

United States Department of the Interior  
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES  
REGISTRATION FORM

1. Name of Property

historic name: **Amona**

other names/site number: **Isla de Mona [preferred], Mona Island**

2. Location

street & number: [redacted] not for publication

city or town: **Mayagüez** vicinity **X**  
state: **Puerto Rico** code: **PR** county: **Mayagüez** code: **097**  
zip code: **00680**

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this **X** nomination \_\_\_ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property **X** meets \_\_\_ does not meet the National Register Criteria. I recommend that this property be considered significant **X** nationally \_\_\_ statewide \_\_\_ locally. ( \_\_\_ See continuation sheet for additional comments.)

Arleen Pabón PhD  
Signature of certifying official

October 29, 1993  
Date

Puerto Rico State Historic Preservation Office  
State or Federal agency and bureau

In my opinion, the property \_\_\_ meets \_\_\_ does not meet the National Register criteria. ( \_\_\_ See continuation sheet for additional comments.)

\_\_\_\_\_  
Signature of commenting or other official

\_\_\_\_\_  
Date

\_\_\_\_\_  
State or Federal agency and bureau

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4. National Park Service Certification  
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I, hereby certify that this property is:

\_\_\_\_\_ entered in the National Register \_\_\_\_\_  
\_\_\_\_\_ See continuation sheet. \_\_\_\_\_  
\_\_\_\_\_ determined eligible for the \_\_\_\_\_  
\_\_\_\_\_ National Register \_\_\_\_\_  
\_\_\_\_\_ See continuation sheet. \_\_\_\_\_  
\_\_\_\_\_ determined not eligible for the \_\_\_\_\_  
\_\_\_\_\_ National Register \_\_\_\_\_  
\_\_\_\_\_ removed from the National Register \_\_\_\_\_  
\_\_\_\_\_ other (explain): \_\_\_\_\_

\_\_\_\_\_  
Signature of Keeper Date  
of Action

=====  
5. Classification  
=====

Ownership of Property

\_\_\_\_\_ private  
\_\_\_\_\_ public-local  
 X  public-State  
 X  public-Federal

Category of Property

\_\_\_\_\_ building(s)  
 X  district  
\_\_\_\_\_ site  
\_\_\_\_\_ structure  
\_\_\_\_\_ object

Number of Resources within Property

Contributing	Noncontributing
<u> 8 </u> lighthouse and outbuildings	<u> 32 </u> buildings
<u> 9 </u> prehistoric and historic sites	<u> 0 </u> sites
<u> 4 </u> 2 guano work ruins, 1 roadway, and cistern	<u> 1 </u> structures (air field)
<u> 0 </u>	<u> 0 </u> objects
<u> 21 </u>	<u> 33 </u> Total

Number of contributing resources previously listed in the National Register  8  (Mona lighthouse and outbuildings)

Name of related multiple property listing: N/A

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6. Function or Use  
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Historic Functions

Cat: Domestic  
Defense  
Transportation  
Industry/Processing/Extraction

Sub: Village Site  
Naval Facility  
Lighthouse  
Extractive Facility

Current Functions

Cat: Landscape

Sub: Conservation Area

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7. Description  
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Architectural Classification: Other - Metal Lighthouse

Materials: Metal  
foundation: Concrete  
roof: Iron  
walls: Iron  
other: Stone and brick used in construction of guano works and  
water cistern

Narrative Description

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8. Statement of Significance  
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Applicable National Register Criteria

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B Property is associated with the lives of persons significant in our past.
- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations

(Exception): A\_\_\_ B\_\_\_ C\_\_\_ D\_\_\_ E\_\_\_ F\_\_\_ G\_\_\_

NHL Criteria: **Criteria 1, 2 and 6**

NHL Theme(s):

- I. **CULTURAL DEVELOPMENTS: INDIGENOUS AMERICAN POPULATIONS**
  - A. The Earliest Inhabitants
    - 3. The Early Peopling of the Caribbean
    - 14. Archaic Adaptations of the Caribbean
  - B. Post-Archaic and Pre-Contact Developments
    - 17. Caribbean Adaptations
  - D. Ethnohistory of Indigenous American Populations
    - 1. Native Cultural Adaptations at Contact
    - k. Native Adaptations to Caribbean Environments
- II. **EUROPEAN COLONIAL EXPLORATION AND SETTLEMENT**
  - A. Spanish Exploration and Settlement
    - 1. Caribbean
  - B. French Exploration and Settlement
  - C. British Exploration and Settlement
- XII. **BUSINESS**
  - A. Extractive or Mining Industries
    - 3. Other Metals and Minerals - Guano

Areas of Significance: **Archeology - Prehistoric, Archeology - Historic -  
Aboriginal, Maritime History  
Maritime History**

Period of Significance: **2380 B.C - A.D. 1500, A.D. 1493-1898**

Significant Dates: **A.D. 1493, 1494**

Significant Person: **Juan Ponce de León, Captain William Kidd**

Cultural Affiliation: **Archaic, Ostiones, Taino (Arawak)**

Architect/Builder: **N/A**

Narrative Statement of Significance

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9. Major Bibliographical References

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Previous documentation on file (NPS)

\_\_\_ preliminary determination of individual listing (36 CFR 67) has been requested.

\_\_\_ previously listed in the National Register

\_\_\_ previously determined eligible by the National Register

\_\_\_ designated a National Historic Landmark

\_\_\_ recorded by Historic American Buildings Survey # \_\_\_\_\_

recorded by Historic American Engineering Record # PR-24 (Lighthouse)

Primary Location of Additional Data

- State Historic Preservation Office Puerto Rico
- Other State agency Secretary, Department of Natural Resources, P.O Box 5887, Puerta de Tierra, San Juan, Puerto Rico 00906
- Federal agency G-ECV-2B, Enviromental Section, Civil Engineering Division, United Sates Coast Guard, 2100 Second Street, S.W., Washington, D.C. 20593
- Local government
- University
- Other

Name of repository: Pedro Gutiérrez, 458 José Canals Street, 4th Floor, Roosevelt, Hato Rey, Puerto Rico 00918

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10. Geographical Data  
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Acreage of Property: [REDACTED]

UTM References

Zone Easting	Northing	Zone Easting	Northing
[REDACTED]			

Verbal Boundary Description

Boundary Justification

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11. Form Prepared By  
=====

name/title: Mark Barnes, Ph.D., Senior Archeologist, National Register Program Division

organization: National Park Service, S.E.R.O. date: July 23, 1993

street & number: 75 Spring Street, S.W.

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city or town: Atlanta state: Georgia zip code: 30303

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Isla de Mona  
Mayagüez, Puerto Rico

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NARRATIVE DESCRIPTION

[REDACTED]

Sea to the south. In 1493, Christopher Columbus discovered and named the island on his second voyage to the New World. Because of its location on a major international sea lane, Mona Island served as a basis of operations and refitting station to generations of explorers, pirates, and privateers from the sixteenth through the early nineteenth centuries. In the late nineteenth and twentieth centuries the Mona Island light served to ensure safe passage for international shipping between the Caribbean and the Atlantic, while the island was a major source of nitrates.

**Environmental Setting:** Viewed from above, Mona Island is elliptical in shape. Most of the north and east coasts of the island presents a sheer cliff face to the sea, ringed with a coral reef, except where the waters of the Caribbean have eaten large caverns into the island. On the western end and a portion of the southern side of the island there are safe anchorages and sandy beaches permitting access to the interior of the island. Along these beaches a number of springs in caves, such as Portuguese Well, furnished drinking water and shelter to the prehistoric and historic occupants of the island. Most of the island interior is a flat plateau with little topographic relief (Crusoe and Deutsche 1974:1; Rouse 1952:363).

According to Frank H. Wadsworth, Mona is composed of primarily of limestone deposits formed millions of years ago on the floor of the Mona Passage. Plate tectonics forced this part of the sea floor upward until it is now about 300 feet above sea level at its highest point (1952:17). During its upward movement

. . . waves began eating at the soft limestone even before the island broke the surface. Afterward they slowly undermined the coast, and large rocks broke loose and fell into the sea, a process which produced sheer cliffs. On the windward [east and north] coast the great

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force of the waves has eaten away the rock to such a depth that there is no shallow water beneath the cliffs. Where the [west and south] shore has been more protected from wave action, a coastal shelf has remained beneath the surface. Upon this shelf corals have produced reefs which break the force of the waves, protecting a narrow coastal plain which makes up about six percent of the land surface.

The weather also molded the island. While it was still young the rains were heavier than now and more effective in dissolving the limestone. The rain water ran off directly into the sea where possible, but elsewhere it collected in natural pockets or depressions in the nearly level surface. During thousands of years this impounded water ate its way down through the softer parts of the limestone. Some distance down, but still above sea level, it met in some places a harder layer [of limestone]. The water there found more ready escape to the sea horizontally along the upper surface of this [harder] layer to the edge of the island than vertically downward through it. Thus horizontal channels gradually formed in the rock. The caving in of the rock above these growing channels produced large caverns. The impurities in the limestone which were not soluble in water accumulated in the depressions on the floor of these caverns. Many centuries later, as the rainfall gradually decreased, a large part of the water which penetrated the limestone evaporated while still in the caves, before it reached the sea. The lime which this water dissolved was then left behind on the surface [and roof] of the caves in the form of stalactites and stalagmites [Wadsworth 1952:17-18].

The topography of the island falls into three categories: the western and southern coastal plain area, the cliffs surrounding the island, and the plateau or mesa of the interior. The coastal plain is the most fertile part of Mona and supports a number of floral species, such as sea grape, acacia, and mangrove. Within this environment the Taino natives produced abundant crops of cassava, maize, and beans (Cardona Bonet 1985:51). Up from the mangrove area are found thick stands of papaya, Australian pine,

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coconut, and mahogany trees.

The plateau area (see Figures 1 and 2) is more xerophytic, or desert-like, because the rain fall, though substantial, percolates away through the limestone of the island. This percolation contributed to the development of extensive limestone caves, that contained extensive deposits of nitrates. The predominate vegetation is cacti and shrub-like growth. The cliffs of the island contain little vegetation (Crusoe and Deutschle 1974:5-8).

The prevailing winds and currents of the Mona Passage are from the northeast. This means that a sailing ship from Mexico or South America heading north would have had to slowly beat to the east to use the Mona Passage. The slow traverse of the Mona Passage was necessary for these ships to reach the more favorable trade winds north of Puerto Rico to carry North American or Europe bound ships through the Florida Straits up the east coast or across the Atlantic, respectively (Hoffman 1980:5).

In May of 1975 the Secretary of the Interior designated Mona and Monita Islands a National Natural Landmark. Designation was based on the floral and fauna unique to the islands and the cave system of Mona which is considered "the largest, most extensive and most unusual in the world" (Anonymous 1992:101).

**Archeological Investigations:** According to Irving Rouse, there was early archeological interest in the Taino culture that once occupied Mona Island.

In 1858, José Julián de Acosta y Calbo, a Porto Rican historian went to Mona, but he was unable to find any trace of human habitation. Around 1930, Dr. J.L. Montalvo Guenard visited the island and located the site [redacted] [1952:365].

Dr. Jorge L. Montalvo Guenard conducted the first archeological investigations on Mona Island in 1933. He identified an archeological site [redacted]

[redacted] Guenard found prehistoric and sixteenth century Spanish artifacts on the surface of this site (see Figure 3) (Dávila 1991:87).

