

Spanish Olive Jars From Fermeuse Harbour, Newfoundland*

John Carter

Résumé/Abstract

L'auteur décrit neuf jarres à olives provenant de Fermeuse Harbour (Terre-Neuve) et interprète les données recueillies à leur sujet. Les jarres à large embouchure et à embouchure étroite sont bien distinctes, les premières remontant à la période de 1580 à 1780. Ces jarres à olives témoignent des variations dans la tradition de la poterie espagnole, variations qui n'ont pas été décrites auparavant. On y retrouve les trois styles classifiés par J.M. Goggin appartenant à la période moyenne, notamment la forme sphérique qui est la plus courante.

Les jarres à olives de Fermeuse proviennent sans doute du commerce que faisaient les navires anglais dans le triangle formé par Terre-Neuve, l'Espagne, et Bideford et Barnstaple dans le nord du Devon en Angleterre. Elles ont peut-être servi à transporter de l'huile d'olive en Angleterre et servi aussi de récipients pour conserver l'eau fraîche à bord des bateaux de pêche allant à Fermeuse ou à bord des chaloupes de pêche quittant Fermeuse chaque jour pour les bancs de poissons. Au milieu du XVIII^e siècle, il y eut vraisemblablement une baisse dans l'utilisation des jarres à olives à Fermeuse. L'auteur propose plusieurs facteurs qui ont pu contribuer à cette diminution.

Nine intact olive jars from Fermeuse Harbour, Newfoundland, are described and interpreted. Wide-mouth and narrow-mouth types are evident, the former dating from 1580 to 1780. These olive jars indicate variations in the Spanish pottery tradition not described before. Goggin's three middle-period styles are represented, with the globular shape being most common.

The Fermeuse olive jars probably originated from triangular trade by English ships between Newfoundland, Spain, and Bideford and Barnstaple in North Devon, England. The jars may have carried olive oil to England, although they could also have been used as water coolers on the fishing ships sailing to Fermeuse or on the fishing shallops rowed out of Fermeuse to the fishing grounds each day. Apparently use of olive jars in Fermeuse was dwindling by the mid-eighteenth century. Several factors which may have been responsible for this are proposed.

Introduction

Spanish olive jars are distinctive coarse earthenware containers with a wide distribution from sites in the Western Hemisphere, northwestern Europe, and East Africa (Goggin 1960; Fairbanks 1972; Watkins 1972; Langouet 1973; Hurst and Lewis 1975; Piercy 1977; de Mello 1979; Martin 1979). They are most common on Spanish and British colonial coastal sites and on Spanish and Portuguese shipwrecks.

Olive jars (referred to as *botijuelas* and *botijas* in official Spanish documents) are characterized by narrow mouths and rounded or pointed bases. They were a natural extension of the Mediterranean amphora tradition of the first and second centuries A.D. The early olive jars (made prior to the mid-eighteenth century) were probably from Seville

or Cadiz in southern Spain (Goggin 1960; Hurst, pers. comm.). Their primary functions were to hold olive oil, olives in brine, wine, and other food items (Goggin 1960). However, olive jars may have had equally important secondary uses as water coolers (Hurst, pers. comm.; Watkins 1972) and buildings construction material (Goggin, 1960).

Classification of olive jars has been difficult. Goggin's original chronology was a compromise between the archaeological contexts of the material he worked on and diagnostic features of the jars. There is some corroboration of Goggin's early olive jar chronology (Martin 1979), but there may also be a case for classification based on the features of the jars (such as shape and mouth type) which may reflect their intended functions (Langouet 1973; Martin 1979).

* I would like to thank members of the Newfoundland diving community who allowed me to examine their olive jars. Janette Barber helped in the analysis of the jars and provided information on ceramics in the west of England. Robert Fisher and Gordon Murray assisted with photography. Denise Hansen, Gerard Gusset, and

Robert Ferguson of Parks Canada were very helpful throughout the course of this study. John Hurst kindly analysed the photographs and descriptive material on the Fermeuse finds and provided useful comments.

