

JAMAICAN RED CLAY TOBACCO PIPES

A Thesis

by

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## ABSTRACT

Jamaican Red Clay Tobacco Pipes. (December 1992)

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This thesis is a study of the red clay tobacco pipes which are found in significant numbers on Jamaican archaeological sites dating to the latter half of the 17th century and the early part of the 18th century. Clay tobacco pipes have proved to be an important class of artifacts because of their widespread distribution throughout colonial sites in the New World and the information they can provide concerning the dates of occupation, trade patterns, and the national origin of the people who occupied a particular site.

Pipes of European manufacture have been studied extensively in the last few decades, and this research has helped to increase their value as a tool for gaining information from archaeological sites. While our knowledge of the white European tobacco pipes has grown considerably, research into locally-made earthenware tobacco pipes has only been undertaken in the last few years. These red clay pipes occur at several colonial sites in North America, the Caribbean, and South America.

This thesis will be a detailed study of the red clay pipes found in Jamaica with a special emphasis on pipes recovered from the important English colonial city of Port Royal. Until it was almost totally destroyed by an earthquake in 1692, Port Royal was the most important English city in the Caribbean.

The goals of this thesis are: to determine as closely as possible the dates in which these pipes were in use, to identify the place of origin of the pipes, to

explain the processes used to produce the pipes, to compile a catalog of the different types of decoration used on the pipes, and to offer possible explanations for the markings and stylistic attributes of the pipes. Locally made earthenware pipes from other colonial sites in the New World will also be examined to identify possible parallels to the Jamaican tobacco pipes.

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## INTRODUCTION

In the archaeology of post-medieval sites in both Europe and the New World, one of the most common artifacts encountered is the clay tobacco pipe. This artifact group also happens to be one of the most useful to the archaeologist in providing information on several aspects of a particular site.

Because tobacco pipes were made, used, and discarded in a very short time, they have great potential for providing information on the dates of occupation for archaeological sites. The large numbers of tobacco pipes found in a wide variety of sites dating from the 17th century and onwards, coupled with the relatively rapid evolution in form and decoration, make tobacco pipes a valuable aid for dating. Variations between pipes made in different areas, both within a particular country and between countries, make tobacco pipes useful for gaining insights into the nationality of people who occupied a site, as well as providing information on trade patterns during the period under consideration.

The past few decades have seen great strides in the study of clay tobacco pipes (Oswald 1975; Atkinson 1962; Walker 1977). This research has helped to unlock much of the tobacco pipe's potential for providing information on archaeological sites by combining studies of historical records with information gained from archaeological sites. This combination of archaeological investigation and historical research has led to the development of reliable typologies and accurate chronologies which have become a key aid in the dating of sites. Research into

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clay tobacco pipes has also made it possible to determine the place of origin for a wide variety of European pipes.

While the mass-produced pipes of Europe, white in color and made from hard-firing kaolin clays, have been studied at some length, clay pipes produced in the Americas during the early colonial period have not received as much attention. Red-colored earthenware tobacco pipes produced in the New World, often handmade from local clay deposits, have been found at many colonial sites in North America, the Caribbean, and South America (Noël-Hume 1979; Pernambucano de Mello 1983; Henry 1979; Faulkner 1992). These pipes, though they date from the same basic time period, vary in style from site to site and are also distinct from the European pipes of the period.

Port Royal, Jamaica is one of the most important colonial sites in the New World as the result of an earthquake which submerged much of the city into present-day Kingston Harbour in 1692. At the time of the quake, Port Royal, rivalled only by Boston, was the largest and most economically important English settlement in the Americas. The catastrophic nature of the disaster has created a unique opportunity for the study of life in a 17th-century colonial city (Figure 1).

In the last 30 years a number of archaeological excavations have been carried out at Port Royal, both in areas of the city which are now underwater (Link 1960; Marx 1973) and on land sites in different locations of the present town (Mayes 1972). Beginning in 1981, the Institute of Nautical Archaeology, in cooperation with Texas A&M University and the Jamaica National Heritage Trust, embarked on underwater archaeological investigations on a portion of the submerged remains of the old city of Port Royal. The area investigated was located off the site of the old British Naval Hospital. During the earthquake, this part of the old city, which

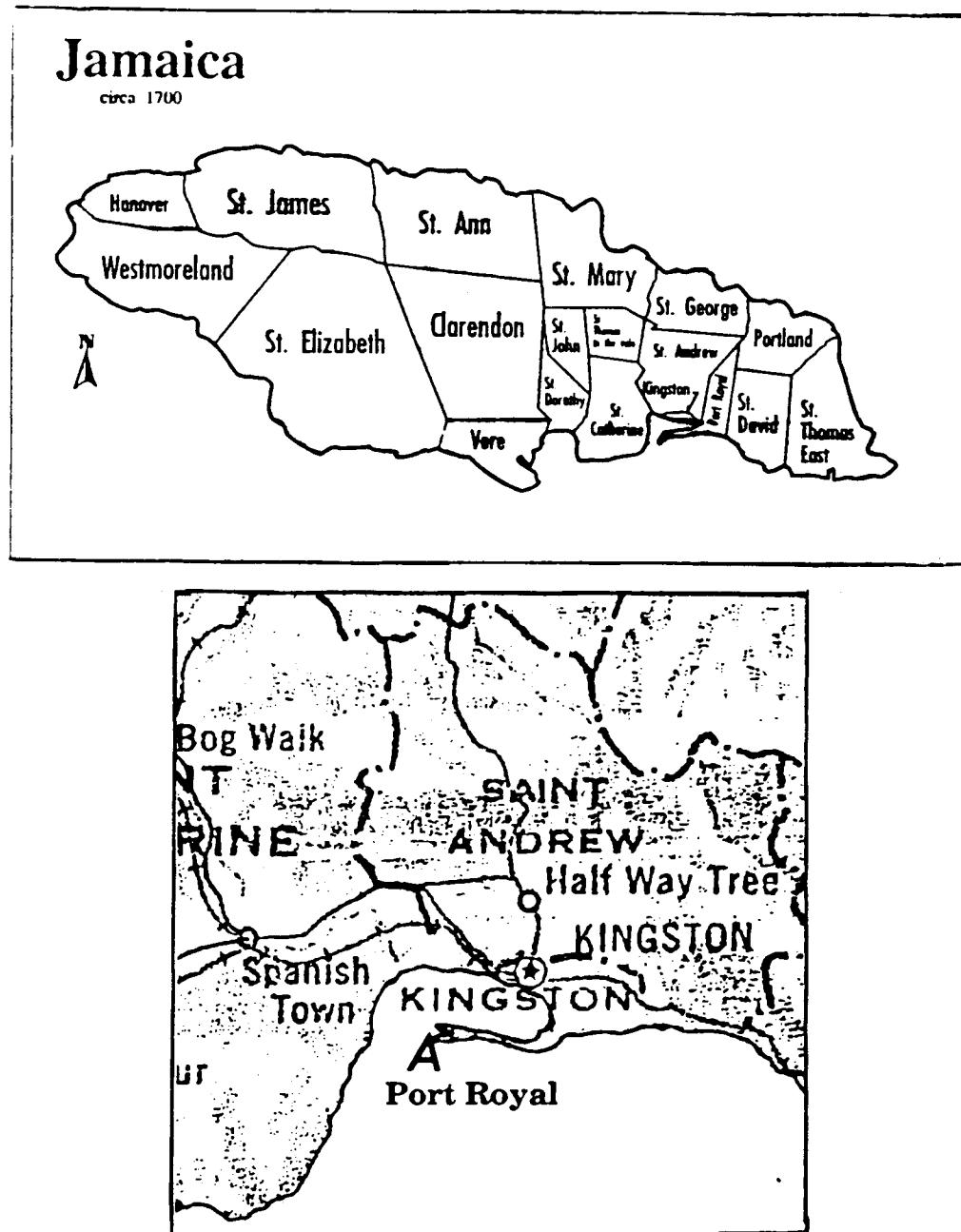


FIGURE 1. Map of Jamaica, top, and Kingston Harbour, bottom.

was situated away from the harbor in 1692, sank vertically with minimal horizontal disturbance through a process called liquefaction (Hamilton 1992:41).

The catastrophic nature of the earthquake and the subsequent sinking of a large part of the city into the harbor have combined to create an archaeological site where a wide range of material remains are present and also well preserved. Spared from many of the damaging effects of continuous occupation, the Port Royal site represents a unique time capsule of cultural remains from a 17th- century colonial city. The availability of many historical records and documents relating to Port Royal have also added considerable value to the city's importance as an archaeological site.

The INA/JNHT/TAMU excavation was carried out over a period of ten years. During this time eight buildings were uncovered and five were thoroughly investigated. These buildings were located in the center of the 17th- century town near the intersection of Queen and High Streets (Figure 2).

As would be expected on a 17th-century English colonial site, the various excavations at Port Royal have produced large numbers of the white kaolin tobacco pipes made in England and other European countries. In addition to the white European-style pipes, the excavations at Port Royal have produced the largest collection of red clay pipes to be found at any site in the Americas. Most archaeologists working on colonial sites in Jamaica have encountered these earthenware pipes (Marx 1973; Mayes 1972) in significant numbers, but little research has been done on them (Gray 1982; Heidtke 1986).

In basic form and style, the red clay pipes resemble tobacco pipes made in England in the late 17th century. The red clay pipes, however, differ from the English types in several important ways: they cannot be dated by standard methods based on the diameter of the stem bore

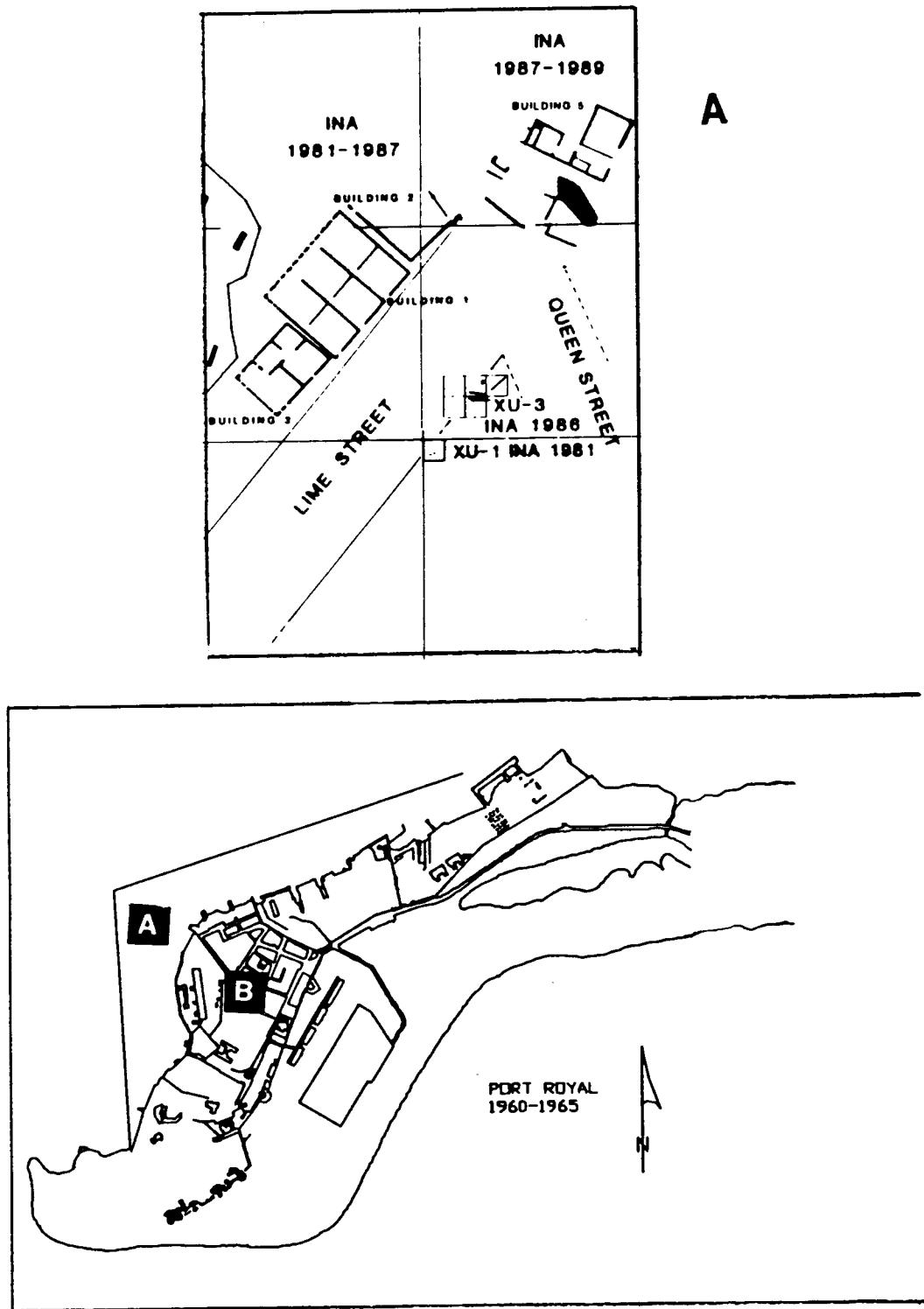


FIGURE 2. Map of Port Royal showing the INA/JNHT/TAMU, a, and the New Street, b, sites. (Port Royal Project)

(Binford 1962; Harrington 1954); they are made mostly by hand, as opposed to European pipes which were made in molds; they are marked in a way that is rare for English or other European pipes of the period; and finally, the redware pipes were made and used for a much shorter time span than were the English pipes (Figure 3).

This thesis will be a detailed study of the red clay pipes found in Jamaica with a special emphasis on the pipes recovered at Port Royal. The goals of this research are: to determine as closely as possible the dates in which these pipes were in use, to identify the place of origin for the pipes, to document the process by which the pipes were produced, to compile a catalog of bowl forms and stamped marks, and to offer possible explanations for the markings and stylistic attributes of the pipes. The Jamaican pipes will also be compared to locally made earthenware pipes that occur around the same time period at colonial sites on the eastern coast of North America.

The major group of pipes on which this research is based come from the carefully documented excavation carried out by the INA/JNHT team. A second group of pipes comes from a land excavation supervised by A.J. Priddy in 1972. The Priddy excavation took place in a small area of Port Royal bordered by New Street, Dove Lane, and Love Lane. Information on redware pipes of the same kind as those from Port Royal that occur at other sites in Jamaica, as well as a few from outside Jamaica, will also be presented.

The collection of pipes which was studied includes many intact pipe bowls as well as hundreds of pipe fragments with identifiable marks. The archaeological provenience will be used to help determine a date range for the red clay pipes. Historical records such as wills and inventories will also be examined for information relating to the use and production of the pipes. The

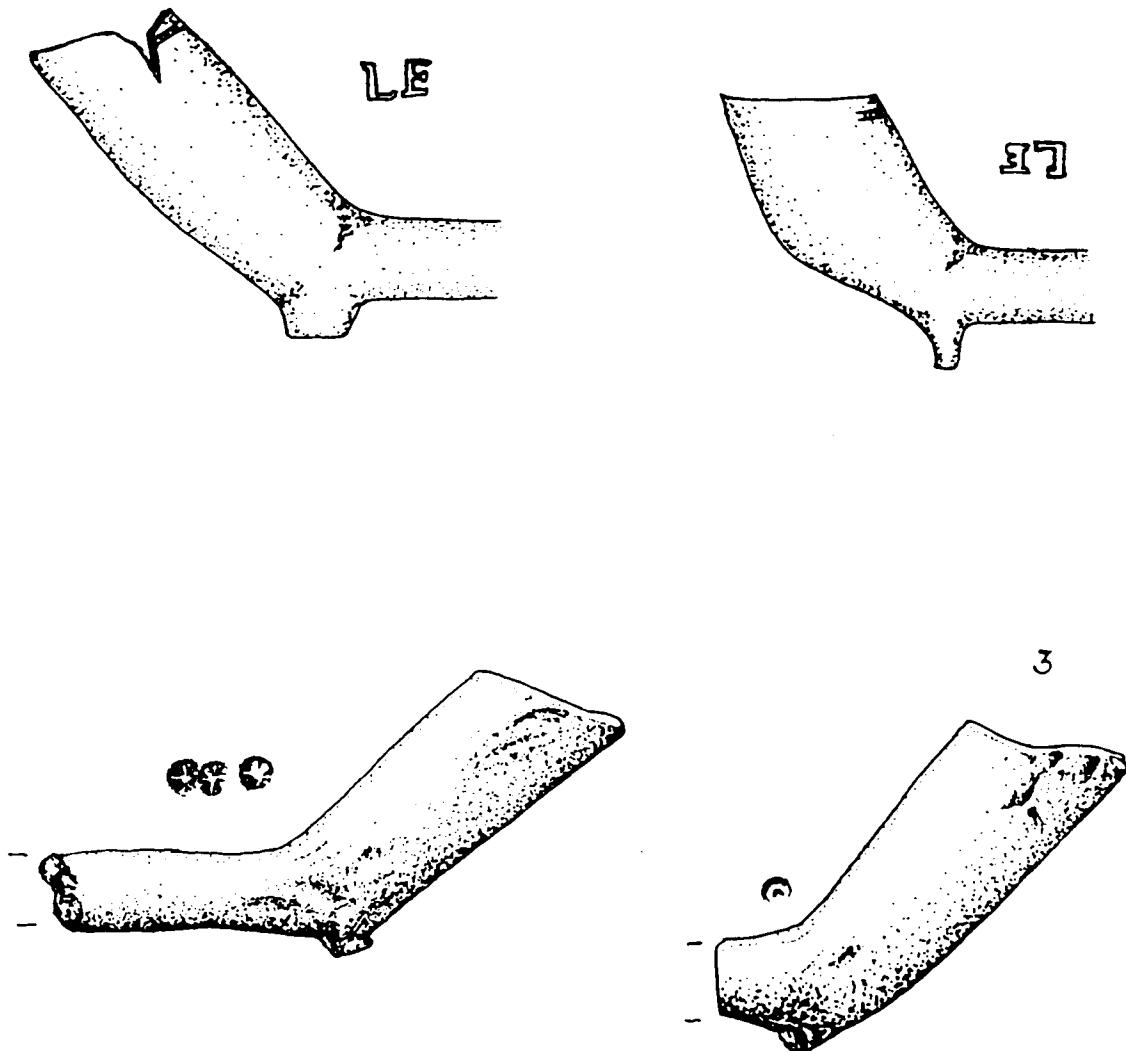


FIGURE 3. Illustrations of white English kaolin tobacco pipes, top, and red clay Jamaican pipes, bottom. (Port Royal Project)

results of chemical analysis performed on samples of the pipes will be presented to support the theory that the red clay pipes were indeed made locally in Jamaica and were not imported into the island from some other location.

The red clay pipes of Jamaica are important in that they represent an early example of a New World phenomena --tobacco smoking-- being adopted by Europeans and developed into an industry which was then transported back to the New World. A thorough study of the Jamaican red clay pipes will hopefully increase their value as a tool for understanding the archaeological record of colonial sites. A more complete knowledge of these pipes should prove useful to dating sites where they occur and in defining contact patterns between Jamaica and other areas in the latter part of the 17th century.

## HISTORY OF THE SITE

The English capture and occupation of Jamaica in 1655 was one step in a series of actions by English government and economic interests to challenge the Spanish dominance in the Americas that had begun over a hundred years earlier. Within a few decades of Columbus' landfall in the Americas, England and other European powers initiated efforts aimed at securing a share of the wealth, real and perceived, that was flowing from the newly founded empires of Spain and Portugal in the New World and the Far East. In spite of the 1494 Treaty of Tordesillas, in which Spain and Portugal accepted the Pope's division of all recently discovered lands, other Europeans were quick to make attempts at gaining a share of the economic rewards accruing to the Iberian countries from their New World domains. Spain's rivals were willing to pursue their goals through peaceful trade where possible, but also through force where necessary.

The potential for profit from direct trade with, or military attacks on, the Spanish colonies was illustrated to the English and other Europeans by the voyages of English adventurers like Drake and Hawkins and the activities of the French corsairs. These actions were often publicly condemned by some of the same government officials who were privately investing in the ventures.

Open warfare broke out between England and Spain in 1585, leading to almost twenty years of government-backed privateering against Spain by mariners from several nations. The 1604 Treaty of London, which ended open hostilities, was, out of diplomatic necessity, vague on the point of trade and colonization by other European countries in the West Indies. Spain maintained the position that the Caribbean was a closed sea, but lacked

the power to enforce the claim. The English, French, and Dutch recognized Spain's control only over those areas actually occupied by Spanish forces. The vagueness of the London Treaty and the knowledge gained by English seamen during the war led to efforts by certain Englishmen to establish their own colonies in the West Indies in areas not occupied by the Spanish.

The post-1609 growth of English, Dutch, and French trade and colonization in the West Indies was part of a world-wide drive by the merchants of those countries to establish direct trading links with the producers of luxury goods which had formerly seeped into Europe through the colonial entrepots in Spain, Portugal, and the merchant houses of Venice. New financial organizations, increases in the number of merchant vessels, the accumulating knowledge of foreign waters and trade routes, and the increasing influence which merchants were gaining in the affairs of state were at once both causes and results of an expanding commercial drive for the "rich traders" (Claypole 1972:31).

The first successful attempts by the English to plant colonies in the West Indies were made in the 1620s with the occupation of the Lesser Antilles islands of St. Christopher, Nevis, and Barbados. The settlement of these islands was mostly due to the efforts of enterprising individuals operating without the help of the government or support from strong financial backers. Later colonies were often developed as a result of government policy or under the direction of well-funded companies organized for the purpose.

The fledgling progress made by the early English colonists was due in large part to the Dutch. While the English government and merchant community pursued a policy that could accurately be described as one of benign neglect, Dutch merchants and ship owners provided valuable assistance to the colonists with credit,

transportation, advice on crops, and access to markets. In the case of sugar, the Dutch were instrumental in transporting the industry en masse from their possessions in Brazil to the island plantations of the English in the West Indies. This transfer included the seeds for growing cane, cultivation methods, the expertise and equipment for processing sugar, and increasing numbers of African slaves to provide labor. In many cases the Dutch were much more generous and helpful to the English colonists than their own government and merchants.

By the middle of the 17th century, the Dutch influence and their large share of trade in the English colonies began to alarm the English government. The English Parliament, having recently been victorious over the King in the English Civil War, was ready to keep a closer eye on her colonies across the ocean. The next several years saw the passage of a number of laws and regulations designed to curtail or exclude the Dutch and other foreigners from trading with the English colonies in North America and the West Indies. The laws were never completely effective, and the English colonies continued to trade with the Dutch, both overtly and clandestinely. The English restrictions on trade were a leading cause of the First Dutch War, which lasted from 1652 to 1654.

The 1640s saw sugar begin to replace tobacco, cotton, and indigo as the focus of economic activity in the English colonies of the West Indies. The rise of sugar, which was more capital and labor intensive, as a major staple began to change the basic complexion of the island colonies. The success of some individual planters at the expense of others led to an increasing concentration of wealth in the hands of a minority of fortunate planters. Rising land prices forced many of the small freeholders to emigrate at the same time the labor requirements of the sugar industry were leading to larger and larger numbers of African slaves.

While the sugar plantations of the western Caribbean were becoming commercially viable in their own right, they did not present the opportunities to English merchants that direct trade with the Spanish colonies offered. From the merchant's point of view the situation took a turn for the better in 1654 when Cromwell, Lord Protector of England, decided to proceed with his plans for an attack on the Spanish Indies.

The target of Cromwell's expedition was the large island of Hispaniola in the Greater Antilles. A large land and sea force under the commands of Admiral Penn and General Venables, including a substantial number of men recruited from the English colonies of the western Caribbean, were thwarted in their attempt to capture Santo Domingo, the Spanish capital of Hispaniola. Forced to retreat from Hispaniola, the leaders of the invasion force opted to attack the Spanish island of Jamaica in the hopes of salvaging some benefit from the costly expedition.

In May of 1655 the English force succeeded in capturing the lightly defended island. Since its discovery by Columbus in 1494, Jamaica had remained a poor and backward area of Spain's New World empire. The English invasion force landed on the south coast of the island and quickly captured Caguaya and Villa de la Vega, the two main Spanish sites in the area of present Kingston Harbour. Although open resistance by the Spaniards was crushed shortly following the English landing, it would take several years before a guerilla campaign carried out by the Spanish was put down. Slaves freed by their Spanish masters at the time of the invasion, who came to be known as Maroons, retreated into the jungle and established their own villages from which they would raid the English settlements and plantations well into the next century.

To protect the excellent harbor on the south coast

of the island, the English forces immediately began to fortify a long sand peninsula that commanded entrance to the bay. The peninsula, called *cayo de carena* by the Spanish, had been used only infrequently by the Spanish as a place to careen their ships. In addition to its strategic command of the harbor's mouth, the tip of the peninsula was the site of a good anchorage where large ships could be brought in close to shore. Shortages of supplies, sickness, and strained relations between naval and land forces made the first few months of the English occupation a difficult time, but despite the difficulties, the settlement at the point began to take shape.

During the latter part of 1656, there was a period of consolidation, both on the Point and on the mainland. A palisade was constructed around Villa de la Vega, now called Spanish Town, and storehouses had been built at the Point and at Passage Fort (Pawson and Buisseret 1975:9). The original settlement at the end of the sand spit was referred to as the Point or Cagway. By the end of 1658, there were at least three rows of houses at the point in addition to Fort Cromwell, a forge for working metal, a house for the commander-in-chief, the state storehouse, and a church or market house; by the middle of 1659, it was no longer easy to obtain land on the harbor side of the spit (Pawson and Buisseret 1975:11). With the restoration of the English monarchy in 1660, the settlement was named Port Royal and the major fort was renamed Fort Charles.

The period between the Restoration and the signing of the Treaty of Madrid saw the notoriety and prosperity of Port Royal increase rapidly. To replace troops and naval forces sent back to England, Governor D'Oyley offered the fortified town of Port Royal as a base of operations to the loosely organized band of French and English pirates operating out of Tortuga as the

"Confederacy of the Brethren of the Coast". Armed with privateering commissions from the Jamaican authorities, the buccaneers became a major threat to Spanish commerce and cities along the Main and throughout the islands of the West Indies. Though poorly organized and often more concerned with plunder than strategy, the privateering force helped defend Jamaica by distracting the Spaniards and keeping them from trying to launch a serious effort at retaking the island.

The Treaty of Madrid in 1670 brought to a close the golden era of the buccaneers, with the English government promising to suppress piracy in return for Spanish recognition of English territory in the West Indies and a slight lessening of restrictions on trade. The treaty did permit ships of either nation access to their ports for victualing and repairs, which increased opportunities for illicit trade (Zahediah 1986:574). Port Royal continued to grow and prosper as an increasingly important center of trade. English, Irish, and North American ships brought wine, linen, silks, ironwork, naval stores, fruit, beef, pork, salmon, cheeses, butter, and flour in exchange for sugar, indigo, cocoa, cotton, ginger, rum, logwood, hides, tallow, and precious metal (Mayes 1972:6). African slaves were also imported under license from the English government.

By 1688 Port Royal was rivalled only by Boston as the largest and most important English economic center in the New World. The food, clothes, goods, furnishings, and accommodations one could find in London could all be found in Port Royal, as well as the merchants, lawyers, clergy, doctors, and tradesmen. In 1690 Port Royal had a mixed population of somewhere between 6500 and 10,000 men, women, and children (Hamilton 1992:40). A contemporary account described Port Royal as having 2000 buildings with 600 of them being made of brick including many of up to four stories high, collared, and "covered

with Tile and glazed with Sash Windows," but signally lacking in chimneys unless they were in small cookrooms, set apart from the others. "These houses," the account continues, "yield as good rents as those in Cheapside in London, seldom less than eighty to a hundred pounds yearly rent" (Bridenbaugh 1972:315).

Another contemporary account describes Port Royal in 1682: "The town, being as it were the store-house or treasury of the West Indies, is always like a continual mart or fair, where all sorts of choice merchandises are daily imported, not only to furnish the islands, but vast quantities are thence transported to supply the Spanish, Indians and other nations, who in return exchange us bars and cakes of gold, wedges, and pigs of silver, pistol[e]s, pieces of eight ... with store of wrought plate, jewels ... of pearls unsorted and undrilled several bushels" (Bridenbaugh 1972:314-315). The fortifications defending Port Royal also grew and were improved as the town prospered. Fort Charles was improved and enlarged, and several other forts and defensive works were built between 1660 and 1690; these included Fort James, Fort Carlisle, Fort Rupert, and Morgan's Line.

The wealth of Port Royal and the riches moving through its economy along with a well-to-do class of merchants and a transient population of mariners and traders earned the city a reputation as the "wickedest city in the World". Many visitors remarked on the number of taverns, punch houses, and brothels to be found in the city. An English author in an 1684 book entitled *Friendly Advice to the Gentlemen-planters of the East and West Indies* had the following to say of the taverns and ale houses of the Indies:

Let no sober well minded men , nor any  
that profess the honourable name of  
Christianity be so frequent in those places  
of Debauchery, viz, Taverns and Ale-houses  
the first whereof being the only places of

all manner of wickedness, where all the high lofty state of Superfluity is practised, being haunts of evil Spirits, and where their chief work is done, Women are defloured, and Estates spent, the Soul made incapable of salvation, the Health destroyed; in a word, the whole Microcosmical man ruined, and is the very Radix of devilish Fewds and cruel Murders... where there is all kinds of wicked lewd Behavior, as Swearing, Lying, baudy songs, drunken Healths, and roaring Huzza's (Tryon 1684:69-70).

As the preeminent center for intra-island as well as international trade and as the only legal port of entry, Port Royal served as the *de facto* capital of the island from 1660 to 1692 (Hamilton 1992:40). There is evidence that the domination of the Jamaican economy was beginning to shift from the merchant class of Port Royal to the wealthy planters of the interior, but in 1690 Port Royal was at or near the peak of her economic climb (Claypole 1972:220-224).

The prosperity of Port Royal came to an abrupt end on June 7, 1692, when an earthquake destroyed the town. Because of its location, overcrowding, and styles of architecture, Port Royal was in about the worst possible condition to endure a disastrous earthquake. Two-thirds of the city were submerged into the harbor while the majority of buildings remaining on dry land were either reduced to rubble or severely damaged. Ships were capsized or swamped by waves in the harbor and the fortifications protecting the town were sunk or left in ruins. Around 2000 people were killed in the quake with many more dying from disease and injuries in the weeks afterwards (Pawson and Buisseret 1975:121-123).

The earthquake dealt a blow to Port Royal from which it could not fully recover. Some of the survivors, who chose not to relocate to the new town of Kingston across the harbor, worked to rebuild the town. Their efforts were eventually thwarted by a series of manmade and

natural calamities including a major fire, several hurricanes, and a number of further earthquakes. By the early eighteenth century, Port Royal had been replaced by Kingston as the commercial center of Jamaica. Port Royal maintained some vitality as an English naval base until 1905 or 1906. Today it is difficult to imagine the Port Royal of old when viewing the quiet streets of the small fishing village and minor tourist center it has become.

## BRIEF HISTORY OF TOBACCO AND THE CLAY PIPE INDUSTRY

The adaptation of tobacco use by Europeans and its rise and development into an important European industry were two of the first major developments to come from the establishment of sustained contact between Europe and the Americas. Little more than a century after Columbus' landfall in the New World, the use of tobacco had spread from the natives of the Americas to the European continent and from there to Africa and the Far East.

Two members of Columbus' crew are credited with being the first Europeans to observe the smoking of tobacco. Rodrigo de Xeres and Luis de Torres observed the natives of Cuba burning dried leaves and inhaling the smoke. They reported that the Native Americans wrapped the dried leaves in palm or maize "in the manner of a musket formed of paper" and after lighting one end [they] inhaled the smoke through the other (Heiman 1960:6). By the mid-sixteenth century, European explorers had described native Americans using tobacco as a snuff, chewing the leaves, and smoking the tobacco with both crude pipes and reed cigarettes (Brooks 1952:19).

The date of the actual introduction of tobacco into Europe is not precisely known. There are early references which claim tobacco was brought back to Europe by sailors who had sailed with Columbus before 1500, and that Cortez's men brought either seeds or live tobacco plants to Spain around 1519, but the references are difficult to verify. By the middle of the sixteenth century tobacco was being cultivated on the Iberian peninsula and by 1575 in Belgium, England and France (Walker 1972:27-29).