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Dr. Rouse, of Yale University, spent some time on Mona in 1938, and during that visit excavated two test pits into the Sardinero Site located by Dr. Guenard. The site of Sardinero is situated at

[REDACTED]. The site was pointed out to Rouse by Civilian Conservation Corp workers on the island who reported finding a stone celt and burial in the vicinity of the site (Rouse 1952:366).

Sardinero proved to be a large stratified Taino village site. The lower levels of the site produced prehistoric Period III Ostiones ceramics (ca. A.D. 1000), while the upper levels yielded late prehistoric and early historic Period IV Boca Chica, Carrier, and Capá ceramics (ca. A.D. 1200-1550) (Rouse 1952:366-368; Rouse and Allaire 1978:466). Mixed in with the upper levels of the site Rouse found "14 European potsherds and a piece of iron" and the faunal remains of "cow and other European mammals" (1952:368), indicating an occupation by Tainos in contact with Europeans of the early sixteenth century (Goggin 1968:40).

During Rouse's 1938 visit to Mona he also learned of the existence of a Taino ball court [REDACTED] island, but he did not visit it" (Alegría 1983:113; Dávila 1991:88). This site, later called Corral de los Indios (see Figure 4), was visited by Ricardo Alegría, in 1951. On this visit Alegría found

. . . evidence of a small batey [ball court] formed by two rows of stones that were greatly disturbed. On the surface we found several shell artifacts and two fragments of Capá-style pottery sherds [Alegría 1983:113].

A later 1972 report noted the ball court was open-ended and measured 28 by 13 m in size (Alegría 1983:113).

Between 1969 and 1977, Dr. Pedro M. Santana, a professor of geography of the Regional College of Bayamón, explored the island with his students. During these explorations Santana found prehistoric petroglyphs and pictographs on the walls of a cave [REDACTED] (Dávila 1991:88). He also explored the interior of the island.

[REDACTED], Pedro Santana reported the

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discovery of another ball court formed by two rows of stones buried on edge, at least 26.5 by 39 m in size (see Figure 4) (Alegria 1983:113-115).

In 1974, National Park Service archeologists Donald L. Crusoe and Stephen A. Deuschle, of the Southeast Archeological Center visited Mona Island to conduct a reconnaissance level archeological survey of the island. This work identified two major sites (Sardinero and Doña Geña) which both appear to date from about A.D. 1000 up through the early sixteenth century (1974:11-12); in addition to the two ball courts previously identified (Cerezos and los Corrales). These archeologists also located four caves sites containing prehistoric pictographs and petroglyphs -- Cueva Negra, Cueva del Agua, an unnamed cave [REDACTED] and Cueva del Caballo (1974:12).

In addition to these prehistoric sites, the survey found old tramways and mining equipment used to remove guano, used for fertilizer, from caves [REDACTED] (Crusoe and Deuschle 1974).

In August of 1981, the Institute of Puerto Rican Culture, in conjunction with the Division of Marine Resource, undertook an eight day assessment of sites [REDACTED] anticipation of potential development projects. One of the sites located in this area is a cave known as Cueva de las Caritas (see Figures 7 and 8), so named because of the numerous petroglyphs carved on limestone boulders at its entrance. This work was followed up in 1982 and 1983 with excavations in a cave, later called Cueva de los Caracoles, [REDACTED] (Dávila 1991:89-90).

This work by Ovidio Dávila, of the Institute of Puerto Rican Culture, uncovered the first evidence of a preceramic or Archaic occupation of Mona Island. Dávila's excavations recovered 163 stone tools, food remains in the form of marine shells (Strombus gigas, Charonia variegata, Cittarium pica, and Neritina virginea) and bones of birds and fish, 4 fragments of human bone, and charcoal, which produced a radiocarbon date of 2,380 B.C. (Dávila 1991:92-93).

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During the latter half of the nineteenth century the Spanish government of Puerto Rico realized the need to improve the harbor and shipping facilities for the island. Exports in sugar, coffee, and tobacco, matched imports in food for the expanding agricultural labor force. Isla de la Mona was selected as a key point in a lighthouse system that ringed the island with navigation beacons. It also served as the main light for international shipping in the Mona Passage throughout the late nineteenth and twentieth centuries.

Construction of the lighthouse began in 1888 at one location, but was later moved closer to the eastern edge of the island. Work was finished ca. 1900. The Faro de la Isla de la Mona (Mona Island Lighthouse) is the only Puerto Rican lighthouse made of prefabricated metal construction. The main structure is a 12.5 m high iron tower with a central cylindrical shaft braced laterally with iron lattice work. It has an iron winding stairway to a 12 sided lantern, 3 m in diameter and 2.5 m high. The illuminating apparatus was a lenticular lamp, 1.4 m in diameter and over 2 m in height, made by Sautter, Lemonnier and Company in France. The metal light keeper's house is connected to the tower by a covered steel passage. The house is approximately 20 m by 10 m in size with 7 rooms. It is built of steel plates over wooden framing. The flashes of light were produced by the revolving lens being mounted on a clock activated chariot system. The clock cord and its 180 pound weight descended through the tower stairway central column. In 1938 the light was electrified, and in 1973, it was automated. In 1976 the light was relocated and the structure abandoned (Nistal-Moret 1979:22-23).

Also associated with the Mona Lighthouse is a turn-of-the-century brick water cistern, and six concrete and metal roof buildings constructed by the United States Coast Guard in the twentieth century (see Figure 9).

During the last half of the nineteenth century nitrate or guano miners constructed a large stone roadway from Playa de Pájaro to the top of the cliffs, to facilitate the movement of guano from other parts of the island to a processing station on Playa de Pájaro, now consisting of two large brick and stone ruins.

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*vivienda*

**Integrity:** With the exception of the construction of 32 dwellings built between 1930's and 1950's on the western and southern edge of the island, and a small grass runway on the southwestern coast of Mona Island, built just before World War II, little on the island has changed since it was discovered by Columbus in 1493, and used as a pirate base from the sixteenth through the early nineteenth centuries. (These have been determined noncontributing resources because Civilian Conservation Corps (1930's) and World War II (1941-1945) historic contexts for the island have not yet been developed.)

Cultural resources on the island consist of 9 prehistoric and historic Taino archeological sites found throughout the island, the roadway constructed by the nitrate miners, the 2 ruins of a nitrate processing station on the southeastern shore of the island, and the site of the first lighthouse (brick water cistern) and the current lighthouse and 7 associated outbuildings, on the east side of the island.

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**NARRATIVE STATEMENT OF SIGNIFICANCE**

**Summary paragraph**

The strategic position of Isla de la Mona (Mona Island) within the international sea lane of the Mona Passage meant that from the earliest period of European exploration of the New World the island would be significant in the maritime history of the Caribbean. It served as an important provisioning station for the earliest Spanish colonial voyages, and later from the sixteenth through the early nineteenth centuries as one of the most feared pirate bases in the Caribbean Basin. Archeological investigations on Mona Island have also produced evidence for the island containing the complete sequence of prehistoric and historic Native American occupation of the Caribbean. In particular, Mona has intact evidence of some the earliest human occupations of the Caribbean (Archaic Period), as well as Ostiones (A.D. 600-1000) and Taino (A.D. 1000-1540s) occupations.

Mona is considered nationally significant for its role as a way station in the early voyages of discovery, and as a pirate base of operations on an international sea lane, under the theme of European Colonial Exploration and Settlement. It is considered nationally significant for its potential to provide the information on prehistoric and historic Native American occupations of the Caribbean, under the theme of Cultural Developments: Indigenous American Populations. Mona is also considered significant under the theme of Business (Mining and Extractive Industries) for its role in guano mining.

**I. CULTURAL DEVELOPMENTS: INDIGENOUS AMERICAN POPULATIONS**

- A. The Earliest Inhabitants**
  - 3. The Early Peopling of the Caribbean**
  - 14. Archaic Adaptation of the Caribbean**
- B. Post-Archaic and Pre-Contact Developments**
  - 17. Caribbean Adaptations**
- D. Ethnohistory of Indigenous American Populations**
  - 1. Native Cultural Adaptations at Contact**
    - k. Native Adaptations to Caribbean Environments**

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Prehistoric and Historic Native American  
Occupation of Mona Island

A date of some "time prior to 5000 B.C." (Willey 1978:541) has been established as the earliest scientifically verified evidence of humans in the islands of the West Indies in the Caribbean. This early occupation, termed the Casimira culture, was identified in the 1960s on island of Hispaniola and is believed to have lasted from ca. 5000 B.C. to ca. 1000 B.C. (Rouse and Allaire 1978:465). The people of this culture "were highly proficient in the working of flint" (Rouse and Allaire 1978:466), and left evidence of their occupation in lithic sites on the interior of Hispaniola, and in shell middens along the coast of that island.

Until the work accomplished by Dávila, in the 1980s, at the Cueva de la Caracoles on Mona, no contemporary evidence of a Casimira-like lithic culture was known to exist outside Hispaniola. A radiocarbon date of 2,380 B.C. for this Mona site, and evidence of faunal materials, such as preserved shell and bone remains, could substantially increase our knowledge of the first human cultures to inhabit the Caribbean Basin and understand how they were able to adapt to an island environment.

Like the Casimira culture period, there are still many gaps in the cultural history of the cultures that inhabited the islands of the Caribbean before the advent of Europeans to the New World. The early Casimira lithic cultures were replaced by ca. 1 A.D. throughout most of the Caribbean, by new cultural groups that possessed ceramics. These cultural groups are referred to in the archeological literature as Saladoid. These cultural groups were probably responsible for the archeological sites found in the twentieth century by archeologists investigating the western coast of Mona. Much is still to be learned about these early ceramic producing cultures in terms of their origin and spread throughout the Caribbean. As a halfway point between Hispaniola and Puerto Rico, investigation of Saladoid sites on Mona could possibly help to date the spread of these ceramic cultures between islands of the Greater Antilles.

Recent archeological investigations in the caves [redacted] [redacted] Mona Island demonstrate that intact archeological remains exist for further research. In particular, the finding of organic

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remains will be significant for using charcoal for radiocarbon dating archeological strata, and determining subsistence using shellfish and animal remains.

Current archeological information, demonstrates that by the 1490s, when the first contact of Europeans with the historically known Taino cultures of the Greater Antilles occurred, Mona was situated within the middle of the Capá culture area covering western Puerto Rico and eastern Hispaniola. Surveys of Mona have produced ceramics and features, such as ball courts, common to the Capá culture. From early Spanish accounts it is apparent that Mona functioned as an important water transportation link between the Taino inhabitants of Hispaniola and Puerto Rico. Archeological investigations of Capá Period sites on Mona could be significant in understanding this late prehistoric and protohistoric culture due to the relative lack of impact on archeological sites on the island.

In addition, we know from these same historic accounts that Mona and its Taino population functioned to assist the Europeans in their conquest of the Caribbean by producing large quantities of cassava bread (see Figure 10). According to Walter A. Cardona Bonet,

Cassava was made from the yuca tuber after painstakingly extracting the poisonous liquid. The finished product resembled a bread-like white mass which upon baking resulted in a hardened edible biscuit. The nearly imporous surface of the biscuit permitted durability throughout most the oceanic journey. In fact, cassava was extensively used for navigational purposes up to the early years of the twentieth century. Highly appraised in the Indies, it constituted an important agricultural crop which brought about the settling and colonizing of immediate isles off Hispaniola. "This bread is good and of excellent maintenance and it lasts at sea, and is made as thick as half a finger for people . . . The cassava bread can last a year or more and is transported by sea to all these islands . . . and even to Spain . . ." noted Oviedo. Friar Joseph Acosta added "The cassava lasts a very long time, and thus is taken in place of bread by the navigators." Throughout the centuries, most sailing

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crews had a weekly ration essentially consisting of a daily one and a half pounds of cassava [1989:25-26].

