant history in Charleston. I couldn’t have written this thesis without your tireless help and support. Grant Gilmore, your expertise on all things Bermuda and St. Eustatius gave me unprecedented insight and resources on Caribbean history. Your willingness to brainstorm, edit, and push for publication were crucial in my completion of this work. Richard Marks, your unrivaled knowledge of Charleston’s built environment was instrumental in helping me not only find Bermuda stone in the city, but to also understand its greater cultural and historical context.

I must also thank the numerous individuals who were so willing to share their own work and experience with me. Jim Ward, your geological expertise and familiarity with Bermuda was invaluable when interpreting Bermuda stone’s presence in Charleston and how it compared to other materials throughout the city. David Hoffman, your immense knowledge of historic building materials and list of Bermuda stone sites in Charleston was
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Respectfully Submitted,

Justin Schwebler
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CHAPTER ONE
THE INTRODUCTION TO BERMUDA STONE

In the summer of 1771 a Bermudian sloop set sail from Salt Cay, a small island in the Turks chain of the Caribbean. The hot sun beat down on the decks as the sloop began to pick up speed with the breeze. The fore and aft masts were raked to the stern, allowing the triangular sails to fill and tack upwind. The holds were full with barrels of salt harvested from the island, salt that was in high demand on the mainland Colonies of North America. The sloop turned northwest towards South Carolina. In Charles Town the salt would fetch a good price, but it wasn’t only the salt that would be for sale when the sloop reached the wharfs in Charles Town harbor. The heavy stone in the bottom of the sloop was also a major economic resource for these Bermudian traders. This resource was blocks of cut Bermuda stone.

This was a fictionalized account of the type of trade that was occurring between Charleston, South Carolina and the Islands of Bermuda in the 18th century and the value of the goods that these ships carried. The Bermuda stone in the ships holds served not only as ballast to keep the ship steady while sailing, but it was also a profitable commodity in colonial markets as a building material. The stone was ballast on the ships while their enterprising masters sailed to the Turks and Caicos Islands for collecting salt, the Bermudian’s primary trade good. The Atlantic world of the colonial period was a bustling time for maritime trade. Thousands of ships came and went from North American ports
every day. They were bound for ports all along the North American coast in cities like New York, Boston, Norfolk, and Charleston. They also serviced Caribbean island chains, and to the colonial Empires of Europe, especially Great Britain. This period of maritime trade was fueled by the transportation and sale of goods necessary for colonial settlement and expansion. This included human cargo for slavery, timber, salt, mercantile goods, tools, building materials, fabrics, food, alcohol, and much more. This thesis focuses on one of the materials of that trade network, Bermuda stone, and on a specific avenue of the vast trade networks in the colonial era, the trade between Bermuda and Charleston. Bermuda stone is a soft limestone that makes up the islands of Bermuda. It was used to construct buildings, stabilize trading ships as ballast, and as a valuable commodity at markets in Charleston.

The period of time that is covered by this thesis ranges from the middle 17th century with the settlement of Bermuda by the British Empire and stretches into the present day, studying the Bermuda stone that still exists in the buildings, gardens, and courtyards of Charleston. The historical narrative that follows focuses on the period of importation for Bermuda stone. As covered later in this thesis Bermuda stone was first brought to Charleston in the late 17th century when the city was founded as Charles Town by the English. This period of importation continued until the early 19th century as wars, changes in trade relations, politics, and preferences in building materials all took their toll on the value, availability, and use of Bermuda stone in Charleston.
The story of Bermuda stone and its use throughout the city of Charleston is closely tied to the colonial history of the city. Charleston was the dominant city and port in the southern colonies of North America. The city’s early economy was supported by a vast array of materials, people, and cultures that all drove the development of the early settlement. Due to its proximity to Spanish Florida, imperial political tension drove the economic development of the Charleston to establish it as a permanent fixture on the landscape of North America for Great Britain. The growing city that emerged in the 18th century, fueled by maritime trade and a booming agrarian plantation economy, had a direct influence on the importation of Bermuda stone by Bermudian and Charlestonian maritime traders. Names that are prominent in Charleston to this day like Tucker, Gibbes, and Savage are a few decedents of the Bermudian merchants whose ambition supported economic success.

The story of the Bermuda stone mirrors the ebbs and flows of Charleston and Bermudian history, and how the growing colonial economy spurred on ever larger trade relationships between Charleston and Bermuda. It reflects how natural disasters altered the ability of merchants to sustain themselves through economic struggles. It especially shows how wars like the American Revolution and the War of 1812 had a significant impact not only on the political environment of the Atlantic world, but also on the trade networks that supported it. This historical narrative is completed in this thesis within the following chapters. It ties together the presence of Bermuda stone in Charleston today with the historic documents on Charleston’s colonial era, scholarly studies on the Atlantic
trade networks, and the study of Bermuda stone as a building material and an economic commodity.

The reasoning behind this thesis is simple. There has never been a comprehensive study on Bermuda stone and its presence in the city of Charleston, South Carolina. When studying the historic architecture of Charleston, Bermuda stone is typically mentioned only as a small note in the description of a building as a construction material. While walking the city streets today, the material has a noticeable presence throughout the historic districts. There was never a sufficient answer or scholarly work that explained how and why the stone had come to be nearly 1,000 miles from its source. The Bermuda stone seemed out of place because of its name and material form; yet due to its regular appearance in fine houses and gardens throughout the city, it was clear that the stone belonged here and gave insight to a rich and diverse history. This thesis is the recovery of that history and is intended to find and record known locations, identify Bermuda stone relative to other materials, explain why Bermuda stone is in Charleston, and make clear the presence of Bermuda stone in Charleston including its initial introduction, the most significant period of importation, and the materials sudden decline.

Though physically present, a more profound understanding of what Bermuda stone reveals about the history of Charleston and colonial South Carolina is not part of the current building culture or historical record. It was imported and used in Charleston with great frequency from the late 17th century until the early 19th century when the trade essentially died out. Many of the houses, merchant buildings, and municipal structures in
Bermuda are made of this native stone and as a maritime society Bermudians brought their stone where they traded. As a local material for the Bermudians, the stone was a readily available item that is still used in Bermuda to this day. The Bermuda stone that still remains in Charleston, South Carolina is a physical manifestation of the vital trade relationship that these two groups of people once shared.

Part of the reason this stone has been forgotten is that most people in the Lowcountry do not know what it is, where it came from, or its level of significance to Charleston’s built heritage. There is no document or exhaustive study that chronicles the material and it is not currently used in Charleston, therefore there is not a pragmatic knowledge of the stone. This is in contrast to more traditional building materials that have been thoroughly documented and studied throughout Charleston. The city is well known for the quality of its historic architecture and its other historic masonry buildings made of brick and stucco. There has been a significant amount of research on these common materials and the craftsmanship that gives Charleston its character.

It is vital for the preservation and construction communities to know and understand the material and then to educate the public whenever possible so that when Bermuda stone is encountered efforts are made to preserve this unique and important aspect of Charleston’s rich heritage. Part of this education is knowing what the stone is, where it comes from, and how to identify it, as well as the role it played in the city. Bermuda stone’s significance is derived from its architectural qualities as a durable and prized building material throughout Charleston’s early history and also its properties as
an imported stone. Further significance comes from what the material can teach us about craftsmanship and larger patterns in Charleston’s historic built environment.

The historic preservation community in Charleston has a long and proud history. Being one of the first cities in the United States to adopt a preservation ordinance to control development in a historic district as a means to protect its architectural heritage, Charleston is a perfect place to shed light on one of its own unique historic building materials. Tourism and greater quality of life are driven by the character of the historic districts on the Charleston peninsula. Much is known about the urban fabric of the early city, including the typological form of Charleston’s architecture such as the Charleston single house. These local building forms, the craftsmanship that went into them, the materials and how they were made (bricks being made from local clay) are all increasingly understood with time, but this is not yet true with Bermuda stone. Even though Bermuda stone has a notable presence throughout the city it is still critical that the stone is recognized by the Charleston preservation community and especially the public.

The story of Bermuda stone contained in this thesis provides a striking narrative on how a simple construction material can change and reflect the history of a community and alter the field of study for historic building materials. The narrative of Bermuda stone in Charleston is no different. The material has a long and varied history throughout Charleston that is tied directly into the social, economic, and political environments that shaped the city that exists today. It is of the upmost importance that the preservation community and the Charleston public recognize Bermuda stone’s importance as a historic
building material, its importance in telling part of the economic and political history of the city, and its importance as a durable, valuable, and increasingly rare material in Charleston’s historic architectural environment.

Charleston’s built environment has a diverse list of different building materials that were used to construct the historic architecture that exists today like brick, timber, tabby, slate, stone, stucco, plaster, terra cotta, and many others. The architectural styles in Charleston range from all throughout its history. Post-medieval, Georgian, Federal, Classic Revival and many others are represented in the architecture of Charleston. Bermuda stone’s use is only represented in the first three of these styles as they are the earliest building forms in the city. The vernacular architecture of Charleston evolved to best suit the colonial inhabitants in respect to the warm coastal climate. The Charleston single house is the most notable example vernacular architecture in the city, but there are many different forms of colonial architecture represented in tenement buildings, warehouses, businesses, municipal buildings, and churches.

Bermuda stone is an important example of this vast built heritage but is far from being one of the most common materials. Brick or wood frame construction are the two most common types of building styles in Charleston. This is partially due to the geography of the South Carolina Lowcountry. The clay-rich soils around Charleston Harbor were perfect for brick making. There were also ample amounts of swamp Cyprus and pine to use as timber. There are no significant quantities of local limestone or sandstone in the immediate area around Charleston but lime-based materials like oyster shells were used
to make mortar and plaster. Lime was also used to make tabby, an early form of cementitious material that was made from lime, oyster shells, and sand compacted to build walls and floors. With no easily accessible local building stone, Charlestonians were forced to import Bermuda stone when not using local construction materials like bricks.

Bermuda stone use, be it in house construction, or in garden walls and courtyards, represents a small fraction of the overall historic built environment. The availability, ease of construction, cost of construction, and architectural preferences were all major factors that favored locally sourced materials like brick and timber for most of Charleston’s historic buildings. Local materials in Charleston were cheap due to availability and lack of transportation costs. Labor was exceptionally cheap due to human slavery that drove most of Charleston’s colonial economy. Imported materials, tools, and craftsmanship knowledge, did play an important role in the development of the city. However, the imported skills, tools, and materials were all part of the development of Charleston’s built environment and the ever present tradition of using buildings and houses as status symbols. This gives Bermuda stone a level of significance not only to the current sites in Charleston, but also to the people who built them in the past. It means that the people who used Bermuda stone were showing that they had the ability to import and use the stone instead of only relying on local materials.

Bermuda stone is one of many imported building commodities that came into Charleston throughout its historic development. Slate, Portland stone, Bristol stone, Bath stone, Purbeck stone, Brownstone, Granite, and Marble are only a few of the popular
building materials that were imported to Charleston.\textsuperscript{1} More materials became available as modes of importation improved from sailing ships to railroad locomotives. These different types of stone came from all over the colonial world and Charlestonians only had access to these materials due to the city’s port. Brownstone and Bluestone typically came from the northern colonies in North America. British limestone like Portland stone, Bristol stone, and Bath stone were regular commodities on ships bound for Charleston from ports like London and Bristol.\textsuperscript{2}

Portland stone is used on a number of Charleston’s finest colonial era buildings such as the Miles Brewton House, The Exchange Building, and Drayton Hall. Bristol stone also appears in the center walkway of the Porter’s Lodge at the College of Charleston. Though sometimes wrongly attributed as Bermuda stone, British limestone is much more dense and consolidated than Bermuda stone which makes distinguishing between the two very easy with some study. A guide on how to identify Bermuda stone is covered in greater depth in the geology section of this chapter.

\textsuperscript{2} The South Carolina Gazette. \textit{Imported in the snow Carolina, William Fituberbert, Master}. July 20, 1765.
All of these materials were imported to Charleston throughout the colonial era and all appear in the city today. With locally produced bricks and timber making up the majority of whole building construction in Charleston, Bermuda stone is one of the only imported materials that was used to construct entire buildings instead of only being used as an architectural detail in features like mantels or lintels. Imported materials were typically far too expensive to be used in whole building construction, making Bermuda stone a unique material.
The different Bermuda stone buildings throughout Charleston that have been identified to date are described in greater detail in Chapter 2. They comprise a wide array of architectural styles and building forms and are a crucial aspect of the historical ties between Charleston and Bermuda. The first examples of Bermuda stone houses in Charleston that date to the early 18th century reflect architectural styles like gambrel and hipped roofs that were common at that time. By the end of the 18th century Bermuda stone was being incorporated into finer houses which had Georgian and Federal styles. The use of Bermuda stone in these historic buildings throughout the city is covered in Chapter 2.

The Geological History of Bermuda Stone

To begin the study of Bermuda stone it is crucial to form an understanding of the limestone’s makeup and form. This starts with an education in the geologic processes that formed the stone over many eons. Bermuda stone is a soft calcium rich limestone that has been quarried from the limestone deposits on the Bermudian Islands for hundreds of years. Bermuda stone and the native Bermuda Cedar (*Juniperus bermudiana*) were the two main construction materials for buildings on the islands. There are two primary types of limestone deposits on the islands of Bermuda. There are Marine Deposit Limestone layers and Aeolian Deposit Limestone layers. These layers of limestone were created

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throughout the Pleistocene Epoch around 2.5 million years ago to roughly 11 thousand years ago. Geological processes that made each of these stone types are still occurring today.⁴

The Bermudian Sea Mount was created by an extinct volcano millions of years ago. This volcano was formed by a hotspot of magma in the Earth’s crust far below the ocean surface. With each subsequent eruption the underwater mountain grew, eventually creating the shallow sea plateau that the Bermudian Islands now sit atop. The force of winds and tides wore the volcanic rock down into a broad shallow platform which provided an ideal environment for the formation of coral reefs. This vibrant ecosystem harbored marine life that formed the calcium rich deposits of fossils. These fossil beds formed the foundations of the Bermudian Islands that exist today.

