DRINKING GLASSES FROM PORT ROYAL, JAMAICA C.1630-1840:

A STUDY OF STYLES AND USAGE

A Thesis

by

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Submitted to the Graduate College of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

May 1988

Major Subject: Anthropology
ABSTRACT

Drinking Glasses from Port Royal, Jamaica c. 1630-1840:
A Study of Styles and Usage. (May 1988)
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Chairman of Thesis Committee: Dr. D.L. Hamilton

Port Royal, Jamaica, was a wealthy and important trading and slave distribution centre during the seventeenth and eighteenth centuries. Later the town became the bastion of British naval power in the Caribbean.

Maritime and terrestrial archaeological sites in Port Royal have yielded representative artifacts from the town's various periods of occupation. Among the numerous glass artifacts recovered was an extensive and varied collection of partially-intact drinking glasses. The comprehensive range of types and styles of tableglass suggest many uses in a variety of locations, and imply a degree of refinement in material culture seldom associated with a frontier colonial existence. According to stylistic attributes and lead content, most of the glassware is English, manufactured in the late-seventeenth, eighteenth and nineteenth centuries.

This thesis is concerned with the identification and analysis of the drinking glasses. A descriptive catalogue is provided with illustrations, useful for comparative purposes. Conclusions drawn from the analysis may provide a fresh perspective of daily life in historic Port Royal.
DEDICATION

This thesis is dedicated to my daughter, Mary Caroline McClenaghan. Her belief in me, her love, support and encouragement gave me the will to prevail.
ACKNOWLEDGEMENTS

I wish to express my profound gratitude to Dr. D.L. Hamilton for accepting the chairmanship of my thesis committee, and to Dr. Zoltan Kosztolnyik and Mr. Richard Steffy who were always behind me in this endeavour.

I can never hope to repay Richard McClure, curator of the Port Royal Museum, for his phenomenal contribution to this project. His drawings illustrate most of the glasses in the collection. Without his interest, support and encouragement this thesis would never have been attempted, much less completed. Special kudos to Roderick Ebanks for facilitating my work at the museum, and to Colleen McGeachy, who photographed most of the collection.

I am indebted to Dr. Peter Kaellgren of the Royal Ontario Museum, Dr. Robert Brill and Mr. Dwight Lanmon of the Corning Museum of Glass. The benefit of their precious time and knowledge in their specific areas of expertise was invaluable to this project. The copyright material from the two museums was most welcome.

I am grateful to Olive Jones and E. Ann Smith, of the Archaeological Research Division, Parks Canada, Ottawa for their inestimable help in the preparation of the catalogue.

The interest and support from H.E. McClenaghan was a special gift and deeply appreciated.

To special friends and family, thank you for your support.
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HISTORICAL SUMMARY OF PORT ROYAL

The present site of Port Royal, Jamaica, is located at the tip of a long sand spit, separating Kingston Harbour from the Caribbean Sea. Jamaica's earliest colonizers, the Spaniards, inhabited the island between 1509 and 1655 and utilized the natural harbour for careenage. They called the site Cayo de Carena. After the English captured the island in 1655, the settlement was called Port Cagway and later renamed Port Royal after the restoration of the monarchy in 1660.

Jamaica, situated in the centre of the Spanish Caribbean, was strategically important to the English, who immediately fortified the town. For several years, immediately after the conquest of Jamaica, there was a sizeable English naval force stationed at Port Royal. However, these vessels were gradually recalled for repair and never replaced, so that from about 1660, there was a negligible English naval presence in the area. With the outbreak of the second Dutch War in 1665, between England and Holland, the English admiralty could not spare a fleet for the West Indies, and Jamaica was left virtually defenceless (Pawson and Buisseret 1975: 41). The governor of Jamaica was forced to engage the help of local pirates

American Antiquity used as a guide for format and style
to defend the island. The pirates or buccaneers were accorded official letters of marque, legally permitting their privateering activities in return for their protection. Port Royal offered the buccaneers an ideal base from which to mount their attacks on all Spanish shipping and colonies in the western Caribbean and, as well, a place to dispose of their contraband and booty (Black 1965: 55). The town grew and prospered initially from pirate treasure. Later, its wealth was augmented by increased trade and commerce between Jamaica and England, and the North American States and Spanish possessions.

Piracy flourished for a relatively short period of time in Jamaica. In 1670, the treaty of Madrid brought peace between England and Spain and, as a consequence, opened up a lucrative trade with the Spanish American continent (Bridges 1968: 282). Jamaica, admirably situated geographically to be an entrepôt of trade between the two continents, would benefit immensely as a result of the extensive trade established between Port Royal merchants and the neighbouring Spanish colonies (Hamilton and Woodward 1984: 40). Privateering ventures against Spanish interests could no longer be condoned and were actively discouraged (Penson 1969: 334).

As a trading centre, Port Royal took precedence in the Caribbean area dealing in British and European manufactured commodities and imported foodstuffs from Europe and the
American colonies. Local tropical produce and goods were exported to England and Europe, often in payment for slaves or manufactured goods (Pawson and Buiserett 1975: 67). A personal diary, written by John Taylor between 1663 and 1668, was an invaluable primary source of historical information. Entitled: The Second Part of the Historie of his Life and Travels in America 1683–1688, it provided a vivid account of seventeenth-century Port Royal from the perspective of personal observation. Extensive trading activities that took place in the town are described in a direct quotation:

To this port merchants, daily resort from England, bringing with them considerable cargoes of English commoditys, as wine, cloath linnen, stuff, silks, fruit, ironwork, pitch, tarr ropes;... here to ye planters and sloop masters, which trade amongst the Spaniards, and in exchange thereof take sugar, indigo, coco, etc. which they end home to their correspondents in England...To this port merchants also daily resort from Dublin and other ports of Ireland, bringing with 'em greet cargoes of Irish provision as beef, pork, salmon, cheese, butter, flour, beer etc., and those merchant trade here for the like commoditys....Also to this port resorts many vessels from New England, New York and so, which bring hither provitions as beef, pork, sturgeon, macerell, cheese, butter and peas, spares, steaves and hoops for cask, with other like commodities: these cheifly trade therefor sugar, rum and die wood: by this quick and free trade, the island begins to gather wealth and strength (Taylor n.d.: 506).

Taylor described the export of local produce from Jamaica:

Now the commodotys which are vended from hence to England, and other parts are these: sugar, indigo, coco, cotton, ginger, logwood, fustick, rum, hides and tallow, which is from hence vended home to England, and Ireland yearly in great plenty, soe that here are loaden from hence yearly with these commodity, above a hundred shipps beside small vessels, for England, Ireland, New England...these
are shipt off from this port, which is the chiefe stall of trade and commers (Taylor n.d.: 507).

Between 1660 and 1690, the town emerged as one of the most prosperous commercial centres in the New World (Hamilton and Woodward 1984: 40).

As well, Port Royal became a major depot and redistribution centre for the English and Spanish slave trade in the Caribbean, which provided a steady stream of income to the island (Martin 1969: 439). The Royal African Company and the South Seas Company, founded in 1672 and 1711 respectively, were organized to facilitate the slave trade, and both these companies had extensive representation in Jamaica for this purpose (Collins 1901: 167).

Likewise here the royall Company of Merchants, and Africa Company, have setled a factory here, and bring abundance of negroa slaves hither daily, which they sell to the planters for ye sugar, indigo coco etc. and give them six months creditt to pay the same (Taylor n.d.: 506-507).

The Port Royal slave-trade facility, and extensive trade with Spanish America earned Jamaica an ample bullion supply for several centuries (Bridges 1968: 271-272).

Tradesmen, merchants and craftsmen flocked to Port Royal to cater to and profit from the high-living tastes of the town's cosmopolitan inhabitants, who used their wealth to establish a lifestyle comparable to similar towns in Europe of the same time period (Buisseret 1966: 25). There was a considerable variety of craftsmen available at Port Royal, some producing goods that rivalled the best imports (Pawson
and Buisseret 1975: Appendix 10). The residents of late-seventeenth century Port Royal were mainly English, Scottish, Irish, as well as a number of Dutch merchants. There were also Spanish Jews, active in the slave-trade, who had:

free commers with the factors of ye Royall African Company for negroa slaves, which they transport to Porta Bella (Panama), and other places amongst the Spaniards, which bring great riches yearly to this port (Taylor n.d.: 500).

The residents built four-storied brick houses with glass windows and furnished them with fine imported pewter, china and glassware. Most inhabitants were able to afford and import the latest and best of everything available at the time. Taylor observes "all which live here verey well, earning thrice the wages given in England, by which means they are able to maintain their families much better than in England" (Taylor n.d.: 507). He characterizes the lifestyle of Port Royal's inhabitants as "living to the height of splendour, in full ease and plenty" and describes the town "as one of the most expensive, dear places of the known world, for all manner of possessions" (Taylor n.d. 500).

During the eighteenth and nineteenth centuries, the town became the bastion of British sea power in the Caribbean. Many naval operations and manoeuvres originated from Port Royal, which became the most important naval base in the Caribbean (Pawson & Buisseret 1975: 125). The naval establishment presence, the British West India Naval Squadron, supported the town until 1905 (Mayes 1972: 8).
A large part of the town site was destroyed and submerged in the sea during a disastrous earthquake in June, 1692. Many of the fine imported possessions of the town's luckless inhabitants were buried or lost at sea in this and during subsequent natural disasters between 1692 and 1905.

Archaeological Investigation and Excavation at Port Royal

Immediately following the first earthquake in 1692, Port Royal, situated in the middle of most of the seventeenth-century commercial activities in the Caribbean, attracted the attention of treasure hunters and scavengers. Utilizing a variety of underwater recovery techniques, they managed to plunder the site quite thoroughly. For the next several-hundred years, sundry divers worked in the area with varied success. In 1956, Mr Edwin Link, a well-known underwater explorer, visited the site. He returned two years later with a submarine to conduct an expedition sponsored jointly by the Smithsonian, the Institute of Jamaica and the National Geographic Society. In the course of investigation, Link and his party managed to produce an accurate map of the town, pre-1692, which has provided the geographical basis for all archaeological excavation projects since 1958 (Mayes 1972: 9). A number of archaeological excavations, both terrestrial and maritime, have been conducted at Port Royal since 1956. All have yielded enormous quantities of artifacts, including many domestic and commercial manufactured items, i.e., fine-
quality ceramics, pottery, pewter, brass, copper and glass, as well as mounds of bricks and a huge collection of clay pipes and glass onion bottles. Several sites have produced tableglass artifacts, in the form of drinking glasses, in a wide variety of types and styles (Map 1).

In 1966, Robert Marx, a former American navy diver, was hired by the Jamaican government to perform an underwater salvage excavation in Kingston Harbour off the Old Naval Hospital, an area threatened by a proposed construction of a luxury-liner pier. Marx's marine excavation, over part of the now-submerged town, between Fishers Row and Lime Street, continued until 1968. During that time he recovered a large body of artifactual material. Most of the artifacts have been illustrated and dated in a series of mimeographed reports published by the Jamaica National Trust Commission (Marx 1969). Unfortunately, most of the artifactual material is unprovenienced.

In 1968, Phillip Mayes, an English archaeologist, was appointed by the Jamaican National Trust Commission to investigate the site of the early naval dockyard, which was in danger of being destroyed by the construction of a tourist hotel complex in the area. Mayes's chance discovery of the remains of Fort Rupert, in 1968, permitted an accurate mapping of many of the seventeenth-century features of Port Royal. It was possible to make use of Fort Rupert to the east and Fort Charles in the west as reference points
(Pawson and Buisseret 1975: 146). Mayes published an archaeological site report on his excavation located at the naval dockyard on the eastern end of the spit, *Port Royal Jamaica Excavations 1969-70* (Mayes 1972). His report documented and described the artifactual material recovered from the site.

From 1971 to 1974, the Jamaica National Trust, under the direction of archaeologist Anthony Priddy, conducted a large terrestrial excavation at New Street in the centre of the town. The excavation managed to uncover a reasonably accurate series of stratified occupation layers dating from pre-earthquake times to the mid-nineteenth century, and many well-provenienced artifacts were recovered from the site. Although the New Street site has been described in an article in the Jamaica Journal, *The 17th and 18th-Century Settlement Pattern of Port Royal* (Priddy 1975), there has never been an official excavation report published. Priddy made several test-trench excavations elsewhere in the town, at St. Peter's churchyard and Fort Charles, which produced a number of representative artifacts. The artifactual material from Priddy's sites is extensive, but regrettably has not been analyzed or catalogued.

Since 1981, the Institute of Nautical Archaeology and Texas A & M University have conducted an ongoing nautical archaeology field school at Port Royal under the direction of Dr. D. L. Hamilton. The underwater area being
investigated is located 100 metres offshore from the Old Naval Hospital, over Lime Street, and many representative artifacts have been retrieved from this site. An article, *A Sunken 17th-Century City: Port Royal Jamaica*, commented on the site and method of excavation and described some of the finds (Hamilton and Woodward 1984).

In 1986, Ywonne Edwards, of the Jamaica National Trust Commission, conducted an investigation of a surface collection of artifacts unearthed in a backfill near the New Police Barracks in Port Royal, and a number of interesting artifacts were recovered.

Careful excavation of the remains of seventeenth and eighteenth-century Port Royal and a detailed study and analysis of the recovered artifactual material will provide useful information about the town and a glimpse of the colonial lifestyle of the day. Conservation of the artifacts will preserve them for future study. Analyses and proper documentation will provide the evidence to support historical reports of other colonial sites of a similar time period. Among the many artifact assemblages recovered from Port Royal excavation sites was a large and varied collection of drinking glass vessels and sherds. Most of the tableglass was in the form of stemmed drinking glasses in many shapes and sizes, and there were a few tumblers and jelly-dessert glasses, as well. The collection provides an example of the types of glassware exported to
the colonies from abroad, and as one of the few colonial tableglass assemblages to be recovered in the Caribbean, it merits careful study and analysis.

Figure 1. Street plan of Port Royal, pre 1692. (After Pawson and Buißeret 1975: 82). (Drawing author).
THE NATURE OF GLASS

Glass is found in many forms in our man-made environment and is one of the commonest synthetic materials in every day domestic life. Its presence in the form of tableware, windows, containers and ornaments is taken for granted. Although the number and variety of products made from glass has significantly increased during the twentieth century, the material has played a large part in the manufacture and design of domestic articles since earliest times. Glass is valued as a container: it is transparent, reusable, odourless and does not impart a taste. The glass products with which most people are familiar are those of the container and domestic glass industries.

Almost all glass objects have been produced from synthetic glass formed by melting raw materials. Glass does not exist in a ready-made or natural state, and natural glass is found only in very small quantities. The most common type is obsidian, formed from volcanic lava.

It is the intrinsic qualities of glass that have enabled it to be adapted to the changing needs of man. There are many types of metal, the glassmakers' term for molten glass. The term metal is used to describe the vitreous material, while glass is reserved to define the products, i.e., drinking glass, wine glass, looking glass (Noel-Hume 1969: 10). Some metals were developed, over
generations of craft practice, in regions where particular raw materials were available. Others were developed to satisfy specific design criteria. The different characteristics of these metals affect the form, colour and surface qualities of the final product. They are critical to both manufacture and design.

Although glass appears to be solid and have a permanent shape, it is, in fact, a liquid that is subject to constant change. A definition for the structure of glass is given by Dr. Robert Brill, research scientist at the Corning Glass Centre, Corning, New York:

Glass is a substance in a glassy state; a state in which the molecular units have a disordered arrangement but sufficient cohesion to induce over-all rigidity. The term "vitreous state" is sometimes used and has exactly the same meaning. Matter of many different compositions may exist in this state. In other words, there is no one substance which is uniquely glass; the word "glass" is a generic term.... This description of glass says nothing about chemical composition because the number of possible compositions is infinitely large. Of course, chemical composition affects the physical and chemical properties of glass (Brill 1962: 131-132).

Glass is a composition made by the fusion of silica, one of the most widely distributed elements in the world with one or more substances of an alkaline nature. The main ingredient is silica or sand, which on its own melts at about 1700°. An alkaline flux, like soda or potash, is added to lower the melting point to about 1450° (Ash 1975:116). Until recently, the flux usually was potash made from the ashes of wood or bracken, or soda made from the
ashes of certain marine plants. The addition of lime, present in the mixture as an impurity in the other ingredients, produces glass that is hard and less prone to attack by water (Brill 1962: 134). Scraps of broken glass, called cullet, are added to hasten the melting process and reduce the time taken to fuse the raw materials, since it also acts as a flux to the silica (Godfrey 1975: 3).

Glass is not naturally colourless but has a greenish colour, due to small quantities of iron oxide in most sands. The properties of glass can be varied by the addition of other substances, often in the form of oxides, lead for example, imparts brilliance and weight to glass, while the addition of manganese will produce a colourless glass. As well, many colours of glass are created by adding metallic oxides, for example the addition of cupric oxide, a derivative of copper, will produce blue-coloured glass (Thorpe 1961: 176). Glass can also be made transparent, translucent or opaque by altering the ingredients of the melt (Jones & Sullivan 1985: 50).

According to Brill, the ratio between the main components and other constituents determines the relative stability of glass upon exposure to various chemical and environmental conditions (Brill 1962:132; 1975:1). As purer raw materials were used in order to obtain a more consistent, finer quality of glass, it was discovered that the addition of a non-alkaline base to the batch effectively
reduced the natural impurities that were present in the alkali. These impurities, however, acted as a natural stabilizer. Glass with insufficient amounts of stabilizer, as well as too much alkali, will develop a condition called crizzling, a very fine surface crazing, which causes diminished transparency. This condition is often associated with glasses made in the late-seventeenth and early-eighteenth centuries (Brill 1975: 1), (Table 1).
Table 1. Percentage of Chemical Constituents in Various Types of Glass

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>SILICA</td>
<td>SiO₂</td>
<td>67.0%</td>
<td>56.7%</td>
<td>64.7%</td>
<td>70.7%</td>
<td>80.0%</td>
<td>49.0%</td>
<td>53.0%</td>
<td>76.3%</td>
<td>57.0%</td>
</tr>
<tr>
<td>SODA</td>
<td>Na₂O</td>
<td>18.0%</td>
<td>2.2%</td>
<td>0.4%</td>
<td>17.7%</td>
<td>3.0%</td>
<td>----</td>
<td>----</td>
<td>0.58%</td>
<td>tr</td>
</tr>
<tr>
<td>LIME</td>
<td>CaO</td>
<td>8.0%</td>
<td>23.0%</td>
<td>20.8%</td>
<td>1.53%</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>7.74%</td>
<td>tr</td>
</tr>
<tr>
<td>POTASH</td>
<td>K₂O</td>
<td>1.0%</td>
<td>6.3%</td>
<td>4.7%</td>
<td>3.42%</td>
<td>9.0%</td>
<td>19.0%</td>
<td>12.7%</td>
<td>14.1%</td>
<td>11.0%</td>
</tr>
<tr>
<td>MAGNESIUM OXIDE</td>
<td>MgO</td>
<td>1.0%</td>
<td>3.6%</td>
<td>2.6%</td>
<td>3.42%</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>0.37%</td>
<td>tr</td>
</tr>
<tr>
<td>IRON OXIDE</td>
<td>Fe₂O₃</td>
<td>0.5%</td>
<td>0.39%</td>
<td>0.7%</td>
<td>0.1%</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>0.42%</td>
<td>tr</td>
</tr>
<tr>
<td>ALUMINA</td>
<td>Al₂O₃</td>
<td>2.5%</td>
<td>?</td>
<td>?</td>
<td>0.5%</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>0.10%</td>
<td>----</td>
</tr>
<tr>
<td>ANTIMONY OXIDE</td>
<td>Sb₂O₅</td>
<td>1.5%</td>
<td>?</td>
<td>?</td>
<td>nf</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>MANGANESE OXIDE</td>
<td>MnO₂</td>
<td>0.5%</td>
<td>?</td>
<td>?</td>
<td>0.38%</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>0.08%</td>
<td>----</td>
</tr>
<tr>
<td>BORIC OXIDE</td>
<td>B₂O₃</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>nf</td>
<td>7.0%</td>
<td>----</td>
<td>----</td>
<td>0.2%</td>
</tr>
<tr>
<td>LEAD</td>
<td>PbO</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>32.0%</td>
<td>33.7%</td>
<td>0.01%</td>
<td>31.0%</td>
</tr>
</tbody>
</table>

Note: The numbers given show the variables in composition, between types of glassware at different time periods. French and Bohemian samples have low calcium levels, and were studied for grizzling problems.

"?", where Wealden glass constituents not given.

"----", where not known or measured.

1. Brill 1962: 134
4. Brill 1975: 2
5. Brill 1980: 30
6 & 7. Watts 1975: 77
8. Ellville 1951: 31
9. Buckley 1912: 21
GLASS MANUFACTURE

History

Glass has been made in a variety of forms by different methods from very early times and in many areas of the world. Glass was valued as ornamentation, in beads for example, before its use as a container material was realized.

Glass was utilized as a glaze before it was manipulated into vessels or plate glass. Glazed steatite and faience objects were made in Mesopotamia in the fifth millenium B.C. and were exported to other parts of the ancient East, including Egypt. The art of glazing beads and objects probably was introduced in Egypt towards the end of the fourth millenium B.C.; a few glass beads have been found in Sixth-Dynasty tombs (Crompton 1967: 7).

The manufacture of vessels from glass seems to have begun in northern Mesopotamia, in the Hurrian-Mitannian area, towards the end of the sixteenth or early-fifteenth century B.C. Glass vases were already being made in Egypt in the reign of Thutmosis III, 1504-1450 B.C., and the art of forming them may have been introduced into the Aegean directly from northern Mesopotamia rather than from Egypt about the same time (Hood 1978: 136). Glass vessels formed on a removable sand core appear to have been used in Egypt and northern Mesopotamia in about 1500 B.C. By 500 B.C.,
Greece was producing miniature, glass versions of pottery shapes using the cire-perdue or lost-wax method as well as cast and cut-glass patella cups (Thorpe 1961: 170). Sand-core vessels were made in Achaemenid Persia c. 450-300 B.C.

Figure 2. Omphalos Bowl, Achaeminid Persia, 450-330 B.C.

The first completely colourless glass vessels were produced in the Middle East. Originally made to imitate rock crystal, they were probably cast in a mould. (Drawing author).

Mould-pressed glass containers were made by early glassmakers before the advent of blown glass in the first century B.C. Moulded objects were made and exported from Mesopotamia to Asia Minor, Syria, Palestine, Cyprus, Egypt and the Mycenaean sites in mainland Greece, no doubt leading to the establishment of a glass-moulding industry in those areas (Frank 1982: 18). Alexandria, after the conquests of
Alexander the Great in 332 B.C., became an important Egyptian glass manufacturing centre. Alexandrian glassmakers exported their techniques into the Italian peninsula in the first century B.C., while the Syrians introduced their innovative glassblowing skills to northern Italy around the beginning of the Christian era (Frank 1982: 18).

The consolidation of the Roman Empire in the Mediterranean area led to relative economic stability and prosperity. The main centres of the glassmaking industry fell under Roman control during the first century B.C., and the Romans adopted the glassmaking techniques discovered by others. There were profitable markets to be served in the newly conquered Roman provinces in northern and western Europe. Roman glass was utilitarian and inexpensive, and eventually it became available in every part of the Roman Empire (Crompton 1967: 9).

Archaeological evidence from numerous Italian sites indicates that blown-glass vessels were available during the first quarter of the first century B.C. Rome, under the rule of Augustus in 26 B.C., was considered a major glassmaking centre. Not only vessel glass was made by Roman glassmakers, window glass came into widespread use during this period. In Pompeii, a city with a reputation for luxurious living, windows of public and private buildings were glazed with sheets of glass (Frank 1982: 20).
Glassmaking was not restricted to Italy or the eastern Mediterranean areas, there were manufacturing centres in the northern regions of the Roman Empire, in the Rhone valley up into northern Gaul. By the second century A.D., a glass industry had become established, in the area between the Rhine and the Seine, that began to rival the manufacturing centres of Egypt, Syria and Rome (Ash 1975: 8).