As Mona produced literally tons of cassava every year for outfitting ships crews, and feeding settlers, the Spanish did not remove the in-situ population until the mid-sixteenth century, but established a mission on the island to help maintain the Mona Islanders. Archeological investigations of historic period Taino sites on Mona could help shed light on the effects of contact between Europeans and the Taino culture and their role in providing the foodstuffs that assisted the Spanish conquest of Puerto Rico.

II. EUROPEAN COLONIAL EXPLORATION AND SETTLEMENT

- A. Spanish Exploration and Settlement
  - 1. Caribbean
- B. French Exploration and Settlement
- C. British Exploration and Settlement

Early European Exploration and Settlement

On his second voyage to the New World (1493), Christopher Columbus (see Figure 11) elected to take advantage of westerly winds and currents in crossing the Atlantic by taking a route that made landfall near the southern end of the Lesser Antilles, instead of making for the more northerly located Bahamian Islands, which would require fighting contrary winds and currents, as he did on his first voyage. This allowed for a quicker transit of the Atlantic, and once on the Caribbean side of the Lesser Antilles, Columbus could coast northward to the Greater Antilles island of Hispaniola (present day Haiti and the Dominican Republic) where he had established a small colony (La Natividad) on the north side of that island during his first voyage.

In was on Columbus's second voyage that he discovered the southern and western coasts of Puerto Rico, which he called San Juan Bautista. Columbus stopped along the west coast to take on water, before heading west across the Mona Passage that separates Puerto Rico from Hispaniola. As he crossed the Mona Passage to Hispaniola, Columbus sighted Isla de la Mona, called Amona by the Tainos. According to Samuel E. Morison,

At daybreak November 22, [1493] the fleet took its

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departure from Puerto Rico the last important island newly discovered on this outward passage, and steered a northwesterly course for Hispaniola as indicated by Arawak [Taino] guides. After sighting the little island named Mona by the Admiral, and from which the Mona Passage is called, they steered northeasterly [1942:422].

Neither Columbus nor any other European visited Mona until the following year (1494), when the Admiral stopped at Mona Island with a Spanish military force to conduct a punitive expedition against the Caribs in the Lesser Antilles (Rouse 1952:363). On September 24, 1494, the fleet anchored off Mona and Columbus went ashore with a party to gather water, where the Admiral became ill and was forced to abandon the expedition (Morison 1942:479). According to Las Casas, a sixteenth century historian of the conquest of the Indies,

The Admiral [Columbus], in a letter which he wrote to the Sovereigns [King Ferdinand and Queen Isabela], says that on this voyage he intended to go to the islands of the cannibals [Caribs] in order to destroy them, but that he had suffered great and continuous hardships and lack of sleep, night and day, without one hour of rest, on his discovery of Cuba and Jamaica, and in going around Española [Hispaniola] until arriving at this small island of Mona. Especially was this so when he was going through the many small islands and shoals near Cuba which he named the Garden of the Queen and where he was thirty-two days without being able to sleep.

He says that when he departed Mona, as he was nearing the island of San Juan [Puerto Rico's west coast], he was suddenly overcome by pestilential drowsiness which totally deprived him of his senses and all his strength. He looked as though he was dead, and they did not think he would last more than one day. Therefore, the sailors, as quickly as they could, turned from the course the Admiral was following and wished to follow, and they brought him to Isabela [located on the northern coast of Haiti] with all three vessels. He arrived there on September 29, 1494 [Tyler 1988:152].

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During the early sixteenth century, Mona became an important stopping point for Spanish ships outbound back to Spain as a source of fresh provisions -- water, food, and wood, and was marked on numerous sixteenth century maps of the Caribbean (see Figures 12 and 13). The Spanish may have obtained their water from Portuguese Well located just to the east of Sardinero Beach. The Taino of Mona raised various crops, such as cassava, sweet potatoes, and cotton, but most important to the Spanish mariners was cassava bread, made from the yuca plant, for ships bread. According to Carl Sauer,

. . . two acres or less of cultivated land would yield a hundred fifty to a hundred seventy five cargas of cassava bread, each carga being two arobas (the arroba 25 pounds), and that a carga provided food for one person for a month. The poisonous roots were grated, drained of their juice, and baked into unleavened flat bread (cassava) in a procedure common to the American tropics. This bread is both tasty and nutritious and keeps without deterioration for months, even in humid and warm weather [1966:54].

Among the Spaniards who accompanied Columbus on his second voyage to the New World, in 1493, was a soldier called Juan Ponce de León (see Figure 14). Born about 1460 in San Servas de Campos in what was then the Kingdom of León, Juan Ponce de León was from a minor noble family that served the kings of Castile-León in their wars with the Moslem Moors to reconquer the Iberian peninsula. In the latter part of the fifteenth century, the marriage of Queen Isabela of Castile-León to King Ferdinand of Aragón united the two major kingdoms of Christian Spain and provided the means for the final conquest of Moorish Granada in 1492. Juan Ponce de León participated in the campaigns against the Moors so that by the time he joined the second voyage of Columbus to the New World in 1493, he was already an experienced soldier and campaigner (Caruso 1963:12).

From 1493 to 1502, Juan Ponce de León served Columbus and his successor, Francisco Bobadilla in maintaining order among the Taino tribes of Hispaniola who were the main source of labor to recover gold from the placer deposits of that island. In early 1502, Bobadilla was replaced by a crown appointed governor for

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Hispaniola, Nicolás de Ovando. Ovando enforced strict rules of conduct and increased the tribute payments for the Tainos in terms of gold to be washed from the gold placers and labor drafts. This led to a series of rebellions against the Spanish by the Tainos. According to Carl Sauer, author of The Early Spanish Main, the last area of Hispaniola to be conquered by the Spanish was the area of Higüey,

. . . the southeast peninsula was wholly overrun in 1504 in the so-called war of Higüey. In it the last major cacique [native chief] of the island was eliminated. The operation was led by Juan de Esquivel and Juan Ponce de León, who were both veterans of Columbus [1966:149].

Juan Ponce de León was awarded control of the Higüey province of extreme southeastern Hispaniola for his service to Governor Ovando during the Higüey War. He established a village called Salvaleón de Higüey and began a profitable business by raising cattle and horses and growing cassava for provisions on homeward bound ships to Spain (Caruso 1963:12).

Ponce de León was in charge at the villa of Salvaleón de Higüey, the easternmost Spanish town in Española [Hispaniola] and near to the Mona Passage. Through this strait ships bound for Spain took the way, stopping to take on cassava bread at the harbor of Higüey or at Isla Mona [Sauer 1966:158].

From his vantage point of Higüey, Juan Ponce de León began to hear rumors of gold on Puerto Rico from Tainos that regularly crossed the Mona Passage in small boats. This stimulated a reconnaissance visit to Puerto Rico by Juan Ponce de León in 1506, that confirmed the island contained gold placers. Later in 1508, Juan Ponce de León established the first Spanish Puerto Rican settlement of Caparra, on the south side of San Juan harbor. Shortly thereafter, he visited Mona meeting "the chiefs and Indians of that island" (Rouse 1952:364; Solís 1988:8) to arrange shipments of cassava for his newly founded settlement of Caparra, on Puerto Rico (Floyd 1971:96-97).

During the first years of colonization Ponce de León seems to have exercised personal control over Mona, from

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which he obtained cassava for the support of the settlements in Porto Rico. His control ended in 1511, when the king ordered that Mona be placed under the jurisdiction of the government of Porto Rico and then, reversing himself a month later, awarded it to Bartolomé Colón, brother of the Admiral, giving him full rights over the Indians and their cassava plantation. Upon his death three years later [1514], the island reverted to the crown and it was again placed under the jurisdiction of the government of Porto Rico [Rouse 1952:364].

According to Walter A. Cardona Bonet,

From 1519, Mona lay under the control of Francisco de Barrionuevo, a rich merchant who had business interests at the pearl fisheries off Margarita and Cubagua Island [on the northern coast of South America], and slave trade and sugar estates at Puerto Plata, in northern Hispaniola. By the time Barrionuevo became Governor of Colombia in 1532, Mona had been well established as a depot station aiding the South American enterprises [1989:55].

During the first three decades of the sixteenth century, at least twice a year, Spanish ships sailed from San Juan Bay to Mona for supplies of cassava to feed the Spanish and the Taino gold miners of Puerto Rico. Walter A. Cardona Bonet noted that two Spaniards were placed on Mona to ensure the flow of cassava to Spanish settlers and Indian miners on Puerto Rico (1989:41). The island was also used as a provisioning area for cassava for expeditions to the pearl fishing grounds off the northern coast of South America (Floyd 1971:99, 206). In June of 1521 Bartolomé de las Casas noted the island supplied 100,000 cargas, or 315,000 bushels, of cassava for the colonization of Cumaná (Cardona Bonet 1985:52). During the early sixteenth century, in addition to cassava, the natives of Mona supplied "maize, fowl, sardines, fruits and beans . . . along with [cotton] hammocks and shirts" (Cardona Bonet 1989:42). In the 1550s, however, the Spanish Governor of Puerto Rico was forced to remove the remaining Taino families from Isla de la Mona, because their produce was feeding the enemies of Spain.

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Piracy in the Mona Passage

Piracy existed in European waters as far back as the Bronze Age, and was only briefly controlled during the time of the Roman Empire when a strong naval presence destroyed the ships and bases of the pirates (Ritchie 1986:3-5). Medieval Europe was plagued by numerous bands of pirates. In fact, because few states maintained a permanent navy, pirate ships often represented the only seagoing transport available for hire to kings before the fifteenth century (Ritchie 1986:6-7).

During the fifteenth century new shipping and navigation technology changed the way European states viewed the importance of navies and the nature of piracy. The Age of Discovery allowed European states, such as Portugal and Spain, to accumulate vast overseas territories, but to hold on to these lands meant controlling the sea lanes. The French were the first to learn of the wealth being carried by unprotected Spanish ships back from the New World. In 1523, the French pirate Jean Fleury, captured a Spanish treasure fleet off the coast of Spain. It contained much of the wealth seized by Cortés from the Aztec capital of Tenochtitlán (Ritchie 1986:11).

The French use of pirates or privateers against Spanish shipping in the sixteenth century was related to a series of wars between the two crowns that initially grew out of a dispute over who would control the Italian peninsula. In 1494, Charles VIII of France attacked Italy to support his claim to the Kingdom of Naples (Duffy 1979:8). A coalition forces from Venice, Milan, the Papal States, and Spain, defeated Charles and brought the Kingdom of Naples under the authority of Ferdinand and Isabela (Duffy 1979:11).

When Charles V ascended the Spanish throne in 1519, he combined the might of Spain and the Austrian Hapsburgs against the French. Throughout the 1520s Spain slowly pushed the French out of Italy until in February 1525, Francis I's (successor to Charles VIII) French army was destroyed at the Battle of Pavia and he was taken as a prisoner to Spain. In order to secure his release Francis promised never to revive his claims to southern Italy (Duffy 1979:19).