Throughout the Pleistocene Epoch periods of glaciation or ice ages occurred every
ten-thousand to twenty-thousand years. These periods of glaciation caused sea levels to

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rise and fall around the world. When sea levels were high during warm periods marine life forms like clams, corals, and protozoans lived and died in the shallow waters around the islands of Bermuda, leaving behind their calcium rich shells. Over thousands of years these deposits created massive mounds of underwater soils. When seas levels dropped during ice ages, these deposits were exposed to the sun and air which hardened the deposits into one of the forms of limestone we see today, the shell and micro fossil filled Marine Deposit Limestone. This type is easily identifiable by its shell fragment inclusions and greater relative density.⁶

Figure 3: A sample of Marine Deposit Bermuda Stone from 32 Legare St Charleston, SC. Photo taken by the author.

⁶ Chandler. Geology, 5.
During this period wind and wave erosion broke down the top layers of these stone deposits, turning them into a calcium rich fine sand. This sand was blown into dunes on the island. Over many thousands of years mildly acidic fell onto the dunes and a chemical reaction occurred, changing the fine sand dunes into a self-cemented dune of limestone. This type is known as Aeolian (wind-blown) Deposit Limestone. This form of Bermuda stone can be identified by its lighter density and the fine granular makeup of the stone with little to no shell fragment inclusions.\footnote{Chandler. *Geology*, 5-7.}

![Figure 4: A sample of Aeolian Deposit Bermuda Stone from the Public Works Quarry in Bermuda. Photo taken by the author.](image)

These two different forms of stone on Bermuda are made of the same material, and are simply layers of geologic processes that took place over many hundreds of
thousands of years. As sea levels rose and fell these layers where built up upon each
other, slowly creating the Bermudian Islands we see today. These layers of deposits can
still be seen in the quarries of Bermuda and in the stone samples here in Charleston.

Bermuda Stone Varieties and Identification

Knowing that there is variation in the stone that comes from Bermuda allows an
observer to identify the material much more readily. The Marine Deposit Limestone is
relatively dense as it is the natural accumulation of sedimentary layers of marine life
forms. Once the layers were exposed to the air it hardened into a dense shell and micro
fossil filled limestone. Its color is typically almost white to a light buttermilk when freshly
cut or scored. On a Munsell Soil Color Chart these colors range from White N 9.5/ through
10 YR 9/2. The shells and fossils within the stone are fine and heavily worn or broken
making species identification very difficult. A paleontologist or an expert in Pleistocene
protozoan fossils may be able to identify different species.\(^8\)

The Aeolian limestone is nearly white. On a Munsell Chart it ranges from N 9.5/
through 10YR 9.5/1. The stone can change color substantially as it is exposed to the
elements. After long periods of exposure the surface of the stone can turn shades of grey.
These colors vary from a Munsell N/8 to a GLEY 1 7/N. Its composition is slightly different
that the marine limestone however. This stone is made of very fine grained lime rich sands

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that have calcified into a solid stone mass. There are often small holes and channels through these layers of stone. These tunnel formations could be from uneven cementation and erosion of the material as it was becoming stone. The tunnels are also the remnants of root pathways from plant growth when the stone was still in a sand dune formation. Aeolian stone is the most common type found throughout Bermuda and also in Charleston’s buildings. In Charleston Aeolian stone is most often seen in building and wall construction, while Marine Deposit stone is typically seen as paving. When Aeolian stone is left exposed it weathers quite significantly which is why it was most likely used in buildings and covered in stucco or a wash. The Marine Deposit stone is very dense and durable which is why it was used for a paving material that required little maintenance. In most cases the research and identification of Bermuda stone in Charleston found that the stone of both types was in good condition. When used properly Bermuda stone is a very durable material and should be preserved whenever encountered.

Quarrying of Bermuda Stone

During the Pleistocene Epoch these different layers of limestone were formed in subsequent layers that built up across the Bermudian Sea Mount. These many layers are still visible today on the surface of the islands and have been the source for Bermuda stone throughout the island’s history. The stone has been quarried from the earliest periods of settlement by the English in the 17th century, and the practice continues to this
day. Each quarry on Bermuda has a unique quality and formation within the stone according to its placement within the geologic processes that formed the islands. Some of these periods of deposits are shown on the following image according to their relative age and location on the islands today.

![Diagram 15: Simplified Geological Map](image)

*Figure 5: This geological map produced by the Bermudian government shows the different limestone formations of Bermuda above sea level.*

When English settlers first began to colonize the Bermudian islands in the 17th century they found that the native stone could be easily cut and shaped with hand tools.

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Two-man hand saws, mauls, chisels, feathers and wedges were the tools of choice for the Bermudian quarrymen. Today the stone is most often cut with large gas powered circular stone saws. After quarrying the stone and the blocks had been cut and shaped they were set aside to cure in the hot Bermudian sun for two to three years. During this time the soft and saturated stones dried out as the lime and calcium hardened into a strong and durable masonry material. The stones were typically cut into two different shapes. The first were the masonry units. These larger rectangular blocks were cut into roughly 30cm (12in) long sections, 20-22cm (8-9in) wide and 12-15cm (5-6in) thick. These large blocks were used throughout Bermuda and Charleston as building stones in foundations and load bearing walls. The second common shape is a thin roofing shingle. The roofing shingles were cut thin, only 2-4cm (1in) thick and roughly 20cm (8in) long and 15cm (6in) wide.

On the islands of Bermuda these shingles were most often used to create a stepped hipped roof. There is no evidence that these roof shingles were ever imported to Charleston as a roofing material. It is probable that the thin shingles were too fragile to be transported in pre-cut form from Bermuda to Charleston on the ships. This could be a reason behind the appearance of pavers in Charleston. The pavers have a similar dimension in length and width but are much thicker than shingle stone. Perhaps these pavers were cut thicker on Bermuda in order for them to survive transportation and to later be cut in Charleston into shingles. This is mere speculation, but there is no documentation or evidence that a Bermudian style roof was ever used in Charleston,
though there are likely thousands of paver sized blocks throughout the city. With the many different forms of Bermuda stone pavers found throughout the city they are roughly 20-30cm square and 4-6cm thick. Most of these pavers are cut from the very dense and durable Marine Deposit limestone on Bermuda.

![Diagram of Bermuda stone blocks](image)

*Figure 7: A simplified diagram of the typical Bermuda stone blocks found throughout Bermuda and Charleston. Sketched by the author.*

Bermuda Stone Literature Review

Bermuda stone itself is one of the few remaining links of the trade relationship between Bermuda and Charleston. In Charleston the stone appears in walls, gardens, pathways, and foundations. In total Bermuda stone has so far been found in 10 buildings, 4 walls, and 5 courtyards or driveways. These are what remains of the thousands of blocks that were brought in each year by Bermudian traders. With a material that has such a massive presence in Charleston’s early history and one that still has a visible existence in
the city today one would expect that there would be a number of publications on the history and use of the material. The story of this material and how it was brought here has mostly been lost, until now. It is likely that most of the Bermuda stone in Charleston exists undiscovered in foundations, stucco covered walls, or underground in gardens and courtyards. Contemporary scholarship has largely over-looked Bermuda stone in Charleston.

Because of the limited number of academic sources on Bermuda stone as a material in Charleston, several other research avenues must be explored in order to fully understand the story of Charleston’s Bermuda stone. This includes the Atlantic trade relationships between Charleston and Bermuda. The history of trade relations between the two is crucial in understanding the way in which Bermuda stone was imported to Charleston, and its level of significance as a commercial material within the trade network.

The first mention of Bermuda stone in Charleston in a scholarly work comes from *The Dwelling Houses of Charleston, South Carolina* in 1917 by Daniel Elliot Huger Smith which references the material several times.\(^\text{11}\) Smith’s first reference comes while discussing early attempts at the construction of a sea wall from White Point to Vanderhorst Creek. Smith says that in the Acts of Assembly from March 25, 1738 the city passed a law to construct a wall with a Bermuda stone foundation below the water line.

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and finished with a brick wall above. A strong sea wall was necessary in Charleston to protect the city from hurricanes. These sea walls were also used as fortifications in the 18th century in order to defend the colony from potential attacks by the French and Spanish.

Bermuda stone is perfectly suited for this application due to its high compressive strength and durability. It is unclear if Bermuda stone was actually used in the 1738 sea wall, but an archaeological dig in January of 2015 found Bermuda stone used in the construction of a 1769 sea wall. This excavation is described in greater detail in Chapter 2. Smith declares that later study has largely ignored this era due to the massive construction projects that bolstered the sea walls in the middle of the 19th century. This first reference to Bermuda stone in Smith’s work gives a foothold from which to conduct further study.

Smith again references Bermuda stone when he talks about a property known as the “Wadboo Barony” along the Cooper River. In this section he uses a quotation from a Geology report conducted in 1848 by Michael Tuomey. At Wadboo Barony a small building’s ruins were analyzed by Tuomey and found to have a stone material that was similar to the “ordinary compact granular and yellowish marl, found in numerous places on the river.” Smith then talks about this material as it were a Bermuda stone. This brings up a major question for this thesis. Was the stone so often seen and used throughout

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Charleston quarried locally as referenced by Smith and Tuomey and given the label of Bermuda stone? The subsequent research presented in this thesis definitively answers that no, though there may have been locally sourced limestone in colonial South Carolina, the material that has been identified throughout the city to this date is easily recognizable as Bermuda stone. As one becomes more familiar with the stone based on the geology provided, and the included photo glossary, it becomes much easier to identify the various forms of stone used throughout Charleston. The local marlstone along the Ashley and Cooper Rivers has a much darker color, an extremely fine silt grain, and has small inclusions within the material.
Figure 8: A fragment of Cooper River Marlstone. The aggregate is extremely fine and a darker color than Bermuda stone.

Figure 9: A fragment of Bermuda stone from the foundation of McLeod Plantation. Notice the distinctive grain size and color difference to the marlstone above.

Interestingly, Smith believed that there is no difference between Bermuda stone and the notable coquina stone from St. Augustine, Florida. The coquina of Florida is a famous marine deposit limestone that was formed in a very similar process to the limestone of Bermuda. The stone was used as a primary building material throughout the Spanish colonial period in Florida.\(^ {13}\) Coquina is very different from Bermuda stone.

however in that is has an extremely high amount of shell fragments in the substrate. These shells are from the Coquina Clam (*Donax variabilis*) which gives the stone its name.

![Image of a typical Florida coquina](image1)

*Figure 10: An image of a typical Florida coquina. Notice the significant amount of coquina clamshells in the blocks. Image courtesy of the Florida Public Archaeology Network.*

![Image of a sample of an Aeolian Bermuda stone block](image2)

*Figure 11: A sample of an Aeolian Bermuda stone block. Though the coquina and Bermuda stone are formed and quarried in similar ways, the two are very different in color and aggregate composition.*

The questions raised by the earliest sources of Tuomey and Smith force a greater look at the material similarities between St. Augustine’s Coquina stone and Charleston’s Bermuda stone. In 2000, the Bureau of Historic Preservation in Florida hosted a symposium on the preservation of Coquina Stone throughout the Southeast Coast.  

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entire symposium study is filled with references to Coquina and its material properties which are valuable as a source for this thesis when trying to understand marine limestone such as ways to best preserve the materials, how to sustainably source new stone, and educating the public on these increasingly rare historic building materials. The most important reference from this symposium is in the article by John Mintz. Titled “Coquinas of North Carolina: A Preliminary Assessment.” The title alone is an interesting note for the study of Bermuda stone and its material similarity to the native stone sources on America’s coastlines. The article begins with “Coquina, also known locally as marl or shell rock is a medium to very coarsely grained fossiliferous sand to arenaceous fossiliferous limestone composed of broken shells, corals, and other organic debris.” This sentence ties in to what Smith and Tuomey referenced as Bermuda stone and marl but does not represent what is actually present in Charleston. Though Mintz is categorizing marine limestone in the same manner as Smith and Tuomey had earlier, he goes an extra step in identifying the specific geologically formed features of the stone which helps in distinguishing it from any other similar material like Bermuda stone.

There is overwhelming evidence from historic documentation resources presented in Chapter 2 which specifies that Bermuda stone was in fact coming from Bermuda on trading sloops. One problem this thesis rectifies is that what the current preservation community incorrectly identifies as “Marl” or “Coquina” in Charleston is actually Bermuda stone. These questions are not answered by any current scholarly work and are rectified by this thesis.
The final literature review of this thesis is the trade between Charleston and Bermuda. The history of the vast network of trade throughout Colonial America and the Atlantic World is too broad to be fully captured by this thesis. Instead it is the microcosm of Bermudian trade networks that take primacy. This section of the Atlantic trade has been summarily covered by Michael Jarvis and his work of Bermuda’s own relationship to this area of history.\footnote{Jarvis, Michael J. 2010. \textit{In the Eye of All Trade: Bermuda, Bermudians, and the Maritime Atlantic World, 1680-1783}. UNC Press Books.}

Jarvis’ work \textit{In the Eye of All Trade} is considered to be a comprehensive study of Bermuda and how its trade network operated through the late 17\textsuperscript{th} century to the end of the American Revolutionary War.\footnote{In the Eye of All Trade: Bermuda, Bermudians, and the Maritime Atlantic World, 1680—1783 by Michael J. Jarvis. Review by: Bradford J. Wood. Page 448 of 447-448. The North Carolina Historical Review, Vol. 87. No 4. October, 2010.} It takes special note of how closely intertwined the economy of Bermuda was with the American Colonies, and how that relationship was damaged by the onslaught of war between America and Great Britain. Information on the greater trends in trade between Bermuda and Charleston in this period greatly helps in determining a period of significance for Bermuda stone in Charleston.