Of the several species of tobacco native to North and South America, the two most widespread and widely utilized by the native Americans and later by the

Europeans were *Nicotiana rustica* and *Nicotaina tabacum*. Both of these species are believed to have originated in South America, but by the time of European contact *N. rustica* was associated with the eastern coast of North America and *N. tabacum* was considered to be limited to the Caribbean area and South America (Walker 1972:28).

The use of tobacco spread more quickly in Europe than the cultivation of the plant itself and led to the leaf becoming one of the first major import commodities from the New World. The traders, sailors, and soldiers returning from the Americas spread tobacco use to all corners of Europe and then to Africa and the Far East. Around 1535 the Spaniards transported seeds of the preferred *N. tabacum* from the Yucatan Peninsula to the island of Hispaniola and then to Cuba (Brooks 1952:23-30).

Many early Europeans looked with disapproval on the use of tobacco by the natives and their own countrymen who had taken up the habit. An Italian, Girolamo Benzoni, who visited Central America in 1541, said of the natives' tobacco use, "there are some who take so much of it that they fall down as if they were dead and remain the greater part of the day or night unconscious ... See what a pestiferous and wicked poison from the devil it is" (Heimann 1960:16). Despite its association with the "heathen savages" of the Americas, tobacco gained a reputation in Europe as a medicine of incredible curative powers. The leaf was "recommended in powders, unguents and otherwise, as cathartics, clysters, and dentrifrices" (Robert 1949:4). There were very few ailments of the human body that at one time or another tobacco was not held to cure. Many in the medical establishment of the time opposed tobacco for purely recreative use, but to little effect.

John Hawkins, the Elizabethan English adventurer, is credited with introducing the pipe as a way to smoke

tobacco to England. In 1565 he had observed natives in Florida smoking tobacco "with a cane, and an earthenware cup at the end " (Heimann 1960:17). Although pipes, in one form or another, were used to smoke tobacco by nearly all of the native groups indigenous to North and South America, the natives of North America used pipes almost exclusively. This was likely due to the fact that the most common species cultivated in North America, *N. rustica*, was more bitter and more difficult to roll than the milder *N. tabacum* available to the inhabitants of the south and central areas of America.

The use of clay pipes to smoke tobacco caught on in England in spite of the availability of the milder species of tobacco leaf which was grown in small amounts in England and also imported from Spain. An Englishman wrote around 1573 that "the taking in of smoke of the Indian herb called tobacco by an instrument formed like a little ladle... is greatly taken up and used in England" (Jackson and Price 1974:9).

In the late sixteenth and early seventeenth century, most of the tobacco consumed in England came from the Spanish West Indies by way of Spain. The Spanish tobacco was expensive enough at the end of the sixteenth century to make English smokers complain that the Spanish leaf "sold for ten times the value of pepper, and the best of it weight for weight, for the finest silver" (Brooks 1952:51). This would change with the successful cultivation of *N. Tabacum* in England's North American colonies. John Rolfe, an English colonist in Virginia, obtained and planted the seeds of the West Indian variety of tobacco in 1612. After a slow start, in 1615-1616 there were 2300 pounds of tobacco shipped to England from Virginia as opposed to 50,000 pounds from the Spanish colonies, and the cultivation of tobacco in the new colony increased dramatically (Robert 1949:8).

Figures for the amount of tobacco imported into

England from Virginia illustrate the degree to which demand for the leaf had risen in England. In 1619 Virginia sent 20,000 pounds of tobacco to London; ten years later, in addition to the considerable amount of tobacco coming from Spain, the amount of tobacco imported from Virginia had grown to 1,500,000 pounds (Rive 1926:58). By 1698 over 23,000,000 pounds of tobacco were being produced in the English colonies, and in an ironic twist of economic fortunes, substantial quantities were being re-exported from England to Spain (Heimann 1960:53).

The development and growth of the tobacco pipe industry in England was on a scale with the rising popularity of tobacco use. In the early seventeenth century the pipemaking industry was centered in the London area. At that time London was the only port through which tobacco could be legally imported into England and the city also had a monopoly on importing the most suitable clays for making pipes. The Pipemakers of London, apparently organized to at least some degree, were protected from competition by government regulation. The Calendar of State Papers for 1620 declared "that those who violate the charter, granted to the Tobacco Pipe Makers, by manufacturing pipes when not of the Society, and violently resisting apprehension or by countenancing or purchasing from such unlawful makers, shall be imprisoned and sued against in the Star Chamber" (Jackson and Price 1974:10). Heavy taxation and government regulation would be a trend in both the buying and selling of tobacco and the manufacture and merchandising of tobacco pipes throughout the life of those industries.

In the second half of the seventeenth century, the cities of Bristol and Broseley emerged as major suppliers of clay tobacco pipes for both the domestic English market and also for export to foreign countries and the

overseas colonies of England. The pipemaking industries of these cities as well as London came to be organized along the lines of royal monopolies, chartered companies, and guilds similar to those existing for most recognized trades. These organizations, often subordinate to the local government or the crown, controlled the pipemaking industry through a variety of means, including a rigid apprenticeship system, powers to investigate and bring action against presumed interlopers in the trade, and the regulation of members by elected masters and wardens (Jackson and Price 1974:14). The fact that illegal pipemakers were a concern to the government and the pipemaking guilds is good evidence that illegal pipemaking was going on to a fair extent.

The clay tobacco pipe industry reached its peak in the latter part of the seventeenth century and then began a gradual decline. Pipe smoking fell out of favor with the English upper classes, and the use of tobacco in the form of snuff increased in popularity. The events leading to the American Revolution and the disruptions in trade caused by the conflict also played a role in the decline of the industry by removing valuable export markets. The decline of the pipemaking industry is reflected in the decreasing numbers of pipemakers recorded at the major industry centers of Bristol and Brosely (Walker 1977:260-261).

#### Tobacco in Jamaica

Tobacco was being grown in the West Indies by the native Arawak Indians before the arrival of European explorers that began with Columbus. The Arawaks used the tobacco plant as a drug, as an ingredient in ritual, and as a means of exchange (Parry and Sherlock 1956:2). The great demand for tobacco in Europe that developed after the leaf was introduced to the people of the Old World

made the cultivation of tobacco one of the first activities undertaken by European colonists in the Americas. Even after the development of the sugar industry, a much more profitable enterprise, tobacco continued to be grown throughout the New World. Tobacco cultivation was carried out by many small landholders who did not have the means necessary to develop a sugar plantation. Many of the more wealthy sugar planters also continued to plant at least some of their acreage in tobacco.

The rise of the sugar industry and the successful introduction of tobacco cultivation to the North American colonies of England led to the decline of tobacco as a major cash crop in the West Indies. By 1677 sugar had replaced tobacco as the currency of the islands (Williams 1984:114). The huge amounts of tobacco coming from the North American colonies and the subsequent fall in price led one late 17th-century observer to complain that tobacco was worth "four shillings a pound before we planted it- now the best Virginia is not above seven pence to the merchant of which the King has five pence" (Dalby 1690:26-27).

When the English captured Jamaica in 1655 one of the first crops they began growing was tobacco. The soldiers who took part in the capture of the island found that feeding themselves was a more difficult struggle than the capture of the island had been. One of the tactics used by the Spanish in their guerrilla war against the English was to drive away the cattle from areas occupied by the invading forces. General Venables was forced to put many of his troops to work planting provisions which could be used to sustain the army (Claypole 1972:78). In spite of the trouble associated with procuring provisions, some of the soldiers planted tobacco. By 1657 Francis Barrington, an officer in the English army, working with the men of his regiment "had formed a very fine plantation of

provisions and tobacco" (Long 1774:268).

By 1660 agricultural production in Jamaica had grown to the point where some commodities were being exported from the island. Between April 5 and July 30 of that year, Colonel D'Oyley granted certificates to merchant Pruhorne to ship 2556 pounds of tobacco; to Captain Burrough permission was granted to ship 6700 of sugar; and Colonel Henry Archbould shipped 2070 pounds of tobacco and 740 pounds of cotton from his plantation in Liguanea (Claypole 1972:96).

Tobacco continued to be grown in Jamaica even after sugar became the most important export crop and the key to the economic health of the island. Jamaica was reputed to make the best tobacco in the West Indies in 1663, but its quality, being unregulated, was uneven; and the council hoping to recover the island's credit, ordered the justices of the peace to nominate sworn persons in each parish to serve as "fit Rollers and Makers of Tobacco" (Bridenbaugh 1972:277). This information indicates that not only was tobacco being grown in Jamaica, but that it was being processed or cured as well. It seems that tobacco for local consumption would have been available in Jamaica from the earliest period of English settlement, regardless of external conditions.

## PIPEMAKING METHODS

To understand how the red earthenware pipes made in Jamaica differ from the white kaolin pipes manufactured in England and other parts of Europe, it is necessary to look at the methods used to produce both types. There is little information available on the earliest pipes made in Europe in the late 16th and early 17th centuries, but there are written accounts for the later part of the 18th century. The most comprehensive and earliest account of the clay tobacco pipe industry comes from a 1771 monograph, *L'Art de faire les pipes à fumer le tabac*, written by H.-L. Duhamel du Monceau. This account gives a detailed description of the production of pipes in northern France and the Netherlands. The account is covered extensively in I. C. Walker's invaluable work *Clay Tobacco-pipes, with a Particular Reference to the Bristol Industry*. The following abridged information is taken almost exclusively from Walker's work which, in addition to the excellent coverage of du Monceau, includes references to other early methods of clay pipe production in Europe.

The 18th-century methods described by du Monceau are comparable in almost all aspects to contemporary methods used in England and are probably much the same as those used in England earlier. Terms for steps and tools used in the production process will be given in English where possible. Figures 4-6 show tools and kilns used in the production of clay tobacco pipes.



FIGURE 4. Tools and wooden tubs used to prepare clay for the manufacture of tobacco pipes. (*L'art de faire les pipes à fumer le tabac*)

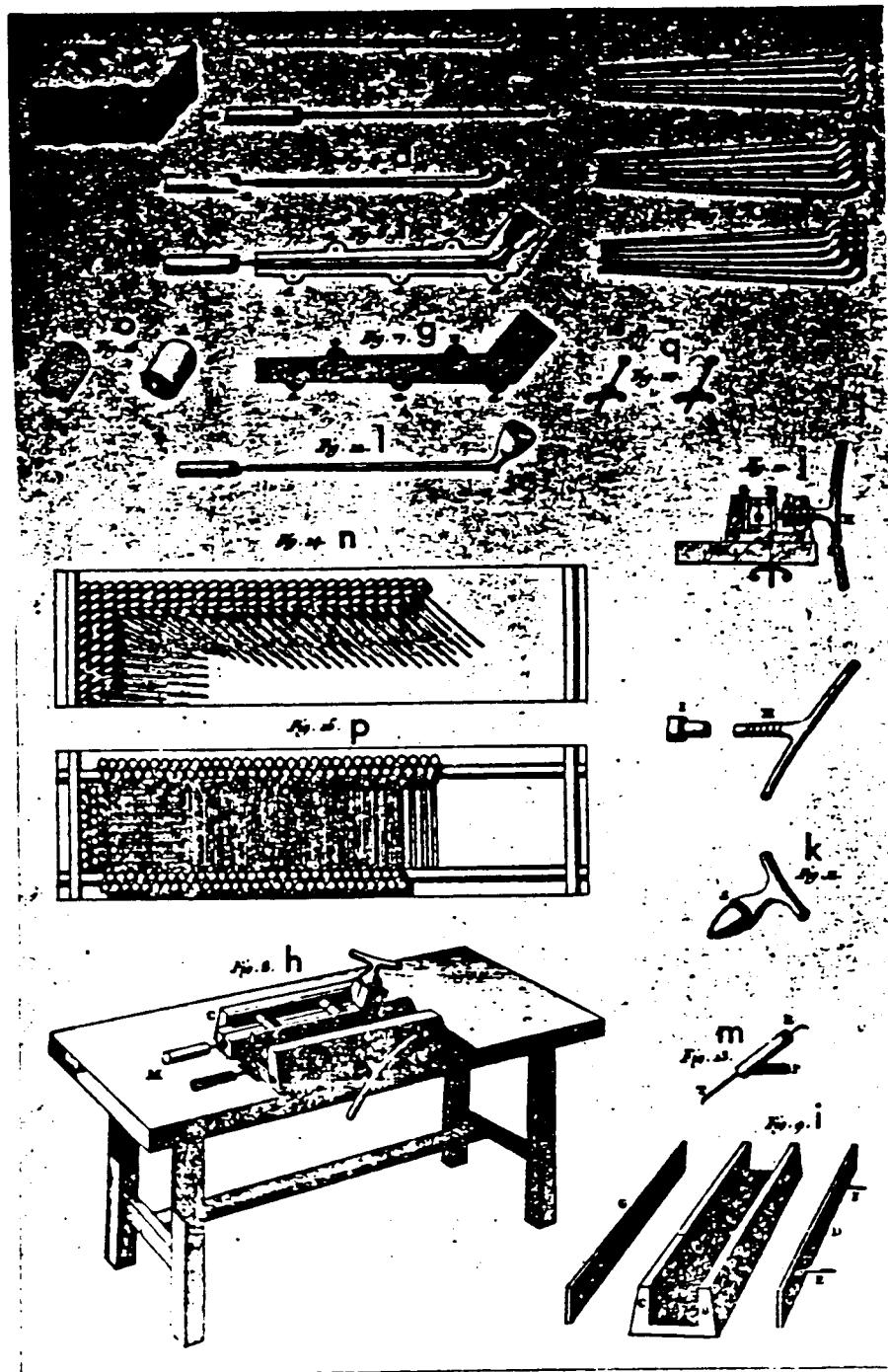


FIGURE 5. Tools used to mold, trim, and dress tobacco pipes. (L'art de faire les pipes à fumer le tabac)

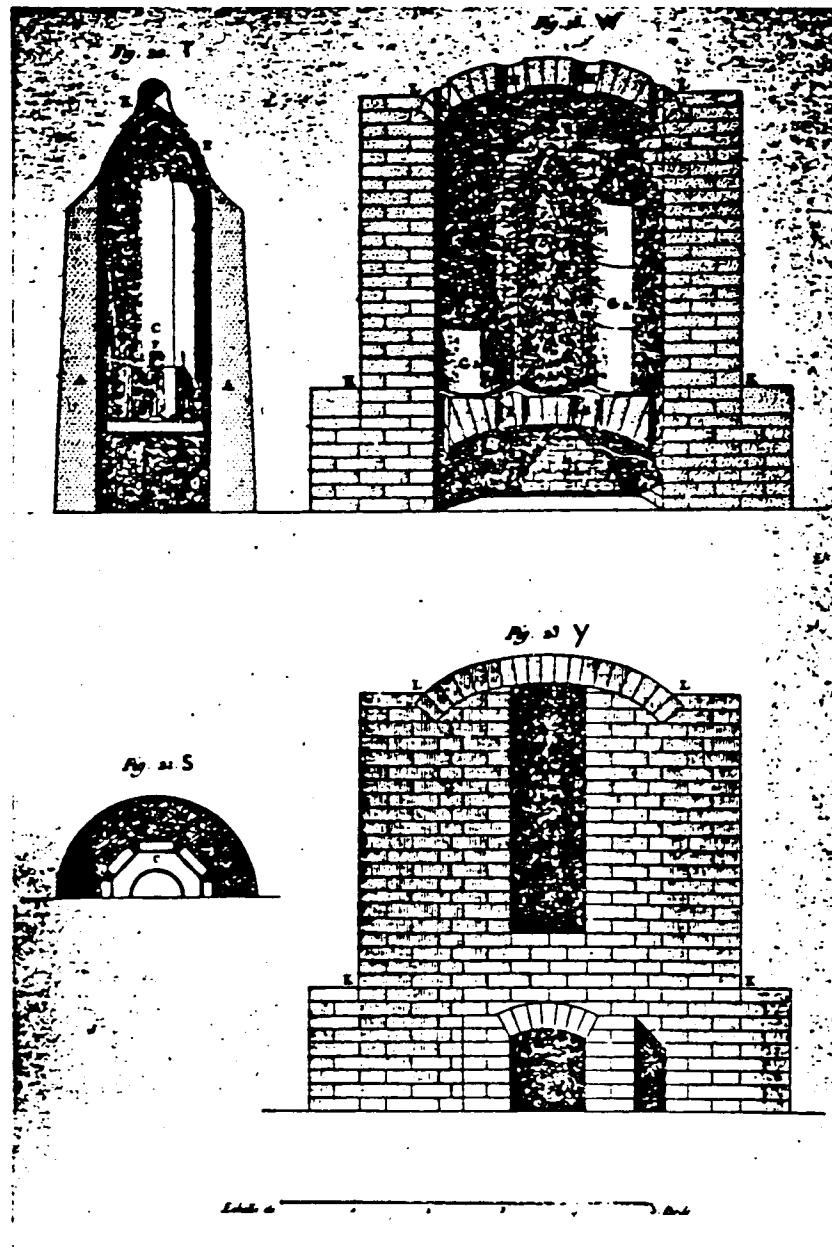


FIGURE 6. Examples of kilns used to fire tobacco pipes.  
(L'art de faire les pipes à fumer le tabac)

The first steps in the production of clay tobacco pipes were the mining, transportation, and the initial preparation of the clay. Although early pipemakers recognized that certain clays were better suited for making pipes than others, in general they tended to use clay located in the nearest suitable deposits to where they were making the pipes. In some cases clays from different deposits were mixed to obtain better results. The desired clays were ones that were of fine texture and had as little iron content as possible. Clays of this type fired to an attractive white or cream color and produced a pipe which was very durable.

The mined clay was transported in wicker baskets to a storehouse where it was protected from moisture as much as possible until it was needed. Prior to being worked, the clay was broken into lumps and soaked in water in a series of tubs in order to remove impurities. A variety of tools were used to work the clay into the right consistency and remove organic material and other impurities. Du Monceau describes the French using three wooden tubs to prepare the clay. In the first tub the clay was soaked overnight and then skimmed to remove any material which floated to the top. In the second tub the damp clay was mixed with dry clay, called spew, in alternating layers. The layers of soaked clay and spew were chopped and mixed together with a large wooden paddle, and then tamped down with a ram into a compact mass.

The clay was then moved to the third tub. Here the clay was beaten with a club to further ensure that the

soaked clay and spew was thoroughly mixed. Next, the clay was spread out on a clean bench and beaten with a heavy, flat-sided, metal bar. The clay was beaten from one direction and then another until a uniform consistency and color was achieved. After the texture and color of the clay was satisfactory, it was formed into square slabs weighing 80-100 lbs. and taken to different workers who would roll and mold the clay.

The *roulers*, or rollers, would then take some of the prepared clay and roll it out on a smooth table to form what would become the stem of the pipe. A bulb of clay, called a "nip" in English, was left at one end of the rolled clay to form the bowl. Fifteen of these blanks would be formed at one time and then stacked in a pyramid shape. At this stage the clay was dry enough to be handled by the worker without losing its shape, but was still flexible.

The bore of the pipe was now ready to be formed. This was done by inserting an iron wire through the stem part of the prepared clay roll. The end of the wire used to make the bore was slightly wider and flattened at the tip which allowed the progress of the wire through the clay to be felt. The wire was inserted by hand through the clay until it was just short of the nip. With the wire in place, the clay roll was placed in a two-piece copper mold which had been oiled to prevent the clay from sticking to the sides. Pins were used to secure the two halves of the mold together and it was then placed in a press.

The press, referred to as the "chest" in the English

industry, used a screw to force a polished wooden plate against the mold, which was held in a three-sided iron clamp. A similar arrangement was used by all of the European pipemakers. The press formed the stem and the bowl in one operation.

The mouth of the bowl was formed by inserting an acorn-shaped stopper into the mold after the clay from the nip had been spread around the walls of the mold by hand. The stopper was fitted with a leather washer to prevent it from damaging the heel of the pipe by penetrating too deeply into the mold. In England, at least by 1688, a machine had been developed to hollow out the interior of the bowl which differed from the manual use of the stopper described above and used in the Dutch industry. This machine, called a "screw" used a lever to plunge the stopper into the bowl part of the mold, instead of having to twist it in by hand (Oswald 1975:16).

After the mouth of the bowl was formed, the mold was removed from the press and the wire was inserted into the cavity formed by the stopper. This ensured that the pipe would draw air. The "dottle" or "pep", clay pushed from the stem into the mouth of the bowl by the wire, was removed at this time. The wire was left in place when the pipe was removed from the mold to help keep the stem straight. The pipe was then trimmed with a wire or a blade to remove excess clay from the seams of the mold. After this initial trimming the wire was removed from the stem and the molded pipe was set aside in a rack for further drying.

When the pipe was sufficiently dried to handle without fear of damaging it, the final trimming and polishing was performed, as well as the placement of any decoration not imparted by the mold. Buttons made of copper or bone were used to smooth out the seams and trim the rim of the mouth of the bowl. The pipe was then allowed to dry more before it was given a final polishing.

Duhamel du Monceau describes two types of kilns which were used to fire the clay pipes. The smaller of the two, used in northern France, was a muffle kiln which had a furnace at the base and a separate chamber above it where the pipes were placed to be fired. For firing, the pipes were placed in ceramic containers called "saggers". A kiln of this type could hold 19-20 gross of pipes and was fired for six or seven hours.

The second type of kiln described by du Monceau was larger and was called an up-draught kiln. This type of kiln was similar to the type used to fire bricks and tiles. In this kiln the chamber where the pipes were placed was not completely separated from the furnace. These kilns were reported to have taken 14-16 hours to fire, and had a much larger capacity than the muffle kilns used by the French, and were said by du Monceau to be more durable and efficient. In both types of kilns, the pipes were fired at a temperature of around 1000 degrees centigrade. Kilns of the up-draught type, dating to the late 17th century, have been found and investigated at several locations in England (Peacy 1982:13).

The factories for making clay pipes described by du Monceau were fairly complex establishments, with the different steps in production being carried out by individuals trained for each specific task. The workers were paid according to how many pipes were produced. Skilled workers were reported to have been able to turn out around 20 gross of pipes per week.

The just-described method of pipe production would be quite similar to the methods used in England at the same time and even earlier. This is due to the fact that tobacco smoking, as well as the making of clay tobacco pipes, was introduced to Holland by the English (Duco 1981:371). The methods and specific tools used might vary slightly over time and from country to country, but in general, the process was the same. Lists of tools used in the production of clay pipes and descriptions of how each was used in England, Belgium, and France are much the same and demonstrate the basic similarities between the pipemaking industries of the various European countries (Oswald 1975:29).

#### Production of the red clay pipes

In describing the methods used to make the redware pipes from Jamaica, there is no other information to go on than the physical remains of the pipes themselves. There are no written accounts in the historical record and there is no modern pipe industry in Jamaica to examine for clues as to how the pipes were made in the seventeenth century. At present there are also no known

kilns or sites where the pipes might have been produced.

The only way to try and recreate the methods involved in the production of these pipes is to carefully examine the examples excavated from archaeological sites. Fortunately there is no shortage of pipes to study. The INA/JNHT excavations at Port Royal have yielded a wealth of redware pipe remains that are often in excellent condition. These excavations, while producing no examples that can be positively identified as complete pipes, have provided thousands of red pipe fragments. The recovered fragments include dozens of complete bowls, and even more partially intact bowls and stems.

The careful examination of these artifacts suggests several likely possibilities as to how the pipes were produced and how the methods differ from those used in England and Europe. The comparison to European methods is valuable since the redware pipes are modeled after contemporary English tobacco pipes which were produced in mass quantities and exported to the English colonies. If the artisans producing the redware pipes were familiar with them, it seems likely they would have imitated English methods as much as possible.

Unlike the European pipes, where the selection and preparation of the clay was considered a crucial step to obtain a quality pipe, the Jamaican pipes show evidence that the preparation of the clay was not given the same amount of care. The clay used to make the redware pipes was a naturally fine-grained, earthenware clay, but the finished products indicate that much less effort was expended to obtain the consistency of color and texture

so prized by the European pipemakers. The redware pipes often exhibit blemishes in the grain of the clay and the overall color that suggest the clay was given little preparation prior to being worked. These blemishes include: variations in color, areas where clay is flaked off from the body, fine and more coarse grained clay within the same pipe, and inclusions of various types within the body of the clay.

It is likely that the clay was soaked at least to some degree as this is the easiest way to remove large impurities and improve the plasticity of the clay, but the rigorous treatment applied by the European pipemakers would seem to be absent from the preparation of the red clay used to make the Jamaican pipes. It is not possible to tell if virgin clay was mixed with spew as in the European fashion, but it probably was as this is a standard practice of potters which makes the clay more workable by absorbing excess moisture from the soaked clay. Only very occasionally can clay be used as dug, either alone or to blend with other clays (Colbeck 1988:30).

The most striking difference between the way the redware pipes were made and the European method is that the Jamaican pipes were made without the use of a mold which formed the stem and bowl of the pipe in a single step. The angle of bowl to stem and the length of the bowl vary for each of the redware pipes as does the shape of the spur (Figure 7). Had the pipes been formed in a mold, there would have had to have been hundreds of individual molds. This is very doubtful considering the

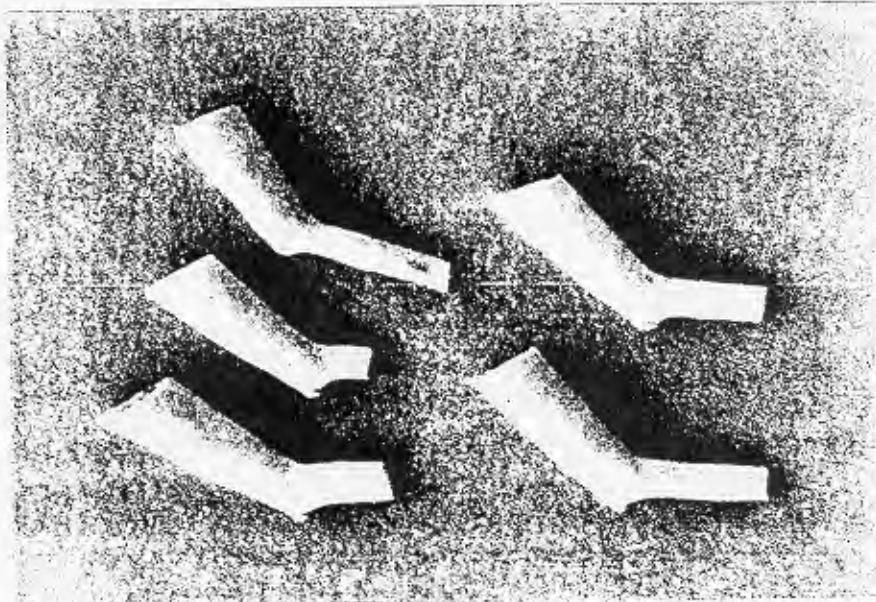
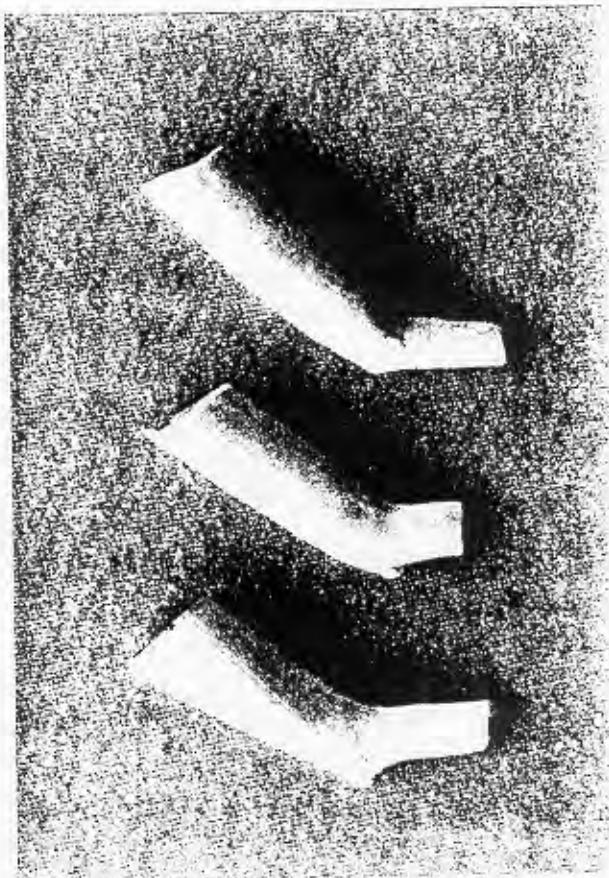


FIGURE 7. Red clay pipes with intact bowls and partial stems.

small geographic area to which the redware pipes are confined and the short time span in which they were in use.

The redware pipe remains suggest that the bowl and stems of these pipes were formed separately by hand and then connected. This sequence of production, though quite different and seemingly more painstaking than the European method, is suggested by several features unique to the redware pipes. The first indication of this method is the fact that the stems of the redware pipes were definitely not made in any type of mold. While some of the redware pipes have straight, smooth stems of uniform dimensions similar to a molded pipe, the vast majority of them are very crude. Many of the stems are curved either up or down or side to side or both, thicker in some places than in others, and have fingerprints along their lengths. None of these pipes, which were given very little if any trimming after they were formed, show even the faintest traces of seams either on the stem or on the bowl.

Another feature of the redware pipes that suggests the bowl and stem were joined after being formed separately is the nature of the junction where these parts of the pipe meet. The use of a mold produces a smooth junction of the bowl with the stem and a uniform spur or heel at the same time. The use of the stopper to produce the mouth of the bowl in the molded pipes is reflected in their appearance as well. Striations made by the stopper on the interior walls of the pipes are usually evident in the bowls of European pipes. Pipes

made in the Dutch fashion have horizontal striations from the twisting motion of the stopper while English bowls formed with the mechanical screw have vertical striations (Oswald 1975:17-18). The use of the stopper also imparts to the interior of the bowl a clean junction of bowl and stem that makes it easy to see that both stem and bowl were formed simultaneously. The junction of the bowl with the stem of the redware pipes does not exhibit these same characteristics. Many of the redware pipes have a definite lip where stem and bowl meet that would have been obliterated had the mouth been formed by a stopper while the pipe was in a mold. This lip at the stem-to-bowl junction suggests that the lower part of the bowl was left open at the time it was formed and then slid over the end of the rolled stem. The excess clay was smoothed down over the forward part of the stem and also used to create the crude spur or heel found on the bottom of the bowl. Figure 8 shows evidence of the excess clay from the bowl being smoothed down over the previously formed stem.

In the European pipes the clay pushed into the bowl, called the "dottle" or "pep", by the bore-making tool was often removed. The Jamaican redware pipes often show one or more indentations on the front wall of the bowl where the implement used to form the bore was worked forward one or more times to ensure the pipe would draw (Figure 9). Many of the redware pipes are also found with the "dottle" or "pep" still in the bowl (Figure 10).

The bowls of the redware pipes pose several questions as to the method by which they were formed. Unlike the stems



FIGURE 8. Layer of clay from bowl overlapping clay used to form stem. This suggests a two-part production sequence.

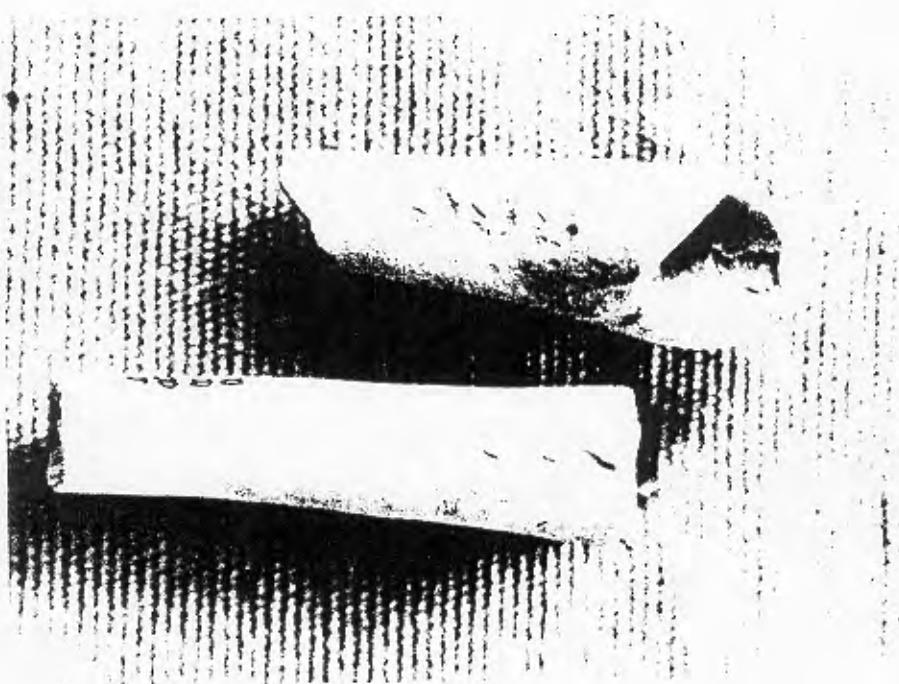


FIGURE 9. Front wall of pipe bowl marred by insertion of bore-making tool.