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During the reigns of the last Tudor Kings, Henry VII and VIII, the English had no reason to attack the Spanish shipping or go to the New World. As allies of the Spanish against the French, who threatened English possessions around Calais, English merchants could obtain West Indies products indirectly through English traders at the **Casa de Contratación de las Indias**, in Seville, resulting in a profitable commercial arrangement to both countries. English textiles and raw wool brought iron, olives, alum, and sugar to England from Spain and the New World (Caruso 1963:16; Wright 1971:13-15).

When war broke out again with the French in 1521, Spanish industries could not keep up with the demand for manufactured goods from their New World colonies and from the troops fighting in Italy and the Low Countries. Soon English merchants were supplying the Spanish with manufactured goods and receiving Spanish New World gold and silver in return (Wright 1971:13-15). Spanish military might regained Pavia, in Italy from the French, in 1525 and a defeated French monarchy was forced to sue for peace in 1529. The only unexpected and alarming outcome was the incursion of French and English ships into the Mona Passage and the Caribbean, an area considered exclusive Spanish territory to that point by Charles V (Parry 1977:119).

In 1510, the King of Spain had ordered Spanish shipping to make their first port of call in the Caribbean at San Juan harbor, by sailing through the Mona Passage, because of the important gold mining carried on there. As the mines decreased in output in the 1520s and the tide of Spanish settlement moved to Mexico, fewer Spanish ships put into Puerto Rico. This left the Puerto Rican population with no means of acquiring basic necessities. Necessity made them willing to trade their island products with any available foreign merchants. The first foreign traders were the Portuguese who traded wine, linen, and African slaves for Puerto Rican sugar and hides (Carrión 1974:9, 12).

Other European ships soon followed. In 1527 an English merchant ship the Mary of Guildford, under the command of John Rut anchored off Puerto Rico on a commercial exploration voyage. Rut had originally been sent by Henry VIII to discover the Northwest Passage, but after several months off Newfoundland wrote "we durst go no further to the Northward for feare of more Ice" (Morison

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1971:235). Sailing south along the east coast of North America Rut reached Mona in the fall of 1527 seeking "sweete water and fresh victuall" (Morison 1971:620). According to Samuel E. Morison

**A Spanish captain named Gines Navarro was loading cassava at Mona Island between Hispaniola and Puerto Rico, when a foreign ship of about 250 tuns' burthen sailed in spoke with him. The officers said they were Englishmen, that the vessel belonged to their king . . . and now proposed to pick up a cargo of dyewood in Puerto Rico [1971:235].**

It was noted by the Spanish, "after inquiring about the route to Santo Domingo, the [English] visitors left Mona Island, from whence they departed to the neighboring colony" (Caruso 1963:17). At Santo Domingo Rut was well received, but did not conduct any trade as he suspected "Spanish treachery" (Morison 1971:235). Recrossing the Mona Passage, he made landfall at San Germán on the southwest coast of Puerto Rico and proceeded to conduct trade in English goods for island products. Other foreigners were less friendly in their relations with the Spanish.

In early 1528, some forty French pirates in a navio of 240 tons attacked and captured a Spanish caravel, the Santa María de la Ayuda, and its pilot and master Juan Troche in the Canary Islands. Apparently from Troche the French gained valuable knowledge regarding the disposition of Spanish possessions in the Caribbean (Cardona Bonet 1989:69). They crossed the Atlantic and using Mona as a base of operations, "on August 12, 1528, the French fell upon the Spanish settlement of San Germán in the western part of Puerto Rico" sacking the town and burning two ships in the harbor (Carrion 1974:13).

The French then returned to Mona captured the two Spanish overseers on the island and after nine days of waiting for other Spanish ships to seize left with their loot to France pausing only to attack the pearl fisheries on the northern coast of South America (see Figure 15) (Cardona Bonet 1989:105). They left behind on Mona the pilot Juan Troche who reported to the Spanish authorities

**. . . they sacked the town [San Germán] . . . and did not leave anything behind, all was placed in the said nao and they burnt a navio, that was in the said port of**

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his belonging, and the caravel of Martel they sent to the bottom [Cardona Bonet 1989:71].

In the 1535, war between France and Spain erupted again. This time the French attacked Spanish and English holdings in the Spanish Netherlands and Calais, respectively. Campaigns on the northern French border resulted in the loss of several important French garrison towns to the English and Spanish monarchs Henry VIII and Charles V. But the expense of such warfare proved exhausting to all parties. In 1544 a general peace treaty was signed at Crépy (Duffy 1979:47).

The poor showing of the French on the European battlefield was somewhat offset by their successful attacks on Atlantic and Caribbean Spanish shipping which seriously effected the economy of Spain and her ability to carry on the war in Europe. French pirates on Mona sacked and burned San Germán in 1538, 1540, and 1543, in addition to taking Spanish ships in the Mona Passage until the Treaty of Crépy in 1544 provided an eight year truce between France and Spain (Carrión 1974:14). From their position on Mona the French made the Mona Passage, Havana, and the northern coast of Puerto Rico one of the most dangerous places for Spanish shipping in the Caribbean Basin.

As an example, in the 1538 raid that saw the sacking of San Germán, French pirates attacked

. . . a Spanish caravel belonging to Andrés González [that] departed from the bay [of San Juan] towards San Germán. On board were various families and a considerable amount of money. Just after departure, a French vessel gave chase forcing the stranding of the caravel. Some Spaniards managed to reach the shore and hide themselves in the woods. The French sent a patache with men which took 4,000 pesos out of the [Spanish] ship. Another group conducted a raid, extracted the stranded vessel and sailed away with the remaining passengers . . . [following their attack on San Germán on August 13, 1538] they headed to Mona Island and sunk Andrés González caravel of the coast [Cardona Bonet 1989:79].

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In May of 1541, the luckless Andrés González lost another caravel to French pirates, as reported by the Audiencia of Santo Domingo in a letter to the Spanish king, dated July 4, 1541:

This past May there came to the island of San Juan [Puerto Rico] a French navío with 35 men and there robbed a caravel. Later it sent to the bottom a navío at the island of Mona. They [the French] jumped on land and robbed what could be found, and took four Indians [from Mona] [Cardona Bonet 1989:84].

Not all of the encounters with French pirates ended in defeat for the Spanish. The French pirate fleet of 1543, composed of 75 men in one patache and two other vessels, got off to a good start by again sacking and burning San Germán and capturing four Spanish merchant ships in the Mona Passage in the month of February. Three of the Spanish vessels were ransomed and released, and the three French ships with a Spanish caravel went to Mona to wait for more Spanish ships. In March of 1543, the French were surprised by 250 Spaniards in four Spanish war vessels dispatched by the Audiencia of Santo Domingo that showed up on Mona. In the ensuing sea battle off Mona the French sank their patache, and lost their main vessel with forty seamen aboard (Cardona Bonet 1989:86-87).

In the official Spanish report of April 8, 1543, it was reported

. . . the [Spanish] nao Capitana, which in truth is a huge navío of sails, with the brig with rows came upon the French Capitana and they began to exchange artillery shots, and in half an hour it made the French Capitana surrender and [the Spanish] seized the captain and forty men that were within her. Seen by the other small [French] nao, and since they were to the Windward, and the other [Spanish] nao and caravel of our armada did not sail fast enough, it set full sails and escaped because it could not be reached [Cardona Bonet 1989:87].

As noted above the prevailing winds in the Mona Passage were from the northeast, which required ships traveling from the Caribbean to the Florida Straits to beat slowly to the east against the wind when travelling through the Mona Passage. The French on Mona had only to look for such slow moving targets from the cliffs of the

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island and take out after the sailing vessels in **pataches**, or small armed oared galleys that could travel against the wind. The **pataches** were prefabricated in France and brought to Mona Island for assembly (Hoffman 1980:67). In August of 1549, it was reported that "a [French] **patache** of eighteen benches cut a ship loaded with sugar out of a group of six [Spanish] ships beating through the Mona Passage" and returned with their prize to Mona Island (Hoffman 1980:67).

Henry II succeeded Francis I in 1547, and when the war between France and Spain resumed in Europe in 1552, over the next seven years, the French were able to regain all of their northern lands from the Spanish, who were hampered by the revolts of German Protestants in Holland, and evict the English from French soil with the capture of Calais (1558). In the Caribbean, "the French pillaged at will the lands adjacent to San Germán in 1554 and stationed at the rendezvous on Mona Island, boasted they would take Puerto Rico" (Carrión 1974:15). During the next five years,

. . . fleets carrying valuable cargos by well-defined and predictable routes through the Caribbean and across the Atlantic were in constant danger of attack, by enemy warships or privateers in time of war, by pirates at any time. French privateers were active off the Azores and in the Caribbean from the 1530s; in 1556 a part of them landed in Cuba and sacked Havana; and down to the Treaty of Cateau-Cambresis [1559] they constituted the principal damage to Spanish shipping [Parry 1977:133].

To keep the oceanic supply lines open, Admiral Alvaro de Bazán organized regular convoys of merchant ships escorted by specialized fighting galleons both back and forth across the Atlantic. A major problem for the Spanish was the fact that the French knew the approximate sailing times and routes for the convoys. The French had only to wait on Mona for the Spanish ships to sail into view, or lie in wait for them in the waters off Mona (Cardona Bonet 1989:97). Outbound fleets from Spain were expected to leave Seville every May and usually entered Caribbean waters by the Mona Passage. Once inside the Caribbean the fleet split up some to the Greater Antilles, others to South America, and the bulk westward to Vera Cruz (Parry 1977:133-134). In the following spring the process was repeated with merchant ships and escort vessels from

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various Caribbean ports meeting at the Mona Passage for the trip back to Spain.

In 1552, the Spanish based a naval squadron on Santo Domingo to clear the Mona Passage of pirates. Their first task was to capture two French corsairs reported based on Mona Island, but the French fled before the Spanish arrived. Spanish squadrons could do little against the French **patache** ships. Paul Hoffman, in The Spanish Crown and the Defense of the Caribbean, 1535-1585, recorded an incident when the Santo Domingo

. . . squadron sailed for the Mona Passage on January 5, 1558, as the escort for two merchantmen bound for Spain. One of these ships got ahead of the group and was captured by a French corsair based on Mona without the squadron being able to do anything about it [1980:90].

After the peace of Cateau-Cambresis in 1559, the Spanish government became increasingly concerned with the spread of Protestant revolts in the Spanish Netherlands and incursions by English traders and French privateers in their New World empire. As a result the Spanish closed the **Casa de Contratación de las Indias** to English Protestant merchants. Spanish members of the **Consulado**, or Seville merchant guild had successfully lobbied the King of Spain to exclude foreign traders from Seville to protect their commissions for consigning manufactured goods to the Indies on the behalf of merchant houses all over Europe (Parry 1977:125).

The loss of Calais to the French actually was of benefit to the English because they could concentrate on trade rather than on continental wars that drained their economy. But being excluded from their traditional trading stations in Seville was the beginning of a weakening of their alliance with Hapsburgs and against the French (Duffy 1979:53). English merchants soon resorted to sending armed trading ships to the West Indies to acquire New World products they once secured in Seville. Here they conducted an illegal trade with the Spanish populace, or raided the Spanish ships and towns when trade was denied them. In the 1560s Englishmen like John Hawkins and Francis Drake began illegally trading slaves to Spanish planters on Caribbean islands (Wright 1971:16-18). According to J.H. Parry

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Many of them were commercial smugglers, trading in slaves, hardware and textiles in exchange for sugar, hides and silver. They usually went armed, and often traded at the pike's point, using threats of force when necessary to secure the connivance of local officials . . . This also was the pattern of the slaving voyages which Sir John Hawkins made to the Caribbean in the 1560s. Hawkins was no pirate but a business man who delivered his goods and paid for his purchases . . . The Spanish settlers in the West Indies, at least in the islands and smaller mainland ports, on the whole welcomed such smugglers. They wanted cheap goods and resented the high prices and infrequent deliveries of the Seville shippers. On the other hand, they both resented and feared the constant outbreaks of war in Europe which loosed fresh fleets of privateers upon the West Indies. They thought little of a [Spanish] naval organization which was largely ineffective against small raiders, but which treated peaceful smugglers, when it caught them, as if they were raiders, and so encouraged them to go armed and take to raiding [1977:253].

