TWO EIGHTEENTH-CENTURY PRAMS FROM THE
IJsselmeer Polders

A Thesis
by
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Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements
for the degree of
MASTER OF ARTS

December 1992

Major Subject: Anthropology
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IJSSELMEER POLDERS

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ABSTRACT

Two Eighteenth-Century Prams from the IJsselmeer Polders. (December 1992)
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This study focuses on the function and status of small watercraft in the Zuider Zee trade network in the eighteenth century Netherlands. The two wrecks studied are believed to represent a type of inland freighter known as *praam* (pram). Prams or pram-like vessels are known from archival sources, as well as eighteenth- and nineteenth-century representations. These vessels carried primarily bulk cargos such as peat, mud, stone, manure, lumber, and grain. The artifact assemblages from the two wrecks are believed to be representative of similar occupations, customs, and social status in eighteenth-century society. The analysis of these pram assemblages along with an exploration of the internal and external economic history for this time period provide some insight into the lifestyle of a particular social and economic class of people.
ACKNOWLEDGEMENT

I would like to thank all those who helped make this thesis a reality, but space limits my list to a special few. For my committee members including Donny Hamilton and Larry Yarak, but particularly my chair, David Carlson, without your help and guidance, I would still be searching. A special thanks goes to the Rijksdienst voor de IJsselmeerpolders for allowing me the opportunity to study their collections, and the personnel of the Museum voor Scheepsarcheologie, particularly K. Vlierman and R. Oosting, who graciously offered their unflagging support and expertise. Finally, I would like to thank my husband Bob Neyland, whose moral support carried me through the most stressful periods of my endeavor.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>INTRODUCTION AND METHODOLOGY</td>
<td>1</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Methodology</td>
<td>4</td>
</tr>
<tr>
<td>II</td>
<td>10</td>
</tr>
<tr>
<td>ECONOMIC HISTORY OF THE NETHERLANDS</td>
<td></td>
</tr>
<tr>
<td>The Decline of the Eighteenth Century</td>
<td>15</td>
</tr>
<tr>
<td>Reasons for the Decline</td>
<td>23</td>
</tr>
<tr>
<td>Zuider Zee Trade and Inland Navigation</td>
<td>24</td>
</tr>
<tr>
<td>The Peat Industry</td>
<td>28</td>
</tr>
<tr>
<td>Summary</td>
<td>30</td>
</tr>
<tr>
<td>III</td>
<td>32</td>
</tr>
<tr>
<td>ANALYSIS OF THE E 14: A WRECK IN EAST FLEVOLAND</td>
<td></td>
</tr>
<tr>
<td>Survey and Excavation of Wreck E 14</td>
<td>32</td>
</tr>
<tr>
<td>Inventory</td>
<td>34</td>
</tr>
<tr>
<td>Dating the Wreck</td>
<td>78</td>
</tr>
<tr>
<td>IV</td>
<td>80</td>
</tr>
<tr>
<td>ANALYSIS OF THE A 71: A WRECK IN SOUTH FLEVOLAND</td>
<td></td>
</tr>
<tr>
<td>Survey and Excavation of Wreck A 71</td>
<td>80</td>
</tr>
<tr>
<td>Inventory</td>
<td>82</td>
</tr>
<tr>
<td>Dating the Wreck</td>
<td>116</td>
</tr>
<tr>
<td>V</td>
<td>118</td>
</tr>
<tr>
<td>COMPARISON ACROSS TIME</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>127</td>
</tr>
<tr>
<td>CONCLUSIONS</td>
<td></td>
</tr>
<tr>
<td>REFERENCES CITED</td>
<td>137</td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>I LIST OF ARTIFACTS FOR THE E 14</td>
<td>143</td>
</tr>
<tr>
<td>II LIST OF ARTIFACTS FOR THE A 71</td>
<td>146</td>
</tr>
<tr>
<td>VITA</td>
<td>148</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>A map depicting the Zuider Zee region as it appeared in 1852</td>
<td>2</td>
</tr>
<tr>
<td>Figure 2</td>
<td>A map of the Dutch Republic</td>
<td>11</td>
</tr>
<tr>
<td>Figure 3</td>
<td>A site map for the E 14 wreck site</td>
<td>33</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Site plan for the E 14 wreck</td>
<td>36</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Ship's equipment for the E 14</td>
<td>38</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Cargo hooks for the E 14</td>
<td>40</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Writing slate from the Administrative Equipment category of the E 14 wreck</td>
<td>42</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Lighthouse tokens from the E 14</td>
<td>42</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Carpentry tools from the E 14</td>
<td>45</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Tools from the E 14 assemblage</td>
<td>48</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Reconstructed window from the E 14 detailing the constructional features</td>
<td>52</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Domestic effects from the E 14</td>
<td>54</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Ceramics from the E 14 galley</td>
<td>57</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Galley ware from the E 14</td>
<td>60</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Pewter spoons from the E 14</td>
<td>62</td>
</tr>
<tr>
<td>Figure 16</td>
<td>Three Dutch wine bottles from the E 14</td>
<td>65</td>
</tr>
<tr>
<td>Figure 17</td>
<td>Sewing accessories from the E 14</td>
<td>68</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Personal possessions recovered from the E 14 wreck site</td>
<td>70</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Combs from the E 14</td>
<td>72</td>
</tr>
<tr>
<td>Figure 20</td>
<td>Smoking accessories from the E 14</td>
<td>73</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Small personal possessions recovered from the stern cabin near the window</td>
<td>75</td>
</tr>
</tbody>
</table>
Figure 22. Dated coins from the E 14......................... 76
Figure 23. Site map indicating location of the A 71 wreck site......................... 81
Figure 24. Site plan for the A 71 wreck......................... 83
Figure 25. An assortment of iron fasteners used aboard the A 71......................... 85
Figure 26. Items from a fore-stay sail......................... 87
Figure 27. Ship’s and Working equipment from the A 71......................... 90
Figure 28. Marline spike from the A 71......................... 91
Figure 29. Iron cooking pots from the A 71......................... 95
Figure 30. Batter bowl from the galley assemblage......................... 96
Figure 31. Ceramic cooking vessel from the galley assemblage......................... 97
Figure 32. Serving dishes from the A 71 galley......................... 99
Figure 33. Rhenish platter from the A 71......................... 100
Figure 34. Cream pitcher from the A 71 galley......................... 101
Figure 35. Tigerware pitcher from the A 71 galley......................... 103
Figure 36. Majolica plate from the A 71 galley......................... 104
Figure 37. A small Rhenish plate from the A 71......................... 105
Figure 38. Dutch ceramic bowls from the A 71......................... 106
Figure 39. Pewter spoons from the A 71......................... 111
Figure 40. A wine bottle and copper can from the Eating & Drinking category......................... 113
Figure 41. Cast pewter pendant......................... 114
Figure 42. Personal possessions......................... 115
Figure 43. A brass farthing from Zeeland......................... 116
Figure 44. A graph illustrating the relative frequencies of the functional categories......................... 125
LIST OF TABLES

Table 1. Classification system............................... 5
Table 2. Demographic changes among socio-economic groups............................................ 22
Table 3. Occupational patterns in the eighteenth century................................................. 26
Table 4. Peat prices at two Leiden hospitals............. 28
Table 5. Contingency table for functional categories 122
Table 6. Compressed functional categories.............. 124
CHAPTER I
INTRODUCTION AND METHODOLOGY

Introduction

The two wrecks comprising the focus of this study were recovered from the land reclaimed by the draining of the former Zuiderzee (Zuider Zee). The Zuider Zee, or South Sea (Figure 1) was a shallow inland sea covering the central portion of the Netherlands. The need for arable land led to the damming of this estuarine environment in 1932 which created a brackish water lake, the IJsselmeer, taking its name from the river IJssel. Since that time, four polders (reclaimed land masses) have been drained and are now inhabited and under cultivation. This process has led to the discovery and reporting of about 350 shipwrecks, over 100 of which have been 'excavated. This ongoing project is conducted by the Museum voor Scheepsarcheologie (Museum for Shiparchaeology) under the control of the Rijksdienst voor de IJsselmeerpolders (Development Authority for the IJsselmeerpolders).

The two wrecks studied are believed to represent a type of inland freighter known as praat (pram). Both wrecks show construction features characteristic of

Format and citations follow that of American Antiquity.
Figure 1. A map depicting the Zuider Zee region as it appeared in 1852.
prams: a medium sized vessel having a box-like shape with a fairly constant breadth throughout, a dead-flat bottom, and sharp angular chine (the intersection between the bottom and sides of a flat-bottomed or V-hulled vessel). Prams or pram-like vessels are known from archival sources as well as eighteenth- and nineteenth-century representations. Primarily, these vessels carried bulk cargos such as peat, mud, stone, fertilizer, lumber, and agricultural products. Prams hauling bulk cargos of low value would have been captained by individuals from the lower to middle socio-economic bracket of the time. Accordingly, artifact assemblages from these wrecks are believed to be representative of similar occupations, customs, and social status in eighteenth-century society. The analysis of these pram assemblages should provide some insight into the lifestyle of this working class.

The wreck sites date to the second half of the eighteenth century, both boats perhaps sinking within fifty years of one another. This time frame is derived from coins and lighthouse tokens, as well as the style of ceramics and other artifacts. A lighthouse token gives a terminus post quem of 1783 for the wreck from East Flevoland (E 14). A badly worn brass farthing with the remnants of 175(?) gives a terminus post quem for the decade of the 1750s for the wreck from South Flevoland (A
71). The analysis of these boats may suggest patterning of the artifact categories, socio-economic status, and living conditions for this working class, while comparison of these boats with similar types wrecked in the seventeenth and nineteenth centuries will test for any significant trends in the data.

**Methodology**

The assemblages for these two wrecks, while not identical, remain complementary. The similarities lie in the artifact scatter—assuming it represents the accommodation plan of the ship, and the types of artifacts representing the functional classifications. When viewed together these assemblages complement each other by offering broader representation of the functional categories.

The inventory of both ships was catalogued according to the functional classification system devised by Reinder Reinders in 1985 (Table 1). A system of standardization was necessary for the classification of inventories because of the sheer number of wrecks found in the IJsselmeer polders. This system will allow comparison of inventories between differing ship types wrecked in the same period and it should reflect changes
<table>
<thead>
<tr>
<th>Table 1. Classification System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. SHIP- HULL WITH STANDING AND RUNNING RIGGING</strong></td>
</tr>
<tr>
<td><strong>B. EQUIPMENT</strong></td>
</tr>
<tr>
<td>ship’s equipment</td>
</tr>
<tr>
<td>ground tackle: anchors, chain</td>
</tr>
<tr>
<td>sails</td>
</tr>
<tr>
<td>cordage</td>
</tr>
<tr>
<td>windlasses</td>
</tr>
<tr>
<td>pumps</td>
</tr>
<tr>
<td>boats</td>
</tr>
<tr>
<td>aids: ladders</td>
</tr>
<tr>
<td>spares: blocks, nails, sailcloth</td>
</tr>
<tr>
<td>working equipment</td>
</tr>
<tr>
<td>loading equipment</td>
</tr>
<tr>
<td>stowing equipment</td>
</tr>
<tr>
<td>weaponry</td>
</tr>
<tr>
<td><strong>C. INVENTORY</strong></td>
</tr>
<tr>
<td>administrative</td>
</tr>
<tr>
<td>ship’s papers</td>
</tr>
<tr>
<td>finances: money</td>
</tr>
<tr>
<td>stationery and writing equipment</td>
</tr>
<tr>
<td>navigation</td>
</tr>
<tr>
<td>instruments: compass, sextant</td>
</tr>
<tr>
<td>radio compass</td>
</tr>
<tr>
<td>timekeeping</td>
</tr>
<tr>
<td>charts</td>
</tr>
<tr>
<td>information sources: tide tables</td>
</tr>
<tr>
<td>lights: running lights, towing lights</td>
</tr>
<tr>
<td>warning</td>
</tr>
<tr>
<td>miscellaneous: spyglass</td>
</tr>
<tr>
<td>tools</td>
</tr>
<tr>
<td>carpentry</td>
</tr>
<tr>
<td>caulking and bottom maintenance</td>
</tr>
<tr>
<td>sail and rigging maintenance</td>
</tr>
<tr>
<td>cleaning</td>
</tr>
<tr>
<td>miscellaneous: whetstones</td>
</tr>
<tr>
<td>domestic effects</td>
</tr>
<tr>
<td>furniture</td>
</tr>
<tr>
<td>sleeping</td>
</tr>
<tr>
<td>lighting</td>
</tr>
<tr>
<td>heating</td>
</tr>
<tr>
<td>storage</td>
</tr>
<tr>
<td>curtains and upholstery</td>
</tr>
<tr>
<td>ornamental decor</td>
</tr>
<tr>
<td>sanitation and waste disposal</td>
</tr>
</tbody>
</table>
Table 1. Continued

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. INVENTORY Continued</td>
<td></td>
</tr>
<tr>
<td>hearth and galley</td>
<td>8.0</td>
</tr>
<tr>
<td>hearth</td>
<td>8.1</td>
</tr>
<tr>
<td>hearth tools</td>
<td>8.2</td>
</tr>
<tr>
<td>fuel</td>
<td>8.3</td>
</tr>
<tr>
<td>cooking vessels</td>
<td>8.4</td>
</tr>
<tr>
<td>cooking utensils</td>
<td>8.5</td>
</tr>
<tr>
<td>cleaning</td>
<td>8.6</td>
</tr>
<tr>
<td>miscellaneous: coffee mill, food preparation</td>
<td>8.7</td>
</tr>
<tr>
<td>eating and drinking</td>
<td>9.0</td>
</tr>
<tr>
<td>table linens</td>
<td>9.1</td>
</tr>
<tr>
<td>dishes</td>
<td>9.2</td>
</tr>
<tr>
<td>cutlery</td>
<td>9.3</td>
</tr>
<tr>
<td>drinking</td>
<td>9.4</td>
</tr>
<tr>
<td>victuals and provisions</td>
<td>10.0</td>
</tr>
<tr>
<td>water storage</td>
<td>10.1</td>
</tr>
<tr>
<td>beverages</td>
<td>10.2</td>
</tr>
<tr>
<td>pens for live animals</td>
<td>10.3</td>
</tr>
<tr>
<td>food</td>
<td>10.4</td>
</tr>
<tr>
<td>miscellaneous: condiments, food storage</td>
<td>10.5</td>
</tr>
<tr>
<td>D. PERSONAL POSSESSIONS AND SKELETONS</td>
<td>11.0</td>
</tr>
<tr>
<td>clothing</td>
<td>11.1</td>
</tr>
<tr>
<td>shoes</td>
<td>11.2</td>
</tr>
<tr>
<td>sewing and knitting</td>
<td>11.3</td>
</tr>
<tr>
<td>tools</td>
<td>11.4</td>
</tr>
<tr>
<td>smoking</td>
<td>11.5</td>
</tr>
<tr>
<td>toiletries</td>
<td>11.6</td>
</tr>
<tr>
<td>pocket money</td>
<td>11.7</td>
</tr>
<tr>
<td>leisure</td>
<td>11.8</td>
</tr>
<tr>
<td>printed matter</td>
<td>11.9</td>
</tr>
<tr>
<td>miscellaneous: walking stick, spectacles</td>
<td>11.10</td>
</tr>
<tr>
<td>E. CARGO</td>
<td>12.0</td>
</tr>
<tr>
<td>containers</td>
<td>12.1</td>
</tr>
</tbody>
</table>

undergone by inventories from the same type of ship over a period of time (Reinders 1985:86).