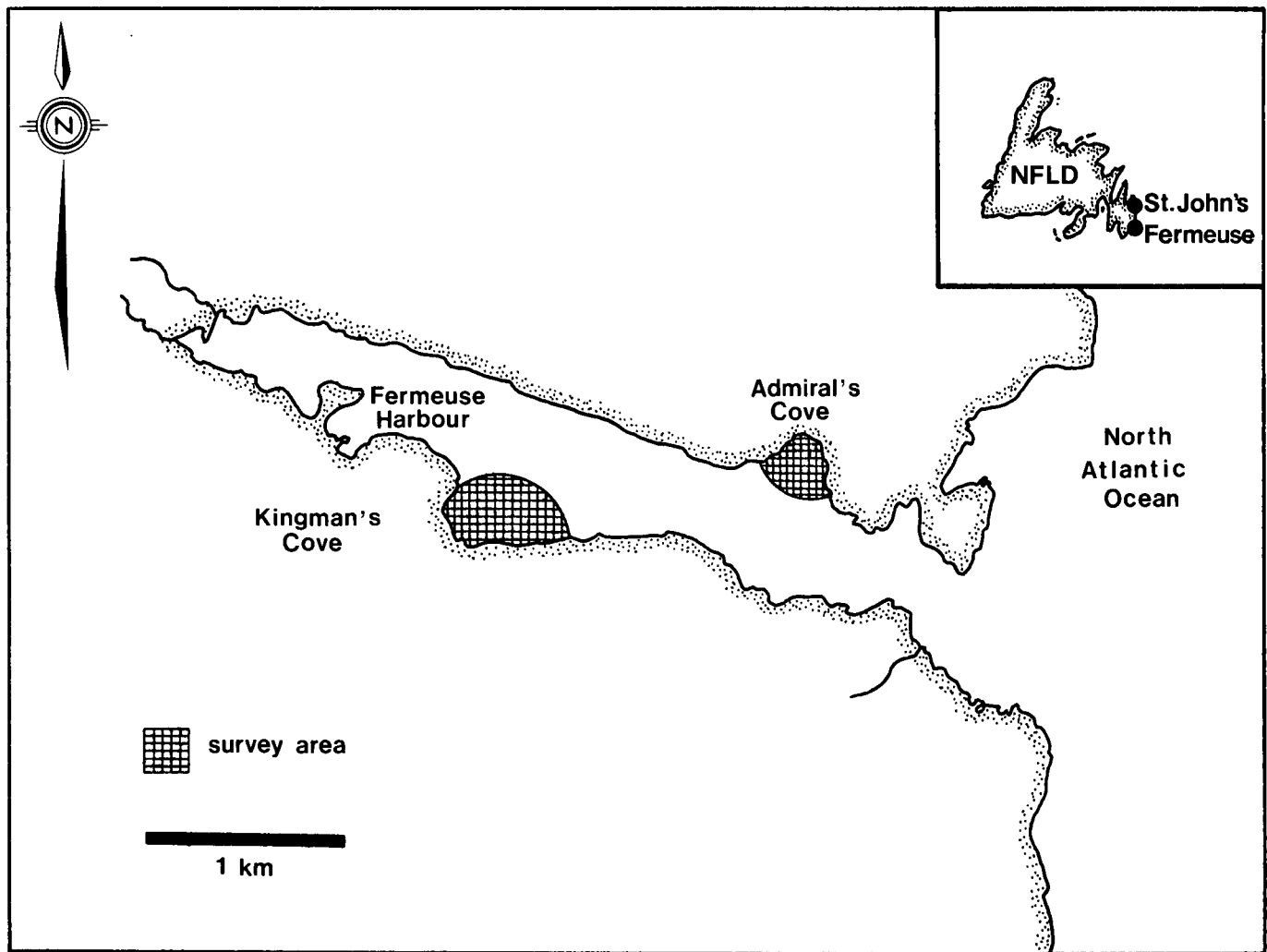


Fig. 1. Survey areas in Fermeuse Harbour, Newfoundland.

In North America, olive jars have been found as far north as Canso and Louisbourg in Nova Scotia (Barton 1977; Ferguson, pers. comm.) and on a British frigate sunk in 1696 in Bay Bulls, Newfoundland (Gusset, pers. comm.). The purpose of this paper is to describe and discuss nine intact olive jars found in Fermeuse Harbour, Newfoundland.

The Site

The olive jars were retrieved by scuba divers from two coves in Fermeuse Harbour (Admiral's Cove and Kingman's Cove, fig. 1) on the southern shore of the Avalon Peninsula, approximately one hundred kilometres south of St. John's. They were found almost completely buried in fine mud in depths of water ranging from seventeen to twenty-two metres. The exposed surfaces of the jars supported a community of marine organisms. These were important in location of the jars. They served as markers of the few patches of hard substrate occurring in the predominantly mud bottom.

These olive jars were not taken from a defined archaeological site. Apart from their concentration in deeper water, they appeared to be randomly distributed. They were frequently found in association with North Devon earthenware items such as those described by Watkins (1960).

Historical Context

An understanding of the history of Fermeuse is essential in the interpretation of the olive jars. Exploitation of the Newfoundland inshore cod fisheries started soon after the rediscovery of Newfoundland by Europeans in the fifteenth century. Initially, the fishery was dominated by the French and Portuguese, but by 1540 Spain had become important in the fishery (Matthews 1973). England lagged behind. For a number of political, military, and economic reasons, however, England dominated the inshore cod fishery of the southern shore (south of St. John's) by 1600, and the Spanish and Portuguese were virtually excluded from Newfoundland. England became the cod

supplier of the Catholic countries of southern Europe and triangular trade (Newfoundland cod to Spain; fruit, nuts, wine, salt, and oil to England; salt, wine, and oil to Newfoundland) was established (Cell 1969; Matthews 1973; Head 1976).

Fermeuse itself was first described by Portuguese pilots, who in 1519 called it *R. formoso* (Seary 1971), meaning beautiful river or freshwater. Fermeuse was prized for its proximity to the inshore cod stock and had the advantages of shelter from wind, proper water depths for anchorage (greater than fifteen metres), good holding ground, and a supply of freshwater (Head 1976). The principal anchorage points and fish-drying areas were Admiral's Cove and Kingman's Cove (known as Vice-Admiral's Place in 1663 as described by the English surgeon James Yonge [Poynter 1963]).