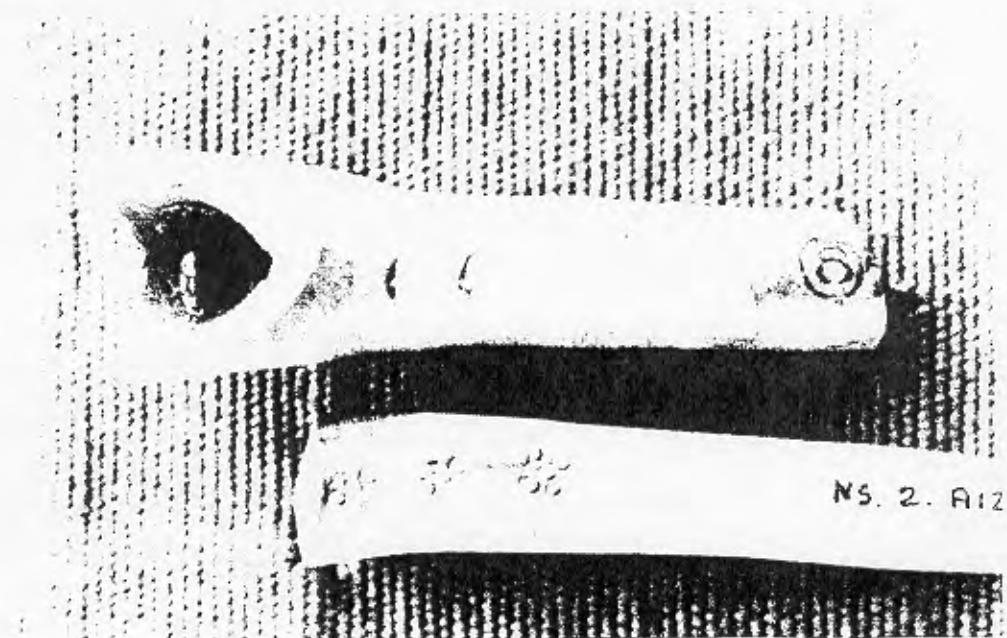


FIGURE 10. Excess clay from bore formation left in pipe bowl.

of these pipes, which were obviously formed by hand, the bowls are much less crude and were likely formed with the aid of some type of jig. The redware pipes' bowls, while varying considerably from pipe to pipe, are smooth and fine-lined and are generally consistent in diameter. Both the inner and outside walls of the pipes are smooth. The absence of any type of seam precludes the use of a two-piece mold on the European pattern, but a mold of some other type could well have been used and seems likely. A simple tapered spindle coated with oil is one possibility. In this case, the clay would have been pushed down over the spindle, or rolled by hand around it, thus creating the smooth inner walls of the bowl. The outside walls of the bowl would have then been formed to the desired shape by hand (Figure 11). A second possibility is the use of the same type of spindle with a sleeve of some type that would be placed over the spindle to form the outside surface of the pipe bowl, which is generally smooth. The third possibility for the method used to form the bowl is that a rolled blank with a bulb of clay, or nip, at one end, prepared in the European fashion, was placed on a bench with the nip portion being rolled out flat with a device like a rolling pin. The flattened part could then be rolled back and connected to form the bowl (Figure 12). A spindle of some type could have been used with this method as well to give the interior of the bowl a more uniform shape and smoother interior walls. Any or all of these methods are consistent with the characteristics of the redware pipes. None of the redware pipes of similar form found at the

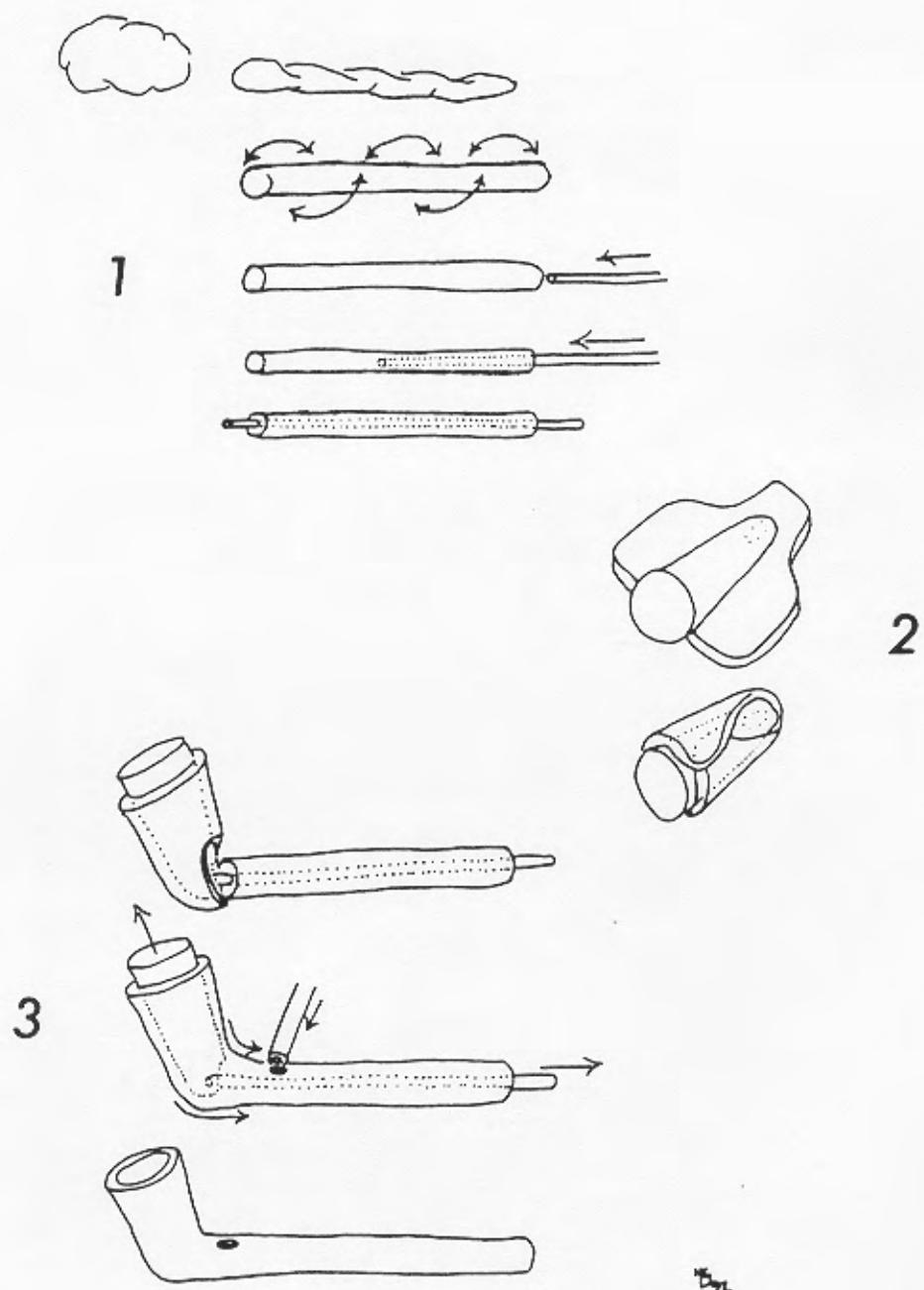


FIGURE 11. Possible sequence for making the red clay pipes where stem and bowl are formed separately and then joined.  
(Drawing: Helen DeWolf)

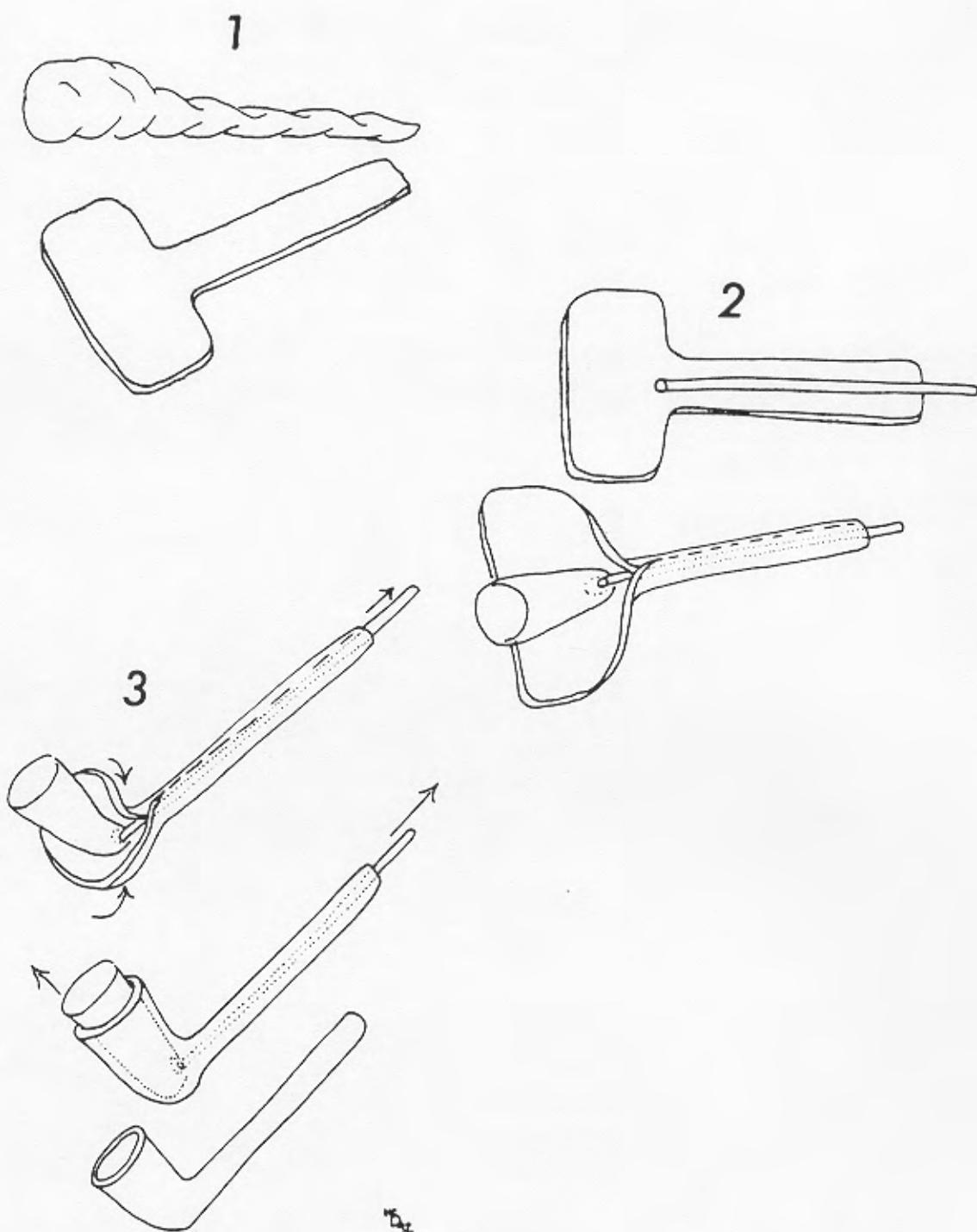


FIGURE 12. Alternative sequence for making the red clay pipes where bowl and stem are formed from the same blank of clay. (Drawing: Helen DeWolf)

Port Royal site show signs of having been molded, but this does not preclude the possibility that some pipes could have been made in a mold. The artisan community of Port Royal was diverse and skilled enough to no doubt fashion a pipe mold had they been called upon to do so.

The method for making the bores through the stems of the redware pipes is difficult to determine solely from the evidence of the pipes. It is impossible to tell if the bores were made with an iron wire tool, as was the case with the European pipes, or if some other method was used. The wide range of bore diameters, 3 sixty-fourths of an inch to 12 sixty-fourths of an inch, taken into account with the fact that the pipes were used for a few decades at most, makes the use of a wire tool less likely, though by no means impossible. The variations of bore diameter in these pipes' bores indicate that, if wire was used to form them, the wire tool was hand wrought and not pulled or cast.

One explanation for the overall diversity of and the individual variations within the bore diameters of the redware pipes is that the bores were formed with some type of organic material. The use of thin wooden dowels or plant shoots would account for the wide range of bore diameters recorded from redware pipe fragments. If a plant shoot of some type was used, it is possible that it was left in place to be burned away when the pipe was fired; though this is doubtful due to the fact that the clay shrinks as it dries.

After the bowl and stem were joined the redware pipes were trimmed to varying degrees. At a minimum, the

rims of the bowls were pared off and flattened evenly with some type of blade. On many of the pipes this was the only trimming performed. Other examples were dressed out more thoroughly with some type of tool being used to smooth the sides of the stem. In some cases the spurs, which had been formed by hand, were shaped further with a blade. When this was done the rear and the bottom of the spur were pared slightly to give them a flat profile.

The markings of the pipes, which will be discussed separately, were probably made last. Once again it is difficult to tell exactly how these were made. The markings, which almost always occur in groups of three, were impressed into the clay with some type of small stamp. The fact that the marks on each pipe are identical copies of each other precludes the possibility that they were incised or carved into the fabric of the clay. The type of instrument used to stamp the pipes is unknown, but the fairly elaborate designs on some of the pipes indicate that the stamps were made of some material that would have been easy to shape. Wood, lead, or clay are three materials that would have been easily shaped and available to the Jamaican pipemakers. The perishability of these materials could also help explain the diversity of marks and the fact that none of the implements used to make the stamps have been found. It is not surprising that none of these implements have been found, as they would be associated with the site of production and not of use.

Besides its advantage of proximity, the clay found near the early English settlements in Jamaica is a low-

firing earthenware clay that becomes hard at a relatively low temperature. It does not take an elaborate type of kiln to produce ceramic objects from earthenware clay, especially if they are produced in small numbers. It is estimated that the redware pipes were fired at differing temperatures somewhere around 800 degrees centigrade. This temperature could have been attained by simply placing the pipes in some form of container and building a fire over it. Some of the pipes exhibit dark discolorations which could indicate the pipes were exposed to smoke as they were being fired, although the discolorations could also be the result of impurities in the clay or post-depositional staining. If the discolorations are the result of smoke, they would suggest the pipes, or at least some of them, were fired in a very primitive manner. Bricks were being made on the mainland across from Port Royal as early as 1658 so there is a possibility the redware pipes were fired in a kiln (Pawson and Buisseret 1975:11).

The methods used to produce the redware pipes illustrate the distinct differences between the Jamaican pipemaking industry and the pipemaking industries of Europe. The redware pipes are made to resemble English pipes produced during the latter part of the seventeenth century, but in a radically different fashion than the pipes produced either in England or other parts of Europe, suggesting that the Jamaican pipemakers were either unfamiliar with European methods or unable to copy them.

A deed from 1680 lists a John Pope the younger as a

pipemaker working in Port Royal at that date (Pawson and Buisseret 1975:105), but none of the pipes can be positively traced to him. None of the few redware pipes bearing initials-- RG, TJ, and RS are the only initials found on the redware pipes-- can be attributed to Pope. The Taylor Manuscript states that the pipes were made by negroes from the "red claire" found in the Liguanea plain (Pawson and Buisseret 1975:105).

The methods used to produce the redware pipes point to their manufacture by artisans who were not familiar with the methods used in England or other European countries. In the case of the redware pipes, it would seem that to meet a demand for a European-style product, local craftsmen used their own methods to imitate the European pipes as best they could. Whether or not John Pope was involved with this, or if he was working independently using English-style methods, it is impossible to say. Pope's will (Port Royal Wills: Vol. 4, Folio 1) and the inventory of his estate (Port Royal Inventories: Vol. 2, Folio 40) do not give any indication he was involved in the making of tobacco pipes at the time of his death in 1684.

#### THE PHYSICAL ASPECTS OF THE JAMAICAN RED CLAY PIPES

The red clay pipes found at Port Royal and other 17th-century sites in Jamaica, while bearing a great resemblance in form to certain white English kaolin pipes of the period, are unique in many ways. There can be little doubt that the redware pipes were made to imitate English pipe forms which were familiar to the Jamaican pipemakers. The redware pipes from Jamaica are similar in form and size to English pipes of the latter seventeenth century (Figure 13) but are quite dissimilar to locally produced tobacco pipes from other 17th-century sites in North and South America. The red clay pipes are also distinct from English-made "American export type" pipes which occur frequently on North American sites but are comparatively scarce in Europe (Noël-Hume 1979:45); these pipes are relatively straight-sided and have neither heels nor spurs. The differences that exist between the Jamaican pipes and the English varieties are largely due to the differing methods of production employed by the Jamaican pipemakers.

The redware pipes resemble in overall appearance types 11, 12, 13, and 14 in I. Noël-Hume's pipe bowl typology (Noël-Hume 1969:303). These types represent bowl forms for the years 1645-1710. Type 13, which unlike the redware pipes has a heel, is most like the Jamaican pipes in the form of the bowl. Pipes with this type of bowl date from 1680-1710.

Adrian Oswald's typologies also contain English pipes very similar in form to the redware pipes from Jamaica. Types 8 and 9 in his Simplified General Typology have heels and slightly more curve to the bowl than the redware pipes, but otherwise are very similar in form. These pipes date from 1680-1710 (Oswald 1975:37-40).

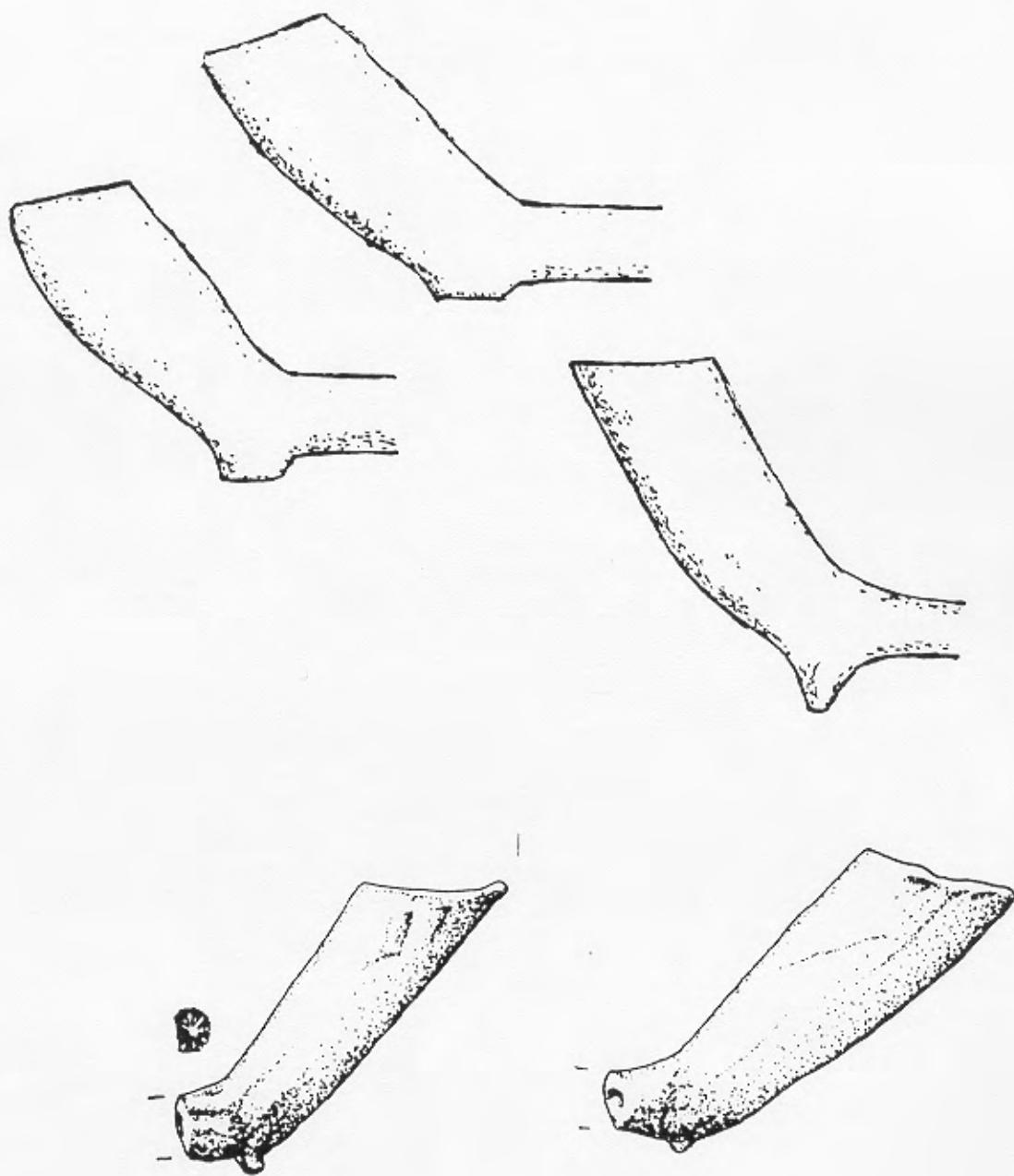


FIGURE 13. Late 17th-century English bowl forms, top, and Jamaican red clay pipe bowl forms, bottom. (Port Royal Project)

Types 18 and 19, which date from 1660-1710, are examples of English spurred pipes which are similar in shape to the redware pipes (Oswald 1975:41-42).

I. C. Walker (Walker 1977:1535,1543) provides a number of illustrations of seventeenth and eighteenth century tobacco pipes from English and colonial sites that show the similarity between the Jamaican pipes and English pipes of the period. Some of these are illustrated in Figure 14. English pipes from the late 17th-century recovered from the excavations at Port Royal, which share bowl forms similar to those of the redware pipes, are illustrated in Figure 15.

Recorded English tobacco pipes for the years 1650-1710 exhibit a wide range of diversity. There are variations in the general shape and profile of the bowl, the angle of the mouth of the bowl in relation to the stem, the angle of the bowl itself in relation to the stem, the use and styles of spurs and heels, and the amount and type of decoration applied to the pipes. The redware pipes from Jamaica do not share the overall diversity found among the English pipes of the period. While the method of producing the pipes by hand makes each individual red clay pipe unique, almost all of the Jamaican pipes are basically similar in color, size, form, and decoration. Figure 16 shows terminology commonly used to describe clay tobacco pipes.

The redware pipes are made from reddish to brownish earthenware clays, with a relatively high iron content, that fire to colors ranging from a bright reddish-orange to a dark reddish-brown with various shades in between (Figure 17). In general the pipes fire to a uniform reddish-brown color with the varying shades a result of differences in the firing environment or post-depositional staining. The grains of the clays used to make the redware pipes range from a medium to a fine grain for the majority of the pipes. A few samples are

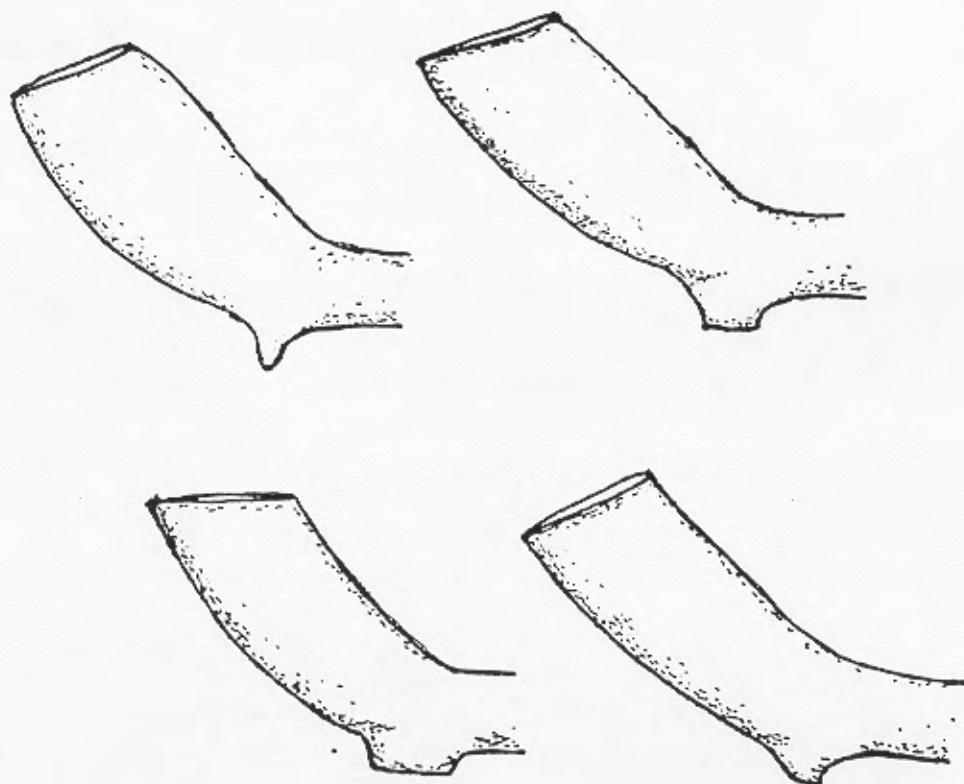


FIGURE 14. English bowl forms dating from 1680-1710.

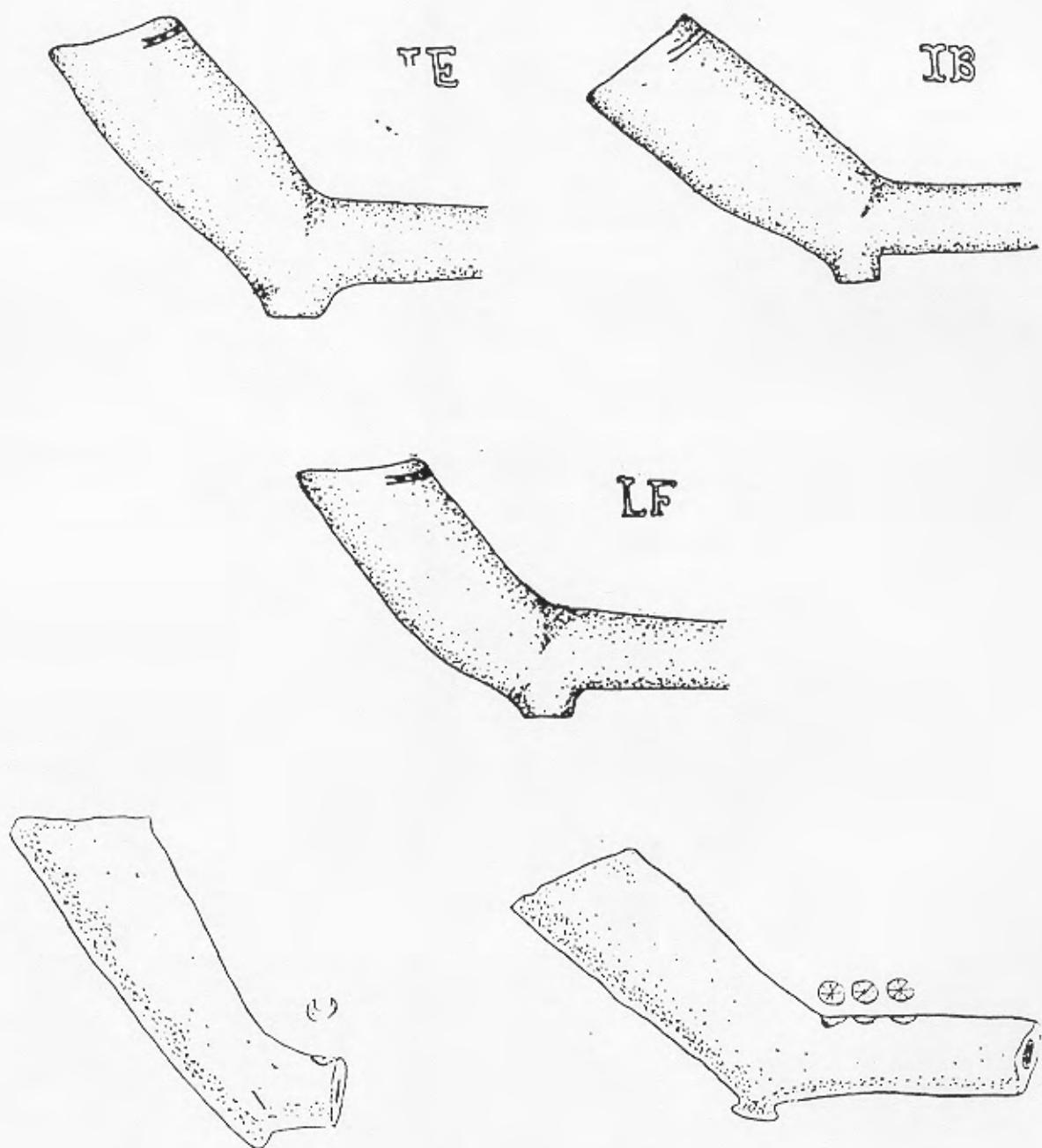


FIGURE 15. White English pipes, top and middle, and red Jamaican pipes, bottom, from the INA/JNHT/TAMU site at Port Royal. (Port Royal Project)

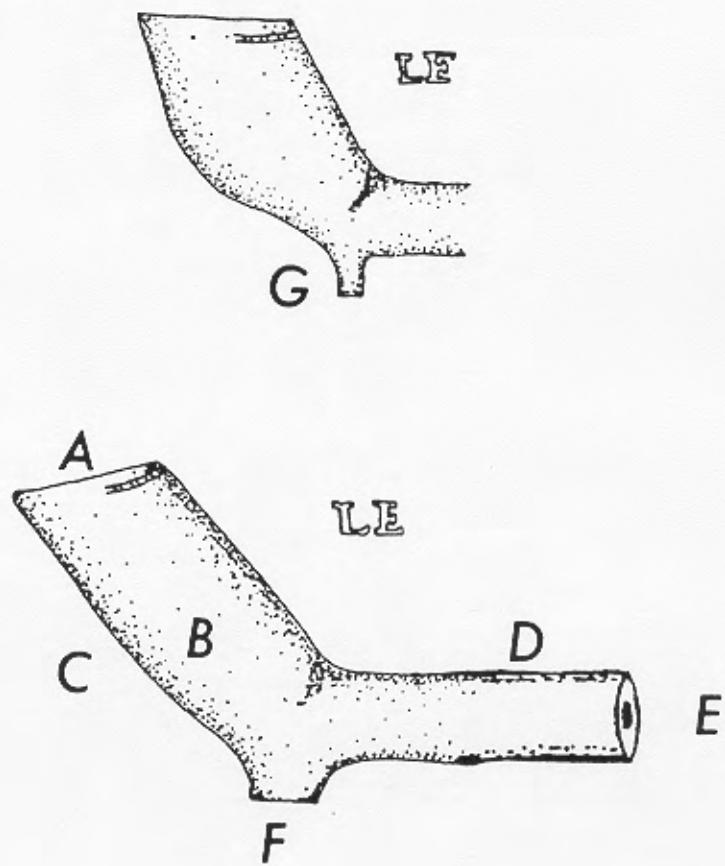
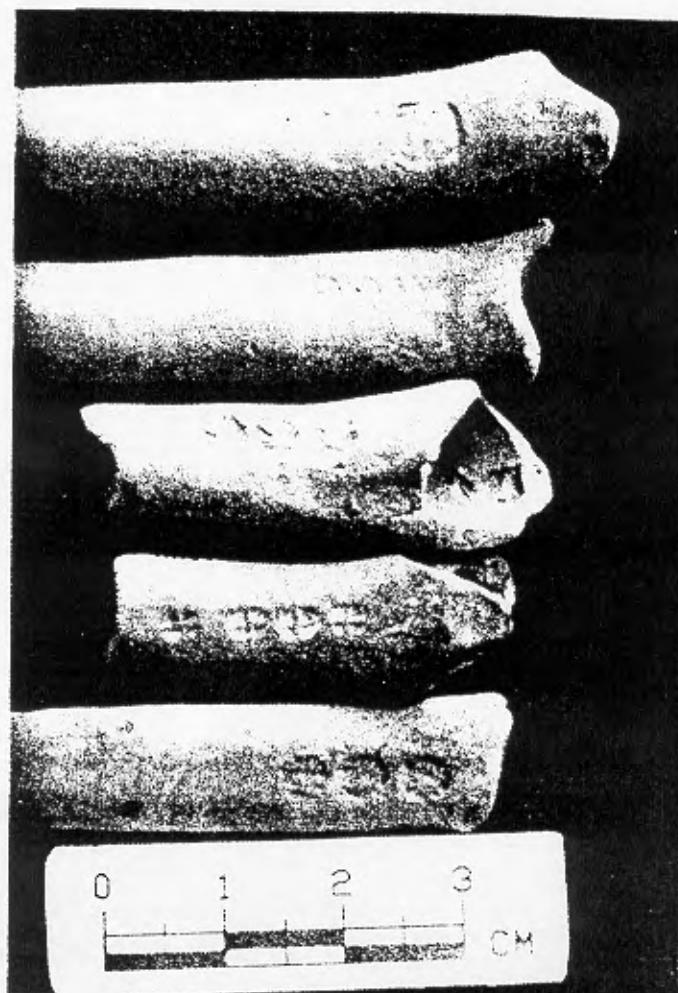


FIGURE 16. Terminology used to describe clay tobacco pipes.  
A mouth, B bowl, C front of bowl, D stem, E bore hole, F  
heel, G spur.