Since numerous kinds of sand and alkali sufficed for making common glass, the industry was never tied to a particular locality. Thus in early medieval times, the glass industry tended to be migratory, following market demands or the need of wood for fuel (Godfrey 1975: 4).

Figure 3. Potash-glass beakers, Anglo-Saxon, Merovingian period in northern Europe. From the fifth to the tenth century A.D., glass drinking vessels were free-blown in shapes probably inspired by drinking horns or rhytons (Haynes 1969: 39) (Drawing author).
During the later Middle Ages, glass manufacture settled in certain well-defined areas of Europe, each with its own tradition and technique. Areas of manufacture were roughly divided into two spheres: that of the north, including Germany, France, Belgium, England and Bohemia, and that of the south, mainly Italy. These divisions were not based on geography, but on divergent technical glassmaking traditions. In the north, after the breakup of the Roman Empire, glass was made from local sands and the ashes of burnt inland-vegetation. Glassmakers in northern and central Europe, including England, made a green potash-glass called forest-glass, to be used in windows and ordinary household vessels and containers. The northern potash-glass was of a poorer quality than the soda-glass produced in the southern Mediterranean lands (Kenyon 1967: 34).

In the south, silica obtained by crushing white pebbles from riverbeds was used with the ashes of burnt marine vegetation. The Italians produced uncoloured transparent glass for the luxury trade called cristallo. Although the forest-glass tradition produced by far the larger part of the total output in Europé, during the later Middle Ages, the most popular glass was Italian cristallo. As it was softer and more ductile than forest-glass, it could be blown into thin and delicate shapes and intricate glassware styles (Buckley 1913: 15). The Italian glass industry, centred in Venice at Murano, attained its greatest prestige during the
mid-sixteenth century (Godfrey 1975: 9).

Eventually, colourless, fine-quality glass was made in many glassmaking centres: potash-lime glass in Bohemia, Germany and the Low Countries, and potash-lead glass in England. Historically, glass was called crystal because of its similarity to the natural quartz crystal. Contemporary use of the word applies specifically to fine-quality glassware with a certain lead content (Godfrey 1975: 3).

Process

The actual glassmaking process has remained essentially the same since ancient times. The components of glass, silica, soda, potash, lime and lead, for example, are fused at a high temperature in seasoned fired-clay containers, boiled down, skimmed and cooled several hundred degrees. The molten glass, referred to as metal, is ladled or poured into moulds. Then it is pressed or blown into the moulds, or alternatively, free-blown. The shaped glass is annealed by slow cooling, on shelves in a melting furnace, to relieve the stresses caused by manipulation.

When heated to about 1140° glass becomes a soft toffee-like mass that can be scooped up on an iron rod and bent, stretched, squeezed, blown and pressed or moulded into shape. It is the ductility of the heated metal that has been the single most important reason for the continuing success of glass as a production material throughout its six-thousand year history. It is the process of free-
blowing that most people associate with the making of glass.

Prior to the middle of the first century B.C., hollow glass vessels were made by winding threads of glass around a core of sand built up on a metal rod, or by dipping the core into a pot of glass several times to gradually build up layers of glass. When the glass had cooled and solidified, the core was removed. Bowls and dishes were also made by pressing glass into open moulds. Lumps of glass could be cut or ground by harder materials such as quartz to form pots and ornaments. The more complex *cire-perdue*, lost-wax, method of glassmaking was known and employed. In this process, a wax replica of the required glass object was coated with clay, which maintained the shape of the object when the clay was subsequently heated to melt out the wax. Then it was fired to form a mould into which the molten glass could be poured. These glassmaking techniques provided a wide variety of useful and decorative vessels, but the greatest single advance in glass technology was the invention of blown glass (Crompton 1967: 9).

**Blown Glass**

Glassblowing was invented in Syria, circa 50 B.C. A blob of molten glass is gathered at the end of a hollow rod, and air is blown down the rod, which insufflates the metal at the end of it, creating a glass bubble or paraison. Glass hardens gradually as it cools, allowing time for the gather of glass to be blown and shaped into a variety of
objects. The glass is reheated periodically and finally transferred to an iron rod, called a ponty, which enables the worker to shape the neck, rim or lip of the vessel. The pontil mark, where the molten glass was attached to the ponty and later broken off when the glass form was completed, can sometimes be used to estimate an early date of manufacture. With the advent of cutting glass in the mid-eighteenth century in England, glassmakers became adept at removing the pontil scar (Charleston 1984: xxv).

At first the bubble was blown into a mould, but it was only a short step to the technique of free-blowing. In this technique, the glass is blown into a bubble and then marvered into shape by rolling the paraison on an oiled surface. Compared with the limited shapes of core-formed vessels, blown-glass objects offered a much wider range of application and were quicker and cheaper to make (Frank 1982: 20).

Moulds

Glassware objects with the shape or decoration determined by moulds are called moulded glass. Eventually glass-moulding methods were developed that surpassed the free-blowing method in time and expense. Glass moulding is performed by forcing the bubble of hot glass, at the end of a glassblowing rod, into the outer extremities of the mould's interior by air pressure from the glassblower's mouth (Jones & Sullivan 1985: 22).
Contact moulding is the process of forming a full-sized object or portion of an object in a mould of any number of pieces, again using air pressure supplied by mouth. The shape of the object formed in the mould is deliberate, and the pattern, if there is one, is determined by the mould. Moulding techniques were used extensively during the Roman period for the manufacture of commercial containers and were reintroduced during the seventeenth century in Venice for forming stems on wineglasses (Jones & Sullivan 1985: 24).

Pattern moulding is a method of blowing mould-decorated glassware and yet avoiding the limitations on shape and size imposed by the use of a mould. The gather of molten glass is collected at the base of a blowing rod and then introduced into a part-sized mould with a simple recurring design or pattern, such as stars, diamonds or ribbing. The object may be given a swirling design, i.e., wrythen moulding, by simply twisting the gather of glass. The gather is expanded, by mouth-blowing, to fill the mould and the now-decorated paraison removed to be free-blown into a final shape. Pattern moulding is one of the few moulding techniques to have continued in use from Roman times, at least in Europe. Pattern moulded glass was being made in England if not before, then certainly after, the arrival of Venetian glassmakers in the late sixteenth century. Pattern-moulded tumblers and stemware bowls are commonly found on colonial sites (Jones & Sullivan 1985: 32).
Optic moulding is a combination of pattern moulding and contact moulding. The hot gather of glass is introduced into a part-sized mould with a simple recurring pattern, such as panels, ribs or circular prunts. The gather fills the mould, is removed, placed in a full-sized mould and blown to full size. The enlarging process transfers the part-sized design to the interior surface of the glass, leaving the full-sized mould impression, if there is any, on the exterior surface of the glass. This method of moulded decoration is more common on tumblers, and examples of optic-moulded tumblers are relatively frequent during the eighteenth century (Jones & Sullivan 1985: 32).

**Metals**

Prior to the seventeenth century, two basic types of metal existed. In one, the metal was fused using a soda flux, and in the other, a potash flux was used. These two traditions of glass manufacture are known as the soda-glass tradition on the one hand, and the potsh or forest-glass tradition on the other.

The soda-glass tradition probably originated in Mesopotamia and spread throughout the Middle East as a result of conquest and trade. Soda-glass was highly valued for its clarity and brightness, and for a standard of craftsmanship the West tried for years to equal. Soda-lime glass is one of the most ancient and common types of glass. Soda was, and still is, used as a flux throughout the
Mediterranean area, particularly in Venice. A type of soda called barilla, obtained by burning certain marine plants such as kelp or seaweed, was used as a flux before the late eighteenth century. Soda-glass, light in weight and appearance, has a yellowish or bluish-green tint (Bickerton 1984:5). After the thirteenth century, Venetian glassmakers were able to manufacture an almost clear soda-glass called cristallo (Frank 1982: 19).

The potash-glass tradition dominated glass manufacture throughout the medieval period in central and northern Europe. The potash-lime glass industry was essentially a forest industry. Glassmakers in northern, western and central Europe used the ashes obtained from burning the wood from indigenous trees and woodland shrubs. Wood ashes, high in potash content, were excellent sources of alkali and could be obtained, as a by-product, from the fuel used in wood-burning furnaces. Early potash-lime glass had a natural-greenish colour, due to the presence of iron oxides in the sand ingredients. Potash glass, called waldglas in Germany and Bohemia and verre fougère in France, was used to make window glass, bottles of every description and cheap ordinary glassware for domestic use (Frank 1982: 20). By 1689, a colourless potash-glass had been invented in Bohemia (Klein and Lloyd 1984: 102).

Potash-lead glass, or lead glass, was developed in England in 1676 by George Ravenscroft. Ravenscroft's early
metal was called flint glass, probably because he obtained the required silica from calcined English flint. Lead-glass is made from flint, potash and oxide of lead.

**Decorative Processes**

The decorative processes of glass manufacture fall into two main groups, hot work and cold work. Except for enamelling, hot work decoration is always undertaken as part of the manufacturing process, whereas cold work decoration can be done at any time and not necessarily at the site of manufacture. Hot work decoration is most often connected with colour. As mentioned earlier, colour and opacity are accomplished by adding small proportions of metallic oxides to the batch after the initial melt has been achieved. Coloured glass was made long before glassmakers discovered the technique of producing clear glass.

The decorative techniques most commonly used on glass in its cold state are cutting, engraving, carving and enamelling. The art of engraving with a diamond point was practised in early Christian times and revived by the Venetians in the sixteenth century. Later the process, which is somewhat similar to drawing, spread to Nuremburg and Antwerp. Diamond-point engraving was particularly suited to decorate the hard metal of soda-glass (Bickerton 1971: 17). The earliest example, of diamond-point engraving in England, is a Verzellini soda-glass goblet inscribed in 1577.
Wheel-engraving is similar in principle to glass-cutting; both are performed by pressing a glass object against a revolving wheel fed with an abrasive. The engraved surface of the glass is normally left unpolished. The engraving wheels are small in size and made of copper. Glass engraving by the copper wheel became popular in England during the eighteenth century, and found its ideal medium in lead glass. Although the technique of engraving glass is similar to that of cutting, the engraving process offers a much greater scope for artistic expression (Crompton 1967: 48).

When glass is cut, relatively larger wheels are used in contrast to those used for engraving. The cut surface is polished with successively finer agents to re-achieve the lustre of the original surface. The use of the wheel for cutting glass facettes goes back to the very early days of blown-glass. Decorative cutting of glass by means of lapidaries' wheels was practised under the Romans, and cameo-engraving or carving in high relief was a popular art form. Lead crystal was ideally suited to the techniques of cutting and engraving because it had a greater refractive brilliance and was considerably softer than continental soda-glass. During the late-seventeenth and eighteenth centuries, English lead glassware was sent to Germany, Holland and Bohemia to be cut or engraved. Glass cutting was not practiced in England, to any degree, until well
after 1760 (Ash 1975: 75-76).

Another technique of decorating glass in its cold state is enamelling, where the glass is decorated by having colours painted on it. The Romans were skilled in the art and used it with great effect. It was introduced into England during the eighteenth century by artists from Germany and the Low Countries (Crompton 1967: 51).

Identification

Attempts to visually identify certain types of glass compositions, such as soda-lime glass or potash-lead glass, by colour alone are not reliable. Chemical analysis is the only consistently accurate method of determining glass composition. However, inferences can be made on the basis of colour, style and fluorescence once chemical analysis has established a particular glass type beforehand (Jones & Sullivan 1985: 12). Soda-lime and potash-lime glass are referred to as non-lead glass in the absence of definitive chemical analysis. Some of the early lead glasses of the Ravenscroft era, circa 1675-1676, give off a light blue fluorescence and are called demi-lead glass in contrast to lead glassware, manufactured later, which fluoresces a characteristic icy blue. Hydrofluoric acid-ammonium sulphide is used to test for lead content where the surface of the glass is too eroded or pitted to permit accurate fluorescence. A drop of hydrofluoric acid-ammonium sulphide is applied to the glass surface, if there is lead
content in the glass, a black exudate will form where the acid was applied. Specific gravity tests can prove the presence of lead oxide in glass by weight (Brill 1987: personal communication). By the beginning of the eighteenth century most English tableglass contained at least 30% lead oxide and will fluoresce a typical icy blue colour. Glasses from the early lead-glass manufacturing period, circa 1675, have been chemically tested for lead as well as for specific gravity. The results show a progressive increase in lead content from early Ravenscroft glasses circa 1676, to late Hawley Bishopp glassware circa 1695, when the lead content was approximately 30% (Watts 1974: 74). Early Ravenscroft glasses contained 12 to 14% lead content and are often referred to as demi-lead glass. The Nonesuch sealed-stem fragment, excavated at Nonesuch Palace in London and believed to have been manufactured by Ravenscroft in 1680-1681, had a lead content of 25% (Watts 1974: 76).

Summary

The basic constituent of glass is silica, one of the most widely distributed elements in the world. Since its melting point is over 1720 C., it has been necessary to employ, among other ingredients, an alkaline flux, which has the effect of lowering its melting point.

When the making of glass vessels began in the eastern Mediterranean in about the second millenium B.C., the flux used was an oxide of soda, which occurred indigenously in
Egypt as a substance called natron. In Syria and elsewhere, the soda was recovered from the ash of certain burnt marine plants. Soda was the usual alkaline flux used throughout the Roman Empire and later in Venice, but inland glassmakers in northern Europe used potash instead, which was obtained by burning wood such as beech, ferns or bracken.

Towards the end of the fifteenth century, the Venetians perfected a colourless glass called cristallo, used for making fine-quality glasses. By the end of the seventeenth century, a heavy, clear potash-lime glass been invented in Bohemia (Frank 1982: 36). Forest-glass, waldglas, or verre fougère was utilized for five centuries in window glass and common vessel glass. Germany, Bohemia and Holland became the centres of the cut-glass and engraving industry.

George Ravenscroft, under the auspices of the Glass Sellers' Company, experimented with traditional glass constituents in the late-seventeenth century. His use of calcined flints, as a source of silica, and lead oxide resulted in the invention of flint glass or glass-of-lead, a heavy lustrous metal with a high refractive index. Popular and distinctive drinking glass styles evolved in England during the next century that took advantage of the properties of the new metal.
ENGLISH GLASS MANUFACTURE

Knowledge of glassmaking in England until the latter half of the sixteenth century is very meagre. Glassmaking was not practiced in Roman Britain to any known degree; it was more convenient to import glassware from the mainland, where the industry was highly organized and competitive (Ash 1975: 9). There were Roman glasshouse sites in Wilderspool, Cheshire and Caistor-by-Norwich, and a late Saxon one at Glastonbury. There were only about a dozen medieval glass furnace sites in England, compared with 168 in France, a reflection on the relative importance of the industry in England. It seems certain that if the Britons did make glass, production did not continue long after the departure of the Romans (Kenyon 1967: 12).

In 1226, Laurence Vitrearius, Lawrence the windowglass maker, arrived in England from Normandy equipped with the knowledge needed to make verre fougère or potash-lime glass. He began to manufacture glass at Dyer's Cross, Chiddingford, by the Surrey-Sussex border, where forest fuel was plentiful. Lawrence and his son were awarded a royal charter to make glass for Westminster Abbey in 1300 and were considered to be the founders of a permanent glass industry in the Weald. The Weald of Surrey, Sussex and Kent was a major rural glassmaking centre in England until the early seventeenth century (Crompton 1967: 12).
The fashion of using glass drinking vessels was introduced into England gradually during the sixteenth century. Before then, the nobility drank from silver or pewter goblets and stoneware cups, while the rest of the English population used pewter, ceramic, wood and horn drinking vessels (Buckley 1912: 11). At the beginning of the sixteenth century, drinking glasses were an imported luxury enjoyed by the wealthy in England; by mid-century, glassware use was more common among the gentry, but it was still a scarce and valuable commodity. By the end of the sixteenth century, ordinary forest-glass drinking vessels were fairly common throughout the country among all classes, although the wealthy continued to prefer imported colourless glassware from abroad (Buckley 1912: 11).

The change to glass for tableware in Britain was initiated by a growing trade with Venice, the centre of European glass manufacture since the thirteenth century. During the first half of the sixteenth century, the bulk of England's glassware imports came from Venice, but later, fine-quality glass was also imported from Bohemia, Germany and the Low Countries, now Holland, Belgium and Northern France. However, the expense and inconvenience of importing so fragile a commodity from abroad eventually led to efforts being made to introduce the art of fine glassware manufacture into England. Continental glassware styles were to have a profound influence on English tableglass design
and manufacture, during the sixteenth, seventeenth and early-eighteenth centuries.

The art of making fine-quality clear glassware reached Britain from the Netherlands, and was established there on a permanent basis from 1567 onwards (Klein and Lloyd 1984: 90). The importance of Antwerp for the development of the English glass industry was considerable; entrepreneurial initiative from that city enticed craftsmen, trained in the traditions of Lorraine, Normandy, Venice and Altare, to come and settle in Britain. When the glassmen arrived in England, early in the reign of Elizabeth I, they had to revive an almost extinct tradition and craft (Godfrey 1975: 8-9). The credit for revitalizing window glass manufacture in England and introducing the manufacture of fine cristallo tableware to London in the sixteenth century belongs to Jean Carre, a glassmaker from Flanders, who had worked in Antwerp (Crompton 1967: 15). Upon his arrival in England, in 1567, he successfully established a glasshouse in the Weald for window glass production and another in London, at Crutched Friars, with a Venetian-type furnace, to make cristallo (Godfrey 1975: 16-17). Under a series of patents, from 1575 and continuing for nearly sixty years, fine-quality soda-glass was produced in English glasshouses by European craftsmen or by English glassmakers working under their direction. (Ash 1975: 202).

In 1574 Jacopo Verzellini, a Muranese glassmaker,
succeeded Carre at Crutched Friars. In 1575, he was granted a virtual monopoly by Elizabeth to make glass in the façon de Venise style in Britain, and under the terms of the monopoly, was expected to instruct local glassmakers in the art of making fine-quality glass (Crompton 1967: 15). Verzellini established a tradition in English glass manufacture, which enabled Sir Robert Mansell in the seventeenth century to lay the foundations of a national glassware industry.

Two quite separate markets were catered for during the mid-sixteenth century in England: one, the Wealden window and vessel glass industry for making common domestic glass, which was scattered, migratory and open to any sort of competition, and two, the London-based cristallo industry, protected by a royal monopoly and controlled by a single family (Klein and Lloyd 1984: 91). By 1590, the English glass industry was still divided into two separate and distinct branches. In 1614, both branches came under the control of a single monopoly indirectly brought about by a lack of fuel. During Elizabeth's reign there were frequent complaints of wood shortages, and as the glass industry expanded, it became increasingly difficult to obtain adequate supplies of fuel-wood (Crompton 1967: 15). In 1615, an edict was passed prohibiting many industries from using wood for fuel. This was a turning point of great significance in the history of English glass production,
because it led to experiments in using coal, rather than wood, to heat glass-making furnaces (Godfrey 1975: 48).

Sir Robert Mansell came into the glass industry in 1615, shortly before the official proclamation prohibiting the use of fuel-wood. He joined forces with Thomas Percival, the man credited with the invention of the coal-burning furnace, and together they pioneered the use of a coal-fuelled furnace for making glass. In 1623, Mansell obtained a comprehensive patent that gave him the sole right to make "all manner of drinking glasses, broad glass, window glass, looking glasses..." (Honey 1946: 97).

The successful change from wood to coal for fuel in glassmaking meant that all types of glass manufacture could be located in the same area under one monopoly (Godfrey 1975: 48). Glassmaking now developed in coal-producing areas, instead of rural forests, in big cities, preferably port cities that could be served by coal-bearing ships. It was no longer a rural affair, but an urban industry with centres at London, Stourbridge, Newcastle and Bristol (Frank 1982: 33). Nevertheless, the manufacture of fine-quality glassware in England was still a limited and expensive business due to the protective monopolies that continued to control the production of vessel-glass through the next fifty years (Delomosne 1985: 2).

In 1664, The Worshipful Company of Glass Sellers was granted its charter by Charles II, to encourage production
of English fine-quality glassware. The Glass Sellers' Company was a city guild that controlled the entire vessel-glass industry in England. The charter empowered them to "enforce standards in vessel glass manufacture, levy fines and other punishments on recalcitrant masters, journeymen and apprentices; and above all to search for false and deceitful goods" (Charleston 1984: 105)

To a large extent the glass-selling trade in Britain was dependent on imports at this time, due to the restrictions on output caused by the continuing monopolies. Many glass sellers preferred to import Venetian glasses made to order, to suit English usage and taste, rather than rely on the limited, expensive local production. These circumstances compelled the Glass Sellers' Company to arrange the ordering and selling of considerable quantities of glass from abroad.

Between 1667 and 1673, a firm of London glass sellers, Measey and Greene, conducted a correspondence and trade with Alessio Morelli of Murano, a Venetian glass manufacturer. Greene's letters to Morelli were accompanied by more than 400 drawings to scale, illustrating the size and shape of the glasses commissioned, and noting the quantities desired (Charleston 1984: 104). The drawings, referred to as the Sloane Manuscripts #857, are preserved in the British Museum. They provide the documentary evidence for drinking glass styles that were fashionable in England at the time of Charles II, circa 1670, and illustrate the type of glassware
that local glasshouses would have produced at the time, had they been capable of doing so (Klein and Lloyd 1984: 104). The Greene designs ushered in a new concept of drinking glass that placed solidity and capacity above delicacy (Charleston 1984: 106).

Anglo-Venetian glassware and imports were the only types of tableglass available in England until the invention of lead crystal circa 1675-1676. The unsatisfactory quality of the imported glassware and frequent breakages, during transport, provided the impetus for the Glass Sellers' Company to instigate research toward making the English glass industry independent of imports. In 1673, they appointed George Ravenscroft, a London glassmaker who had an established reputation as a chemist and a thriving glasshouse in the Savoy, to head the research. His experiments were concerned with making an improved metal from local ingredients and the components, utilized by Ravenscroft, were calcined flints for the silica, and potash and lead oxide for the alkali. For some time, in addition to the silica which consisted of sand and calcined flints, he had used an excessive amount of alkaline flux in order to make the calcined flint more fusible. This produced an unfortunate condition in his glass called crizzling, where the glass developed a white, foggy opacity. Ravenscroft substituted oxide of lead for a portion of the alkali with the object of curing the defect. The successful result was
Figure 22. Rudimentary, facet-cut, centrally ball-knopped stem, bell bowl with eight cut oval flutes on body, domed, terraced foot. Lead metal. English or Irish manufacture. Circa 1815. Courtesy: The Royal Ontario Museum, Toronto.
the production of a stable, heavy type of lead glass called flint glass. By 1676, after the new glass-of-lead seemed to have overcome its initial tendency to crizzle, the Glass Sellers' Company marked the improved product with a rebus, a seal in the form of a raven's head, to honour Ravenscroft's accomplishment and to distinguish his glassware (Ellville 1951: 63). The improved metal provided glassmakers with a material so superior that it set English glassware ahead of all rivals for more than a century (Delomosne 1985: 2).

Ravenscroft and his Italian assistant, De Costa, did not actually invent the use of lead oxide in flint glass. Lead had been used centuries earlier by the Romans, and flint is the Latin word for a very pure silica. Antonio Neri, a Florentine glassmaker, wrote a glass formula book in 1612 L'Arte de Vetraria, where he states that lead glass was "as to colour the finest and noblest glass". Neri's book was translated into English by Christopher Merrett in 1662, and the translation may have helped Ravenscroft in his early glassmaking experiments (Crompton 1967: 19).