Systems of classification are arbitrarily designed to answer certain questions raised by the researcher and problems are inherent in any system of classification. Reinders (1985:95) placed one restriction on this system,
that of being able to accurately provenience artifacts to the accommodation plan of the ship in order to correctly identify their function. However, regardless of how meticulously a classification system is devised, some objects will defy categorization.

The taxonomy used for these assemblages is based upon functional categories. A specific problem arising from this includes the inability to identify an object, a problem which seems to increase as the age of the wreck increases. Hence the older the wreck, the more difficult to identify the components of the inventory with regard to their function. A more persistent problem, is the tendency of artifacts to possess multiple functions thereby defying classification into a stiff taxonomy. These problems result in artifacts being awkwardly placed into existing categories or unclassified altogether. In spite of the weaknesses inherent in this type of categorization, a functional classification structures the data for analysis better than a material taxonomy because activity patterning is highly visible in this type of investigation.

The functional classification system used in the site plans is a modified version of the system devised by Reinders (1985). Certain classifications were regrouped into broader categories for illustration on the site
plan. This reclassification simplified the illustration because several related categories were regrouped under one classification and represented symbolically. This allowed the artifacts to be represented on the site plan with a minimum of symbols. The categories were regrouped as Ship’s and Working Equipment, Administrative and Domestic Equipment, Tools, Hearth and Galley, and Personal Possessions. An additional category was added, that of Intrusive Material. This is not a functional classification but it does allow the inclusion of material that could be relevant to site formation or site disturbance. This modified classification is presented in a legend on the site plans of the wrecks.

When inventories like these are viewed in a wider perspective and compared to similar wrecks, they may suggest what was common or typical for this type of craft. This would promote more accurate predictions of, and research questions for, future excavations of similar vessels.

A review of the economic history of the Netherlands in general and the Zuider Zee region in particular can reveal how boats of this type functioned during the eighteenth century relative to the internal economy of the country. Moreover, a comparison with assemblages of similar types of wrecked craft from the seventeenth and
nineteenth centuries should reveal some trends across time in what was carried on-board these vessels exclusive of cargo. This should lead to insights of what life was like aboard a small cargo vessel.
CHAPTER II
ECONOMIC HISTORY OF THE NETHERLANDS

The Dutch Republic (Figure 2) was a union of seven northern states, formed after the 80 years war (1568-1648) against the Spanish Hapsburg rule. The Union of Utrecht in 1579 comprised the core of the central government's constitution, while each province retained full sovereignty (Bosscher 1987; Boxer 1965). The economy of Europe was, by this time, transforming from a system of medieval capitalism into a more global system in which the Netherlands was beginning to figure prominently. The trade of western Europe was shifting from a Mediterranean focus to the North Sea and the Atlantic, while advances in industry, transportation, and communication accelerated the production and distribution of goods (Barbour 1950).

The sixteenth century brought an unprecedented increase in population and prosperity to the United Provinces. This phenomenon was fostered by the war of independence, when the northern provinces undermined Spanish power by paralysing the Antwerp market (Van Houtte 1972). The successful blockade of the Scheldt river managed to dethrone the entrepot of Antwerp and shift the balance of economic power northward to
1. Amsterdam  
2. Hoorn  
3. Enkhuizen  
4. Kampen  
5. Zwolle  
6. Harderwijk  
7. Rotterdam  
8. Delft  
9. Leiden

Figure 2. A map of the Dutch Republic.
Amsterdam (Van Houtte 1972). Thriving industries developed in the Netherlands resulting from the influx of thousands of refugees possessing both capital and talent, fleeing the war, the dire economic decline of Antwerp, and religious repression. The early prosperity of the Netherlands was founded on the economic development of the two maritime provinces of Holland and Zeeland and the increase in Dutch maritime trade from 1590 onwards (Boxer 1965). This economic development was focused on the North Sea, the heart of which was grain from the Baltic and French wine and salt, but also included goods centered in the shipbuilding industry such as timber, pitch, tar, metals, hemp, and flax (Barbour 1950; Boxer 1965). This trade in turn provided solid foundations for expansion and diversification.

Bosscher (1987) indicates that the rise of the Dutch as a major sea power, and their subsequent development through the eighteenth century, were based primarily upon their geographical position. The land occupied by the Netherlands was formed by fluvial deposition and it stretches across the estuaries of the rivers Scheldt, Maas, and Rhine. This strategic location gives access to Europe through these major waterways, while England and the Atlantic trade are to the west. Furthermore, the Netherlands lies midway between the grain and timber of
the Baltic to the north and the rich trades of the Mediterranean to the south (Bosscher 1987).
Consequently, the geographical positioning of the Netherlands allowed the Dutch to insert themselves as merchants into the most vital trade networks of the period.

The Treaty of Munster in 1648, marked the economic pinnacle of the Dutch 'golden age'—they were the greatest trading nation in the world (Boxer 1965). They constituted an hegemony in the seventeenth-century world economy:

a situation wherein the products of a given core state (dominant economic power) are produced so efficiently that they are by and large competitive even in other core states, and therefore the given core state will be the primary beneficiary of a maximally free world-market [Wallerstein 1982:95].

They controlled three-quarters of the Baltic grain trade, and an almost equal percentage in the timber and salt traffic, while one-third to one-half of Swedish metals were handled by Dutch merchants. Additionally, they were the largest importers and distributors of colonial products such as spices, sugar, porcelain and trade wind beads, and one-half the cloth imported to the Baltic was manufactured or finished in Holland (Boxer 1965).
In an analysis of energy consumption, Zeeuw (1978) explains the economic wealth of the seventeenth century in quite a different way. The countries of southern and western Europe hit a developmental limit in the sixteenth century as a consequence of deforestation. Wood for burning and construction materials became progressively more expensive because of an increase in distances of conveyance. The Netherlands was the only country that supplemented its energy resources with the large scale exploitation of its extensive peat bogs—thereby breaking through this developmental limit a century ahead of its neighbors. This cheap source of energy supplied several fuel intensive industries such as breweries, potteries, bakeries, the textile industry, and sugar refining to name but a few, thereby allowing the Dutch to undersell their competition.

The Dutch are remembered as a trading nation but industry also played a very important role in the seventeenth century. A plethora of small cottage industries such as: brick, tile, and glass factories, pottery works, breweries, bakeries, distilleries, the linen and wool industries, leather, ropes, sails, and paper manufacture sprung up around the country (van Bath 1982). Rural Dutch farmers were also allowed to pursue cash ventures because of the importation of cereals from
the Baltic. They grew commercial crops on small plots of land near the towns and marketed these products in the cities (van Bath 1982).

During the seventeenth century, the masses of skilled and unskilled laborers were employed by the major industries which were centered in the cities: the textile industry in Leiden; shipbuilding in Edam, Hoorn, and Rotterdam; sail-making and paper manufacturing in the Zaan; salt-refining in Rotterdam; pipe manufacturing in Gouda; and ceramic manufacturing in Delft. However, by the eighteenth century, these large industries had undergone a process of ruralization to capitalize on the cheaper labor force in the south and east (van der Woude 1975).

The Decline of the Eighteenth Century

The small size and population density of the Netherlands implies a small home market with little prospects for expansion, thus they were vulnerable to serious competition and exclusionary politics (Bosscher 1987). This vulnerability formed an important background element in the economic downturn of the eighteenth century. These economic trends were exacerbated by the antagonism with England over the Navigation Acts restricting Dutch trade in the Atlantic, the effects of
privateering against Dutch ships, and over-investment in plantation colonies.

Although historians hotly debate the nature and extent of the economic decline of eighteenth-century Holland, it cannot be denied that the standard of living decreased. This can be measured quantitatively in regionally declining populations, population movements, falling agricultural prices, a rise in bankruptcies in Amsterdam from 63 to 154 annually between 1750 and 1780 (Riley 1984 quoting Oldewelt), and a general industrial decline affecting the largest industries including textiles, and shipbuilding (van Dillen 1974).

Holland was in desperate need of money as a result of the many wars in the late seventeenth and early eighteenth centuries, and the discovery in 1732, that teredo navalis, commonly known as shipworms, had destroyed the sea dikes (van der Woude 1975; Lambert 1971). This financial decline was intensified by an agricultural recession between 1650-1750, which was evidenced by a drop in lease- and property prices, an increase in arrears in taxes, and an increase in farm size caused by an abandonment of small owner-occupied farms (van der Woude 1975). Taxation took between 16-25% of the gross income of agriculture, contributing further to rural poverty (van Houtte 1977). However, during the
second half of the eighteenth century, the agricultural recession abated, although most other Dutch industries continued to decline (van der Woude 1975:240-241).

One school of thought views the eighteenth-century economy as a time of stagnation or moderate decline (Wilson 1939; Boxer 1965; Blok 1970; van Dillen 1974; Israel 1989), while another school sees it as a time of absolute decline between 1650-1750, with limited recovery after 1750 (van de Woude 1975; Jan de Vries 1984, 1985). In a review article documenting economic fluctuations between 1650-1750, van Dillen (1974) found a decline in some areas and progress in others. He noted that fortunes fluctuated as industries tried to compensate for falling prices and increased competition. In documenting the shifts in the Baltic trade, he observed that a decline in herring and salt carriage was partially compensated by an increase in timber imports and colonial exports from the West Indian colonies (van Dillen 1974). Faber (1965) also recognizes that a recession does not necessarily mandate a decline in all economic indicators. In reference to the Dutch decline of 1650-1750 he writes:

When weighing losses against gains, employment should be an important criterion. In this respect a prolonged crisis in agriculture could never be compensated for by greater activity in the stock-
market, nor could the decline of shipping be made good by increased sales of colonial produce, while the employment created by the new spirit-industry bore no proportion to the unemployment due to the slump in the brewers' trade throughout the province [Faber et al 1965:61].

Van Dillen (1974) and Riley (1984) both maintain that the powerful economic growth before 1650 seems to be followed by a long period of stability, which declined after 1740. They subscribe to the school of decline relative to an economic upswing among neighboring nations, particularly Britain (van Dillen 1974:208-209; Riley 1984). Israel (1989) also views the Dutch downfall as a relative decline reverting into a passive state of warehousing after 1740. This economic trend however, seemed to be a slow sometimes erratic decline of all industries, especially those concerned with importing raw materials and re-exporting finished products. The growth of certain economic sectors can be attributed to an increase in the home market such as with sugar and gin while the decline of important industries such as the textile industry, can be blamed on the new policies of neighboring nations of imposing high import duties on foreign processed goods. Stated thus:
Within the next two decades (after 1720) most of northern Europe was incorporated into a framework of systematic industrial mercantilist policy. Those few Dutch industries which survived the 1730s and 1740s intact either declined soon after 1750 or else were sustained in the late eighteenth century owing to heavily increased demand in the home market [Israel 1989:384, 389].

Israel (1989) holds contradictory views on the Dutch Baltic trade indicating a relative and absolute decline of 20% between the 1720s-1770s (Israel 1989:380), and later stating that it was the only sector of Dutch commerce which possibly did not decline (Israel 1989:392). This confusion may stem from the fact that the number of craft involved in this trade did not change appreciably over this time, but the size and carrying capacity of the craft decreased markedly because of the types of craft used. Many of the vessels still involved in the trade after 1740, were smaller Frisian vessels, thus, they were less likely to carry principal commodities such as French wine, salt, or herring (Israel 1989:380-1; Boxer 1965:287).

The eighteenth century brought economic stagnation, static population growth, high unemployment and decay to the United Provinces. Boxer (1965) wrote that in some
small sea towns of North Holland and Zeeland, streets and houses were leveled to make room for gardens and meadows for grazing, while surplus urban population fled to work in the peat bogs of the northeastern provinces of Drenthe and Overijssel.

As a whole, population fell due to poor economic conditions resulting in postponement of marriage, contraception, and flight from the cities. Overijssel was an exception, its population increased by 90% between 1675 and 1795. Boxer attributes this to urban flight while others believe it was a natural growth resulting from an excess of births over deaths (Faber et al 1965:84; de Vries 1985). Lis and Soly (1979) analyzed a similar situation in Flanders, attributing a population growth there to the ruralization of industry. "Disposing of a source of supplementary income, more cotters (Dutch share-croppers) could marry, and do so earlier. Hence, the reproduction rate rose steadily" (Lis and Soly 1979:143). Regardless, population in Overijssel rose 42% (from 71,000 to 122,400) between 1650-1748, and 25% in Veluwe (from 40,700 to 54,220) between 1650-1749 (van Houtte 1977). This increase corresponded with considerable industrial development in these areas, as with the linen industry in Twente and paper manufacture in Veluwe (van der Woude 1975).
The economic downturn of the eighteenth century led to deteriorating living conditions among the poorer segments of society.

People who know the peasants of Brabant, wrote an eyewitness in 1785, must acknowledge that they are deprived of all the comforts in life that are properly the part of human beings. They drink sour buttermilk or water, they eat potatoes and bread without butter or cheese, they are miserably clothed, they sleep on straw. A prisoner in Holland lives better than a peasant in Brabant [Boxer 1965:289].

Increasing poverty was evident among the declining working class population in towns such as Leiden and Delft, but also in the rural provinces of Overijssel where the growth in population was accompanied by a corresponding increase in poverty (Boxer 1965:293). Housebuilding lagged behind this population increase, only 29% of new families had access to housing (van Bath in Faber et al 1965:82). This resulted in people living under appalling conditions in peat huts, old sheds, and pigsties. Many new houses were less than 2 m high with a surface area of 3.5 by 4 m (van Bath in Faber et al 1965:85). The demographic changes brought on by
increasing pauperization are illustrated by Van Bath as shown in Table 2 (adapted from Faber et al 1965:78).