Munsell color chart identification of the  
red clay pipes.

2.5 YR 5/6 red  
2.5 YR 6/4 light reddish brown  
2.5 YR 6/8 light red  
5 YR 5/4 reddish brown  
5 YR 5/6 yellowish red  
5 YR 6/4 light reddish brown  
5 YR 6/6 reddish yellow  
7.5 YR 6/6 reddish yellow  
7.5 YR 6/8 reddish yellow

FIGURE 17. Color range of the red clay pipes.

made from a coarser-grained clay, but these are rare.

The bowls of the redware pipes are smooth-sided, straight, and generally taper slightly as the lower part of the bowl approaches the stem (Figure 18). While similar in overall shape, several features of the red clay pipes vary considerably from one pipe to the next: the length of the bowl, the angle of the stem to the bowl, and the orientation of the mouth of the bowl.

In the large collection of pipes recovered from the Port Royal excavations, the distance from the front rim of the bowl to the spur ranges from 4 cm to just over 7 cm in length. Most of the redware pipes have bowls measuring from 5 to 6 cm in length. As far as capacity goes, the redware pipes would hold about the same amount of tobacco as English pipes of the same style and from the same late 17th-century time period.

The angle of the stem to the back of the bowl is another area where there is a large degree of variation from one redware pipe to the next. In a group of 65 pipes where the bowl and stem were both intact enough to measure the angle, the angle of the bowl in relation to the stem varied from less than 120 degrees to over 145 degrees (Table 1). Close to half of the pipes had an angle of stem-to-bowl that fell between 136 and 140 degrees. In cross section the walls of the redware pipes' bowls are not uniform like those of the mold-made English pipes; however, the variation in thickness encountered in the walls of each bowl is slight, as are the variations in wall thickness from bowl to bowl. The angle at which the mouths of the bowls are pared off also varies extensively from pipe to pipe. In general, the mouths of the redware pipes are pared off at a slightly downward angle in relation to the stem (Figure 19).

The spurs, or in a very few cases the heels, of the red clay pipes are one more area in which the Jamaican pipes differ substantially from the English and other

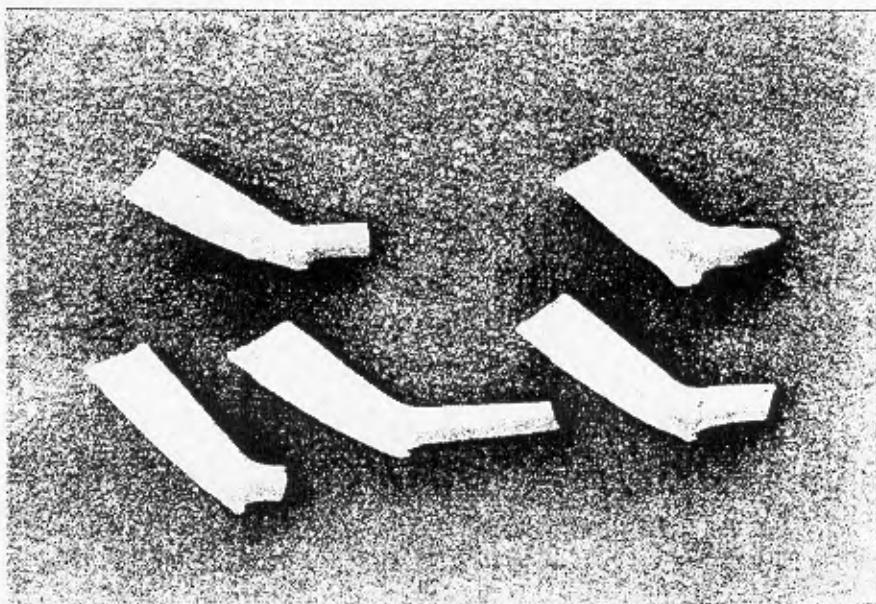
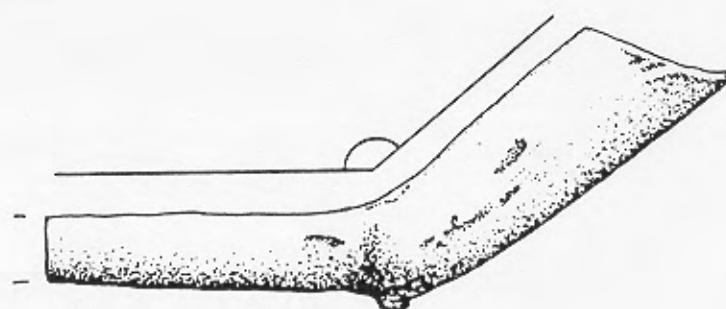


FIGURE 18. Red clay pipe bowls.

TABLE 1  
BREAKDOWN OF THE BOWL-TO-STEM ANGLES OF THE RED CLAY  
PIPES

Bowl-Stem Angle	Number of Pipes	Percentage of Sample
115° - 120°	1	1.5%
121° - 125°	2	3.0%
126° - 130°	13	20.0%
131° - 135°	9	13.8%
136° - 140°	29	44.6%
141° - 144°	9	13.8%
146° - 150°	2	3.0%



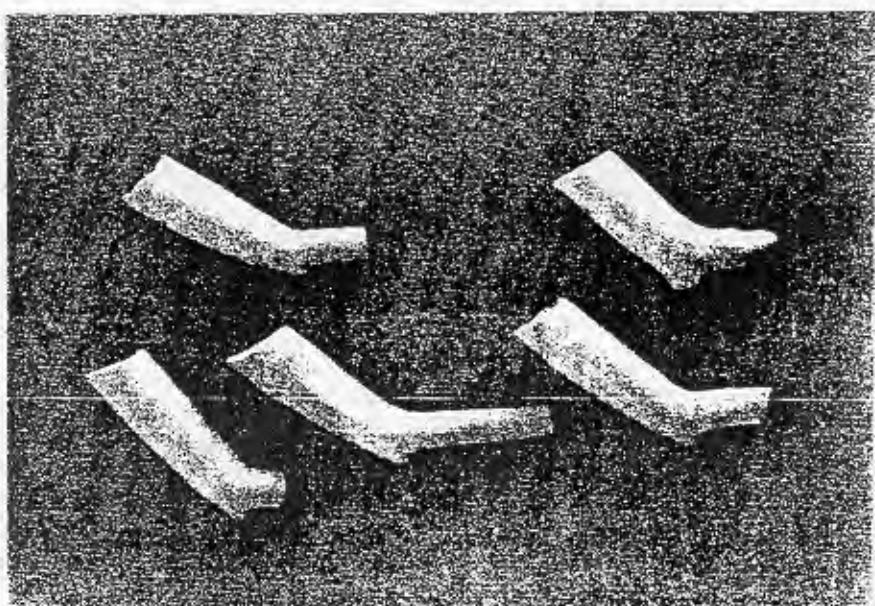
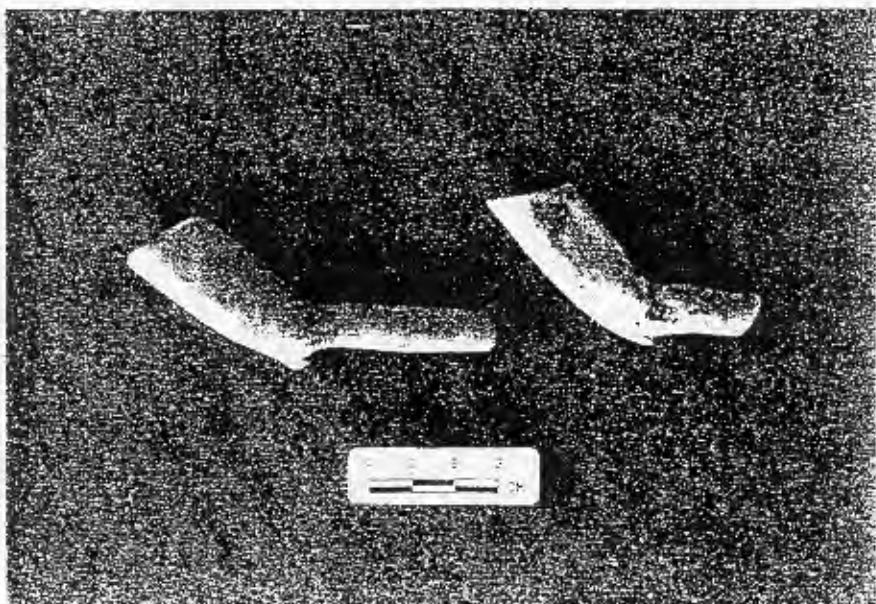


FIGURE 19. Red clay pipe bowls with the mouths of the bowls pared off at different angles in relation to the stem.

European clay pipes of the period. Only a small number of the pipes recovered from Port Royal have what could be termed a heel (Figure 20) in the European sense. In many cases the spurs of the redware pipes are also of a style somewhat different from the English spurs found on pipes from the period.

The heel first appears on English pipes around 1620 as a flattened, often drooping, either horizontal or inclined upwards, part of the pipe below the bowl. The heel on English pipes then evolves into a large, low, and flat form with a variety of shapes . On English pipes, the spur appears around 1640 and continues in use, concurrently with the heel, throughout the 17th and 18th centuries (Walker 1977:12). Both the heel and the spur were originally intended to balance the pipe while it was set aside when not in use; however, as time passed both features became more ornamental and less functional in nature.

Most of the Jamaican redware pipes have a crude approximation of a spur, rather than a heel. These spurs, like most other features of the redware pipes, vary greatly from one example to the next. Some of the pipes have a pronounced hand-formed spur which is quite similar to the spurs of English pipes though not as elongated and with less of a point; others have little more than a barely noticeable, flattened, finger-pinched nub. The spurs of several examples of the redware pipes are shaped more carefully than the others into an oval shape and then pared off flat on the side of the spur facing the stem. The spurs of this type resemble a miniature version of the traditional heel found on English pipes (Figure 21). Another type of spur common among the redware pipes is a small finger-pinched protrusion which extends down from beneath the bowl and is flattened out at its tip, giving it the appearance of a button (Figure 22). Very few of the spurs or heels of the redware pipes

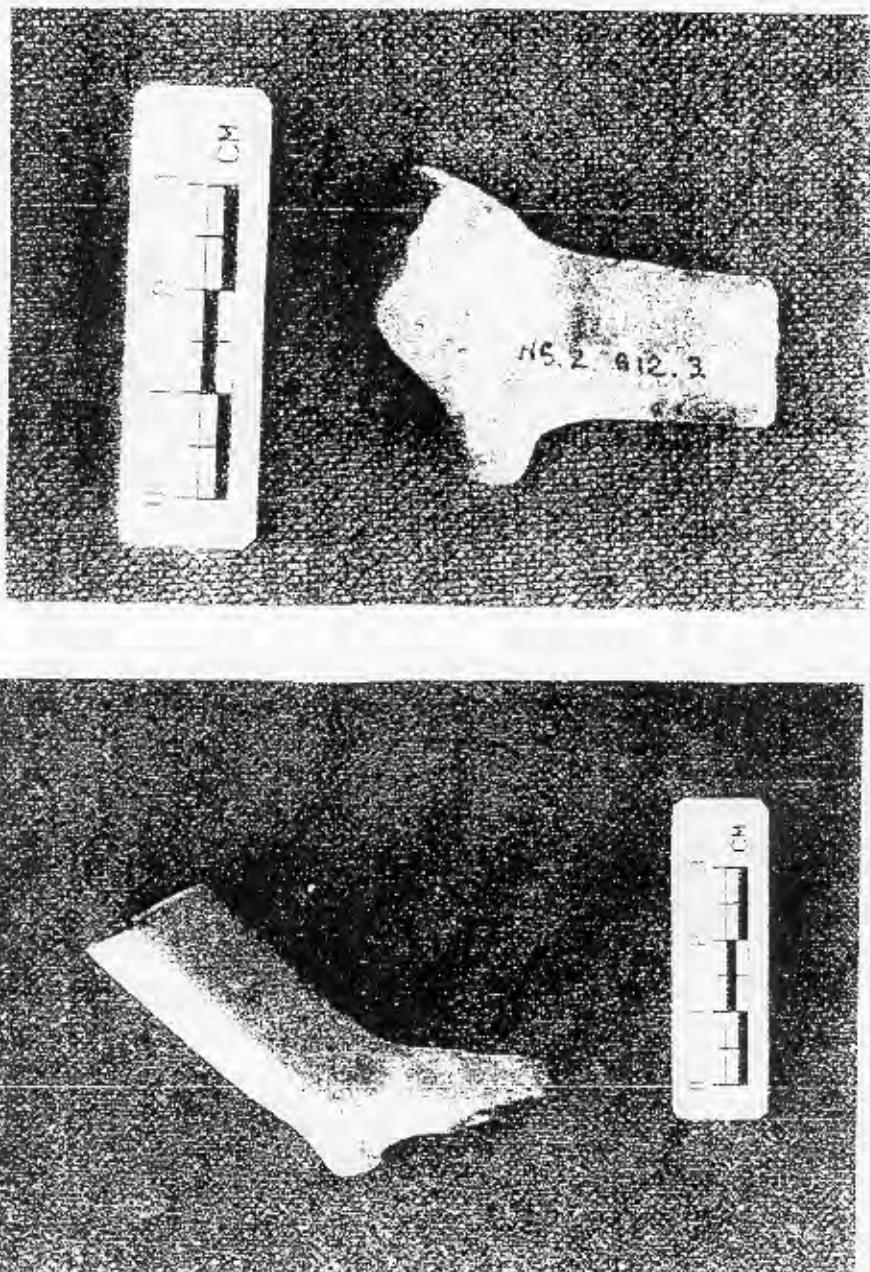


FIGURE 20. Red clay pipes with crude heel-type features.

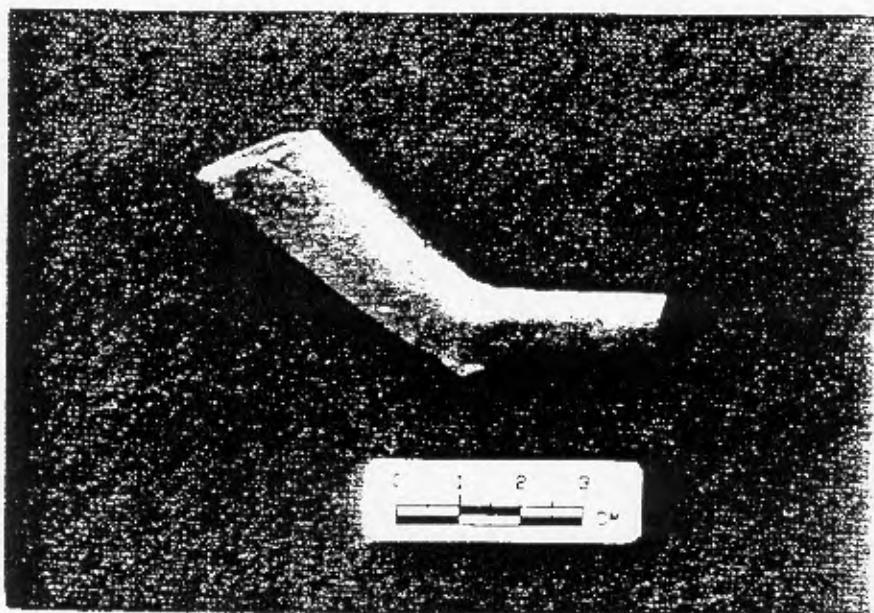


FIGURE 21. Pipe with spur flattened and pared off at rear.

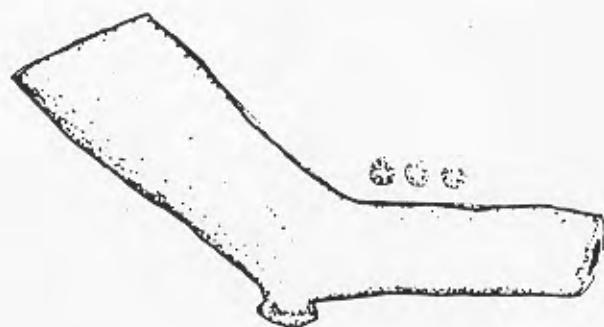


FIGURE 22. Button-type spur. (Port Royal Project)

would have been substantial enough or of the correct shape to balance the pipe while the user was not holding it.

The most primitive feature of the redware pipes is undoubtedly their stems. Again as with the other aspects of these pipes, the stems exhibit a wide degree of variation between individual pipes. The handmade nature of the redware pipes is most evident when one examines the differing forms to be found among their stems (Figure 23). Virtually none of the stems show any sign of having been trimmed or burnished in the manner of the European pipes; fingerprints, flat areas, varying external diameters, and odd curvatures are all common to many of these pipes.

It is impossible to tell how long the stems of the redware pipes were at the time they were made, or whether or not they were consistent in length, since no complete examples have been found. The average length for English pipes for the years 1660-1680 appear to have been 10-13 inches while pipes made in England around 1700 were 15-16 inches long. An agreement from a Bristol Pipemakers' Guild record book dated 1710 which was designed to standardize stem lengths for certain type of pipes gives 13 inches as the length for "Jamayca Pipes" (Walker 1977:15). The pipes referred to in the agreement would likely have been pipes produced for export to the English colonies in the West Indies.

It is doubtful that the redware pipes made in Jamaica had stems as long as the English pipes, but there is no way to tell short of finding a number of the pipes completely intact or contemporary illustrations depicting the pipes. The reference to red clay pipes in the Taylor manuscript describes the common women of Port Royal "trampousing" about the streets of the city with a red pipe in their mouths (Pawson and Buisseret 1975:105). This suggests that the red clay pipes could be

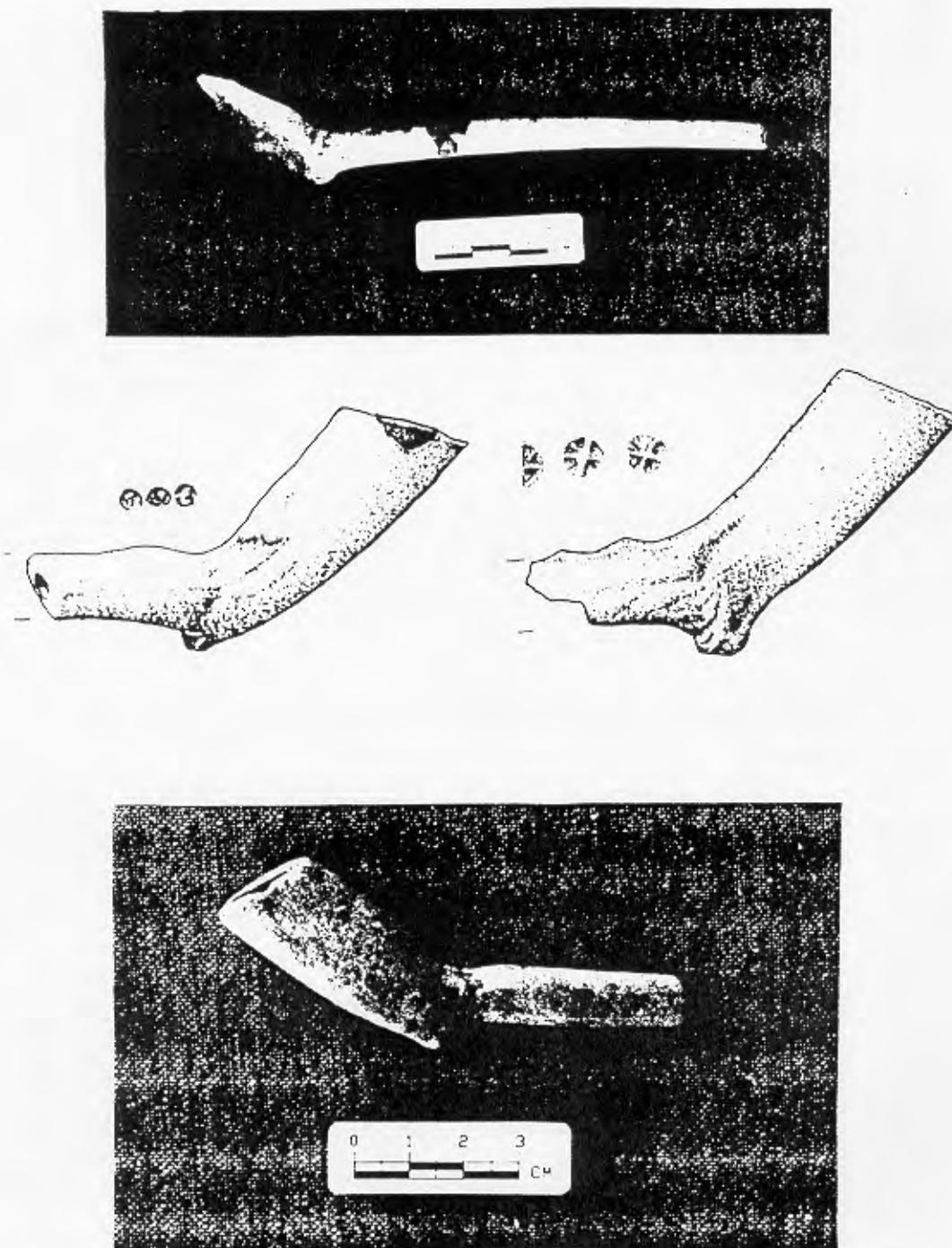


FIGURE 23. Selection of pipes showing variations in stem form.  
(Drawings: Richard McClure)

comfortably clamped in the mouth of the smoker. The typically longer English pipes, due to their length, were more likely to have been held in the hand when not in actual use. It is possible that the pipes used by the women Taylor remarked upon were broken pipes being reused.

The longest red clay pipes recovered from Port Royal measure around eight inches from the bowl to the tip of the stem and there are very few examples of pipes this long. Most of the stem fragments found at Port Royal are shorter than three inches. Because the redware pipes were made by hand and were given very little trimming, it is difficult to identify fragments that might have been examples of the mouthpieces.

The stems of the redware pipes do not have the smooth, uniform thickness that is a feature of most mold-made English pipes. The stems of the redware pipes usually increase in outside diameter as they approach the bowl; however, in addition to the general increase in diameter towards the bowl, many of the stems increase and decrease in diameter in various places along the entire length of the stem.

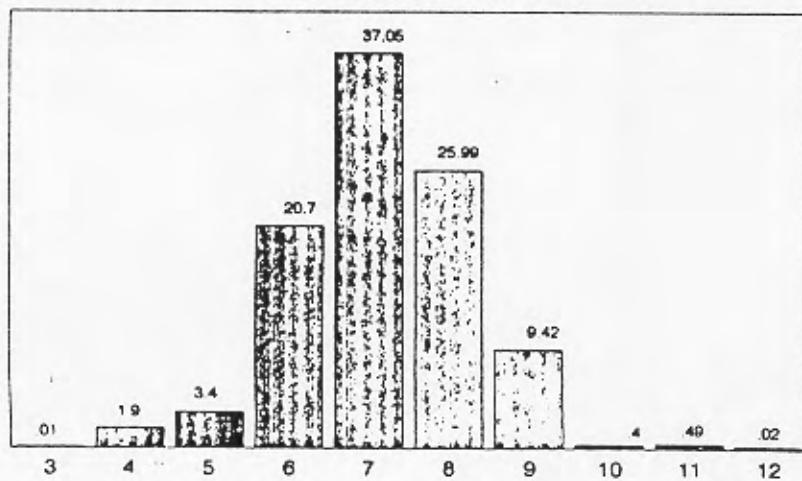
The stem bores of the red clay pipes exhibit diameters that range from 3 sixty-fourths of an inch to 12 sixty-fourths of an inch. In a group of 3427 stem fragments with measurable bore diameters a little over 30% had bore diameters of 7 sixty-fourths of an inch. Close to 26% of the pipes had bore diameters of 8 sixty-fourths of an inch while 20% had bore diameters of 6 sixty-fourths of an inch. Bore diameters of 3, 4, 5, 9, 10, 11, and 12 sixty-fourths of an inch accounted for less than ten percent of the sample each (Table 2). It was not uncommon to find pipes which had bore diameters that varied slightly along the the length of the stem; a pipe fragment with a bore diameter of 7 sixty-fourths of an inch on one end might measure 6 or 8 sixty-fourths on

TABLE 2  
BREAKDOWN OF STEM BORE DIAMETER AMONG THE RED CLAY PIPES

Bore Diameter in 64th of an Inch	Number of Pipes	Percentage of Sample
3/64"	5	.01%
4/64"	67	1.9%
5/64"	119	3.4%
6/64"	712	20.7%
7/64"	1,270	37.05%
8/64"	891	25.99%
9/64"	323	9.42%
10/64"	14	.40%
11/64"	17	.49%
12/64"	9	.02%

## Stem Bore Diameters

in 64ths of an inch



the other.

As illustrated by the above description, most of the features of the redware pipes that differ from the English pipes of the period are a result of the less sophisticated methods used to make the redware pipes. The Jamaican pipemakers, working with the skills, materials, and technology available to them, imitated the form and style of the white kaolin pipes from England as best they could.

## THE MARKINGS

The most enigmatic attribute of the redware pipes is the variety of markings that occur at the juncture of the back of the bowl with the upper surface of the stem. While the basic designs of these marks are often the same, or at least very similar, almost no two pipes have markings which are actually identical. Only two fragments have been found which appear to have the same exact stamp (Figure 24). Other pipe fragments are likely to contain exactly identical impressions, but the nature of the marks and the angle at which the stamps are impressed into the clay make them hard to verify.

In a group of over 700 pipes containing examples of these marks from the INA/JNHT underwater site and a land excavation at New Street, there are over 70 separate and distinct markings. Robert Marx (Marx 1968a:10 ;Marx1968b:9) reported around 50 different types of marks from a sample of 1074 redware pipe fragments from Port Royal. Dorrick Gray (Gray 1983:10) reported 108 different marks in a sample of 408 marked pipes surface collected at Port Royal, Spanish Town, and Black River. In many cases there are numerous variations of a particular mark within each group (Figures 25 and 26).

The markings are usually small impressed stamps with a simple design occurring in relief, although some of the marks are stamped in a way that the design is actually flush with the surface of the stem (Figure 27 shows examples of each). The marks usually consist of three identical impressions placed close together in a row lengthwise along the stem. A small number of the redware pipes contain one to five impressions instead of the usual three.

Out of the 707 pipes with markings, 11 examples had more than three marks and 14 had less than three marks.

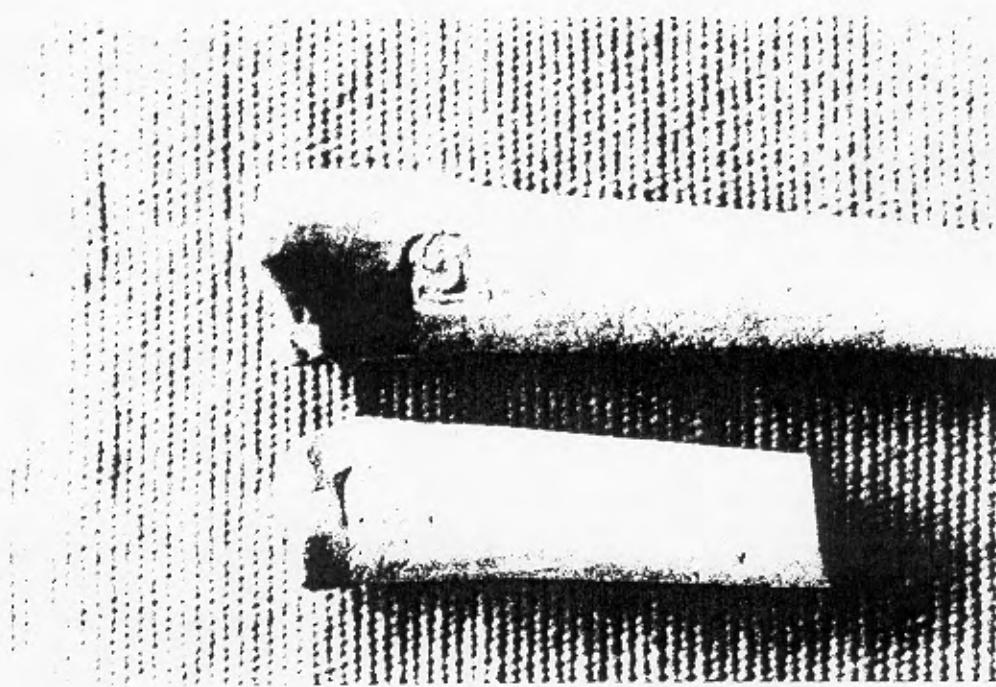


FIGURE 24. Rare example of identical marks on two different stem fragments.

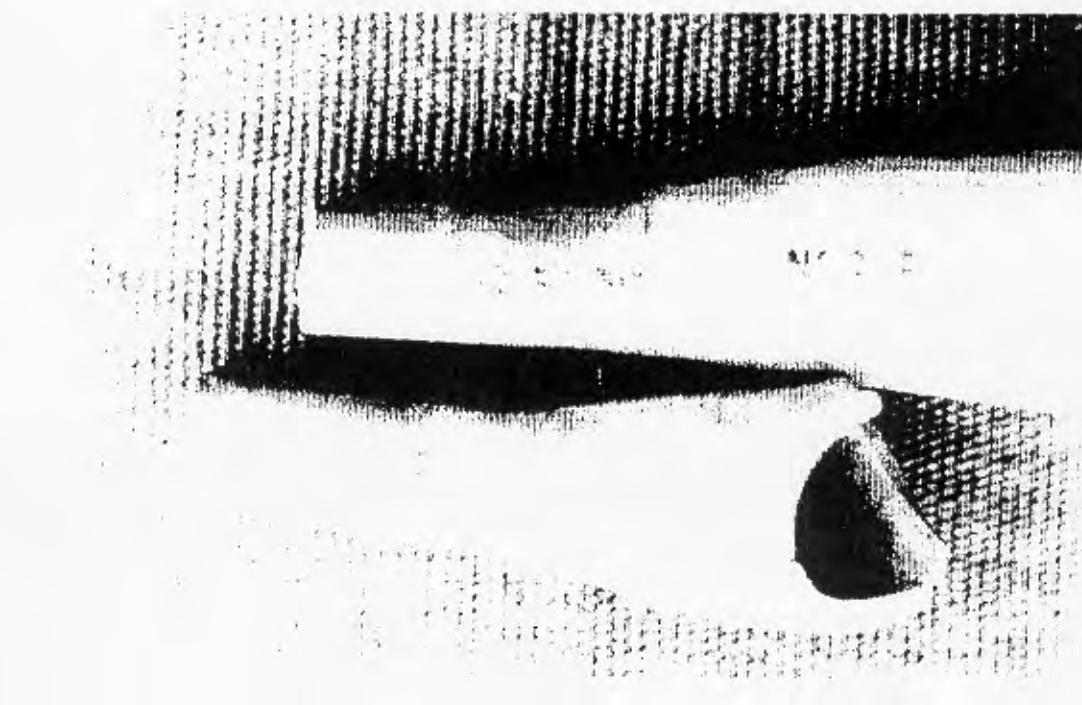


FIGURE 25. Two variations of Type 4.5 stem markings.