By 1600, English migratory fishermen dominated the area around Fermeuse. The captain of the first ship to arrive in a particular harbour each spring became the master or admiral of that harbour – hence the prevalence of Admi-

ral's and Vice-Admiral's Coves in Newfoundland. The fishing ships carried three to four months' worth of supplies and foodstuffs. Upon arrival, the ship was anchored, unrigged, unloaded, and shore installations for the fishery were constructed (Cell 1969). Fishing was conducted from small boats on a daily basis. Sack ships took the dried cod to Mediterranean markets at the end of the summer. The fishing ships themselves either returned directly to England or went to Mediterranean ports prior to returning home in the fall.

Early in the fishery, Fermeuse was favoured by merchants and fishermen from Bideford and Barnstaple in North Devon, England (Matthews 1973). For example, James Yonge noted 7 Barnstaple fishermen in Fermeuse in 1663. However, the North Devon ports started to drop out of the migratory fishery by the 1730s (Head 1976). During that "North Devon" period, the summer population of Fermeuse fluctuated considerably. Compared to 7 fishermen in 1663, between 330 and 550 men were working in the Fermeuse area in 1677 (Head 1976). Between 1720 and 1770, there was a 400 per cent increase in the

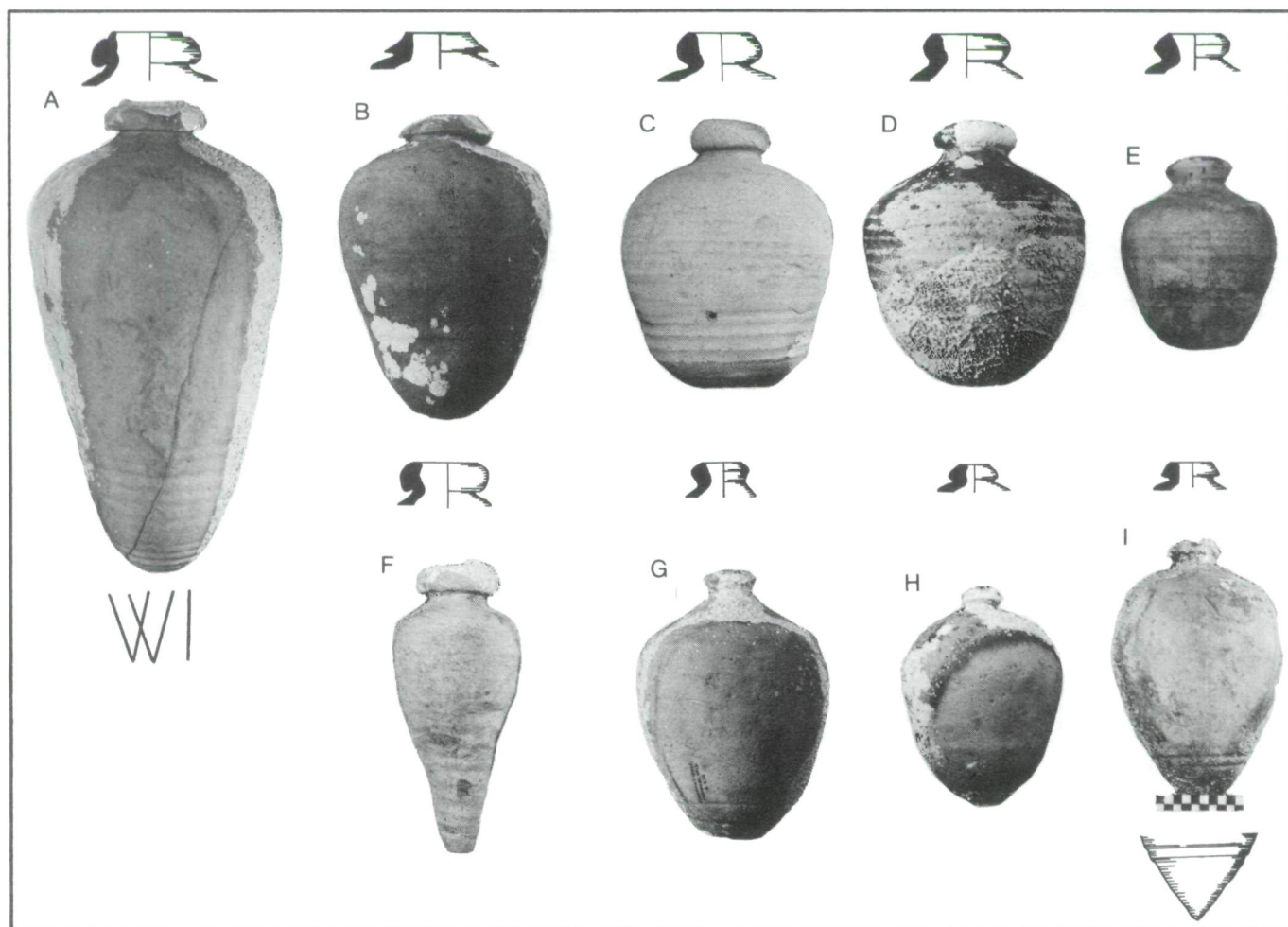


Fig. 2. Fermeuse Harbour olive jars. Scale in centimetres; all jars at the same scale. "WI" is inscribed on the shoulder of jar A.

summer population of southern shore harbours (Head 1976).