Existing glasshouses discarded their soda metal and adopted Ravenscroft's glass of lead, and new glasshouses sprang up all over the country to exploit the lead metal (Ellville 1951: 63). By 1685, lead glass of good quality, free from crizzling, was being made by most progressive glasshouses in London (Charleston 1984: 127). There were eleven glasshouses in London producing fine-quality lead
glassware by the end of the century (Haynes 1959: 196).

After Ravenscroft's death in 1681, his factory at the Savoy was run by his partner Hawley Bishopp, who continued to experiment in the manufacture of glass-of-lead. From 1681 to 1695, he produced glassware in a similar style to Ravenscroft with a few minor improvements in proportion (Noel-Hume 1968b: 188).

By 1690, as a result of these late-seventeenth century experiments, a widespread industry unhampered by private monopolies was established for the creation of high-quality glassware in England. The period from 1690 to 1830, following the general adoption of lead metal by English glasshouses, was a time of great achievement in English tableglass manufacture. The best and most characteristic work was performed in the area of drinking glass stemware for actual use. The simplified designs of Robert Mansell and John Greene pointed the way towards the development of a distinctively English style, in the evolution of stemware styles during the next two centuries.

The Evolution in English Glassware Styles

The late-seventeenth and eighteenth century English drinking glass styles have been discussed and classified by many writers since Hartshorne published the first glassware chronological grouping, in 1897, in a monumental work: Old English Glasses. Order was brought to the subject later by
E. Barrington Haynes in his book *Glass Through the Ages* (Penguin Books 1948, revised 1959). Subsequent writers, scholars and collectors have used Haynes classification of eighteenth century drinking glasses, each, with a few modifications of their own. Balustroid for example, is one of Haynes' terms that has not been used consistently in the literature, and many authorities prefer the more expressive term, light baluster.

Harry J. Powell, W.A. Thorpe and G. Bernard Hughes are the authorities on very early English glass. Powell's work *Glass Making in England* (1923), Thorpe's two books, *English and Irish Glass* (1927), and *English Glass* (1961, third edition), and Hughes' *English, Scottish and Irish Table Glass* (1956) described the historical events and technological problems surrounding glass manufacture in England, prior to the invention of lead-glass in 1675. They focused on the influence of continental styles on English drinking glasses in both lead and non-lead glass and explained why the façon de Venise styles inspired glassmakers everywhere. The books provided illustrations of the various drinking glass styles, which became fashionable during the stylistic evolution of English tableware.

Where a discrepancy existed, between literary sources for the dates of certain stemware styles, the explanation possibly lies in the overlapping of popular styles in a certain country. It may have to do with the elapse of time
between periods when a glassware style was invented and produced, its popularity in the country of origin, and when the style was considered an exportable commodity.

Drinking glasses conveniently fall into a classification system according to their stem formation (Ellville 1951:64). Stemware was usually made in three parts; the bowl, stem and foot being made from separate gathers of glass (Figure 4). An exception was the drawn straight stem with a trumpet bowl, where the stem was drawn out from the bowl and made from the same gather of glass, and considered to be of two-part manufacture, with a separate foot (Bickerton 1984: 4). Changes, during the evolution of stemware styles, occurred mainly in the stem form, and it is therefore considered to be the most important feature for dating purposes (Noel-Hume 1968b: 189).

Basically the evolution in drinking glassware followed the prevailing changes of style, according to needs and taste, in architecture and furniture design in England, during the late-seventeenth, eighteenth and nineteenth centuries. For example, the generic term baluster is derived from the shape of an architectural feature, which was copied, usually inverted, in glass stemware designs for three centuries (Bickerton 1984: 6).

Stemware styles passed through the seventeenth and eighteenth-century baroque period of massive form and elaborate decoration, i.e., heavy balusters and baluster
Figure 4. Stemware Nomenclature. Stemware is a general term for vessels consisting of a foot, a stem and a bowl. (Drawing author)
knop variations, and into the rococo period of circa 1720-1740, characterized by elaborate designs intended to provide a fragile and delicate effect i.e., straight stems, light balusters and air-twists. They continued to evolve through the Neo-Classicism of the Adam period, circa 1760, where a light elegant, essentially decorative design and style were fashionable i.e., faceted stems and some of the rudimentary stem styles (Appendix B: Glassware Terminology, page 261).

Most of the fine-quality soda-glass tableware, manufactured in England from 1567 until the 1670s, was made by international craftsmen in the current continental styles. As such it cannot really be called English glassware per se, but Anglo-Venetian, manufactured in the façon de Venise style. Glassware, made outside of Italy, in the delicate elaborate style of Venice, is called façon de Venise, literally... in the style of Venice. Glassware manufactured in England by continental glassmakers is known as Anglo-Venetian glass made in Venetian or continental styles.

The few surviving glasses attributed to Giacomo Verzelini, one of the earliest Venetian artists working in England, are an example of the elaborate, delicate façon de Venise style of glassmaking in England, circa 1572-1592 (Figure 5: a). Verzelini's cristallo glasses, direct copies of current European styles, were hollow-blown with ribbed or plain button-knopped stems. Their round funnel or bell-shaped bowls were large in proportion to the stems, and
Figure 5. Non-lead façon de Venise stemware styles.

b & c) Early Mansell period, hollow-blown inverted baluster, wide or round funnel bowl, plain foot. Circa 1615-1640. After Buckley 1914: plate x.

d, e & f) Late Mansell period, hollow-blown ribbed or plain button-knopped stem, flat-based or round funnel bowl, plain foot. Circa 1640-1660. After Thorpe 1961: figure 7.
(Drawing author)
there was often gadrooning or rigaree decoration around the base of the bowl. A merese or sharp bladed collar separated the stem from the bowl and/or from the foot; the foot rim was plain or folded. These glasses were one-of-a-kind collectors' items, not meant for actual use, and most of them were decorated with diamond-point engraving, which commemorated an important occasion to their owners. During the Mansell era of tableglass manufacture in England, circa 1615-1656, fine-quality drinking glasses were made of soda-glass in the continental style, but without the elaborate Venetian decoration (Crompton 1967: 18). Those produced in London circa 1620, were extremely tall and urn-shaped, the design based on the simple turnery of current silver and furniture styles, almost in the shape of an elongated inverted baluster. Alternatively, they could be short stubby inverted balusters (Figure 5: b & c). The ribbed or wrought button stem was a popular stem feature later in the Mansell period, circa 1640-1660, with gadrooning or rigaree decoration often seen around the base of a round funnel or bucket bowl (Figure 5: d, e & f). A merese or short collar might separate the stem from the bowl and/or the stem from the foot, and the foot rim could be plain or folded, or decorated with rigaree along the outer rim. The glasses were made of thin, fragile soda-glass (Noel- Hume 1968b: 185). English copies of the fragile and elaborate façon de Venise styles, attempted during Mansell's monopoly circa
1623-1649, had elaborate stem forms incorporating entwined serpents with coloured, twisted or pincered crests, fins or wings. Coloured or milky-white, trailed filagree or rigaree cordons were another form of stemware decoration popular on the Continent (Noel-Hume 1968b: 185). The whole effect of these elaborately fashioned imports was one of fussy embellishment, utterly unsuited for ordinary use as a drinking vessel (Figure 6). Between 1660-1672, Anglo-Venetian soda-glasss, made in the façon de Venise styles, continued with similar stem formations. The button-knopped stems were ribbed, plain and/or elongated, a merese often encircled the bowl-base with or without rigaree decoration. Another merese might separate the stem from the foot, which could be domed or plain with a folded rim. These glassware styles were copies of stemware designs produced in the Low Countries as well as Venice (Figure 7 and 8). The influence of continental styles on English stemware continued from the sixteenth century to the beginning of the eighteenth century, with similar styles evolving in soda and potash-glass and lead-glass simultaneously by the end of the seventeenth century (Noel-Hume 1968b: 185).

From 1662 to 1667, the London Glass Sellers' Company was forced to import most of its glassware from Venice in order to supply a growing English market. By this time, glassware use had spread farther down the social ladder and larger, heavier, more capacious glasses, meant to be used
Figure 6. Elaborate façon de Venise goblet. An example of the decorative style in continental table glass manufacture, during the late-seventeenth century. Non-lead metal, probably of Bohemian or Low Countries' manufacture. Circa 1670. After Klein & Lloyd 1984: 108. (Drawing author)
Figure 8. Façon de Venise goblet, diamond-point engraved. Hollow-blown, ribbed melon-shaped stem, solid-base conical bowl, folded foot. Non-lead metal. Probably of Bohemian or Low Countries' manufacture. Circa 1665.

Courtesy: The Royal Ontario Museum, Toronto.
for everyday use in taverns and ordinary households, became popular for the beverages of common people, such as beer, ale and home-brewed concoctions (Figure 9). Glass sellers' companies, such as Measey and Greene for example, ordered many varieties of custom-made soda-glass tableware from Venice, to their own specifications, and not strictly in accordance with current Venetian styles. These glassware styles were in a sense, English styles made in Venice (Haynes 1959: 73).

Few of the designs were original. The styles ordered from Venice had evolved during Mansell's era, as being more suitable for the requirements of English use and taste (Buckley 1912: 12). A typical group of glasses from Greene's drawings, of 173 glassware vessels, is shown in figure 10. Most of the button-knopped stemware had flat-based straight funnel bowls, except in the case of beer glasses, whose bowls were conical and tapered to a point at the stem-bowl junction. The bowls were deep, and the plain feet were substantial, to give strength and stability to the glass (Noel-Hume 1968b: 187). Every taste was apparently catered to by Greene: in his drawiings, there were flutes and versions of the German roemer, as well as sturdy tavern glassware styles for beer and wine (Ellville 1951: 62).

Ravenscroft's invention of lead glass, in the late-seventeenth century, facilitated a change in style in English drinking glasses. His successful glassmaking
Figure 9. Examples of Anglo-Venetian stemware.


(Drawing author)
Figure 10. A group of John Greene stemware designs for glassware to be made in Venice. Circa 1666–1672. After the Sloane Manuscript #857, British Museum. Ms.: Courtesy Microfilm Library, Corning Museum of Glass, Corning, New York.
experiments produced a new English metal and a distinctive glassware style to accommodate it. At first Continental styles were attempted in the new lead metal, and the influence appears in glasses with applied ornamentation on the stem in the form of pinched trail and pinceried work. The bowls often exhibit ribbed or flammiform gadrooning or a rigaree decoration around the bowl base (Figure 11). Many of Ravenscroft's early Venetian-influenced stems were decorated with ribbed or wrythen moulding, and he made lead-glass versions of the German roemer as well (Crompton 1967: 19), (Figure 12: e & f).

A transformation from elaborate Venetian styles to the plainer baroque lines came with the realization that lead metal was more suited to graceful curves than elaborate decorative detail (Figure 12: a, b & c). The change provided the strength and durability that had been lacking in Venetian glassware (Charleston 1984: 115). By the beginning of the eighteenth century, English lead glassware had acquired a distinctive style and continued to develop along almost totally English lines (Buckley 1912: 14). The new metal, admirably suited to English fashion and taste, was heavy, brilliant, solid and durable. It imposed a discipline upon glassmakers, inevitably compelling them to concentrate on simple elegant forms that took advantage of the lustrous, metal with its light-refracting powers (Davis 191: 7-8). Most of the surviving Ravenscroft drinking
Figure 11. Lead metal façon de Venise goblet.  
Round funnel bowl with spiked flammiform gadrooning around bowl-base, winged pincered quatrefoil-knopped stem, conical folded foot.  
Courtesy: The Royal Ontario Museum, Toronto.
Figure 12. Ravenscroft period, lead façon de Venise stemware styles.

a, b & c) Sealed Ravenscroft glassware, hollow-blown short inverted baluster stem, conical or round funnel bowl, plain or folded foot. Circa 1675-1685. After Buckley 1913: plate xi.


(Drawing author)
glasses exhibited the beginning of a distinctive English style: simple, unadorned and substantial. They consisted of a short, hollow-blown inverted baluster with a conical or round funnel bowl set directly on the stem, and a plain foot (Figure 13: a). In all the surviving sealed Ravenscroft glasses, the bowl merged directly with the stem without an intervening merese (Charleston 1984: 117). Alternatively, the inverted baluster was pinched into a four-lobed or quatrefoil shape (Figure 13: b). The stems were considerably shorter than the bowls, a feature that originated in Venice and continued to be popular for some time. Both of these stem styles were illustrated by John Greene in his letters to Morelli between 1667 and 1673.

Successors to the Ravenscroft style of glassware have been found, recovered mainly from excavations in England. These glasses have been attributed to Hawley Bishop, Ravenscroft's partner at the Savoy glasshouse, who had continued to experiment with early lead-glass styles, after Ravenscroft's death in 1681 (Charleston 1984: 128). He followed the Ravenscroft design of a short inverted baluster profile with a straight-sided funnel or round funnel bowl, but improved the proportions by lengthening the stem and decreasing the depth of the bowl (Figure 14: a, b & c). Smaller versions of the two types of Ravenscroft bowl, made by Bishopp, have been found on stems that had a hollow-blown flattened-quatrefoil knop set on top of a plain
Figure 13. Incipient demi-lead baluster stemware, Ravenscroft and Bishopp periods.

a) Hollow-blown, short inverted baluster stem, straight-sided funnel bowl set directly on stem, slightly rising foot, thinly-folded rim. Circa 1675-1680.

b) Hollow-blown, quatrefoil, four-lobed, inverted baluster stem, round funnel bowl set directly on stem, slightly rising foot, thinly-folded rim. Circa 1685-1690.

After Charleston 1984: 117, figure 22.
(Drawing author)
Figure 14. Heavy baluster stemware styles, circa 1680-1730
a, b & c) Inverted baluster or straight stem, flat-based, conical or round funnel bowl, folded foot. Hawley Bishopp period. Circa 1685.
d) Teared inverted baluster, round funnel bowl, basal knop, folded foot. Circa 1700.
e, f & g) Massive, teared inverted baluster. Circa 1700. After Buckley 1913: plate xii.
(Drawing author)
capstan stem (Figure 12: d, page 57), or alternatively on an inverted baluster stem (Figure 14: a, page 59).

Associated with the production of fine English glasses during the last twenty years of the seventeenth century was the manufacture of a plain and sturdy type of glassware meant for use in inns, taverns and minor households (Figure 15). These glasses were made from less expensive demi-lead metal, and show a crude, irregular construction. There were plain baluster stems (Figure 15: a, b & c), and drawn straight stems with trumpet bowls (Figure 15: e). These popular tavern glassware styles, could be called the offspring of the earlier John Greene designs, as well (Buckley 1913: 33).

Balusters include stemware, which appeared in England, from Mansell's and Greene's time for nearly one-hundred years, but which were modified in various ways depending on where and when they were made (Ellville 1951: 64). The baluster stem had been a popular stem form on the Continent since the fifteenth century. In the late-seventeenth century, glasses with baluster stems mark the beginning of stemware styles that can claim to be distinctly English; they were among the first glasses to be produced in Ravenscroft's new glass-of-lead.

The heavy baluster period, in eighteenth-century England, produced a number of variations in style, from an earlier, more elaborate Venetian-style baluster in non-lead
Figure 15. English Lead tavern glassware, of cheap and irregular construction. Circa 1690-1775.

a, b & c) Teared inverted baluster, flat-based or round funnel bowl, folded or plain foot. Circa 1740.
d, & f) Teared or solid straight stem, bell, drawn-round funnel bowl, folded or plain foot. Circa 1740-1775.
e) Teared drawn straight stem, trumpet bowl a
After Buckley 1913: plate xv drawn trumpet bowl, folded foot. Circa 1690-1740.
After Buckley 1913: plate xv iii.
(Drawing author)
metal to a simple, elegant and uniquely English lead-metal example that remained in vogue until 1730. The inverted baluster could be long or short, squat or graceful; it could be solid or teared, from a tiny bubble to an irregular cavity, semi-hollow or truly hollow. The hollow-blown, lead-metal variant of the baluster was the earliest of the baluster stem formations, circa 1675-1710, in the English baluster stem period.

The inverted baluster frequently appeared as the single feature of a glassware stem, or there could be a knop above and/or a basal knop below. Characteristically, the bowl was a solid-base conical or round funnel, although the bell-shaped bowl appeared later. The foot was domed with a folded rim at the beginning of the baluster period, but by 1710, usually was domed and plain (Wilkinson 1968: 114). Nevertheless, the functional and decorative folded foot, which gave increased strength to the outer rim, was continuously in use on some glasses until 1745 (Ellville 1951: 85). In the first-half of the eighteenth century, until the advent of cut-glass in 1760 eliminated the pontil mark, stemware feet were made in a slightly rising or conical domed-shape to prevent the pontil mark, on the underside of the foot, from scratching a table surface (Bickerton 1984: 6).

The inverted baluster stem-form underwent a number of changes between 1685 and 1730. The stem was lengthened
gradually, and the simple inverted baluster-stem component was replaced or elaborated to include a wide variety of knop forms (Noel-Hume 1969: 16). The stem consisted of a single knop or combination of knops, and the shapes varied. Some were geometric, i.e., the round ball, elliptical ovoid, or the cylinder, while other knop shapes were inspired by nature, such as the acorn and the mushroom (Figure 16). A few of these styles were produced during the light baluster period as well, circa 1725-1760. The approximate dates for the knopped variations of the English baluster stem are given in order, from their first appearance to the end of their period of relative popularity:

<table>
<thead>
<tr>
<th>Inverted baluster</th>
<th>1675-1710</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opposing balusters</td>
<td>1685-1730</td>
</tr>
<tr>
<td>Drop knop</td>
<td>1690-1710</td>
</tr>
<tr>
<td>Angular knop</td>
<td>1690-1720</td>
</tr>
<tr>
<td>Ball knop</td>
<td>1690-1740</td>
</tr>
<tr>
<td>Acorn knop</td>
<td>1700-1725</td>
</tr>
<tr>
<td>Mushroom knop</td>
<td>1705-1720</td>
</tr>
<tr>
<td>Cylinder knop</td>
<td>1705-1730</td>
</tr>
<tr>
<td>Annulated knop</td>
<td>1710-1730</td>
</tr>
<tr>
<td>True Baluster</td>
<td>1710-1730</td>
</tr>
<tr>
<td>Ovoid or Egg knop</td>
<td>1710-1740</td>
</tr>
<tr>
<td>Multi-knopped</td>
<td>1710-1760</td>
</tr>
<tr>
<td>Dumb-bell knop</td>
<td>1715-1725</td>
</tr>
<tr>
<td>Bobbin knop</td>
<td>1725-1750</td>
</tr>
<tr>
<td>Annular knop</td>
<td>1730-1760</td>
</tr>
</tbody>
</table>

(Bickerton 1971: 2-7; Haynes 1959: 211-216 and Noel-Hume 1968b: 190-191, figure 64). These figures represent an average date for a style period, compiled from the data supplied by numerous authorities on English glassware styles.

The first-thirty years of the eighteenth century were devoted to the development of shapes, stem shapes as shown
Figure 16. English Baluster Stemware Knop Formations. After Ash 1975: 178-180. (Drawing author)
above, and bowl shapes, created to grace the stems in good proportion (Figure 17). Stemware bowls were usually made for specific uses and certain contents i.e., claret, champagne, cordials, and desserts (Noel-Hume 1969: 16).

During the period 1675-1825, glasses were hand-blown, although some moulding techniques were used to gain a special effect, as in the moulded pedestal (Silesian) stem for example. The stems were often referred to as Silesian because of their continental origins (Delomosne 1985: 3). This stem was an intrusive element in English glassware design, arriving in England from Germany with the accession of the Hanoverian kings to the English throne. The moulded pedestal stem-form derived from the flute-cut baluster, which was the most popular form of Bohemian and Silesian glassware in the first-half of the eighteenth century (McNally 1982: 47). The earliest form of the moulded pedestal stem, of which few survive, had four flat sides tapering towards the foot. A few of them had crowns on the shoulder, and there was often a tear in the stem. The four-sided Silesian stems are dated to 1715. Gradually the number of sides increased, to six, then eight, ending circa 1760, with a debased, badly-formed stem that had lost the crisp elegance of the earlier forms. Like many glasses of the late-seventeenth century, these glasses had solid-based straight, funnel bowls, but the bell and thistle bowls became popular on later models, the latter being particularly
Figure 17. English Stemware: Bowl Types, Foot Forms
After Haynes 1959: 194-199. (Drawing author)
successful with Silesian stems of all kinds (Ash 1975: 175).

About the first quarter of the eighteenth century, because of increased demand and because glassware was sold by weight in the early years of the lead-glass industry, drinking glasses became lighter, the stems slimmer, and the knops less substantial. Multi-knopped, bobbin and annular knopped stems typify the light baluster style. The bowl forms from the earlier period continued, but without a solid base; the trumpet, and round funnel and bell bowls predominated. The ogee-shaped bowl began to make its appearance in conjunction with the lighter stem about the same time, and it was a popular bowl-shape until the end of the century (Bickerton 1984: 9). The lightening of the stem was a gradual process, and the transitional period produced some beautiful examples of English lead crystal glass, often in multi-knopped forms, where three or four different knops were employed in balanced proportion (Delomosne 1985: 4), (Figure 18).

Throughout the long evolution of the baluster and light baluster stems in England, a parallel tradition in English glass manufacture occurred with the straight stem-style of drinking glass. The style originated in the Low Countries during the fifteenth century, and a tall straight-stemmed soda-glass version, with a drawn trumpet or flute bowl, was always fashionable on the Continent (Klein and Lloyd 1984: 131), (Figure 19). Drawn stemmed glasses, made from soda-
Figure 18. Multi-knopped stemmed goblet, short collar, inverted baluster, flattened ball knop, true baluster, pointed, round funnel bowl, domed plain foot. Lead metal. English manufacture.
Circa 1740
Courtesy: The Royal Ontario Museum, Toronto.
glass existed in the seventeenth and eighteenth centuries in England, and in numerous lead-glass varieties, during the eighteenth century (Figure 20 & 21). Lack of distinguishing characteristics makes them difficult to date, though a high proportion of them had a folded foot that suggested a date of circa 1720 (Ellville 1951: 65, figure 21). The majority of straight-stemmed glasses were of two-piece manufacture, and this included straight stems with ogee, ovoid and funnel bowls, and most had a folded foot (Haynes 1959: 246). Plain stems were frequently teared: indeed a tear at the top of the stem was a common decorative effect on early plain stems (Bickerton 1984: 11). In glasses with a waisted bowl, the tear was confined to the bowl-base (Haynes 1959: 246).

In 1745, an excise tax was imposed on the glass and ceramic industries in England. It put an end to the generous use of lead metal in glassware styles and prompted the invention of new decorative techniques where the accent was on the decoration of the glass rather than on the perfection of its form. Plain, hollow-stemmed styles of glassware provided for a means of weight reduction in the stem to the extent that for cheapness, a stem might have an irregular cavity running from top to bottom, which saved on metal weight for common domestic glassware. Obviously this was a method of glass decoration that did not add weight or expense to the product, but the resulting glasses were too fragile to withstand daily use and soon passed out of
Figure 20. Teared drawn straight stem, round funnel bowl, slightly rising plain foot. Lead metal. English manufacture. Circa 1740
Courtesy: The Royal Ontario Museum, Toronto.
Figure 21. Teared drawn straight stem, drawn trumpet bowl, conical folded foot. Lead metal. English manufacture. Circa 1740-775.

Courtesy: The Royal Ontario Museum, Toronto.
favour. It seems that, in a further attempt to reduce weight, glassmakers also tried to reduce the level of lead in their metal, and some glasses, of circa 1745 to 1750, show much lower levels of lead under fluorescence, and an inclusion of some soda-glass in the melt (Klein and Lloyd 1984: 131). However, the plain straight-stemmed glasses were dull and uninteresting to the connoisseur of fine-quality table glass. Clearly a new method of glass decoration was needed that would enliven the plain straight-stemmed wineglass.