There is a great deal of confusion as to not just what Bermuda stone is, but where and when it was coming from. Jarvis’ work helped greatly in determining whether or not the trade relationships between Charleston and Bermuda could have supported the amount of Bermuda stone that we see throughout the city. It allowed a comprehensive look into whether or not the material seen in Charleston fit within the time frame of a
healthy trade relationship, or if the trade relationships had changed and this material needed to be sourced from elsewhere.

The work of Dr. John McCusker was also a valuable source for determining the broad history of the colonial trade networks. His work *The Early Modern Atlantic Economy* and *Essays in the Economic History of the Atlantic World* provided a complete analysis on the trade relationships throughout the Atlantic world prior to the American Revolution. This was a vital area of study to fully understand the complex nature of the trade between Charleston and Bermuda in the colonial era and how it was affected by the larger political and economic events of the time.

Another crucial source of information was *Measuring Charleston’s Overseas Commerce, 1717-1767* by Converse D. Clowse. His work was a pure statistical analysis covering the colonial imports and exports of Charleston according to the Naval Office Shipping Lists for the Colony of South Carolina. These records come from the British National Archives, formerly called the Public Records Office. His compilation of this statistical data was critical in tying together the specific goods that were coming and going from Charleston throughout its colonial history. It also included many statistics from the other ports that merchant vessels were sailing to and from. These ports were listed from places all over the Atlantic world such as London, Bristol, Bermuda, Barbados, the West

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Indies, Bahamas, and the Northern Colonies of North America. It was from these lists that the hard statistical data about the importation of Bermuda stone to Charleston was retrieved. These seminal works on the history of colonial maritime trade throughout the Atlantic formed the backbone of the historical narrative for this thesis.

Primary source material forms the main body of information in this thesis. This research took place in a number of archives, libraries, research centers, and digital archival sites. Most of these facilities are located in Charleston. The South Carolina Room of the Charleston County Public Library, The College of Charleston Library archives, Historic Charleston Foundation, and the South Carolina Historical Society were all invaluable resources for finding primary source data. The majority of the primary sources collected are from Charleston city records and historic newspaper advertisements. The official city papers provided numerous accounts of Bermuda stone use throughout the city, including some of the sea wall fortifications. These records are valuable for the identification of different locations for Bermuda stone and its relative cost. Family papers of contractors and wharf owners throughout Charleston were analyzed as well. The lack of scholarly information on the material itself is being bypassed through research on similar materials and fields of study. The architectural history of Charleston was also analyzed to give a context for the existing sites where Bermuda stone is used, and how these places are either similar or dissimilar to the traditional architectural trends within the city. Scientific studies on similar materials were also reviewed, specifically on the coquina stone that is prevalent throughout Florida. This gives a greater background on
how to categorize Bermuda stone in a material sense, and also to understand the process for a technical study on stone materials.

The material testing for this thesis was limited to microscopic analysis and detailed photography. The microscopic analysis looked at pieces taken from different stone samples from around Charleston and directly from Bermuda. These portions were placed under the Motic Type 107M microscope at the Master of Science in Historic Preservation lab at 292 Meeting St, Charleston, South Carolina. Photo micrographs were taken in order to determine the different levels of shell composition and calcification within the stone. The camera attached to the microscope is a Canon EOS Rebel T3i. Stone samples were collected from the Sword Gate House at 32 Legare Street in Charleston, South Carolina, the Smithsonian Institution in Washington D.C, the Horry-Lucas Plantation Ruins at Charlestowne Landing, The Charleston Museum, the Fortified Sea Wall at White Point Gardens, and from private collections. These samples were analyzed in order to determine levels of similarity. The photographs of locations and samples are compiled into a photo catalog for future researchers looking to identify Bermuda stone in Charleston. This photo catalog is appended at the end of this thesis.

In depth chemical analysis was left out of this thesis intentionally. Future testing methods such as XRF (X-Ray Fluorescence) and INAA (Instrumental Neutron Activation Analysis) would be helpful in identifying the chemical makeup of the Bermuda stone samples but this testing is far more detailed than needed for the scope of this thesis as a historical narrative and basic material analysis. The testing methods that were employed
aid in the creation of a field guide definition for the identification of Bermuda stone in Charleston. If a future researcher wishes to create an in-depth chemical or material analysis of Bermuda stone in comparison to other like materials, tests like XRF, INAA, or electron microprobe would be an appropriate place to begin.

The final portion of this methodology is the analysis of the data. The data from primary source research was used to create the history of Bermuda stone in Charleston. This included gathering information about the cost, use, and trade history of Bermuda stone listed in the city records in order to create a comprehensive study about the presence of Bermuda stone in Charleston. Different narratives were also established based on family papers that contained useful information regarding the stone, as well as newspaper articles and advertisements. These interpretations along with existing sites throughout the city come together to form a history about the different people who used Bermuda stone, its significance to the people who used it, and what it tells us about the economic and trade relationships between Charleston and Bermuda. The definition of Bermuda stone was determined after the microscopic analysis of the stone samples and the photographic records were taken of the samples. These data sets were used to create a way to identify Bermuda stone in the field not only for this thesis, but for future researchers. The complete historical narrative and conclusions about the presence of Bermuda stone in Charleston are included in the following Chapters.
CHAPTER TWO

THE HISTORY OF BERMUDA STONE IN CHARLESTON

Section 1

The Early Years of Bermuda Stone in Charleston

The start of the historical narrative for Bermuda limestone begins with the islands themselves. In 1503 Spanish explorer Juan de Bermudez discovered the series of rocky islands in the western Atlantic. The islands were uninhabited and had no source of fresh water other than rainfall. Though the islands were used as a supply point for the better part of a century by Spanish and Portuguese ships, permanent settlement was not attempted until the early 17th century by the British. The first settlement was established in 1612 with the city of St George as the Bermudian capital. In the earliest years of the colony the islands were controlled by the Virginia Company, the same company that ran the Jamestown settlement of Virginia. As the population of Bermuda grew the islanders who became permanent residents looked to form an independent company to govern the affairs of the islands. An official royal charter later transferred control of Bermuda to the Somers Isles Company. Thus, the island’s colonial inhabitants were subject to the bidding of their new company masters. As an island colony, maritime support was always vital to sustaining the Bermudian economy. The Somers Isles Company preferred to earn

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profits through agricultural production with a focus on the tobacco crops which had
become so lucrative in the North American colonies.²¹

However, due to the thin soils on the island, agricultural production was difficult
and the island population subsequently fought for independence from the Somers Isles
Company after more than 60 years of control. In 1684 the crown dissolved the Somers


Figure 12: An image from Google Maps showing Bermuda’s location relative to the United States. The island’s placement between the North American Colonies and Great Britain made it a valuable stopping point for ships making trans-Atlantic voyages.
Isles’ charter, putting control of the colony in the hand of an appointed Royal governor. This marked the beginning of a fundamental shift in the Bermudian economy. Under relative self-governance, the community began looking to the vast ocean that surrounded them as the main economic vehicle. They turned away from agriculture and focused on earning their fortunes through maritime trade. It was this shift to an exporting economy that would place Bermuda stone over 1,000 miles away in Charleston, South Carolina.

During the early years of colonial occupation the islands of Bermuda had a significant population of Bermuda Cedar trees (*Juniperus bermudiana*). The Bermuda Cedar has a very dense wood that is incredibly strong and resistant to rot. This made the wood exceptionally useful for the construction of timber frame buildings on the island, but also for the construction of a merchant fleet of sailing ships.\(^2\)

As a maritime community, the colonial Bermudian economy drove the construction of hundreds of merchant sloops. A Bermudian sloop was a 30-40 ton ship that could carry cargo to and from the North American colonies. The Bermudian sloops utilized triangular sails and a shallow draft (the amount of ship below the water line). These two design features meant that the sloops produced in Bermuda were impressively fast compared to their European or American made counterparts. Their triangular sails also meant that they were highly effective at sailing against the prevailing winds. The ships could tack against the winds with greater ease than vessels with traditional square-rigged sails.

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sails. This gave the Bermudian merchants an advantage in that they could get their goods to port markets faster than their counterparts, and that they could also sail more direct routes at greater speed. All of this created increases in profits for Bermudian maritime merchants and allowed them to make more voyages than their other colonial competitors.\textsuperscript{23}

![Image](image.png)

\textit{Figure 13: A typical Bermudian sloop from the colonial era. The engraving was created by Pierre Ozanne, c.1750. Image courtesy of the Bermuda Historical Society.}

The Bermudian sloops like the one shown above were the workhorses of the Bermudian trade economy. In the earliest years of the Bermudian maritime trade the

\textsuperscript{23} Jarvis, \textit{In the Eye of All Trade}, Sloop building, 84, 124, 127; \textit{kin cedar use in}, 89, 143-144; as part of maritime economy, 144. \textit{Sloops: transit speed of}, 5, 127, 129; advantages of, 124-125.
ships were loaded with Bermuda Cedar for transportation to other island colonies and North American ports where it was prized for its durable properties. The Bermudians were also loading their ships with food stores, mercantile goods, tools, guns, and much more to supply the feeble but growing British colonial settlements along the North American coast. As a waypoint for British ships heading for America, Bermudian merchants and adventurers were often making trips back and forth between the mainland colonies. Many of the Bermudian merchants decided to capitalize on the available land in these settlements and became permanent residents. One of the colonial settlements that was heavily influenced by Bermudian trade and settlement was Charleston.

The city of Charleston, South Carolina that we know today was originally a small fortified settlement known as “Charles Towne.” After his return to the throne in 1660 following the English Civil War, King Charles II gave eight of his loyal friends a massive land grant known as the “Carolina Territory” in North America. These eight men were known as the Lords Proprietors of Carolina. In 1670 the Lords Proprietors sent out three ships to establish their colony. A group of around 150 English, Barbadian, and Bermudian colonists were selected to establish this new settlement for the Lords Proprietors. From the very beginning of the city’s history, Bermudians, their expertise, and material culture were at the heart of Charleston’s development.24

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The colonists established their first settlement on the west bank of the Ashley River, a few miles upriver from the current city location. These colonists along with their English and Barbadian leaders sought to establish a foothold on what was a dangerous and unexplored frontier for the British Empire. The site upriver was chosen due to its strategic and defensible position. A picket fort made of cut timber and earthen ramparts was established on a small beachhead to defend the settlement from Spanish raids and hostile Native Americans.

The early city of Charles Towne was heavily reliant on imported goods from Britain. There were also shipments of supplies from Barbados and Bermuda that helped to keep the settlement afloat as it struggled along and developed. The presence of a significant Barbadian population has been well documented in the many histories of Charleston and South Carolina. It was the Barbadians who passed on the economic tradition of slave-based rice plantations. This agricultural system came to form the basis of Charleston’s colonial and antebellum society.25 The Bermudians were quick to establish communities of their own as well. Their agricultural heritage served them well in the Charles Towne settlement. The Bermudian community that developed on James Island just down river from Charles Towne was an influential population throughout Charleston’s development. This Bermudian community is described in greater detail later in this section.

The small defensive settlement on the west bank of the Ashley River lasted only a decade before plans were made to move Charles Towne to a permanent location at the head of the peninsula in Charleston Harbor. In 1680 a plan known as the “Grand Modell” of Charles Towne was laid out for the establishment of a heavily fortified walled city with proscribed lots. The move to the peninsula drove the construction of a massive fortified brick sea wall along the city’s border with Charleston Harbor. Earthen fortifications tied into the sea wall to form a defensive border around the lots of the “Grand Modell.” It was the brick sea wall and bastions that served as Charleston’s primary defensive fortification to protect the city from the French and Spanish, as well as hostile Native American tribes, and pirates.  

The fortifications surrounding the city were completed in 1704. It was throughout this period, the earliest years of the walled city, that the first known evidence of Bermuda stone was used in Charleston.

The process of importing the stone began over 1,000 miles to the east of Charleston on the Bermudian Islands. The first permanent settlers of Bermuda in the 17th century first made their structures out of timber. The Bermuda Cedar tree is a very dense and fast growing species native to the islands that provided a fast and durable building material. Within the first few decades of settlement, however, the Somers Isles Company was forced to enact conservation laws to protect the prized Bermudian Cedars as building and ship construction had nearly deforested the islands. With their primary construction

material in short supply the settlers began experimenting with other native resources. It was the local limestone that became the material of choice.\textsuperscript{27}

Due to the Island’s geological composition the limestone is very soft and porous when it is unexposed. The settlers discovered that the stone could be quarried quite easily with simple hand tools. Large, two-man saws, masons axes, adzes, chisels, feathers, and wedges were all the laborers needed to quarry the limestone into usable blocks.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure14.png}
\caption{A late 19th Century image of Bermudian quarrymen. The large two man saw was the primary tool for dividing and shaping blocks. Image courtesy of the Wisconsin Historical Society.}
\end{figure}

\textsuperscript{27} Jarvis, \textit{In the Eye of All Trade}, 91.
These stone blocks were typically cut to fit two primary uses. The first was a large construction block that was most often used in foundations and wall construction. The second form of block most often cut were stone roof shingles. The roof singles were often close to one foot square and two inches thick. Once the blocks were cut by the quarrymen they were stacked in the quarry to dry in the hot Bermudian sun. As the stones dried out they became stronger and more consolidated. Large finished wall blocks can be seen stacked for drying on the right side of Figure 7.