The first overwintering settlements had appeared in the area by the 1670s (Matthews 1973). Proper settlements were not established until about 1750, and the migratory fishermen always outnumbered the permanent residents until the last twenty years of the eighteenth century. From

1720 onwards, the North Devon settlers were being replaced by Irish and South Devon immigrants. By 1753, the Irish overwintering inhabitants of Fermeuse outnumbered the English residents (Head 1976), and by 1760/61, Fermeuse had 16 families comprising 100 people, almost all of whom were Irish. Fermeuse is still dominated by Irish families and fishing is the mainstay of the economy, as it has been for four centuries.

TABLE 1
Characteristics of Olive Jars Found in Fermeuse Harbour, Newfoundland

| Jar | Height (cm) | Largest diameter (cm) | Lip height (cm) | Lip diameter (cm) | Mouth ring thickness (cm) | Smallest mouth diameter (cm) | Wall thickness (cm) | Capacity (litres) | Throwing marks |
|-----|-------------|-----------------------|-----------------|-------------------|---------------------------|------------------------------|---------------------|-------------------|---|
| A | 48.0 | 27.0 | 2.2 | 10.0 | 2.3 | 5.5 | 0.8 | 10.90 | one-third of the way up from base, 1.5 cm apart; faint marks at shoulder, inside lip, 0.7 cm apart |
| B | 34.0 | 24.0 | 2.3 | 10.2 | 2.1 | 6.0 | 0.8 | 6.85 | over whole height of jar; slight juncture one-third of the way up from base |
| C | 28.0 | 23.0 | 3.2 | 8.9 | 2.2 | 4.5 | 1.1 | 6.60 | over whole height of jar; 1.2 cm apart; juncture one-third of the way up from base with paste flashing |
| D | 29.0 | 24.0 | 2.8 | 10.0 | 2.0 | 6.1 | 0.7 | 6.00 | over whole height of jar |
| E | 23.8 | 20.0 | 3.0 | 8.7 | 2.1 | 4.5 | not measurable | 2.75 | over whole height of jar, 1.0-1.5 cm apart; juncture one-third of the way up from base |
| F | 34.0 | 14.0 | 2.5 | 9.0 | 1.9 | 5.2 | 1.0 | 1.70 | over whole height of jar; smooth inside; oblique marks at base; rough work at middle of jar |
| G | 33.0 | 20.0 | 2.3 | 6.0 | 1.6 | 2.8 | 0.8 | 4.95 | smooth outside; 2 grooves encircle base; oblique scrapes around middle of jar |
| H | 25.0 | 18.0 | 1.3 | 4.6 | 1.0 | 2.6 | not measurable | 3.00 | Smooth outside; juncture one-third of the way up from base |
| I | 30.5 | 19.5 | 1.9 | 5.2 | 1.4 | 2.4 | 0.7 | 3.60 | grooves one-quarter of the way up from base and on shoulder, 1.5 cm apart; ridges inside neck, 0.2 cm apart |

The Olive Jars

Nine relatively intact olive jars were found (fig. 2), eight in Kingman's Cove and one in Admiral's Cove. The characteristics of the jars are noted in table 1. The jars represent a wide variety of shapes, sizes, and mouth features; however, at least two types are evident – wide-mouth jars (A-F) and narrow-mouth jars (G-I). Of the

eight characteristics measured, only lip diameters, mouth-ring thicknesses, and mouth diameters of the wide-mouth and narrow-mouth jars are exclusive of each other (table 2).

Olive jars A-F are characterized by throwing marks (made by the potter's fingers) over the whole height of the jar, whereas jars G-I are relatively smooth on the outside.

| Glaze | Paste | Additional observations |
|---|---|--|
| none | pale terracotta, heavy tempering with quartz gravel and mica | "WI" inscribed on shoulder; incomplete round 1-cm hole one-third of the way up from base; large crack from base to shoulder |
| none | pale terracotta, mild tempering with gravel and mica | lump of paste inside jar at base |
| internal yellow-green glaze | pale terracotta core, beige exterior, heavy tempering with quartz gravel and mica | over-fired beige exterior; round 0.7 cm hole one-third of the way up from base; thin crack in lip and shoulder; lumps of paste near middle of jar; rough workmanship |
| green glaze inside and out | pale terracotta core, beige exterior, heavy tempering with gravel | over-fired beige exterior; very well-made jar, although poor wedging of clay evident as bubbles at jar surface; groove in lip |
| olive-green glaze in lip and spilled outside, blackened in places | pale terracotta, mild tempering with gravel | over-fired beige exterior; lumps of paste on shoulder and sides of jar; poor wedging of clay; black coating inside jar; thin crack at base |
| none | pale terracotta core, beige exterior, mild tempering with quartz gravel and mica | over-fired beige exterior; incomplete hole one-quarter of the way up from base; poor wedging of clay |
| none | pale terracotta, heavy tempering with quartz gravel and mica | round 0.6 cm hole one-quarter of the way up from base; poor wedging of clay |
| yellow-green glaze in neck and spilled outside | pale terracotta, mild tempering with quartz gravel and mica | poor wedging of clay |
| none | pale terracotta, moderate tempering with quartz gravel and mica | oblique groove in lip; poor wedging of clay |

Two of the latter (G and I) have tool-incised grooves encircling the base. Jars B, C, E, and H have obvious junctures one-third of the way up from the base; in the case of jar C, the juncture has been smoothed over with paste.