<table>
<thead>
<tr>
<th>Group</th>
<th>% of Population 1675</th>
<th>1758</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobility</td>
<td>1.1</td>
<td>0.6</td>
<td>-45.00%</td>
</tr>
<tr>
<td>Wealthy citizens (&gt; 10,000 guilders)</td>
<td>1.8</td>
<td>1.0</td>
<td>-44.00%</td>
</tr>
<tr>
<td>Higher middle class (500-9,999 guilds.)</td>
<td>25.5</td>
<td>20.0</td>
<td>-21.50%</td>
</tr>
<tr>
<td>Lower middle class (&lt; 500 guilders)</td>
<td>46.5</td>
<td>42.7</td>
<td>-00.08%</td>
</tr>
<tr>
<td>Paupers</td>
<td>25.1</td>
<td>35.7</td>
<td>+29.70%</td>
</tr>
</tbody>
</table>

The general conditions around 1800 saw the decay of the republics' maritime commerce. The manufacturing cities were drained of talent as poverty increased. Orphan and widow asylums as well as other poor houses were filled as evidenced by Amsterdam's statistics of 1796 where one quarter of the population were supported as paupers (Blok 1970). However, trade on land rose slightly in agricultural products and cattle, and the German, French, and Belgian trade increased somewhat (Blok 1970:323).

Taxation also contributed to rural poverty—direct taxes took between 16-25% of the gross income of agriculture (van Houtte 1977:227-229). Van Bath (1965) charts the shift in taxation in the period 1680-1790. In
1680, during the period of low cereal prices, property owners bore 68% of the tax burden while 31% of taxes were levied from food products. Between 1760 and 1790, when cereal prices had risen and there were large numbers of unemployed industrial workers, only 43% of taxes came from property while the proletariat sector paid 53% of the country’s taxes in excises on food (van Bath in Faber et al 1965). This resulted in the poorest segments of the population paying the largest share of the tax burden.

Reasons for the Decline

The reasons for this economic decline are also debated. The Netherlands were very poor in raw materials and their internal market was very small, corresponding to the size of their country. Protectionist measures by rival northern European countries effectively stimulated the consumption of manufactured goods from locally based industries at the expense of the Dutch (Boxer 1965; Bosscher 1987).

Wilson (1939) viewed the economic downturn after 1730 as resulting from natural changes in the economy and far from catastrophic. He summed them up as follows: first, Holland lost her intermediary position in world trade; second, this decline was not
counterbalanced by any industrial development; and third, there was a gradual shift of interest from trade to finance—to insurance and credit banking, and to foreign loan business and speculation [Wilson 1939:113].

However, Barkhausen (1974) explained the depression as a structural crisis brought on by high wages, a high cost of living, and a failure by the state to extend protective tariffs and prohibitions on imports as was being done in other areas of Europe. He notes that the interests of trade took precedence and as with modern industry which is not tied to local natural resources, they frequently move into poor districts paying low wages (Barkhausen 1974:246). This is born out by the wage structure for the country as wages were artificially high only around Holland, quickly declining in every direction equivalent with Antwerp, or 50% less than in Amsterdam (de Vries 1982).

**Zuider Zee Trade and Inland Navigation**

Regional exceptions to stagnation and decline persisted in certain economic areas. Certain branches of the Baltic trade (timber and grain) were still conducted by skippers doubling as merchants of their own cargo and factors for merchants shipping cargo with them (Boxer
Agriculture generally flourished in the second half of the eighteenth century because more land had been reclaimed and prices rose for agrarian products such as grain, cash crops, potatoes, hay or fodder, dairy products, and livestock (Boxer 1965:285-6). There was moderate growth in the bailiwick of Bois-le-Duc, the sandy regions of Friesland and the Veluwe, and in Salland and Twente in Overijssel. This growth can be attributed to the textile industry, paper manufacture, the peat industry, and the cultivation of tobacco developing alongside traditional agriculture (Roessingh in Faber et al 1965).

City populations as a rule earned their livelihood by handicraft industry (51%), trade (25%), and by other professions (15%), mainly services. In the country however, only 20% of the labor force were engaged in handicraft industry, while in the regions abounding with water, the normal level for trade and traffic seems to be about 10-12% (van der Woude 1975). Cotters in the Veluwe for instance supplemented their incomes in a variety of ways besides day laboring for wealthy land owners. There was seasonal work if one was willing to travel. In the winter there was bark stripping and excavating mud and excess vegetation from canals for paper mills, spinning and weaving, binding heath-besoms, and collecting
bilberries. Bark stripping was also carried out in the spring in Drenthe while summers were spent in Holland and Friesland mowing grass and later wheat and oats (Roessingh in Faber et al 1965). Some of the gross occupational patterns are outlined in Table 3 (adapted from van der Woude 1975:232).

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Industry</th>
<th>Trade</th>
<th>Other</th>
<th>Laborers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Holland, 1811</td>
<td>17</td>
<td>33</td>
<td>25</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Friesland, 1749</td>
<td>5</td>
<td>45</td>
<td>27</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Veluwe, 1749</td>
<td>7</td>
<td>36</td>
<td>26</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Overijssel, 1795</td>
<td>13</td>
<td>49</td>
<td>23</td>
<td>14</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Industry</th>
<th>Trade</th>
<th>Other</th>
<th>Laborers</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. Holland, 1811</td>
<td>54</td>
<td>17</td>
<td>12</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Friesland, 1749</td>
<td>62</td>
<td>19</td>
<td>14</td>
<td>5</td>
<td>--</td>
</tr>
<tr>
<td>Veluwe, 1749</td>
<td>66</td>
<td>22</td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Overijssel, 1795</td>
<td>60</td>
<td>23</td>
<td>11</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

However, between 1650-1750, populations bordering on the Zuider Zee in North Holland, Southwest Friesland, and in the municipalities of Veluwe and Overijssel were in serious decline. The population of the Veluwe harbor of Harderwijk declined by about 20% in that period. Analogous developments can be seen in Hattum, Kampen, Vollenhove, Kuinre, and Blokzijl, all of which are situated on or near the Zuider Zee (van der Woude 1975:230). During the mid- to late-seventeenth century, freshwater fishing on the Zuider Zee, in the lakes, and
in the canals, had almost disappeared in comparison with its enormous extent in the early seventeenth century. The water had turned brackish in the Zuider Zee due to climatic changes (van der Woude 1975:237). This environmental change coincided with a severe population decline in this region. Also coinciding with this decline, the formerly thriving ship building industries in the cities of Hoorn, Edam, Haarlem, and Rotterdam were on the verge of collapse (van der Woude 1975:239).

Contrary to the trend for the rest of the country, Friesland recorded a marked increase in the number of ships in the eighteenth century. There were 2000 vessels registered in that province in 1779, however, most of these were small coasters under 80 tons (Boxer 1965:287). Boat dimensions for inland craft were dictated by the size of canals and locks which did not increase appreciably until the early to mid-nineteenth century (van Konijnburg 1913, Schutten 1989 personal communication). An estimation of the total fleet of inland sailing vessels is computed at 8,000 for the seventeenth century, and Zeeuw (1978) quotes a 1969 publication of van Schaik in concluding that a large, if not the largest part of inland navigation on the Zuider Zee in that period can be attributed to peat shipping.
The Peat Industry

Peat cutting began on a large scale in 1580 in Herenveen in Schoterland and excavation of low moor peat peaked in Friesland about the same period. Early in the next century companies were set up in Groningen for the speculative exploitation of the surrounding swamps while partnerships of rich aristocrats bought up the moors around Friesland. The goal was to supply peat as a household and industrial fuel for the fast-growing towns of Holland (Lambert 1971, Faber et al 1965). The rising prices for peat were an incentive to the producers, as illustrated in Table 4 (adapted from Faber et al 1965:66,69).

<table>
<thead>
<tr>
<th>Year</th>
<th>Guilders per ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>1575</td>
<td>0.06</td>
</tr>
<tr>
<td>1600</td>
<td>0.18</td>
</tr>
<tr>
<td>1625</td>
<td>0.26</td>
</tr>
<tr>
<td>1650</td>
<td>0.30</td>
</tr>
<tr>
<td>1675</td>
<td>0.32</td>
</tr>
<tr>
<td>1700</td>
<td>0.30</td>
</tr>
<tr>
<td>1725</td>
<td>0.31</td>
</tr>
<tr>
<td>1750</td>
<td>0.45</td>
</tr>
<tr>
<td>1760-1769</td>
<td>0.47</td>
</tr>
<tr>
<td>1770-1779</td>
<td>0.48</td>
</tr>
<tr>
<td>1780-1789</td>
<td>0.53</td>
</tr>
<tr>
<td>1790-1799</td>
<td>0.49</td>
</tr>
</tbody>
</table>

In the moors around Groningen and Drenthe the land was normally turned over to the individual peat-cutters for agricultural development before the peat was completely dug away. In Friesland, however, much of the
completely dug away. In Friesland, however, much of the land was reforested by the aristocracy who owned the moors. In the agricultural lands, deficient plant nutrients were supplied by the addition of street sweepings from Groningen, at first supplied free but later sold to the peasants and supplemented from the towns of Holland. Cash crops were grown near the farmstead, while the far end consisted of the untouched bog where peat was dug for the farmer’s use—in between lay pastures and hayfields. The chief agricultural products were rye and buckwheat while cattle served chiefly as dung producers. However, the extent of new land being impoldered annually was less in the years 1650-1775 than at any time since the Middle Ages (Lambert 1971).

The mid-eighteenth century saw an abandonment of several peat bogs north of Overijssel, while population declined after this period in Vollenhove (van Bath in Faber et al 1965). Coincidentally, the central districts of Friesland saw a population increase corresponding to their flourishing peat-digging industry after 1750 which stimulated trade and inland navigation in this area (Roessingh in Faber et al 1965). During the eighteenth and nineteenth centuries, great quantities of peat were cut in the bogs west of the Vecht river, which were well
situated to serve the Amsterdam market, while peat skippers, mainly from Groningen and Friesland, went as far as Antwerpen and other Flemish cities to sell their cargo (Zeeuw 1978).

Peat workers operated from April until mid-December. Large crews of women and children were used to load the peat but a skipper only needed one or two mates to sail the ladened craft (Schutten 1989 personal communication). Most of the skippers had their wife as their only crew member. Only on some of the bigger ships were 2 men involved. It took 15 years of apprenticeship, beginning at age 12 to 13, to become a skipper. These mates were paid once a year at the end of the season, while the skippers’ made their profits as merchants of the peat (Schutten 1989 personal communication).

Summary

The Dutch had risen to economic power after seizing Spanish markets abroad. Their supremacy at sea allowed them the power to flaunt trade restrictions enacted by other European countries and surreptitiously insinuate themselves between well-established trading partners thereby gaining control over the rich trades of the east and the bulk trades with the west. Treaties with the English in the seventeenth century and a breakdown in
commitment at home (because of divided interests between the provinces) led to a decline in sea-power in general and a decline in naval power in particular. Thus, they lost the power to continue conducting business in a coercive fashion and grew increasingly vulnerable to increasing trade barriers and higher taxes on products they exported to neighboring European countries. This resulted in a loss of jobs at home and a corresponding loss of revenue for the country. The central government attempted to compensate for this loss by raising taxes, particularly on agricultural products. Unfortunately, this had the reverse effect and removed capital for reinvestment, or for modernizing factories at a time when the industrial revolution was sweeping the continent. The excessive tax burden is seen by Faber (1965) as the main cause of the economic decline. Taxes, particularly on agricultural products, accounted for an increasing percentage of production costs when agriculture was struck with multiple natural disasters, a situation that would normally elicit a tax reduction (Faber et al 1965). The Dutch had few natural resources to compensate for their loss of trade in finished products. The net result of these events was their loss of economic dominance in the world economic order and a reversion to their pre-seventeenth century position as a warehouse.
CHAPTER III

ANALYSIS OF THE E 14: A WRECK IN EAST FLEVOLAND

Survey and Excavation of Wreck E 14

In April 1968, agricultural superintendent J. Kuipers of the Development Authority for the IJsselmeerpolders reported that a ditching machine encountered ship’s wood on a parcel of agricultural land in Oostilijk (Eastern) Flevoland (Figure 3). A reconnaissance in June 1968 confirmed the presence of a shipwreck, fragments of which were visible in two ditches. The Museum for Shiparchaeology assigned the wreck the catalogue designation E 14 in accordance with the Museum policy of numbering archaeological sites after the lot where they are found.

The excavation began on April 14, 1973. A back-hoe removed the bulk of overburden and the remaining sediments were hand shoveled. Artifacts and loose wreck fragments were catalogued, and the hull cleaned of soil and debris. The wreck was 253 meters from ditch E 14/15 and 200 meters from ditch E 14/28. Thus, when she sank, the vessel was 15 km north-northwest of Harderwijk in water 2.8-3 m deep at average ebb tide (Hydrographic map 1852).
Figure 3. A site map for the E 14 wreck site.
A detailed reconstruction of the ground profile was not possible due to disturbance of the soil by agricultural equipment and a heavy growth of a marsh grass, *Phragmites communis*, which has a deep root system that penetrated to the lowest part of the wreck. The profile revealed the shipwreck had settled into the upper layers of a Zuider Zee clay deposition occurring after A.D. 1700. The nature and depth of these sediments indicate that the boat would have mired herself shortly after sinking hindering any attempts at salvage.

**Inventory**

The inventory of the wreck E 14 was collected without recording provenience. This compromised the system of functional classification, because in some cases items were assigned to categories based upon analogy instead of their relation to the accommodation plan of the ship. The site plan is a reconstruction from field notes, photographs, and personal interviews with the excavator, K. Vlierman.

**Ship’s Equipment**

The category of ship’s equipment includes such items as anchors, chains, sails, cordage, windlasses, pumps, boats, ladders, punting poles, and spare equipment. The
majority of the ship's and working equipment was recovered from the bow of the ship as shown in the site plan (Figure 4). A forward compartment or cuddy is evidenced by a bulkhead that partially survived on the port side of the ship. Such a compartment seems to have served as storage space for tools and equipment.