Once the stones were dried for a sufficient time they were ready for use in any number of Bermudian residences, municipal buildings, industrial structures, and fortifications. On Bermuda the stone was and is almost exclusively coated by a stucco or lime wash. The stucco and washes helped to add a soft protective barrier the shielded the stone from the elements. Due to the granular makeup of the limestone it is subject to severe weathering by wind and rain and must be covered for optimal preservation. If the stone is coated in an appropriate manner it can last indefinitely as a strong and durable masonry material. The large stone blocks were historically used to build foundations and thick walls for the buildings of Bermuda. These thick walls would also have had to support the massive weigh of the heavy stone shingle roofs. Bermudian cedar timbers and later North American timber served as the primary roof structure. Once the timbers were in place the stone shingles were laid in a step pyramidal shape, usually in a hipped roof form to properly shed water from the roof. The roofs were also coated in a lime wash or stucco to protect the stone from wind, rain, and sun exposure. Water channels were created on
the roofs to collect rainwater into cisterns as there are no fresh water sources on the islands.28

This basic description is a brief introduction to the primary architectural heritage of Bermuda but it establishes a precedent for the stone use before it reached the shores of South Carolina.

Stones like the ones described above were coming into Charleston from the very beginning of its history. Due to the limited number of existing buildings from this period, large gaps in documentary records, and the heavy later development of Charleston’s early locations, it is unclear how much Bermuda stone was being shipped into the city during the first few decades of settlement.

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28 Jarvis, In the Eye of All Trade, 91-93.
It is generally agreed by historians throughout Charleston that the “Pink House” on Chalmers Street, is one the oldest buildings in the city. According to the architectural standard, *The Buildings of Charleston*, the Pink House was constructed circa 1712. Of interest to this thesis is that the house is believed to be been constructed of Bermuda stone. Chalmers Street was a red light district of sorts in early Charleston according to *The Buildings of Charleston*. The Pink House sat in the center of this street and operated as a tavern and possibly a brothel for much of its early history. The house is a small two and a half story house with a gambrel pantile roof. The house is reportedly constructed of

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Bermuda stone and is finished with a thick layer of stucco. In the 1930’s the house was renovated by the Morawetz family. Unfortunately this renovation included the application of a very hard Portland-cement-based stucco to the exterior of the house. This stucco application still clings to the walls to this day and makes identification of the structural material of the walls unidentifiable. As with any historic house Portland cement can often be an extremely damaging and incompatible material. This stucco completely covers the house and obscures any view of the Bermuda stone walls.\(^\text{30}\)

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Figure 16: The "Pink House" on Cholmers Street in Charleston, South Carolina. Image dates to 1890. Image from the Lowcountry Digital Library.
Even though the stone is not currently visible there is much to learn from this house. There is some debate in the preservation community that the house could have actually been constructed as early as the 1690’s. If this early construction date is correct, it means that the Bermudian settlers and their maritime trade was well established in the earliest years of Charleston’s history. The idea that Bermuda stone was a building material choice in the last decade of the 17th century is corroborated by the documented reality that in the first decade of the 18th century Bermudians were bringing enough stone into Charleston on ships to construct houses like the Pink House.

Sources on Atlantic trade establish that both Charleston and Bermuda were on the brink of establishing a vast maritime economy at this time. The Bermudians had recently been freed from the agriculturally minded Somers Isles Company and were slowly amassing one of the largest merchant shipping fleets in the Atlantic World.31 The new Charlestonians were also inexorably tied to the seas. Though some material resources were plentiful in the colony of Charleston, the ocean was the lifeline to the Old World, to supplies, and to fortune. The Bermudians and those who began identifying themselves as Charlestonians in the early 18th century were importing massive amounts of trade goods from the British Empire and Bermuda to South Carolina. It is evident that Bermuda stone was one of the primary trade goods coming into the city from the very beginning, especially since the Pink House demonstrates it was being imported in sufficient

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31 Jarvis. *In the Eye of All Trade*, 144.
quantities to construct houses. The basis for this trade relationship is covered in the following chapter that analyzes the peak of Bermuda stone importation.

With the ravages of time and development, many of Charleston’s earliest structures were demolished or fell victim to natural disasters. Throughout the last three centuries of Charleston’s history, the city has been hit by many different disasters that have taken a major toll on the built environment of the city. In 1698 the city experienced its first earthquake and major fire in the same year. 32 The fire of 1698 destroyed nearly a fourth of the city. In 1699 a hurricane struck the city. The fire of 1740 burned nearly half of the city, including large portions of Broad, State, and Church Streets. These are major streets on the southern part of the Charleston peninsula and are central to the historic core of the city, and contain many of the prominent residences and buildings that give the city and historic district its character. In 1752 two “extremely destructive” hurricanes hit the city within two weeks of each other. During the Revolutionary War a fire destroyed several blocks of the city in 1778. Another fire in 1796 burned a large swath across the city from East Bay to Meeting Street between Broad and Chalmers Streets, midway up the peninsula through residential and commercial districts. In 1811 a tornado struck the city and damaged many buildings. Another hurricane struck in 1813. A fire in 1838 destroyed nearly 1,000 buildings over 145 acres of the city. 33 In 1861 the worst fire in Charleston’s history burned a massive swath across city all the way from the Cooper River.

33 The Great Fire at Charleston, S.C. Amherst, N.H. Farmers’ Cabinet, May 11, 1838.
to the Ashley. In 1863 the city fell under bombardment from Union forces during the Civil War; the bombardment lasted eighteen months. In 1886 a devastating earthquake struck Charleston and destroyed and damaged many buildings throughout the city.\textsuperscript{34} This impressive list of natural disasters and acts of war is not even complete with the many smaller fires and storms that have hit Charleston throughout its history. The sheer number of disasters that have struck the city prove how rare and lucky it is that any Bermuda stone houses, walls, and pathways have survived. The fact that there are still surviving examples from the earliest years of Charleston’s development is incredibly significant. The ability to withstand these many disasters is a testament to the strength and durability of Bermuda stone.

It is impossible to say how many other Bermuda stone houses were constructed in the earliest years of the walled city. Few records of vernacular structures were made at the time and the remaining examples are the primary evidence for their construction. This is also subject to the potential loss of buildings from development and disasters, including the difficulty in identifying Bermuda stone when it has been covered with stucco, or used as a foundation material. Some records do show, however that throughout the first 50 years of Charleston history, Bermuda stone was used in applications outside the Walled City, proper. Bermudians set up agricultural communities on James Island just across the Ashley River from the walled city. Early Bermudian settlers

like Samuel Trott, Perient Trott, and John Tucker often employed lawyers to look after their cattle and hog plantations in the late 17th century while they were away. Large amounts of Bermuda stone were used in the foundations or even building’s walls at these plantations. One source of evidence for Bermuda stone use on James Island comes from McLeod Plantation. The present house at McLeod dates from the antebellum period, but the plantation dependencies are much earlier. The slave quarters, kitchen house, and dairy are believed to have been constructed in the first half of the 18th century to support an earlier plantation complex.

The first plantation developed on the site was in the 1740’s by Samuel Perroneau, a descendant of French Huguenots. During archaeological excavations in 2010, a significant amount of Bermuda stone was discovered at the dairy or “buttery” building on the plantation. The large Aeolian stone blocks were stacked in a foundation trench to support the brick building above. A sample of the Aeolian stone was collected by the Charleston Museum staff during the excavations. Perroneau was the son of French Huguenot immigrants and likely sourced the stone from Bermudian merchants in Charleston. Samuel’s brother, Alexander Perroneau, was also a successful businessman and developer in Charleston. Two of his tenement houses still stand in downtown Charleston. 141-145 Church St were constructed by Alexander as investment properties

in the 1740’s. The buildings are commonly referred to as the “Pirates House” or the “Pirates Courtyard.” Legends say that the houses were frequented by Charleston’s notorious pirates. Pirate stories aside, the houses are also constructed using Aeolian blocks of Bermuda stone. The stone is visible as part of the exterior wall construction on the south façade of 145 Church St in the narrow alley between the two buildings. There is no discernable bond pattern for the stone which means the stone was likely laid and cut to fit where needed. The window lintels are also made of brick instead of Bermuda stone as it was easier and more economical to cut and shape small bricks for lintels than large Bermuda stone blocks. For some reason the stone on this façade was never finished or coated with a wash or stucco as the builders may never have anticipated for it to be seen. The hipped roofs are also an architectural indicator of their vintage, as hipped roofs were more common in the early 18th century. Having been built in the 1740’s these two tenement buildings are some of the earliest surviving Bermuda stone buildings in the city. The family connection between the two properties is an interesting note for Bermuda stone use in Charleston. As successful businessmen and developers, the Perroneau brothers likely shared their access to different resources that each used to build their properties. In a future study, in depth material or chemical analysis might be able to deduce if the Perroneau brothers were sourcing their Bermuda stone from the same quarries in Bermuda.

Figure 17: The Alexander Perroneau Tenement Houses at 141-145 Church St. Both houses in the image were partially constructed of Bermuda stone c. 1740. Image by the author.

The McLeod Plantation buildings and the Church St tenements serve as a great indicator that Bermuda stone was not only used across James Island plantations, but also used in houses, outbuildings, and dependencies on Charleston’s peninsula. Though there is evidence that both communities drew on the materials imported to Charleston, it was the Bermudians who settled on the peninsula however who primarily retained their ties to the sea and brought about the vast importation of Bermuda stone.39

Another example of Bermuda stone in Charleston is the St. Philip’s Parish Glebe Tenements. These houses which share a party wall are located on the south western side

39 Jarvis, In the Eye of All Trade, 333.
of Wentworth Street. Architectural historians and preservationists have debated the date of construction for these tenements. Most estimates put the buildings between 1730 and 1750. They were constructed on the St Philip’s Parish Glebe Lands. “Glebe lands” were parcels of land distributed to the different parishes of Charleston by the colonial government to help offset the maintenance and living costs of the church and its staff. At the time of their construction these buildings were well outside the fortified walls of the city proper. The houses were built as a joined pair of tenement houses on church lands, and were constructed of brick and Bermuda stone. The houses likely appear on the 1733, Herman Moll Map of Charleston shown below as the “parsonage.”

![Figure 18: The Herman Moll Map of Charleston c.1733. Courtesy of the Charleston County Public Library. The Parsonage house is marked in the top left of the map.](image-url)
A parsonage is a house or building used as a residence for a church member or clergymen. Given the history of the houses constructed by St. Philip’s Parish, it is likely that the parsonage and these tenements are one and the same. The tenements have been modified slightly over time, but the western house still retains its original, early jerkin-head roof. These were a popular roof type very early on in Charleston’s architectural history and is an excellent clue to an early date of construction. The fine early Georgian wood interiors are also a solid indicator of early construction. There are cut Bermuda stone window sills on the western house still visible. The presence of Bermuda stone in a finely crafted and detailed house shows that Bermuda stone was not seen as a cheap or hasty building material. Not only was the stone being used in the walls and foundations of Charleston’s earliest buildings, it was also being used as a finished architectural detail material in fine houses. This adds more credit to the value of Bermuda stone as a building material in the 18th century.

Figure 19: The St. Philip’s Parish Glebe Tenements. The sills of the right tenement were identified as Bermuda stone. The sill photograph is included in the Index. Image by the author.
There are no other known examples of Bermuda stone from the first half-century of Charleston’s history. However, the Pink House and the tenements on Wentworth Street are indicators of a robust and diverse presence of Bermuda stone in Charleston’s early building history. Unfortunately only two of the early 18th century Bermuda stone buildings still survive or the Bermuda stone is just not visible in the undiscovered locations.

Development is another likely culprit for the limited presence of early Bermuda stone buildings. Buildings like the tenement houses were regular buildings for their time and there was likely little focus on saving them from redevelopment. The fact that any number of these early Bermuda stone buildings survive is significant. The important aspect of the early study of Bermudian and Charleston relationships is that a well-established and significant trade relationship had been created in the first few decades of the city’s existence and that Bermuda stone was a regular commodity imported to Charleston early on. Identifying some of these individual Bermudian traders, and the discussion of the rising maritime economy is presented in the next section.

Section 2

The Period of Greatest Importation of Bermuda Stone

As the 18th century progressed Charleston was no longer a small river settlement in a distant colonial landscape. By the 1740’s Charleston’s maritime economy was growing at an unprecedented rate. Trade had expanded from not only relying on imports from
England, but including the other colonies of North America and the Caribbean. Immigrants and material goods flowed into Charleston from the around Atlantic world and beyond. Trade with Bermuda had nearly expanded tenfold. There were merchants from the Bahamas, St. Eustatius, Barbados, and Jamaica, while goods like coffee, cocoa, fruits, and cotton were shipped into Charleston in vast quantities. Enslaved African were brought to Charleston as well. Some historians estimate that as much as 40 to 60 percent of enslaved Africans brought to North America arrived via the port at Charleston.40 This enormous population of enslaved labor was required to support the rice and indigo plantation economy of South Carolina that had been introduced by the Barbadian colonists.