Most of the jars are unglazed. Jars C and D are glazed inside and jars D, E, and H have patches of glaze on the outside. Only jar D is clearly glazed inside and out. All the olive jars have a pale terracotta paste colour. Jars C, D, and F have beige slip-like overfired exteriors.

The degree of tempering is variable, even within the two jar types noted. The temper comprises quartz sand and gravel and smaller quantities of mica.

All the jars show characteristics of mass produced utilitarian ceramics. Jars D-I all have evidence of poor wedging of the unfired clay. Several jars have post-firing features. Jar A has "WI" inscribed on the shoulder. Jars A, C, F, and G have round holes or incomplete holes bored near the base of the jar, and jars D and I have grooves cut into the mouth rings.

Discussion

Dating

The obvious disadvantage of collecting harbour material is lack of stratigraphy to help in dating. However, since Goggin's (1960) chronological classification, many olive jars have been found on well-documented shipwrecks. The Fermeuse olive jars can be compared with this material and approximate dating established.

Goggin theorized that there were three olive jar periods: early (1500-80), middle (1580-1780), and late (1780-1850 or later). Hurst (pers. comm.) suggests that the middle period may have extended further back into the sixteenth century. The earliest ceramics from Fermeuse Harbour date from at least 1575 (Nuytten 1978). These are narrow-base pots known locally as "butterpots." To my knowledge, no olive jars early in style have been found in Fermeuse Harbour, although an item similar in all respects, except that it has a narrow, flat base, was found in Kingman's Cove (Carter, unpublished data).

As with many North American colonial sites, the ceramic material record of Fermeuse Harbour appears to become firmly established in the seventeenth century. Many pieces of North Devon ware dating from this period have been found there (Carter, unpublished data). and, given the high frequency of middle-period olive jars on other colonial sites, they would be expected in Fermeuse Harbour as well. Jars A-F fit relatively well into Goggin's middle period (1580-1780), based on comparisons of

mouth and neck features, capacity, and shape. All three of Goggin's middle-period jar shapes (long egg-shape, globular, and carrot-shape) are represented in the Fermeuse finds. Comparisons of the Fermeuse olive jars with finds from shipwrecks firmly fix jars A-F into the middle period, the dated material ranging from 1588 to at least 1750 (Goggin 1960; de Leeuw 1972; Langouet 1973; Fanning and Hurst 1975; Platt et al. 1975; Barton 1977; Dethlefsen et al. 1977; Piercy 1977; de Mello 1979; Martin 1979; Petersen 1979; Gusset, pers. comm.). The most obvious similarities between the Fermeuse jars A-F and other middle-period jars are in mouth features and shape. Goggin's B shapes (globular), represented by Fermeuse jars C, D, and E, are the easiest to fit into the middle-period classification. Hurst (after examining photographs and descriptions of the Fermeuse jars) suggested that the middle-period jars probably date from the seventeenth rather than the eighteenth century, based on the nature of the glazes and fabrics.

Jars G-I are more problematic. Narrow-mouth jars are not commonly found. De Mello (1979) found a jar similar to H on a Portuguese galleon lost off Brazil in 1668, and Ashdown (1972) showed a jar, very similar to H, from a post-medieval site in the Thames River. Jar H, therefore, could be an uncommon, middle-period style. The styles of jars G and I have not been described before. However, they both have several features of Goggin's late-period olive jars. Compared to jars A-F, jars G and I have thinner mouth rings, an absence of throwing marks, and the presence of spiralling tool marks on the main body. Clearly, more narrow-mouth jars have to be recovered from dated sites before a chronology for this type can be established.

The Fermeuse olive jars reflect a period of use ranging from, at the earliest, 1580 to 1750. If the narrow-mouth jars are late period, the terminal date can possibly be extended into the nineteenth century.

As with land sites, older material in the harbour tends to occur deeper in the mud than more recent material; therefore, more recent olive jars have a higher chance of being found by divers. The random sample collected by divers must reflect at least the later chronology of olive jar use in Fermeuse. Most of the jars date from before 1750, and, even if jars G-I are late period, there was clearly a declining use of olive jars in Fermeuse after about 1750. This phenomenon has been documented on other Spanish and English colonial sites (Deagan 1978; Gusset, pers. comm.).