It was remembered that the inclusion of air, in the form of a bubble or a tear, had been used decoratively in early balusters and drawn-stemmed glasses. The principle was extended; several tears were introduced into a straight cylinder of glass, which was heated, drawn out and twisted to provide an attractive pattern of air filaments, just below the surface of the stem. The decorative device, used on a straight stem, produced a new style called the air-twist stem, popular circa 1730-1760. Twelve evenly-produced filaments were the most common type of air-twist decoration, forming what is known as a multiple-spiral air-twist stem. There were many variations of the air-twist, such as the incised twist, where the twist was moulded in close spirals on the stem exterior, and the cotton and opaque-twists. Air-twist stems were mostly found in combination with a trumpet or round funnel bowl and occasionally with a bell bowl. The
foot was conical, domed, or terraced with a plain rim (Davis 1961: 256).

Air inclusions were just one of the ways to enhance a plain-stemmed glass. During the second quarter of the eighteenth century, plain straight stems, manufactured in three parts, were popular and often wheel engraved. Wheel engraving had become popular with the flowered glasses of the early 1740s, especially on light baluster glasses with waisted or ogee bowls. The art of cutting table glass came into vogue in England about 1760. Before that time, English glasses had been sent abroad to be decorated, as the finest cutting and engraving decoration was performed in the Netherlands and Bohemia (Crompton 1967: 21). The cut-glass or facetted-stemmed wineglass was essentially a plain stem that lent itself admirably to modifications of facette and flute-cutting. The light dispersing qualities of lead-glass have already been mentioned, and when it was discovered how much cutting enhanced this quality, cut-glass began to be employed decoratively on all types of fine-quality glassware (Crompton 1967: 30). Little of the early-English, cut-glass survives, because much of it was destroyed and used as cullet when the costs of materials increased due to the excise tax levied on the industry. Straight stems were decorated with either diamond or hexagonal facetting and later, the facettes were cut in fluted shapes that extended the length of the stem, often up onto the base of the bowl
where it became bridge fluting. By 1765, the straight stem was expanded in the middle by a knop, and the cutting technique adapted to accentuate that profile, creating a multi-prismed effect. The whole stem was then ground and polished into a pattern of facettes (Noel-Hume 1968b: 193). Eventually, vertical flutes, which were less demanding to execute, became the more common type of decoration and it lasted well into the nineteenth century (Figure 22). The cutting and polishing technique led to an elimination of the pontil mark, on the underside of the foot, and the foot became flatter.

The predominant change in stemware styles during the 1770s was a pronounced shortening of the stem (Jones and Smith 1985: 39). Haynes classified a varied group of glassware, which have short stems in relation to their bowl forms, as rudimentary stems. Since they have such short stems it is difficult to date them exactly, but they seem to have been a popular drinking glass style throughout the eighteenth into the mid-nineteenth century. Early rudimentary-stemmed glasses can sometimes be identified by their bowl decoration i.e., flammiform gadrooning around the base. A folded foot frequently confirmed an early date as well (Haynes 1959: 292).

Rummers make up a large proportion of the rudimentary stemmed-style category and can be dated to 1770 at the earliest (McNally 1982: 99). The name rummer has nothing in
common with the earlier, seventeenth-century style of roemer drinking glass, or with the spirit rum. As a style of drinking glass they belong to the Neo-classical period circa 1760, and were derived from classical originals, in various materials, including silver and glass, which were discovered in the excavations of Herculaneum and Pompeii (Ash 1975: 163). They were produced in a large variety of shapes and sizes, from gigantic specimens used for serving toddy or punch by means of ladles and toddy-lifters, to small dram glasses. The earliest examples had an ovoid bowl, made in one piece with a short stem, the foot was circular or square. The round-footed type was the most common and resembled an ordinary china egg-cup. Most of the early rummers were entirely plain, while a few had moulded-fluting on the lower-half of the bowl. The general impression of these glasses was that they would not have belonged in a formal, elegant setting, but were plain glassware for daily domestic and tavern use. The two-piece rummer with an ovoid bowl, short plain stem, and circular or square foot remained widely popular up to the end of the eighteenth century (Ash 1975: 164).

In the last decade, a three-piece version, with bowl, stem and foot made separately, was offered as a more expensive alternative (Ash 1975: 164). The bowl was ovoid or had an incurved bucket-shape and the stem was centrally-knopped or bladed. After 1800, rummers frequently had from
one to three collars or pads under the bowl (Jones and Smith 1985: 47, figure 50). The lower-half of the bowl was often decorated with cut-fluting, and other designs of a classical origin were frequently used, such as bands of fine or coarse diamond-cutting around the bowl rim (Figure 23). When such a rummer had a square foot, it was fairly thin and flat with polished edges. The pontil mark was removed from the base, which then may have been cut in a star pattern consisting of splits radiating out from the centre. These glasses were usually made from a superb quality metal (Ash 1975: 165).

During the last few years of the eighteenth century, the bucket-shaped bowl, which had been a popular bowl form on numerous stems for over 150 years, appeared in proportions appropriate to the rummer. In general, the bucket bowl-type of rummer began in the late 1780s and became increasingly fashionable during the nineteenth century. It had a centrally-bladed or knopped stem and the moulded foot was often square. An unusual type of foot, consisting of a hollow dome with radiating flutes or channels of v-section underneath, which reflected light up through the glass, was set on top of the base. The foot has been described as a lemon-squeezer design.

In the early-nineteenth century, rummers with bucket-shaped bowls, decorated with cut panels, centrally-knopped or bladed stems and/or plain or decorated feet were in fashion (Jones and Smith 1985: 48). They were of such high-
Figure 23. Rudimentary stem with centrally-bladed knop, ovoid bowl decorated with a band of fine diamond-cutting pattern around the upper-half and thirteen v-shaped cut-facettes on the bowl-base, star-cut round flat foot. Lead metal. English manufacture. Circa 1800-1820. Courtesy: The Royal Ontario Museum, Toronto.
quality that they frequently graced formal table-settings (Figure 24). Rummers and wineglasses of this style and type were very prevalent in naval and military circles, during the late eighteenth and nineteenth centuries (Jones and Smith 1985: 48, figure 52).

In diminished proportions, a wineglass style with flute-cut bucket bowl and centrally knopped or bladed stem imitated this form, and became the standard wineglass of the first-half of the nineteenth century (McNally 1982: 103, figure 78). The pontil mark was finished, or removed, on all fine-quality glassware styles of the latter part of the eighteenth and the nineteenth centuries.

Tumblers are beakers with a flat base, a commonly recognized drinking vessel of simple form, varying in shape and size. As a style and type of drinking glass, they defy the general rules of chronology and typology applied to stemware. They generally had a flat or shallow, concave base, a plain rim, and a circular horizontal cross-section (Jones and Sullivan 1985: 143). The earliest examples tended to have a high kick in the base (Figure 25: a). A concave-sided form became popular in about 1740, and during the second-half of the eighteenth century, a cylindrical form appeared (Ash 1975: 200). The majority of tumblers were plain, but a few of the better-made examples were decorated with diamond-point or wheel-engraving, cut-fluting, or pattern-moulding (Jones and Smith 1985: 35). During the
Figure 24. Rummer, short centrally-bladed knopped stem, flat-based bucket bowl with six cut oval flutes on lower-half of bowl, collar below bowl-base, plain round foot. Lead metal. English manufacture. Circa 1800-1820.

Courtesy: The Royal Ontario Museum, Toronto.

eighteenth and nineteenth centuries, tumblers were common
table glass vessels, serviceable and versatile; when
necessary, tumblers might be used for anything from drinking
liquor to taking medicine (Jones and Smith 1985: 35).
Although they were common, tumblers were not necessarily
cheap since glass was sold by weight, and a tumbler
generally weighed more than most stemware (McNally 1982: 63,
figure 35).

A type of footed tumbler, the jelly glass was a small
concave-sided vessel with a ring-based foot (Figure 25:b).
Although occasionally used for common neat spirits such
as gin or rum, these glasses were specifically designed to
serve jelly and other prepared sweet desserts such as custard,
sylabub and ices. Jelly and custards were sometimes served
in wineglasses in the early eighteenth century and possibly
later, but from about 1680 onwards, glasses made for dessert
concoctions made their formal appearance. The earliest
specimens were in the form of small rounded basins with
folded rims. In the early-eighteenth century, a trumpet
or funnel-shaped glass became popular, with or without
handles, on a short stem with a ring-base foot
ANALYSIS OF THE PORT ROYAL GLASSWARE COLLECTION

In 1985 and 1986, a group of 536 drinking glass vessels and sherds, recovered from a number of archaeological excavations in Port Royal, Jamaica, was assembled to form a tableglass collection. The artifactual material furnished the raw data for the interpretative and descriptive glassware analysis contained in this study.

Each vessel and sherd in the collection are identified by an accession or provenience number, which indicates the year of recovery and the artifact-location site. A detailed explanation of the sites and accession numbers is provided in the catalogue, page 124-125. The approximate locations and names of the sites are shown in Map 1., page 8.

Before the cataloguing process could begin, the glass was mended and crossmended, and a minimum vessel count was performed. The minimum vessel count was established by first identifying the kinds of glassware present in the collection and then by arranging them into meaningful categories by stylistic classification. All of the vessels and sherds, belonging to a particular category, were examined and the diagnostic attributes were counted. In any given category, the diagnostic attribute present in the greatest quantity was designated as the basis for the minimum vessel count. For example, in the case of the inverted baluster stem style-category, whole stems were present in the
number and were therefore considered to be the identifying attribute in this category. The number of vessels in each category was equal to the total number of the designated attribute present. Four-hundred and eighty-four recognizable drinking glass vessels were identified out of a total of 536 sherds.

Occasionally the uniqueness of an attribute, or combination of attributes, was used as the basis for vessel identification. For example several tiny fragments of a decorative stem element, which were identified as part of an elaborate façon de Venise goblet, were considered to be representative of a vessel rather than random sherds, as there was nothing in the collection that could possibly be associated with them.

The percentage of vessels in each stylistic category was calculated by taking the total number of vessels in a given category, dividing them by the total number of vessels in the collection, and multiplying by 100. The same method was used when it was necessary to estimate the percentage of sherds in certain style-categories i.e., where the sherd count was higher than the minimum vessel count.

It was decided that the analysis and study of the drinking glass vessels and sherds would be accomplished best by preparing a detailed evaluation of the recovered glassware in catalogue form, with the material presented in chronologically-arranged stylistic categories. The
classification method, used in the analysis of the Port Royal glassware, was suggested by Olive Jones and E. Ann Smith, glass curators in the Archaeological Research Division, Parks Canada, Ottawa. The descriptive format, used to document the Port Royal tableglass in catalogue form, was suggested by the Parks Canada Archaeological Records Department and modified by the author to describe the glassware. An explanation of the data sheet format is in the catalogue, page 126-127. During the cataloguing process, the vessels and sherds were measured, drawn, and photographed. The glassware was tested for lead content by fluorescence, using short and long-wave ultraviolet light.

Of the total number of glassware vessels and sherds that were analyzed and catalogued for this study, the greatest number of specimens came from the Anthony Priddy terrestrial excavation sites at New Street, Fort Charles and Saint Peter's Churchyard, with New Street being the most prolific. The second-largest group of drinking glass artifacts was retrieved by Robert Marx from his maritime site near Lime Street and Fishers Row. The excavation yielded representative examples of nearly every style-category in the catalogue, and most of the material has been illustrated in Wine Glasses Recovered From the Sunken City of Port Royal: May 1, 1966- March 3, 1968. Almost all of the drinking glass vessels and sherds that came from the INA/TAMU and New Street archaeological sites were recovered
from controlled archaeological contexts, which made it possible to determine the approximate dates of usage. While these dates did not necessarily coincide with the item's date of manufacture, the archaeological evidence provided important information about the styles of glassware in popular use during specific time periods in Port Royal.

A significant proportion of the recovered tableglass was unstratified and lacked controlled archaeological context, due to the effects of several hurricanes, earthquakes, severe floods, and the exceptionally high water table at Port Royal. Distinct time periods for this material were determined by grouping individual drinking glass specimens together, according to similarities in metal and style. The English lead stemware was particularly adaptable to this method of dating, owing to the fact that well-known and documented English stemware styles evolved in rapid succession during the late-seventeenth, eighteenth and nineteenth centuries. Changes occurred predominately in the stem form during the evolution of styles in English stemware manufacture (Noel-Hume 1968b: 189). Fortunately the stem, being the most substantial part of a stemmed drinking glass, survived the best on Port Royal sites and was therefore the most important and useful feature in the analysis, stylistic interpretation, and dating process. Bowl shapes and foot forms were certainly significant, but very few were recovered, sufficiently intact, to be useful for dating
purposes.

Drinking glasses are frequently named according to their specific uses or contents, i.e., wine, ale, sherbert or cordial glasses, champagne flutes, claret cups, or posset pots for example, but nomenclature based on this criteria has been inconsistent in the literature. Identification of specific stemware types, which have survived on archaeological sites, was difficult when based on bowl size, as they were the least able to survive intact for this purpose. The Parks Canada Glass Glossary (1985), by Olive Jones and Catherine Sullivan, was extremely helpful in defining terms used in catalogue records and reports for the description of tableware, as well as providing discussions on glass composition, and dated manufacturing and decorative techniques. It also provided guidance on the measurements to take, and attributes to describe.

Several archaeological site reports that listed tableglass, recovered from controlled and dated late-seventeenth century contexts, provided the substantiation to corroborate the approximate dating of the Port Royal glassware on stylistic merit. A relevant report, A Search for the City of Saint Maries (1983), by Henry Miller, furnished examples of Anglo-Venetian non-lead glassware and lead façon de Venise stemware, which were useful for comparison purposes and aided in the identification and classification of some of the early-dated glassware, recovered from Port
Royal sites. Saint Mary's City, an early colonial site in Maryland, was settled in 1634. Like Port Royal, it reached its peak of development in 1690, and there were many inns and taverns on the site. Another report, citing the recovery of tableware from the third-quarter of the seventeenth century, was Les collections archéologiques de la place Royale (1981), by Camille LaPointe. Place Royal, a French colonial site in Quebec, yielded a continuous line of drinking glasses, dating from 1682 to 1760, including many non-lead, wheel-engraved glass tumblers from the Netherlands and Bohemia. The report assisted in the recognition of the shape, size, and manufacture of many of the Port Royal tumblers, most of which survived in too fragmentary a state to be accurately identified for illustration purposes.

Other colonial site reports that aided in the stylistic analysis and dating, by providing comparative examples of drinking glass vessels and sherds, were Phillip Mayes' Port Royal Jamaica Excavations 1969-1970 (1972); Francoise Neillon's and Marcel Moussette's Le site de l'Habitation de Champlain à Québec: étude de la collection archéologique (1976-1980) (1981); Noel-Hume's Excavations at Rosewell (1962) and A Collection of Glass from Port Royal, Jamaica with some Observations on the Site, its History and Archaeology (1968a). Glassware from a Reputed Siege Debris Context at the Fortress of Louisbourg (1981), by E. Ann Smith, demonstrated how the use of a structured cataloguing
method had established successful control of a large collection of tableglass and permitted conclusions to be drawn about the site and its inhabitants.

In the following text, the discussion and description of a particular drinking glass will be referred to, and identified by, a plate number, i.e., Cat. Plate 1, which corresponds to a specific style-category in the catalogue.

The earliest-dated group of drinking glasses that survived on Port Royal sites were fragments of non-lead glassware known as Anglo-Venetian glass, made in the façon de Venise stemware styles. This type of glassware could have been manufactured on the Continent or made in Britain by English or European glassmakers. The glasses have been dated by stylistic comparison to circa 1630-1700. A few examples of early-dated Anglo-Venetian stemware, made in the façon de Venise styles, have been recovered from colonial sites of the period circa 1670-1685 (Noel-Hume 1968b: 187). The exact country of origin for this group was difficult to identify on stylistic merits alone, as many glass-manufacturing centres were making similar types of non-lead drinking glasses in the Venetian-inspired styles at this time, i.e., Bohemia, the Netherlands, and the Low Countries.

The majority of the Port Royal fragmentary stemware specimens were of the hollow-blown, plain or ribbed-button and quatrefoil knopped-stem variety. Probably made of soda-lime or potash-lime metal, they could have been manufactured
in England during the Mansell and Greene periods of glass manufacture, circa 1630-1680 (Cat. Plate 2: 3; & 5). Of this type, there were three ribbed melon-shaped knop stems with a merese or bladed knop separating the stem from a fragmentary bowl-base (Cat. Plate 4). The miniature stems averaged 27 mm in height. A well-preserved example of a hollow-blown quatrefoil knopped stem was recovered from the INA/TAMU excavation site (Cat. Plate 5). Dated to circa 1640-1675, it was light and delicate and probably formed the entire stem of a fine-quality stemmed drinking glass. An example of this type of stem is illustrated on page 50, figure 7. There were several examples of button knopped-stems that had surviving bowl-bases set directly on the stem. A number were decorated with a band of trailed-glass, called rigaree, around the bowl-base (Cat. Plate 2: c; Cat. Plate 3: a & c). This was a popular façon de Venise decorative technique employed on soda-glass stemware of the sixteenth century (Figure 9: a & c, page 53). Little else survived of these delicate and fragile non-lead glasses, with the exception of a single stemware foot fragment, which exhibited another use for trailed rigaree decoration around the outer rim of a foot (Cat. Plate 6). The surviving flakey, thinly-blown button stem components were mostly of a greenish-grey or pale green colour. Several displayed a pinkish irridescence, which is a commonly-observed phenomenon in antique non-lead glass that has deteriorated. Many of the
stem fragments resembled stem formations depicted in the Greene drawings. Examples of both beer and wine glasses of Greene design are common on most colonial sites of the period circa 1670-1685 (Noel-Hume 1968b: 187).

Several well-preserved, but delicate and very fragile decorative stem elements, probably part of an elaborate façon de Venise stem of a goblet, were recovered from the TAMU/INA excavation site (Cat. Plate 1). The decorative stem element was in the form of a blue-coloured, pinched-wing ornament (Cat. Plate 1: c). The colourless stem elements were of an average 28 mm in height. One was a straight stem, topped by a marginal milky-white pinched trail of glass, which resembled several small coils of opaque glass (Cat. Plate 1: b). The other was a tiny inverted baluster with a coiled white filagree twist decoration (Cat. Plate 1: a). All of the three elements, or at least two of them, could have been part of an elaborate stem of a façon de Venise goblet, which would have suited the continental taste for complicated stem forms during the sixteenth and seventeenth centuries. An illustration of a façon de Venise stem, incorporating similar decorative elements, is on page 49, figure 6. Although more complicated designs for drinking glass styles were attempted in Britain during the Mansell monopoly, circa 1623-1660, specimens of elaborate and fragile Venetian-style glassware, commonly found on early colonial sites, were probably imports from Venice or
the Low Countries (Noel-Hume 1986b: 185). The glassware in this group fluoresced a typical bright yellow colour of soda or potash-lime metal. They formed 4.75% of the minimum vessel count, (M.V.C. to be used hereafter), and were recovered mainly from the INA/TAMU and Marx excavation sites.

A number of non-lead decorated tumbler vessels and sherds, made in Bohemia and the Low Countries, belonged to this early-dated group of glassware. They will be discussed in the tumbler style-category.

Unlike many colonial sites in Canada and the United States, of a similar time period, Port Royal yielded few examples of verre fougère or green potash-lime glass. Of the two examples recovered, one was a crudely-fashioned hollow-blown inverted baluster stem with a round funnel bowl and slightly rising foot fragment (Cat. Plate 7). It was dated to circa 1650 and was probably made in Bohemia or the Low Countries (Lanmon 1986: personal communication). The other example of a Verre fougère drinking glass was a teared, drawn straight stem with a drawn trumpet bowl and a folded foot, made in two-part manufacture (Cat. Plate 39). This glass will be discussed in the straight stem-style category.

The diagnostic attributes, stylistic characteristics, and lead content of the remainder of the glassware collection suggested an English origin, dated from the late-seventeenth
century to circa 1840. The large group of English lead
tableware was typed and classified according to well-known
stylistic criteria and compared to established well-
documented examples of glassware in published museum and
private collections, and in archaeological site reports, which
cited English lead tableglass assemblages.

Works such as L.M. Bickerton's *An Illustrated Guide to
English Drinking Glasses* (1971) and *English Drinking Glasses
1675-1825* (1984); Francis Buckley's *English Baluster-Stemmed
Glasses of the Seventeenth and Eighteenth Centuries* (1912)
and *Old London Drinking Glasses* (1913); R.J. Charleston's
*English Glass and the Glass Used in England, c.400-1940*
(1984); S.C. Crompton's *English Glass* (1967); Frank Davis'
*Early 18th-Century Glass* (1971); and E.M. Ellville's *English
Table Glass*, (1951) provided many fine examples of English
lead drinking glasses, from the late-seventeenth, eighteenth
and nineteenth centuries, for comparative purposes. *A
Dictionary of British Antique Glass* (1975), by Douglas Ash,
was an invaluable aid in providing information concerning
British glass from the late-sixteenth century to the early-
nineteenth century in useful dictionary format. Noel-Hume's
*Artifacts of Colonial America* (1968b) and Paul McNally's
*Tableglass in Canada 1700-1850* provided excellent reference
material on the types and styles of drinking glasses that
have been found on colonial, and other archaeological sites
in the United States and Canada.
No sealed-Ravenscroft drinking glasses were recovered from Port Royal sites i.e., glasses distinguished by a raven's head, the Glass Sellers' seal of guarantee, conferred on Ravenscroft's glasses in 1676 in honour of his successful experiments in the production of a stable glass-of-lead. However, there were many demi-lead and lead metal drinking glass vessels and sherds that were found in reliable archaeological contexts of the same time period, circa 1676-1700, which exemplified the glassware products of early English lead-glass manufacture. These glasses fluoresced a light blue colour in the case of the demi-lead specimens with an approximate 12-14% lead content, which was typical of the early Ravenscroft-period lead tableware. A characteristic icy blue colour was the normal fluorescence of fine-quality lead glass containing approximately 30-35% lead oxide. The glass-of-lead was colourless with a slight greyish tinge and appeared heavy and lustrous. The glasses felt solid and sturdy in comparison with the light fragility of the Anglo-Venetian, soda or potash-lime glassware. The demi-lead glassware felt less substantial than the lead-glass and was slightly cloudy in appearance. The opacity probably occurred as a result of a slight crizzling condition, which sometimes occurred in unstable, early lead glass manufacture of the Ravenscroft period.

The style-category containing the greatest number of drinking glass vessels and sherds, from Port Royal
excavation sites, contained 126 vessels and 134 sherds. The short hollow-blown inverted baluster stem had a round funnel bowl and plain foot (Cat. Plate 10). They formed 26% of the M.V.C. and 27.68% of the total sherds in the collection. The elevated sherd count suggested that there were probably many more vessels of this style present on the site, but they could not be positively identified as such owing to their lack of a diagnostic attribute, in this case a recognizable, inverted baluster stem. The glasses in this group fluoresced the typical light blue of demi-lead metal of the early Ravenscroft period, circa 1675-1680. The majority of them came from the New Street site in good seventeenth-century context i.e., from layers 2, 2a & 3, which identified them as artifacts that were deposited before the earthquake of 1692. There were many fire-deformed specimens in the group that were found on Priddy's New Street site in the form of several large amorphous lumps of glass, which could not be separated or counted individually, as vessels. A large portion of the New Street glassware material was retrieved from wells or cisterns on the site and survived by being covered with fire-blackened bricks, dated to the fire of 1703, and the occupational debris of later years (Priddy 1987: personal communication).