The trade between the English and Puerto Ricans of the sixteenth century became increasingly hostile. Whereas, trade had at first been welcomed by the Puerto Ricans to obtain scarce European goods, now warfare between the two crowns made former trading partners unwilling to deal with the English. In early 1595, Robert Dudley found he was unable to sell his cargo of African slaves and a small Spanish vessel captured off Grenada to the Spanish inhabitants of the Caribbean.

I coasted all the South side of the said yle [isle] of S. John [Puerto Rico], till I came to ancker [anchor] at Cape Roxo [Cabo Rojo], where riding 14 days to expect S[anto] Domingo men, which often times fall with the yland [island] of Mona, and finding none (neither would the Spaniards of S. Juan de puerto rico buy my prize) I unladed her, tooke in the goods, and after burned her [Cardona Bonet 1989:198].

Increasingly, English privateering expeditions replaced the old trading approach to securing New World riches. Between 1588 and

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1595 at least twenty-five known English privateering expeditions departed to the West Indies. Most of these were financed privately as joint stock ventures (Andrews 1959:1). Some, however, like the 26 vessel fleet headed by Sir John Hawkins and Sir Francis Drake of 1595 intended to capture San Juan and hold the island of Puerto Rico were financed by the English government. Hawkins became ill on the voyage and died on the day of their arrival at San Juan, November 12, 1595 (Andrews 1972:91). In the end, the Puerto Rican enterprise proved too costly in men and ships. Drake was forced to lift his siege on November 25th and move the fleet west to the Mona Passage from whence it entered Caribbean waters for a try at attacking Porto Bello where Drake died of dysentery in January of 1596 (Cardona Bonet 1989:196). While passing through the Mona Passage it was noted that the merchantman **The Exchange**, commanded by Captain William Winter, was so badly damaged in the San Juan assault that she sank close to Mona during the night of November 25, 1595 (Cardona Bonet 1989:198).

Between 1566 and 1648, Spain embarked on a seemingly endless series of campaigns and sieges against Protestant forces in Holland, who were aided by the English and French at various times. Constant warfare in the Netherlands proved to be a financial drain on the economic resources of the Spanish empire. Exclusion of the Protestants from Seville resulted in the loss of the English as allies, who under Elizabeth I began to systematically attack Spanish targets in the New World. As warfare between the English and Spanish crowns intensified in Europe in the last two decades of the sixteenth century, English sea captains like Hawkins and Drake participated less in illegal trade and more in attacking the Spanish towns of the Caribbean. To add to the problems of the Spanish the English were soon joined by the Dutch in this effort (Wright 1971:19; Duffy 1979:58; Ritchie 1986:9-10).

. . . the minor harbors of the West Indies were never safe from raiding. Even the principal cities, though safe enough against mere pirates, were still vulnerable to attack by organized fleets in time of war. Their situation grew worse as relations with England worsened, as religious bitterness came to reinforce the rapacity of the corsairs [Parry 1977:253].

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So audacious were the English corsairs, in 1592 the English captain William King captured two prize ships inside San Juan Harbor, "and from there went to Mona Island where . . . he watered and refreshed with potatoes and plantains" (Carrión 1974:21). In addition, to the English, French privateers continued to harass Spanish possessions in the Caribbean. In 1569 and 1576, the French continued their attacks on San Germán from their base on Mona (Carrión 1974:16). In response Spain began the construction of major fortresses throughout the Caribbean to protect her ports and fleets (Wright 1971:21). Puerto Rico's strategic location astride the Mona Passage maritime route used by the Spanish treasure fleets made the island a target for privateers and European naval attacks. The Spanish crown invested large sums for the defense of the island to protect the maritime route, and to prevent the island from being used as a base to attack other Spanish possessions in the Caribbean Basin, especially Cuba and Hispaniola.

Toward the end of the sixteenth century, the English had acquired enough information about the New World that an interest in colonization was developing. One of the earliest backers of colonization was Sir Walter Raleigh, who obtained from Queen Elizabeth I a patent "to discover, search, find out, and view such remote, heathen and barbarous lands, countries, and territories, not actually possessed by any Christian prince, nor inhabited by Christian people" in 1584 (Rowse 1986:50). His patent for a colony to be called Virginia, covered nearly the entire eastern seaboard of the present day United States, although his colonization efforts over the next six years would center on Roanoke Island, off North Carolina.

Raleigh sent a reconnoitering expedition of two ships in 1584 to inspect his patent. From the days of John Cabot's expedition to North America in 1497, English expeditions to the northern latitudes had often been delayed by northern gales and fogs. The pilot for Raleigh's expedition to North America was Simon Fernandez, an English-naturalized Portuguese familiar with the faster southern route to the New World first pioneered by Columbus. For these reasons, the 1584 and succeeding early English expeditions to Virginia would sail south to the Canaries and thence west to the Lesser Antilles before heading northward to Virginia through the Mona Passage. The reconnoitering expedition headed by Philip Amadas and Arthur Barlow, reported to Raleigh the Mona

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Passage area was an area where they had "refreshed ourselves with sweet water and fresh victual" (Rowse 1986:52) after the Atlantic crossing before heading northward through the Florida Straits to Virginia. The Mona Passage and Isla de la Mona would become a way station to acquire fresh water and food, and wood for cooking before heading north to Virginia on these expeditions (Morison 1971:620).

Impressed with the expedition's report of Virginia, in April of 1585, Raleigh sent a small fleet of seven ships via the south Atlantic route to the Mona Passage area under the leadership of Sir Richard Grenville. As Spain and English were now at war Grenville constructed a large earthwork fort in the area of San Germán, possibly next to the Guayanilla River when he stopped in the Mona Passage. The Spanish Governor and local militia soon arrived, but being outnumbered by the English could do little. Later Grenville's men mined salt at Cabo Rojo on the southwestern tip of Puerto Rico, after constructing another smaller earthwork (Morison 1971:633-636; Rowse 1986:65-67).

While in the Mona Passage, Grenville used the opportunity to take Spanish prizes

. . . we took a Spanish frigate, which was forsaken by the Spaniards upon the sight of us. The next day in the morning very early we took another frigate with good and rich freight and divers Spaniards of account in her. These afterwards we ransomed for good round sums, and landed them in St. John's (Puerto Rico) [Rowse 1986:67].

The first Virginia colony was deposited on Roanoke Island, North Carolina, in August of 1585, by Grenville who anticipated returning to the colony the next year with more supplies and colonists. Unfortunately, troubles with the local Algonkin tribes and a storm that destroyed their crops made the colonists elect to return to England with Sir Francis Drake in mid-June of 1586, who showed up after successfully raiding Spanish possessions in the Caribbean and St. Augustine, Florida (Morison 1971:649-650). Grenville's relief expedition to Roanoke missed the colonists by just 30 days (Morison 1971:650).

Not to be undone, Raleigh prepared another colonization effort of three ships. This expedition, also under the direction of pilot

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Simon Fernandez, took the southern trans-Atlantic crossing arriving in the Mona Passage area in early July of 1587. However, the pilot convinced Governor John White not to tarry in the area as they had done in 1585, arriving at Roanoke Island in late July (Morison 1971:660-661; Rowse 1986:116-117). After settling the new colonists Governor White returned to England in August 1587 with the promise to return with more supplies (Rowse 1986:122). Unfortunately, it was not until 1590 that John White was able to return to the New World with supplies for what became the "Lost Colony."

White's relief fleet stopped at Mona Island in April of 1590

The thirteenth [of April] we landed on an island called Mona, whereon were ten or twelve houses inhabited of the Spaniards. These we burned and took from them a pinnace, which they had drawn aground and sunk, and carried all her sails, masts and rudders into the woods, because we should not take him away. We also chased the Spaniards over all the island; but they hid them in cave, hollow rocks and bushes, so that we could not find them. On the fourteenth we departed from Mona [Rowse 1986:126].

White made landfall on Roanoke Island about a month after leaving Mona, but was unable to find any survivors of Raleigh's Virginia Colony. His return to England ended English attempts to colonize North America for the rest of the sixteenth century.

The next effort at colonizing Virginia fell to a privately sponsored and funded company called the Virginia Company of London. Under the direction of Captain John Smith (see Figure 16), this group of settlers also followed the south Atlantic route like the earlier Raleigh expeditions and made landfall at Mona on April 7, 1607 (see Figure 17). According to an account of their visit,

Upon the sixt day, we set saile and passed by Becam [Vieques Island], and by Saint John de Porto Rico. The seventh day, we arrived at Mona: where wee watered, which wee stood in great need of, seeing that our water did smell so vildly that none of our men was able to indure it. Whilst some of the Saylers were filling the Caskes with water, the Captaine [John Smith], and the rest of

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the Gentlemen, and other Soldiers marched up in the Ile sixe myles, thinking to find some other provision to maintaine our victualling; as wee marched we killed two wild Bores, and saw a huge wild Bull, his hornes was an ell [45 inches] betweene the two tops. Wee also killed Guanans [iguanas], in fashion of a Serpent, and speckled like a Toade under the belly. These wayes that wee went, being so troublesome and vilde going upon the sharpe Rockes, that many of our men fainted in the march, but by good fortune wee lost none but one Edward Brookes Gentleman, whose fat melted within him by the great heat and drought of the Countrey: we were not able to relieve him nor our selves, so he died in that great extremitie [Hudson 1957:12].

During the sixteenth and seventeenth centuries, the English and Dutch explorers and merchants would realize the great potential for wealth in the newly discovered lands and would use their navies to acquire a share by raiding Spanish shipping. One of the primary means of attacking the wealth of the Spanish empire was through piracy sanctioned by European governments and supported by private finances (Ritchie 1986:9-10). Piracy in the sixteenth century consisted of raiding of Spanish ships and coastal settlements by French, Dutch, and English privateers. These privately financed vessels and crews were controlled and encouraged by European states as a means of attacking other nation's shipping without having to establish a strong state navy. According to Robert Ritchie, "in wartime the privateering commission or letter of marque permitted privately financed warships to attack enemy shipping" (1986:11). This form of officially sanctioned piracy permitted piratical acts in wartime because some European nations found it convenient to ignore such activities or even sponsored them for a share of the plundered loot achieved by piracy (Ritchie 1986:11).

Throughout the seventeenth century the French, Dutch, and English governments hoped to establish their own New World empires in the Caribbean, but they did not have the resources to achieve this goal. Private entrepreneurs with the sanction of northern European countries seized unprotected islands in the Lesser Antilles as bases to attack Spanish shipping and settlements in wartime. During intervals of peace, the privateers provided protection for the establishment of plantations and other enterprises on the

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islands. After Jamaica was seized by the English from the Spanish in 1655, the governor of the colony Sir Henry Morgan regularly issued letters of marque to captains of all nationalities that would attack Spanish possessions and return their ships to trade their cargos in English ports (Ritchie 1986:15-16).