Origin

There is little doubt that the middle-period olive jars were made in Seville or Cadiz in southern Spain. The Casa de la Contratación in Seville and Cadiz had a monopoly on transatlantic trade (Martin 1979). Olive jars appear on

most Spanish shipwrecks in the New World. It is unlikely that jars would have been made very far away from their ports of departure. Seville, in particular, is implicated as an olive jar centre. With the relaxation of Spanish trade laws in the eighteenth century, the late-period olive jars could have been made in other centres in the north and east of Spain as ports there were drawn into transatlantic and eastern Atlantic trade (Goggin 1960).

Olive oil and storage jars were brought to Red Bay, Labrador, by Basque whalers as early as the mid-sixteenth century (Tuck and Grenier 1981), so there is certainly evidence of an early, direct, material culture link between the Newfoundland area and Spain. However, considering the virtual exclusion of the Spanish from eastern Newfoundland by 1600 (Matthews 1973), the Fermeuse olive jars, are unlikely to be from Spanish ships. The middle-period jars coincide in time with the use of Fermeuse by English fishermen, and it is conceivable that the olive jars were associated with them.

Triangular trade between Newfoundland, the Iberian Peninsula, and England was established by the 1590s (Cell 1969). In the early 1600s, Plymouth and Dartmouth in South Devon dominated this trade. One of the commodities brought back was olive oil which was important in the Bristol soap industry in the sixteenth and seventeenth centuries (Cell 1969). Olive oil was also shipped from West Country England to Newfoundland. For example, in 1677, St. John's, Newfoundland, received 500 small jars of oil from the Mediterranean (Head 1976). In 1731, the ports of Dartmouth, Exon, and Poole in Devon and Dorset shipped over 600 gallons of olive oil to Newfoundland. Olive oil must have been an important trade item, as merchants' agents were instructed to sell Newfoundland fish in Spain for bills of exchange or oil (Head 1976). Olive oil was also shipped to New England, either through the trade triangle, or directly from Spain, in violation of the English Navigation Acts (Bailyn 1955). Contrary to Fairbank's (1972) conclusion that olive jars on English sites reflect sporadic trade with Spain, olive jars were probably regularly carried on English ships (Watkins 1972) and therefore should be expected to occur in English colonial harbours. Since the fishermen and merchants of Barnstaple and Bideford dominated Fermeuse until the 1730s (Matthews 1973), it is probable that olive jars were carried directly from Spain to North Devon by the fishing ships in the fall, then shipped to Fermeuse in the spring, either containing olive oil or water.

Function and Deposition in Fermeuse Harbour

Spanish documents indicate that olive jars were used to carry olive oil, olives in brine, wine, and honey (Goggin 1960; Martin 1979). Goggin (1968) suggested that the glazed jars were intended to hold wine, whereas the unglazed jars could have held olive oil. Martin (1979) pro-

TABLE 2

Ranges of Measured Parameters

| | Wide-mouth jars | Narrow-mouth jars |
|------------------------------|-----------------|-------------------|
| Height (cm) | 23.8-48.0 | 25.0-33.0 |
| Largest diameter (cm) | 14.0-27.0 | 18.0-20.0 |
| Lip height (cm) | 2.2- 3.2 | 1.3- 2.3 |
| Lip diameter (cm) | 8.7-10.2 | 4.6- 6.0 |
| Mouth ring thickness (cm) | 1.9- 2.3 | 1.0- 1.6 |
| Smallest mouth diameter (cm) | 4.5- 6.1 | 2.4- 2.8 |
| Wall thickness (cm) | 0.7- 1.1 | 0.7- 0.8 |
| Capacity (litres) | 1.70-10.90 | 3.00-4.95 |

posed that Goggin's A, B, and C shapes were intended for specific contents (A for wine, B for olive oil, and C for honey). Although Fermeuse jars A-F could have held any of these items, the narrow-mouth jars (G-I) probably held only liquids, because they could be filled with dry goods only with difficulty.

Since olive oil was shipped to Newfoundland in jars (Head 1976), this could have been the primary function of the Fermeuse olive jars. However, secondary uses might have been equally important. Taken directly from the olive oil trade in the West Country, the jars could have been used to hold water, either on the fishing ships crossing the Atlantic or in Fermeuse itself. Evaporation of liquids through porous earthenware would have enhanced cooling (Hurst, pers. comm.). Those jars with the beige over-fired exterior would have been reflective and more likely to stay cool than the plain terracotta jars.

The Fermeuse olive jars show evidence of use as water coolers. Four have holes or incipient holes, which might have taken a spigot (Watkins 1968; Barton 1977), and two have grooves cut into the mouth rings which could have acted as spouts. The jars might have been suspended from wicker or leather straps in the fishing ships or might have stood in wooden racks in the fishing shallows. A spigot would have been a useful addition to the jar in either case.

Most of the Fermeuse jars are intact. They therefore appear to have been lost by accident. The fact that all the jars were found in anchorage depths implies that they were lost from fishing ships anchored there for the summer. The olive jars could have been lost while being loaded into the shallows for replenishment of freshwater at the head of the harbour. Alternatively, they could have been lost between the shallows and the fishing stages which extended a considerable distance into the coves. Jar A with an incomplete spigot hole may have been cracked during the bor-

ing of the hole and therefore discarded. It is interesting that the loss of material and the subsequent filling in of English harbours in Newfoundland was recognized as a problem as early as 1675 (Head 1976).