Large numbers of a quatrefoil version of the short, hollow-blown inverted baluster stem were also found on the
New Street site (Cat. Plate 11). The glasses were very close stylistically to the hollow-blown, short inverted baluster stem but dated slightly later, circa 1685-1695. They had round funnel bowls and conical feet with a slightly folded rim. The glasses fluoresced a light blue colour and they formed 5.6% of the M.V.C.

As a group, this early-dated, short, solid, and hollow-blown inverted baluster stem with the quatrefoil version formed 33.26% M.V.C. The simple and unadorned glasses represented the beginning of a distinctly English style in the evolution of lead glassware styles.

English glassmakers' attempts to create façon de Venise stemware styles in the new metal are evident in several of the recovered specimens of lead glass stemware fragments from Port Royal. The colourless, lead glass roemer for example, originally made on the Continent in a green, potash-lime glass and intended for German hock or white wines, was made by Ravenscroft and other English glassmakers in colourless, lead metal, circa 1676-1700 (Figure 12: f, page 57). The Port Royal specimen consisted of a hollow-blown cylindrical stem fragment with three applied raspberry prunts (Cat. Plate 8). Another example of a lead drinking glass, made in England in the façon de Venise style, was a winged, pincered-type of quatrefoil-knopped stem (Figure 11, page 56). An example of this type of stem, from Port Royal, had a solid-base conical bowl and a solid
merese, which separated the bowl from the stem. It was dated by stylistic comparison to circa 1685 (Cat. Plate 9). There were several inverted baluster stems, plain and knopped, decorated with wrythen-moulding in the collection (Cat. Plate 16). Wrythen-moulding, a twisted ribbing type of stem and bowl decoration, was a popular Venetian decorative technique in the sixteenth century and became prevalent in the Low Countries in the seventeenth century (Noel-Hume 1968a: 32). Another Venetian-inspired style, produced in lead metal, was a stem formation consisting of a large and flattened hollow-blown quatrefoil knop, between two mereses, set on a capstan-shaped stem (Figure 12: d, page 57). The bowls of the Port Royal specimens had a solid-base conical or round funnel shape and several of them had a conical plain foot (Cat. Plate 12). Most of the glasses of this type were retrieved from Priddy's New Street site in good seventeenth-century context, and have been dated by stylistic comparison to circa 1685-1695. Ivor Noel-Hume identified several glasses of this style in the Cornman collection from Port Royal. All of the glasses in the lead metal façon de Venise styles fluoresced icy blue.

There were several unusual, one-of-kind tableglass artifacts, not drinking glasses, recovered that should be mentioned, such as a pipe stopper or tobacco tamper and a toddy lifter. In the case of the pipe stopper or tobacco tamper, the solid ball knop, which actually was the bulb-
handle of a tobacco tamper, was originally presumed to be a miniature ball knop stem-constituent of a small goblet (Cat. Plate 13: a). The bulb was decorated with five applied strawberry prunts and was identified as a handle of a pipe stopper by Dwight Lanmon, of the Corning Museum of Glass, who kindly provided a comparative example from the museum, dated circa 1710-1720 (Figure 26). Glass tobacco tampers, considered as tableware, were used to tap tobacco into the bowl of a pipe. The only toddy lifter fragment found at Port Royal would have been used to siphon a glassfull of liquid from a punch bowl or jug into a glass (Cat. Plate 13: b). It was hollow-blown and dated to circa 1780-1790 (Ash 1975: 198-199).

Three unique styles of drinking glasses, dating to the last-quarter of the seventeenth century, were each given a style-category to themselves. No convincing parallels could be found for them in the literary sources or published collections, and the glasses did not appear to fit into any of the well-known, style-categories of English glassware. Mr. Dwight Lanmon of the Corning Glass Museum and Dr. Peter Kaellgren of the Royal Ontario Museum kindly advised on the dating and styles of a few of the unique drinking glass specimens in the collection, which were difficult to classify stylistically. The first two glasses were retrieved from the Marx excavation site. Of the two examples in the third unusual glass-style category, one
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fragmentary specimen was retrieved from the back-fill of a septic tank insertion site at the New Police Barracks, and the more-intact specimen came from the New Street site.

The first, in chronological order, was a small stemmed cordial or ratafia glass, dated to circa 1680 (Lanmon 1986: personal communication). The glass consisted of a solid inverted baluster stem 30 mm in height, a merese, a pattern-moulded flute-shaped bowl 45 mm in height, and a folded foot with a foot-rim diameter of 50 mm (Cat. Plate 14). The cone-shaped bowl had a pointed base, which fitted directly into the top of the solid inverted baluster stem. The point of the bowl-base was quite visible inside the stem. The tiny glass was almost intact, in excellent condition, and it fluoresced an icy blue colour. Ratafia was an alcoholic fruit-liquor, flavoured with kernels of almonds, peaches, or cherries and was a popular ladies' drink in the late-seventeenth and early-eighteenth centuries. The Port Royal specimen closely resembled a particular style of glass reserved exclusively for the cordial, which was a small, slender flute with a straight funnel bowl, no more than 25 mm in bowl-rim diameter (Ash 1975: 157). The second glass in the group was an unusually styled, stemmed glass, thought to be a jelly glass because of its proportions and dated to 1685 (Lanmon 1986: personal communication). It had a short, solid straight stem 25 mm in height, a merese, a flat-based bucket bowl and a conical
foot fragment (Cat. Plate 15). The glass was badly crizzled and very thinly-blown, and it fluoresced a light blue colour, typical of demi-lead metal. The third, unusual glassware-style was presumed to be a crudely-fashioned ale glass. The glass had a type of multi-knopped stem, which resembled coiled loops of glass diminishing in size toward the foot, instead of distinct knop forms. The stem measured 55 mm in height, the large bucket bowl was 45 mm in height and the almost flat, folded foot had a rim-diameter of 50 mm (Cat. Plate 17). Dated to circa 1690-1695, the glass fluoresced the icy blue colour of true lead metal. By its styling and date, this drinking glass could possibly have been a prototype in a transitional period of English glass manufacture, when glassmakers were experimenting with new styles in a new and different metal (Lanmon 1986: personal communication).

The third-largest style category in the Port Royal glassware collection were the plain, solid inverted baluster stems with a basal knop (Cat. Plate 23). Dated to circa 1690-1720 by stylistic comparison, the plain solid inverted baluster stem-style was a version of the earlier Ravenscroft-period inverted baluster. They had solid-base, round funnel or solid-base conical bowls. Few feet survived on these glasses, but the feet in all the comparative examples, of the heavy baluster type of glassware, were usually domed and folded. The fold in the earlier types of
inverted baluster stems was somewhat thin and hardly
noticable, in the Venetian fashion, but after 1690, the fold
was developed into a wide thick rim in proportion to the
bowl and stem for stability. The well-preserved glassware
in this category fluoresced an icy blue colour and formed
5.16% of the M.V.C. The majority of the solid inverted
baluster glasses with basal knops were recovered from the
New Street site. This style of inverted baluster belonged
to a larger stylistic category called heavy balusters, which
were popular circa 1685-1740.

There were nine variations of inverted balusters
represented in the Port Royal collection (Cat. Plate 18-26),
and they were found on most of the excavation sites referred
to in this study. The stems were hollow-blown, semi-hollow,
teared or solid. The inverted balusters were plain or
knopped above and/or had a basal knop below, at the
stem-foot juncture. The bowls were mostly solid-base, round
funnel, pointed, funnel or solid-base, conical. Very few foot
rims survived, except one or two with a folded rim
(Cat. Plate 21: c; Cat. Plate 25: a). As a group they formed
23.34% of the M.V.C. and all fluoresced icy blue. Most of
them were heavy and lustrous in appearance and survived in
excellent condition.

The heavy baluster period, after many variations of the
inverted baluster had been tried and adopted, evolved toward
a single distinctive knopped-stem style. Knops are the
individual turned elements of a stem (Delomosne 1984: 3). A considerable variety of distinct knop forms and combinations of knops were produced during the first forty years of the eighteenth century, in English glassware manufacture. The Port Royal collection contained excellent examples of many of them, although not in large numbers. As a group they represented 12.05% of the M.V.C. and spanned a time period of between 1685 and 1740. English baluster-stem knop formations are illustrated on page 65, figure 16.

The following knop formations belonged to this group and were represented as individual categories in the catalogue. Angular and wide angular knop forms made up the largest stemmed style-category of this group and represented 4.3% of the M.V.C. (Cat. Plate 29). Drop knopped stem-styles are represented in the collection (Cat. Plate 28), as well as opposing balusters, where a true baluster and inverted baluster were placed in opposition to one another (Cat. Plate 27). There were several dumb-bell knop varieties (Cat. Plate 30); ball knops (Cat. Plate 31); acorn knops (Cat. Plate 32); mushroom knopped stems (Cat. Plate 33) and a cylinder knopped stem, in a rare combination with an acorn knop, which formed the solid-base of a thistle bowl (Cat. Plate 34). The annulated knops, one of which was combined with a true baluster (Cat. Plate 35); annular knops (Cat. Plate 38); a bobbin knopped stem (Cat. Plate 37) and the multi-knopped stems (Cat. Plate 36) formed, with the others, the group of
individually-knopped and combined-knop baluster stems. The bowls of these glasses were all solid-based. There were several thistle bowls and the rest were round funnel, pointed, round funnel or conical. The surviving foot rims were folded. Most of the knopped glasses had some type of teared decoration in their bowl-bases or knopped stem components. One of the ball-knopped glasses, found on the Marx excavation, was completely intact, and dated by stylistic comparison to circa 1685-1740 (Cat. Plate 31: a). The ball knopped-stem with a basal knop was 60 mm in height, the solid-base round funnel bowl was 75 mm in height and had a bowl-rim diameter of 68 mm. The folded foot had a foot-rim diameter of 78 mm. There was an oval tear decoration in the solid-base of the bowl, and a larger oval tear in the ball knop. Apart from the blackened, fire-damaged surface, the glass provided a fine example of a knopped heavy baluster stem.

There were no light baluster stemmed-glasses, circa 1725-1760, found at Port Royal.

About 1710, entire stems began to be shaped in moulds. They were produced in four, six, and eight-sided models and were frequently decorated on the shoulders with crowns, stars or diamond-shaped losenges. The Port Royal collection contained a few well-preserved specimens of each of the three types of moulded pedestal stems (Cat. Plate 40, 40a, 40b). The average stem height of the moulded pedestal stems
was between 55 and 60 mm. All varieties were decorated with diamond-shaped losenges at the stem angles, and one six-sided example had pointed stars between the losenges. They all had elongated tears in their stem. The three varieties were dated to periods of circa 1715-1720, 1718-1730, and 1725-1750 respectively, by stylistic comparison. Solid base-thistle bowls appeared with all three stem varieties, as well as solid-base conical and round funnel bowls. Folded foot-rims, with an average foot-rim diameter of 72.5 mm, survived on the six and eight-sided stems. All of the moulded pedestal stems fluoresced an icy blue colour and survived in excellent condition. As a group they formed 3.08% of the total M.V.C.

In the interests of economy, drinking glasses with simple plain stems were made as early as 1730 in England and continued to be popular for the next forty-five years. There were several, well-preserved, drawn straight stem specimens in the Port Royal collection, dated stylistically from circa 1690-1740. Made of two-part manufacture, the tall, flute-shaped glasses had been a popular style of drinking glass in the Continent during the sixteenth and seventeenth centuries. The glasses consisted of teared, solid, drawn straight stems, drawn trumpet bowls and folded feet. The earliest-dated example, circa 1690, was retrieved from Marx's excavation badly etched and crizzled. It was a green non-lead, probably potash-lime, verre fougère
model with a teared drawn straight stem 73 mm in height, a drawn trumpet bowl 50 mm in height, and a folded foot with a foot-rim diameter of 80 mm (Cat. Plate 39). One of the most beautiful examples, of this style of drinking glass, was found on the TAMU/INA excavation site. It was a lead version of the teared, drawn straight stem with a trumpet bowl and folded foot. The stem measured 75 mm in height, the bowl height was 55 mm and the bowl-rim diameter 70 mm, and the folded foot had a rim diameter of 70 mm. Almost completely intact, only missing a small piece of the bowl-rim, it fluoresced an icy blue colour. Unfortunately, the trumpet bowl was badly crizzled, although the stem was in fine condition (Cat. Plate 39a). It was dated circa 1730-1745. The teared drawn straight stems with drawn trumpet bowls made up 2.47% of the M.V.C.

The remainder of the glasses in the straight-stem category had plain solid stems, trumpet or round funnel bowls, and the feet were plain or folded. Many of the heavier, less-elegant glasses had shorter stems, on an average of 55 mm in stem height, and they were made in three-part manufacture. Besides the drawn, straight stems with trumpet bowls of two piece manufacture, the solid straight stems had waisted-bell bowls. None of the foot-rims survived in this group (Cat. Plate 39b; Cat. Plate 39c). They were dated to circa 1740-1775 by stylistic comparison. Interestingly, some of the heavier, crudely-made straight-
stemmed glasses fluoresced the light blue colour of demi-lead metal. These glasses formed 3.7% of the M.V.C. As a group, the straight stemmed glasses formed 6.19% of the total M.V.C.

There were a few solid straight stems decorated by multiple-spiral air-twist decoration in the Port Royal drinking glass collection (Cat. Plate 41). An extremely well-preserved, air-twist stem came from the Marx excavation and consisted of a solid straight stem, 72 mm in height, that had a multiple-spiral air-twist decoration, and a solid-base, waisted bowl. It was made in two part manufacture. Another example of an air-twist was a multiple-knopped stem fragment, with a multiple-spiral air-twist decoration, and a pointed, round funnel bowl fragment. The glass was found on the back-fill of a septic tank insertion-site, near the Old Naval Hospital. Neither of the stems had surviving foot forms. There were also several fragmentary specimens of air-twists recovered from the New Street site. The air-twist stems were dated stylistically from circa 1730-1745 and fluoresced an icy blue colour of fine-quality lead metal.

A single, facette-cut straight stem specimen was found at Port Royal, in the form of a partially-intact glass recovered from the Marx excavation site. It was a large goblet with a facette-cut, six-sided incurving stem, 51 mm in height. The waisted-bucket bowl had six oblong, vertical
wheel-cut flutes as decoration on the lower-half, and the plain flat foot had a foot-rim diameter of 60 mm (Cat. Plate 42). Although ornamental cutting on goblet stems can be traced back to the early years of the eighteenth century in Europe, this type of cut-glass decoration did not become common in England until circa 1760. The facet-cut decorated style on a straight stemmed glass can be dated stylistically to circa 1760-1810. Archaeological evidence supports the view that examples of English cut glass, prior to 1750, were relatively rare (Noel-Hume 19.9: 22).

A collective term, rudimentary stems, describes stemmed glasses that have relatively short stems in relation to their bowls and feet. The Port Royal examples had short centrally-knopped stems that measured an average 37 mm in stem height. The bowls were bucket or incurved-bucket shaped, and a few had pattern-moulded decoration on the lower-half. The feet were flat and plain with a foot-rim diameter of 65 mm (Cat. Plate 43). The glasses, dated to 1815-1850 by stylistic comparison, made up 1.44% of the M.V.C. and 3.17% of the total sherd count, which implied there were more of the vessels on the site than could be accounted for in the M.V.C. Most of the bowls had moulded or wheel-cut fluted decoration on the lower-half. These glasses fluoresced in both colours, an icy blue colour of true lead metal, and the light blue colour of demi-lead metal.
Rummers are most often found in archaeological contexts of the nineteenth century and Port Royal is no exception, (Noel-Hume 1968b: 195). The best-preserved glass in this group was a large rummer, 135 mm in height with a stem height of 40 mm, a bowl height of 85 mm, a bowl-rim diameter of 74 mm, and a foot rim diameter of 70 mm. In its proportions, the glass illustrated the classic rummer shape, where the bowl was longer than the stem and wider at the mouth than at the foot. The glass had a massive incurved-bucket bowl, decorated with a band of fine diamond-cutting design around the rim, a short centrally-bladed knopped stem, and a round conical foot with a folded rim (Cat. Plate 44). The large glass was almost totally intact and was found in good nineteenth-century context in a deep cistern on the New Street site. Other rummers had flat-based bucket bowls, short, centrally-bladed knopped stems, of an average 42 mm in height, and thick, flat, domed or terraced feet with an average foot diameter of 77 mm. One of the Port Royal rummers had a moulded base in the form of an inverted lemon-squeezer shape, but the glass was in too fragmentary a condition to be illustrated. These glasses were popular with the military and navy, which perhaps explains their presence on Port Royal sites in such great numbers (Jones and Smith 1985: 48). The rummer group of drinking glasses fluoresced an icy blue colour and formed 3.31% of the M.V.C. and 3% of the total sherds in the collection. They have
been dated by stylistic comparison to circa 1780-1840. Rudimentary stemmed glass, with a centrally-knopped short stem, flat-based bucket bowl and thick terraced or domed foot occurred in rummer and wineglass size on Port Royal sites (Cat. Plate 44: c & d).

Tumblers as a group, both lead and non-lead, decorated and plain, formed 6.18% of the M.V.C. and 14% of the total sherd count. The presence of many unidentifiable body sherds in this category caused the sherd count to be higher than the minimum vessel count, as bases were the diagnostic attribute chosen to define vessels in this style category.

The decorated non-lead tumblers from this collection dated stylistically to the late-seventeenth and early-eighteenth centuries. The diamond-point and wheel-engraved decoration suggested a Bohemian or Low Countries origin and a date of circa 1690-1730. This variety of tumbler formed 1.23% of the M.V.C. and a huge 5.41% of the total sherd count for this category, which was 14% of the total sherd collection. The Port Royal decorated non-lead tumblers were free blown and of dip-moulded and pattern-moulded manufacture (Cat. Plate 45; Cat. Plate 45a; Cat. Plate 45b). The non-lead decorated tumblers fluoresced a bright yellow colour, typical for non-lead metal, and were probably made of potash or soda-lime glass. They were thinly-moulded in manufacture and felt quite light and fragile to the touch.
Two, fine-quality tumblers from this group had bases decorated with a spiked gadrooning around their rims, which suggested a seventeenth-century date of manufacture. One of the tumbler bases was domed and the other flat (Cat. Plate 45b). A convincing parallel, for this type of decorative technique, was found in an illustration of a sealed Ravenscroft posset pot with a cylindrical bowl, which was heavily gadrooned at the base with a medium kick, and dated to circa 1677 (Crompton 1967: plate 27). The Port Royal specimens may have been posset pots or tumblers, but as little else survived, it was impossible to estimate their complete shape. Ivor Noel-Hume found a similarly-decorated tumbler base in the Cornman collection in Port Royal.

The best-preserved tumbler in the Port Royal collection was a completely intact, wheel-engraved tumbler (Cat. Plate 45). Missing a small piece of the rim, it was non-lead, probably made of potash-lime metal in the Netherlands or Bohemia, and was dated by the engraving style and design-motif to 1700 (Kaellgren 1986: personal communication). For some reason this glass was not included in Marx's mimeographed report, although Marx has acknowledged its presence in his glassware collection (Marx 1986: personal communication). The straight-sided tumbler was dip moulded in manufacture. It had a slight, iridescent patina on the surface, and there were many fine, seed-like, air bubbles throughout the metal. The tumbler was beautifully
decorated by a wheel-engraved frieze around the body, which consisted of three, repeating panels, each containing a bird in a cage, or a flower. The frieze, thought to illustrate the bliss of domesticity by its design motif, probably was engraved by a Dutch artist. Wheel-engraving was a well-known art in the Low Countries by the early-eighteenth century, and the design-motif was a popular subject for artists, in various media, at the turn of the century (Christie's Amsterdam catalogue 1985: 49-50).

A distinctive, non-lead body sherd, in the collection, had a wheel-engraved figure of a man in Puritan attire, a costume that was fashionable in the 1680s (Cat. Plate 45a). By stylistic comparison, it resembled Noel-Hume's description of a ceramic find in the Cornman collection from Port Royal, which was dated to the late-seventeenth century (Noel-Hume 1968a: 10, figure 2a).

The plain non-lead variety, probably potash-lime or soda-lime, tumblers were dated to the late-seventeenth century by stylistic comparison to similar glassware in other colonial site reports (Lapointe 1981; Smith 1981). As there were no relatively intact specimens, they were not illustrated in the catalogue (Cat. Plate 45c). The plain tumblers made up 1.65% of the M.V.C. and 3.17% of the total sherd count.

Decorated lead tumblers in the collection had moulded designs on the body and/or base and were manufactured by
press moulding, pattern moulding and optic moulding techniques. They survived in too fragmentary state as well, to be properly illustrated (Cat. Plate 45e). They were dated by stylistic comparison to circa 1750-1850 (Jones and Smith 1985; Smith 1981), and represented 2.27% of the M.V.C. and 3.91% of the total sherd count. The plain lead tumblers were of optic-moulded manufacture (Cat. Plate 45d). They were dated by stylistic comparison to 1750-1810 (McNally 1982; Neillon and Mousette 1981), and formed 1.65% of the M.V.C. and 1.53% of the total sherd count. These tumbler vessels and sherds were not illustrated for the same reasons.

The jelly glasses found on Port Royal sites were not illustrated because, in most cases, only the bases survived. Unfortunately there was not one complete vessel that could be drawn or photographed (Cat. Plate 46). Jelly glasses were designed, after 1800, primarily for sweet desserts such as jelly, custard and ices. The Port Royal fragmentary specimens were round in body and base and had an applied ring-base foot. There were several green, nonlead, probably potash-lime metal glasses that have been dated by stylistic comparison to circa 1690-1700 (Haynes 1959). The colourless varieties were dated slightly later to the early-eighteenth century by stylistic comparison (Jones and Smith 1985). As a group they formed 1.23% of the M.V.C. and 1.30% of the total sherd count.
CONCLUSIONS

The drinking glass vessels, recovered from Port Royal archaeological sites, were recorded in the form of a descriptive catalogue for several reasons. First, it was decided that a complete analysis of the glassware would be accomplished best by preparing a fairly detailed evaluation in catalogue form. This method established control of the collection and permitted conclusions to be drawn concerning the presence of glass tableware on Port Royal archaeological sites. Secondly, a catalogue would provide a record of comparative data for glass scholars and archaeologists involved in artifactual research.

A comprehensive range of types and styles were evident in the recovered glassware. The styles spanned an interval of approximately 210 years, between 1630 and 1840, in English glassware manufacture, a fact that confirmed a long period of popular usage for drinking glasses in Port Royal.

The peak of the town's commercial prosperity occurred during the years between 1670 and 1692 (Claypole and Buisseret 1972: 19; Pawson and Buisseret 1975: 94; Taylor n.d.: 500). The largest, individual style-categories of glassware, in the collection, represented time periods of between 1670-1680, 1680-1705, and 1690-1710 respectively. Therefore the glasses, classified as belonging to those categories by stylistic comparison, can be accepted as
having been in popular use when the town was flourishing. Their numbers reflected a large population, a substantial trade volume, and an increasing prosperity during the late-seventeenth century.

As Taylor has suggested, Port Royal was a city of taverns and punch houses, where it was possible to purchase and consume a wide variety of imported wines and spirits (Taylor n.d.: 502). In a twenty-year period, between 1665 and 1685, there were at least nineteen taverns in business according to a list of Port Royal tavern deeds (Pawson and Buisseret 1975: appendix 12). There were probably many more and their abundance was not to everyone's liking. In 1665, a disgruntled landowner, John Styles complained of the dissolute conditions in Port Royal, which in his opinion, prevented able men from seeking honest employment: "the numbers of tippling houses is now doubly increased so that there is not now resident upon this place ten men to every house that selleth strong liquors" (Collins 1901: 150). The numerous tavern glasses found on Port Royal sites would seem to corroborate historical references to the drinking habits of many of the town's inhabitants.