From the English point of view their policy was an expedient one of providing a defense by private means when the public coffers were incapable of furnishing it. The French and Dutch colonists in the Caribbean, relying on their own buccaneers to help defend them, similarly enjoyed the profits of the association. Even national governments used them during the imperial wars of the 1690s: England and France both employed buccaneers to supplement the fleets they sent to the West Indies . . . This ancient technique of conducting public policy with private means is directly comparable to the use of pirate fleets by the medieval monarchy. There would be few other such instances after King William's War of 1688-1697, however, for the new states would be set on another course: they would prefer to exercise the state's growing monopoly of violence [Ritchie 1986:16].

Additional sources of financing piracy were conducted by wealthy colonial merchants. They invested in privateers just like their counterparts in government. The expansion of colonial empires and the increase in colonial ports allowed merchants to send private privateer expeditions to various parts of the globe. New York merchants supported Captain William Kidd's privateer voyage to the Indian Ocean during the 1690s (Ritchie 1986).

The last group of pirates were buccaneers, or independent marauders. Individuals owing no allegiance to a state, or financial backer, these roving bands possessed no base of operations, but were part of a fluid society of dispossessed individuals who combined in times of opportunity to attack and plunder. Sir Henry Morgan used these independents for major raids on Spanish colonial cities in the Caribbean during King Williams War (1688-1697).

King Williams War saw England and France undertake a struggle that spanned the globe when

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. . . in 1688 William of Orange and his wife, Mary Stuart, succeeded to the English throne vacated by James II, whose penchants for Catholicism and for a powerful monarchy had cost him the loyalty of his people. As soon as King William had settled onto his throne, he brought England into the war he was fighting against France. This contest engulfed Europe and spread across a large part of the world before it ended nine years later. The peace that followed turned out to be only a period of truce; the war started again in 1702 and lasted until 1713. These conflicts marked the beginning of the century-long struggle between France and England over which nation would be the dominant imperial power. In the Caribbean Spain was thrust into the background as the belligerents confronted each other. Neither side had sufficient naval power for the conflict, so the buccaneers were called upon once again. For some time they had been discouraged, even attacked, because the colonists favored the regular income derived from sugar and the profits of a clandestine but growing trade with the Spanish colonies. Now the buccaneers were asked to remember their patriotism and if that was not enough, they could get a commission from the king against the enemy [Ritchie 1986:29-30].

After the end of King Williams War in 1697, many of the independent pirates decamped to the Pacific and Indian Oceans, where European governments who were gradually withdrawing their sponsorship could not yet reach them. Toward the end of the seventeenth century piracy sanctioned by a European government, as a means of imperial policy began to undergo a change. New economic forces began to call for an end to privateer raids that hurt trade. In addition, Caribbean plantation owners and businessmen were pressuring their governments to bring under control the pirate population. According to J.H. Parry, the suppression of the pirates was

. . . economically essential to merchant and planter alike; and West Indian planters and merchants were beginning to exert an influence in economic affairs. The English government was the first to grasp these facts, and to discover that an enfeebled Spain would be

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willing, in return for an end of raiding, to recognize effective English possession in the Americas, including even Jamaica. An agreement to this effect the Treaty of Madrid, was concluded in 1670, the very year of Morgan's sack of Panama. Enforcement was another matter; it was easier to disown buccaneers than to control them; but in the 1680 Treaty of Windsor England reaffirmed and strengthened the agreement, and in 1685, for the first time, an English naval squadron was sent to Jamaica to hunt buccaneers. The Dutch - their power in America now relatively much reduced by their wars with England and France - made a similar agreement at the Treaty of the Hague in 1673. They and the English had no longer much to fear from the Spaniards in the Caribbean; common fear of France, indeed, was drawing them together and ranging, at least temporarily, on the side of Spain. With new-found virtue they both protested vigorously against the crimes of the French buccaneers. Louis XIV still employed them, convinced that an enfeebled Spain could be bullied into ceding St. Domingue and granting to France a share of the supposed riches of the Indies. In 1683, however, at the Truce of Ratisbon, the two governments agreed that "all hostilities shall cease on both sides, both by land and by sea and other waters . . . within Europe and without, both on this side of and beyond the Line." The possibility was opening before Louis XIV of acquiring the whole of the Spanish Indies by inheritance from the sickly idiot King Charles II: or else of imposing a successor who would grant the French a privileged position in the American Trade. This was a more attractive prospect than mere casual plunder or piecemeal conquest. Administrative and naval action against buccaneering followed the truce. The new policy was not at first consistent, but eventually it prevailed. The last employment of buccaneers by a European government was in the successful and immensely lucrative French capture of Cartagena in 1697. The force so employed was disbanded immediately afterwards. Some became planters and some pirates; but with naval squadrons constantly in the area they ceased to influence policy and were never again a serious menace. The Treaty of Ryswyck of 1697, by which Spain formally ceded St.

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Domingue to France, also marked the end of buccaneering  
[Parry 1977:266].

The execution of Captain William Kidd, in 1701, on Tilbury Point, in London, represents a turning point in the history of nations and piracy. According to historian Robert Ritchie,

The very success and geographic expansion of piracy in the seventeenth century could not continue in an era of thriving imperial trade. The roistering buccaneer did not suit the hard-headed merchants and imperial bureaucrats, whose musty world of balance sheets and reports came into violent conflict with that of the pirates. Eventually the imperial powers would reform their methods of handling piracy and create new means of suppression. Not that piracy was wiped out, but the large groups of European deep-sea marauders ceased to exist [1986:2].

Captain William Kidd commanded the pirate vessel **Blessed William** during King Williams War, fighting on the side of the English in the Caribbean, where he distinguished himself in naval action around the island of Nevis, in the Lesser Antilles, before going into semi-retirement in New York City (Ritchie 1986:30-32). New York of the 1690s was a wide open port town that encouraged pirates to trade their loot and refit their vessels under the protection of a lassiz-faire colonial administration. With the need to promote trade, and the increasing pressure on pirates in the Caribbean, New York merchants hit upon an imaginative scheme of sponsoring pirates to establish bases on the island of Madagascar, off the southeast coast of Africa. The New York merchants would "supply the pirates with liquor, guns, gunpowder, and clothing in exchange for expensive textiles, drugs, spices, jewels, gold, and currency" (Ritchie 1986:37) looted from Indian Ocean merchant ships, in addition to a profitable sideline in transporting Madagascar slaves back to New York.

In 1695 Kidd went to London, where he obtained a commission to attack enemy vessels, and ironically to hunt pirates. In early 1696 Kidd left London on the **Adventure Galley** to return to New York to recruit a pirate crew for a voyage to the Indian Ocean. By January of 1697, Kidd and the **Adventure Galley** had arrived at

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Madagascar (Ritchie 1986:76-79). But prizes eluded Kidd until January of 1698 when he captured the Indian-built merchantman **Quedah Merchant**, with a cargo of muslim, silk, opium, spices, and sugar valued at 400,000 rupees (Ritchie 1986:108-110).

Unknown to Kidd was the fact that the **Quedah Merchant**, which he renamed **Adventure Prize**, was under the protection of the British East India Company, and was owned by Muklis Khan a leading member of the Indian Mughal Emperor Aurangzeb's court (Ritchie 1986:127-128). The Emperor forced the East India Company to compensate all parties who lost goods on the **Quedah Merchant**, under the threat of revoking the East India Company's trading rights in India (Ritchie 1986:134).

Meanwhile, Kidd abandoned the **Adventure Galley** in Madagascar and prepared to sail the **Quedah Merchant** and her cargo back to New World waters. He arrived in the Lesser Antilles in April of 1699 to find the British government, at the urging of the East India Company had declared him a pirate and exempting him from any pardon (Ritchie 1986:165). Kidd sailed to the neutral port of St. Thomas, in the Danish Virgin Islands, but the governor refused him protection from the British. Having sailed in the Caribbean during King Williams War, Kidd was familiar with the safe harbors open to him with a British warrant issued for him, so he now steered for the old pirate base on Mona.

Leaving Saint Thomas, he steered the **Quedah Merchant** toward the island of Mona, in the channel between Puerto Rico and Hispaniola, where he had arranged to have supplies delivered. Mona was small and not under the immediate control of any government, so it was a safe place to anchor. Once he was there, Kidd could consider his problem . . . His reception at Saint Thomas had convinced him it was unlikely that he could find protection elsewhere. The Spanish colonies were out, the Dutch too far away, and the French too unreliable. He could remain at one of the out-of-the-way islands such as Mona, but every day he risked detection: the ungainly **Quedah** could hardly be hidden forever from prying eyes [Ritchie 1986:165-166].

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While anchored at Mona, Kidd arranged for former Caribbean shipmates to sail from Dutch Curaçao and trade the bulky cloth cargo to more transportable hard currency. Before they arrived, however, bad weather forced the **Quedah** into the Bay of Savona, and aground at the mouth of the Higüey River, on Hispaniola. Throughout the spring of 1699, Kidd off loaded the cargo, eventually buying a smaller vessel which he sailed to Boston, arriving in June of 1699. Kidd expected to be protected by his commission, but the East India Company had arranged for the Governor of New England to have him arrested and transported to England in April of 1700. Eventually, Kidd was hanged for murder and piracy on May 23, 1701 under an anti-piracy law passed in March of 1700 (Ritchie 1986).

Throughout the eighteenth century, Caribbean waters became increasingly hostile to pirates as English, Dutch, and French naval squadrons hunted down the last elements of the buccaneers. Warfare in the Caribbean during this century was fought with regular naval and army units, either to gain possession of specific islands or to force open colonial ports to trade (Parry 1977:267).

However, one last eruption of piracy occurred in the West Indies in the early decades of the nineteenth century, when the latin american colonies started their struggle for independence against the Spanish Empire. As part of their struggle new Latin american governments, such as Argentina, Columbia, and Venezuela

. . . commissioned swift-sailing vessels, manned each by twenty-five to one hundred men, as privateers to prey on Spanish merchant-men. However, it was not long before these ships began to plunder vessels of neutral nations, and, as their first acts of violence were not nipped in the bud, piracy soon spread to an alarming extent [Bradlee 1923:1].

In response to these privateers from their former South American colonies and lacking the means effectively blockade the insurgents ports and commerce the Spanish governments of Cuba and Puerto Rico established their own guarda-costas naval forces, or privateers.

**In the early nineteenth century regular Spanish warships were few, and rarely appeared in the Caribbean. The**

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enforcement of trade regulations was entrusted mainly to guarda-costas fitted out in colonial ports and carrying commissions from the local governors. These ships were manned by ruffians trained in the long war against the buccaneers. They were fitted out privately, and received their remuneration from the sale of the prizes they brought in. They cruised in the regular routes of colonial trade, stopping every ship they met, and searching for "contraband." The guarda-costas and the colonial courts accepted the presence in a foreign ship of any Spanish colonial produce - indigo, cocoa, logwood or Spanish money - as evidence of unlawful trade [Parry 1977:297].

The privateer activities in the West Indies in the 1820's expanded first to include the unarmed merchant ships from the United States and Europe which conducted trade with the insurgents. However, in 1821 after independence of the latin american colonies was achieved the former guarda-costas turned to piracy attacking all merchant shipping regardless of the nationality. Former Puerto Rican guarda-costas like Roberto Cofresi and Juan Portugües in the 1820's, used Mona and Saona Islands as a base of operations to attack foreign sailing vessels, local towns and fishermen (Cardona Bonet 1985:62-64).