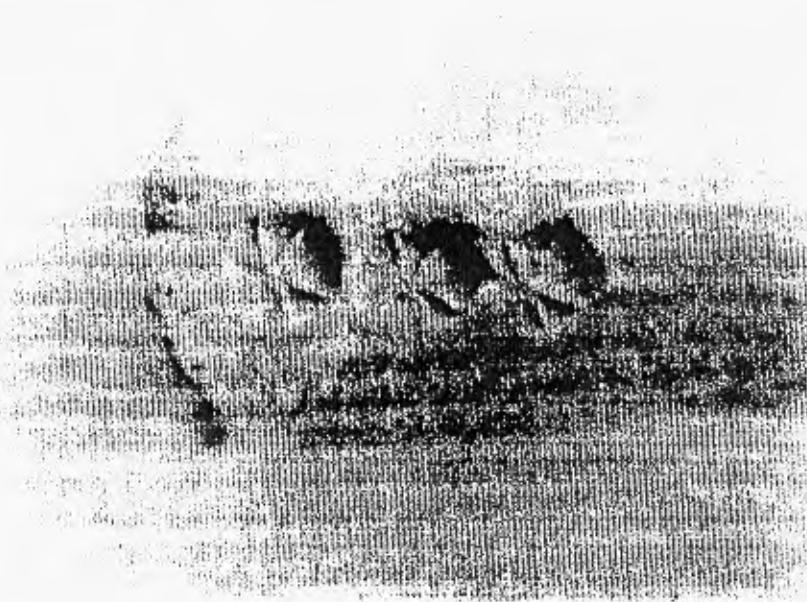


FIGURE 26. Another variation of the Type 4.5 mark.

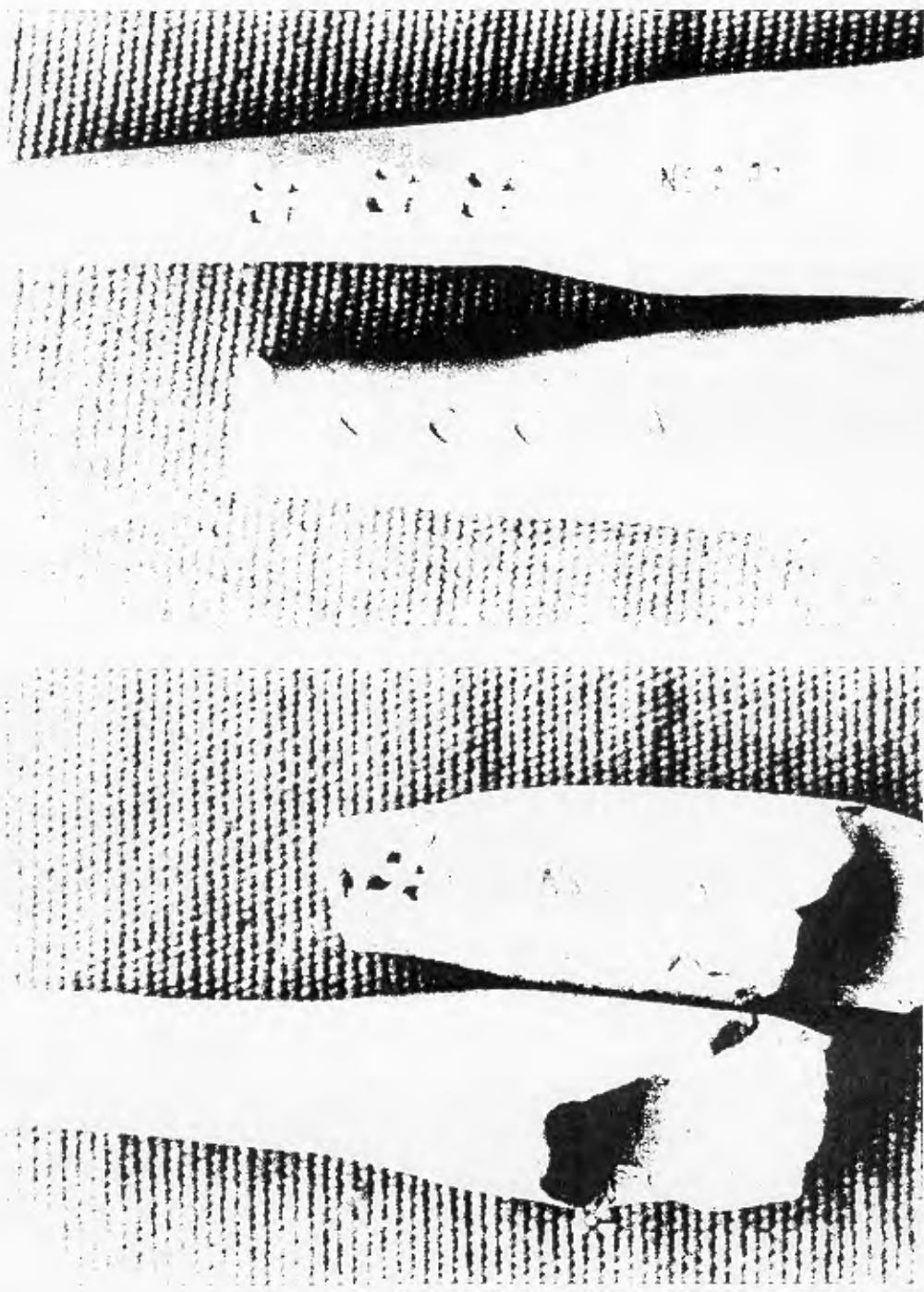


FIGURE 27. Stem markings occur both with the design impressed into the clay of the stem and also with the design flush with the surface of the stem.

Many of the pipes were broken at the point where the impressions were stamped into the stem, so it is possible that a greater number of pipes than the 25 mentioned above had either more or less than the usual three marks. Only two pipes in the group appeared to have no marks. The pipes containing more than three marks carried only two different designs (Types 1.3 and 5.3) while the pipes with less than three marks carried nine different designs (Types 1.0, 1.3, 2.0, 2.1, 3.2, 4.4, 4.6, 5.3, and 6.1). For descriptions and illustrations of each type of design see Appendix A.

The marks vary from simple geometric designs such as circles, squares, and diamonds to more elaborate patterns like hearts, initials, and variations of the *fleur-de-lys*. Only three red clay pipes from any of the Port Royal excavations are stamped with initials-- RG, TJ, and RS. The most common design among the sample of pipes was an impressed circle containing three raised dots. This design (Type 1.3) has been dubbed the "pawnbroker" by Richard McClure of the JNHT because of its resemblance to business signs used by pawnbrokers in England. There were 165 pipes, or 25.1% of the sample, bearing some variation of this design (Figure 28).

The next two most common designs found in the group of pipes were a plain impressed circle with no elements in relief and an impressed circle containing a raised circular area within; pipes of these two types (Types 1.0 and 2.0) accounted for 84 of the pipes or 12.7% of the total sample (Figure 29).

Thirteen other designs (Types 1.2, 1.10, 2.1, 4.0, 4.4, 4.5, 5.2, 5.3, 6.0, 20.0, 30.0, 40.0, and 50.0) accounted for more than 1.5% of the sample each. The remaining designs each made up less than 1.5% of the total sample.

Rouletting or milling is a decorative feature sometimes found on English and other European pipes from

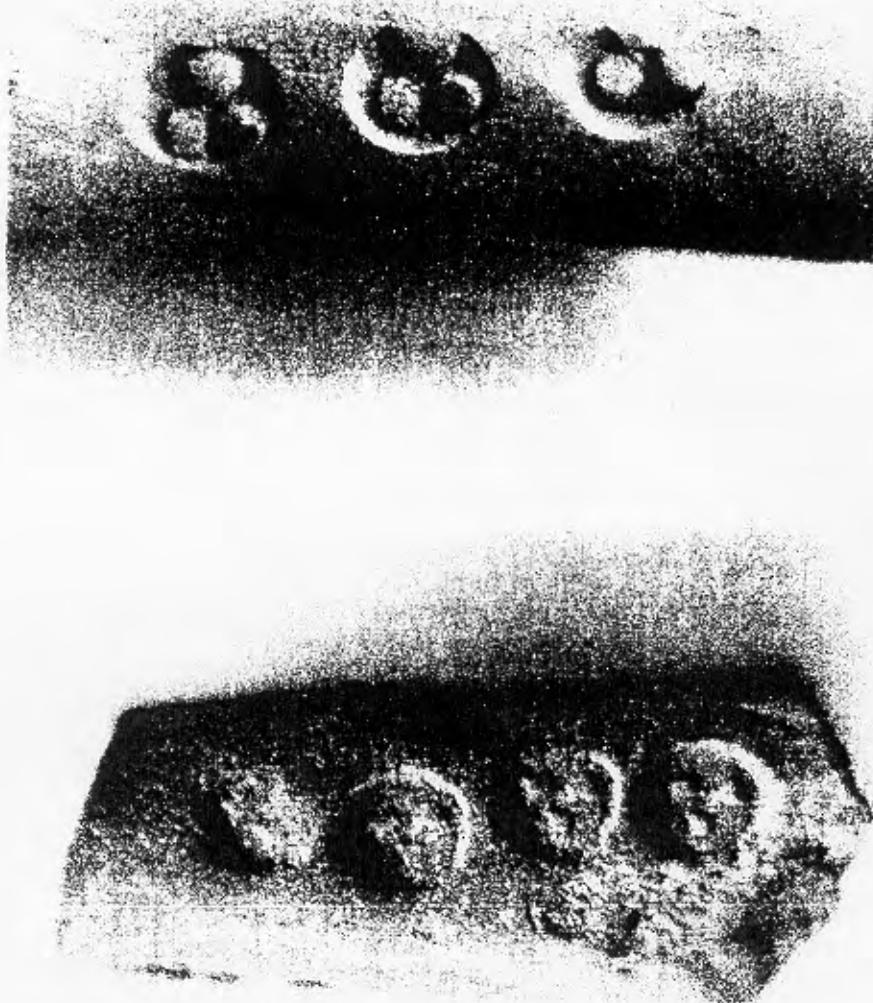


FIGURE 28. Type 1.3 "pawnbroker mark".

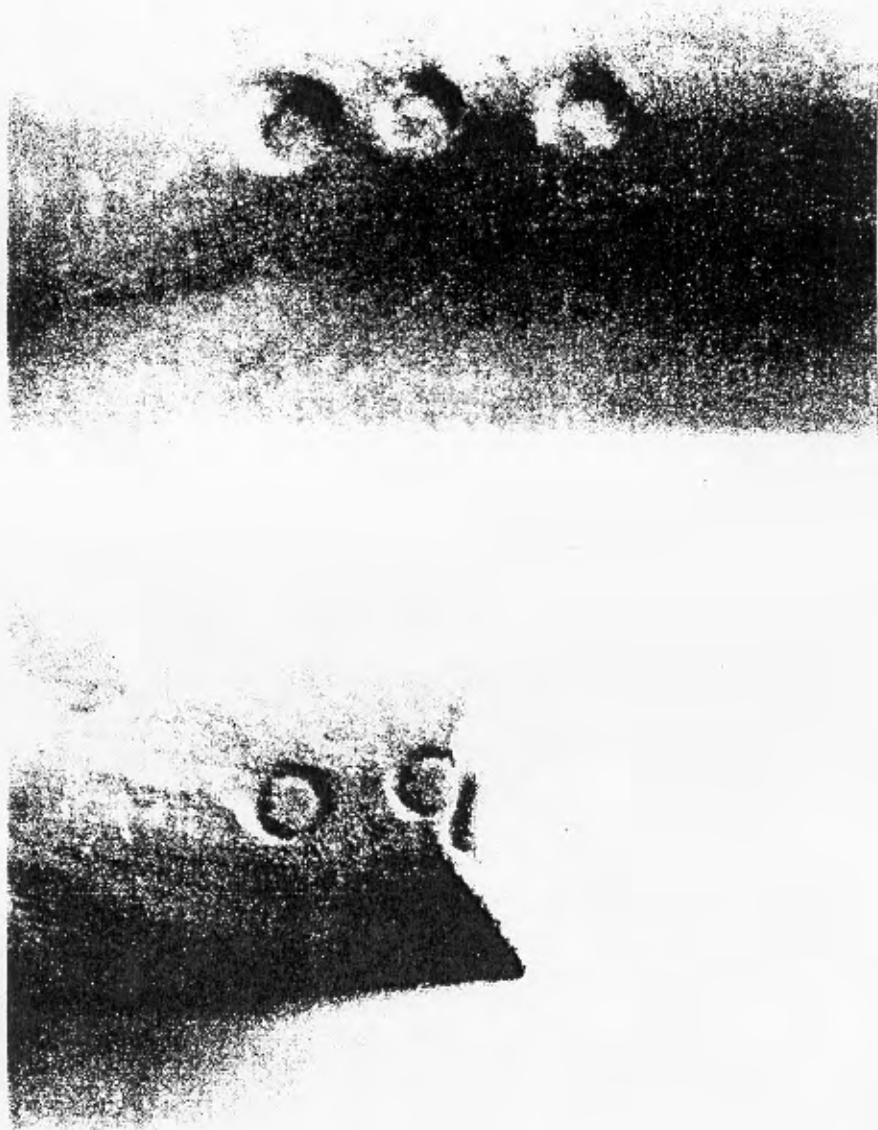


FIGURE 29. Type 1.0 mark, *top*, and Type 2.0 mark, *bottom*.

the 17th century and is generally used around the mouth of the bowl and sometimes around the stem. Only a few examples of red clay pipes have been found with rouletting around the stem (Figure 30) and none of the red clay pipes have been found with any type of decoration around the mouth of the bowl. The only other type of stem decoration to be encountered among the red clay pipes was plain circular impressions placed around the stem and along the entire length. One example was squarish in cross-section (Figure 31).

There has been a good deal of speculation concerning the significance of these marks; whether or not they are maker's marks, owner's marks, or marks signifying that the pipes were associated with some type of commercial establishment. The most logical answer seems to be that in most cases, the marks are indeed a type of "maker's mark".

English pipes with maker's marks occur at the beginning of the 17th century and generally consist of the initials of the maker's first and last names, although full names, place names, and symbols were also used. The marks are found on the base, back and sides of the bowl, on the sides of the spur or the base of the bowl, and on the stem (Oswald 1975: 62-63). English pipes with initials or other decoration on the stems are known by 1670 but are rare; generally, decorated stems are not common on English pipes, particularly before the nineteenth century (Walker 1977: 17).

The markings found on the redware pipes have very few parallels to markings or decorations found on English or other European tobacco pipes of the 17th century. With the exception of the three red clay pipes bearing initials, the marks impressed into the Jamaican pipes do not resemble either the typical English maker's marks or other types of decoration used on English pipes of the period. In a few cases the markings of the Jamaican pipes

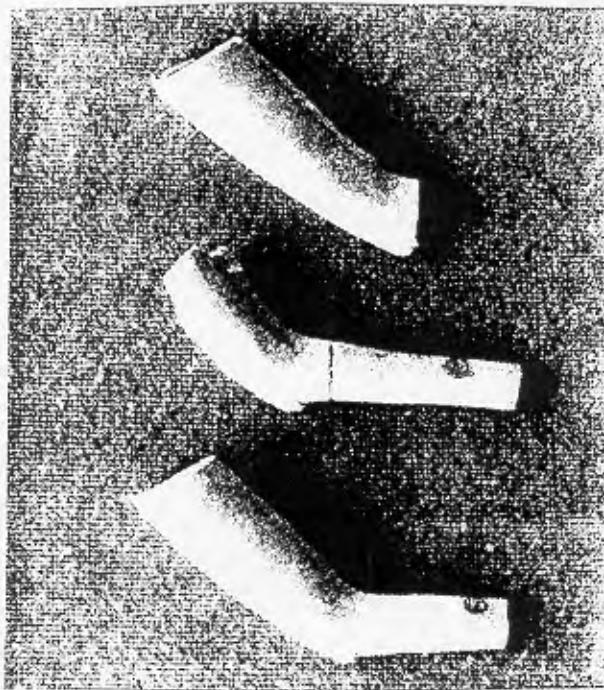


FIGURE 30. Pipe with rouletting around stem, center.



FIGURE 31. Pipe stem fragment square in cross-section with impressed marks along entire length.

are somewhat similar to decorative elements used on English pipes, but the markings found on the red clay pipes are never used in the same manner as the similar marks to be found on the English pipes. Designs such as rosettes and wheel forms, as well as heart-shaped devices, are found on some English pipes dating from 1650-1680, but the English marks occur on the bowls or heels of the pipes and are single marks (Oswald 1975:67), as opposed to the markings on the Jamaican pipes which occur on the upper part of the stem and are almost always repeated.

When English pipes of the 17th century do contain stem decoration, it most often takes the form of lettered designs such as the initials of the maker, the location of the pipemaking facility, or the full name of the pipemaker. This decoration is usually embellished with some form of encircling lines, scrolls, or rouletting and often wraps completely around the stem of the pipe (Oswald 1975:76). The few examples of red clay pipes which bear stem decoration that differs from the usual geometric designs, such as rouletting around the stem, do not resemble the decorations used on English or other European pipes.

The markings of some Dutch pipes from the 17th century are in a few cases similar in style, and in fewer cases still, to the placement of the markings found on the red clay pipes. In Dutch pipes of the period the maker's mark was almost without exception placed on the heel of the pipe (Duco 1981:376). One of the most common heel marks found on Dutch pipes in the 17th century is the Tudor rose. The popularity of the Tudor rose is believed to be a result of the influence of English fugitives or refugees, among them pipemakers, who fled England for the Netherlands when the Catholic James I became king of England in 1603 (Duco 1981:371,376). Variations of the Tudor rose, which had evolved to the point where they

bear little resemblance to the original design, are found on many Dutch pipes from the 17th century. A few of these variations of the Tudor rose are quite similar to the markings found on some of the Jamaican red clay pipes (Figure 32). The Dutch marks, however, occur on the heel of the pipe and not the stem.

The *fleur-de-lys* also appears on Dutch pipe heels in the 17th century. In addition to the use of the *fleur-de-lys* as a heel impression, the design was sometimes used as a stem decoration as well. Two Dutch pipes from around 1640 both have diamond-shaped stamped impressions containing the *fleur-de-lys* that are placed end to end on the upper surface of the stem (Duco 1981:Figs.107,108). Pipes with markings of this type have been found on sites in North America; fifteen pipes with three stamps bearing the design were found at a site in New York state which dated from 1689-1693 (McCashion 1979:140). Pipes with this type of stem decoration have also been reported from sites in Maryland (Hurry and Keeler 1991:67; Miller 1991:80) where terra-cotta pipes produced locally are also present. This type of Dutch stem decoration represents the closest parallel in style to the marks of the red clay pipes to be found among European pipes of the period. Though similar to the Jamaican markings, the Dutch examples are placed further back on the stem and the design is quite different from the *fleur-de-lys* marks used on some of the red clay pipes (Figure 33). The bowl forms, more rounded in profile and often referred to as belly bowls, of the Dutch pipes are also quite different from the bowls of the red clay pipes.

Though not particularly likely, the possibility of Dutch influence on the style and placement of the markings used by the Jamaican pipemakers does exist. During the latter half of the 17th century, Dutch pipes had gained a reputation as being superior to tobacco pipes produced in England and elsewhere in Europe. One



FIGURE 32. Red clay pipe stem impression, top, and similar designs from the heel impressions of 17th-century Dutch pipes, bottom.

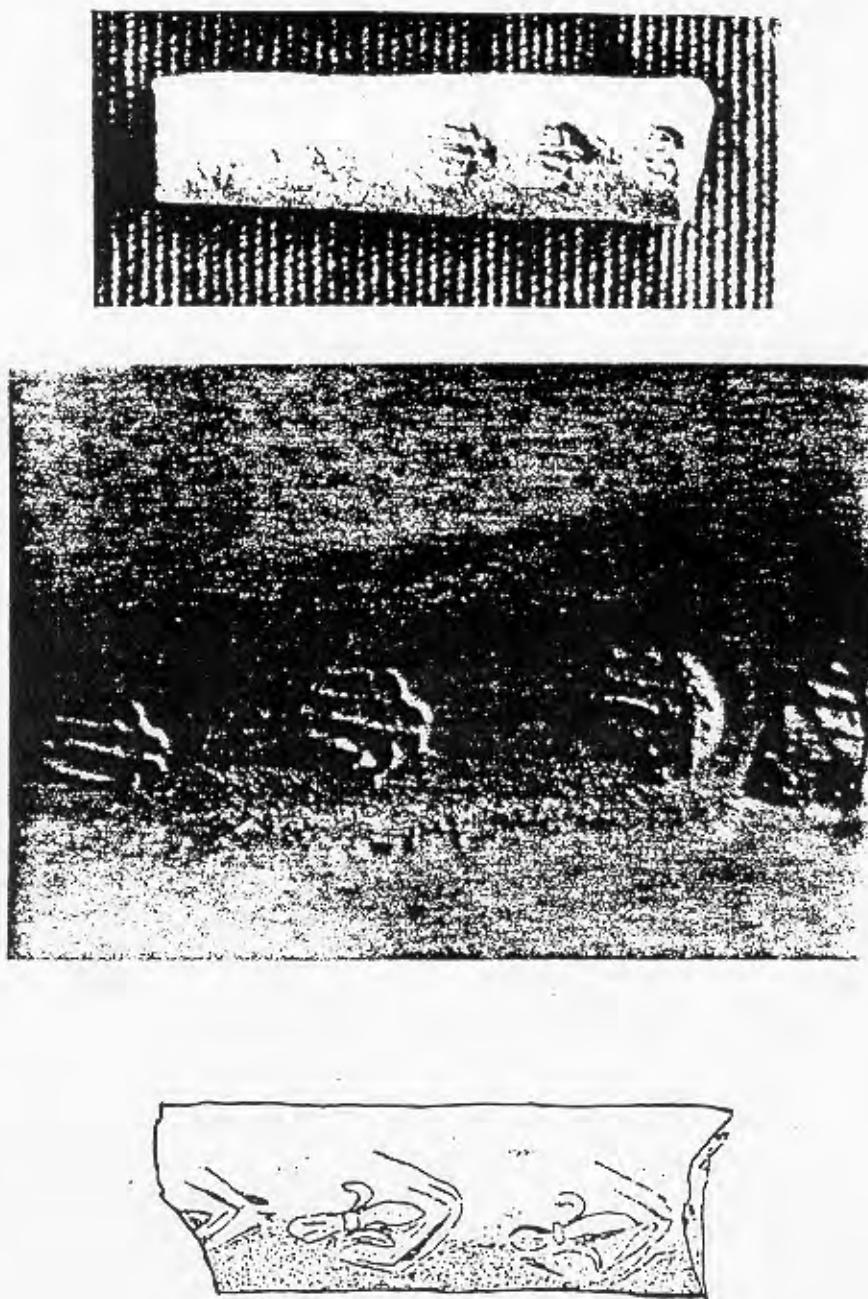


FIGURE 33. *Fleur-de-lys* marks on red clay pipes, top and middle, and on the stem of a 17th-century Dutch pipe, bottom. (Drawing after McCashion)

English observer at the end of the century, commenting on a small number of imported Dutch pipes, said "truly [they] are very fine. If there comes no more they'll do us no great hurt," and went on to urge that they be used to set an example to English pipemakers (Walker 1977:96).

If there is a connection between the style of decoration used on certain Dutch pipes and the way in which the Jamaican pipemakers decorated their wares, it is probably a case of imitation. If the Dutch pipes were considered by the public to be more desirable than English pipes, the local Jamaican pipemakers might have placed their marks on the pipes after the Dutch fashion in order to make their wares seem more valuable. Considering the extensive contact between Dutch merchants and shippers and the English colonists of the West Indies, it is quite likely that Jamaican pipemakers would have been familiar with tobacco pipes of Dutch origin.

Copying the marks of other pipemakers who were known for quality products was not uncommon in the 17th-century tobacco pipe industry, a good example being the "TD" marked pipes which turn up at a wide range of archaeological sites and in a seemingly endless variety of sizes, shapes, colors, and styles of marking (Alexander 1983:198). Although the Dutch markings discussed here are closest in style and placement to those found on some of the red clay pipes, there is no conclusive proof that the Jamaican pipemakers were in any way influenced by Dutch tobacco pipes.

The possibility has been put forward that the markings on some of the red clay pipes might signify that the pipes were associated with particular commercial establishments (Gardner 1984; Heidtke 1986). The use of marked pipes with motifs related to public houses or tobacco retailers is documented in England during the 19th century and it is possible that motifs designed to appeal to the clientele of certain public houses-- motifs

involving the inn's sign-- were being put on London-made pipes as early as the first quarter of the 17th century, and it has been suggested that Chester pipemakers were also doing this in the first half of the 18th century (Walker 1977:156).

The Island Record Office deeds in Jamaica contain the following names of taverns which were operating in Port Royal prior to the 1692 earthquake; The Three Crowns, The Three Mariners, and The Three Tunns, as well as The Sign of the Mermaid, The Sign of Bacchus, and The Sign of the George (Pawson and Buisseret:Appendix 12). The only marking found among the red clay pipes that might be associated with one of the taverns listed above is a stem fragment reported by Marx which contained two stamped impressions resembling crowns (Marx 1968:117). It is not clear from the report if the fragment actually had only two crown impressions or if a third impression might have been on a part of the fragment that was not recovered. Other taverns or business establishments that might be related to designs found on the red clay pipes could have existed in Port Royal or elsewhere in Jamaica, but at present none are known. The crude nature of these pipes and the fact that they seem to be associated with the common people (Taylor 1688:265) argues against their use as a form of advertising.

Another type of mark or decoration which is sometimes found on English pipes is some type of decoration that would indicate the owner of the pipe. Individuals with the means to do so would have pipes custom-made with their initials or some other design of their choice. The only markings found among the red clay pipes which might possibly be examples of owner's marks are the three examples which contain initials. Once again, it is unlikely that someone would have a pipe of such crude quality as the red clay pipes made to order with their initials.

## THE PIPEMAKERS

As stated previously, the historical documentation relating to the red clay pipes is extremely sparse. The only known 17th-century source which mentions the pipes is the Taylor Manuscript. John Taylor was an Englishman who visited the West Indies in the latter part of the 17th century and left a valuable descriptive account of his travels. Taylor was in Port Royal in the late 1680s and his manuscript is the best eyewitness account available regarding life in Port Royal before the earthquake in 1692.

In describing Port Royal Taylor says,

"The common people here goe generally arrayed in good linnen, but many of them barefooted, without shoo or stockins, soe that you shall see a common woman, only in her smocke or linnen peticote, bare footed, without shoo or stockins, with a Strawn hatt, & a red tobacco pipe in their mouths, and thus they Trampouse about their streets, in this their warlike posture, and thus arrayed they will boose a cupp of punch cumly with anyone" (Taylor 1688:265).

Taylor also says the pipes are made by negroes from the "red cliae" found in the Liguanea plain and around Spanish Town (Pawson and Buisseret 1975:105).

The only other contemporary record of either red clay pipes or pipemaking in Jamaica is a deed dated June 1, 1680 which identifies the name of a pipemaker, John Pope the younger. No similar craftsman has been found earlier than this, nor is there any recorded in later surviving deeds (Pawson and Buisseret 1975:105).

On the surface this information seems to answer several important questions concerning the redware pipes: who made the pipes, where the clay came from, and who used the pipes; it does not, however, tell us why the pipes were made, if this John Pope was coordinating the

production, or whether or not the negroes referred to by Taylor were freemen or slaves.

Aside from the one deed which identifies John Pope as a pipemaker, there is no other concrete evidence that points to him as being involved in the production of the red clay pipes. There are nine transactions in the index to the Grantors Series ( Island Record Office: Grantors Series-- Index to Vols. 1-11) which list a John Pope as receiving some type of property. At least three of these transactions involve the transfer of ownership of land in Port Royal to a John Pope. The first mention of Pope in the deeds is for the year 1664, while the last one is dated 1680. Five of these transactions date from between 1670 and 1679.

A John Pope is also mentioned three times in the Plat Records for Port Royal (Port Royal Plats:Vol. 28, pp. 99,113.116). In two instances plots of land granted to Pope are described; in the third instance Pope is mentioned in passing as the owner of land adjacent to a property being granted to another individual. The three pieces of land mentioned in the plats are located in different areas of Port Royal. It cannot be determined if Pope owned all three pieces of land simultaneously, or if he was selling one property in order to purchase another. If Pope did own all three properties at once, he would have necessarily been a man of some wealth, as property values in 17th-century Port Royal were quite high. With the exception of the 1680 deed identifying Pope as a pipemaker, none of the other records above indicate Pope's occupation or refer to him as John Pope the younger.

An inventory taken after Pope's death (PRI V.2.f.40) in 1684 values his estate at over 677 English pounds (Figure 34). None of the possessions listed in the inventory, with the possible exception of 11 slaves, gives any indication of what type of work Pope did. A

## v.2 f.40 John Pope of Port Royall shown us by Richd. Holloway of Port Royall cooper

4 featherbeds & bolsters .....	16 00 00
3 standing & 1 trundle bedstead .....	01 10 00
3 suits curtains & vallans old fashion .....	01 10 00
3 rugs 2 blankets 3 pains 1 quilt .....	02 15 00
2 chest .....	02 15 00
?	01 00 00
5 chest & a close stool .....	01 00 00
5 side board & 1 large table .....	03 00 00
4 punch bowles at .....	01 10 00
2 broken looking glasses .....	00 05 00
an old fashion painted .....	00 05 00
9 chairs 6s 6 p p .....	02 14 00
13 Cane chairs & one couch .....	07 15 00
2 wooden elbow chairs .....	00 15 00
1 of plate at 5 ox .....	37 15 00
1 annimonais cup 4 a = base & black Jack topt wth silver .....	01 00 00
9 brass 00 07 06 .....	
one small Brass mortar .....	00 03 00
161 pewter ot 71/2 .....	03 03 1½
a keatle & skillets wd 50 9 .....	07 17 06
9 iron potts .....	01 15 00
2 frying panns .....	00 02 06
2 carpets 3 p ps .....	00 06 00
8 Cows 18 calves running to leeward valued by those of at .....	27 00 00
16 Ewes 7 lambs 1 Ram sold for .....	16 00 00
19 Sheets .....	03 10 00
11/2 doz .....	00 14 06
1 draper table clothe & 12 small napkins .....	00 13 00
3 table cloths & 19 course napkins .....	00 15 06
2 Hamacoës .....	01 05 00
Stomach Pillow .....	00 04 00
2 pesle lumber at .....	02 00 00
.....	00 15 00
Credits two hundred forty five pounds .....	245 00 00
Debits upon good .....	142 00 00
4 men 4 women 1 boy 2 pickannings at .....	148 00 00
Sume Totall .....	677 00 7½

19th Aprile 1684

Joseph Jennings X

FIGURE 34. The 1684 inventory of John Pope of Port Royal.

will in the name of John Pope (Port Royal Wills:V.4.f.1) from January of 1684 describes Pope only as a "freeholder being now of good and perfect memory". His wishes for the disposition of his estate also fail to give any clue to Pope's occupation. The will makes Pope's wife Elizabeth the executrix of his estate. No children are mentioned in the will. Pope's transcribed signature on the will is accompanied by a mark resembling a "T" and the words "his Mark" (Figure 35). This implies that Pope was not literate, which would not have been uncommon for the period. It should be noted that the mark accompanying Pope's name on the will does not resemble any of the designs found among the markings of the red clay pipes.

The single reference to a John Pope the younger in the 1680 deed raises the possibility that there could have been more than one John Pope in Port Royal, but this is doubtful considering that there is only one will, one inventory, and one use of "the younger" in conjunction with the name John Pope. The references to John Pope in the records of Port Royal, with the exception of the one deed, do not provide any proof that this John Pope had anything to do with the manufacture of the red clay pipes.

Among the property records from Jamaica there are at least two other references to individuals with the name John Pope who are listed as residing in other areas of Jamaica. These references are distinct from the nine transactions found in the index to the Grantor's Deeds mentioned above.

One of these references describes the sale of 250 acres of land in the parish of St. Andrew to a person named Willmot. The deed is dated 1679 and the seller is a John Pope of Liguanea, who is identified as a planter (Grantors Series:V.11.f.n/a). The mark accompanying Pope's signature on the deed is very similar to the one used on the Pope will from Port Royal (Figure 36). It is



FIGURE 35. Mark accompanying the signature of John Pope of Port Royal as it appears on Pope's 1684 will.