The largest, single style-categories, in the tableglass collection, were found to be those comprised of numerous demi-lead, short, hollow-blown inverted balusters and quatrefoil baluster stems. The glasses had been recovered from good seventeenth-century stratigraphic contexts on the
New Street site. Early-dated, Ravenscroft glasses of this style, although considered to be collectors items today if found intact, essentially were the ordinary tavern glasses of the late-seventeenth century (Lanmon 1986: personal communication). Many rudimentary-stemmed glasses, rummers, and straight-stemmed glasses, which were the ordinary tavern glasses of the eighteen and nineteenth centuries, were found as well. The presence of such a large and varied group of tavern glassware, on a single site, would seem to suggest the existence of numerous taverns and punch houses in the neighbourhood during a considerable period of time (Pawson and Buisseret 1975: appendix 12).

Although it was impossible to discern the precise use for each drinking glass in the collection, the variety of shapes and sizes implied that different kinds of imported wines and spirits were being consumed in Port Royal. Taylor mentioned an extensive assortment available in seventeenth-century Port Royal:

...good Madera wine both reed, and whit... canary, whitwin, rhenish, clarrat, brandy... and good English bear and mum...punch, perrino...Adam's ale, and amongst others rumpunch, killdivile, rapp, mobby and water... (Taylor n.d.: 502).

A definition of some of the drinks and concoctions that were popular and available in Port Royal is provided in appendix C on page 265.

Marx's excavation and the TAMU/INA site are located in
an area near Lime Street, Thames Street, and Fishers' Row, which was prime waterfront land in the seventeenth century (Figure 1, page 11). This part of town contained many warehouses, storehouses, fish and meat markets, a tobacconist's shop, and numerous private dwellings (Pawson and Buisseret 1975: 83-85). Probably there were several inns, taverns, and punch houses as well, around the harbour and waterfront areas, to cater to seamen, dockworkers, merchants, and slave traders (Pawson and Buisseret 1975: appendix 12). Large quantities of onion bottles, made for transporting wines and spirits, were found on both sites, as well as a number of drinking-glass fragments. Obviously alcoholic beverages were being sold and consumed publicly and privately in many of the buildings in the area (Hamilton and Woodward 1984: 84).

There were many large, prosperous warehouses and private mansions located on the convenient, harbour-side lots of Lime Street and Thames Street between 1670 and 1690 (Pawson and Buisseret 1975: 94). Drinking glass fragments of fine-quality Anglo-Venetian soda or potash-lime stemware, made in the façon de Venise styles, were retrieved among the early-dated lead glassware finds on both the INA/TAMU and Marx excavation sites in this area. They may have belonged to the wealthy establishment of Port Royal who lived and worked in the vicinity during the late-seventeenth century.

Imports from England to Jamaica rose steadily from 1670
(Claypole and Buisseret 1972: 19). Port Royal citizens were increasingly able to afford imported luxuries as they continued to benefit from the town's booming economy. In addition to wines and liquors, a demand for relatively-sophisticated manufactured goods from abroad would have occurred as the inhabitants became more affluent and discerning in their lifestyle. Imported Chinese porcelain, delftware from Holland, salt-glazed ceramics, westerwald ware, and lead-crystal from England have been recovered from most of the archaeological sites in Port Royal. The nature of the surviving artifacts illustrates the fact that an affluent material culture and cosmopolitan taste must have existed in Port Royal, quite fashionable for its time.

Relatively few representative drinking glasses of the style-periods, circa 1720-1760, were found on Port Royal sites. The numerous storms and hurricanes that battered the exposed spit of land during the eighteenth century in 1712, 1722, 1744, and 1751, probably were responsible for this phenomenon, but we can never be sure if all of the artifacts, which survived from this period of time, have been recovered. The fact that so few glasses of the period were found, in reliably dated contexts, could be attributed to the disruptive effects of the storms. Possibly some of the lightweight, English glassware styles were incapable of surviving the upheaval. However, the existence of a number of relatively fragile Anglo-Venetian soda and potash-lime
glasses on Port Royal excavation sites, from a much-earlier period of manufacture, would seem to contradict this theory.

Historical sources have noted the decline in Port Royal's population after each cataclysm (Pawson and Buisseret 1975: 124). The surviving glassware, ascribed to the style-categories of this time period, reflected by their numbers a reduced population with a decreased buying power. The glasses may have been the property of naval personnel stationed in the town, for it was during this period, circa 1715 to 1763, that proper dockyard facilities were established in Port Royal for the repair and provisioning of naval ships (Pawson and Buisseret 1975: 129). Perhaps the English navy was the only presence capable of sustaining a reasonably-comfortable lifestyle in Port Royal during that time.

Drinking glass fragments that have been found on maritime sites in Port Royal, from this interval, probably were intrusive. They may have been part of a ship's inventory and lost at sea when the ship was wrecked in one of the eighteenth-century storms. No doubt broken glasses were jettisoned, with other debris, from ships that were anchored in Port Royal's harbour, which had expanded over the inundated part of the town after the 1692 earthquake. In the nineteenth century, refuse from the naval hospital was regularly towed offshore and sunk, and the town's occupational debris was probably handled in a similar
manner. Few rubbish dumps were available on land because of the abnormally-high water table in Port Royal (Priddy 1987: personal communication).

In conclusion, the presence of an extensive collection of drinking glass fragments, on various Port Royal sites, has been used as an interpretative tool to define the historical economy and material culture of the town, and as well, to discover the status of glassware in the social and cultural lifestyle patterns of the town's inhabitants. The quantity of recovered drinking glass artifacts helped to establish the density of settlement and population, during certain phases of occupation, while the quality of the glassware revealed varied patterns of trade and commerce. Most of the fine-quality tableglass, in use at Port Royal during various intervals, proved to be contemporary with the popular and fashionable glass styles in use in England and on the Continent. This fact suggested close trade connections to glassmaking centres abroad and an intimate knowledge of current glass styles, by the people using them.

The volume of fine-quality drinking glasses, found in Port Royal, implied that a comfortable domestic and social life existed among a large, and relatively prosperous cosmopolitan society, during the late-seventeenth century. In contrast, the few examples of drinking glasses that survived from a later period of Port Royal's history, circa
1715-1751, mirrored the vicissitudes of the town during the eighteenth century and revealed the increasingly-meagre lifestyle of the inhabitants.

Fine-quality table glass, found on a late-seventeenth century colonial site in the Caribbean, is a diagnostic artifact in the sense that it indicates relative wealth and prosperity. Glass is normally one of the later acquirements of a culture to appear. Only when an element of prosperity and stability entered the life of a colonial settler, can we expect to find any demand for luxury goods.

Table glass is an article of service, fashion, and taste. As such, its presence on archaeological sites in Port Royal Jamaica, provides a significant contribution to the historical reconstruction of an important English colony in the Caribbean.
CATALOGUE

The catalogue consists of a data sheet and an illustration, in the form of a drawing, and in most cases a photograph, of the drinking glass artifacts chosen to represent a specific style-category.

An accession number identified each vessel and sherd in the collection, showing the year of recovery and the artifact-location site. Site accession numbers are explained as follows:

1) RM 66-68 Robert Marx Excavation:

indicates an artifact, recovered by Robert Marx from a maritime excavation, performed between 1966 and 1968. The date is followed by a Roman numeral signifying the stylistic category, and a lower-case letter indicating the type within the category. An Arabic numeral may follow, indicating the number of the vessel within the category, if there are more than one.

2) PR 81-86 INA/TAMU Excavation:

indicates an artifact recovered from the INA/TAMU excavations, 1981-1986. The first two digits indicate the year of recovery, the following numbers show the location, i.e., square or feature, where the piece was found.

3) ONH Old Naval Hospital surface collection:

indicates an artifact found on the grounds of the Old Naval Hospital between 1971 and 1974.

4) SPS1 Septic Pit Site, #1:

indicates an artifact recovered by G.A. Aarons in 1982 from a spoil heap, created by the insertion of a septic tank near the Old Naval Hospital.
5) PBST 1986 Police Barracks Septic Tank, 1986:

indicates an artifact recovered in 1986 by Ywonne Edwards from a spoil heap, created by the construction of a new police barracks.

The following sites were excavated by Anthony Priddy between 1970 and 1974:

6) FC1 Fort Charles, #1

indicates an artifact retrieved from an excavation performed at Fort Charles, between 1970-1971. The accession number, FC1, may be followed by an 'S', for structure number, and/or an area number, separated by a period.

7) SP1 Saint Peter's (Churchyard), #1

indicates an artifact recovered from an excavation at Saint Peter's Churchyard in 1971. The accession number, SP1, may be followed by an 'S', for structure number, and/or an area number, separated by a period.

8) UMLIST University Marine Lab Insertion Septic Tank

indicates an artifact recovered from a spoil-heap, created by the insertion of a septic tank at the University Marine Laboratory in 1972.

9) NS1 New Street, #1

indicates an artifact retrieved from the initial test-trench, dug at New Street in 1971.

10) NS2 New Street, #2

indicates an artifact recovered from the New Street excavation site between 1972 and 1974. 'A' indicates the area, where the artifact was found on the site, numbered from one to twelve. A lower-case letter, from 'a to c' may accompany the area-location number, which signifies a sub-area. If there are two, sequential area-location numbers divided by a period, coming directly after the 'A', the artifact was found between two area locations. The letters 'WR', or wall removal, indicate that the artifact was found where a wall had been previously standing. The number, appearing
after the area-location numbers and letters and separated by a period, indicates the layer or strata in which the object survived. The layers are numbered from one to three in chronological order, layer one being the most recent. The first layer may have a lower-case letter, from 'a to f', following, which indicates sub-layers. 'F' stands for feature, i.e., a well, hearth or cistern, where the artifact was found.

During the cataloguing process, the vessels and sherds were measured, drawn and photographed. It was considered unnecessary to illustrate every specimen of glass in the collection, but to select one or two relatively intact examples from each category for this purpose. The artifacts were drawn to scale unless otherwise noted, and a scale, drawn in centimetres, accompanies most of the illustrated figures.

Each style-category in the catalogue was allotted a plate number. The catalogue plates were numbered sequentially, from 1 to 44, according to a stylistic chronology for stemware. The last two style-categories, numbered 45 and 46, consist of tumblers and jelly glasses respectively. As these glasses represent a different type of tableglass entirely, their dating sequence is unique to their category.

The descriptive data sheet, for each of the style categories, provides the following information:

Plate number: name of stylistic category
Number of vessels: in each category
Number of sherds: including vessels, in each category
Accession numbers: of illustrated vessels

Description: of stem, foot and bowl in stemware, body and basal profile for tumblers

Decoration: if any, of each of the extant parts described

Dimensions: measurements, expressed in millimetres; in the case of more than one example, the measurement is shown as a mean

Manufacture: number of manufactured parts of the glass

Colour: the colour, not the patina, is expressed wherever necessary

Condition: mentioned wherever necessary

Metal: kind of glass

Published illustration: reference to published, available literary sources and reports that demonstrate comparable glassware or reasonable facsimiles.
PLATE 1: Façon de Venise Stemware: Decorative Stem Elements

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) RM 66-68.Ia.3; b) PR 84.817;
(of illustrated vessels) c) PR 83.312-40

DESCRIPTION:
stem- a) miniature solid inverted baluster, basal knop
    b) miniature solid straight stem

bowl-

foot- a & b) conical foot fragment

DECORATION:
stem- a) coiled, white filagree twist above solid inverted
    baluster
    b) marginal, milky-white pinched trail above solid
    straight stem
    c) blue, pinched-wing decorative stem ornament

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 28 \text{ mm} \) (30 mm, 26 mm; 2 examples)
bowl rim diameter- bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: c) turquoise blue

CONDITION: very thin and brittle

DATE: circa 1630-1660

METAL: non-lead, probably soda or potash-lime

PUBLISHED ILLUSTRATIONS: Charleston 1984: plate 15: d
Klein and Lloyd 1984, 108
Thorpe 1961: plate XVII: b
PLATE 2: Façon de Venise Stemware: Ribbed-Button Stem

VESSELS: 11

SHERDS: 11

ACCESSION NUMBER: a) RM 66-68.Ia.12; b) RM 66-68.Ia.13; c) NS2.A12.3 #49

(of illustrated vessels)

DESCRIPTION:
stem- short collar, hollow-blown ribbed or wrought-button, merese
bowl- probably flat-based funnel
foot- conical

DECORATION:
stem-
bowl- c) trailed rigaree around base
foot-

DIMENSIONS:
stem height- $\bar{x} = 26.3$ mm (27 mm, 27 mm, 25 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: a & b) greenish-grey
         c) pale green

CONDITION: thin, flakey, very fragile

DATE: circa 1640-1670

METAL: non-lead, probably soda or potash-lime

PUBLISHED ILLUSTRATIONS: Charleston 1984: plate 21: a
                          Powell 1923: 48, figure 35
                          51, figure 39
                          Wilkinson 1968: 102, figure 5
Plate 2. Façon de Venise hollow-blown, ribbed or wrought-button stem, merese, rigaree decoration around bowl base. Non-lead metal. Probably of English manufacture, during Mansell or Greene-style periods, or of Venetian, Bohemian or Low Countries manufacture. Circa 1640-1670.
PLATE 3: Façon de Venise Stemware: Plain Button Stem

VESSELS: 3

SHERDS: 3

ACCESSION NUMBER: a) RM 66-68.Ia.1; b) RM 66-68.Ia.6; c) RM 66-68.Ia.2

DESCRIPTION:
stem- a & c) short collar, hollow-blown plain button
    b) short collar, hollow-blown plain button, merese
bowl- flat-based, funnel
foot-

DECORATION:
stem-
bowl- a & c) trailed rigaree around base
foot-

DIMENSIONS:
stem height- $\bar{x} = 27.5$ mm (25 mm, 30 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: a & b) pale green
c) clear

CONDITION: thin, flakey, very brittle

DATE: circa 1640-1670

METAL: non-lead, probably soda or potash-lime

PUBLISHED ILLUSTRATIONS: Powell 1923: 51, figure 39
 Thorpe 1961: 172, figure 6: c
Plate 3. Façon de Venise hollow-blown plain button stem. Non-lead metal. Probably of English manufacture, during Mansell or Greene-style periods, or of Venetian, Bohemian or Low Countries manufacture. Circa 1640-1670.
PLATE 4: Façon de Venise Stemware: Miniature, Ribbed Melon-shaped knop stem

VESSELS: 3

SHERDS: 3

ACCESSION NUMBER: a) RM 66-68.Ia.4; b) PR 83.328; c) PR 84.801

DESCRIPTION:
stem- merese, hollow-blown, ribbed melon-shaped knop
bowl- probably flat-based bucket
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height - $\bar{x} = 27$ mm (30 mm, 25 mm, 20.7 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: clear

CONDITION: brittle, very fragile

DATE: circa 1640-1670

METAL: non-lead, probably soda or potash-lime

PUBLISHED ILLUSTRATIONS: Bickerton 1971: plate 1
Powell 1923: 53, figure 42
Thorpe 1961: 172, figure 6: h
PLATE 5: Façon de Venise Stemware: Quatrefoil Button Stem

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: PR 83.311-86
(of illustrated vessels)

DESCRIPTION:
stem- double mereses, hollow-blown, quatrefoil button stem,
single merese

bowl- solid-base, conical

foot-

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- 31 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: pale yellow

CONDITION: badly etched, slightly crizzled

DATE: circa 1640-1675

METAL: non-lead, probably soda or potash-lime

PUBLISHED ILLUSTRATIONS:
Bickerton 1971: plate 13
1984: 3, left & right
Noel-Hume 1968b: 190, VI
191, figure 64: VI
Powell 1923: 49, figure 37
Thorpe 1961: 175, figure 7
181, figure 8
Plate 5. Façon de Venise style hollow-blown quatrefoil knop button stem. Non-lead metal. Probably of Venetian or Bohemian manufacture. Circa 1640-1675.
PLATE 6: Façon de Venise Stemware: Decorated Foot Fragment

VESSELS: 0

SHERDS: 1

ACCESSION NUMBER: RM 66-68.Ia.14
(of illustrated vessels)

DESCRIPTION:
stem-
bowl-
foot- outside rim

DECORATION:
stem-
bowl-
foot- trailed rigaree decoration around outer-rim

DIMENSIONS:
stem height-
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR: pale green

CONDITION: etched,

DATE: circa 1645-1670

METAL: non-lead, probably potash or soda-lime

PUBLISHED ILLUSTRATIONS: Powell 1923: figure 20: 3
(reasonable facsimile)
Plate 6. Façon de Venise style stemware: foot fragment
a) Rigaree decoration around outer rim of stemware
foot. Non-lead metal. Probably of Venetian or
Bohemian manufacture. Circa 1645.
b) Rigaree decoration on tumbler foot, after Powell
1923: 22, figure 20; 3
PLATE 7: Verre Fougère: Inverted Baluster Stem

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.IIId.1
(of illustrated vessels)

DESCRIPTION:
stem- hollow-blown, crudely fashioned elongated, inverted baluster
bowl- round funnel
foot- conical foot fragment

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- 50 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: dark green, slightly opaque

CONDITION: pitted surface

DATE: circa 1650

METAL: non-lead, probably potash-lime

PUBLISHED ILLUSTRATIONS: McNally 1982: 28, figure 8
PLATE 8: Ravenscroft Period Lead Stemware: Roemer

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: NS2.A2.3 #50
(of illustrated vessels)

DESCRIPTION:
stem- hollow-blown, cylindrical
bowl-
foot-

DECORATION:
stem- three applied raspberry prunts
bowl-
foot-

DIMENSIONS:
stem height-
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: clear

CONDITION: excellent

DATE: circa 1675-1700

METAL: lead

PUBLISHED ILLUSTRATIONS: Ash 1975: 160 & 161
Charleston 1984: plate 23: d
Thorpe 1927: plate XVI: c, d
PLATE 9: Ravenscroft Period Lead Stemware: Winged, Pincered Quatrefoil Knopped Stem

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: FC1.S2.1 #E-1
(of illustrated vessels)

DESCRIPTION:
stem- merese, solid, pinched-wing quatrefoil knop

bowl- solid-base, conical

foot-

DECORATION:
stem- cross-hatching pattern on four lobes

bowl-

foot-

DIMENSIONS:
stem height-
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: clear

CONDITION: excellent

DATE: circa 1685

METAL: lead

PUBLISHED ILLUSTRATIONS: Ash 1975: 156
Bickerton 1984: 7, left
Crompton 1967: 99, plate 33
Noel-Hume 1969: 15, figure 3
PLATE 10: Ravenscroft Period Lead Stemware: Short Hollow-blown Inverted Baluster Stem

VESSELS: 126

SHERDS: 134

ACCESSION NUMBER: a) NS2.A6.1c #B-17; b) NS2.A2.2 #B-32; c) NS2.A3.2 #B-38; d) PBST 1986 #J-3; e) PR 83.423-20

DESCRIPTION:
stem- light, short, hollow-blown inverted baluster
bowl- round funnel set directly on stem
foot- slightly rising, plain rim

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 40 \text{ mm} \) (120 examples)
bowl rim diameter-
bowl height-
foot rim diameter- \( \bar{x} = 80 \text{ mm} \) (72 examples)

MANUFACTURE: three-part

COLOUR: clear to opaque

CONDITION: good to fair

DATE: circa 1675-1685

METAL: demi-lead

PUBLISHED ILLUSTRATIONS: Charleston 1984: 117, figure 22
Lapointe 1981: 150 & 151, plate 46
Noel-Hume 1968a: 23, 13; 14; 15 22, figure 9: 13; 14; 15
Watt 1975: 86, figure 6: b & c
PLATE 10a: Ravenscroft Period Lead Stemware: Short Solid Inverted Baluster Stem (Not Illustrated)

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) NS2.A6.1c #B-16;
                 b) NS2.A5.6.2b #B-46;
                 c) RM 66-68.IIa.1;2

DESCRIPTION:
    stem- light, short solid inverted baluster
    bowl- round funnel set directly on stem
    foot- slightly rising, plain rim

DECORATION:
    stem-
    bowl-
    foot-

DIMENSIONS:
    stem height- $\bar{x} = 33$ mm (30 mm, 35 mm, 35 mm, 32 mm; 4 examples)
    bowl rim diameter-
    bowl height-
    foot rim diameter-

MANUFACTURE: three-part

COLOUR: straw coloured

CONDITION: a, c & d) good,
            b) crizzled

DATE: circa 1675-1685

METAL: demi-lead

PUBLISHED ILLUSTRATIONS: Noel-Hume 1968b: 190, V
                          191, Figure 64: V
PLATE 11: Ravenscroft and Bishopp Period Lead Stemware: Quatrefoil-lobed Inverted Baluster Stem

VESSELS: 31

SHERDS: 31

ACCESSION NUMBER: SP1.2.Fl #9
(of illustrated vessels)

DESCRIPTION:
stem- light, short, hollow-blown quatrefoil-lobed inverted baluster

bowl- round funnel set directly on stem

foot- slightly rising, plain rim

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 40 \) mm (27 examples)
bowl rim diameter-
bowl height-
foot rim diameter- \( \bar{x} = 84 \) mm (13 examples)

MANUFACTURE: three-part

COLOUR: pale straw

CONDITION: mostly good, some slightly brittle

DATE: circa 1685-1695

METAL: demi-lead

PUBLISHED ILLUSTRATIONS: Charleston 1984: 117, figure 22
Noel-Hume 1968a: 22, figure 9: 11
23, 11
1968b: 190, VI
191, figure 64: VI
1969: 15, figure 3: right
Powell 1923: 49, figure 37
Watt 1975: 83, figure 6: b
PLATE 12: Ravenscroft and Bishop Period Lead Stemware: Flattened Quatrefoil Knop, Capstan Stem

VESSELS: 5

SHERDS: 8

ACCESSION NUMBER: a) RM 66-68.Ib.2; b) NS2.A7.8.2a.Fl #51; (of illustrated vessels)

DESCRIPTION:
stem- a) merese, hollow-blown, flattened quatrefoil knop, cushion collar, solid capstan
   b) hollow-blown, flattened quatrefoil knop between two cushion collars, solid capstan

bowl- a) solid-base, conical
   b) round funnel

foot- conical

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- $\bar{x} = 38$ mm (40 mm, 37 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: clear

CONDITION: good

DATE: circa 1685-1695

METAL: lead

PUBLISHED ILLUSTRATIONS: Noel-Hume 1968a: 23, 10
                         22, figure 9: 10
                         Watt 1976: figure 6: d
PLATE 13: Early English, Lead Table Glass: a) Pipe Stopper  
   b) Toddy Lifter c) stemware bowl decoration
VESSELS: n/a
SHERDS: n/a
ACCESSION NUMBER: a) UMLIST #25; b) NS2.A2a.1 #64  
   (of illustrated vessels) c) NS2.A7.1d #63
DESCRIPTION:  
a) pipe stopper: bulb handle- double mereses, solid ball  
   knop  
b) toddy lifter: hollow-blown neck and stem  
c) round funnel bowl-base
DECORATION:  
a) five applied strawberry prunts  
c) applied petal decoration to base of round funnel
DIMENSIONS:  
a) bulb diameter- 20 mm  
a) handle length- 25 mm
MANUFACTURE: a) two-part  
   b) one-part
COLOUR: clear
CONDITION: good
DATE: a) circa 1710-1720 (Lanmon 1987: personal  
   communication)  
b) circa 1780-1790  
c) circa 1677
METAL: lead
   b) Ash 1975: 198  
       Wilkinson 1968: 139  
       140, plate 10  
c) Crompton 1967: plate 27
UMLIST #25