Most of the material in this category is comprised of spares including an array of fasteners, 18 sheaves, and 7 blocks. The sheaves are made from ironwood and range from 8.1 cm to 15.4 cm in diameter. They cluster into three basic size ranges, two are about 8 cm, fourteen are between 10 and 12 cm, while another two are about 15 cm in diameter. All of the sheaves show signs of wear and some are quite damaged around the edges. Two of the sheaves seem to have been specialized or altered for some reason. One of these has two fragments of a leather strap lining the interior hole while the second has two small perforations, one on either side of the central hole, probably for a pin to lock it in place. Such a large number of spare sheaves might indicate that the ship had been in use for a long time. The number of used sheaves stored with the spare equipment might also suggest that the ship was run very frugally. The seven blocks found on the site may also have been spares since any blocks in use on the rigging would probably not have
Plan for the E 14 wreck.

- O Ship's and Working Equipment
- □ Administrative and Domestic
- O Personal Tools
- ▲ Galley Assemblage
- O Personal Possessions
been preserved. One block has the number "XII" carved into its cheek, but the reason for this mark is unknown. Most of the blocks remain in conservation and are not available for study at this time. A variety of iron fasteners were recovered concreted inside a small wooden barrel (Figure 5a-h). Again, many of them appear to have been used and some appear purposefully bent perhaps to function as home-made latches, while others are haphazardly broken or bent. The fasteners may represent metal accumulated gradually from repairs or fasteners salvaged after a refit to the ship. The salvaging of scrap lends further support to the frugality of the skipper in operating the boat. The surviving pump components, two leather washers and a wooden cog (Figure 5j), are also categorized as spares because it is unlikely that these items, if part of the functioning pump, would have survived when the pump itself did not.

The second sub-category represented in the equipment classification for this collection is that of aids. This includes the ladder rungs and the knobs to puntng poles. One of the two ladder rungs (Figure 5m) was available for study. It measured 28.5 cm long with a diameter of 2.8 cm and is notched 2.5 cm in from either end for a rope. The ladder rungs indicate that a rope ladder was kept on board. This could be used over the side of the boat or
Figure 5. Ship's equipment for the E 14.
through a hatchway into the hold of the ship. The use of punting poles is suggested by two very similar knobs (Figure 5k, l) each with a central hole diameter of 2.2 cm. They appear to be lathe turned with simple incised lines around their circumference. Punting was an important means of propulsion in shallows, and punting poles could be used both to push away from banks and as a sounding lead to check water depth.

Working Equipment

The working equipment were those items necessary to perform the function for which the ship was built (Reinders 1985). This would include equipment involved in loading and unloading the cargo of the ship. This category is represented by two hooks found in the bow. It is plausible that they were used to load cargo into the ship, however because hooks are multi-functional, they may have functioned as part of the rigging. One of these hooks (Figure 6a) had a fluked end and was crudely made with hammer indentations evident over the entire surface. The second hook (Figure 6b) had a small hole in the end. This may have allowed a thin rope to secure the hook to prevent accidental loss of a load.
Figure 6. Cargo hooks for the E 14.

Weaponry

The classification of weaponry refers to personal weapons excluding those carried as equipment on a warship or as part of a cargo (Reinders 1985). The field catalog lists three small lead bullets found among the wrackage. Unfortunately these artifacts are unavailable for study. No other items from this category were recovered, therefore this classification will not be treated in the analysis.
Administrative Equipment

The category relating to administrative functions includes items such as ship’s papers, finances, stationary, and writing equipment. A writing slate (Figure 7) and a large lump of chalk (number 30) were found among the wreckage. Chalk was often used in carpentry, in marking cargo, and the ends of barrels (K. Vlierman, 1989 personal communication). The slate measures 39.3 cm by 26.8 cm. The edges are beveled somewhat and the impression of a wooden frame can be seen along the perimeter. Approximately 90% of the original article was recovered in twelve pieces. The surface of the slate is marred by many permanent scratches. This may have been caused by the crystalline inclusions in the chalk or it could be the result of a slate pencil, which was the more common instrument used in that time (K. Vlierman, personal communication). Unfortunately, it is not possible to read any of the writing on the slate because one message overlies another and the orientation of writing changes frequently.

The most important artifact used in dating the ship is a lead token (Figure 8b) for the lighthouse in the region of North Holland and West Friesland. These tokens were purchased annually by ship captains to support and maintain the operation of the lighthouses (Rijksdienst
Figure 7. Writing slate from the Administrative Equipment category of the E 14 wreckage.

Figure 8. Lighthouse tokens from the E 14.
voor de Ijsselmeerpolders 1987). The date on the token is 1783, and gives us a terminus post quem for the wreck. Also found was a small lead object resembling a baling seal (Figure 8a). Impressed upon one surface of this seal is a cipher mark of "82". It is suggested by K. Vlierman (1990:5) that this seal is also an example of a lighthouse token, albeit from a different lighthouse, and the cipher "82" indicates the year 1782.

Navigational Equipment

The category of navigation includes instruments such as compasses, sounding leads, charts, tide tables, and running and towing lights. There were no artifacts from this classification found in the wreckage of this ship. This would not be unusual if this craft were primarily used on inland waterways where a compass would not be necessary and a punting pole could serve to measure water depth. Much of the upper structure of the ship was lost and this would have destroyed any navigational lights if they ever existed. Furthermore, skippers of this type of vessel would have been well acquainted with these waterways thus making charts and tide tables unnecessary.
Tools

The category of tools encompass those tools that are involved with the management of the ship including the sub-categories of carpentry, caulking, sail and rigging maintenance, and cleaning. Carpentry tools dominate this classification. A saw handle (Figure 9a) is typically Dutch with its smooth lines, pistol grip, and brass ferrule. Goodman (1964:146) dates this style specifically to the eighteenth century, indicating that it was replaced in the latter part of the eighteenth century by the English-style handle and blade. A comparable Museum example from shipwreck M 65, which was wrecked at the end of the seventeenth century, supports this time frame.

The zig-zag folding rule (Figure 9b) is made of copper and divided into increments of half a duim (the Dutch equivalent to an inch) numbered on the duim. The duim was originally a natural measurement equal to the breadth of a person’s thumb, and there would be anywhere from ten to twelve duims in a Dutch foot (Verhoeff 1979:103). The duim increments on this rule are consistent with the present standard used to measure an inch. Only the last segment of the rule remains intact and is numbered from twelve to sixteen. Sixteen duims must have been the full extension of the rule since there
Figure 9. Carpentry tools from the E 14.
is neither a rivet nor a hole for a rivet on the terminal end, and only two segments would be able to pivot on any one axis for the rule to extend to its full length. The rule pivots at one end on a copper pin, 0.9 cm long, which secures a copper binding and another small broken piece of copper, probably a second segment of measurement. The holes in the two exterior segments are beveled so that the pin is recessed into the surface of the metal. The pivotal end is bent and has semi-circular striations along this bend consistent with the expected wear patterns resulting from opening and closing the rule. However, these three pieces comprise only 0.35 cm of the 0.9 cm pin length. According to Salaman (1975) rules of this type are usually equipped with a self-locking joint that acts to lock the rule in place when extended; fastenings of any sort are missing from this example. It is possible that there was a self-locking joint at one time that has since deteriorated. Tension, such as a wood backing might have provided, would supply an alternative method of locking the rule into place. It is also possible that if backed by wood, the instrument was thus equipped to function as a bevel (Goodman 1964, Salaman 1975, Horsley 1978). Horsley (1978:150 figure 53) shows examples of boxwood and brass bevel gauges similar in construction that double as rules, and a
similar example was recovered during the excavation of the *Machault*, a French supply ship sunk off the coast of Canada in 1760 (Sullivan 1986).

Three stones were found for sharpening and polishing metal blades, all of which show considerable use. The largest stone (Figure 9c) is a grey whetstone. It is harder and coarser than the other two stones and deep grooves are cut into opposite surfaces. The remaining two stones are of a softer and finer grained rock, one looks like a fine-grained sandstone while the other seems to be of hematite. Their wear patterns are very smooth and gently curved, consistent with use as polishing stones.

One intact brace and a knob for a second brace were recovered. The complete brace (Figure 10a) is small, measuring 36.5 cm long, with a shallow sweep. It is constructed of wood with a copper-alloy ferrule reinforcing the bit-end. Its crude construction suggests that it is homemade, however the knob is lathe turned and possesses a simple circular incised decoration around its circumference. This knob is 5.3 cm high and pivots on a wooden pin. A fragment of the wooden pin survived measuring 1 cm in diameter. The bit is wedged into the brace with two iron nails and it would have bored a hole 0.5-0.6 cm in diameter. This brace is quite similar to
Figure 10. Tools from the E 14 assemblage.
the shipwright's brace pictured in Salaman's *Dictionary of Tools*. Of this he writes:

For light work shipwrights sometimes use a homemade wooden brace often known as a Belly Brace or Boat Sway. These have a rather shallow sweep, and a square, tapered socket to take wooden pads. A stock of these pads is kept, each holding a different size of awl or bit, ready to be placed in the socket as required. They were used for boring the planks of smaller craft before nailing [Salaman 1975:98-99].

The knob (Figure 10b) is identified as belonging to a brace because of its similarity to the knob on the complete brace. This knob is lathe-turned with an identical incised decoration. It measures 8.7 cm high and pivots on a surviving wooden pin, measuring 1.5 cm diameter. It seems likely, based upon its size, that it was part of a much larger brace and possibly that the two knobs or braces were purchased as a pair from the same craftsman.

The remaining equipment in this category consists of two red earthenware cups believed to be receptacles for caulking material or brushes. Both cups are damaged. One cup (Figure 10c) is filled with a hard pitch or other caulking material and remnants of fiber and iron encrustation are cemented into the pitch. Some of the
fibers appear to be from a plant, consistent with a type that might be used on a caulking brush. Other materials are knitted and knotted wool fragments, possibly indicating the use of an old garment such as a hat or stocking, for caulking. The iron encrustation protruding from the surface of the pitch might be the remains of a caulking iron; if so, it is the only evidence of a caulking iron on board. The second cup also has small patches of pitch residue on the exterior surface, rim, and a large round area on the interior, off-center from the bottom. This pattern is compatible with how a pitch-covered brush or other caulking tool might have rested in the cup.

The assemblage of tools seems incomplete for what would be expected on a boat of this type. The basic tool chest might contain a hammer, chisel or caulking iron, adz, axe, caulking mallet, pincers, knives, and equipment for rigging such as a marline spike. However, none of these items were found. This might suggest most repairs were made elsewhere, if so, the implication is that the boat's primary use was for short journeys.

Domestic Effects

Domestic effects are those articles relating to the interior of the living quarters such as furniture,
sleeping accommodations, lighting, heating, storage, and sanitation. The domestic effects in this assemblage are few, encompassing only three objects, a window, a *snotneus* oil lamp, and a chamberpot.

The window (Figure 11) measures 38 cm across and 43 cm high. It is constructed with mortise and tenon joints and has four thin glass panes held into their framework with a white plaster-like chinking. The panes are of different thicknesses and shades of light green, possibly indicating installation at different times or the use of left-over or recycled glass. Prams from the nineteenth century often had windows set into the hull in the stern of the craft, however this window does not appear to have been sturdy enough to have functioned as an exterior portage. It seems likely that it may have served as the door to a locker or cupboard. There are indentations in the top and bottom right side of the frame where hinges attached and a lock partially survived on the left edge. There are two indentations on the outside of the frame, one on either side of the lower panes, possibly for the attachment of a metal bar spanning the breadth of these panes. The exterior molding was painted red while the interior was left unpainted and rough. The window was found in the stern, close to the stern bulkhead, which is thought to have separated the living quarters from the
hold. It was surrounded by small personal objects and bits of thin glass from several vessels which seems to support the supposition of its having functioned as part of a locker.

Figure 11. Reconstructed window from the E 14 detailing the constructional features.
The *snotneus* oil lamp (Figure 12c) is constructed of thin welded copper sheets and stands 23 cm tall. It is an oil burning lamp designed for interior lighting and can be placed on a level surface or suspended from a hook. It is the only means of lighting that was found and probably gave only faint illumination depending upon the type of oil that was burned—whale oil giving brighter illumination than either sheep or vegetable tallow. Lamp light would be augmented by firelight in a household setting; however, an open hatch or enclosed lanterns would have been less of a fire hazard on a boat unless it was docked and stationary.

The last artifact in this category is the chamber pot (Figure 12b). The chamber pot was broken into several pieces, some of which were not recovered. It is a red earthenware vessel with one handle and a clear lead glaze over an abstract floral slip design in yellow and green. The rim is everted and stepped, and has an estimated diameter of 18 cm. The footring is well formed and the bottom is unglazed and fire-blackened. An absence of staining inside indicates this vessel was probably not used for sanitation and waste disposal (Vliereman 1989 personal communication). The fire-blackened bottom indicates that it was heated, but there is no evidence suggesting what it might have contained.
Figure 12. Domestic effects from the E 14.
Hearth and Galley

The category of hearth and galley includes artifacts related to the preparation of meals on board ship. This entails not only the hearth and hearth tools but also fuel, cooking vessels, utensils, and other vessels involved in food preparation. A hearth as such was not found in this excavation; however the preponderance of the evidence suggests there having been a hearth of some kind on board. Three unglazed red clay tiles were found. They measure 22 cm square and show some burn marks. Three yellow fire bricks were also recovered, however other tools and accoutrement necessary for a hearth are missing. A fire box, a grill or trivet, an iron or tile hearth plate, and fire tongs are integral parts of a working fireplace; yet they were not found. A large cauldron would also be expected, but again one was not found. The absence of a hearth plate or tiles may be negative evidence suggesting a simple hearth arrangement, such as a firebox constructed of wood and sand. A hearth of this kind would have left little evidence of its existence, and the few unglazed tiles and bricks might be all that remains. Unfortunately, there is not enough evidence to discern the true nature of the hearth.

The ashpot (Figure 12a) is another indicator of some type of hearth. It is a large red-earthenware
vessel with two stirrup handles, a plain straight rim, and well-formed footing. This vessel type usually has a lid, however one was not recovered in this instance. It has a clear lead glazed exterior with portions of deglazed surface and clumps of glaze damaged in the firing process. It stands 22.2 cm high and the interior is fire blackened. The ashpot functioned primarily as a container for coals and ashes from the hearth so that they could be disposed of safely, thereby reducing the chance of the boat igniting. However, when the ashpot was filled, it may also have served as a stove with which to warm hands or feet.