The apparent dwindling use of olive jars in Fermeuse by the middle of the eighteenth century was coincident with a number of other factors. In general, trade patterns between Spain and other countries shifted. Certainly by the nineteenth century, England was importing olive oil from Italy in wide-mouth oil jars (distinct from olive jars) (Ashdown 1974). Whether this meant that shipments of olive oil from Spain decreased or not is uncertain. By 1780, Spanish olive jars had changed in appearance, probably because of their manufacture in northeast Spain (Goggin 1960). Also, by the 1730s, the North Devon influence in Fermeuse was diminishing as South Devon and Ireland increased their presence (Head 1976). The relationship between these factors and the apparent disappearance of olive jars in Fermeuse after 1750 is speculative.

As olive jars fell out of favour or were less available, something had to replace them. Green glass bottles are common in Newfoundland harbours. The older varieties date from about 1700, and bottles from 1730 and later are relatively abundant (personal observations). Some of these have inscribed initials (Carter, unpublished data) and appear to have served as decanters or water containers, possibly replacing olive jars. Also, by the mid-eighteenth century, Ireland was exporting beef to Newfoundland (Head 1976), which would have been shipped in wooden casks. As the Irish influence in Newfoundland increased from 1720 onwards, there might have been an increasing use of casks for water storage.

Manufacture of Olive Jars

The manufacture of olive jars has been discussed a number of times (Goggin 1960; Martin 1979). In general, the Fermeuse jars show several universal features, such as poor wedging, terracotta paste, presence of throwing marks on middle-period jars, heavy tempering, and variable capacity. The latter is an interesting feature. Martin (1979) suggested that two classes of olive jars were made: official forms and civilian forms. The official forms would have been much more uniform in shape and capacity than the civilian forms. The Castilian oil *arroba* was 12.56 litres (Martin 1979) and Goggin's egg-shaped jars seem to fit this capacity generally. The egg-shaped jars were tall and, although the diameter of a jar could be well controlled by the potter, the height would have been more difficult to judge. Hence, these jars (such as Fermeuse jar A) have variable capacities. Jar A appears to be a small *arroba*.

Martin (1979) found a high incidence of globular olive jars on the Spanish Armada wrecks. These were half-*arroba* jars. Fermeuse jars B, C, and D appear to be half-*arrob*as as well, ranging from 6.00 to 6.85 litres capacity. The globular-shaped olive jars, being shorter than the egg-shaped jars, may have been easier to make to a predetermined capacity. This feature of globular-shaped jars might explain the prevalence of such jars on "official" Spanish shipwrecks (Goggin 1960; Martin 1979; Petersen 1979). It is not clear if smaller capacities than half-*arrob*as were specified in the manufacture of olive jars; however, jars E-I are smaller than half-*arrob*as.

Martin (1979) suggested that globular middle-period olive jars were started from a moulding dish. This was suggested by the absence of throwing marks on the bases of the jars. Flashing above the base marked the juncture between the moulded and the turned part of the jar. Fermeuse jar H appears to have been made in this way. Goggin (1960), on the other hand, suggested that the jars were made on the potter's wheel in two sections, with a juncture at the shoulder. Most of the Fermeuse jars indicate yet another tradition. Several of them have obvious junctures one-third of the way up from the base. Both sections were turned on the wheel, and in some cases a paste flashing was applied (see jar C).

Glazing is generally restricted to the globular-shaped jars (C, D, and E). They also show the highest incidence of an over-fired beige exterior (Barton 1977), referred to as a slip by Goggin (1960) and Martin (1979). This may be a functional relationship. One firing at least was required to bake the jar. In the case of glazed jars, a second firing at higher temperatures was required (Lister and Lister 1979). An oxidizing atmosphere was preferred to retain a bright glaze colour. With this amount of firing and high temperatures, the exterior of the jar would turn beige.

Only one jar (A) has inscriptions. The "WI" probably represents the initials of the owner of the container, although an abbreviation of "West Indies" as a consignment label is a tempting possibility as well.

Conclusions

1. Olive jars were clearly useful ceramic items in seveneenth- and eighteenth-century Fermeuse. They probably originated from triangular trade carried out by English ships between Newfoundland, Spain, and North Devon. The jars may have been used to carry olive oil to Newfoundland or may have served as coolers for the fishing ships' water supplies. In Fermeuse itself, the olive jars may have been used as water coolers in the fishing shallows which were rowed daily to the fishing grounds. An inscription on one jar suggests a private water supply. The

jars were probably lost accidentally while off-loading the fishing ships or the shallops at the fishing stages.

2. There was an apparent dwindling use of olive jars in Fermeuse by the mid-eighteenth century. The reason for this is unclear but may be related to factors such as a shift in trade patterns, declining North Devon influence, a change in the style of olive jars, and an apparent increased use of green glass bottles as water containers.

3. Although the Fermeuse olive jars show some of the features of Spanish olive jars, they also indicate variations in the Spanish pottery tradition of making jars in sections. Narrow-mouth jars appear to be a different style altogether, and may be late period (after 1780).