Despite all of the diverse goods coming to Charleston from rocky islands throughout the Caribbean and Atlantic only the Bermudians were importing stone.41 According to Converse Clowse’s study Bermudians were the only group of people importing sawed stones into Charleston from the near Atlantic or Caribbean. Their primary imports of salt, cedar, and Bermuda stone sustained this trade relationship. Bermudian families living in Charleston also spurred on this economic growth. They include the family names Bristow, Crosskeys, Darrell, Dill, Downing, Evans, Frith,

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Unlike the murky records of how much Bermuda stone was imported in the late 17th and early 18th century discussed in section 1, by the mid-18th century Bermuda stones were imported to Charleston in staggering numbers. In 1730 only a few hundred stones were brought to Charleston, yet by 1760 more than 20,000 blocks were shipped to and sold in the city annually. There are numerous newspaper advertisements from this period in the South Carolina Gazette that mention Bermuda stone for sale at different wharves throughout the city. By the 1760’s Bermuda stone had become a well-recognized and desirable material. This means that Bermuda stone was likely being brought to Charleston in the early years mainly as a ballast material that was accessible and within reach of the Bermudian maritime merchants. Yet the stone began to achieve a greater presence in Charleston as the city developed and the demand for the material began to grow. The building culture brought with Bermudian traders also influenced the demand for the stone as people were more familiar with the material and how to use it. The lack of easily accessible local stone around Charleston also helped to drive this need for Bermuda stone.

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42 Clowse, Measuring Charleston’s Commerce, 41.
43 For Sale a Deck’d Schooner. The South Carolina Gazette. January 1, 1771.
The majority of buildings in Charleston that have Bermuda stone features date from the mid-18th century. This means that with the statistical data showing a greatest period of importation, the citizens of Charleston were also purchasing this stone to use in their houses, dependency buildings, and gardens. It wasn’t only the private residents of Charleston that were interested in the material, however.

In 1767 the Commissioners of Fortifications for South Carolina looked for a way to improve fortifications around the southernmost point of the Charleston Peninsula. This was done in order to expand the fortified walls that protected the city from natural disasters and militarism. The original brick walls that made up the Walled City referenced earlier were not large enough to encompass the growing boundaries. This intertidal area was known as “the White Point” because of a large outcrop of oyster shell deposits, and a few Charlestonians had begun developing the limited high land outside the southern wall of the fortified city. The Commissioners of Fortifications were in charge of building
and maintaining the colonial fortifications of Charleston since its founding on the peninsula, and thus their responsibility extended with the region of development.\textsuperscript{44}

The commission was made up of wealthy Charleston merchants and gentleman. With the city’s boundaries ever expanding it was only natural for the commission to seek a permanent boundary on the southern end of the peninsula. Not only would a substantial wall serve as a place for fortifications and gun emplacements to defend the river juncture, it would also serve as a place to fill in lowlands and create usable high ground. Throughout the later months of 1767 and the early months of 1768 the commission approved plans for construction of a two part wall that would stretch from Granville’s Bastion at the southernmost point of the city wall, all the way down to Broughton’s Battery at the White Point. The wall would then turn west, rounding the south end of the peninsula and creating a final barrier along the first section of the Ashely River bank.

\textsuperscript{44} South Carolina, Commissioners of Fortifications. Journal of the Commissioners of Fortifications, 1755–1770. The South Carolina Room of the Charleston County Public Library.
In the Commissioner of Fortification minutes, the new fortification wall was to be constructed of brick with a Bermuda stone foundation. The minutes document that the commissioners purchased over 25,000 blocks of Bermuda stone for the construction of this wall. The account was paid to Horace Wood for 231 pounds sterling. This equates to around 37,000 dollars today. The Bermuda stone was a valuable commodity. By the calculations each block of Bermuda stone would cost almost $1.50 in today’s market.

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45 Commissioners of Fortifications, November 13, 1767.
Though this may seem like a cheap material, the only other alternative masonry available for the commission was brick. Brick production was much cheaper in Charleston as there were ample supplies of clay and sand, and the labor required for brick manufacturing was free due to enslaved workers. This means that the commission was looking at Bermuda stone, even though it had an added expense, because of its quality as a building material and its availability in Charleston. Bermuda stone was not simply a useless ballast material that was being brought into Charleston as an afterthought, instead it was a desired and valuable building material. This is critically important because it shows that Bermuda stone was not simply being brought to Charleston as an accidental commodity, but as an intentional construction material and in significant enough quantities to be used in massive public works projects.

Another one of the Charlestonians listed in the Commission minutes was Josiah Smith. Smith was an extremely successful Charleston merchant who took on the entire contract for the 1769 portion of the wall. This meant that the city would no longer source materials from a number of different suppliers, instead Smith was supplying all of the materials and labor that the city required according to the construction parameters. As a successful merchant he is also found advertising the sale of a schooner in 1771 through the South Carolina Gazette. On board the schooner that Smith was selling is also 2,000 blocks of sawed Bermuda stone. Smith’s prowess as a tradesman and his access to

47 Commissioners of Fortifications, December 3, 1767.
48 South Carolina Gazette. For Sale, A Deck’d Schooner. January 1, 1771.
Bermuda stone is what most likely drove him to supply vast amounts of the stone for the fortified sea wall. This was actually the largest public works project for the Colony of South Carolina in the 18th century. Given the average importation rates in this period previously established at 20,000 blocks a year in the 1760’s, the fortified sea wall could easily have used close to the entire annual supply of Bermuda stone in Charleston during 1768 and 1769. There are no surviving buildings with Bermuda stone from the late 1760’s, so it is possible that this project used the entire supply of stone coming into the city. With no Bermuda stone left for the public to purchase, it is possible that trade may have also started to increase for the material in order to accommodate the spike in demand for the stone.

In January 2015, archaeological excavations at the edge of White Point Garden sought to uncover the remnants of this fortified sea wall. Under the direction of the Mayor’s “Walled City” Task Force, The Charleston Museum, and the Charleston County Public Library, 5 test pits were dug in order to find and understand the construction of the wall.
The excavations did not uncover the 1768 and 1769 wall in its original form, but it did identify the line of the wall. Using archaeological evidence and documentary records, the archaeology team believes that the first wall on the site was heavily damaged and even partially destroyed by hurricanes in the first years of the 19th century. The brick and Bermuda stone wall was then used as rubble fill in a sea wall constructed on the same line as the original fortified wall that employed much larger ballast stone and granite. Evidence for this hypothesis was supported by the discovery of massive chunks of Bermuda stone and crumbled bits of mortared brick within the rubble fill of the wall. The remnants unearthed are believed to be the second generation of the wall system. With
pottery shards and analysis of the construction design, the team was confident that they found the 1769 wall but in a form following the repairs immediately after hurricane damage.

The presence of massive Bermuda stone blocks, some as much as 22kg (50lbs), was encouraging evidence to support the idea that Bermuda stone is heavily distributed throughout Charleston and exists in significant quantities underground. Shortly after the construction of the fortified sea walls, Charleston achieved its greatest year for the importation of Bermuda stone. In 1772 over 40,000 blocks were brought into Charleston from Bermuda.\textsuperscript{49} On the following chart a notable drop in taxable Bermuda stone can clearly been seen for 1768 and 1769. The number of Bermuda stone blocks returns to normal the following years and steadily increases to the importation zenith of 1773. This indicates that the construction projects of 1768-69 did in fact use the entire amount of stone brought to the city that was for sale and because the city purchased all of the stone it was not recorded on the tax records. It also shows that it also helped to increase the demand for Bermuda stone in Charleston substantially.

\textsuperscript{49} Clowse. Measuring Charleston’s Commerce, Table A-53.
Figure 23: Amount of Bermuda Stone Importation per year timeline. This information is based off of the research by Converse Clowse in “Measuring Charleston’s Overseas Commerce, Table A-53.”

With such an industrial scale of importation, it is important to understand the economic demand that was fueling the Bermuda stone trade. Though Bermuda stone was being brought to Charleston in massive quantities, it was by no means the most important commodity for Bermudian and Charlestonian merchants. In fact the most important trade good for Bermudians was salt. The merchants would load their ballast holds with cut Bermuda stone and set sail from Bermuda tacking southwest towards the Turks Islands which were well known producers of salt. On the Turks large sluice gates would be opened to allow sea water to flow onto inland salt flats. The sea water was then left to evaporate in the hot Caribbean sun. Once the water was gone only the fine salt crust was left behind on the salt flats which was raked into a granular powder and put in large kegs for transportation. The Bermudian merchants would purchase the barrels of salt at a low cost.
and fill their ships with as much as possible.\textsuperscript{50} Salt was an essential commodity in colonial Charleston for the preservation of food.

Once the Bermudians had acquired their final payloads they set sail for Charleston. The salt would fetch a high price in the growing North American colonies. By the middle of the 18\textsuperscript{th} century Bermudian ships were making as much as 200 pounds sterling per cargo of salt. Each ship could carry around 900kg (2,000lbs) of salt to be sold at 2 pounds sterling per bushel. These costs sustained the markets and farmers of Charleston who used the salt for cooking and curing fish or meat.\textsuperscript{51} The salt was the first material to be sold from the Bermudian sloops, but second was the Bermuda stone kept in the holds. Bermudian merchants had a leg up on their colonial competition and also merchants from Great Britain. Ballast is any type of heavy material that is stacked in the bottom of wooden sailing vessels to stabilize the ship in the water. Trade vessels from the other colonies and from Great Britain typically only used local cheap materials like gravels and river rocks to fill their holds. This material was essentially useless once the ship arrived at port and had no value.\textsuperscript{52} For the Bermudians the salt itself was not only a lucrative cargo, as these traders were able to sell their ballast.

In Charleston a group referred to as the “Ballast Masters” was created in order to organize the dumping of ballast from ships as landfill along the harbor shores. Because

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\textsuperscript{50} Jarvis, \textit{In the Eye of All Trade}, 196-197.
\textsuperscript{51} Ibid., 197.
\end{flushleft}
most ballast was valueless and unloaded not for profit, strategies of where to dump the waste material were organized. Channels were kept free of dumping and ballast was strategically discarded along the shores. This was done to help stabilize fill the intertidal land around the wharves. This landfill helped to prevent flooding during high tides and heavy rains and provided more usable land on the peninsula.53

The Bermudians however were not throwing their cut stone ballast overboard when they arrived in Charleston like other merchants. The Bermudians were stacking their stone at the ends of the wharfs and selling their ballast for a considerable fee while their British counterparts threw theirs into the harbor. In reaction to this growing trend, new regulations on taxing Bermuda stone came into play. An Act of Assembly from April 12, 1768 established that any sloop unloading cargo at the Charleston wharfs must pay five shillings per day, and that any ship storing Bermuda stone at the wharfs must pay two shillings and six pence per 100 stones.54 The stone was being weighed and sold along the wharfs with all other types of mercantile goods. A merchant could also store one ton of coal, 100 raw or tanned hides, or 1,000 Hay or Corn blades for the same price as the Bermuda stone which illuminates Bermuda stone’s relative value with other goods. With such detailed information on Bermuda stone it is clear that it was a regular commodity in Charleston markets by the mid-18th century.

53 John Bee Holmes, Esq. An Ordinance to define and ascertain the Duties of a Harbor-Master for the Port of Charleston. Ordinances of the City Council of Charleston, in the State of South Carolina. 1802
54 South Carolina Gazette. Rates of Wharfage of Ships and Merchandize and of Storage in Charleston. Published April 22, 1768.
The majority of structures built with Bermuda stone in Charleston date from this period of high importation. From 1750-1780 there are almost 20 confirmed structures that were either constructed of Bermuda stone, or the stone has been found on the property used in garden walls or as paving material. The majority of known Bermuda stone locations are within the boundaries of the original Walled City, which points to the theory that most Bermuda stone was being used in the old and historic districts throughout the early and middle 18th century. Most of the buildings with Bermuda stone used in walls and foundations have Aeolian Bermuda stone. This is likely tied to the material properties and its durability when coated with stucco. Marine Deposit stone typically appears in paving. The harder denser Marine Deposit stone was more durable than Aeolian stone when used as a paving material and was therefore more often used in that application. These properties can be seen on the Known Bermuda Stone Locations table in Appendix A, and in the image glossary. Many of these properties were identified through document research and sales advertisements in period newspapers like the South Carolina Gazette. Nine different advertisements in the Gazette specifically mentioning Bermuda stone date from 1764-1778, and of these advertisements there are nine other buildings listed that mention Bermuda stone being used in the building...
construction. The historical advertisements listed at the end of the bibliography mention properties on King Street, Beaufain Street, Church Street, and Stoll’s Alley where Bermuda stone was used, but have not been successfully identified for this thesis.

Figure 24: An advertisement from the October 28, 1778 issue of The South Carolina Gazette. The advertisement shows five houses made of Bermuda stone for sale around the intersections of Church St and Queen St. The houses were all built within 5 years of 1778 according to the advertiser, and “are so well known as to need no further description.”

These Bermuda stone properties are not only to be found in historical records. There are a number of surviving houses throughout the city that date to this date range. Properties like the William Gibbes House at 64 South Battery St (c. 1772), and 7 Stoll’s Alley (c. 1750), utilized Bermuda stone to construct their dependencies and out buildings.