Three of the ceramic vessels from the galley assemblage are fire-blackened, suggesting their use in cooking. The first is a small red-earthenware tripod skillet (Figure 13b) with a wide rim. The rim is undercut, has a diameter of 19.2 cm, and a pouring lip at a right-angle to a short thick handle. The vessel interior and the exterior rim are covered in a clear lead glaze while the bottom is unglazed. The bottom is heavily fire-blackened and the interior has deep scratches in the glaze indicating its use in the galley. The second and third objects used for cooking are a pair of red-earthenware bowls. These bowls are quite uniform in size, shape, and decoration. They both have a
Figure 13. Ceramics from the E 14 galley.
straight grooved rim, diameter of 14.5 cm, from which springs a single handle. The exterior is decorated with a green and yellow slip in an abstract pattern, while the interior has a yellow slip beginning half way down the wall covering the basin. The vessel is covered inside and out by a clear lead glaze. One bowl (Figure 13c) has a pouring lip opposite the handle, while the corresponding region on the second vessel (Figure 13d) is missing. Both bowls are fire blackened on the bottom and around the footing, and may have served the dual functions of heating a single portion of stew or gruel taken from a larger pot and as vessels of consumption. The similarity of these two bowls may suggest that they were perhaps purchased from the same potter; however, similar vessel forms and decorative styles were geographically diffused and spanned a period of several hundred years. Such ceramics were differentiated by small changes in rim and handle design; thus this implication would be difficult to prove.

Three other vessels seem to have functioned for food preparation. The first is a red-earthware tripod sieve (Figure 13a) with a grooved hammer-head rim and two handles. The rim measures 32.5 cm in diameter. The basin is shallow and perforated with holes of 0.5 cm in diameter. The entire vessel is covered in a clear lead
glaze. The second item is a red-earthenware batter bowl (Figure 13d) with an outward curving bead rim measuring 22.3 cm in diameter. It has a well formed footring and handle, and a pouring lip opposite the handle. A yellow slip coats the bottom half of the interior, while a light-greenish lead glaze covers the entire pot. The third container, a red-earthenware milk pot (Figure 14d), could have been used for food preparation as suggested by its size, or storage as suggested by its form. It has a plain rim, 21 cm diameter, with a slightly concave collar from which spring two well-formed handles. It has a globular body tapering to a footring and the entire vessel is covered in a clear lead glaze. It is in fact a miniature of a larger storage pot found in the wreck.

Eating and Drinking

The classification of eating and drinking encompasses table linens, dishes, cutlery, and other vessels used exclusively for the consumption of meals. It seems unusual that no dishes were found that can be exclusively attributed to this category. Neither glasses nor drinking vessels of any kind were found and only a few pots are presumed to have served for heating and serving single portions. However, fragments belonging to
Figure 14. Galley ware from the E 14.
a delicate polychrome faience bowl were found which may
have been used as a drinking cup or a tea bowl.

The E 14 assemblage contains two pewter spoons. The
first (Figure 15b) has a round back and shows signs of
use, possessing multiple scratches and dents. There is a
maker's mark in the hollow of the spoon bowl below the
handle, a crowned rose with the initials "H H" stamped on
either side. The style itself was in use from the
fifteenth through the twentieth century; however, this
particular form of handle attachment, tapering to a
point, is more common in the later examples (Dubbe 1978).
The second spoon (Figure 15a) has an oval or egg-shaped
bowl and appears to have been relatively new, judging
from the lack of wear, at the time of deposition. Bevel
marks, resulting from the manner in which it was shaped,
are still visible across the back of the bowl. This oval
style for the Dutch is usually attributed to the
nineteenth century (Dubbe 1978), however, a similar
spoon, dating to the second half of the eighteenth
century, was found during the excavation of
Oostenburgermiddenstraat in Amsterdam (Baart et al 1986).
The Provincial Overijssel Museum in Zwolle has dated a
silver spoon of this style to the eighteenth century,
while similar examples for both types of spoons were
Figure 15. Pewter spoons from the B 14.
recovered during the excavation of the Amsterdam, an East-India trading ship that sank in 1749 (Marsden 1985).

Vicuals and Provisions

The category of Victuals and Provisions is predominantly concerned with the storage of food and drink on board ship. Sub-categories are designated for food; however, food remains are rarely preserved in this type of site. The remainder of the identifiable ceramic forms consist of storage and serving vessels. There is a Tigerware pitcher (Figure 14e) that stands 27.8 cm high. It has a bead rim with a pouring lip opposite a well-formed and decorated handle. The globular body tapers on both ends to an inward flaring neck and a footring. The exterior is covered in a white slip and decorated with a brown pigment to resemble the markings on a tiger, while the interior is coated with a yellow lead glaze. It may have been used for both storing and serving a beverage.

The large red-earthenware storage pot (Figure 14a) has a rim diameter of 32.8 cm and stands 28 cm high. The shape and detail are the same as the smaller milk pot, however it lacks the exterior glaze possessing instead a simple interior lead glaze. There is also a red-earthenware jar (Figure 14d) standing 31 cm high. It has a decorated handle, bead rim, inward flaring neck, and globular body
tapering to a footring. The interior and exterior are covered entirely in a greenish-yellow lead glaze. The last storage vessel is a small stoneware pot with a strap handle and a flat base (Figure 14b). It is made from a buff paste covered in a grey saltglaze and has a flat everted rim measuring 9.5 cm. The pot may have originally been purchased for its contents such as marmalade, mustard, or honey.

Three intact onion bottles (Figure 16a-c) were recovered. They range in size from 16-20 cm high and all have a string finish, where a thin stream of glass is applied below the lip. This allowed a cork closure to be securely fastened into place with wire strands and was in use since the mid-seventeenth century (Jones 1986). Shards from at least one more wine bottle and perhaps a case bottle, comprise the remainder of this galley assemblage.

The galleyware is sparse and each piece probably served multiple functions possibly indicating a lower economic bracket for the ship's inhabitants. The entire ceramic assemblage is composed of only twelve pieces, most (83%) of which are an inexpensive lead glazed red-earthenware common in the Netherlands. This sparseness is unusual, evidenced by the assemblages of comparable ships wrecked during the same period. Many of the pieces
Figure 16. Three Dutch wine bottles from the E 14.
appear to be of fair quality judging from their symmetry and attachment of handles and footrings, and about half, 42%, have some type of decoration. Deformation during the firing process did not necessarily relegate a pot to the waster pile. Ceramics have been found aboard wrecks recovered in the Netherlands that would not have been considered first-quality pieces because of warping and other deformations. Items of this sort would doubtlessly have been sold at a reduced price. However, as meager as this assemblage is, ceramics of second or third quality were not found on this wreck. Thus the quantity and quality comprising this assemblage suggests that only one or two people sailed this boat. It is also probable that these inhabitants had permanent dwellings and that the ship was used seasonally or for day travel.

The sparseness of the artifacts recovered and the nature of those found do not suggest a full-time kitchen, rather they imply a small working galley for heating food that was prepared in advance and transported in storage pots. Alternate explanations for the scarcity of this functional category are that post-wreck disturbances such as those caused by salvage, ice-drift, nets or anchors catching on the wreck, or plowing, have removed items from the site or destroyed them entirely. The hull remains were such that an accurate reconstruction of the
living quarters is not possible, thus the exact nature of the hearth and galley cannot be confirmed. However, the small size of all the cooking vessels, the few large storage pots, and the scarcity of galley-ware in general seem to lend credibility to a small make-shift galley for a small crew such as a skipper and his mate.

Personal Possessions

The category of personal possessions includes such items as clothing, sewing and knitting objects, personal tools, smoking and toiletries, pocket money, and items of leisure. Artifacts from this category usually contribute the richest glimpse of everyday life. The largest component in this category is composed of sewing accessories (Figure 17a-1) and consists of seventeen buttons, one blue glass bead that may have served as a button, nine brass pins with round heads of coiled wire, a pin or needle case of turned wood, and eyes from hook and eye type clothing fasteners. Many of these same articles, comprising more or less a sewing kit, have been recovered from the wrecks of different ship types from the same time period such as the Amsterdam, wrecked in 1749.

The only remains of clothing recovered were some leather shoe fragments: a partial insole, heel, and
Figure 17. Sewing accessories from the E 14.
welting from the seam. Unfortunately, these are too fragmentary to adequately determine if all the fragments belonged to one or more shoes. These fragments might even represent the recycling of scrap leather. Other possessions of leather include fragments possibly from a bag or pouch and a knife sheath (Figure 18a) with an stamped floral decoration. The stitches on the bag and the knife sheath have deteriorated, but the stitch holes and impressions remain. The sheath is relatively intact and remarkably similar to another knife sheath (OB 19/31) in the Museum collection that was found on the wreck of a mud-scow and dated to the second half of the seventeenth century based on the stratigraphy of that site (Reinders et al 1984).

Several bottles or bottle fragments were found, all of which were missing their closures; hence, there is no way to discern their contents. There are two glass bottles that are relatively intact. One of these is a small green molded case bottle (Figure 18b), minimum height of 7.5 cm. This one has a complete neck which it appears would have required a stopper of a soft material such as cork or leather since the wall of the neck is fragile. It would most likely have contained a thin liquid or a dry granular substance as the diameter of the neck would not have allowed a viscous, chunky, or clumpy
Figure 18. Personal possessions recovered from the E 14 wreck site.
material to have passed through unhindered. Thus, it may have contained a medicine or tonic, even perhaps a scent or smelling salt. The second glass bottle (Figure 18c), 2.3 cm high, is small enough to be considered a vial. The vial curls in at the neck and the finish appears broken along a ridge at this point. With no means of comparison, it cannot be determined if this effect was purposeful or accidental and whether or not it was due to the wrecking. If in fact it was accidental, the vial may actually be the top to a glass stopper rather than a vessel in itself. The other intact bottle (Figure 18d) is constructed of wood turned on a lathe. It stands 4.7 cm high with a body diameter of 4.5 cm and a depth of 4 cm. It has a bulbous body, narrowing at the neck and a simple incised decoration around the circumference. The interior is straight-sided with a slightly rounded bottom. The rim is indented and pierced through by a small hole. The lid is missing but the absence of threads on the neck would seem to indicate a stopper-type closure. There is a comparable example in the Museum collection (OB 19/41). It was found on the same seventeenth-century mud-scow as the tooled knife sheath that serves as a parallel to the one in figure 18h. The closure on this wooden bottle is unavailable for examination; however, a Museum illustration reveals it to
be a wooden stopper with a round knob on top. The Museum example is relatively intact. A brass ferrule pinned to the rim corresponds to an indented wooden rim with two small holes on the eighteenth-century example, thereby strengthening the possibility that they are analogous. However, the contents and function are unknown.

Several miscellaneous possessions were recovered that fall into several of the sub-categories for personal possessions. Two hair combs were recovered; one is a black large toothed comb (Figure 19a) made from baleen, bone or horn, and the other is a very fine-toothed bone comb (Figure 19b). Fine toothed combs are commonly found on historic sites and may indicate the habitual presence of lice and the necessity to remove lice and nits from the hair shaft.
Two kaolin tobacco pipes were also recovered. Both pipes are identified by bowl shape and design features as coming from Gouda in the eighteenth century. The bowls of both are an ovoid shape that was popular from 1750-1850, and one pipe (Figure 20a) has a relief molded design of a crown, fish, and waves that was produced from the second half of the eighteenth century until around 1830 (Duco 1987). The second pipe (Figure 20b) has a relief molded "S" above a small Gouda crest, the "S" indicates a pipe of common quality (Duco 1987).

Figure 20. Smoking accessories from the E 14.
A coal-pot (Figure 20c) of red clay with a clear lead glaze inside and out was recovered and was identified by the excavator K. Vlierman to be an ashtray for the clay pipes. This assumption is based upon several factors: the presence of an interior glaze—impractical on a vessel used for hot coals, the absence of burn marks contraindicating its use as a coal-pot, and seventeenth- and eighteenth-century paintings showing this type of vessel used as a pipe rest.

Three small copper or copper alloy fish hooks (Figure 21a) were found in the same area as the sewing accessories. A small kaolin lion (Figure 21b), was found among the personal possessions and it seems to serve no other function than as a toy or decoration. The next two finds suggest a woman’s presence on the ship at some time. A turned bone spindle (Figure 21c) resembling a broken hair pin, and a decorative brass scallop shell (Figure 21d) were recovered in the wreckage in close proximity to the window. Zeeuw (1978) indicated that most peat skippers of the seventeenth century had their wife as their only mate, while women were often used as laborers to load peat onto the turf prams of the nineteenth century (G. Schutten, personal communication 1989). Therefore, it is possible that a similar relationship existed during the period this ship was in
use and some personal possessions may have broken and been lost in the hold of the ship. An alternative hypothesis however, is that these items are residuals from a cargo of street sweepings or nightsoil, often a return cargo from peat shipments to Amsterdam and Groningen (Wallerstein 1982, Schutten 1982).

The final sub-category from this function classification is pocket money. Three coins were found in this wreck, two brass farthings and a large silver coin, a French ecu, of greater value. One of the farthings (Figure 22a) is in fairly good condition while the other is quite deteriorated. The first is stamped Utrecht, bearing the arms of that city, and is dated 1766. Details on the second farthing are at present totally indistinguishable. However, before it was
cleaned, the excavators discerned in the corrosion that it was minted in Holland sometime in the eighteenth century. The last coin is a French écu (Figure 22b), minted in Monaco in 1653, and is stamped "Hono II", indicating Honore II, a prince of Monaco (Reinders in preparation). The silver content of the coin had international value that was retained over the years.
However, it is still surprising that a coin of this age, value, and condition was found on a wreck of this type.

Cargo and Intrusive Material

The only evidence for a possible cargo for the E 14 were some birch branches found in the forward section of the hold, at the turn of the bilge. These branches comprised an area of 30-50 cm high and measured 3-5 m in length. They were uniform in size and were formed into sheaths or bundles (K. Vlierman, 1989 personal communication). They may have been part of a cargo intended for a broom maker as brooms of that time were commonly constructed from bundles of birch twigs, or sometimes heather, which were bound onto a handle with skeins of cleft willow, oak, or other wood (Salaman 1975). If the ship was loaded when she sank, the cargo may have been salvaged, it may have caught in fishing nets being drug across the sea-bed and been carried off the site, or depending upon its inherent characteristics, it may have decomposed or been removed from the site due to natural processes such as currents and waves.

Intrusive material may be introduced into an archeological site in several ways, such as salvage operations, disposal of debris over or near the site, and anchors or fishing nets catching on parts of the wreck
protruding above the seabed. There were several items that were identified on the field list as intrusive and subsequently discarded, for example necks to two green glass wine bottles, two red-earthenware rim sherds, a net that was reinforced with iron studs, and a kaolin pipe bowl and stem. There were also twenty-eight lead net weights recovered aft, next to the rudder. The provenience of these weights suggests that a net was dragged across and caught on the rudder resulting in part or all of the net being abandoned or cut away.