FIGURE 36. Mark accompanying the signature of a John Pope of Liguanea as it appears on a 1679 deed.

possible that this John Pope is related to the John Pope, described as John Pope the younger, living in Port Royal. According to the 1679 deed, the John Pope from Liguenea has a wife named Prudence, making the possibility that the two people in the deeds are actually the same individual unlikely. The similarity of the marks used with the signatures could indicate a relationship between the two men. A relationship between the John Pope of Port Royal and the John Pope from Liguenea also makes sense in light of the Taylor manuscript's assertion that the clay used to produce the red pipes comes from Liguenea. The inventory of the Port Royal John Pope also lists "eight cows and eighteen calves running to leeward" (PRI:V4.f.1); this indicates that Pope either owned, leased, or had access to property on the mainland where this livestock was pastured.

The second reference to a John Pope living outside of Port Royal comes from a 1673 deed which describes the transfer of property from a Colonel John Pope, described as a resident of St. Johns or St. Thomas, to a Peter Beckford (Grantors Series:Vol.1, p.122). In this case the mark included with the signature of Pope does not resemble the marks described above.

One person who is not identified as a pipemaker in the historical records, but who seems to be a likely individual for some type of involvement in the redware pipe phenomena is Daniel Hickes (sometimes spelled Hicks). Daniel Hickes was a wealthy Jamaican merchant who appears to have made a substantial fortune through the manufacturing of clay pots for use in refining sugar. The fortune amassed by was one of the few in Jamaica considered comparable to that of a successful London merchant of the time (Claypole 1972:210). Hans Sloane, who while visiting Jamaica in 1687 had a chance to view Hickes' pot-making operation described the product-- "Pots for refining sugar are made at Liguanea, (and)

though more brittle and dearer than when brought from England, they are made to supply the present need of the planters; the clay of which they are made is dug up near the place" (Sloane 1707:61).

Hickes' inventory (PRI V.3.f.249-252) does not contain any information that would indicate he was involved in the production of earthenware tobacco pipes, but this does not necessarily mean he was not. Neither John Pope's inventory nor his will suggest he was involved in the manufacture of pipes, yet he is identified as a pipemaker in a deed. It is possible that by 1689, the date of Hickes' inventory, the red clay pipes were no longer in demand and were no longer being produced. It is safe to say that by the time of Hickes' death it would have been difficult to make tobacco pipes as cheaply and as well as the ones coming in from England. Hickes' inventory does indicate that his pot-making operation was still a viable concern in 1689 as the expansion of the sugar industry was still in full swing. Among the items listed under the heading of "At the Pott Worke" are 3050 Dripps and 1000 refining potts. The inventory also lists a sizable number of slaves belonging to Hickes and seven white servants who were apparently under indenture contracts (PRI:V.3.f.249-252).

One of the more common marks to be found on the red clay pipes (Types 6.0, 6.1, and 6.2), that might be attributed to Hickes, is an impressed stamp containing the letter "H" (Figure 37). Variations of this design account for close to five percent of the marked pipes. While it is impossible to prove a definite link between the "H" design found on many of the red clay pipes and Daniel Hickes, it is evident that he had a labor force experienced in working with the local clay and that his "Pott Worke" was located in the area where Taylor says the clay used to make the pipes was obtained.

The wide range of designs used on the red clay pipes



FIGURE 37. Variations of "H" mark (Types 6.0 and 6.1).

suggests that a considerable number of individuals were involved in their manufacture. It is very doubtful that a few individuals, such as Pope or Hickes, were directly related to the production of all the red clay pipes produced in Jamaica. The Afro-Jamaicans referred to by Taylor could represent individuals producing tobacco pipes on their own or in small groups. Since Taylor does not say if the Afro-Jamaican pipemakers were slave or free, there is no other evidence from which to infer what their status might have been.

One estimate put the number of free blacks and mulattoes living in Jamaica at 3700 during the first part of the 18th century (Long 1774:378) while a 1778 report by the Jamaican Assembly estimated an average of 500 free negroes in each parish which would give a total of 10,000 for the island as a whole (Edwards 1793:217); both of these estimates exclude the semi-autonomous Maroon population. With a free Afro-Jamaican population of this size, it is quite possible that the pipemakers, or at least some of them, mentioned by Taylor were among this group. The difficulty of obtaining land in the white-dominated society of colonial Jamaica would have made the practice of a small scale trade or craft one of the few opportunities available to a free Afro-Jamaican.

Tobacco smoking and the use of clay pipes to do so was known among the people of West Africa, many of whom were transported to the New World as slaves. A 17th-century visitor to the Guinea Coast of Africa remarked that native potters spent almost as much time making clay pipes for smokers as they did jugs and bowls for households (Bridenbaugh 1972:233). It is known that the slaves brought their pottery making skills with them to Jamaica and continued to produce pottery wares called yabba. Tobacco smoking was also very popular among the slave populations throughout the English colonies and it is quite possible that they could have made pipes for

their own use. The overwhelming similarity of the red clay pipes to European, and especially English forms, precludes the possibility of African influence in their design, but it does not rule out the possibility of an African influence in the methods used to make the pipes.

The above information does not answer conclusively the question of who made the Jamaican red clay pipes, but it does suggest a few possibilities. It could be that both free and slave Afro-Jamaican labor was involved, as well as the labor of either free or indentured white craftsmen.

The overall similarity of the red clay pipes in form and decoration, suggests a smaller pipemaking community than might be supposed on the basis of the large number of distinct markings. This similarity between the pipes also suggests that the pipes were made within a limited geographic area by individuals who produced their wares using methods based on either formal or informal standards.

Even though the pipes have been recovered in greater quantities from Port Royal, it is very doubtful that the redware pipemaking industry was centered in that town. The problems of transporting the clay and the fuel needed for firing the pipes and the high cost of land on the peninsula would have made the large scale production of the pipes in Port Royal costly and impractical. The price of tobacco pipes in England during the late 17th century was generally in the area of one to two pence a dozen (Walker 1972:419-420). Even when the cost of transportation of the mass-produced English pipes is considered, it is still unlikely that it would have been cost-effective to produce the hand-made red clay pipes in Port Royal or even elsewhere in Jamaica, once the cheaper English-made pipes were imported in large numbers.

## ORIGINS OF THE RED CLAY PIPES

The place of origin of the red clay pipes has been a puzzle to researchers since the time the pipes were first encountered in archaeological sites. Robert Marx, who worked at Port Royal from 1966 to 1968 originally felt that the pipes were not made in Jamaica (Marx 1968A:12). After consulting with Adrian Oswald and Ivor Noël-Hume, two noted researchers having extensive experience with clay pipes from various sites in Europe and North America, Marx later agreed with these two individuals' conclusion that the pipes originated in the Caribbean region and most likely on the island of Jamaica (Marx 1968B:9). Since that time most archaeologists have agreed that the pipes are most likely Jamaican in origin.

Unfortunately it is still impossible to say with complete certainty that the red clay pipes were produced in Jamaica; however, the existing evidence does point overwhelmingly to a local origin for the pipes. One of the strongest arguments for a local origin for the pipes is that they are found almost exclusively on the island. This type of pipe occurs in large quantities at several sites throughout Jamaica but is extremely rare in Europe and North America. A curious artifact from the New Street site also supports a Jamaican origin for the pipes; a small, hand-rolled, ball of fired red clay identical to the clay used to make the pipes was found in the 1692 level of the site along with a number of the red clay pipes (see Appendix A). The few examples of earthenware pipes reported from sites in Europe do not seem to be of the same type as those found in Jamaica. Alan Vince and Peter Davey, English archaeologists familiar with the Jamaican pipes, reported that they were unaware of pipes of this type occurring on English sites (Vince

1991:personal communication).

A 19th-century book on the history of tobacco describes crude, hand-molded pipes of red clay "ornamented with small circles pressed into it as from the end of a stick" which the author ascribes to a pre-Raleigh period (Billings 1875:164). From this short description it is difficult to tell if these pipes are similar to the Jamaican pipes; it is unlikely as the date is far too early and the pipes described have not been reported by any modern researchers.

Red clay pipes have been reported in small numbers from other sites in the Caribbean: St. Martins, Trinidad, the Bahamas, Old Providence Island, and on the mainland at Porto Bello in Panama (Marx 1968A:12). A single pipe of this type has also been found on a colonial site in Boston (Pendery 1992: personal communication). The example from Boston and the pipes from Porto Bello (Gray 1992: personal communication) are the only ones that are readily identifiable as being similar to the Jamaican pipes. The occurrence of the pipes in these areas is not implausible as all of the above locations are likely to have had at least some contact with Jamaica during the period the pipes were in use.

The Taylor manuscript also clearly indicates that the pipes, or at least some type of red-colored tobacco pipes, were being made in Jamaica from the local clay during the appropriate time span. Unfortunately there are no sites in Jamaica which have produced direct evidence of pipe production such as kiln debris or pipe-waste material. If the pipes were made as suspected, that is in small numbers in primitive kilns or open fires, there would be little chance of finding evidence of their manufacture. Adding to the problem is the fact that little research has been done in Jamaica to locate and investigate possible kiln sites and there have been only a few archaeological excavations of colonial sites

outside of Port Royal and Spanish Town.

An alternative method for determining the origin of the pipes, though not as reliable as hard archaeological evidence, is to examine the chemical composition of the clay used to make the pipes and compare it to the composition of local clay deposits. Close similarities between the clays would support the argument that the pipes were made in Jamaica and not imported from another area; some work of this type has been performed in the past. Michael Pawson, who did some work with the redware pipes in the late 1960s, had some samples analyzed by the Jamaican Geological Survey Department. He reported that the clay had a typical montmorillonite composition in its major constituents of silica and alumina and that the ratio of alumina to iron oxide suggested that it could possibly be the parent clay from which Jamaica bauxite was derived (Marx 1968A:9). There is unfortunately no more specific information available concerning Pawson's study. Dorrick Gray, of the JNHT, also had some pipe clay analyzed. This analysis was performed by the Scientific Research Council of Jamaica and also indicated that the clay used to make the pipes is closely related to Jamaican bauxite (Gray 1992:personal communication). Mr. Gray has kindly provided some of the results of his analysis, as well as a sample of clay from the Liguanea area of Jamaica, for this study. Liguanea is the area mentioned as one of the sources for the pipe clay in the Taylor manuscript.

Although there are only a few distinct types of clay, the variation in chemical composition is wide. Even among clays of the same type the composition of individual samples can vary within a fairly wide range. Materials definable as clay exist in immense variety within a range of materials which have certain chemical and mineralogical characteristics in common (Colbeck 1988:7). The standard definition of clay is: an earth

that forms a coherent, sticky mass when mixed with water; when wet, this mass is readily moldable, but if dried it becomes hard and brittle and retains its shape; when heated to redness, clay becomes still harder and is no longer susceptible to the action of water (Worral 1986:1). These properties have made clay an extremely utilitarian substance throughout history.

It is difficult to determine the origin of a clay sample based solely on the basis of its chemical composition, but clays of the same type and from the same geographic area or geological source will generally be similar in composition. Clay samples from the same clay deposit should be very similar in composition, although minor differences in some of the constituent elements are not uncommon.

For this study several samples of the red clay pipes and a sample of raw clay from the Liguanea area of Jamaica were analyzed to determine their respective chemical compositions. Eight samples were prepared by grinding the clay into a fine powder. The first sample was made up of a single piece of the raw clay material from Liguanea; the second sample was made up of clay taken from different portions of the piece of raw clay in order to get a composite picture of its makeup. The red clay pipe samples used in the analysis came from the INA/JNHT/TAMU excavation of Port Royal.

Two samples were prepared from the bowl fragments of a single pipe. This pipe was darker in color than the usual red color. Two samples were also prepared from a number of stem fragments which were the standard red color. The samples were thoroughly rinsed in deionized water to remove salts prior to being ground into a powder.

The analysis was performed by the TAMU-based Center for Chemical Characterization and Analysis. Neutron activation was the method used to determine the composition of the samples. Three separate processes were

used to obtain the percentages of different elements present in each sample. Pneumatic irradiation, in which the clay samples, along with samples of known composition to act as standards, are inserted directly into the core of the nuclear reactor for a short period of time, was used to determine the presence and amounts of elements with relatively short half-lives. This is achieved by performing gamma spectroscopy on the irradiated samples with a high-purity germanium detector. This method was used to measure the amounts of aluminum (Al), sodium (Na), magnesium (Mg), calcium (Ca), and titanium (Ti).

To measure the amount of iron (Fe) in the samples a longer period of irradiation was required. For this part of the analysis, samples of the clay and samples of the standard materials were placed in aluminum canisters and irradiated for 14 hours by means of a rotisserie. Spectroscopy was performed at intervals over a period of weeks in order to get an accurate measurement of the samples' iron content. Fast neutron activation, utilizing a sealed-tube neutron generator, was used to measure the silica content of the samples.

The results of this analysis are shown in Table 3. It can be seen from the table that the clay from the tobacco pipes is very similar in composition to the raw clay samples from Liguanea. It can also be seen that the composition of the darker-colored clay (Sample 3) and the lighter-colored clay pipe fragments (Sample 4) are nearly identical; this indicates that the color variations found among the pipes are more likely due to differences in the way the pipes were fired than in differences in the composition of the clay.

For comparative purposes, the composition of clay is usually expressed as percentages of the oxide forms of the major constituent elements, since this is the form the elements take in the clay. Table 4 lists the composition of the clay samples in their oxide forms.

TABLE 3

ANALYSIS OF THE COMPOSITION OF A SAMPLE OF RAW CLAY FROM  
THE LIGUANEA AREA OF JAMAICA (SAMPLES 1 AND 2) AND OF CLAY  
USED TO MAKE THE JAMAICAN TOBACCO PIPES (SAMPLES 3 AND 4).

	Sample 1	Sample 2	Sample 3	Sample 4
Al	9.859	10.17	11.24	10.47
Ba	.09	.10	.11	.10
Mn	.12	.14	.15	.13
Na	1.45	1.49	1.50	1.43
Ti	.40	.36	.78	.72
V	.01	.01	.01	.01
Ca	1.69	1.80	1.85	1.53
Mg	.54	.51	.50	.56
Si	26.28	28.72	27.41	27.28
Fe	4.69	5.08	5.73	6.13

COMPOSITION (EXPRESSED IN THE OXIDE FORMS OF THE VARIOUS ELEMENTS) OF SEVERAL SAMPLES OF JAMAICAN CLAYS AND OF SAMPLES OF CLAY FROM THE TOBACCO PIPES.

Source of Sample	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	S/A *	Na <sub>2</sub> O	K <sub>2</sub> O	CaO	MgO	TiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>
1. dark colored red pipe	58.66	42.47	1.38	4.06	—	2.58	.84	1.31	16.4
2. light-colored red pipe	58.37	39.59	1.47	3.86	—	2.14	.93	1.2	17.43
3. red pipe	55.64	18.76	2.96	—	—	2.56	—	.84	8.21
4. Liguanas Sample (St. Andrews)	61.44	37.85	1.62	4.01	—	2.5	.86	.26	14.52
5. Liguanas Comp. (St. Andrews)	56.23	38.06	1.48	3.91	—	2.35	.9	.66	13.43
6. Liguanas Sample (St. Andrews)	56.57	20.19	2.8	1.35	2.6	—	4.08	.97	6.95
7. Spanish Town (St. Catherine)	55.87	19.93	2.8	1.84	2.06	—	—	.97	10.43
8. Tulloch (St. Catherine)	59.08	18.95	3.11	2.87	2.42	1.12	3.3	.76	6.36
9. Benbow (St. Catherine)	53.5	25.5	2.1	.3	4.2	1.1	2.5	—	3.7
10. Kirkvine (Manchester)	43.2	29.6	1.46	TR	TR	4.4	3.3	—	4.4
11. Oxford Valley (Manchester)	51.57	22.97	2.24	.07	.17	.72	1.12	1.32	7.05
12. Rahaen (St. Elizabeth)	49.3	22.34	2.2	.22	.45	1.14	1.41	1.22	7.52
13. Maccott (St. Elizabeth)	40.98	25.3	1.6	.54	.48	.3	1.86	1.46	12.96

\* ratio of silica to alumina

Included in the table are the samples of clay discussed above as well as the compositions of clay samples from other areas of Jamaica. The table also includes the composition of some red clay pipe fragments which were analyzed by the Scientific Research Council of Jamaica at the request of D. Gray of the JNHT.

It is interesting to note that the pipe samples are most similar in composition to the clays found in the parish of St. Andrews and at Spanish Town in the parish of St. Catherine (Samples 4-7). Both of these areas are mentioned in the Taylor manuscript as sources for the clay used to make the red pipes. These areas are also located in the part of Jamaica which was most developed in the late 17th century.

Another interesting point illustrated by this comparison is the difference in composition noted between Samples 1 and 2 and the composition of Sample 3. The first two samples, one a sample from an individual pipe and the second a composite of several pipe fragments, are quite similar to each other; while Sample 3, which is also pipe material, has a much lower content of alumina and ferric oxide. Sample 3 is quite similar in composition to the raw clay sample from Spanish Town (Sample 7). These observations suggest two distinct sources of clay for the pipes; the Sample 1 and Sample 2 pipes seem to be made from clay obtained in the Liguanea plain, while the Sample 3 pipes likely originated in the area around Spanish Town.

While not conclusive, this information supports the statements made in the Taylor manuscript, which identified both the Liguanea area and Spanish Town as separate sources for the clay. This corroboration provides further evidence that these are indeed the pipes Taylor was referring to.

Although this type of analysis cannot prove with certainty that the red clay pipes found on Jamaican

archaeological sites were made from the local clay deposits of Liguanea and Spanish Town, the similarities in composition between the pipe clay and the local clay deposits add strong support to the case for a local origin for the pipes. The chemical similarities of the clays, combined with the historical record and the archaeological evidence make a very strong argument that the red clay pipes were in fact produced in Jamaica.

## DATING THE RED CLAY PIPES

The Jamaican red clay pipes, because they are made by hand and decorated in a way that is unique among pipes, are difficult to date by methods generally used for dating clay tobacco pipes. Methods used to date European, and especially English pipes, include the development of typologies based on stylistic elements such as bowl form and type of decoration (Oswald 1975); the use of statistical analysis based on the stem-bore diameter of a group of pipes (Harrington 1954; Binford 1962); and the comparison of makers' marks found on the pipes to historical records of pipemakers (Jackson and Price 1975).

Unfortunately the red clay pipes which occur in Jamaica do not lend themselves to any of the standard methods used to date tobacco pipes. Typologies used to date tobacco pipes are based on evolutions in the form, style, and decoration of the pipes that occur over time. The red clay pipes do not exhibit this evolution, but instead are all of the same basic form and style of decoration. The absence of difference in form, other than the minor variations attributable to the method of their manufacture, makes the development of traditional typologies impossible.

The distinct type of stem decoration found on almost all of the red pipes is also of little or no value as an aide for determining the dates within which they were used. Although the individual markings exhibit a great deal of diversity, the basic form and the manner in which they are used remains constant for all of the pipes. There does not seem to be any correlation between the type of mark present on a pipe and the pipe's form (Figure 38). The same type of mark can often be found on pipes which differ from each other in elements of form --

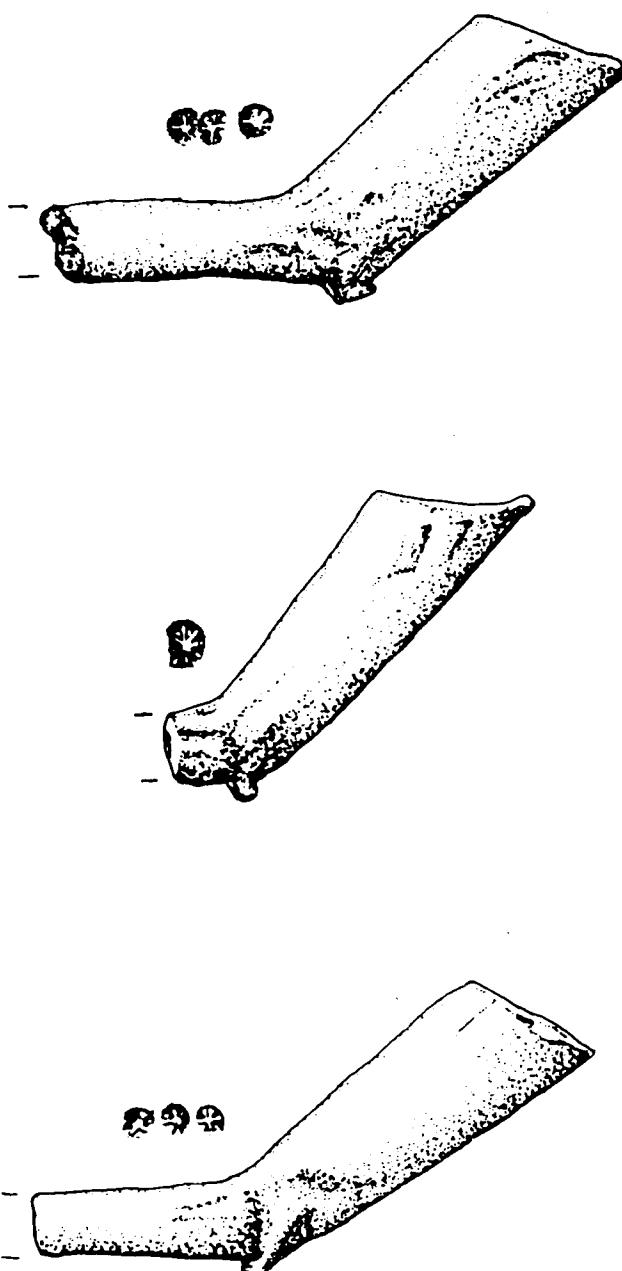


FIGURE 38. Red clay pipes with similar markings but which are different in form. (Drawings: Richard McClure)

bowl length, bowl-to-stem angle, bore diameter, and type of spur. The absence of a relationship between the form of a pipe and the type of mark it bears, coupled with the basic similarity of all the red clay pipes, make it impossible to develop a typology based on the pipes' stem decoration. The individual marks are also fairly evenly distributed throughout the INA/JNHT/TAMU site as well as among the different sites throughout Jamaica. Unlike many English pipes which bear maker's marks which can often be connected with a documented pipemaker known to be working within a specific time frame, the paucity of historical documentation relating to the red pipes precludes this approach to establishing dates for the pipes.

The statistical methods used to date 17th and 18th-century English pipes also fail to yield reliable date information when applied to the red pipes. There are two main statistical dating methods which have been developed to date tobacco pipes from archaeological sites; both are based on the diameter of the pipes' stem-bores which have been found to decrease in size over time. The first method (Harrington 1954) uses a series of bar-graphs developed by measuring the bore diameters of a large sample of pipes from sites of known dates. Pipes from sites where the date is uncertain are then compared to the graphs in order to arrive at a date range for the site.

The second method, developed by L.R. Binford (Binford 1962), is based on Harrington's work but employs a straight-line regression formula to arrive at a mean date for a sample of pipes. Both of these methods for dating tobacco pipes of English origin have been used successfully on collections of pipes from England and North America, but in some cases they have proved to be inaccurate (Alexander 1983:238; Walker 1977:10).

When applied to the Jamaican red clay pipes, the Binford regression formula gives a mean date that is too

early for English sites in Jamaica; this is because the Jamaican pipes have stem bores which are considerably larger than those of the English kaolin pipes on which the formula is based. The bore measurements of a sample of 3427 pipe-stem fragments from the INA/JNHT/TAMU excavation and the New Street site, both in Port Royal, gave a mean date of 1665. A mean date of 1665 is too early for the Port Royal site. Binford's formula gave a mean date of 1627 when applied to a collection of 1902 pipe fragments surface collected at Black River, Spanish Town, and Port Royal (Gray 1983:6). The 1627 date is patently impossible as the English did not occupy Jamaica until 1655. The by-hand method used to make the red clay pipes, which often results in noticeable variations in bore diameter in a single pipe, is the chief reason the pipes are not amenable to statistical analysis. Table 2 provides a breakdown of stem-bore diameters for the red pipe fragments from the INA/JNHT/TAMU and the New Street sites. Over 83% of the pipe fragments had bore diameters of 6, 7, or 8 sixtieths of an inch; a little more than 5% of the pipes measured 5 sixtieths or less; slightly more than 12% measured 8 sixtieths of an inch or more.

The failure of traditional methods to provide useful information on the dates of the redware pipes creates an ironic situation in which instead of providing clues to the date of the sites in which they occur, the red clay pipes can only be dated by determining the date of the sites themselves. Fortunately the redware pipes occur in several sites where the periods of occupation are documented. From the various archaeological sites where the pipes are found, it is evident that the red clay pipes were used from around 1660 to 1735, though not necessarily on a continuous basis.

In a stratified test trench at the Old King's House in Spanish Town red clay pipes made up around 40% of the

total pipe assemblage in levels tentatively dated to the 1660–1670 period, while making up only 22% of the assemblage from early 18th-century levels (Mathewson 1972:7).

Philip Mayes, an English archaeologist who conducted investigations of land sites in Port Royal, proposed a beginning date for the pipes of at least 1680 and a terminal date no later than 1735 (Mayes 1972:111). These dates were based on the occurrence of pipes sealed below the structure of a church believed to have been built around 1680 and the absence of pipes in levels dating after 1735.

The red clay pipes from the New Street site occur predominately in the 1692 earthquake level. Over 73% of the pipe fragments were found in levels or features believed to be contemporary with the earthquake. A level dating from after the earthquake but prior to 1700 accounted for 20% of the red pipe assemblage while post 1700 levels contained only 6% of the red pipes.

The underwater site investigated by the INA/JNHT/TAMU team was found to be naturally stratified into three distinct levels. Layer 1 consisted of material post-1722 in date. Layer 2 was made up of broken coral and debris associated with a major hurricane in 1722. Layer 3 is the level where the remains of the town submerged by the 1692 earthquake are found. Around 95% of the red clay pipes are found in Layer 3; Layer 2 accounts for 3% of the pipes, and Layer 1 for around 1% of the red pipes.

From the foregoing information it is clear that the vast majority of the redware pipes date from the period prior to 1700 and that they were much more common before the 1692 earthquake than after. It is difficult to narrow the date range of these pipes any further due to the lack of more closely-dated sites either in Port Royal or elsewhere in Jamaica. Of course in all these sites,

especially the land sites, some mixing is to be expected. While Mayes and Mathewson both suggest a terminal date as late as 1720 to 1735, the nature of the sites excavated make such a late date somewhat suspect.

The context in which the red pipes are found provides some indication that the use of the pipes was more widespread several years prior to the 1692 earthquake and could have been in decline by the time of the disaster. In the underwater site at Port Royal the red clay pipe fragments occur most frequently outside of buildings in use at the time of the quake and are sometimes found below floors. The largest concentration of red pipe fragments was located in an alley separating Building 1 and Building 2 (Figures 39 and 40). In other areas of the site the red pipes occur mostly in yards or in association with streets or sidewalks.

Room 5 of Building 1 is believed to have been used as a shop where tobacco pipes were sold; the room contained well over a thousand white kaolin pipe remains, many of which were well preserved and showed no evidence of being smoked, but only a few dozen fragments of red pipes.

R. Marx reported (Marx 1968A:9) a substantial concentration of white clay pipes in association with 88 intact and many more broken onion bottles (a common glass vessel often used to hold spirits) in an eight by eleven foot area under a fallen wall. He identified the area as the site of tavern based on the large number of bottle remains and the fact that a majority of the pipes had been smoked. This area contained 489 white clay pipe bowls but not a single red one. The small number of red pipes present in Building 1 and their absence from Marx's tavern site suggests that the inferior red pipes were not as much in demand at the time of the earthquake and were, for all intent and purpose not found inside the main rooms of the buildings.

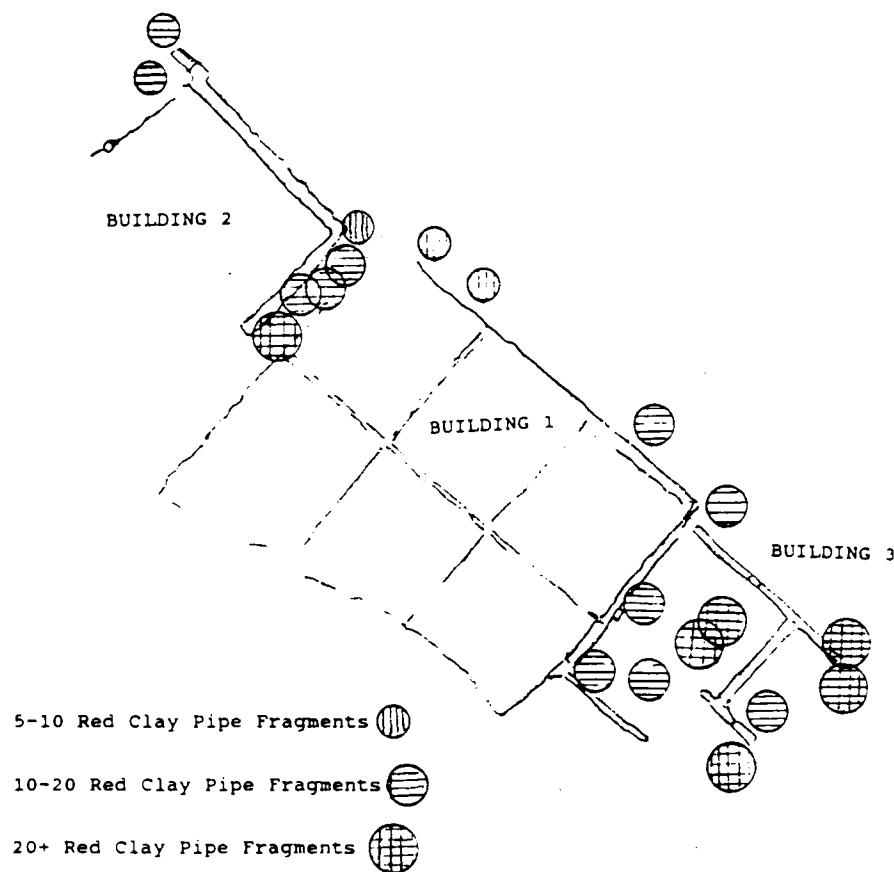


FIGURE 39. Site plan of Buildings 1, 2, and 3 showing where red pipe fragments occur. (Port Royal Project)

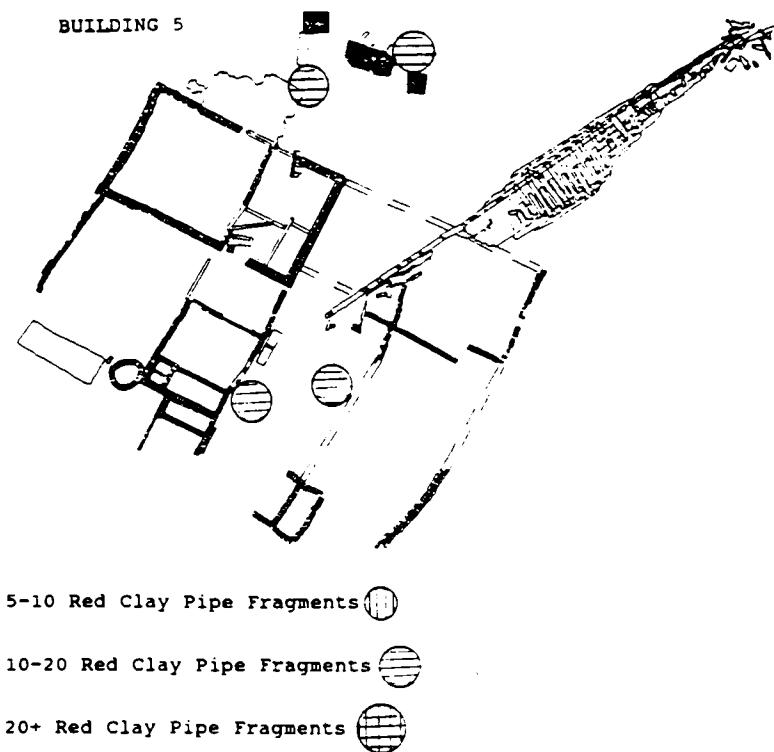


FIGURE 40. Site plan of Building 5 showing areas where red clay pipe fragments occur. (Port Royal Project)

Another indication that the red clay pipes might not have been widely in use at the time of the earthquake is the generally poor condition in which they are found; while it is not uncommon to find examples of the white clay pipes which are wholly or partially intact, it is very rare to find red clay pipes in which the bowl and stem are both intact. The red pipe fragments are also generally smaller than the white pipe remains with only a limited number of intact pipe bowls and stem fragments which are usually less than two inches in length. This could indicate that the majority of the redware pipes had been discarded a good deal earlier than the time of the earthquake and were subjected to the effects of continued occupation up until 1692 when they were submerged into the harbor. It is also possible however that the red pipes survive in poorer condition than the white pipes because they are made from inferior clay and fired at a lower temperature than the white pipes. The use of poor quality clay could make the pipes more susceptible to breakage, although this does not appear to be the case.