William Gibbes, who constructed 64 South Battery St, built the kitchen house for his stately property partially out of Bermuda stone. The front façade of the kitchen is constructed with Aeolian Bermuda stone and coated in stucco. Gibbes was a descendent of Bermudian immigrants and had accrued a massive fortune as a merchant and banker. His house faced the Ashley River and his private 300 foot wharf from where he controlled his personal trading empire. The presence of Bermuda stone at such a fine estate and the
house of a Bermudian descendent is a prime example of the availability of the material at Charleston markets and its perceived value. Not only was it being used in walls and courtyards, but the stone was being incorporated into the houses and outbuildings of some of Charleston’s most prominent citizens. 55

38 State St (c. 1780), 70 Tradd St (c. 1774), 14 Legare St (c. 1800), and several others used large quantities of Bermuda stone in their gardens and courtyards as paving material. There are also a number of houses from this period that were constructed of Bermuda stone. 56 Tradd St (c. 1751), 4 St. Michael’s Alley (c. 1760), the Horry-Lucas Plantation Ruins (c. 1760), and 48 Tradd St (c. 1760) are all constructed out of Bermuda stone or have Bermuda stone as a foundation material. Amongst the many 18th century buildings in Charleston that date to the 18th century only these are known to have Bermuda stone as part of their construction. It is unclear how common Bermuda stone houses and buildings were in the 18th century simply to the loss of historic fabric over time. But the fact that there are still at least ten or more properties partially constructed of Bermuda stone from this period is an encouraging sign that there may still be others left undiscovered.

The Horry-Lucas Plantation is of particular interest due to its location at the original Charles Towne Landing. There is little known about the plantation or when it was constructed, but it is estimated to have been built in the mid-18th century. The house no

longer stands, it was lost in a fire long ago.\textsuperscript{56} The plantation foundations still exist and are constructed of Aeolian Bermuda stone. The stone is only partially visible today above ground. The stone, where visible, is exposed to the elements and is heavily worn and discolored. The stone has turned a deep gray color and has significant amounts of bio-growth on it. Despite being left exposed to the weather and featuring aesthetic changes associated with this exposure, the stone is very stable and remains in fair condition.

Figure 25: A corner of the Horry-Lucas Plantation Ruins (c. 1760) constructed of Bermuda stone. Photo by the author.

\textsuperscript{56} Tradd St and 4 St. Michael’s Alley are also good examples of mid-18\textsuperscript{th} century developments in Charleston. Both of the houses are two story, stuccoed, and have simple colonial details. 4 St. Michael’s Alley is partially constructed of Bermuda stone. This was

\textsuperscript{56} Stanley A. South. \textit{Archaeological Pathways to Historic Site Development}. Springer Science & Business Media, 2002. 125.
discovered through a historic image from the 1860’s which shows a corner the front façade of the house exposed. The Bermuda stone blocks can be seen near street level on the right side of the image.

Figure 26: 4 St. Michael’s Alley is pictured at the far right of this 1860’s image. The Bermuda stone blocks that make up at least the front facade of the house are in the lower right corner of the image. Image courtesy of Lowcountry Digital Library.

This list of houses only includes houses with documented Bermuda stone in their walls, gardens, or foundations. There is a strong likelihood that other houses throughout Charleston’s Old and Historic District are still hiding their Bermuda stone blocks
underground or beneath many layers of protective stucco coatings with only two known
examples from the earliest period of use, and around twenty examples from the middle
and late 18th century. The number of properties that have Bermuda stone from this period
is a strong indicator that the mid-18th century was the high water mark for Bermuda stone
use and importation to Charleston. The prominence if Bermuda stone as a traded
commodity and building material is shown throughout the commercial records,
newspaper advertisements, and the built environment. With so much Bermuda stone
being brought into the city, and the number of buildings, walls, and pathways being made
of the stone, what caused the decline in the importation of the material at the turn of the
19th century? The mystery of why Bermuda stone disappears from the Charleston market
and landscape is answered in the following section.

Section 4

The Decline of Bermuda Stone Importation and Use

By the end of the 1820’s, Bermuda stone had become a less important material in
Charleston. Many people in the city likely still knew what the material was and had a
general understanding of where it had come from, but by this time Bermuda stone was
no longer a regular commodity available at Charleston markets. The statistical records for
Bermuda stone in Charleston end with the start of the American Revolution, so there is
no known data for the amount of stone that may have still been reaching the city. One
way we know that Bermuda stone was no longer a regular material in the market is due to the lack of properties that use the stone by this time. The question of why Bermuda stone importation could reach its zenith in 1771 and all but collapse in less than fifty years has a complex answer.

As visited in the previous section, the maritime trading network between Charleston and Bermuda had been going strong for over 100 years by the start of the American Revolution. Unbeknownst to Charlestonians and especially Bermudian sailors, the American War for Independence forever altered the relationship that had been so well established since the founding of Charleston.

Charleston’s colonial economy and population expanded rapidly in the years prior to the Revolution. With the vast increases in colonial immigration the merchant fleets in Charleston were also growing at an unprecedented rate. The markets were no longer reliant on the imports and goods flowing in from the small islands of the near Atlantic and Caribbean. The Charleston economy had become far more self-sufficient through the increases in a slave based agricultural economy. The maritime economy that did exist had matured and become dominated by Charleston born merchants and investors like Miles Brewton, Henry Laurens, William and Thomas Savage, and Gabriel Manigault. A table of the prominent Charlestonian merchants can be seen on the following page.

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The dominance of North American colonial merchants producing goods locally and selling them in Charleston began to put increased strain on the traders coming to
Charleston from Bermuda. The Bermudians had done well throughout the mid-18th century as the Atlantic trade networks continued to grow and American demand for salt and stone stabilized. Problems began however with the political turmoil of the 1760's between American colonists and the Royal government of King George III. To avoid writing a complete history of the revolution this thesis focuses on the effects of the war on Charleston and Bermudian maritime economies.

As the Americans came into open conflict with the British Empire the Bermudian merchants were caught in a political and economic trap. The Royal Navy set up blockades along the American coast to stop importation of war-time supplies and merchant goods. This was intended not only to limit the colonist’s military strength, but also to strangle the colonial economy into a depression that would force them to surrender. The North American colonies had always been the primary marketplace for Bermudian merchants. With the British Naval blockades enforced it became illegal and even treasonous for Bermudians to sell goods to the “rebellious” American colonists. The Bermudian sailors were forced to make a difficult choice. They could continue to harvest and supply salt, a much needed commodity in wartime America, and sell it illegally in colonial markets or they could stay loyal to the crown and become part of the new privateering fleet working against American smuggling ships.58 Privateering is legally operating as a pirate under the protection and issuance of a country against another.

58 Jarvis, In the Eye of All Trade, 375.
Due to the economic strains of war, much of the Bermudian merchant fleet turned to privateering for the Royal Navy despite their political sympathies for the American colonists. The geographical distance between Bermuda and Charleston, as well as the ever present threat of treason when trading with Americans was enough to drive most Bermudians away from their normal markets. It was this decision by the majority of the Bermudian fleet that redefined the American-Bermudian relationships both politically and economically.\textsuperscript{59}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{bermudian_sloops.png}
\caption{An etching of Bermudian sloops similar to those used by privateers against the American merchant fleet in the War for Independence. Image courtesy of “The Bermudan.”}
\end{figure}

\textsuperscript{59} Jarvis. \textit{In the Eye of All Trade}, 392.
As word of Bermudian privateers preying on American vessels spread throughout the 13 colonies, American perceptions of their once loyal business partners began to spoil. Harbor towns up and down the coast began excluding Bermudian merchants regardless of their declared loyalty from trading in the American markets. The fledgling Bermudian fleet, forced by economic hardship, had chosen the wrong side of a two edged blade, and their economic ties to America were completely severed through their group’s real and perceived allegiances.

The American Revolution wasn’t the only disaster to alter the Bermudian merchant fleets influence in North American markets. In 1780 the deadliest hurricane in recorded history rolled through the Caribbean. Over 20,000 people were killed in the storm and hundreds of ships were sunk or dashed against the rocky islands throughout the Caribbean and western Atlantic.\(^{60}\) Despite the storm’s horrific death toll the most long lasting damage from the storm was the destruction of the salt resources in the Turks and Caicos Islands. The storm flooded and demolished the carefully constructed salt flats and processing mills on the islands that Bermudian salt rakers relied on. This meant that the Bermudian’s most prized commodity in American markets had almost been completely eliminated. The storm, along with the British capture of Charleston in the same year, meant that not only did Bermudian merchants have a limited amount of trade goods to bring to Charleston, but the few Bermudians who were still on friendly terms with the American markets were not able to sell their wares due to the Royal Navy’s control of the

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harbor. This double blow was the final nail in the coffin for Bermudian and Charlestonian economic ties. With no salt to bring to Charleston markets, the Bermudians were also not shipping in the Bermuda stone that traditionally filled their holds.

Once the Revolutionary War came to an end the economic environment between the newly formed United States and their former friends the Bermudians improved slowly along with Anglo-American relations. Regrettably no records survive that show the amount of Bermuda stone that was coming into Charleston’s post war markets. There are numerous advertisements in the newspapers however that still mention the material being used in houses and transported by ships. In 1786 there are advertisements from the *State Gazette of South Carolina* and the *Charleston Evening Gazette and Daily Advertiser* that list ships in the harbor with Bermuda stone for sale and also houses on Church Street with Bermuda stone buildings for sale.

Nevertheless the revival of Charleston-Bermuda economic ties was short lived. The end of the American Revolution was by no means the beginning of a peaceful era on the North American continent, and far less in the Atlantic trading networks. As Great Britain restructured their colonial holdings following the loss of the 13 colonies, Bermudian’s were still encouraged to participate in privateering against French merchant vessels bound for the United States and France’s own North American colony.61 Though the majority of the Bermudian merchant fleet had returned to traditional maritime trade,

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the privateers continued to sour the former alliance between Americans and Bermudians. Throughout the 1790’s and the first years of the 19th century numerous American vessels fell victim to Bermudian privateers, especially those vessels carrying French goods. This practice continued and increased as the British Empire and the United States were once again at war in 1812.

Bermudians once again took to privateering in the years leading up to the War of 1812. Over a quarter of the Bermudian merchant fleet returned to earning their fortunes through privateering. With twenty four vessels operating throughout the Atlantic, the Bermudian privateers were able to significantly dampen American trade, especially with France. They captured dozens of American merchant vessels and confiscated the goods on board. These prizes went a long way in sustaining the Bermudian families who had struggled economically after the American Revolution. It was only a temporary revival of prosperity however as their privateering actions were the final act that ended any positive American-Bermudian relationships. Adding insult to injury, the crown forced many of the Bermudians to repay their prizes for any American ships captured before the war as the American’s had declared themselves neutral to any conflict between France and Great Britain. This meant that the Bermudian privateers had to repay their American victims in court by order of their own government. Most of the Bermudians had long since dispersed their contraband among their crews which meant that the reprisal came from their own

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62 Jarvis. *In the Eye of All Trade*, 453.
savings. This was yet another step in the ruination of the Bermudian maritime trade network.\textsuperscript{63}

The War of 1812 was a critical moment in Bermudian-American relations, as it was the final straw that severed the economic ties between the two nations. During and after the War of 1812, Bermudian sloops were no longer present in American harbors like Charleston. Without ships from Bermuda frequenting the harbor, Bermuda stone was no longer brought to Charleston as a ballast or a commodity. This is effectively the end of Bermuda stone importation to Charleston. The material presence of the stone in Charleston also confirms the historical narrative. None of the Bermuda stone buildings discovered in the research for this thesis date later than 1800. There are still several advertisements in Charleston newspapers throughout the early years of the 19\textsuperscript{th} century that advertise Bermuda stone buildings for sale, but these houses and outbuildings were likely built in the mid-18\textsuperscript{th} century and are only noted for the sale of the property. The transition from Bermuda stone as a frequent material in the building culture of Charleston to zero remaining examples from the 19\textsuperscript{th} century is a dramatic drop off, more steep even than the material’s rise to prominence in the 18\textsuperscript{th} century.

\textsuperscript{63} Ibid., 453-454.
The Sword Gate House at 32 Legare St has a Marine Deposit stone walkway. The house is believed to have been constructed sometime before 1810. It is unclear when the Bermuda stone path was added, but it is likely that the stone was recycled from other sources, or had been on the property before the current house was constructed. The Marine Deposit pathway is in exceptional condition and is a great example of Bermuda stone use in the later periods of the stone’s presence in Charleston.

Figure 29: The Sword Gates and Bermuda stone path at 32 Legare St. Photo by the author.
Though Bermuda stone was no longer being imported to Charleston by the early 19th century, it does not mean that the stone disappeared from use throughout the city. Due to the vast quantities of stone that were brought into the city throughout the 18th century it is highly likely that Bermuda stone was being recycled and reused in different ways. This was common practice for almost all other building materials at the time and is likely the reason for some of the more unique Bermuda stone features in the city. As mentioned previously Bermuda stone not only appears in building walls, but it was also commonly used in garden walls, pathways, and courtyards.

Bermuda stone also appears in a landscape wall at 14 Legare St. This Marine Deposit stone is in very small quantities and likely represents a recycled use of the material. Marine Deposit stone, as opposed to Aeolian stone is usually seen in landscape applications. With the frequency of change in landscapes it is highly likely that Bermuda stone blocks used in landscapes were often moved and recycled a number of times. The house at 14 Legare dates to 1800, so it is unlikely that the stone was imported directly for its limited use in the property wall and may well be a leftover material that was found on the property.

One of the most notable examples of a Bermuda stone wall in Charleston is the wall at 24 Water St. The wall is a jumbled conglomerate of many different recycled building materials. Bricks, granite, bluestone, and large Bermuda stone blocks are all part of the haphazard construction. The wall has a regular construction of Bermuda stone along the bottom courses. The wall changes composition near the top and farther along
its length. The brick courses that cap the wall appear to be a later addition or repair to the wall to give it a finished cap. It is possible that the Bermuda stone portion of the wall dates to the 18th century, and that the wall was hastily repaired and added to throughout the 19th century as it fell into disrepair. The wall is constructed of both Marine Deposit stone and Aeolian stone, which is an indicator to the haphazard construction and repair of the wall.