Plate 13. a) Pipe stopper: bulb, solid ball knop, with five applied strawberry prunts. Circa 1710-1720.
b) Toddy lifter: hollow-blown neck and stem fragment. Circa 1780-1790
Lead metal, English manufacture.
PLATE 14: Ratafia Glass: Solid Inverted Baluster Stem with Pattern-Moulded Flute Bowl

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.IIIa.4c
(of illustrated vessels)

DESCRIPTION:
stem- merese, solid inverted baluster
bowl- pointed, solid-base flute set into solid stem
foot- slightly rising, folded rim

DECORATION:
stem-
bowl- eight symmetrical, pattern-moulded flutes
foot-

DIMENSIONS:
stem height- 30 mm
bowl rim diameter-
bowl height- 55 mm
foot rim diameter- 50 mm

MANUFACTURE: three-part

COLOUR: clear

CONDITION: excellent

DATE: circa 1680-1690 (Lanmon 1986: personal communication)

METAL: lead

PUBLISHED ILLUSTRATIONS: none located
PLATE 15: Unusual, Small Straight-Stemmed Glass

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.IId.2
(of illustrated vessels)

DESCRIPTION:
stem- merese, solid straight stem
bowl- flat-based, bucket
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- 25 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: pale straw

CONDITION: fragile, badly etched surface

DATE: circa 1685 (Lanmon 1986: personal communication)

METAL: lead

PUBLISHED ILLUSTRATIONs: Journal of Glass Studies, Vol.18,
(reasonable facsimile) Recent Acquisitions, Corning Museum of Glass 1976: 245, 24
Plate 15. Unusual glass, solid straight stem, flat-based bucket bowl, possibly, a jelly glass. Lead metal. English manufacture. Circa 1685.
PLATE 16: Ravenscroft and Bishop Period Lead Stemware: Wrythen-Moulded Decorated Inverted Baluster Stem

VESSELS: 5

SHERDS: 5

ACCESSION NUMBER: NS2.A2.2 #14
(of illustrated vessels)

DESCRIPTION:
stem- solid flattened ball knop, solid inverted baluster
bowl- solid-base, conical
foot-

DECORATION:
stem- wrythen-moulding
bowl-
foot-

DIMENSIONS:
stem height- 40 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1685-1700

METAL: lead

PUBLISHED ILLUSTRATIONS: Charleston 1984: plate 26: b
Noel-Hume 1968a: 20, 1
21, figure 8: 1
Powell 1923: 54, figure 43

b) Wrythen-moulded decoration. After Powell 1923: 54, figure 43.
PLATE 17: Unusual Multi-Knopped Stem

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: a) NS2.A2.22a #48; b) PBST 1986 #J-1
(of illustrated vessels)

DESCRIPTION:
stem- crudely-fashioned, solid, multiple knops diminishing
in size toward foot

bowl- a) flat-based, bucket

foot- a) slightly rising, folded rim

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- a) 55 mm
bowl rim diameter-
bowl height- a) 45 mm
foot rim diameter- a) 50 mm

MANUFACTURE: three-part

COLOUR: clear

CONDITION: good

DATE: circa 1690 (Lanmon 1986: personal communication)

METAL: lead

PUBLISHED ILLUSTRATIONS: none located
PLATE 18: Hollow Inverted Baluster with Basal Knop

VESSELS: 8

SHERDS: 8

ACCESSION NUMBER: a) UMLIST #7; b) PBST 1986: # J-4
(of illustrated vessels)

DESCRIPTION:
stem- hollow-blown inverted baluster, basal knop

bowl- a) round funnel
   c) solid-base, conical

foot-

DECORATION:
stem-

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 55 \text{ mm} \) (60 mm, 50 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1685-1710

METAL: lead

PUBLISHED ILLUSTRATIONS: Charleston 1984: plate 33b: right
Delomosne 1985: 14 & 15: 5
Noel-Hume 1968b: 190, VIII
191, figure 64: VIII
PLATE 19: Teared Inverted Baluster Stem

VESSELS: 14

SHERDS: 14

ACCESSION NUMBER: a) NS2.A5.6a.1e.F2 #26; b) UMLIST #14
(of illustrated vessels) c) UMLIST #12
d) UMLIST #11

DESCRIPTION:
stem- solid inverted baluster

  a, b & d) solid-base, pointed, round funnel
c) solid-base, conical

foot- a) slightly rising, plain rim

DECORATION:
stem- oval tear

bowl-

foot-

DIMENSIONS:
stem height- a) 50 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1684-1720

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 28
Charleston 1984: 163, plate 33: 2
Noel-Hume 1968a: 26, figure 11: 27
    27, 27
1968b: 190, VII
191, figure 64: VII
PLATE 20: Solid Inverted Baluster Stem

VESSELS: 10

SHERDS: 10

ACCESSION NUMBER: 1) NS2.A4.1f #19; b) RM 66-68.IIIa.1b
(of illustrated vessels)

DESCRIPTION:
stem- solid inverted baluster
bowl- a) solid-base, conical
       b) round funnel
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 44.8$ mm (44.5 mm, 45 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR:

CONDITION: excellent

DATE: circa 1690-1700

METAL: lead

PUBLISHED ILLUSTRATIONS: Noel-Hume 1969: 8, figure 1: 1
                           16, figure 4: 1
                           Thorpe 1927: figure 8: a
PLATE 21: Semi-Hollow Inverted Baluster with Basal Knop

VESSELS: 13

SHERDS: 13

ACCESSION NUMBER: a) PR 83.423-39; b) NS2.WR.1 #20; (of illustrated vessels) c) NS2.A10.1a & NS2.WR.1 #21; d) NS2.A21.1 #22

DESCRIPTION:
stem- semi-hollow inverted baluster, basal knop
bowl- a & b) round funnel c) bucket
foot- a & c) slightly rising, folded rim

DECORATION:
stem-
bowl- c) applied sepal gadrooning around base
foot-

DIMENSIONS:
stem height- $\bar{x} = 47.5$ mm (50 mm, 55 mm, 35 mm, 50 mm; 4 examples)
bowl rim diameter-
bowl height-
foot rim diameter- a) 80 mm

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1690-1710

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 30
Delomosne 1985: 12 & 13: 4a
PLATE 22: Massive, Teared Inverted Baluster Stem

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: a) RM 66-68.IIIa.1a.1; b) RM 66-68.IIIa.1a.2
(of illustrated vessels)

DESCRIPTION:
stem- short collar, massive, solid inverted baluster
bowl- solid-base, pointed, round funnel
foot-

DECORATION:
stem- oval tear
bowl- small oval tear in solid-base
foot-

DIMENSIONS:
stem height- \( \bar{x} = 80 \text{ mm} \) (85 mm, 75 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1684-1720

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 28, 29
Charleston 1984: plate 32a: 1 & 2
Delomosne 1985: 8 & 9: 2
Hughes 1956: 87, figure 35
Noel-Hume 1962: 216 & 217, figure 32: 1
PLATE 23: Solid Inverted Baluster with Basal Knop

VESSELS: 25

SHERDS: 25

ACCESSION NUMBER: a) NS2.A4.1f #7; b) NS2.Ala.1a #1; (of illustrated vessels) c) NS2.A8a.1c #3

DESCRIPTION:
stem- solid inverted baluster, basal knop
bowl- round funnel
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 50$ mm (50 mm, 60 mm, 60 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1690-1720

METAL: lead

PUBLISHED ILLUSTRATIONS: Noel-Hume 1968a: 24, figure 10: 18
25, 18
1969: 16, figure 4: 2
Thorpe 1927: plate XLIII: bottom-row, 1
PLATE 24: Knopped, Solid Inverted Baluster with Basal Knop

VESSELS: 14

SHERDS: 14

ACCESSION NUMBER: a) RM 66-68.IIIa.2b.1; b) NS2.A1b #15;
(of illustrated vessels) c) NS2.A10a.1b #16;
d) NS2.A6c.1b #29

DESCRIPTION:
stem- solid ball-knopped inverted baluster, basal knop
bowl- round funnel
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- \( \bar{x} = 45 \text{ mm} \) (47 mm, 43 mm, 45 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION: b) crizzled

DATE: circa 1695-1725

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 32
Davis 1971: 8, right
Mayes, 1972: 124, figure 43: 18
PLATE 25: Teared Inverted Baluster with Basal Knop

VESSELS: 15

SHERDS: 15

ACCESSION NUMBER: a) PR 84.635-1; b) NS2.A6c.1b #29
(of illustrated vessels)

DESCRIPTION:
stem- a) solid inverted baluster, basal knop
b) solid, flattened ball-knopped inverted baluster, basal knop
bowl- round funnel
foot- a) conical, folded rim
b) conical foot fragment

DECORATION:
stem- elongated tear throughout
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 48$ mm (50 mm, 46 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: a) circa 1695-1700
b) circa 1710-1740

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1984: 4: right
Delomosne 1985: 55, 26a
Noel-Hume 1968b: 190, XIV 191, figure 64: XIV
1969: 17, figure 6: 1 & 2
Plate 25. Teared, inverted baluster with basal knop.
PLATE 26: Knopped, Solid Inverted Baluster Stem

VESSELS: 12

SHERDS: 12
ACCESSION NUMBER: a) NS2.A2b.1 #18; b) RM 66-68.IIIa.2a.1
(of illustrated vessels)

DESCRIPTION:
stem- solid, ball-knopped inverted baluster
bowl- a) round funnel
   b) solid-base, conical
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 42.5$ mm (40 mm, 40.7 mm, 40.3 mm, 40 mm;
   4 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR: clear

CONDITION: good

DATE: a) circa 1685-1700
   b) circa 1700-1725
METAL: lead

PUBLISHED ILLUSTRATIONS: Noel-Hume 1968a: 24, figure 10: 23
                          25, 23
1968b: 8, figure 1: 4 & 5
1969: 190, IX
1971, figure 64: IX
PLATE 27: Baluster Stem Variation: Opposing Balusters

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) ONH #H-3; b) RM 66-68.IIIj.1; (of illustrated vessels) c) NS2.A5.6a.1e.F2 #59

DESCRIPTION:
stem- a) solid, asymmetrical opposing balusters separated by solid annular knop
    b) merese, solid symmetrical balusters separated by solid annular knop
    c) solid symmetrical balusters separated by solid annular knop

bowl- a) round funnel
    b) solid-base, conical

foot- b) conical

DECORATION:
stem- a & c) oval tear in each baluster
    b) elongated tear throughout

bowl-

foot-

DIMENSIONS:
stem height- $\bar{x} = 49.3$ mm (47 mm, 46 mm, 55 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1685-1730

METAL: lead

PUBLISHED ILLUSTRATIONS: Davis 1961: 253, figure 3
    Smith 1981: 212, figure 48
PLATE 28: Baluster Stem Variation: Drop Knop

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) RM 66-68.IIIe.1; b) RM 66-68.IIIe.2; (of illustrated vessels) c) SP1.3 #20; d) UMLIST #4

DESCRIPTION:
stem- a) cushion collar, solid drop knop, basal knop  
   b) solid drop knop, straight stem 
   c) cushion collar, solid drop knop fragment 
   d) cushion collar, solid drop knop, solid annular knop, basal knop

bowl- a, c & d) solid-base, pointed, round funnel 
   b) solid-base, conical

foot- a) slightly rising, folded rim

DECORATION:
stem- c & d) elongated tear throughout

bowl- c) small tear in base

foot-

DIMENSIONS:
stem height- $\bar{x} = 55.6$ mm (70 mm, 47 mm, 50 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter- a) 86 mm

MANUFACTURE:

COLOUR:

CONDITION: a) fire blackened  
   b) badly etched

DATE: circa 1690-1710

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 47, 50  
1984: 5, left  
Delomosne 1985: 34 & 35: a
PLATE 29: Baluster Stem Variation: Angular, Wide Angular Knop

VESSELS: 21

SHERDS: 21

ACCESSION NUMBER: a) RM 66-68.IIIb.2; b) NS2.WR.1 #37
(of illustrated vessels)

DESCRIPTION:
stem- a) short collar, solid angular knop, basal knop
  b) short collar, semi-hollow, wide angular knop, true
      baluster
bowl- pointed, round funnel
foot- conical foot fragment

DECORATION:
stem- a) elongated tear throughout stem
bowl- a) small oval tear in solid-base
foot-

DIMENSIONS:
stem height- \( \bar{x} = 51 \text{ mm} \) (50 mm, 52 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1690-1720

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: 41; 36; 37; 38
  Delomosne 1985: 18 & 19: 7
  Wilkinson 1968: figure 57
PLATE 30: Baluster Stem Variation: Dumb-Bell Knop

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: a) NS2.A9.1b #32; b) NS2.A1.2 #33
(of illustrated vessels)

DESCRIPTION:
stem- a) merese, solid ball knop, solid dumb-bell knop
       b) solid ball knop, merese, solid flattened knop,
           dumb-bell knop
bowl- round funnel
foot-

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 42.5$ mm (40 mm, 45 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1690-1720

METAL: lead

                      24, figure 10: 21 & 24
PLATE 31: Baluster Stem Variation: Ball Knop

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: a) RM 66-68.IIIk.1; b) RM 66-68.IIIk.2
(of illustrated vessels)

DESCRIPTION:
stem- a) solid ball knop, straight stem-section, basal knop
    b) short collar, solid ball knop, straight stem-section, basal knop
bowl- a) solid-base, round funnel
    b) solid-base, pointed, round funnel
foot- a) slightly rising, folded rim
    b) conical, folded rim

DECORATION:
stem- oval tear in ball knop
bowl- a) small round tear in solid-base
foot-

DIMENSIONS:
stem height- \( \bar{x} = 58.5 \text{ mm} \) (60 mm, 57 mm; 2 examples)
bowl rim diameter- a) 68 mm
bowl height- a) 75 mm
foot rim diameter- \( x = 76.5 \text{ mm} \) (78 mm, 75 mm; 2 examples)

MANUFACTURE:

COLOUR:

CONDITION: a) surface blackened, etched and fire damaged

DATE: circa 1690-1740

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1984: 4, right
Davis 1971: 17, 2
PLATE 32: Baluster Stem Variation: Acorn Knop

VESSELS: 3

SHERDS: 3

ACCESSION NUMBER: a) UMLIST #2; b) RM 66-68.IIIh.1 (of illustrated vessels)

DESCRIPTION:
stem- a & b) solid acorn knop, basal knop
bowl- solid-base, pointed, round funnel
foot- c) conical, folded rim

DECORATION:
stem- a & c) elongated tear throughout
bowl-
foot-

DIMENSIONS:
stem height- $\bar{x} = 51$ mm (42 mm, 60 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter- c) 94 mm

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1700-1725

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 58: 112
Charleston 1984: plate 32b: left
Davis 1971: 17, 1
Delomosne 1985: 24 & 25: 10a & 10b
26 & 27: 11a & 11b
PLATE 33: Baluster Stem Variation: Mushroom Knop

VESSELS: 6

SHERDS: 6

ACCESSION NUMBER: a) RM 66-68.IIIG.1; b) NS2.A10a.1b #45; (of illustrated vessels) c) UMLIST #3; d) NS2.A5.6a.1e.F2 #60

DESCRIPTION:
stem- a) short collar, solid mushroom knop, basal knop b) solid mushroom knop c) solid mushroom knop, annular knop above, basal knop d) annular knop, solid mushroom knop, basal knop
bowl- a) solid-base, conical b) round funnel, domed interior c) solid-base, pointed, round funnel, domed interior
foot- b) conical

DECORATION:
stem- a & c) elongated tear in mushroom knop d) elongated tear throughout
bowl-
foot-

DIMENSIONS:
stem height- \( \bar{x} = 47.7 \) mm (45 mm, 35 mm, 65 mm, 45 mm; 4 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1705-1720

METAL: lead

PLATE 34: Baluster Stem Variation: Cylinder Knop

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.IIIi.1
(of illustrated vessels)

DESCRIPTION:
stem- merese, solid cylinder knop,
bowl- acorn-knop base, thistle
foot-

DECORATION:
stem- elongated tear throughout cylinder knop
bowl-
foot-

DIMENSIONS:
stem height- 50 mm
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1705-1730

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 62; 117
1984: 8, above right
Charleston 1984: plate 36: d
Crompton 1967: plate 38: left
Delamosne 1985: 30 & 31: 13b
(rare bowl form) Delamosne 1985: 26 & 27: 11a
Plate 34. Unusual stem formation: solid acorn knop, as part of solid base thistle bowl, merese solid cylinder knop below. Lead metal. English manufacture. Circa 1705-1730.
PLATE 35: Baluster Stem Variation: Annulated Knop

VESSELS: 7

SHERDS: 7

ACCESSION NUMBER:
a) NS2.A5.6a.1e.F2 #58;
(b) NS2.A5.6a.1e.F2 #46;
c) RM 66-68.IIId.2
(of illustrated vessels)

DESCRIPTION:
stem- a) solid, three-ringed annulated knop, true baluster knop
      b & c) solid, three-ringed annulated knop, basal knop

bowl- a) solid-base, conical
      b & c) solid-base, pointed, round funnel

foot- a) domed
     b) conical

DECORATION:
stem- a & b) elongated tear
      c) vertical tooling, ribbing on exterior

bowl-

foot-

DIMENSIONS:
stem height- $\bar{x} = 54.3$ mm (55 mm, 53 mm, 55 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1710-1730

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 95
1984: 6, left
Charleston 1984: plate 36a
Miller 1983: 358, plate 48
Noel-Hume 1969: 16, figure 4, 5
Drawing to scale 1:1

PLATE 36: Baluster Stem Variation: Multiple Knops

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) UMLIST #5; b) RM 66-68.IIIa.5c.1
(of illustrated vessels) c) PBST 1986 #J-2

DESCRIPTION:
stem- a) solid annular knop, wide angular knop, drop knop, basal knop
   b) merese, solid flattened ball knop, inverted baluster, basal knop
   c) solid flattened ball knop between mereses, inverted baluster

bowl- a) solid-base, thistle, domed interior
   b) solid-base, round funnel
   c) solid-base, conical

foot- a & b) domed
   c) conical

DECORATION:
stem- a) large oval tear in drop knop

bowl- a) small tear in solid-base

foot-

DIMENSIONS:
stem height- $\bar{x} = 52.5$ mm (60 mm, 45 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1710-1740

METAL: lead

PUBLISHED ILLUSTRATIONS: Delomosne 1984: 18 & 19: 7
Noel-Hume 1968a: 20, 6
: 21, figure 8: 6
PLATE 37: Baluster Stem Variation: Bobbin knop

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.IIIf.1
(of illustrated vessels)

DESCRIPTION:
stem- three solid, diminishing-in-size, bobbin knops between short collars
bowl- solid-base, pointed, round funnel
foot- slightly rising, folded rim

DECORATION:
stem-
bowl-
foot-

DIMENSIONS:
stem height- 65 mm
bowl rim diameter-
bowl height-
foot rim diameter- 70 mm

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1720-1745

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 175, 176
1984: 10, above, right
Delomosne 1985: 59 & 60: 29
PLATE 38: Baluster Stem Variation: Annular Knop

VESSELS: 3

SHERDS: 3

ACCESSION NUMBER: a) RM 66-68.IIIc.2; b) RM 66-68.IIIc.1 (of illustrated vessels)

DESCRIPTION:
stem- a) collar, semi-hollow annular knop, basal knop
    b) merese, solid annular knop, basal knop
bowl- a) pointed round funnel
    b) solid-base, conical
foot- conical

DECORATION:
stem- b) elongated tear throughout
bowl- b) small oval tear in solid-base
foot-

DIMENSIONS:
stem height- $\bar{x} = 57.5$ mm (60 mm, 55 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE:

COLOUR:

CONDITION:

DATE: circa 1730-1760

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure, 151; 152; 155
1984: frontispiece
PLATE 39: Verre Fougère, Teared Drawn Straight Stem and Trumpet bowl

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: a) RM 66-68.Vb.1
(of illustrated vessels)

DESCRIPTION:
stem- solid, drawn, straight
bowl- drawn trumpet
foot- slightly rising, folded rim

DECORATION:
stem- elongated tear throughout
bowl- foot-

DIMENSIONS:
stem height- 73 mm
bowl rim diameter-
bowl height- 50 mm
foot rim diameter- 80 mm

MANUFACTURE: two-part

COLOUR: dark green

CONDITION: crizzled, badly etched

DATE: a) circa 1690-1730

METAL: non-lead, probably potash-lime

PUBLISHED ILLUSTRATIONS: Ash 1975: 182
Hughes 1956: figure 114: a
PLATE 39a: Solid Drawn Straight Stem and Trumpet Bowl

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: a) PR 86.1135-3
(of illustrated vessels)

DESCRIPTION:
stem - solid, drawn, straight
bowl - drawn trumpet
foot - flat, folded rim

DECORATION:
stem - elongated tear throughout
bowl -
foot -

DIMENSIONS:
stem height - 75 mm
bowl rim diameter - 70 mm
bowl height - 55 mm
foot rim diameter - 70 mm

MANUFACTURE: Two-part

COLOUR: clear

CONDITION: bowl, badly crizzled and etched

DATE: circa 1730-1745

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 231; 234
Noel-Hume 1962: 217, figure 32: 7
b. PR 86.1135-3 Drawing to scale 1:1

PLATE 39b: Heavy, Teared Drawn Straight Stem, Tavern Glassware

VESSELS: 10
SHERDS: 10

ACCESSION NUMBER: a) UMLIST #19; b) FC.1.S2.3 #E-2; (of illustrated vessels) c) UMLIST #18

DESCRIPTION:
stem- a & b) solid, straight
c) solid, drawn, straight

bowl- a & b) waisted-bell, domed interior

foot-

DECORATION:
stem- c) elongated tear throughout

bowl- a & b) small oval tear in base

foot-

DIMENSIONS:
stem height- $\bar{x} = 53.3$ mm (10 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: a & b) three-part
c) two-part

COLOUR: clear

CONDITION:

DATE: circa 1740-1775

METAL: lead

PUBLISHED ILLUSTRATIONS: Ash 1975: 182
Noel-Hume 1969: 18, figure 8
PLATE 39c: Solid Straight Stem, Tavern Glassware

VESSELS: 18

SHERDS: 18

ACCESSION NUMBER: a) NS2.A9.1 #D-2; b) NS2.A9.1 #D-3; c) NS2.A4a.1b.F7 #D-9; d) RM 66-68.Va.1

DESCRIPTION:
stem- a, c & d) solid, straight
b) solid, drawn, straight stem, basal knop

bowl- a, b & d) drawn trumpet
 c) waisted-bell

foot- a) flat, folded rim

DECORATION:

stem-

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 51.2 \text{ mm} \) (50 mm, 40 mm, 55 mm, 60 mm; 4 examples).
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: a, b & d) two-part
c) three-part

COLOUR:

CONDITION:

DATE: circa 1745-1775

METAL: lead

PUBLISHED ILLUSTRATIONS: Haynes 1959: figure 77: d
McNally 1982: 96, figure 71;
97, figure 72;
98, figure 73
Neillon & Moussette 1981: 508,
figure 78: 5 & 6
Noel-Hume 1969: 18, figure 8: 4 & 5
PLATE 40: Four-Sided, Moulded Pedestal (Silesian) Stem

VESSELS: 3

SHERDS: 3

ACCESSION NUMBER: a) RM 66-68.IVa.1; b) RM 65-68.IVa.2 (of illustrated vessels)

DESCRIPTION:
stem- a) short collar, round shoulder, four-sided moulded pedestal, basal collar
    b) round shoulder, four-sided moulded pedestal

bowl- a) solid-base, thistle

foot-

DECORATION:
stem- a) elongated tear throughout
    b) diamond-shaped losenges at stem angles, elongated tear throughout

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 57.5 \) mm (70 mm, 45 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1715-1720