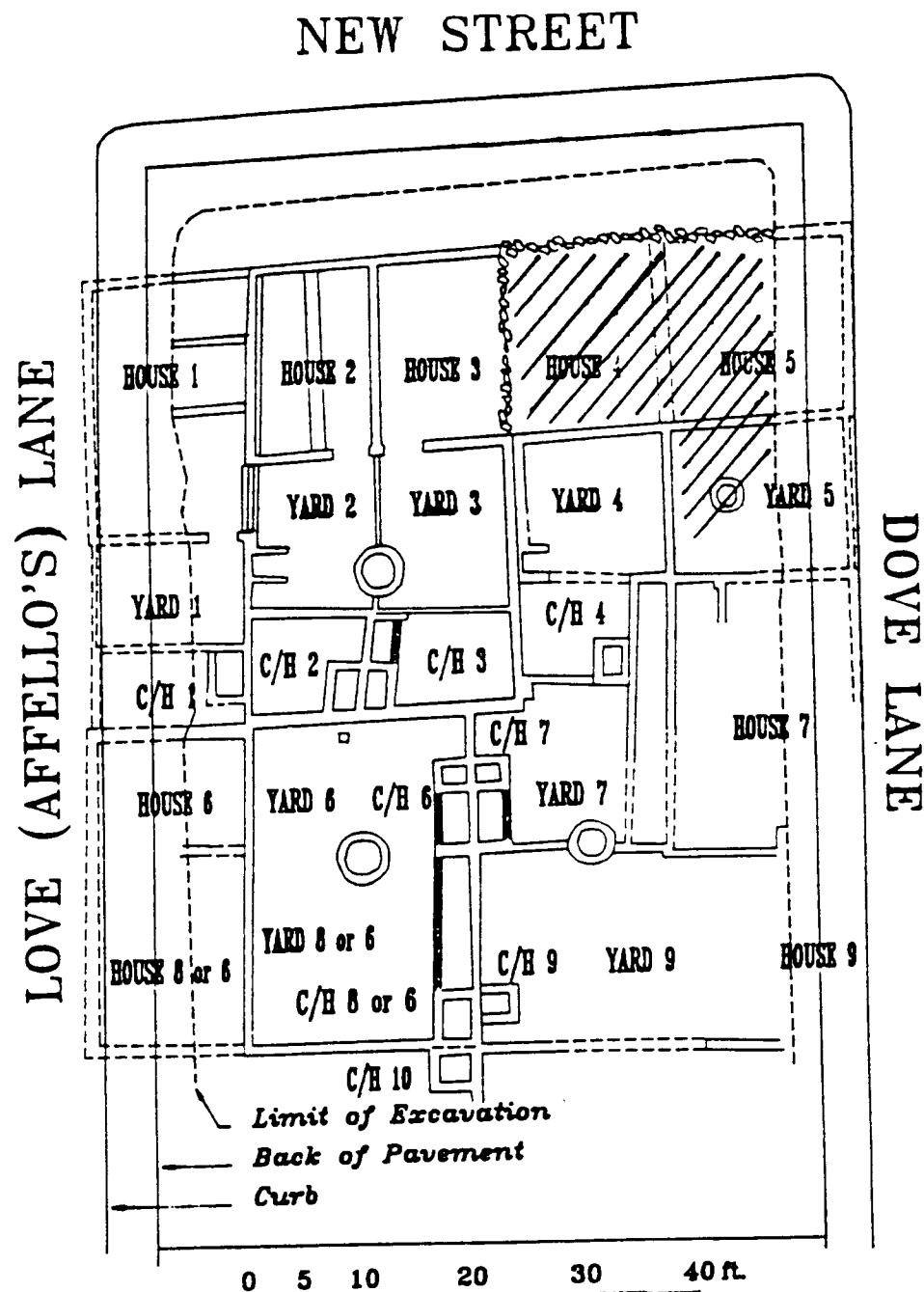
In addition to clues relating to the dates of the pipes, their distribution within the New Street and underwater site at Port Royal suggests that the use of the red pipes, at least at the time of the earthquake, was confined to a sub-group within the population of the town.

Of the five buildings investigated by the INA/JNHT/TAMU group, only Building 3 (Figure 39) contained a significant number of red pipe fragments within the walls of the building. Most of these were found in rooms at the rear of the buildings in association with a large number of onion bottles in what appear to be storage areas. Unlike several of the other buildings investigated, Building 3 was constructed with an interrupted sill foundation with the outside walls probably made of wood instead of brick. The front room of

the structure had a badly fractured plaster floor while the rear area had a floor of sand. A large number of the red pipes were found in the area of the structure which had a sand floor and therefore could have been discarded before the structure was built. It was observed during the course of excavation that most, if not all of the red clay pipes were below the floor levels. It appears that Building 3 was constructed over layers containing the degraded red pipes. The architectural features and artifact assemblage of Building 3 point to a proprietor and/or clientele in a lower social class than the occupants of the other better-built and richly furnished buildings of the site. The occurrence of red pipes in Building 3 supports the author of the Taylor manuscript, who stated that the red clay pipes were used by the "common people" of the town.

The distribution of the red clay pipes in the New Street site also indicates that their use was not general. Over 30% of the red pipes from the site were associated with the remains of a single building, while other buildings and yard areas contained few or no red pipe remains (Figure 41).

A discussion of the date range of the red clay pipes should also consider the contemporary economic, social, and political conditions in Jamaica at the end of the 17th century. Terra-cotta tobacco pipes similar in form to English types, though quite distinct from the Jamaican variety, also occur in colonial sites in North America. Preliminary investigations into the locally produced redware pipes from Maryland and Virginia showed that datable occurrences of these pipes tended to coincide with at least two of the major economic depressions in the last half of the 17th century (Henry 1979:14). The number of earthenware pipes was found to increase at times when the price of tobacco, the key cash crop of the region, fell. The manufacture and use of red clay pipes



NEW STREET EXCAVATION (N.S.2)  
1692 LEVEL BY A. PRIDDY

FIGURE 41. Site plan of the 1692 level of the New Street site showing areas in which the red clay pipes are most numerous.

in Jamaica is also probably attributable, at least in part, to economic, political, and societal conditions.

Jamaica in the latter part of the 17th century, unlike the tobacco colonies in North America, had a more robust and diversified economy. Sugar production was the main source of wealth in the economy, but other sectors such as trade, privateering, and spice production were also important. Sugar was also less susceptible to dramatic price fluctuations than tobacco. Taking into account the relatively healthy state of the Jamaican economy, it is more likely that contemporary political and societal conditions played a part in the redware pipe phenomena.

We know from the excavations at Port Royal that red clay pipes were found most often in the areas outside of buildings such as the streets and in alleys and in layers beneath floors. This gives a sound pre-earthquake date. However, relatively few red pipes were found in the main rooms of the excavated buildings. When found in buildings assigned to the time of the earthquake, the red pipes tend to be associated with the back rooms and butcher areas. This indicates that the redware pipes were used by the people utilizing these areas, i.e. members of the lower economic classes such as slaves and indentured servants.

From the time of its capture by the English until well into the next century, the history of Jamaica was often violent. The impressive defenses built and continuously improved at Port Royal attest to the atmosphere of impending violence that was prevalent during much of the island's early history. The early years of conflict with the Spanish were followed by various wars with the French and the Dutch.

The Second Dutch War (1665-1667) between England and Holland for the first time forced the English Admiralty to convoy merchant vessels to protect them from enemy

action (Bridenbaugh 1972:170). Measures of this type could not help but to disrupt trade in the Caribbean.

The Third Dutch War (1672-1678) saw England and France fighting the Dutch a short five years later. King William's War (1689-1697), pitting France and Holland against England, was especially damaging to Jamaica as the island was raided repeatedly by French expeditions. A large-scale invasion attempt by the French in 1694 resulted in the destruction of 50 sugarworks and 200 dwellings; 1300 slaves as well as sugar, rum, molasses, grind-stones, and stills were carried off by the French after the attack (Claypole 1972:237).

The disruptions in trade caused by these conflicts could well have spurred the local production of tobacco pipes to augment supplies from England which were either threatened or periodically cut off by hostilities. Hans Sloane, in describing refining pots made at Daniel Hicks' pot works in 1687, said the pots were "more brittle and dearer than when brought from England" (Sloane 1707:61). The higher price for a less-durable, locally-made product as opposed to a higher quality import indicate that shortages of some items existed even in times of peace.

Without information from a range of more closely-dated sites, it is not possible to tell whether or not the redware pipes were in continuous use, were only used at times when the English pipes were in short supply, or were used only in the 17th century. The information available tends to indicate that the red clay pipes were used continuously from around 1660 to 1720, although it also seems likely that their use increased during shortages of the white English pipes. The continuous use of the redware pipes is also supported by the continuity in form and style that is a feature of the pipes.

#### EARTHENWARE PIPES FROM OTHER COLONIAL SITES

The phenomenon of producing tobacco pipes from local clay deposits was not confined to Jamaica in the 17th century; locally made pipes which are generally more crude than their European counterparts often occur on colonial sites in North America (Henry 1979; Faulkner 1972) and have also been reported in Brazil (Pernambucano de Mello 1983). The pipes from both of these geographic areas are quite distinct from the locally made pipes found at colonial sites in Jamaica.

Very little information has been published concerning the tobacco pipes found in Brazil. The red clay pipes from Brazil occur in archaeological sites dating to the 17th and 18th centuries. The pipes are described as having shorter but thicker stems than European pipes, with cylindrical, tapered bowls that are positioned at right angles to the stems (Pernambucano de Mello 1983:263). The Brazilian pipes are reported to have incised decoration which occurs either on the stems or the bowls of the pipes.

In North America locally made pipes from 17th-century contexts are found primarily in the area bordering Chesapeake Bay and in New England. The redware pipes from the Chesapeake Bay area exhibit a wide range of diversity in form and decoration and appear to be made by both European colonists and Native American peoples (Henry 1979:20), as well as imported African slaves (Miller 1991: personal communication). Both handmade and mold-made pipes occur at sites in the region (Miller 1991:82). Like the Jamaican red clay pipes, the Chesapeake area pipes seem to have been produced as a result of social, political, and economical conditions which caused shortages and a consequent rise in the price of European-made tobacco pipes (Henry 1979:35). The

Chesapeake Bay area pipes have been found on sites which date from as early as 1620 to as late as 1720, but are most common at sites dating from around 1650 to 1700.

The earthenware pipes from New England do not exhibit the extensive variations that are found among the pipes from the Chesapeake Bay area. The New England pipes are almost always made with the use of European-style molds and in form are either like the European belly-bowl pipes of the period or the funnel elbow type which is often referred to as the American "export" type. The New England pipes are also noted for their lack of decoration and makers' marks; generally the only type of decoration found on the pipes is dentate rouletting around the rim of the pipe bowl or in some cases rouletting around the stem (Faulkner 1992:2).

The New England redware pipes occur at a wide variety of sites including rural and urban residences, fishing stations, military fortifications, and trading posts. The sites where the redware pipes occur date from around 1640 to 1680 (Pendery 1992: personal communication). The pipes are most common in the 1660 to 1675 period and are believed to have been made at a number of different locations by a number of different makers who were using European technologies (Faulkner 1992:20).

Although it cannot be argued that the Jamaican red clay pipe phenomena is directly related to either the Chesapeake Bay or New England red clay pipe traditions, the same 17th-century time frame in which all three of these traditions arise suggests that the conditions which led to the local production of pipes might have been similar in each of the three areas. There is also some evidence that the locally produced pipes from North America had at least some distribution in Jamaica and vice versa. In a 1686 probate inventory from Port Royal there is listed among the goods of a James Phelps "two

parcells of Virginia Bowle Pipes" (PRI: V.2.f.200-201). A site in Charlestown, Massachusetts produced a red clay pipe bowl that is almost certainly from one of the Jamaican pipes. The site was a cellar-fill from a building dating from 1638 to around 1660; one of the building's owners has been identified as a sea captain (Pendery 1992: personal communication). Future excavations in both Jamaica and North America could well turn up further examples of locally-made earthenware pipes in areas far from their points of origin.

## CONCLUSION

The Jamaican red clay pipes are a unique class of artifact representing the transportation of a cultural phenomenon from the New World to the Old World and then back to the New World in a modified form. In a relatively short time span, the use of tobacco went from a curious practice noted among the natives of the Americas to a structured industry of considerable economic importance to the people of Europe and the European colonies in the Americas.

The red clay tobacco pipes found in Jamaica reflect the interaction between European, African, and native American societies which was a key element in shaping the history of the colonial period. The pipes were made to imitate European tobacco pipes which had evolved greatly from their Native American antecedents; the craftsmen who made the pipes in Jamaica seem to have been predominately of African origin or descent who could well have made the pipes using elements of their own ceramic traditions; finally, the pipes were made in order for the members of a mixed African and European community to indulge in a practice adopted from the Native American peoples.

Although many questions remain unanswered regarding the red clay pipes, it is hoped that the information presented in this study has provided a more complete understanding of this unique artifact group and its place in the archaeological and historical contexts of the colonial period in the New World.

## REFERENCES

ALEXANDER, L.T.

1983 More Light on the Theory of Dating Clay Pipes by Measuring Stem Hole Diameters. In *The Archaeology of the Clay Tobacco Pipe. Vol. VIII, America*, edited by P. Davey, pp. 235-244. BAR Series 175. Oxford, U.K.

ATKINSON D.R.

1962 Makers' Marks on Clay Tobacco Pipes Found in London. *Archaeological Newsletter*. 7(8):182-188.

BILLINGS, E.R.

1875 *Tobacco: Its History, Varieties, Culture, Manufacture and Commerce*. American Publishing Company, Hartford, CT.

BINFORD, LEWIS R.

1962 New Method of Calculating Dates from Kaolin Pipe Stem Fragments. *Southeastern Archaeological Newsletter*. 9(1). Cambridge, MA.

BRIDENBAUGH, CARL and ROBERTA

1972 *No Peace Beyond the Line-- The English in the Caribbean 1624-1690*. Oxford University Press, New York.

BROOKS, JEROME

1972 *The Mighty Leaf-- Tobacco through the Centuries*. Little, Brown and Company, Boston.

CLAYPOLE, WILLIAM A.

1972 The Merchants of Port Royal 1655 to 1700. Unpublished Ph.D. thesis, Department of History, University of the West Indies. Kingston, Jamaica.

COLBECK, JOHN

1988 *Pottery Materials: Their Composition, Preparation and Use*. Batsford, London.

DALBY, THOMAS SIR

- 1690 *An Historical Account of the Rise and Growth of the West-India Colonies-- And of the great Advantage they are to England in respect to trade.*  
Jo Hindmath, London.

DUCO, D.H.

- 1981 *The Clay Tobacco Pipe in Seventeenth Century Netherlands. In The Archaeology of the Clay Tobacco Pipe, Vol.V Europe 2*, edited by P. Davey, pp.368-525. BAR Series 106(ii).

EDWARDS, BRYAN

- 1774 *The History, Cultural and Commercial, of the British Colonies in the West Indies.* Vols. I and II, Luke White, Dublin.

FAULKNER, ALARIC

- 1992 Redware Clay Tobacco Pipes from Maine's 17th-Century Anglo-Acadian Frontier. Paper presented at the Annual Meeting of the Society for Historical Archaeology Conference on Historical and Underwater Archaeology, Kingston, Jamaica.

FAULKNER, ALARIC and G. FAULKNER

- 1987 *The French at Pentagoet.* Occasional publications in Maine Archaeology 5. Maine Historic Preservation Commision, Augusta, ME.

GARDNER, KAREN M.

- 1984 An Analysis of the Ceramic Pipes from Room 5, Building One, Port Royal, Jamaica. Unpublished manuscript on file at Texas A&M University.

GRAY, DORRICK

- 1982 Analysis of Mike Pawson's Red Clay Pipes.  
Unpublished MS. Jamaica National Heritage Trust.  
Kingston, Jamaica.
- 1992 Personal communication. Jamaica National Heritage Trust, Kingston, Jamaica.

HAMILTON, D.L.

1992 Simon Benning, Pewterer of Port Royal. In *Text-Aided Archaeology*, edited by B.J. Little, pp. 39-53. CRC Press, Boca Raton, FL.

HARRINGTON, J.C.

1954 Dating Stem Fragments of Seventeenth and Eighteenth Century Clay Tobacco Pipes. *Quarterly Bulletin of the Archaeological Society of Virginia*, 9(1):9-13.

HEIDTKE, KENAN

1986 Jamaican Red Clay Pipes. Unpublished manuscript on file at Texas A&M University.

HEIMANN, ROBERT K.

1960 *Tobacco and Americans*. McGraw-Hill, New York.

HENRY, SUSAN L.

1979 Terra-Cotta Tobacco Pipes in 17th-Century Maryland and Virginia: A Preliminary Study. *Historical Archaeology*, 13:14-36.

ISLAND RECORD OFFICE

m.s.- *Grantors, Deeds, Old Series*. Vols. 1-11. Spanish Town, Jamaica.

m.s.- *Wills*, Vol. 4. Spanish Town, Jamaica.

JACKSON R.G. and R.H. PRICE

1974 Bristol Clay Pipes: A Study of Makers and their Marks. *Research Monograph No. 1*, Bristol City Museum, Bristol, U.K.

JAMAICA PUBLIC ARCHIVES

m.s.- *Port Royal Plat Book*, Vol. 28, 1661-1713. Spanish Town, Jamaica.

m.s.- *Inventories*, Vols 2,3. Spanish Town, Jamaica.

LINK, M.C.

1960 Exploring the drowned city of Port Royal. *National Geographic*, 117(1):151-183

LONG, EDWARD

1774 *The History of Jamaica; or, General Survey of the*

*ancient and modern State of the island: with reflections on its situation, settlements, inhabitants, climate, products, commerce, laws, and government.* T. Lownudes, London.

MARK, ROBERT

1968a *Clay Smoking Pipes Recovered from the Sunken City of Port Royal: May 1, 1966- September 30, 1967.*  
Jamaica National Trust Commission, Kingston, Jamaica.

1968b *Clay Smoking Pipes Recovered from the Sunken City of Port Royal: October 1, 1967- March 31, 1968.*  
Jamaica National Trust Commission, Kingston, Jamaica.

1973 *Port Royal Rediscovered.* Doubleday and Company, New York.

MATHEWSON, R. DUNCAN

1972 *History from the Earth-- Archaeological Excavations at the Old King's House. Jamaica Journal*, 1(2):3-11.

MAYES, PHILIP

1972 *Port Royal, Jamaica: Excavations 1969-1970.*  
Jamaica National Trust Commission. Kingston, Jamaica.

MILLER, HENRY M.

1991 *Tobacco pipes from Pope's Fort, St. Mary's City, Maryland: an English Civil War Site on the American Frontier.* In *The Archaeology of the Clay Tobacco Pipe*, Vol. XII. Chesapeake Bay, edited by P. Davey and D. Pouge, pp.73-88. BAR Series 566. Oxford, U.K.

1991 Personal communication. Historic Saint Mary's City, MD.

NOËL-HUME, AUDREY

1979 *Clay Tobacco Pipes Excavated at Martin's Hundred Virginia, 1976-1978.* In *The Archaeology of the Clay Tobacco Pipe*, Vol. II, edited by P. Davey,

- pp. 3-36. BAR Series 60. Oxford, U.K.
- NOËL-HUME, IVOR  
1978 *A Guide to the Artifacts of Colonial America.*  
Reprint of a 1969 edition. Alfred A. Knopf, New York.
- OSWALD, ADRIAN  
1975 *Clay pipes for the Archaeologist.* BAR Series 14.  
Oxford, U.K.
- PAWSON, MICHAEL and D. BUISSERET  
1975 *Port Royal, Jamaica.* Clarendon Press, Oxford, U.K.
- PARRY, J.H. and PHILIP SHERLOCK  
1956 *A Short History of the West Indies.* St. Martin's Press, New York.
- PEACEY, ALAN  
1982 The Structural Development of Clay Tobacco Pipe Kilns in England: A Preliminary Study. In *The Archaeology of the Clay Tobacco Pipe, Vol.VII, More Pipes and Kilns From England*, edited by P. Davey, pp. 3-18. BAR Series 100. Oxford, U.K.
- PENDERY, STEPHEN  
1992 Personal communication. Boston City Archaeologist, MA.
- PERNAMBUCO de MELLO, ULYSSES  
1983 Clay Pipes from Nort-East Brazil. In *The Archaeology of the Clay Tobacco Pipe, Vol. VII, America*, edited by P. Davey, pp. 259-286. BAR Series 175. Oxford, U.K.
- ROBERT, JOSEPH C.  
1949 *The Story of Tobacco in America.* Alfred A. Knopf, New York.
- RIVE, ALFRED  
1926 The Consumption of Tobacco Since 1600. *The Economic Journal (Supplement) Economic History Series*, No. 1, MacMillan and Company, London.
- SLOANE, HANS  
1707 *A voyage to the Islands of Madera, Barbados,*

*Nevis, St. Christopher and Jamaica, with a Natural History of the Herbs and Trees, Four-footed Beasts, Fishes, Birds, Insects, Reptiles, etc. of the last of these Islands, to which is Prefix'd an Introduction wherein is an Account of the Inhabitants, Air, Water, Diseases, Trade, etc. of that Place, with some Relations Concerning the Neighbouring Continent and the Islands of America.*  
2 vols., printed for the author.

TAYLOR, JOHN

1688 *Second Part of the Historie [sic] of his Life and Travels in America.* Manuscript on file at the Institute of Jamaica, Kingston.

TRYON, THOMAS

1684 *Friendly advcie [sic] to the Gentlemen-planters of the East and West Indies.* Andrew Sowle, London.

VINCE, ALLAN

1991 Personal communication. City of Lincoln Archaeology Unit, Lincoln, U.K.

WORRALL, W.E.

1986 *Clays and Ceramic Raw Materials.* John Wiley and Sons, New York.

WALKER, IAIN C.

1977 *Clay Tobacco-Pipes, with Particular Reference to the Bristol Industry. History and Archaeology II.*  
4 vols. Department of Indian and Northern Affairs, Parks Canada, Ottawa.

ZAHEDIEH, NUALA

1986 *The Merchants of Port Royal, Jamaica, and the Spanish Contraband Trade. William and Mary Quarterly,* Vol. XLIII(4):570-593.

## SUPPLEMENTAL SOURCES CONSULTED

ALEXANDER, L.T.

1983 Clay Tobacco Pipes from the Caleb Pusey House. In *The Archaeology of the Clay Tobacco Pipe. Vol. VIII, America*, edited by P. Davey, pp. 195-234. BAR Series 175. Oxford, U.K.

ARMSTRONG, DOUGLAS V. and K. KELLY

1990 *The Old Village and the Great House: an archaeological and historical examination of Drax Hall Plantation, St. Ann's Bay, Jamaica*. University of Illinois Press, Urbana, IL.

1992 Spatial Transformations in African Jamaican Housing at Seville Plantation. Paper presented at Annual meeting of the Society for Historical Archaeology Conference on Historical and Underwater Archaeology, Kingston, Jamaica.

ATKINSON, D.R.

1972 A Brief Guide for the Identification of Dutch Clay Tobacco Pipes found in England. *Post-Medieval Archaeology*. 6:175-182.

BENLOCH, A.

1984 Estudio de Pastas de Gres para pavimentos. *Ceramica y Cristal*. 23(6):64-68.

BRONGARS, GEORG A.

1964 *Nicotiana Tabacum*. H.J.W. Becht's Uitgeversmaatschappij, N.V., Amsterdam.

DAVIS, C.E., B.E. THOMPSON, and D.A. HOLDRIDGE

1970 The Mineralogy of Clays of the Nassau and Oxford Valleys, St. Elizabeth and Manchester Parishes. *The Journal of the Scientific Research Council of Jamaica*. 1(2):53-70, Kingston, Jamaica.

HAMILTON, D.L.

1984 Preliminary Report on the Archaeological Investigations of the Submerged Remains of Port Royal, Jamaica, 1981-1982. *International Journal of Nautical Archaeology and Underwater Exploration*, 13(1):11-25.

1985 The City Under the Sea. In *Science Year 1986*. World Book Encyclopedia, pp.92-109. Chicago.

MACHIN, R.J. and D.A. HOLDRIDGE

1971 Production of Wall Tiles from Jamaican Raw Materials. *The Journal of the Scientific Research Council of Jamaica*, 2(1):17-24. Kingston, Jamaica.

McCASHION, JOHN H.

1979 A Preliminary Chronology and Discussion of Seventeenth and Early Eighteenth Century Clay Tobacco Pipes from New York State Sites. In *The Archaeology of the Clay Tobacco Pipes*, Vol. II, edited by P. Davey, pp. 63-150. BAR Series 60.

NORTON, F.H.

1952 *Elements of Ceramics*. Addison-Wesley Press, Inc. Cambridge, MA.

OSWALD, ADRIAN

1983 Sources of Port Royal Pipes. In *The Archaeology of the Clay Tobacco Pipe*. Vol. VIII, America, edited by P. Davey, pp.255-258. BAR Series 175. Oxford, U.K.

SHERIDAN, RICHARD B.

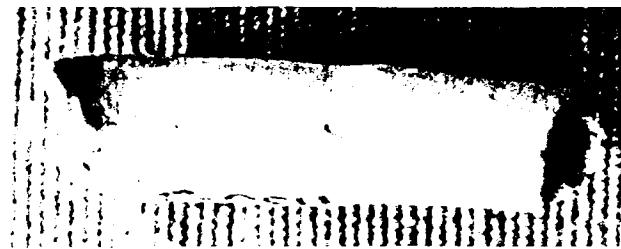
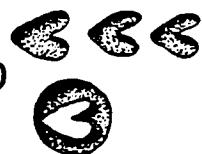
1973 *Sugar and Slavery- An economic history of the West Indies 1623-1775*. Johns Hopkins University Press, Baltimore, MD.

SMITH, LACY B.

1966 *This Realm of Engalnd 1399-1688*. D.C. Heath and Company, Boston.

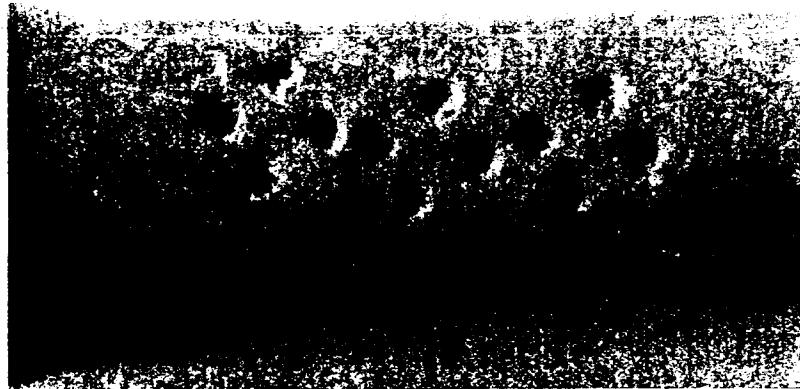
Type 40.0 Various designs with some form of an impressed "V" shape.

40.0



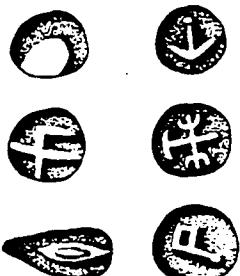
Type 50.0 Four indentations placed into the clay which result in a crude Maltese cross design which occurs flush with the stem of the pipe. 16 examples.

50.0



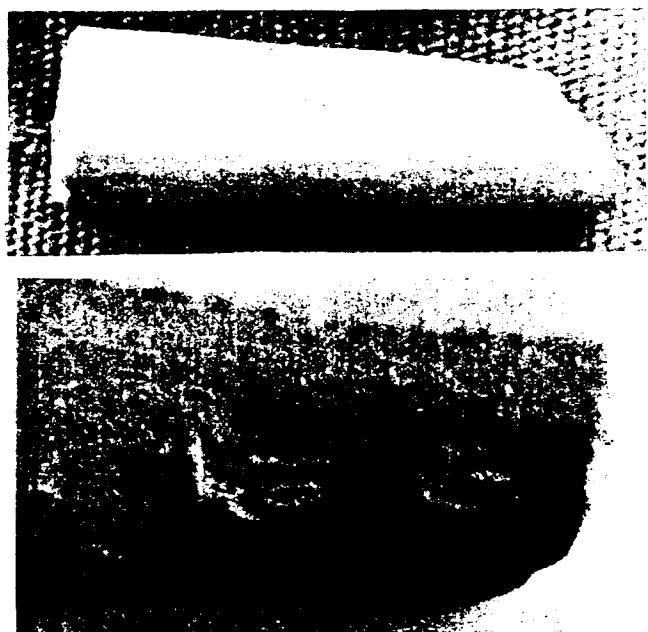
Type 60.0 This category includes markings which do not resemble the others but are more elaborate in design than the Type 12.0 marks.

60.0



Type 70.0 Various stylized markings which resemble a *fleur-de-lys*. Similar, though more well-defined, markings appear on the stems of some 17th-century Dutch pipes in groups of three or more. One example had four marks. Eight examples.

70.0



Type 72.1 Scrolled designs within square impressions. These designs might represent initials. Two examples. Both had two marks.

72.1



Type 72.2 Designs having what appears to be a stylized representation of the letter "W". Two examples.



Type 72.3 Design consisting of the initials "RS". Two examples found each having two marks. These two pipes are the only two in the sample group bearing marks which were recognizably made with the same stamping tool.



Type 72.4 Design consisting of the initials "RG". One example found. (Marx 1968A:117)



Type 72.5 Design consisting of the initials "TJ". One example surface collected.