Figure 30: The wall at 24 Water St. The wall has a regular composition of Aeolian and Marine Bermuda stone along with many other recycled materials.

There are numerous courtyards and pathways in the city as well that have Bermuda stone blocks clearly visible. Some of these paved surfaces could be original with the stone in situ, but with the weathering characteristics of the stone and the possibility of changing fashions it’s likely that most of these pathways and courtyards are later reuses
for the Bermuda stone that Charlestonians were finding in their yards, outbuildings and old foundations.

2 Water St has a significant amount of Bermuda stone in the driveway behind the house. This stone was placed there during a renovation and addition to the house in the early 2000’s. The main house at 2 Water St dates to around 1810, but the stone found exposed during the renovation is likely much earlier. The Bermuda stone was laid as a paving material but had been completely covered. The fact that the paving stone was not visible indicates that it was not a part of the 1810 house and garden plans. As seen on the Ichnography map below, Water St gets its name from the creek that used to run there into the Cooper River. Vanderhorst Creek was a small inlet to which numerous small ships docked and unloaded cargo throughout the 18th century.64 It is possible that the Bermuda stone seen at 2 Water St was part of landfill or a retaining wall to help stabilize the ground along the creek and may have been placed near the end of the 18th century. This would show the continued use of Bermuda stone in civic infrastructure projects. The few glimpses of Bermuda stone as associated with 19th century buildings at first seem to tell of small ongoing importation of Bermuda stone to Charleston; however upon further investigation in fact speak to the patterns of building material reuse or the archaeology of built fabric layered over older applications of Bermuda stone in the urban landscape of Charleston.

Despite the death of Bermuda stone importation at the turn of the 19th century, the stone still has a remarkable and regular presence in the city. The stone has proven to be a durable and reusable material that Charlestonians have recycled and preserved for generations. Even if the survival of the remaining Bermuda stone in Charleston is pure happenstance, the stone is a rare and unique material that has stood the test of time and helps to tell a vital part of Charleston’s history.
The previous historical narrative is not only a broad analysis of Charlestonian and Bermudian trade, it also gives great insight to the uses of Bermuda stone seen throughout Charleston. Understanding the different forms of Bermuda stone is critical to identifying the stone around the city. The geologic study in the introduction gives a foundation for understanding the forms of Bermuda stone that are in Charleston. The Aeolian Bermuda stone is almost always white or very light cream colored and composed entirely of small round grains. The Aeolian stone typically appears in building walls and foundations throughout Charleston. Examples of Aeolian stone use in Charleston are the Pink House, 141-145 Church St, the William Gibbes House, and McLeod Plantation’s outbuildings. Due to its loose granular structure the Aeolian stone does not stand up well to being exposed to the elements or physical wear. This is why Aeolian stone is rarely seen used as paving or in exposed garden walls.

Marine Deposit Bermuda stone, the harder more durable form of Bermuda stone, is most often seen as paving blocks or in garden walls. This stone, having been formed by the natural accumulation of marine life and fine sands was compacted into a dense and strongly consolidated material throughout the Pleistocene Epoch. Marine deposit stone is the oldest form of limestone on Bermuda and stands up well to the elements. The St. Philips Parish Glebe Tenements at 87/89 Wentworth Street in Charleston utilize Marine
Deposit stone as an architectural detail on the window sills. Built c. 1730 these tenements are contemporaries to many of the earlier buildings that use Aeolian stone. This means that both forms of Bermudian limestone quarried simultaneously and were looked at as desirable and reliable building materials from the earliest uses of the stone throughout Charleston. The stone is also in many other places as paving including the Sword Gate House at 32 Legare St, 2 Water St, 38 State St, and many others. The density and strength of Marine Deposit stone means that it wears slowly over time, even when exposed to the elements and physical wear from foot or light vehicular traffic. In all of the courtyards and drives where Bermuda stone was found for this thesis the Marine Deposit stone was in good condition.

With the two primary types of stone at Bermudian’s disposal, the colonial merchants capitalized on the economic potential of their native building material. In the 17th century Bermudians used the stone to construct their own houses on the islands. The Bermuda stone and Bermuda cedar native to the island were strong and plentiful resources that allowed the development of a permanent colony from which to establish a thriving maritime economy. The cedar was also a reliable source of lumber for construction of the famous Bermudian sloops. According to Michael Jarvis’ book In the Eye of All Trade these 30 to 40 ton trading ships were renowned for their speed and maneuverability. These attributes fueled the Bermudian merchant’s ability to sail from their home islands to port cities throughout the Atlantic world faster than their other colonial competitors. The British colonies and their ports were a reliable and extremely
profitable market for the Bermudian merchants to sell their goods. Salt was the most lucrative commodity the Bermudians had to sell by weight in the colonies but they were also able to sell the sawed Bermuda stone. In Charleston, the largest colonial port city in the south, Bermudians brought tens of thousands of Bermuda stone blocks throughout the 18th century.  

The thousands of Bermuda stone blocks that were sold in Charleston were used by private merchants and home owners as well as the city’s colonial government. A number of Bermudians were among the first 150 settlers that arrived in the Lowcountry to establish a colony for Great Britain. The English, Barbadians, and Bermudians who settled in Charles Towne, and later Charleston brought with them religious, agricultural, culinary, and building traditions from their homelands to use in the new colony. The earliest known use of Bermuda stone in Charleston is the Pink House at 17 Chalmers St. The house was possibly constructed as early as 1690. Partially constructed of Bermuda stone, the house is an early example of post-medieval architecture in Charleston from the first decades of the settlement on the peninsula.

The Pink House is a perfect example of the earliest European and Bermudian architectural traditions that were used in Charleston. The building tradesman utilized the most plentiful resources they had at hand in the early colony. With so many supply ships coming and going from Charles Towne by the end of the 17th century the Bermudians had established a strong network for maritime trade with their island home. Bermuda stone

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65 Clowse. Measuring Charleston’s Commerce, Table A-53.
was a regular commodity on the Charleston market and is why the Bermuda stone shows up in one of the cities earliest surviving buildings and also speaks to the durability of the material.

The success and durability of Bermuda stone in Charleston buildings of the early 18th century drove the importation of the stone in greater numbers. As the city grew and the Bermudian and Charleston merchants realized the monetary value of the stone. The stone was a commodity imported strictly for use as a profitable building material to sell that happened to double as a suitable ballast. With this noted increase of value and availability, more stone came into the city every year as the 18th century progressed. The stone was also used in more and more houses, paths, and civil works. By the middle of the 18th century an average of 20,000 blocks were being registered for sale at Charleston Harbor each year.66 By 1772 the number had doubled.67 Eight of the 19 properties in Charleston with Bermuda stone used in some manner date from just before the American Revolution.

141-145 Church St and 56 Tradd St are two of the Bermuda stone houses constructed in this period and are prime examples of the evolution from early architectural styles popular in Europe and Bermuda to vernacular styles that were developed in Charleston like the single house. The early colonial architectural styles like hipped roofs, regular proportions, simple exterior details were prevalent on both of these

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67 Ibid., Table A-53.
buildings, but 141-145 Church St differs from 56 Tradd in that it still retains the form and orientation that was used in England and Bermuda, while 56 Tradd is side-on to the street, and has a piazza, which were vernacular features developed in Charleston.

The years leading up to the revolution were the high water mark for Bermuda stone importation to Charleston. Even the city of Charleston was utilizing the stone in its civil projects. In 1768 and 69 the Commissioners of Fortifications passed an act to construct a fortified sea wall that would wrap around the southern tip of the Charleston peninsula. The sea wall had a foundation of 24,000 blocks of Bermuda stone and was completed with brick above ground. This wall was one of the largest public works projects of the 18th century in Charleston and shows the significance of the materials presence in the city. Enough stone was coming into Charleston to support massive projects designed to protect the city from storms and foreign colonial threats. Bermudian maritime traders and Charleston merchants were making significant amounts of money on the stone during this period. Many of them used the stone in their own houses and dependency buildings like William Gibbes at 64 South Battery St. His kitchen house is constructed with brick and Bermuda stone on one of the finest lots on all of the Charleston peninsula. It is unknown how many of the Bermuda stone houses in this survey were constructed by Bermudians. Further study on the individual property histories could help to extrapolate how many Bermudians were using Bermuda stone on their own houses, versus how many non-Bermudian Charlestonians were using the stone as a building material.
The value of Bermuda stone and its success as a building material were not enough to overcome the trials of war however. The American Revolution brought about major political and economic changes in the Atlantic world. As an independent people Charlestonians and their American brethren no longer continued trading relationships with their former Bermudian allies. Many of the Bermudian sailors had turned to privateering for the British crown against American trading vessels during the war. This act forever turned Bermudians against the Americans. This was in part to British sanctions that made trading with the rebellious American colonist an act of treason. This meant that the Bermudian merchants had lost their primary trade partners. In order to avoid economic failure the sailors were forced to try and smuggle goods through the Royal Navy blockades to trade with the Americans, or they could become privateers, making money by capturing American merchant cargoes travelling between the colonies and Europe.

The war of 1812 between the United States of American and the Empire of Great Britain was the final nail in the coffin of American-Bermudian trade relationships. Once again the Bermudians remained loyal to the crown and acted as privateers against the American fleets. This time however the Americans were not rebellious colonists, they were an independent nation and privateering against their ships was a direct act of war. This was the end of any major ties between Charleston and Bermuda. The material presence of Bermuda stone in Charleston reflects this dramatic shift in political and economic relations. According to the documentary record there is no mention of Bermuda stone in Charleston advertisements or city records after 1816. The few
documents that do reference the stone in the early-19th century are advertisements for
the sale of houses constructed of the stone which date to the 18th century. No longer
were merchants advertising fresh shipments of stone to be sold at the wharfs, and
builders no longer had a steady supply of the limestone with which to construct houses
or walls without having to recycle pre-existing structures. The last properties identified in
the city that have the stone are 14 and 32 Legare St. These houses date from 1800 and
1803. The Bermuda stone at both of the houses is used in pathways and garden walls. It
is likely that these stones were recycled from elsewhere in the city as they appear in
limited quantities.

In the span of 30 years Bermuda stone blocks were being imported to Charleston
by the tens of thousands, only to disappear from the markets in a few years. This is a
crucial story for understanding how Charleston, or any city’s material culture can reflect
the historic narrative of a place. By studying the different sites where Bermuda stone was
used in Charleston, as well as the trade networks between Charleston and Bermuda it
shows that much of Charleston’s built environment is a direct response to the political
and economic events throughout the city’s history.
Bermuda Stone’s Significance

Bermuda stone is a significant material for preservationists to study, understand, and protect in Charleston. It reflects the greater cultural and economic history of the city. The stone is used throughout many of Charleston’s most historic districts and buildings. Bermuda stone is an increasingly rare material in the city as the public and much of the current preservation community misidentify or dismiss Bermuda stone when it is encountered throughout the city. The material is often removed or destroyed because its value and importance are not yet understood. It is critical that the preservation community strives to protect the material throughout Charleston, and actively seeks to identify the material and document it whenever found. This can be done through public awareness campaigns, educational programs, and publications about Bermuda stone that are accessible to the public, preservationists, and the building trades in Charleston.

This history and analysis of Bermuda stone is also significant for the preservation community outside of Charleston. As stated the historical narrative of Bermuda stone trade and the material presence in Charleston are a reliable way to study and discuss the many different aspects of Charleston’s history. Preservationists can learn from this material. Bermuda stone is one of many thousands of materials that were used and sold in Charleston’s colonial period, but even looking at only one material can teach the community about the events in Charleston’s history. Bermuda stone’s presence in Charleston sheds light on the earliest history of the city, the people that settled the
colony, the slave based economy and building trades that utilized the stone in construction projects, the architectural heritage and built environment of the city, the broad patterns of economic relationships between Charleston and other British colonies before and after the American Revolution, and much more. It is important for preservationists everywhere to understand how the study of any material in their city can be a critical tool in understanding not only the architectural heritage of a place, but also it tying together the many aspects of the historic narrative that was part of the material’s presence.

There is still study that needs to be done to fully understand the presence of Bermuda stone in Charleston and to complete the history of not only the material, but of the trade relationship between Charleston and Bermuda. In depth chemical and material analysis would be the next logical step in continuing this study. By isolating rare earth metals through chemical analysis future researchers may be able to identify which quarries and limestone deposits on Bermuda, the blocks in specific houses of Charleston came from. This could help gain a better understanding of the timeframes in which different quarries were operating on Bermuda, which types of stone were preferred and more often quarried, and also what types of Bermuda stone were being imported to Charleston in specific years. The creation of a Bermuda stone repository in Charleston could also be a useful asset for the city and the preservation community by providing a source of Bermuda stone for the city and the public in case repairs or reconstruction on a building is required.
Based on the statistical data found in the research for this thesis, there are as many as 192,600 recorded blocks of Bermuda stone that were imported to the city in the 18th Century. This number of recorded stones only accounts for twelve years in the 1700’s from which the records still survive. It is very likely that there is far more Bermuda stone in Charleston as these twelve years of data only represent a small fraction of the total period of importation for the stone. Only 25,000 blocks were used in the construction of the 1768-69 Fortified Sea Wall. This means that there may be more Bermuda stone buildings in Charleston yet to be discovered, and that much more Bermuda stone likely exists archaeologically throughout the city. Given the significant amount of missing data, a very rough estimate could place the total amount of Bermuda stone in Charleston close to half a million blocks. With this amount of stone potentially still in the city it is crucial for preservationists and the public to properly identify and conserve this unique material.