**Dating the Wreck**

The wreckage of this ship can be positively dated to the fourth quarter of the eighteenth century based upon the composition of the assemblage, the coins, and most importantly on the lighthouse token. The ceramics as well as the saw handle, are dated in general to the eighteenth century. Other finds such as the buttons, needle case, and spoons have analogies in other catastrophic sites dated to the eighteenth century. The tobacco pipes from Gouda are dated more precisely to the second half of the eighteenth century based upon their form and decoration, which were popular from the mid-eighteenth century until around 1830 (Duco 1987). Aside from the Monaco coin, which spuriously dates the wreck to
the mid-seventeenth century, the brass farthings support
and narrow the dates suggested by the artifacts to
sometime after 1766. However, the lighthouse token gives
us a terminus post quem and probably the actual year of
the wreck as being 1783.
CHAPTER IV

ANALYSIS OF THE A 71: A WRECK IN SOUTH FLEVOLAND

Survey and Excavation of Wreck A 71

On July 28, 1975, agricultural superintendent M.W. Koops reported that during drainage work on lot A 71 in Zuidelijk (Southern) Flevoland, the ditching machine encountered ship's wood. A reconnaissance on July 30, 1975, confirmed the presence of a shipwreck. A flat-bottomed vessel with a sharp, hard chine was visible in two 70 cm deep ditches. It measured approximately 19 m long and 3.5 m wide and was shallowly covered by 20 to 25 cm of overburden.

The wreck was located in Southern Flevoland on lot A 71, (Figure 23). Measured from its center, the wreck was 250 m from the brick road and 143 m from ditch 2A 70/71. The vessel sank 6.5 km to the northeast of the mouth of the Vecht River and 12 km east of the harbor of Amsterdam, where the water depth was 2.8 m at the average ebb-tide (Hydrographic map 1852). Recording was performed as on the E 14, with steel tapes, water levels, and plummet. A detailed site plan of the wreck was drawn at 1:20 scale, while a separate drawing details the
position of artifacts and loose fragments associated with the wreck.

The stratigraphy of the wreck site was relatively simple. The wreck lay in a lens of sandy clay riverine sediments deposited by the Vecht River. It rested on top of a hard shell layer which prevented it from sinking into the heavy thick clay of the seabed directly beneath the shell.

The site may have been disturbed by shifting sands and the scouring action of currents as many artifacts were found dispersed beyond the port side of the hull. In fact, two pieces of heavy iron hearth plate were recovered, one off to port and one fragment lay directly underneath the vessel.

**Inventory**

The provenience for the inventory of the A 71 was recorded in the field notes and field catalogue during the excavation of this vessel. In addition, a scaled site plan was drawn by K. Vlierman showing the in situ artifacts. The provenienced data was recorded with more precision than the E 14 excavation, thereby allowing the functional classification process to more accurately reflect the accommodation plan of the ship. This data is reflected in the site plan (Figure 24).
plan for the A 71 wreck.

- Ship's and Working Equipment
- Administrative and Domestic
- Personal Tools
- Galley Assemblage
- Personal Possessions
Ship's Equipment

Most of the vessel's equipment was stored in the bow compartment. The equipment consists of twenty items, most of which are probably spares. Nails, spikes and a leather washer are no doubt spare equipment, but a headstick, two blocks, four or five thimbles, and three hooks could be the remains of a fore staysail in storage when the vessel wrecked. However, it is also possible the blocks and hooks were spares or working equipment.

An iron fragment, found in the stern, might have been part of a rosebolt (Figure 25f). It has a surviving length of 34 cm. About half of this length, 18-20 cm, was hammered flat and is pierced in three places for fasteners.

A U-shaped iron fragment (Figure 25g) may have been part of a pump, but is too fragmentary to be positively identified. However, similar hardware was recovered from a seventeenth-century wreck off the East coast of Africa and identified as a chain pump, in use on European vessels since the late sixteenth century (Oertling 1991:14). A single leather washer or valve, 6 cm in diameter, might also have belonged to the pump. It is theorized that these items were spares or replacement parts because it is unlikely that these individual
Figure 25. An assortment of iron fasteners used aboard the A 71.
components would have been spared if the remainder of the pump did not survive.

An assortment of iron fasteners was found (Figure 25). There were four spikes (Figure 25a-c), ranging in length from 16 to 21.5 cm with diameters from 1.3-1.8 cm, two of which have barbs near their ends to inhibit withdrawal. Three smaller iron nails and an iron staple were also found (Figure 25h-k).

The headstick (Figure 26a), a short round stick to which the top or head of a triangular sail is fastened to prevent it from twisting, is 31.3 cm long with a tear-shaped cross-section of 4.4 cm by 5 cm and is rounded on each end. A headstick of a similar size is represented in the sail plan of a nineteenth-century zomp (Schutten, 1981:217), while another headstick of about the same proportion is found on the fore staysail of a nineteenth-century model (Maritiem Museum Prince Hendrik, model number 117). A U-shaped bolt is in the center of the headstick. Two deep asymmetrical grooves are present near either end. One groove is wider and angled more sharply than the other, which probably indicates that as the forward end of the headstick.

The four thimbles are unique (Figure 26b). Their shape is circular to slightly oval with overlapping ends that become projections which were beaten together at the
Figure 26. Items from a fore-stay sail.
point of overlap. The projections are perhaps to enable them to be served with a rope. All are about the same size with an oval inner diameter of 6.6 by 8 cm, while the outer diameter has a 1.0 cm wide groove to be served with a rope.

One example of another thimble type was found, (Figure 26c). This variety has an oval inner diameter of 4 cm by 5 cm and an outer groove with a width of 1.8 cm. This groove was once served with a rope.

As mentioned above, the three hooks represent a ubiquitous tool type; they could fit into one of three related function categories: spare equipment, working equipment such as loading hooks, or as part of the rigging equipment for the fore staysail. The feasibility of the hooks fitting into either of the first two categories probably needs no explanation. Hooks are such necessary tools that spares would be expected. Also, hooks used for loading and unloading cargo might be stowed away below when not in use. However, the possibility for the use of the hooks with a sail should not be excluded. The three hooks are all relatively short. The above mentioned model of a nineteenth century pram is constructed with similar short hooks for forestay and foresail blocks, however these may not necessarily be made to scale.
One short fluked hook has a swivel joint fitted onto it (Figure 27d). An iron fragment (Figure 27c) seems to fit the impression on the hook left by the swivel. The head of the hook was flattened over to prevent the swivel from slipping off. The second hook (Figure 27e) is a relatively short-bodied fluked hook. Most of the eye was not preserved, but was reconstructed in the drawing. However, the third hook (Figure 27f) is a slightly longer hook than the other two. The tip is curled indicating that it also had a fluked end that was not preserved.

Two single-pulley oak blocks were found. Both blocks had iron straps around them. One block (Figure 27a) is slightly smaller than the other, measuring 16 cm by 13.7 cm, and has a 10.5 cm diameter sheave. The larger block (Figure 27b) is 21.7 cm by 17.2 cm, with a sheave of 12.1 cm. Both sheaves are of a hard tropical wood, probably lignum vitae.

Unrepresented categories

Several classifications are totally unrepresented in this assemblage. The category of working equipment would include items necessary for performing the function for which the vessel was employed. This category was not represented in the wreckage of the A 71. There were no
Figure 27. Ship's and Working equipment from the A 71.
weapons found with this wreck either as personal, equipment, or cargo. The category of administrative equipment includes ship's papers, finances, stationary, and writing equipment. It is unusual for paper to survive in wet environments and this classification is unrepresented. The category of navigation includes instruments, charts, and lights that are necessary to the safe maneuvering on open waters such as the North Sea or the Zuider Zee. However, if this craft was traditionally a canal vessel, it would not be surprising that this category is unrepresented.

Tools

The category of tools for this wreck is sparse, consisting of a marline spike (Figure 28) and a heather brush head. Marline spikes were used for splicing and generally working ropes. The specimen recovered in this wreck measures 20 cm in length, has a button-shaped top, and a gently curved shaft. It was found aft, under the

Figure 28. Marline spike from the A 71.
hearthplate fragment that was situated beneath the hull. The heather brush consists of twigs with a minimum length of 12 cm. However, these heather twigs comprise a fragile and fragmentary bunch compacted with mud and lack indentations that might suggest how they were bound. There were two similar brushes found on the wreck of the Amsterdam. Both were of heather, approximately 27 cm in length, and were bound with thin wood skeins (Marsden 1985:89).

Hearth and Galley

The remains of the hearth and galley assemblage indicate a working kitchen aboard this vessel. The hearth fragments consist of a broken iron hearth plate and pieces of six unglazed tiles. The hearth plate was found in two large sections, separated by approximately one meter. One segment was located underneath the hull, aft and slightly to the port side, situated next to several other items from the galley assemblage. The other half was located perhaps a meter away on the port side. The plate measures 71 cm in length and is 1 cm thick. A precise width cannot be taken as half of the plate was used for conservation experimentation and was destroyed. However, a fairly accurate estimation of 65 cm can be made, based upon photographs indicating the
relationship between the two halves and measurements taken from a site plan drawn to scale at the time of the excavation. The hearth plate is very heavy and the iron, although covered by a surface corrosion, in quite good condition. It would appear to have taken tremendous force to break such an object in half. This leads one to assume that the plate was broken before the wreck and not as a consequence of the wreck. The tiles measure 22 cm square and are 3 cm thick. They all seem to have had a nail or bolt through their centers and some mortar still adheres to their edges. They were probably bolted in place upright as a backplate. Fires on the iron hearthplate left burn marks and smoke residue on the ceramic backplate. Some burn marks are evident, not enough however to allow an accurate reconstruction of the tiles' relative positions. A framework or enclosure was not found, however a strip of copper molding was found aft, clustered with items from the hearth assemblage. It measures 78 cm long, is step-shaped, and has nail holes along two of its faces. It is approximately 2.5 cm deep and is angled so it may fit lengthwise over a corner piece of wood and has end pieces that would fold over the end cuts of wood. Lead, tin, and copper were often used as sheathing for the wooden framework of a hearth (K. Vlierman, 1989 personal communication). This strip may
have served that function, protecting such a framework from sparks and extreme heat.

The galley assemblage is comprised of vessels for food preparation and consumption, the balance of which consist of a variety of ceramics of differing forms and designs. The ceramics as a whole can be viewed from many perspectives, such as composition, decoration, place of manufacture, and market value. All of these add to a body of information that epitomizes the way of life of the occupants of the ship when it sailed the Zuider Zee. This analysis will look at each piece within the context of functional groups, taking into account provenience and wear marks as an indication of use. The market value of the assemblage as a possible indicator of economic status will be addressed, as will the origin of manufacture--indicative of the concurrent market availability.

Two iron cooking containers were found. The cast iron cook-pot (Figure 29b) has a bale handle, three legs, and a rim diameter of 23.5 cm. One leg is not original but was replaced by a bolt and washer sometime during the life of the pot. Very little remains of the iron pancake pan (Figure 29a); however enough is present to obtain an estimated diameter of 23 cm and to note that the bottom of the pan had been repaired, evidenced by the small nail
Figure 29. Iron cooking pots from the A 71.
or brad holes in what is left of the bottom. One batter bowl (Figure 30) was presumably used for the preparation of pancake batter, pancakes being a staple in the diet in times past. Two ceramic bowls have fire blackened exteriors implying their use as cooking vessels. One is a red-earthenware bowl (Figure 31) with a spout and a handle. It is rather small having a rim diameter of only 13.5 cm. The bottom is missing but the rest of the
Figure 31. Ceramic cooking vessel from the galley assemblage.

exterior shows evidence of heating. The second bowl, (A71-14) not pictured here, is fragmentary with an estimated base diameter of 10 cm. It has a white paste with a slip design in brown and green and has an interior and exterior lead glaze. The underside is fire-blackened. The last item from this category is a small copper lid to a tea kettle, of which comparable examples exist in the Museum collection. It is 11.6 cm in diameter and is bent. There is a hole in the center where the handle should be. It was recovered aft next to the iron cooking pot, but the kettle was not found.

The remainder of the galley ceramics, 10 items, presumably were associated with the service and
consumption of food. Several of the items were recovered from a cluster of galley ware, the cookpot, water can, a serving dish, and majolica plate. This may indicate that these items were stored together in a cupboard at the time of the wreck. A serving dish (Figure 32a) found in this cluster is of undecorated red-earthenware with a rim diameter of 22.7 cm. The rim is hammer-headed, the footring is symmetrical and well formed, and the form is shallow and graceful. It is covered in its entirety in a clear lead glaze. These dishes are found in abundance and in a variety of sizes among other wrecks of this period, they have even been found used as lids covering cast iron cooking pots (K. Vlierman, 1989 personal communication). A third serving dish (Figure 32b) is identified on the basis of style as British, probably from the Staffordshire area. Several black-glazed wares were popular from the mid-eighteenth to the beginning of the nineteenth century. Jackfield ware and Pratt ware, which usually took the form of pitchers, teapots, etc., were a red-ware covered in a black glaze, manufactured in Little Fenton and Shropshire (Cox 1970:909,921). Buckley ware were coarse cooking vessels, cream pans, and pitchers which were heavily black-glazed
Figure 32. Serving dishes from the A 71 galley.

over a dark red body with yellow inclusions (Hume 1969:35). However, another imitation of black ware was manufactured at Namur, Belgium (Cox 1970:908). The dish from this wreck has two handles, a plain rim with a ribbed exterior, and a slightly concave base. The paste is red with some possible yellowish inclusions and is overlain by a thick, black lead glaze. It was found aft, outside the ship on the port side. A Rhenish platter, (Figure 33) measuring 32 cm at the rim, was also found. It has a stepped flanged rim and a slightly concave base with no footing. The slip decoration is composed of three circles in the center, out of which begins a
Figure 33. Rhenish platter from the A 71.
spiraling line that continues across the bottom. An apple-green lead glaze is dabbed on the blobs and on the outer rings of the spiral. The walls of the vessel are slipped with four wavy lines, the third one of which is overlain by an apple-green while the others are covered with a clear lead glaze. The stepped rim is decorated with five thin spirals. The front of the dish is covered with a clear lead glaze while the exterior is unglazed. The design identifies this vessel as being manufactured in the lower Rhine valley around 1740. Another vessel form used for food service is the cream pot. This is a spouted bowl (Figure 34) with a plain L-shaped rim which probably received a lid. It has a white body covered in a yellow interior glaze and a green exterior glaze with a small unglazed circle on the interior of the bottom.
approximately 2 cm in diameter. The majority of the vessel is reconstructed, thus the rim diameter is an estimate of 12.6 cm. The footing is well formed and the spout has dimpled impressions where it is attached to the body. The final serving form is a Tigerware pitcher (Figure 35). It stands 23.5 cm tall and has a bead rim. The red paste is covered in a white slip decorated on the exterior with a brown pigment to resemble the pattern on a tiger’s coat while the interior has a brown lead glaze. It was found aft beyond the port side.