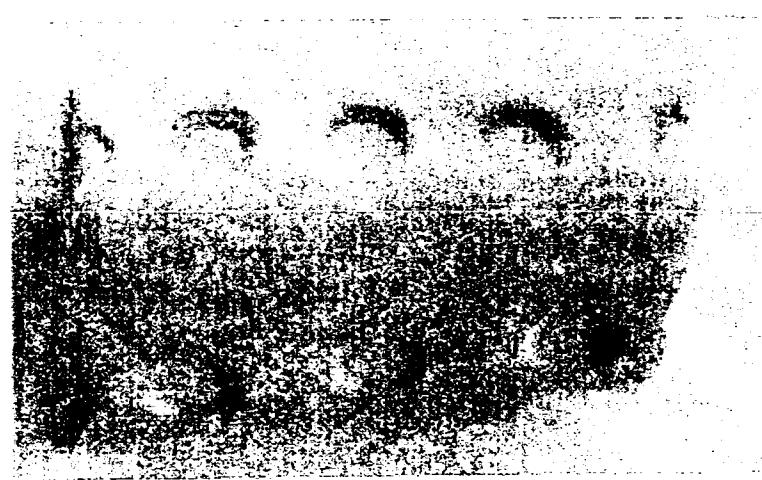
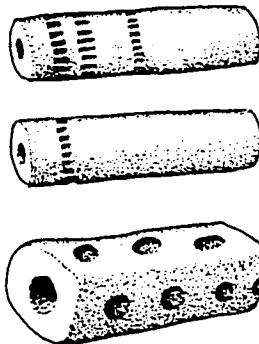
Type 73.0 Crown-shaped design made up of raised dots and lines within crown-shaped impression. One example (Marx 1968A:117)

73.0

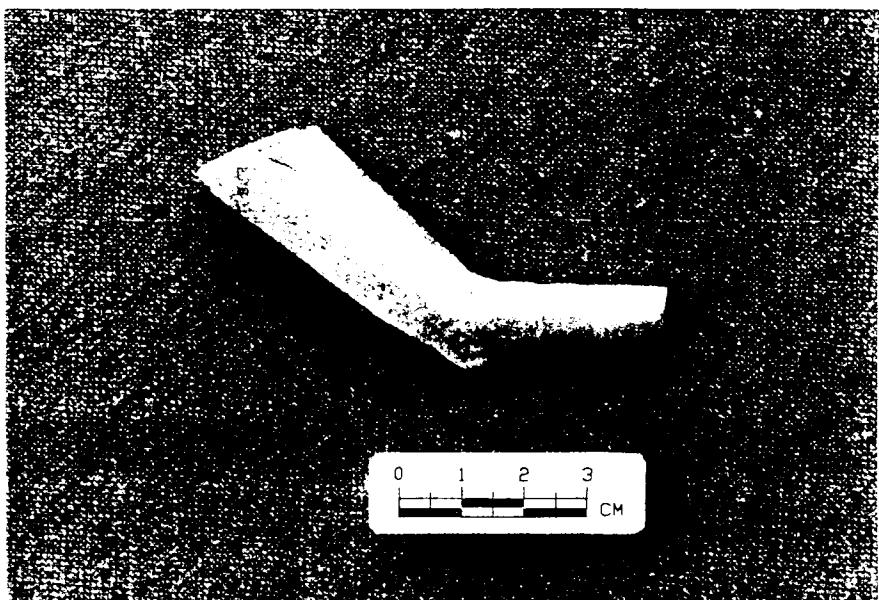
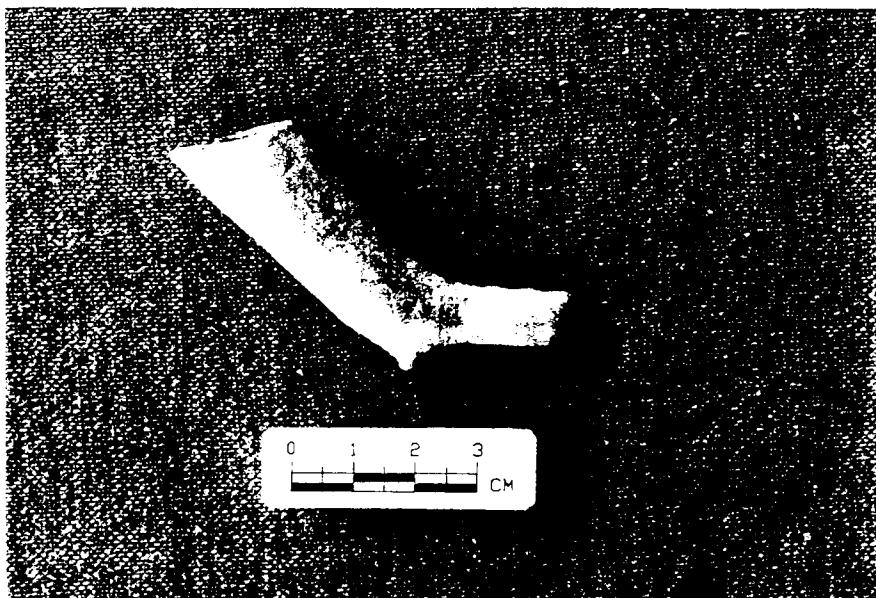


Type 90.0 Pipes bearing stem decoration other than the usual marks. Three examples.

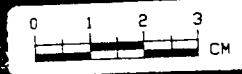
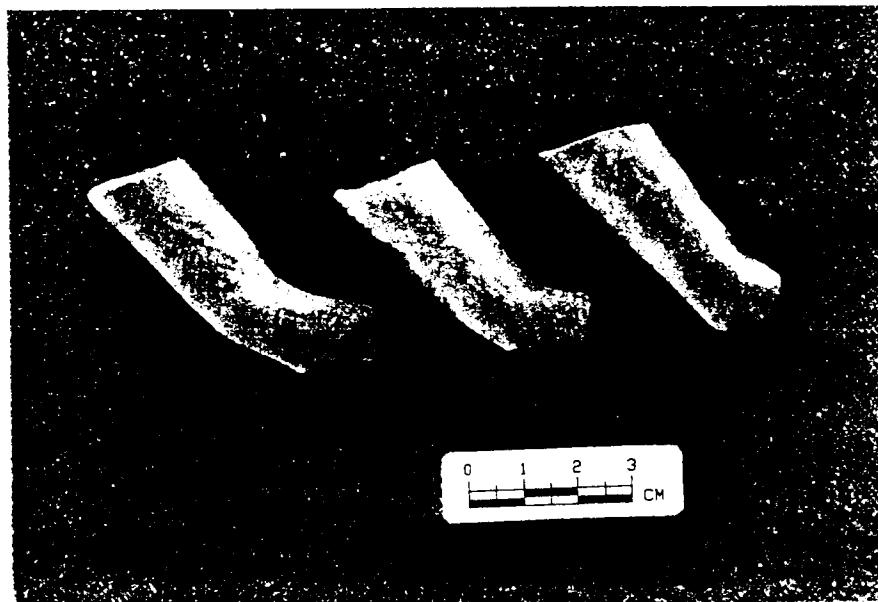
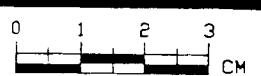
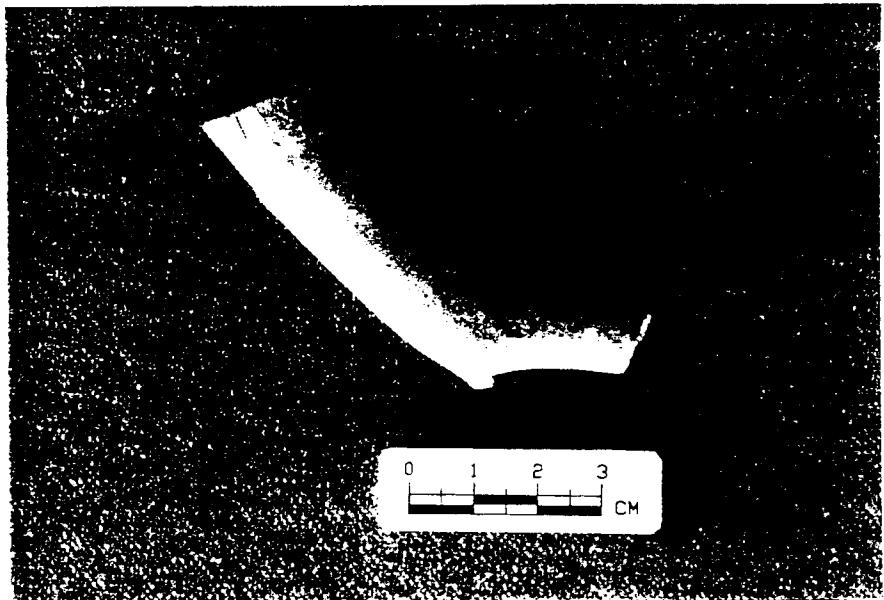
90.0



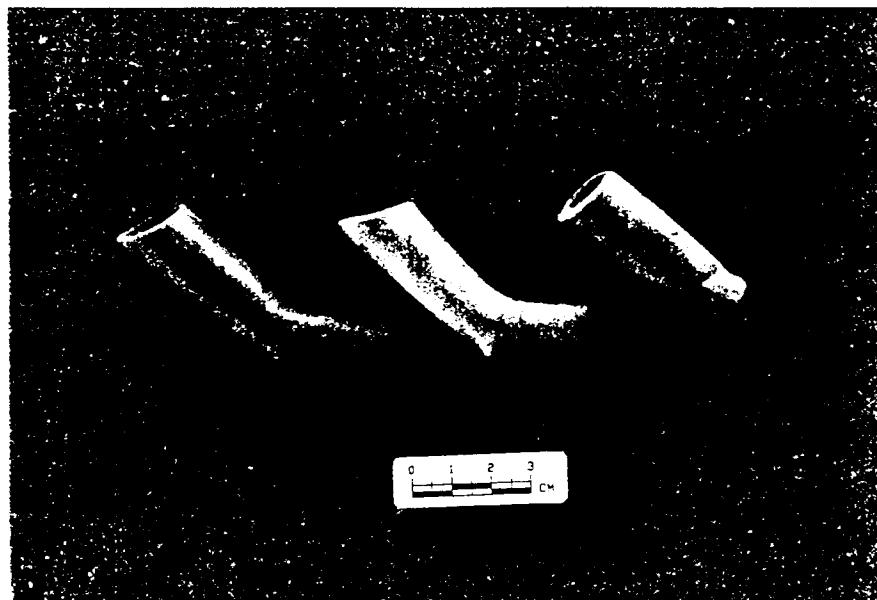
Illustrations of bowl shapes found among the red clay pipes. As stated in the text of this thesis, the bowl forms of the red clay pipes are dictated by the production methods used to make the pipes.



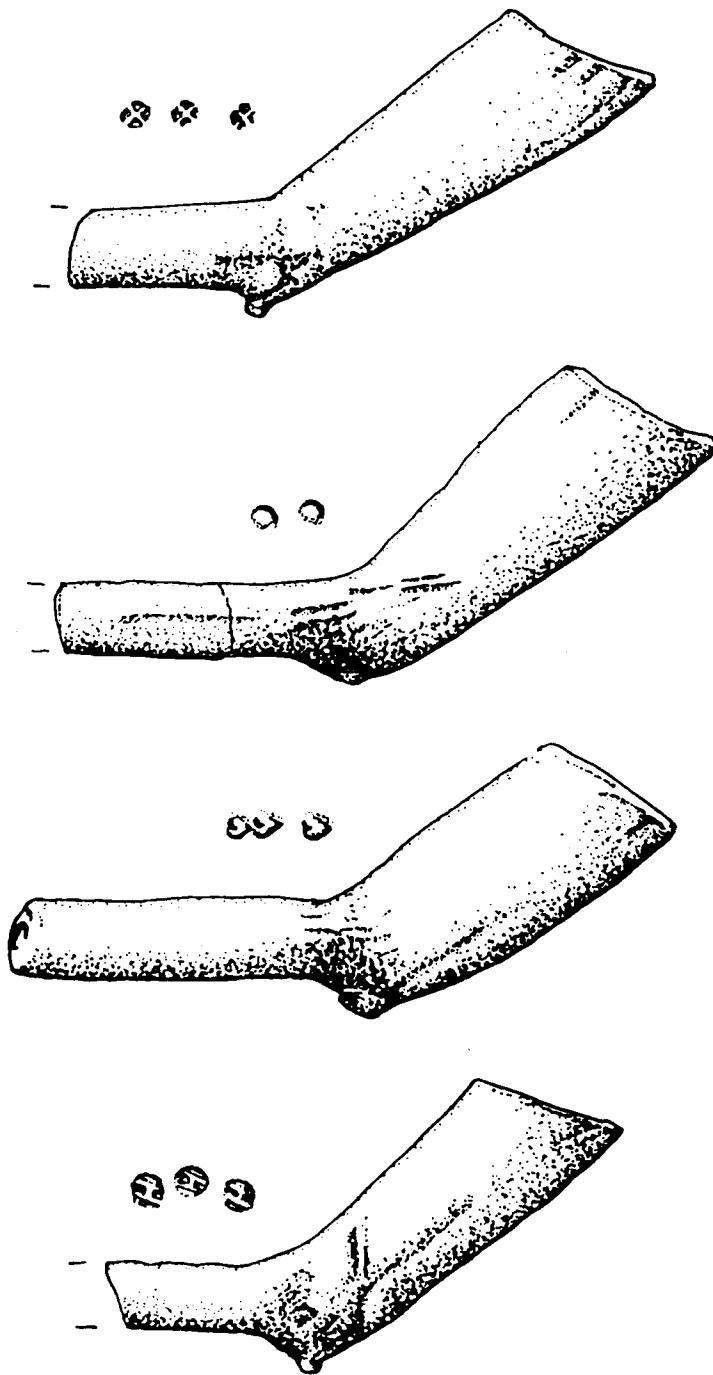
Red clay pipe bowl forms.



Red clay pipe bowl forms.

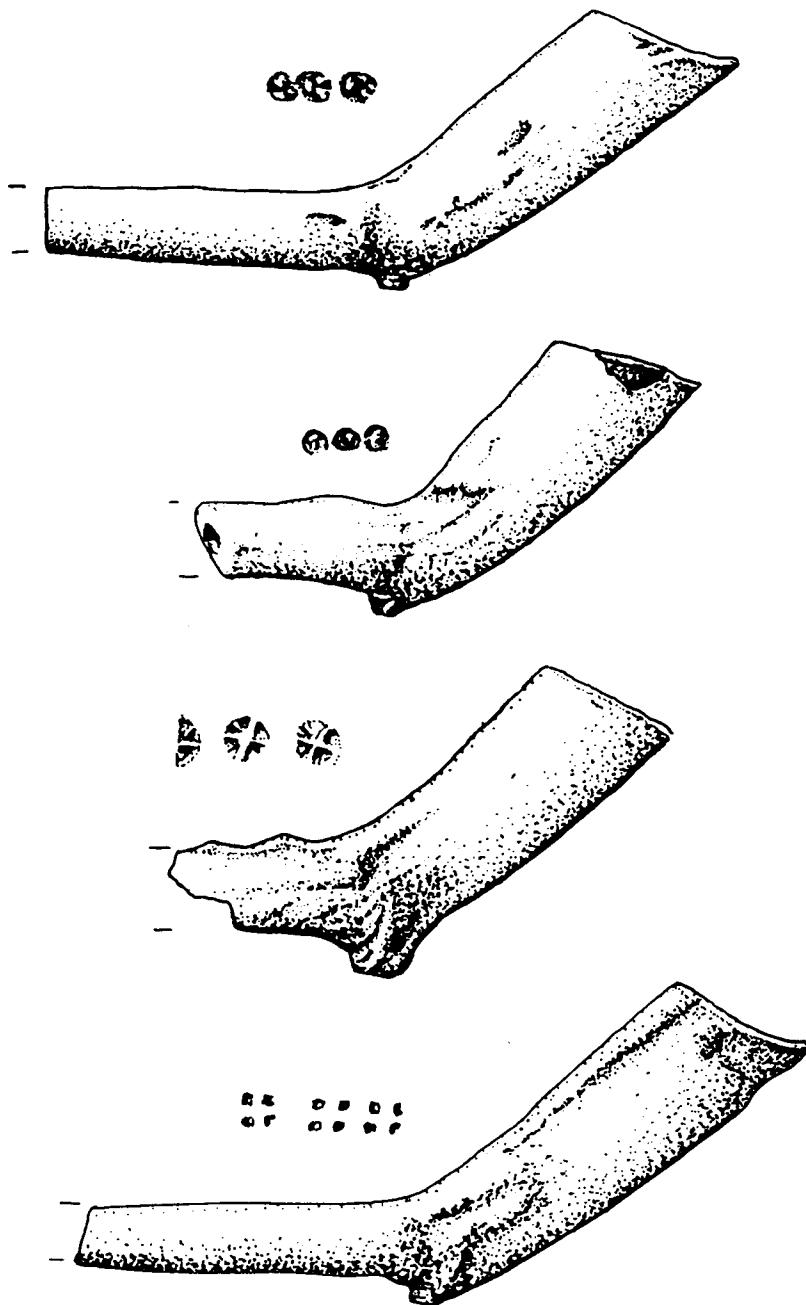


Red clay pipe bowl forms.



SCALE 1:1

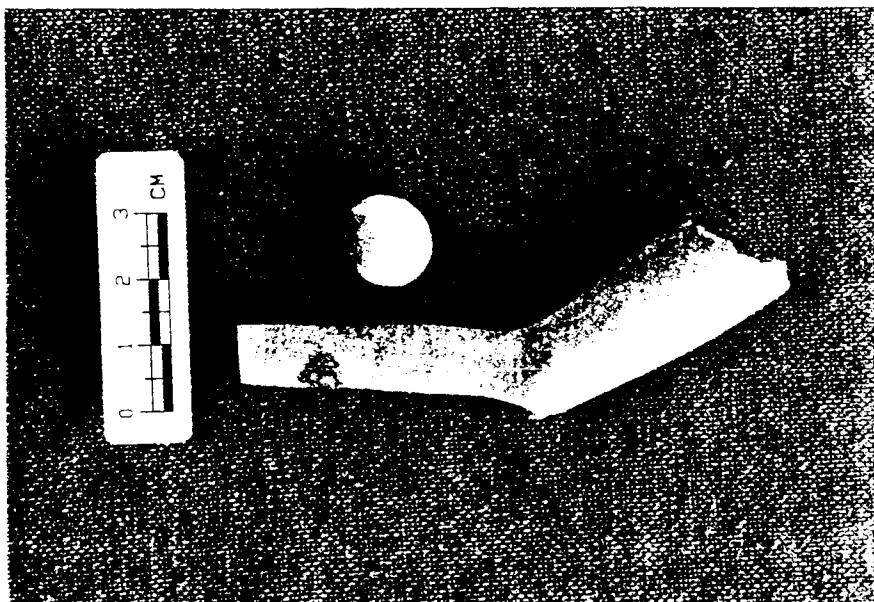
Red clay pipe bowl forms.

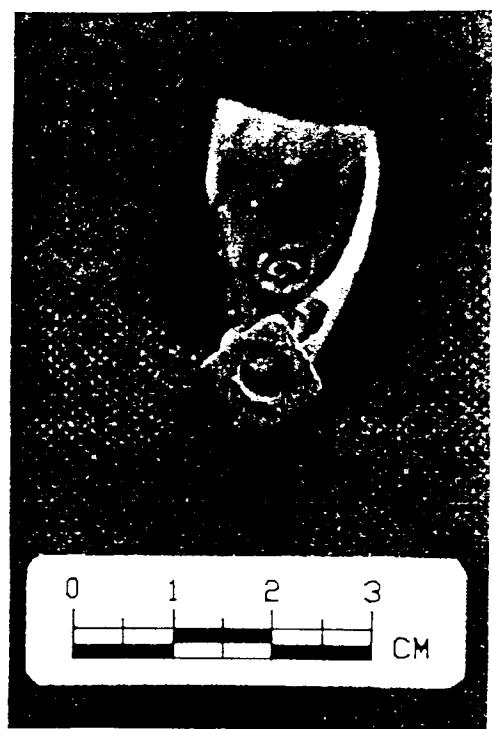
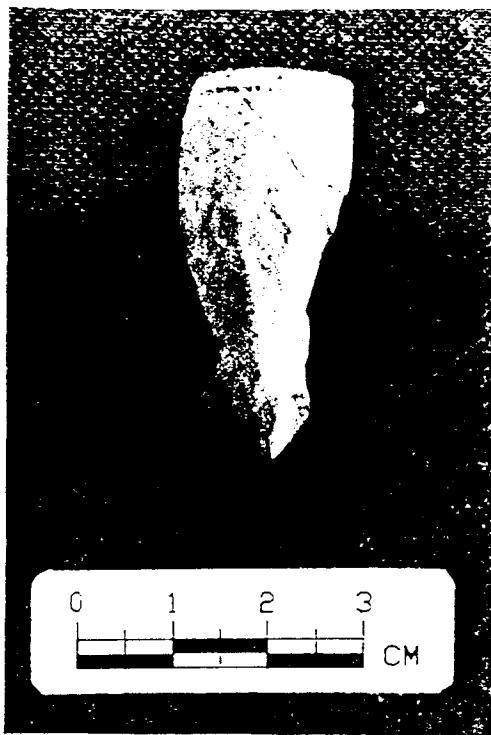
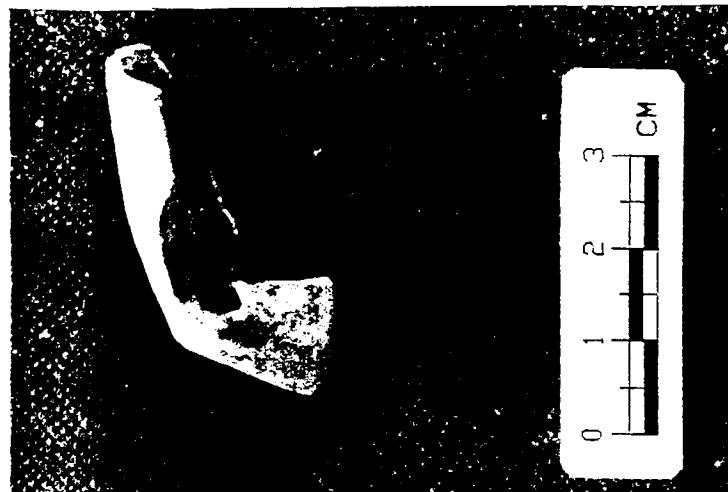


SCALE 1:1

The New Street site produced two anomalistic pipe-related artifacts. One was a small ball of fired clay that appears to be made from the same clay as the tobacco pipes (A) while the other is a seemingly mold-made pipe designed to be smoked with the aid of a removable stem (B). Marx (Marx 1968A: 123) also reported a pipe of this type. The closest 17th-century parallel to these pipes comes from the Chesapeake Bay area in North America. Both of these artifacts came from the 17th-century layer of the excavation.

A



**B**

## VITA

Kenan Paul Heidtke was born in Fredericksburg, Texas and grew up in a number of towns and cities within the state. He graduated from Texas Lutheran College in 1984 with a B.A. degree and majors in History and Political Science. He has travelled extensively in Europe, Mexico and Central America. In 1986 he participated in the Texas A&M Field School in Port Royal, Jamaica. In 1992 he presented a paper on the Jamaican red clay tobacco pipes at the annual meeting of the Society for Historical Archaeology in Kingston, Jamaica. His address is 2310 Roosevelt, Bryan, Texas 77801.

THOMPSON, BRUCE F.

1981 Pipe Smoking in Old Port Royal: Jamaican Operations 1981. Unpublished manuscript on file at Texas A&M university.

WAKAMATSU, MITSURU

1985 Influence of Kiln Atmosphere on Color and Sintering Properties of Red Clay Containing Iron. *Yogyo Kyokaishi*, 93(7):349-356.

1986 Influence of Kiln Atmosphere on Chemical States of Iron in Red Clay. *Yogyo Kyokaishi*, 94(11):931-935.

ZAHEDIAH, NUALA

1986 Trade, Plunder, and Economic Development in Early English Jamaica, 1655-89. *The Economic History Review*, Second Series, 39(2):205-222.

**APPENDIX A**

## APPENDIX A

As discussed in the text of this thesis, the Jamaican red clay tobacco pipes are difficult to fit into the parameters of a traditional typology. The following should be considered a catalog of the major types of marks found on the red clay pipes and not an attempt to develop a typology of the marks. The numbering system used to identify individual marks is designed to keep groups of markings that are stylistically similar together and to allow for the inclusion of new markings that will no doubt come to light in the future. Table A provides a breakdown of the number of pipes in the sample bearing the 18 most common types of mark. Almost all of the pipes were found to carry three impressions or were broken in the area where the marks are placed and thus could have had three marks; pipes having more or less than the standard three impressions are noted below. Only one pipe in good condition was found to have no evidence of any type of mark.

Type 1.0 Design is a simple impressed circle. 54 pipes had marks of this kind. One example had only two impressions.

1.0

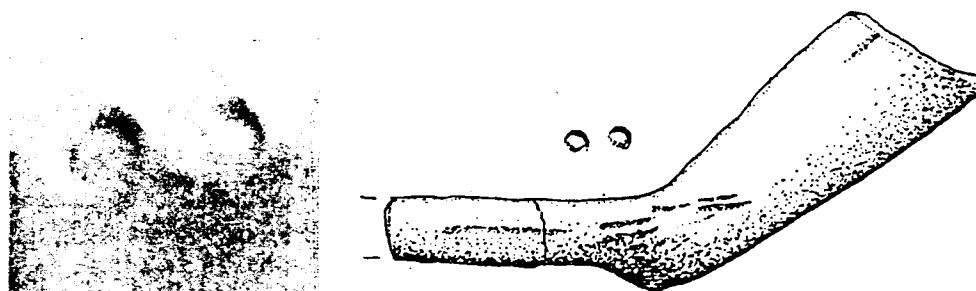
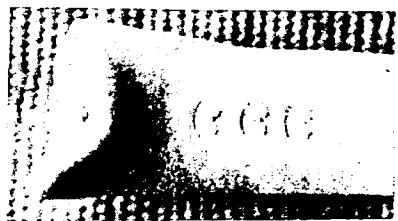


TABLE A  
NUMBER OF PIPES AND PERCENTAGE OF TOTAL SAMPLE  
BEARING THE MOST COMMON TYPES OF MARK

Mark Type	Number of Pipes	Percentage of Sample
1.0	54	8.2
1.2	13	1.9
1.3	165	25.1
1.5	9	1.3
1.10	10	1.5
2.0	30	4.5
2.1	11	1.6
4.0	18	2.7
4.4	15	2.2
4.5	64	9.7
4.7	18	2.7
5.3	47	7.1
6.0	28	4.2
20.0	24	3.6
23.1	10	1.5
30.0	13	1.9
40.0	15	2.2
50.0	14	2.1

Type 1.2 Two raised dots within an impressed circle. Size of dots and position within impression vary as does the shape of the impression. 11 examples.

1.2



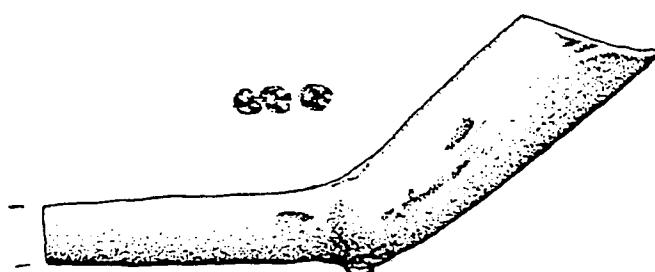
Type 1.3 "Pawnbroker" mark. Three raised dots within impression. This was the most common mark with 165 pipes bearing some variation. Five examples had four stamps while one had five. One example had two stamps.

1.3



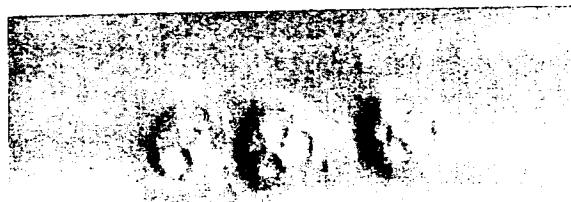
Type 1.4 Similar to Type 1.4 but with four raised dots.  
Four examples.

1.4



Type 1.5 Similar to Types 1.3 and 1.4 but with five raised dots. This mark is similar to variations of the "Tudor Rose" which are found on some 17th-century Dutch heel stamps. Shape, arrangement, and position of raised dots vary. Nine examples.

1.5

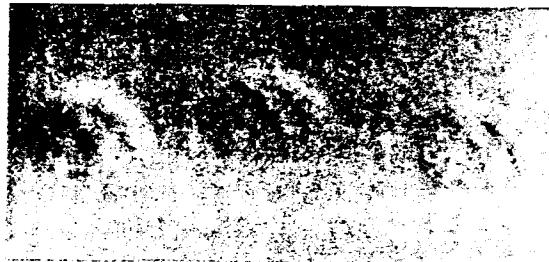


Type 1.6 Three raised dots in overlapping circles. This mark could be a poorly placed example of Type 2.1. One example with a single impression.

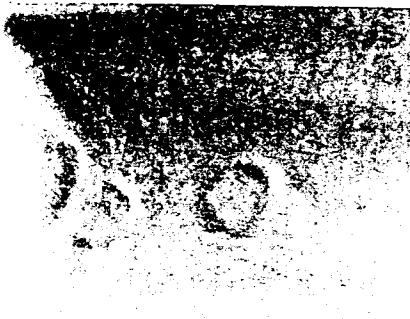
1.6



Type 1.10 Six or more raised dots within an impressed circle. Ten examples.



Type 2.0 An impressed circle with the center raised. Size of raised inner circle varies. 30 examples. Four examples had two marks.



Type 2.1 Circular impression with small raised dot in center. Size and position of raised dot varies. 11 examples. One example had only one mark.

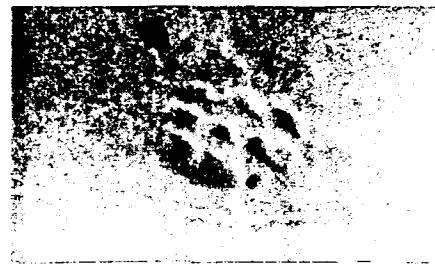
2.1



Type 3.0 3x2 hatch pattern in circular impression. One example.

3.0

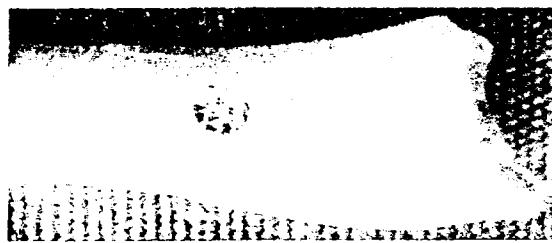
3x2



Type 3.1 3x3 hatch pattern in circular impression. Two examples.

3.1

3x3



Type 4.4 Six raised spokes within circular impression. Position, shape and size of spoke varies. 15 examples. one sample with only two marks.

4.4  6-spoked



Type 4.5 Eight uniform spokes within impressed circle. Size of impression and design varies. 64 examples.

4.5  8-spoked



Type 4.6 Four spokes within impressed circle. Six examples. One example had one mark, one had two marks.

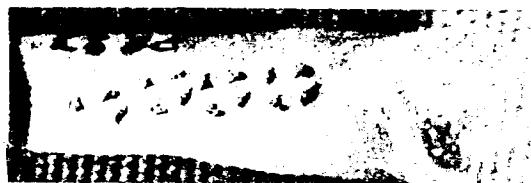
4.6 



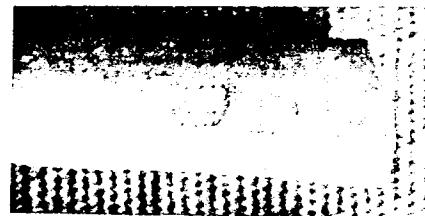
Type 4.7 Eight spoked design taking the form of a larger cross imposed over a smaller one at different angles. 18 examples.



Type 5.3 Cross-shaped design with thick arms. Design is often flush with surface of stem. 47 examples. Four examples have four marks, one example has only one mark.



Type 6.0 Raised "H" shaped design within impressed circle. In some examples the crossbar of the "H" extends slightly past the horizontal bars. 28 examples.



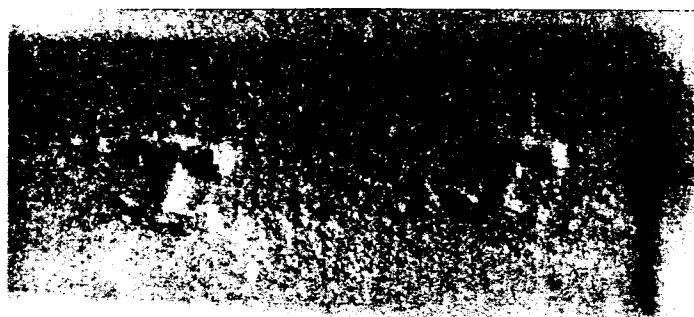
Type 6.1 Raised "H" shaped design within square impression. Four examples. Two examples with only one mark.

6.1



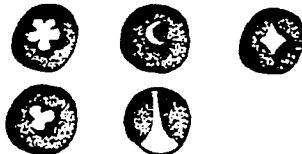
Type 6.2 "H" shaped design that is actually impressed into stem. One example.

6.2



Type 12.0 This type includes single examples of pipes with various designs occurring within an impressed circle. It is possible that some of these marks are poorly executed examples of other more common marks. Eight pipes had markings fitting this category.

**12.0 misc. circular**



Type 20.0 Square impression with five raised dots in the pattern of dots found on a "five die". Angle at which impression is placed along stem varies. 24 examples.

**20.0**



Type 20.1 Square impression divided into quarters with one raised dot in each quarter. One example.

20.1



Type 21.0 Four small and deep impressions that create a cross-shaped design that is flush with the surface of the stem. 17 examples.

21.0



Type 21.1 Four small rectangular impressions arranged like the arms of a cross. Two examples.

21.1



Type 21.2 A raised cross within an outlining impression. This was one of the more elaborate of the designs. Three examples.

21.2



Type 23.0 "X" shaped design within rectangular impression. Three examples.

23.0



Type 23.1 Raised cross within a square or rectangular impression. Impression applied at different angles to stem. One example had four marks. 10 examples.

23.1



Type 25.0 Four raised dots within a square impression.  
Possibly a poorly executed Type 20.0 mark. One example.

25.0



Type 30.0 Various heart-shaped designs usually found in  
heart-shaped impressions. 13 examples.

30.0