If the stone is not going to be preserved on site, it should be saved and added to the aforementioned Bermuda stone repository for others to use in case of repair or research.

Understanding the impact of other building materials and their influence on the importation of Bermuda stone is also important for future study, especially brick manufacturing in the Lowcountry. The impact of the emerging brick industry in Charleston throughout the 18th and early 19th century likely had a significant influence on the demand for Bermuda stone in Charleston as a reliable and economically viable masonry material. Understanding this relationship will help in determining the broader economic
connections between Charleston and Bermuda, as well as the local building material culture that developed in Charleston.

The final area of future study for Bermuda stone would be trying to identify and document other places throughout the United States and the Atlantic world where Bermuda stone appears. Charleston was only one of the many hundreds of ports where Bermudians traded. The stone was likely used in many of the other cities where Bermudians traded and settled along the American coast and throughout the Caribbean. Identifying these sites will help to tie Charleston and Bermudian trade networks together with the rest of the Atlantic world in the 18th century, and provide a greater understanding of how a building material can reflect the economic and political history of a culture.

Charleston has a vibrant, well preserved, and heavily studied historic built environment. Even during the final editing of this thesis Bermuda stone blocks were found at the Edmondston-Alston House, and at 23 Legare Street. Bermuda stone continues to be revealed throughout the city and ongoing study is crucial for its identification and preservation. It is critical that the public, the preservation community, and the building trades use materials like Bermuda stone and many others to understand the cultural and material heritage of the city. There is much more that can be learned by studying these materials and even more to be earned by ensuring their survival for generations to come. Though it was transported thousands of miles by Bermudian sailors over 200 years ago, Bermuda stone has a significant presence in Charleston to this day. Bermuda stone is a
significant feature of Charleston’s cultural, material, and economic heritage and merits careful preservation and documentation to ensure that it has a permanent place in the future.
Appendix A

Bermuda Stone Locations Map: Charleston, South Carolina

Figure 32: Bermuda stone locations map. Image courtesy of Google Maps. *McLeod Plantation (James Island) and Horry-Lucas Plantation Ruins (West Ashley) are not within the map area.

<table>
<thead>
<tr>
<th>Bermuda Stone Locations Map Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bermuda stone house:</td>
</tr>
<tr>
<td>Bermuda stone wall:</td>
</tr>
<tr>
<td>Bermuda stone paving:</td>
</tr>
</tbody>
</table>

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### Appendix B

**Bermuda Stone Locations Chart**

<table>
<thead>
<tr>
<th>Location in/ around Charleston</th>
<th>Approximate Date of Installation</th>
<th>Aeolian Stone</th>
<th>Marine Deposit Stone</th>
<th>Whole or Partial Building Construction</th>
<th>Garden or Property Wall</th>
<th>Paving in Courtyard or Driveway</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Chalmers St – The Pink House</td>
<td>1690-1720</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 Church St – Rear 2 story building</td>
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<td>Unknown</td>
<td>Unknown</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>141-145 Church St</td>
<td>1715-1750</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Legare St- Simmons- Edwards House</td>
<td>1800</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Legare St- Sword Gate House</td>
<td>1803</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McLeod Plantation- Buttery Foundation</td>
<td>Possibly mid-18th c.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horry- Lucas Plantation Ruins</td>
<td>1750-1760</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 St. Michael’s Alley</td>
<td>c.1750</td>
<td>Unknown</td>
<td>Unknown</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location in/around Charleston</td>
<td>Approximate Date of Installation</td>
<td>Aeolian Stone</td>
<td>Marine Deposit Stone</td>
<td>Whole or Partial Building Construction</td>
<td>Garden or Property Wall</td>
<td>Paving in Courtyard or Driveway</td>
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<td>-------------------------------</td>
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<tr>
<td>38 State St</td>
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<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>78 Church St (stone relocated from 38 State)</td>
<td>2001</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>58 South Battery</td>
<td>1800</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>64 South Battery - William Gibbes House (kitchen house)</td>
<td>c.1772</td>
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<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>White Point Gardens- Fortified Sea Wall</td>
<td>1769</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2 Water St</td>
<td>Pre-1800</td>
<td>X</td>
<td></td>
<td></td>
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<td>24 Water St</td>
<td>Mid-19th c.</td>
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<td>X</td>
<td></td>
<td></td>
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<tr>
<td>48 Tradd St - foundation</td>
<td>c.1770</td>
<td>X</td>
<td></td>
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<tr>
<td>56 Tradd St</td>
<td>c.1750</td>
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<td>Unknown</td>
<td></td>
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<tr>
<td>70 Tradd St</td>
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</tr>
<tr>
<td>87-89 Wentworth St</td>
<td>c.1730</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
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</table>
Appendix C

Bermuda Stone Location Photographs

Image 1: 143-145 Church St Charleston, SC. Constructed c. 1740 primarily out of Bermuda stone.

Image 2: The narrow alley between 143 and 145 Church Street shows an uncovered wall of Bermuda stone.
Image 3: The Horry-Lucas Plantation Ruins (c. 1760) front staircase at Charlestowne Landing. The foundation and front stair of this plantation were constructed of brick and Bermuda stone.

Image 5: The gate and walkway of 32 Legare St c.1800. The front walk is paved entirely with large Bermuda stone blocks.

Image 6: Looking through the sword gates at 32 Legare the Bermuda stone walkway.
Image 7: 4 St. Michael’s Alley c.1750 (the house on the right of the image) is partially constructed of Bermuda stone.

Image 8: 4 St. Michael’s Alley again on the right side of the image. The stucco has worn away at this time revealing the Bermuda stone blocks. Image c.1865 courtesy of the Lowcountry Digital Library.
Figure 33: The Pink House c.1690. This house is one of the oldest buildings in Charleston and is partially constructed of Bermuda stone.

Figure 34: An 1890 image of the Pink House. Courtesy of Lowcountry Digital Library.
The entire courtyard of this former shipping merchant’s house was paved in massive Bermuda stone blocks. Unfortunately most of the stone was moved to 78 Church St during a renovation in the early 2000’s.

Only a few blocks of Bermuda stone remain in the courtyard of 38 State St.
This rear courtyard contains the massive amounts of Bermuda stone that was removed from 38 State St. The stone was removed in order to help save it from destruction during the renovations of 38 State St.

56 Tradd St c.1751 is partially constructed of Bermuda stone. Though no stone is visible through the stucco, the Preservation Society plaque makes reference to the material.
Image 13: 70 Tradd St, the Judge Robert Pringle house was built c.1774. There is a solitary Bermuda stone block in the driveway. It does not appear to be in its original placement as the driveway is a newer construction.

Image 14: The solitary Bermuda stone block at 70 Tradd is seen in the bottom center of the image.
Image 15: 2 Water St c.1810. A significant amount of Bermuda stone was removed from the rear courtyard of the property before the construction a new addition (2007) seen on the left of the image.

Image 16: 2 Water St. Many of the stones were re-used by the contractor in the new driveway.
Image 17: The wall at 24 Water St contains a significant amount of large Bermuda stone blocks.

Image 18: The large Bermuda stone blocks are likely part of an earlier wall that had fallen into disrepair. The wall was then capped at a later date with brick and other fill materials were added to patch the original wall.
Image 19: 87-89 Wentworth St. The St. Philip’s Parish Glebe Tenements. c. 1730. The tenement houses have architectural details, like the window sills, fashioned out of Bermuda stone.

Image 20: A view of the second story western window sill seen from above. The heavily aged grey Bermuda stone is seen through the degraded blueish green stucco.

Image 22: Bermuda stone was found in the large rubble wall on the left side of this image during excavations in January, 2014. These excavations found what had originally been a 1769 Fortified Sea Wall in White Point Gardens. Sample 7 from the following sample glossary was recovered from this test pit.
### Appendix D

**Bermuda Stone Sample Photographs**

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Aeolian Stone</th>
<th>Marine Deposit Stone</th>
<th>Not Bermuda Stone</th>
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<tbody>
<tr>
<td>Sample 1: Smithsonian block</td>
<td>X</td>
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<tr>
<td>Sample 2: Atlantic Wharf</td>
<td>X</td>
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<td></td>
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<tr>
<td>Sample 3: Smithsonian fragment</td>
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<tr>
<td>Sample 4: Ashley River marlstone</td>
<td></td>
<td></td>
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<tr>
<td>Sample 5: Horry-Lucas Ruins</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample 6: Sword Gate House</td>
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<td></td>
</tr>
<tr>
<td>Sample 7: 1769 Fortified Sea Wall</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample 8: William Gibbes House</td>
<td>X</td>
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<td></td>
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</table>
Image 23: Sample 1, view 1- The Smithsonian sample. This Aeolian Bermuda stone was quarried from the Public Works Quarry on Bermuda in 2001. It was intended for use in the Smithsonian Folk Life Festival in Washington D.C. that highlighted Bermudian architecture.

Image 24: Sample 1, view 2- The Smithsonian sample weighs 57lbs. It was used as a control sample for comparison to Bermuda stone identified at sites throughout Charleston.
Image 25: Sample 2, view 1- A small fragment of Aeolian Bermuda stone from archaeological excavations at Atlantic Wharf. Courtesy of Martha Zierden and the Charleston Museum. This Bermuda stone was recovered from a stratified layer dating to approximately 1760.

Image 26: Sample 2, view 2- The fine round grains of Aeolian Bermuda stone are clearly visible in this macro image.
Image 27: Sample 3, view 1-fragments of Aeolian Bermuda stone from the Smithsonian sample shown later in the gallery.

Image 28: Sample 3, view 2-These fragments fell off of the Smithsonian sample during shipment. Once again the fine round grains of Aeolian Bermuda stone are easily identifiable.
Image 29: Sample 4, view 1- A small fragment of local Ashley River Marlstone. The aggregate of local marlstone is a very fine silt like material and has a yellow to light umber hue. It is distinctly different from the Bermuda stone samples found throughout the city.

Image 30: Sample 4, view 2- The Ashley River Marlstone. This sample is included as a control to differentiate it from the Bermuda stone samples.
Sample 5, view 1. A Bermuda stone sample from the Horry-Lucas Plantation Ruins at Charlestowne Landing. This Aeolian Bermuda stone makes up the majority of the house ruin foundations.

Sample 5, view 2. The exposed stone at the Horry-Lucas house ruins has left the Bermuda stone foundations in extremely weathered condition.
Image 33: Sample 6, view 1- A Bermuda stone paver from 32 Legare St. The Marine Deposit Bermuda stone is a prime example of the possible variation in Bermuda stone samples.

Image 34: Sample 6, view 2- Though the Aeolian Bermuda stone samples and Marine Deposit are similar in color, the Marine Deposit stone has far more shell and fossil inclusions.
A large piece of Bermuda stone recovered from archaeological excavations in White Point Gardens to locate the 1769 Fortified Sea Wall of Charleston.

This sample is only one of many large pieces of Aeolian Bermuda stone recovered from the Fortified Sea Wall excavations. The team believes that these blocks were part of the original wall which was partially constructed of 25,000 Bermuda stone blocks.
Image 37: Sample 8, view 1- This Aeolian Bermuda Stone was recovered at 64 South Battery. The William Gibbes House c.1772 was the family seat of the Bermudian Merchant family. This is likely a fragment left over from the construction of the Bermuda stone kitchen house that still stands.
Appendix E

Bermuda Stone Identification Guide

It is important to note that through the investigation of the many locations in Charleston that there was no evidence of marl stone or coquina being used. The reason for this quick reference guide is to inform the reader of the different variations of Bermuda stone and its changes of time. It is also to empower the reader to confidently identify Bermuda stone in situ as compared to other materials it may be confused with.

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**AEOLIAN BERMUDA STONE:** Characterized by its white to light cream color and very fine round grains. There is little to no shell content in this type of stone. The material is fairly light by weight and typically includes many voids, channels and loosely stratified layers. It will sand heavily to the touch and sometimes retains evidence of tool marks.

**MARINE DEPOSIT BERMUDA STONE:** Characterized by the presence of shell fragments and fossils. The stone is usually an off white to buttermilk color. It is denser than aeolian stone and has strongly consolidated aggregate.

**HEAVILY WORN BERMUDA STONE:** When Bermuda stone is left exposed for long periods of time it can often change to a light grey color and breaks down into smaller pieces. Aeolian Bermuda stone is more subject to color change and destructive weathering.
ASHLEY/COOPER RIVER MARL: THE MARLSTONE THAT IS LOCAL TO THE CHARLESTON AREA IS MUCH DIFFERENT THAN BERMUDA STONE. THE AGGREGATE IS TYPICALLY A VERY FINE SAND AND SILT MATERIAL. IT HAS A DARKER AND MORE IRREGULAR COLORING THAN BERMUDA STONE OFTEN WITH GREY, UMBER, AND ORANGE INCLUSIONS. THE MATERIAL IS DENSLY CONSOLIDATED WITH FEW VOIDS.

COQUINA STONE: BERMUDA STONE, EVEN MARINE DEPOSIT BERMUDA STONE IS VERY DIFFERENT THAN COQUINA STONE. THOUGH THERE ARE VAST DEPOSITS OF COQUINA STONE ALONG THE FLORIDA COASTS AND THE STONE WAS CREATED IN A SIMILAR WAY, COQUINA HAS FAR MORE CONSISTENT SHELL DEPOSITS WITHIN THE SEDIMENT LAYERS. THE COQUINA CLAM (DONAX VARIABILIS) IS THE PRIMARY FOSSILIZED SPECIES IN COQUINA AND APPEARS IN MUCH HIGHER DENSITY THAN THE SHELL CONTENT IN BERMUDA STONE SAMPLES WITH SHELL CONTENT.
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