Eating and Drinking

The next five dishes may have held food while it was being consumed. A blue and white majolica plate (Figure 36), minimum diameter of 20 cm, was recovered. The blue and white design is characteristic of faience, however, the thick body, greenish lead glaze on the reverse, and three proen marks on the front identify it as majolica. The pattern is very similar to the pattern on a plate fragment recovered from St. Olave’s parish in Southwark England (Hume 1977:79 Figure X-3). Hume identified that fragment as English delftware, probably of London manufacture, dating to the mid-seventeenth century. It is possible that the majolica plate found among the A 71 wreckage was manufactured during the mid-seventeenth
Figure 35. Tigerware pitcher from the A 71 galley.
century, which was the transitional period when both types of tin-glaze were in production (Wilcoxen 1987). This however would make it 100 years old at the time of the wreck. Perhaps a more plausible explanation is that this piece is Friesian, where majolica flourished until the beginning of the nineteenth century (Wilcoxen 1987:58). Surprisingly there is no hole in the footing, as was common for Netherlands majolica, allowing it to be displayed on a wall. Presumably though, it was used as a decorative piece as well as a serviceable dish. A second Rhenish vessel was found, a red-earthenware plate. This
plate (Figure 37) is rather small with a slightly stepped flanged rim measuring 17 cm. The obverse is slip decorated in a diamond pattern and is covered in a clear lead glaze terminating just below the rim. Some areas are deglazed and look burned. The base is flat without a
footring and the reverse is unglazed. A red-earthenware bowl (Figure 38a), measuring 12.7 cm rim diameter, was found aft in the scatter off the port side. It has a simple everted rim, and a handle and footring that are lopsided and sloppy in their attachment. There is a simple scroll slip design along the upper sides of the exterior and an interior slip covering the bottom half of the bowl. It is covered inside and out in a clear lead glaze and the absence of burn marks seem to indicate that it was used for consumption of a single serving. A second bowl (Figure 38b) of similar design and form, measuring 13.5 cm at the rim, was also found. The handle is missing but the size and general shape suggest a single service vessel. However the provenience, 0.4 m aft of the stempost, leaves this open to criticism.

Figure 38. Dutch ceramic bowls from the A 71.
The remaining item of this sub-category is composed of two fragments of a refined white earthenware covered in a clear lead glaze, most likely an English creamware. These two fragments do not articulate and may represent more than one vessel. The vessel form appears to be a cup or bowl with an estimated rim diameter of 9.5 cm. They were found aft, one fragment was concreted inside the cast iron cooking pot while the other was several meters away behind the sternpost and slightly to starboard.

The galley artifacts for the most part were recovered from two tight clusters aft at the chine, surrounded by a wide scatter of artifacts to port outside the ship. The scatter resulted from the boat listing to port as it sank causing the artifacts to roll to the lowest point in the ship. However, the clustering might have resulted from these items having been stored in a locker or cabinet built against the side of the boat. Unfortunately, the ship sank on a hard shell layer, and the majority of the hull was not preserved; thus the presence of a locker can not be confirmed. However, the iron cook-pot was found in situ in an upright position. If it had rolled to the lowest point, then it would be expected to have been oriented in a more haphazard
fashion. Thus, the evidence suggests that a locker for the storage of galley ware was feasible.

The majority of the ceramics, 71%, appear to be of Dutch manufacture the balance being composed of English and Rhenish ceramics, 14.5 % respectively. Among the Dutch wares are one majolica plate and two white-earthenware bowls, however inexpensive red-earthenware comprises the majority. J.M. Baart et al (1986) provide a price list in stuivers, of an average eighteenth-century dish. This list was compiled from active price descriptions used in stores and estate inventories in the eighteenth century. The stuiver was the common denomination used by the Dutch during this period and is equivalent to 1/20th of a guilder. Red-earthenware vessels from the Lower Rhine Valley could be purchased for one stuiver. This is comparable to the price for locally manufactured red-earthenware pots which were available for one to two stuivers, presumably the more ornate and decorative vessels bringing a higher price than the simple or imperfect wares. Majolica and English ceramics were priced a little higher at three stuivers per piece, but these were all relatively inexpensive and well within the affordable range of the lower middle-class household. The upper price brackets were held by Chinese porcelain at eight stuivers per piece, local
pewter at ten stuivers per piece, and Amstel porcelain at forty stuivers per piece. With this list as a guide, the worth of the recovered ceramic assemblage for the A 71 comes to one guilder and twenty cents or twenty-four stuivers. This represents a rather small cash investment even when allowing for an incomplete assemblage, and could be indicative of a lower middle-class socio-economic bracket. However, it could also indicate a temporal nature for the boat or the boat could have been owned by a peat extraction company with a hired crew. If the latter is true, then the expectation would be very low frequencies for personal possessions and living accoutrement compared to equipment necessary for the operation of the craft.

Other pram wrecks from the late eighteenth and nineteenth centuries possess larger and more varied assemblages. Higher percentages of English and Dutch refined earthenware, metal teapots, complete tea services, drinking glasses, and personal belongings are common (K. Vlierman, 1989 personal communication). Thus, it seems that the crew of this boat lived at the lower end of the economic scale. However, the disparity between the E 14 and A 71 and the wrecks with large assemblages may result from those boats serving as primary domiciles.
Three pewter spoons were recovered from this excavation. Two of these are very similar in style, size, and touchmark. They are 18.5 cm long and have a bowl diameter of approximately 6 cm. They both have a rose and crown touchmark indicating a good quality pewter (Dubbe 1978). There are stamped initials incorporated into the touchmarks of these spoons. One (Figure 39a) has the initials "L A", along with scratches that might signify an owner’s mark of "X". The second spoon (Figure 39c) has the initials "K W". The touchmark on both is located in the hollow of the bowl below the attachment of the handle, and the initials in both cases form part of the crown. Both spoons are considerably scratched and dented, but the first has four small elongated indentations and a dimple on the back of the bowl. The indentations crudely suggest a square with the dimple in the center. The nature of these marks is not known. The third spoon (Figure 39b) is quite small. It measures 12 cm long and the bowl is elongated from side to side measuring 4.5 cm at its widest point. There is a faint touchmark at the top of the handle on the back that looks like a crown and rose. This handle style was manufactured after 1730 (Wadley 1985) and gained popularity in the nineteenth-century Netherlands.
However, this handle was universally associated with an oval shaped bowl suggesting that this example has been modified, perhaps down-sizing it for a child (Cathy Hoyt, 1991 personal communication).

The last two items from the galley, an onion bottle and a water measure, concern the storage of liquids. The onion bottle (Figure 40a) is of dark green glass, stands 23 cm high, and has a string finish. The water measure (Figure 40b) is a small copper can standing 17.5 cm high with a diameter of 7.8 cm. There are fastenings for a bale handle and what look like repairs from previous fastenings located ninety degrees from the current handle fastenings. It has a volume of approximately 21 fluid ounces and was used to dip a ration of water through the bung of the water barrel. The fact that glasses and mugs are absent from this assemblage may indicate that the water measure was also used to drink from. A barrel was not found but the presence of the water measure suggests that a barrel had been on board at one time as was common for this vessel type, evidenced by water barrels detailed on models of nineteenth-century peat prams from the Prins Hendrik Maritiem Museum.
Figure 40. A wine bottle and copper can from the Eating & Drinking category.
Personal Possessions

The personal possessions recovered from this wreck were few and scattered about the ship. A small cast-pewter pendant or medal (Figure 41) was found aft, outside the ship on the shell layer. A small iron box was also found, aft, next to the iron cookpot. Its contents had been replaced by mud but it may have contained snuff or possibly a spice such as pepper or salt. An undecorated wooden knife handle (Figure 42) was recovered. It measures 10.5 cm in length and was fastened with three iron nails or tacks. Two Gouda pipe bowls were recovered, one in the midships area and one aft. The first one (Figure 42a) has a Gouda crest and the letter "s" impressed on the heel and a cipher mark of
"77" on the bottom of the heel. The second pipe has the remains of an "S" on the side of the heel. The "S" on both indicates a pipe of common quality while the cipher mark could indicate the year 1777 (Duco 1987). The last two objects from this category are two brass farthings found in the bow of the ship, under the frames of the starboard side. The first one (Figure 43) is very worn and corroded but some letters can be discerned on one side and the excavators suggest that the coin was minted in Zeeland, alternatively spelled Zeelandia. The date on the reverse side is within the decade of 1750, the last number being indecipherable. The second coin was in very poor condition and is unavailable for study.

Figure 42. Personal possessions.
Figure 43. A brass farthing from Zeeland.

Dating the Wreck

The wreckage of this ship can be dated to the second half of the eighteenth century based upon the artifact assemblage. The ceramics are in general dated to the eighteenth century by comparative analysis with other wreck sites. The Rhenish platter, A 71/10, can be dated stylistically to some time after 1740 (Frankewitz 1988), while the small Rhenish plate, A 71/08, has an analogy in the Oostenburgermiddenstraat site in Amsterdam (number OBM9-179) dating to the second half of the eighteenth century. The imitation black ware was popular from 1750-1800, while creamware was popular from 1750-1815 (Cox 1970, Hume 1969). The pipes from Gouda may also be used as indicators of dating; their ovoid shaped bowl was
popular from 1750-1850 and the cipher mark suggests a manufacture date of 1777 (Duco 1987). However, a brass farthing, possibly from Zeeland, gives a terminus post quem of 1750. It seems probable that the boat wrecked some years after this date however, based upon the general composition of the assemblage.
CHAPTER V

COMPARISON ACROSS TIME

The assemblages for these two wrecks, while not identical, remain complementary. The similarities lie in the artifact scatter which it is assumed represents the accommodation plan of the ship and the types of artifacts representing the functional classifications. When viewed together these assemblages complement each other by offering more complete representation of the functional categories. When inventories like these are viewed in a wider perspective, compared to a multitude of similar wrecks, they may suggest what was common or typical for this type of craft. This would promote more accurate predictions on future excavations and research questions for similar vessels.

The artifact scatter for both vessels consisted of ship’s equipment and tools in the bow and personal possessions and galley items in the stern. This pattern indicates that equipment was stored in the forward compartment, while the galley and living quarters were located aft, in the stern compartment.

Prams and other small cargo vessels of the nineteenth century often served as primary domiciles as well as work boats (G. Schutten, 1989 personal
communication). However, these two craft do not seem to support this supposition, evidenced by the incomplete hearths, small galley assemblages, scarcity of personal possessions, and seemingly incomplete tool assemblages. At best, these vessels were sufficiently equipped for overnight or perhaps seasonal occupation, during the periods when cargo was available for shipment.

The types of artifacts representing the functional categories for these ships were in many instances quite similar. Ship’s equipment was predominantly composed of spares such as blocks, iron fasteners, and pump and block components. The galley was represented by hearth tiles and other accoutrement, cooking pots, and skillets. The ceramics were predominantly a local slip decorated redware and generally inexpensive, while the pewter spoons recovered from each wreck were quite common for the time period. The category of personal possessions for both ships consisted of a knife, common pipes from Gouda dating to the eighteenth century, and a few stuivers in coins. The wreckage of the E 14 added combs, the remains of a sewing kit, and some small bottles to this category.

The assemblages, when viewed together, represent more complete functional categories. The categories of tools, personal possessions, administrative, and domestic
effects are more complete for the wreck of the E 14, while that of hearth and galley is more comprehensive for the A 71. Together these inventories give a fairly accurate concept of what work and life aboard one of these vessels would have been like. Above all they speak of frugality and multiple functions. This may result from many factors: the skipper’s membership in a lower socio-economic profession, the ship’s serving only as a temporary short-term domicile during the working season, or the general decline in the Dutch economy during the eighteenth century.

In order to identify a pattern in the types and ratios of artifacts expected on a boat of this sort, a temporal comparison was made between these eighteenth-century craft and similar types wrecked in the seventeenth and nineteenth centuries. The inventories of all the craft were catalogued according to the functional classification system devised by Reinder Reinders in 1985. The total assemblages for the eighteenth-century craft are quite small, 135 pieces for the E 14 and 65 pieces for the A 71. The seventeenth-century wreck (OZ 71) had a total of 156 objects while the nineteenth-century wreck (The Lutina) had a total of 437 objects. This represents a wide range in raw numbers, however, a statistical analysis may reveal some patterns or trends
in the data which are not readily apparent when looking at the raw numbers.

The chi-squared statistic is used to determine if the observed frequencies differ significantly from the expected frequencies. The expected frequencies are a derivation of the observed frequencies set up in a contingency table because no a priori theory is used. Thus, the null hypothesis is stated: there is no difference in the artifact assemblages of the various ships. If the null hypothesis is correct, the differences between the observed and expected frequencies will be small. If the differences exceed the critical value, the null hypothesis can be rejected. The alternate hypothesis, that there are differences between the vessels must be accepted. The results of this statistic are presented in Table 5.

The chi-square value for the contingency table is 136.11, greater than would be expected by chance, therefore the null hypothesis is rejected. However, there are problems with using chi-square in this instance because several of the functional categories have small expected values. Thirty-six percent of the expected values are below a count of five. Two steps were used to compensate for this and to increase the power of this statistical tool. First, the significance level was
### Table 5: Contingency Table for Functional Categories

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<th>Functional Categories</th>
<th>Wreck Assemblages/Expected Frequencies</th>
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<tr>
<td>SHIP EQUIP</td>
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<tr>
<td>WORK EQUIP</td>
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<td>WEAPONRY</td>
<td>7/ 1</td>
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<tr>
<td>ADMINISTRTV</td>
<td>0/ 3</td>
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<tr>
<td>NAVIGATION</td>
<td>0/ 1</td>
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<tr>
<td>TOOLS</td>
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<tr>
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<tr>
<td>GALLEY</td>
<td>23/13</td>
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<tr>
<td>DISHES</td>
<td>19/14</td>
</tr>
<tr>
<td>PROVISIONS</td>
<td>10/10</td>
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<tr>
<td>POSSESSIONS</td>
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<td>TOTAL</td>
<td>139</td>
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### CHI-SQUARE TABLE

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<th>A71</th>
<th>LUTINA</th>
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<td>18.98</td>
<td>46.34</td>
<td>25.93</td>
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Critical value at 0.05 significance, with 30 DF = 43.80
Critical value at 0.001 significance, with 30 DF = 59.70
Χ² for the contingency table = 136.11
increased to 0.001 or the 99.9% confidence interval. If a significant association is present, it should still be apparent in this level. Second, the functional categories were compressed to reduce the low values in the expected frequencies. The categories of weaponry, administrative, and navigation were compressed into the classification with work equipment, thereby reducing the cells with expected values below a count of 5 from 36% to 10%. These figures are listed in Table 6.