In response to pirate attacks on American shipping, in 1821, the United States established the West India naval squadron composed of six vessels (the sloop of war Hornet, brigs Enterprise and Spark, and schooners Shark, Porpoise, and Gampus) under the command of Commodore David Porter, and stationed at Key West to hunt down the pirates preying on neutral shipping, be they Spanish guarda-costas, privateers commissioned by Latin American countries, or just pirates (Bradlee 1923:1).

Congress, memorialized by the ship-owning interests of the country, lost no time in enacting statutes prescribing the penalty of death and giving extraordinary powers to the Executive for the purpose of apprehending the pirates; the right to search suspicious vessels, and bays and coasts suspected of being piratical nests, even though beyond American territorial jurisdiction in foreign land, if not under the direct control of the

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recognized de facto governments. The Spanish government afforded all the assistance in its power, but its navy, never large or well managed, was also crippled in its contest with the South American revolutionary colonies, so that the Spanish officials could only acquiesce in permitting our naval officers to operate within their territory where they had not sufficient force to stop piracy. This, notwithstanding our well-known sympathy with the [former Spanish] colonies. A number of privateers were fitted out by the Spanish government to help its own naval force and also to fight the pirates, but, when opportunity offered, many of these armed vessels seized and plundered defenseless craft of any nationality, while others boldly renounced allegiance to Spain and hoisted the black flag. Some of the Spanish governors and alcaldes in remote districts secretly connived at this business, as it increased their always meager salaries. They allowed the pirates to refit in port, and in some cases furnished supplies of arms and ammunitions in consideration of a share of the booty [Bradlee 1923:12-13].

During this time British, French and Spanish naval elements were also involved in the efforts to eradicate piracy in the West Indies.

However, Commodore Porter was not able to secure the needed cooperation from the Spanish authorities in Puerto Rico to eradicate pirate bases or capture of the pirates hiding on the island. The regional military, naval and municipal authorities, particularly in the western region of Puerto Rico, were sympathetic to local pirates, protecting them and profiting from the sale of products obtained from raided ships. Some pirates, like in the case of Roberto Cofresí, were also related by family to the local authorities of the town of Cabo Rojo. For these reasons some local authorities, who were actively involved in the economic activity generated from piracy, were uncooperative or even hostile to the efforts to track down the pirates and the stolen goods.

Friction between the Spanish local authorities on Puerto Rico and Commodore Porter culminated in an American landing and attack on the coastal defenses of Fajardo, Puerto Rico, by 200 seamen and

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marines, led by Porter, when Lieutenant Commandant C.T. Platt of the Beagle was "imprisoned and shamefully treated" as he attempted to inspect "a quantity of dry goods supposed to have been deposited there by pirates" (Bradlee 1923:125). Porter was later "court-martialed for overstepping his authority" (Bradlee 1923:126-127) and was replaced by Captain Lewis Warrington.

One estimate indicates between 1820 and 1830 approximately 2500 pirates were engaged in attacking shipping in the West Indies resulting in losses of twenty millions of dollars annually. American, British, and Spanish Caribbean naval squadrons of the same period captured a total of 97 vessels and about 1750 pirates (Bradlee 1923:22-23).

However, by 1823 with end of the constitutional period in Spain and the reinstatement of the absolutist monarchy the tide had turned against the pirates. The acting governor D. Miguel de la Torre gradually replaced the regional officials with spanish officials who had emigrated to Puerto Rico as result of the independence of the latin american countries. The positioning of Spanish officials to regional posts facilitated the cooperation between the Americans and Spanish concerning the pursuit of the pirates. Although Francis Bradlee believes the cooperation was due to factors other than Spanish altruistic interest in eliminating West Indies piracy.

Driven off the water, with their lairs invaded, their plunder seized, their vessels burned, their occupation afloat gone, the marauders organized themselves into bandits, and turned their predatory practices against the towns and villages of Cuba. This aroused the Spanish governors from the indolent complacency, not to say more, with which they had watched robberies upon foreigners that brought profit rather than loss to their districts. When the evil was thus brought home, the Spanish troops were put in motion, and the pirates, beset on both sides, gradually disappeared [1923:74-75].

One of the most well-known Puerto Rican pirates, Roberto Cofresí, operated out of Mona as early as 1823 (Cardona Bonet 1991:73). The United States Caribbean Squadron learned of Cofresí's activities after his men captured the William Henry, out of Salem, Massachussetts and took the vessel to Mona, in November of 1823.

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In January of 1824, Commodore Porter dispatched the **U.S.S. Spark**, under the Lt. John W. Newton to investigate the incident. On February 8, 1824, a group of United States Marines and seamen from the **U.S.S. Spark** landed on the present-day Playa de Pájaro, on the southeast coast of Mona. They found several buildings constructed by Cofresí's men and papers from the **William Henry**, but the pirates ran away before the American landed. Newton ordered the buildings burned at the pirate base before they left Mona (Cardona Bonet 1991:74-78)

The American expedition on Mona was followed up by a Spanish assault on the pirates of Mona that lasted from June 22 to June 27 1824. Under the direction of Don José Mendoza, Spanish commander of the western area, a group of volunteers sailed from the port of Cabo Rojo on the small vessel **Avispa**. They returned from their expedition with three pirates captured in Mona and the head and arm of the pirate Juan Portugúes "El Portugúes" which was displayed as a warning to other pirates in the vicinity (Cardona Bonet 1991:111-118).

With pursuit by international naval squadrons and land based Spanish troops, pirates could no longer utilize Isla de la Mona and the Mona Passage to prey on merchant vessels. By the 1830s three hundred years of pirate activities were finally at an end.

It was found necessary to keep a squadron in these waters with a view to prevent piracy, for some years and although sporadic outbreaks took place from time to time, there was no comprehensive revival of the free-booters "trade." The same system of marine police was continued, and with the more or less active co-operation of the Spanish authorities, the marine highwaymen became fewer and far between, until by the early 1830's it was difficult to find any more, and merchant vessels bound to the West Indies had a reasonable chance of arriving at their destination without being attacked [Bradlee 1923:133-134].

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Lighthouse System of Puerto Rico

During the nineteenth century, large scale expansion of agricultural products, such as sugar, coffee and tobacco, for export on the island of Puerto Rico was matched by a growing dependency on the importation of manufactured commodities and foods. As the planters produced more agricultural goods for export there was a decrease in subsistence crop production --plantain, sweet potato, corn and manioc -- that could only be met by the importation of food on seagoing vessels.

To meet the needs of an emerging shipping trade the Spanish government on Puerto Rico undertook the construction of channels, ports, and lighthouses. This was necessary because of the increasing numbers of shipwrecks around the island due to unsafe, outmoded, inadequate, and ill-protected maritime facilities.

In 1869, the Central Lighthouse Commission of Spain approved a plan for the construction of 14 lighthouses, including Mona, that would provide navigation beacons ringing the entire island of Puerto Rico. No monies were provided for construction until 1875, and from 1876 to 1885, under the Public Works Office the first seven lighthouses were constructed at San Juan Harbor (atop El Morro), Cabo de San Juan, Isla Culebrita, Punta Borinquen, Cabo Rojo, Isla Caja de Muertos, and Isla Cardona.

In 1888, the lighthouse plan was revised stressing the need for construction of a light on Mona, because of the increase in international traffic going through the Mona Passage. According to this 1888 report,

According to all statistic and geographic information, the number of European ships South America-bound which use the Mayaguez and Saint Domingue Channel [Mona Passage] is larger than that which use other channels. And if the opening of the Panama Canal is added to the illumination of these coasts all the aforementioned navigation will follow that route, which is the shortest. It is thus, of utmost international and national interest to light this shore well and promptly [Nistal-Moret 1979:6].

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The Mona lighthouse is the only Puerto Rican lighthouse for which two entirely different plans were drawn. The first (1885), showed a masonry structure, while the second (1886) showed a prefabricated metal structure. When actual construction commenced in 1888, the traditional brick and masonry design was abandoned in favor of a prefabricated metal lighthouse structure for Mona.

The 1888 construction initially consisted of building a large brick cistern to catch rain water on the heights above Playa de Pájaro. After completion of this cistern, however, it was realized the light needed to be placed closer to the eastern edge of the island because of poor visibility from the northern approach to the island and this building site was abandoned. Today the original construction site is marked by the brick cistern and quantities of prefabricated iron brackets and bolts (see Figure 18).

Apparently the 1886 plan, detailing the poor quality sandstone of the island, had the government opt for a lighter construction metal lighthouse rather than a massive brick and masonry structure. Begun in 1888, construction was finished between 1898 and 1900 on the new site. Today the iron lattice work tower, and metal lighthouse keeper dwelling stand as the only Spanish colonial metal lighthouse in the Puerto Rican lighthouse system (see Figure 9 and 19).

**XII. BUSINESS**

- A. Extractive or Mining Industries**
  - 3. Other Metals and Minerals - Guano**

Nitrate extraction in Mona Island

The Industrial Revolution of the late eighteenth and early nineteenth centuries might not have been possible without the ability of European farmers to increase the production of food to feed the ten of thousands of factory laborers that swelled the towns of Europe. This increase in productivity of farm land was due to the use of inorganic fertilizers high in nitrate and phosphate content. At first, farmers used stable manure, soap-boilers waste, night soil, and even animal bone dissolved in sulfuric acid, but they proved of limited value as fertilizers. In the 1820s, "the first cargo of Peruvian guano arrived" in Europe "to be followed not much later by shipments of Chilean nitrate"

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which established a global market for nitrates (Singer et al 1958:20).

Toward the middle of the nineteenth century scientific studies in Germany and in England demonstrated the effects of nitrate of soda and other mineral nutrients on agricultural production. In the succeeding decades the cultivation of cereals was displaced from European countries to the great semivirgin lands of the United States, Argentina, Russia, and elsewhere. European agriculture was profoundly transformed by the intensive cultivation of new crops and the adoption of inorganic fertilizers. These changes brought about a broad and dynamic market for nitrate, the only one of the nitrogenous nutrients that was found in a natural form. Thus, from the beginning, nitrate held a privileged status among fertilizers on the world market [Conde and Hunt 1985:153].

South American Guano or nitrate soil, is rich in phosphate was found to be an outstanding natural fertilizer for food crops in northern Europe and America. It occurs in limited quantities throughout the world as deposits of bird or bat droppings and its value as a trading commodity in the last half of the nineteenth century was worth tens of millions of dollars to the country that controlled guano deposits (O'Brien 1982).

On Mona the guano deposits ranging from a few inches to several feet in depth were made of decomposed marine life trapped in the numerous caves along the perimeter of the island, as the island slowly rose out of the sea. Eventually, over thousands of years the guano deposits were covered over by the formation of stalactites and stalagmites (Wadsworth 1952:24).

In 1858 an official Spanish government survey of the guano deposits was undertaken and some thirty tons of material were sent to Cadiz and London for analysis (Wadsworth 1952:25). According to Frank H. Wadsworth

The first concession of exclusive phosphate right on Mona by the Government of Puerto Rico was apparently that made to Manuel Homedes y Cabrera in 1874. Two years later

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this franchise was transferred to Miguel Porrata Doria of Fajardo and Juan Contreras of Madrid. The "Sociedad Porrata Doria, Contreras y Cia" did the first organized mining. Between 1877 and 1887, thirty two ships took 7,830 metric tons of Mona phosphate to various parts of the world, including England, France, and the United States. At one time during 1883 about 40 tons were mined daily at Playa de Pájaro . . . however, this activity decreased, and by 1888 once more there was no continuous colony on Mona [1952:25].