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 188; 191; 192; 193; 194
Charleston 1984: plate 37: e
Delomosne 1985: 44 & 45: 20a & b
Ellville 1951: 48, figure 19
Noel-Hume 1968a: 28, 38
    29, figure 12: 38
1968b: 190: XV
    191: figure 64: XV
PLATE 40a: Six-Sided, Moulded Pedestal (Silesian) Stem

VESSELS: 8

SHERDS: 8

ACCESSION NUMBER: a) RM 66-68.IVb.4; b) NS2.A8.1a #40;
(of illustrated vessels) c) RM 66-68.IVb.2
 d) RM 66-68.IVb.1

DESCRIPTION:
stem- a, b & d) square shoulder, six-sided moulded pedestal
 c) cushion collar, round shoulder, six-sided moulded pedestal

bowl- b) round funnel
c) thistle
d) solid-base, conical

foot- a) conical, folded rim

DECORATION:
stem- a) diamond-shaped losenges at stem angles, pointed
 stars between losenges, oval tear throughout
 b, c & d) large, oval tear throughout

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 55.3 \) mm (58 mm, 50 mm, 48 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter- a) 72 mm

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1718-1730

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: figure 196; 197; 198
 Delomosne 1985: 46 & 47: 21a
 Noel-Hume 1968a: 28, 34; 35; 36
 29, figure 12:
PLATE 40b: Eight-Sided, Moulded Pedestal (Silesian) Stem

VESSELS: 4

SHERDS: 4

ACCESSION NUMBER: a) UMLIST #6; b) RM 66-68.IVc.1; (of illustrated vessels) c) RM 66-68.IVc.2

DESCRIPTION:
stem- a) cushion collar, square shoulder, eight-sided moulded pedestal
    b) square shoulder, eight-sided moulded pedestal
    c) round shoulder, eight-sided moulded pedestal

bowl- a) pointed round funnel
    b) solid-base thistle
    c) solid-base, conical

foot- c) conical, folded rim

DECORATION:
stem- a) diamond-shaped losenges at stem angles, oval tear throughout
    b & c) oval tear throughout

bowl-

foot-

DIMENSIONS:
stem height- $\bar{x} = 55$ mm (65 mm, 55 mm, 45 mm; 3 examples)
bowl rim diameter-
bowl height-
foot rim diameter- c) 73 mm

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1725-1750

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: 202
Ellville 1951: 48, figure 18
Delomosne 1985: 46 & 47: 21b
Noel-Hume 1968b: 190, XVI
191, figure 64: XVI
PLATE 41: Air-Twist Stem

VESSELS: 5

SHERDS: 5

ACCESSION NUMBER: a) RM 66-68 VI.1; b) SPS.1.M3 #F-1
(of illustrated vessels)

DESCRIPTION:
stem-  a) solid straight stem
b) short collar, ball knop and angular knop separated
     by solid straight stem

bowl-  a) solid-base, waisted-bell
b) pointed, round funnel

foot-

DECORATION:
stem- multiple-spiral air-twist

bowl-

foot-

DIMENSIONS:
stem height- \( \bar{x} = 71 \text{ mm} \) (70 mm, 72 mm; 2 examples)
bowl rim diameter-
bowl height-
foot rim diameter-

MANUFACTURE: a) two-part
b) three-part

COLOUR:

CONDITION:

DATE: circa 1730-1760

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1971: a) 273; 368
b) 641; 644
Haynes 1959: figure 80: b
Noel-Hume 1969: a) 19, figure 9: 2
PLATE 42: Facetted Stem

VESSELS: 1

SHERDS: 1

ACCESSION NUMBER: RM 66-68.VII.1
(of illustrated vessels)

DESCRIPTION:
stem- facetted, six-sided, incurving
bowl- waisted-bucket
foot- flat, plain rim

DECORATION:
stem- six, vertical, wheel-cut facettes

bowl- six oblong, wheel-cut flutes

foot-

DIMENSIONS:
stem height- 51 mm
bowl rim diameter-
bowl height-
foot rim diameter- 60 mm

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1760-1810

METAL: lead

PUBLISHED ILLUSTRATIONS: Bickerton 1984: 19, right
Crompton 1967: plate 132
PLATE 43: Rudimentary Centrally-Knopped Stem

VESSELS: 7

SHERDS: 17

ACCESSION NUMBER: a) RM 66-68.VIIIc.1; b) RM 66-68.VIIIc.2
(of illustrated vessels)

DESCRIPTION:
stem—flat collar, centrally-knopped rudimentary stem,
bowl—waisted-bucket
foot—flat foot, plain rim

DECORATION:
stem—
bowl—pattern-moulded flutes on lower-half
foot—

DIMENSIONS:
stem height—$\bar{x} = 37$ mm (10 examples)
bowl rim diameter—
bowl height—
foot rim diameter— a) 65 mm

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1815-1850

METAL: lead

PUBLISHED ILLUSTRATIONS: Haynes 1959: figure 95: b
Jones and Smith 1985: 48, figure 52
McNally 1982: 107, figure 82
108, figure 83
126, figure 101
Noel-Hume 1968a: 20, figure 10: 3
1968b: 190, XXV
191, figure 64: XXV
PLATE 44: Rudimentary Stem: Rummer

VESSELS: 16

SHERDS: 16

ACCESSION NUMBER: a) NS2.A5.6a.1e.F2 #44; (of illustrated vessels) b) RM 66-68.VIIIb.1; c) PBST 1968 #J-7; d) PR 83.300-10

DESCRIPTION:
stem- centrally-bladed knop
bowl- a) incurved bucket b, c & d) flat-based bucket
foot- a) domed, terraced, folded rim b) flat, folded rim d) flat, terraced

DECORATION:
stem-
bowl- a) wheel-cut, diamond pattern band, enclosed by two wheel-cut, horizontal bands around rim
foot-

DIMENSIONS:
stem height- \( \bar{x} = 42 \text{ mm} \) (40 mm, 50 mm, 36 mm; 3 examples)
bowl rim diameter- a) 74 mm
bowl height- a) 85 mm
foot rim diameter- \( \bar{x} = 77.3 \text{ mm} \) (70 mm, 84 mm, 60 mm; 3 examples)
vessel height- a) 135 mm

MANUFACTURE: three-part

COLOUR:

CONDITION:

DATE: circa 1780-1830

METAL: lead

PUBLISHED ILLUSTRATIONS: Jones & Smith 1985: 48, figure 52
McNally 1982: 103, figure 78
104, figure 79
105, figure 80
106, figure 81
108, figure 83
PLATE 45: Tumbler: Non-lead, Decorated Tumbler

VESSELS: 1

SHERDS: 12

ACCESSION NUMBER: RM 66-68. VIIIa.1
(of illustrated vessels)

DESCRIPTION:
body- round in horizontal cross-section, tapered sides
basal profile- extremely shallow

DECORATION:
body- wheel-engraved frieze encircling upper body:
consisting of six alternating panels: one depicting a
bird in a cage, and the other, a flower. The panels
are separated by vertical bands of scroll design and
enclosed by horizontal wavy lines at the top and bottom
of the frieze.

DIMENSIONS:
vessel height- 90 mm
body rim diameter- 75 mm
foot diameter- 50 mm

MANUFACTURE: free-blown and dip-moulded

COLOUR: clear

CONDITION: very thin, irridescent, a few air seed-bubbles

DATE: circa 1700-1730

METAL: non-lead, possibly potash-lime

PUBLISHED ILLUSTRATIONS: LaPointe 1981: 126 & 127b,
(reasonable facsimiles), plate 34c
McNally 1982: 39, figure 16
Neillon & Moussette 1981: 5-9,
figure 79: 1-6

Decorative Motif- Christie's Amsterdam Sale Catalogue,
September 19-23, 1985: 49-50
Plate 45. Tumbler, dip-moulded with round body and tapered sides. Wheel-engraved frieze on body, between rim and base. Non-lead metal. Probably of Bohemian or Low Countries manufacture. Circa 1700.
PLATE 45a: Tumbler: Non-lead, Decorated Rim and Body Sherd

VESSELS: n/a

SHERDS: n/a

ACCESSION NUMBER: a) SP1.2a #27; b) NS2.A3.1.Fl.3
(of illustrated vessels & sherds)

DESCRIPTION:
rim- a) decorated rim and body sherd
body b) decorated body sherd

DECORATION:
rim- a) rim decoration, wheel-cut horizontal wavy band,
straight horizontal band, cross-hatched decoration

body- a) pattern-moulded oblong flutes

b) wheel-engraved figure of a man in Puritan costume

DIMENSIONS: n/a

MANUFACTURE: a) pattern-moulded

COLOUR: a) clear
b) yellowish tint

CONDITION: fair, very thin and fragile

DATE: a) circa 1700-1730
b) 1680

METAL: non-lead, probably potash-lime

PUBLISHED ILLUSTRATIONS: a) McNally & Harris 1979: 72,
(reasonable facsimile   b) Noel-Hume 1968a: 10, figure 2a
for style of decoration)
PLATE 45b: Tumbler: Non-lead, Decorated Base

VESSELS: 2

SHERDS: 2

ACCESSION NUMBER: a) NS2.A7.8.2a.Fl #61; (of illustrated vessels) b) NS2.A7.8.2a.Fl #62

DESCRIPTION:
body- probably round in horizontal cross-section, tapered sides
basal profile- a) deep, domed interior, high kick
b) shallow, flat bottom

DECORATION:
base- spiked gadrooning around base

DIMENSIONS:
base diameter- $\bar{x} = 62.5$ mm (65 mm, 60 mm; 2 examples)

MANUFACTURE: pattern-moulded

COLOUR: clear

CONDITION: slightly crizzled

DATE: circa 1680-1700

METAL: non-lead, probably potash or soda-lime

PUBLISHED ILLUSTRATIONS: McNally 1982: 48, figure 24
Noel-Hume 1968a: 22, figure 9: 16
23, 16
Smith 1981: 224 (form B) & 226
PLATE 45c: Tumbler: Non-lead, Plain (Not Illustrated)

VESSELS: 8

SHERDS: 17

ACCESSION NUMBERS: a) NS2.A4.2a (1 rim, 8 body sherds); b) SP1.1; c) SP1.2; d) SP1.3; e) NS2.A2a.WR; f) NS2.4.1f.F9; g) NS2.5.6.2a; h) NS2.A6b.1d; i) NS2.A10a.1a

DESCRIPTION: body- round in horizontal cross-section with tapered sides basal profile- extremely shallow

DECORATION: none

DIMENSIONS: base diameter- $\bar{x} = 54.3$ mm (45 mm-65 mm; 6 examples)

MANUFACTURE: probably dip-moulded

COLOUR: clear, light green, dark green

CONDITION: 3 examples are crizzled

DATE: circa 1745-1784

METAL: non-lead

PUBLISHED ILLUSTRATIONS: Smith 1981: 220 & 221, figure 50 & 51
PLATE 45d: Tumbler: Lead, decorated  (Not Illustrated)

VESSELS: 8

SHERDS: 8

ACCESSION NUMBER: a) NS2.A8.1.2; b & c) NS2.A4a.1;
d) NS2.A8.1; e) NS2.A8.1a; f) NS2.A9b.1a;
f) NS2.A8a.1d;  g) NS2.A5.2

DESCRIPTION:
body- round in horizontal cross-section
basal profile- shallow to medium-deep

DECORATION:
base- a) moulded sunburst design
body- b-f) moulded vertical panels on the exterior
g) moulded vertical panels on domed interior

DIMENSIONS:
base diameter- $\bar{x} = 61.8$ mm (44 mm-70 mm; 8 examples)

MANUFACTURE: a) press-moulded;
b-f) pattern-moulded
g) optic-moulded

COLOUR: colourless

CONDITION: excellent

DATE: circa 1750-1850

METAL: lead

PUBLISHED ILLUSTRATIONS: Jones and Smith 1985: 36, figure 31
38, figure 34
Smith 1981: 222, 223, figure 52
224, 225, figure 53
224, 226, figure 54
PLATE 45e: Tumbler: Lead, Plain (Not Illustrated)

VESSELS: 11

SHERDS: 21

ACCESSION NUMBER: a) SP1.F4; b) NS2.Al.1a; c) NS2.Al.1a;
d) NS2.Al.2; e) NS2.A2.a.1; f) NS2.A4.1;
g) NS2.A4.1f; h) NS2.A4.1f.F9;
i) NS2.A6.a.1b; j) NS2.A6b.1; k) NS2.A6b.1d

DESCRIPTION:
body- round in horizontal cross-section
basal profile- shallow to medium-deep

DECORATION: none

DIMENSIONS:
base diameter- \( \bar{x} = 51.27 \) mm (44 mm-67 mm; 11 examples)

MANUFACTURE: optic-moulded

COLOUR: clear

CONDITION: good

DATE: mid-18th through early 19th century

METAL: lead, a few demi-lead

PUBLISHED ILLUSTRATIONS: McNally 1982: 63, figure 35
Neillon & Moussette 1981: 414; 509: figure 79
PLATE 46: Footed Tumbler, Jelly Glass with Applied Ring Base
(Not Illustrated)

VESSELS: 7

SHERDS: 7

ACCESSION NUMBER: a) NS2.A4.1f.F9; b) NS2.A5.6a.1e.F2;
c) NS2.A9.1b; d) NS2.A7a.1d;
e) NS2.A5.6.2a; f) NS2.A2.2; G) UMLIST

DESCRIPTION:
body- round in horizontal cross-section with a rounded base
foot- conical

DECORATION: none

DIMENSIONS:
base diameter- $\bar{x} = 49.4$ mm (42 mm-57 mm; 6 examples)

MANUFACTURE: two-part

COLOUR: a) greenish
b-g) colourless

CONDITION: fair to good

DATE: a, b & d) late-seventeenth century
c, e-g) eighteenth century

METAL: a, b & d) non-lead, probably potash or soda-lime
c, e-g) lead

PUBLISHED ILLUSTRATIONS: Haynes 1959: plate 27: c
Jones and Smith 1985: 79, figure 95
McNally 1979: 75, plate 27
Smith 1981: 234 & 235, figure 58
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Thorpe, W.A.

Watts, D.C.

Wilkinson, O.N.
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THE CORNING MUSEUM OF GLASS

May 26, 1987

Ms. Patricia E. McClenaghan
Apt. 1102
50 Quebec Avenue
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Dear Ms. McClenaghan:

Thanks for your letter of May 5th. We will send a photograph of our pipe tamper (83.2.32) separately. You do have our permission to use this illustration in your thesis. If you publish this object in the future, we ask you to contact us again — so that we can keep track of where it appears. I am sorry, but we have no drawing of the piece.

I do appreciate your sending the full list of fragments from controlled archeological excavations. I shall add these notes to the photocopies you gave me. It is an exciting and important group of glass finds.

I do hope that we will have the chance of acquiring a copy of your thesis when it is completed. Good luck.

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Dwight P. Lanmon

Dwight P. Lanmon

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Appendix B: Glassware Terminology

Annealing  Cooling at a controlled rate to relieve stresses in a glass object
Air-twist  Tears of glass drawn out to form threads, then twisted
Baluster  A stem narrow above and swelling below, an inverted baluster reversing this order; baluster also used to describe the whole style of simple substantial stems of the early-eighteenth century
Barilla  Soda ash obtained from burning certain marine plants, the alkaline flux used in soda glass manufacture
Base-ring  The rim of a foot
Blowpipe  Hollow iron rod used to gather and insufflate hot glass
Capstan  A section of a wine glass stem swelling at both ends
Contact mould  A full-sized mould in which glass has been blown to form at least part of a vessel to a finished shape, size and pattern
Crizzling  A defect in glass caused by an imbalance between the alkali and calcium constituents, producing surface roughness, internal hairline cracks and ultimate disintegration
Cullet  Broken or waste glass re-used, added to the batch of raw materials to facilitate fusion
Cutting  Abraiding of the glass surface on a wheel, the abraded area is then polished for a prismatic effect
Decoration, (extrinsic)  All decorative procedures carried out after annealing
Decoration, (intrinsic)  All decorative procedures carried out before annealing
Diamond-point engraving  Surface of the glass is scratched or engraved with a diamond point
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux</td>
<td>Chemical constituent of glass which lowers its melting point</td>
</tr>
<tr>
<td>Folded foot</td>
<td>Disc-foot made by folding the rim of the foot under the base, forming a double layer of glass on which a vessel stands, greatly increasing the stability</td>
</tr>
<tr>
<td>Gadrooning</td>
<td>A heavy gather of glass, normally mould-blown in the form of raised ribs around the lower-part of a stemware bowl</td>
</tr>
<tr>
<td>Gather</td>
<td>A blob of glass rolled onto the blow pipe or pontil from the surface of molten glass in the melting pot</td>
</tr>
<tr>
<td>Jelly glass</td>
<td>A small footed vessel with little or no stem, used for jelly or other sweet desserts</td>
</tr>
<tr>
<td>Kick</td>
<td>Conical re-entrant in the base of a cylindrical or spherical vessel to ensure stability</td>
</tr>
<tr>
<td>Knop</td>
<td>Spherical component of a stem</td>
</tr>
<tr>
<td>Marvered</td>
<td>The action of smoothing the paraison externally and consolidating it by rolling on a flat slab of iron as a preliminary to further working</td>
</tr>
<tr>
<td>Merese</td>
<td>A sharply protruding bladed collar interposed between the main components of a stem</td>
</tr>
<tr>
<td>Metal</td>
<td>Glass material in the molten state in the pot, ready to work, widely used to describe the material of a finished vessel</td>
</tr>
<tr>
<td>Moulding</td>
<td>The process of shaping glass by air or mechanical pressure against an enclosing form</td>
</tr>
<tr>
<td>Off-hand</td>
<td>Manufacture of glass vessels without the use of moulds, i.e. free-blown</td>
</tr>
<tr>
<td>Ogee-bowl</td>
<td>Wine glass bowl where the line of the bowl and stem forms an ogee or double curve</td>
</tr>
<tr>
<td>Opaque-twist</td>
<td>Coloured glass rods embedded in a gather of glass, then covered in a second gather, and finally drawn and twisted</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Optic moulding</td>
<td>The paraison is given its initial shape and decoration by being blown into an optic mould, then after the paraison is withdrawn, a second full-sized unpatterned mould is used and the pattern is thus transferred entirely into the interior</td>
</tr>
<tr>
<td>Paraison</td>
<td>The partly insufflated gather of glass ready for further working, i.e. shaping</td>
</tr>
<tr>
<td>Pattern Mould</td>
<td>A pattern mould is a part-sized mould used to form the approximate shape of a vessel and to impress a pattern by blowing glass into it</td>
</tr>
<tr>
<td>Pontil (punty)</td>
<td>An iron rod used for holding the vessel at the base by means of a small gather of glass, enabling the glassman to continue the work of shaping the neck and rim etc.</td>
</tr>
<tr>
<td>Pontil mark</td>
<td>The scar, rough area underneath the foot, left by the removal of the pontil from the base of a glass vessel after manufacture</td>
</tr>
<tr>
<td>Prunt</td>
<td>A decorative small lump of glass fused to the surface of a vessel, then usually impressed with a tool to form a shaped pattern</td>
</tr>
<tr>
<td>Rigaree</td>
<td>A trailed horizontal thread of glass, dented to form tiny vertical ribs, a decorative device around a stemware bowl or foot</td>
</tr>
<tr>
<td>Roemer</td>
<td>A drinking glass, usually for Rhenish white wine, with ovoid bowl made in one piece with a hollow cylindrical stem usually mounted on conical foot. The stem is usually decorated with prunts, originally made in German waldglas, later made in English lead crystal</td>
</tr>
<tr>
<td>Stemware</td>
<td>A vessel commonly used for drinking with three separate elements: bowl, stem and foot</td>
</tr>
<tr>
<td>Tears</td>
<td>Bubbles of air intentionally enclosed in glass for decorative purposes</td>
</tr>
<tr>
<td>Trailing</td>
<td>Pulling out a thread of glass and applying it to the surface of a vessel in spiral decoration</td>
</tr>
</tbody>
</table>
Tumbler  A more or less cylindrical drinking vessel usually with a flat bottom although in the early 18th century it may be footed

Veriform  A worm-like decorative trail of glass applied to the outer surface of a vessel

Wrythen  Spirally twisted ribbing, a swirled fluting often used to camouflage weld marks on a vessel

Appendix C: Popular Drinks in Port Royal

Adam
Cocktail of rum, grenadine and lemon

Ale
An ancient name for beer or ale, came into English from the Anglo-Saxon word alu or ealu

Beer
A beverage made by fermenting cereal, by a process called brewing; the original distinction between ale and beer was that beer was flavoured with hops. Hops were introduced into England for brewing by Dutch settlers. They have a valuable preservative action and impart a characteristic bitter and aromatic taste

Brandy
A potable spirit distilled from wine. The name brandy is also applied to spirit distilled from fermented juice from fruits, always with the name of the source fruit preceding, i.e., apricot brandy

Canary
A wine made in the Canary Islands, a Spanish Atlantic outpost, once important for wine production. Canary sack was a celebrated and highly-esteemed wine, from Elizabethan times until the nineteenth century, as a superb desert wine

Caudle
A hot beverage made by mixing gruel with wine or spirits

Claret
A light, clear red wine, the word having no geographical significance and not known in France as coming from a particular district. In England however, the word was applied specifically to red wines from Bordeaux

Gin
First made in Holland during the fifteenth century, it is a spirit distilled from grain, flavoured with oil of juniper. When William III came to the English throne, circa 1689, the excise duty on French wines and brandy was increased and gin was sold cheaply. Gin Lane became a synonym for depravity during the seventeenth century in England

Killdivile
An old naval name for rum, literally ... to kill the devil
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madeira</td>
<td>A celebrated highly expensive wine, a great favorite in England in Elizabethan times. It is wine fortified with spirit, made from sugar, thus a type of rum, though highly rectified, leaving no flavour. A long maturing period is usual. Casks of madeira were formerly shipped as ballast on sailing ships, as the wine was thought to benefit from a rolling voyage.</td>
</tr>
<tr>
<td>Malmsey (Malvasia)</td>
<td>A sweet or fortified wine known for many centuries. The name is derived from Monemvassia, a town on the east coast of Greece, from where the wine was originally imported. The malvasia grape was introduced into Italy by the Romans and into Madeira by the Portugese in the fifteenth century.</td>
</tr>
<tr>
<td>Mobby (Mobbi)</td>
<td>A West-Indian name for a variety of beverages, including a spirit distilled from sweet potatoes and fruit brandy.</td>
</tr>
<tr>
<td>Mumm</td>
<td>An extremely potent and bitter ale or beer, from Brunswick, Germany, imported to Britain, circa 1660 until the mid-eighteenth century.</td>
</tr>
<tr>
<td>Periquita</td>
<td>A Portugese dry red wine.</td>
</tr>
<tr>
<td>Perrino (Perrano)</td>
<td>One of the lesser grapes used in Spain to make sherry.</td>
</tr>
<tr>
<td>Punch</td>
<td>Any mixed alcoholic drink containing fruit juice, usually hot and spiced; almost all punches contain lemon juice and sugar as well as other ingredients.</td>
</tr>
<tr>
<td>Rapp (Rappi)</td>
<td>An Elizabethan cordial or aperitif wine containing cinnamon and cloves.</td>
</tr>
<tr>
<td>Ratafia</td>
<td>Any liqueur made with a fruit or kernel base.</td>
</tr>
<tr>
<td>Rhenish</td>
<td>An obsolete English name for white wines of the German Rhine region. The term was used until they were called hocks, circa 1700.</td>
</tr>
<tr>
<td>Rum</td>
<td>Spirit made from sugar cane, first made in Barbados and made wherever sugar cane is grown. The source material for rum is the residue or by-product of sugar refining, especially molasses. Rum is colourless when...</td>
</tr>
</tbody>
</table>
first distilled; ageing in oak gives rum its characteristic colour. Until recently rum and gin had a low social reputation, and rum was considered the drink of sailors

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