4. The beige exterior of olive jars has been described as an over-firing or high oxidation feature. This would explain the general association between beige exteriors and glazing in some jars.

5. There may have been general guidelines for capacities of olive jars. Several of the Fermeuse jars roughly fit into *arroba* and half-*arroba* categories. However, capacities of olive jars are clearly variable.

6. Neck and mouth features appear to be useful criteria for classifying olive jars. The Fermeuse jars can be divided into wide-mouth and narrow-mouth types, the former being exclusively middle-period jars (1580-1780).

BIBLIOGRAPHY

- Ashdown, J. 1972. Mewstone Ledge Site. B. Oil Jars. *International Journal of Nautical Archaeology* 1: 147-53.
- . 1974. The Oil Jar as a London Shop Sign. *London Archaeologist* 2: 166-70.
- Bailyn, B. 1955. *The New England Merchants in the Seventeenth Century*. New York: Harper and Row.
- Barton, K.J. 1977. Coarse Earthenwares from the Fortress of Louisbourg, Nova Scotia. Typescript.
- Cell, G.T. 1969. *English Enterprise in Newfoundland, 1577-1660*. Toronto: University of Toronto Press.
- Deagan, K. 1978. The Material Assemblage of 16th Century Spanish Florida. *Historical Archaeology* 12: 25-50.
- de Leeuw, G. 1972. Spaanse kruiten uit Westerbork. *Nieuwe Drentse Volksalmanach* 89: 159-73.
- de Mello, U.P. 1979. The Shipwreck of the Galleon Sacramento-1668 off Brazil. *International Journal of Nautical Archaeology* 8: 211-23.
- Dethlefsen, E.S., E. Davison, and D.L. Buchman. 1977. The Stonewall Wreck. Interim report on a 17th century Spanish vessel wrecked off Bermuda. *International Journal of Nautical Archaeology* 6: 315-29.
- Fairbanks, C.H. 1972. The Cultural Significance of Spanish Ceramics. In *Ceramics in America*, ed. I.M.G. Quimby, 141-71. Charlottesville: University Press of Virginia.
- Fanning, T., and J.G. Hurst. 1975. A Mid Seventeenth-Century Pottery Group and Other Objects from Ballyhack Castle, Co. Wexford. *Proceedings of the Royal Irish Academy* 75: 103-15.
- Goggin, J.M. 1960. *The Spanish Olive Jar. An Introductory Study*. Yale University Publications in Anthropology 62. New Haven: Yale University Press.
- . 1968. *Spanish Majolica in the New World*. Yale University Publications in Anthropology 72. New Haven: Yale University Press.
- Head, C.G. 1976. *Eighteenth Century Newfoundland*. Carleton Library No. 99. Toronto: McClelland and Stewart.
- Hurst, J.G., and J.M. Lewis. 1975. The Spanish Olive-jar in Ireland. *Proceedings of the Royal Irish Academy* 75: 115-18.
- Langouet, L. 1973. Les jarres de la Rance. *Annales de la Société d'histoire et d'archéologie de l'arrondissement de Saint-Malo*: 1-13.
- Lister, F.C., and R.H. Lister. 1979. A Descriptive Dictionary for 500 Years of Spanish-Tradition Ceramics (13th through 18th centuries). *Special Publication Series No. 1*. Washington, D.C.: Society for Historical Archaeology.
- Martin, C.J.M. 1979. Spanish Armada Pottery. *International Journal of Nautical Archaeology* 8: 279-302.

- Matthews, K. 1973. *Lectures on the History of Newfoundland: 1500-1830*. St. John's: Maritime History Group, Memorial University of Newfoundland.
- Nuytten, P. 1978. Shipwreck Yarns of the East Coast. *Diver and Underwater Adventure* 4: 28-32.
- Petersen, M. 1979. Graveyard of the Quicksilver Galleons. *National Geographic* 156: 850-76.
- Piercy, R.C.M. 1977. Mombasa Wreck Excavation. Preliminary report, 1977. *International Journal of Nautical Archaeology* 6: 331-47.
- Platt, C., and R. Coleman-Smith. 1975. *Excavations in Medieval Southampton, 1953-1969. Vol 2. The Finds*. Leicester: Leicester University Press.
- Poynter, F.N.L., ed. 1963. *The Journal of James Younge (1647-1721), Plymouth Surgeon*. London: Longmans, Green and Co.
- Searly, E.R. 1971. *Place Names of the Avalon Peninsula of the Island of Newfoundland*. Toronto: University of Toronto Press.
- Tuck, J., and R. Grenier. 1981. A 16th-Century Basque Whaling Station in Labrador. *Scientific American* 245: 180-90.
- Watkins, C.M. 1960. North Devon Pottery and its Export to America in the 17th Century. *United States National Museum Bulletin* (Washington, D.C.) 225: 17-59.
- . 1968. The Cultural History of Marlborough, Virginia. *United States National Museum Bulletin* (Washington, D.C.) 253.
- . 1972. Ceramics Used in America: Comparisons. In *Ceramics in America*, ed. I.M.G. Quimby, 191-96. Charlottesville: University Press of Virginia.