Contemporary drawing (see Figures 20 and 27) of this guano mining concern show the mining of guano in the caves, transportation of the guano by rail carts, and the processing station on Playa de Pájaro.

The period of greatest guano extraction occurred between 1890 and 1896, under the second concession given to a German named Anton Mobins.

A colony of at least 200 miners was established. Trails were made, and all but the most remote caves on the north side of the island were worked. Mona phosphates were shipped during this period to France, Norway, England, Denmark, and Germany. From 1890 to 1892 at least 50 ships were loaded. In 1894 twelve ships took about 4,500 metric tons. The activities of the German company came to an abrupt halt in 1896 when the competitive working of phosphate deposits in Peru, Curacao, and Florida destroyed the market in the United States and when the demand in Germany declined because of the discovery of cheaper substitutes. The total quantity extracted was not more than 50,000 tons [Wadsworth 1952:26].

A third concession, called the Mona Island Phosphate Company operated the equipment left by the German company on Playa de Pájaro, from 1903 to 1924, removing less than 36,000 tons of guano (Wadsworth 1952:27). The world-wide demand for natural fertilizers eventually died out due to "the development of artificial fertilizers in Germany during the [first world] war" (Conde and Hunt 1985:153).

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According to an interview conducted in 1952 by Frank H. Wadsworth of one of the guano miners of Mona

The "guano" is a phosphate, a loose, powdery, frequently damp and sticky mass. It was dug from the floor of the caves with picks, shovels, and steel bars, carried out in wheelbarrows, or on the backs of men, and transported in small trams to the roadsteads at Playa de Pájaro [Lighthouse Beach on the southeast coast] . . . Before shipment it was pulverized, screened to remove stones and other impurities, and dried in the sun . . . In the absence of a protected harbor it had to be lightered in small boats to ships anchored offshore [1952:9].

In June of 1993, a group of archeologists from the National Park Service, Puerto Rican Department of Natural Resources, and the State Historic Preservation Office went to [redacted] and found extensive brick and rubble masonry ruins of the late nineteenth century guano works, probably built by the German concession in the 1890s. Also noted were the remains of iron boilers and machinery used in the pulverizing and screened of guano from the caves [redacted] were noted evidence of guano mining, including earthen tramway ramps, remains of narrow gauge iron tram rails, and iron tram carts. Many of the caves exhibited extensive damage to the stalactites and stalagmites which were removed by explosives set by the guano miners to extract the guano deposits under these formations. The Germans also constructed a massive roadway [redacted] island, to facilitate the movement of guano from different parts of the island to the processing station.

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Figure 10. Early sixteenth century engraving showing the making of cassava bread by Caribbean female Indians in a manner used by the Tainos that occupied Mona in the sixteenth century (Cardona Bonet 1989:26).

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Figure 11. Oldest known portrait of Christopher Columbus (1446 - 1506), the discoverer of Isla de Mona. From Paulus Juvius' Elogia Virum Illustrium (Lehner and Lehner 1966:16).

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Figure 14. Portrait of the Spanish explorer Juan Ponce de León first governor of Puerto Rico. Utilized the Mona Islanders to supply Spanish settlers and Indian workers on Puerto Rico with cassava bread (Lehner and Lehner 1966:17).

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Figure 16. Portrait of the English Captain John Smith (1580 - 1631), colonizer of Virginia, who visited Mona in April of 1607. Portrait is from the margin of a map by Simon van Pass from Smith's General Historie of Virginia published in London in 1624 (Lehner and Lehner 1966:26).

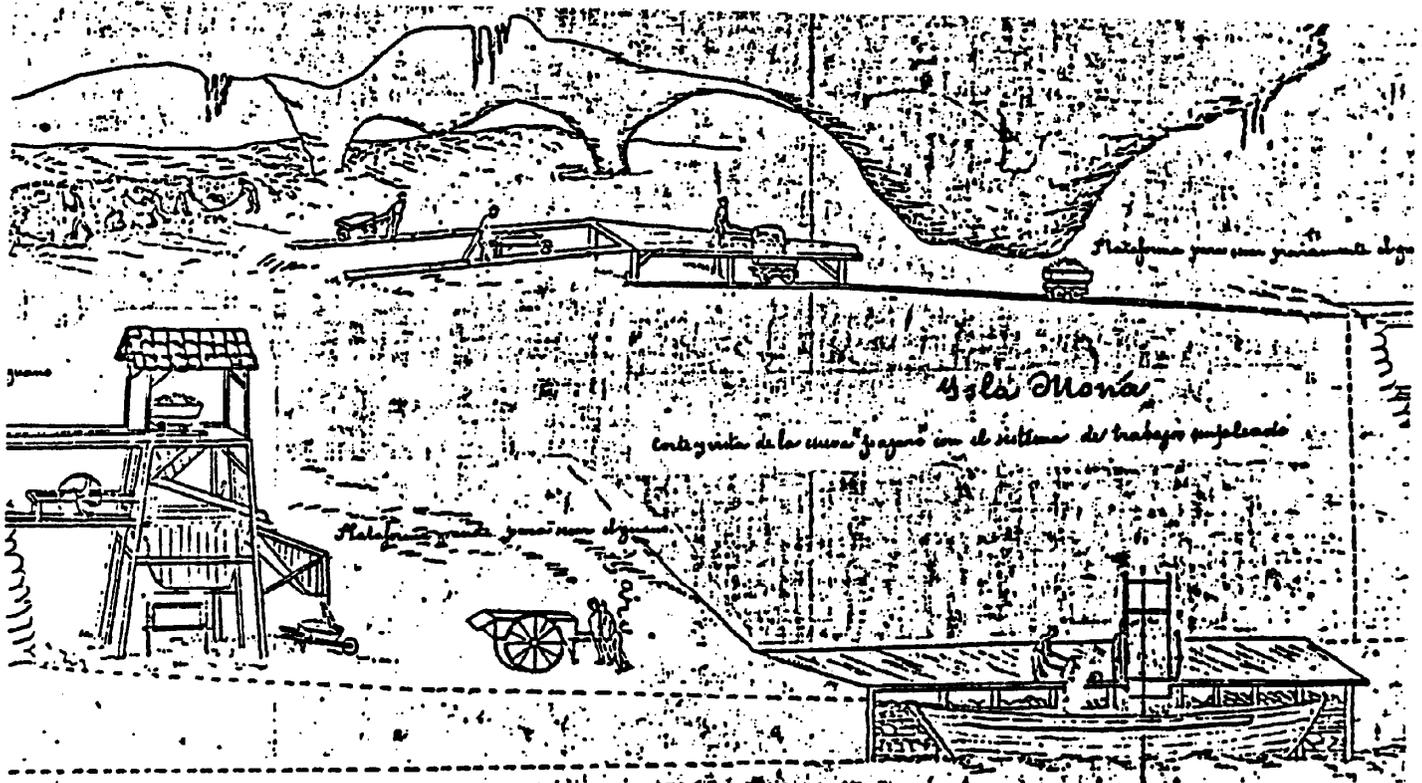
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Mina de guano en Cueva de Pájaros en el 1883. (Vasconi y Vasconi)

Figure 20. Drawing of 1883 showing the method of mining guano from the caves of Mona, its transport to Playa de Pájaro (on the southeast coast of Mona) by wheel barrow and rail carts, and loading on lighters (Wadsworth 1976:605).

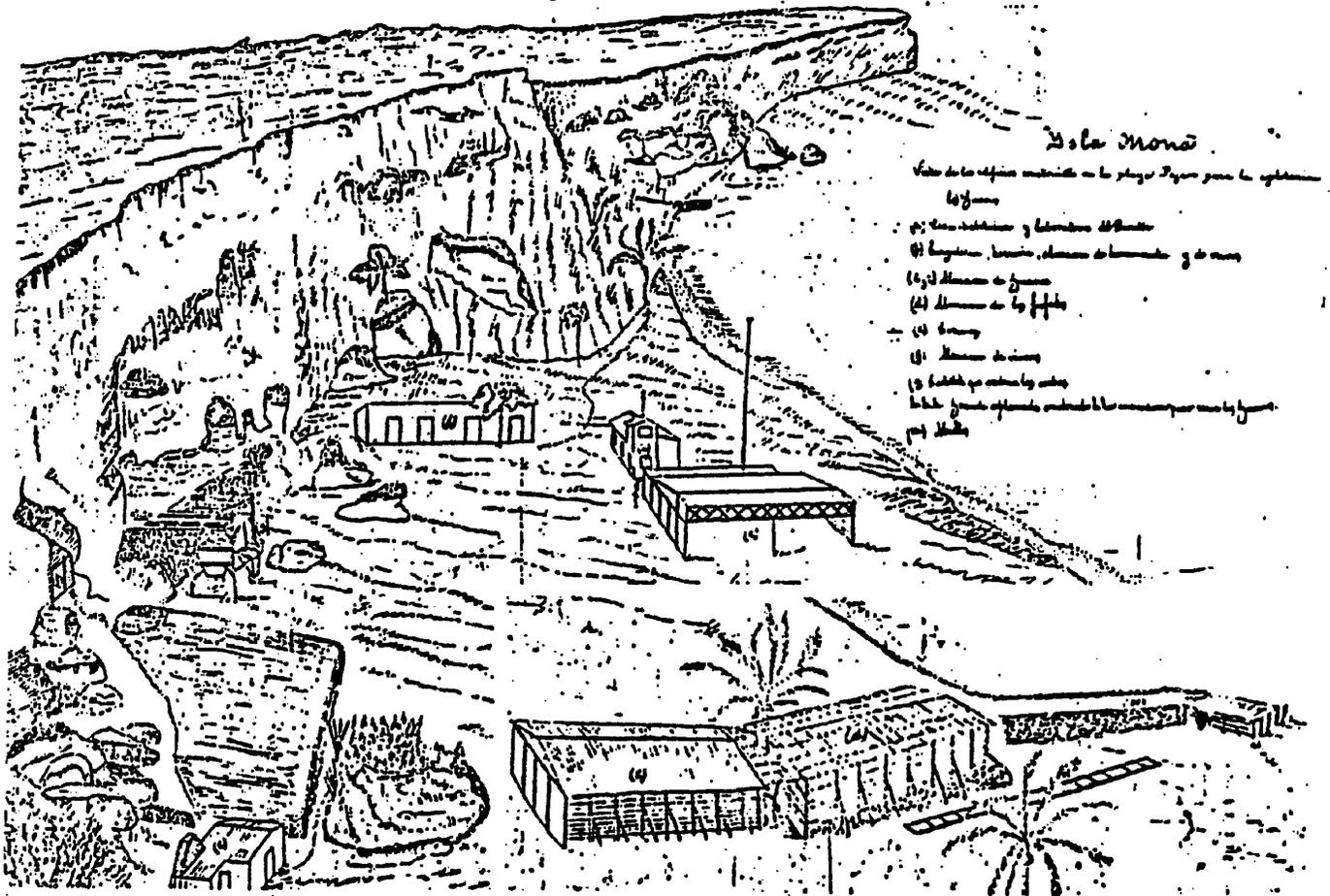
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Panorama del procesamiento de guano en Playa de Pájaros en el 1883. (Vasconi y Vasconi)

Figure 21. Drawing of 1883 showing the guano processing station on Playa de Pájaros, on the southeast coast of Mona (Wadsworth 1976:606).