The null hypothesis is again rejected indicating there are significant differences between the assemblages. This can be shown graphically in bar charts illustrating the percentages of the functional categories relative to the total assemblages (Figure 44).

Differences are significant, but they may not relate to temporal differences. When the eighteenth-century assemblages are combined to calculate chi square for a boat of the seventeenth-, eighteenth-, and nineteenth centuries, then chi square (107.02) still exceeds the critical value (45.31) at 0.001 significance with 20 degrees of freedom. Thus, the null hypothesis is still rejected; significant differences are seen across time. However, would this temporal difference account for the significant differences between the assemblages or are other variables more important. How do we account for
Table 6: Compressed Functional Categories

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</tr>
<tr>
<td>WORK RELATED</td>
<td>11/10</td>
<td>6/6</td>
<td>0/4</td>
<td>35/31</td>
</tr>
<tr>
<td>TOOLS</td>
<td>25/23</td>
<td>7/15</td>
<td>2/10</td>
<td>86/72</td>
</tr>
<tr>
<td>DOMESTIC</td>
<td>1/8</td>
<td>3/5</td>
<td>1/3</td>
<td>38/26</td>
</tr>
<tr>
<td>GALLEY</td>
<td>23/13</td>
<td>9/8</td>
<td>8/6</td>
<td>29/42</td>
</tr>
<tr>
<td>DISHES</td>
<td>19/14</td>
<td>4/9</td>
<td>15/6</td>
<td>34/43</td>
</tr>
<tr>
<td>PROVISIONS</td>
<td>10/10</td>
<td>6/6</td>
<td>1/4</td>
<td>34/31</td>
</tr>
<tr>
<td>POSSESSIONS</td>
<td>27/32</td>
<td>25/20</td>
<td>7/13</td>
<td>107/100</td>
</tr>
</tbody>
</table>

Chi-Square for Compressed Function Groups

<table>
<thead>
<tr>
<th>Category</th>
<th>OZ14</th>
<th>E14</th>
<th>A71</th>
<th>LUTINA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHIP EQUIPMENT</td>
<td>0.90</td>
<td>5.60</td>
<td>12.00</td>
<td>3.80</td>
</tr>
<tr>
<td>WORK RELATED</td>
<td>0.10</td>
<td>0.00</td>
<td>4.00</td>
<td>0.50</td>
</tr>
<tr>
<td>TOOLS</td>
<td>0.20</td>
<td>4.30</td>
<td>6.40</td>
<td>2.70</td>
</tr>
<tr>
<td>DOMESTIC</td>
<td>6.10</td>
<td>0.80</td>
<td>1.30</td>
<td>5.50</td>
</tr>
<tr>
<td>GALLEY</td>
<td>7.70</td>
<td>0.10</td>
<td>0.70</td>
<td>4.00</td>
</tr>
<tr>
<td>DISH/UTENSILS</td>
<td>1.80</td>
<td>2.80</td>
<td>13.50</td>
<td>1.90</td>
</tr>
<tr>
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<td>0.00</td>
<td>0.00</td>
<td>2.20</td>
<td>0.30</td>
</tr>
<tr>
<td>POSSESSIONS</td>
<td>0.80</td>
<td>1.20</td>
<td>2.80</td>
<td>0.50</td>
</tr>
<tr>
<td>TOTAL*</td>
<td>17.60</td>
<td>14.80</td>
<td>42.90</td>
<td>19.20</td>
</tr>
</tbody>
</table>

X² at 0.05 significance, with 21 DF = 32.7
X² value for the compressed contingency table = 94.5
Figure 44. A graph illustrating the relative frequencies of the functional categories.
the proportionately larger assemblage of the *Lutina* from the other three vessels. We know from newspaper accounts of the *Lutina* wreck, that she was owned by her skipper, Jan Kisjes, and both he and his mate, Reinder Tulp, had private domiciles in Traandijksbrug and Zwartsluis (Zwiers 1988). Thus, we can eliminate primary domicile as a contributing factor. This leaves us with three viable factors: improved economic conditions, private verses corporate ownership, and salvage operations undertaken at the time of the wreck. Unfortunately, there is not enough information available from the two craft analyzed to answer these questions.
CHAPTER VI

CONCLUSIONS

The E 14 and A 71 shipwrecks compare favorably with one another. Both wrecks date to the second half of the 18th century and represent the type of vessel called pram. They have complementary artifact assemblages, are similar in material and style, and raise similar questions pertaining to their sinking in the Zuider Zee. What is known from the nineteenth and early twentieth centuries, of prams constructed similar to the E 14 and A 71, shows that these vessels were used primarily in the canals and rivers (Schutten 1981, Sopers 1974), yet both vessels sank in the Zuider Zee. The A 71 was 6.5 km to the northeast of what would have been the mouth of the Vecht River and 12 km east of the harbor of Amsterdam, while the E 14 was recovered 15 km north-northwest off the former coast of Harderwijk, and the lighthouse token from North Holland and West Friesland, found with the E 14 wreckage, indicates that it probably crossed the sea with some frequency.

The assemblages for both craft are quite small and several functional categories are entirely unrepresented: weaponry and navigation for the E 14; and working equipment, weaponry, administrative, and navigation for
the A 71. Additional categories are very sparsely represented in both craft: working equipment, administrative, domestic effects, eating/drinking and victuals/provisions in the E 14; tools, domestic effects, victuals/provisions, and personal possessions for the A 71.

Salvage operations might explain this lack of representation. Material could easily have been salvaged from the A 71 because of the shallow water at ebb tide and the hard shell layer which prevented it from sinking into the mud. However, the E 14 would have more quickly sunk into the clay bottom hindering any attempt at salvage. This scarcity of artifacts might also suggest a temporal nature for these craft: equipment were mostly spares and fasteners; tools were few, just enough to make simple repairs until the vessel could make port; items related to the galley and personal possessions were meager and ordinary. Life on board would have been very basic and thus is interpreted as having been of a very temporary nature.

The galley-ware from both craft were sparse and each piece probably served multiple functions. The entire ceramic assemblage from the E 14 is composed of only twelve pieces, 83% of which is comprised of an inexpensive lead glazed earthenware common in the
Netherlands. A hearth was not found in this excavation; however the preponderance of the evidence suggests there having been a hearth of some kind on board. Three unglazed redware tiles were found. They measure 22 cm square and show some burn marks. Three yellow fire bricks were also recovered.

The excavation of the A 71 recovered an iron hearth plate and pieces of six unglazed tiles. The majority of the ceramics, 71%, appear to be of Dutch manufacture the balance being composed of English and Rhenish wares, 14% respectively. Once again, most of the local ceramics were an inexpensive red earthenware while the two iron cooking vessels recovered from this wreck display obvious repairs.

The equipment from both assemblages were mostly spares, and there were just enough tools to make simple repairs. Other pram wrecks from the late eighteenth and nineteenth centuries possess larger and more varied assemblages. Higher percentages of English and Dutch refined earthenware, metal teapots, complete tea services, drinking glasses, and personal belongings are common finds. Thus it seems that the crew of these boats lived at the lower end of the economic scale.

This analysis is supported by historic documentation. Wage estimates for the period indicate
that 78% of the population in 1758 earned less than 500 guilders a year, or fell in or below the lower-middle class. The annual salary of a master bargeman remained constant at around 360.00 fl. from 1760 through the 19th century, while it only reached 240.00 fl for barge workers for the same period (J. de Vries, 1982). Based upon price descriptions and estate inventories taken from the eighteenth century (Baart et al 1986), the total estimated value of the E 14 ceramic assemblage is 21 stuivers at 20 stuivers to 1 guilder, while the A 71's assemblage is appraised at 24 stuivers. This represents a rather small cash investment when compared with Amsterdam probate inventories from the period 1701-1710, which found that persons in the lowest economic bracket had on average 172 guilders worth of chinaware per person, (Faber 1980:153).

The economic downturn of the eighteenth century led to deteriorating living conditions among the poorer segments of society. As a whole, population fell due to poor economic conditions resulting in postponement of marriage, contraception, and flight from the cities. Overijssel was an exception, its population increased by 90% between 1675 and 1795. C.R. Boxer, a noted historian, attributes this to urban flight while others believe it was a natural growth resulting from an excess
of births over deaths (Faber et al 1965:84, J. de Vries 1985). A similar situation in Flanders was attributed to the ruralization of industry (Lis and Soly, 1979) where a supplementary source of income meant earlier marriage and a steady increase in reproduction (Lis and Soly 1979:143). Regardless, population in Overijssel rose 42% between 1650-1748, and increased 25% in Veluwe in the same period (van Houtte 1977). This increase corresponded with considerable industrial development as with the linen industry in Twente and paper manufacture in Veluwe (van der Woude 1975).

Increasing poverty was evident among the declining working class population in towns such as Leiden and Delft, but also in the rural provinces of Overijssel where the growth in population was accompanied by a corresponding increase in poverty (Boxer 1965:293). Housebuilding lagged behind this population increase. Only 29% of new families had access to housing (van Bath in Faber et al 1965:82), resulting in people living under appalling conditions in peat huts, sheds, and pigsties while many new houses were less than 2 m high with a surface area of 3.5 by 4 m (van Bath in Faber et al 1965:85).

Based upon the general economic decline for the country during this period, I theorized that most of the
prams of this period served as primary domiciles. This theory is supported by the literature; according to Schutten (1982) privately owned prams and other small cargo vessels of the nineteenth century often served as primary domiciles for the skipper and his family or mate. However, the two craft under consideration here do not support the primary domicile theory. There was not enough material culture to indicate habitation. The incomplete hearths, small galley assemblages, scarcity of personal possessions, and seemingly incomplete tool assemblages are evidence that these vessels were, at best, sufficiently equipped for overnight or perhaps seasonal occupation during the periods when cargo was available for shipment. Thus, it seems that this segment of the lower-middle class was somewhat insulated from the national economic crisis by their dependence on the internal economy and assured a meager but steady income.

In general, prams were small narrow boats with a flat bottom and shallow draft capable of navigating in the canals that interlaced the Netherlands. Functional definitions of prams include that from William Falconer (1771) "a sort of lighter, used in Holland and parts of the Baltic sea, to carry the cargo of a merchant ship alongside in order to lade her; or to bring it ashore to be lodged in the storehouses after being discharged out
of the vessel". Another definition is from Aubin (1702), "a sort of bark, or boat, for navigating in the canals". And Sopers (1974) quoting a 1681 publication by W. van Winschooten, "pram, a scow, that is laden with mud". Thus, functional definitions alternately describe a pram as a lighter, a canal boat, and a mud barge. However, it is estimated that a large, if not the largest part of inland navigation on the Zuider Zee in the seventeenth and eighteenth centuries can be attributed to peat shipping (Zeeuw 1978), while an estimation of the total fleet of inland sailing vessels is computed at 8,000 for the seventeenth century.

Schutten (1982) distinguishes between large and small prams of the nineteenth century by size and function. The small prams, ranging between 28-45 tons, primarily carried peat from the peat bogs to the outer lock of the Zuider Zee where it was then transshipped to Amsterdam on prams as large as 80 tons. Peat workers operated from April until mid-December. Large crews of women and children were used to load the peat but a skipper only needed one or two mates to sail the laden craft (Schutten 1989 personal communication). Most of the skippers had their wife as their only crew member, and only some of the bigger ships used a crew of two men. These peat shipments to Holland were highly dependent
upon the weather. However, if the weather was favorable, it was a short sail of a few hours duration. A short journey such as this could just as easily be made by small prams in fair weather. Thus, small privately owned prams may have been employed to freight peat and agricultural products to Amsterdam in the eighteenth century, thereby fulfilling the same functions as large prams of later years.

The mid-eighteenth century saw an abandonment of several peat bogs north of Overijssel, while population declined after this period in Vollenhove (van Bath in Faber et al 1965). Coincidentally, the central districts of Friesland saw a population increase corresponding to the flourishing peat-digging industry after 1750, which stimulated trade and inland navigation in this area (Roessingh in Faber et al 1965). During the eighteenth and nineteenth centuries, great quantities of peat were cut in the bogs west of the Vecht river, which were well situated to serve the Amsterdam market, while peat skippers from Groningen and Friesland travelled as far as Antwerpen and other Flemish cities to sell their cargo (Zeeuw 1978).

In conclusion, these prams most likely carried peat and agricultural products between the northeastern provinces, Amsterdam, and the surrounding urban centers.
The evidence indicates that they did not serve as primary domiciles. The question of private verses corporate ownership cannot be answered. Sufficient information on assemblages from known barges or privately owned vessels is not available, although the extremely low frequencies of galley ware and personal possessions does suggest a barge manager operating a corporate owned vessel. If this were the case, a company would have greater resources to mount a salvage operation, targeting the cargo rather than personal possessions of the crew. The probability of insurance coverage on such a vessel is extremely low. Insurance premiums were very high, between 1.5 and 6% of the value of the cargo, while profitability was usually quite low in mass consumption goods (Brulez 1981). However, insurance coverage would probably have no bearing on an attempt to salvage a low-priced bulk cargo such as peat. The salvage operation itself would most likely cost as much as the cargo to be recovered, while insuring such a cargo would cost more than the expected profits.

Hopefully, such questions might be answered by future excavations and analysis of pram wrecks in the IJsselmeer polders, facilitating a more complete understanding of this vessel type relative to the internal economy of the Zuider Zee region. A more
serviceable statistical analysis would be a comparison of 10-20 eighteenth-century pram assemblages to determine expectations and minimum numbers to use in future comparisons.
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APPENDIX I.

List of artifacts for the E 14

L= length  D= rim diameter
W= width    T= thickness
H= height   (all measurements are in centimeters)

0001 MOLDED KAOLIN LION
0002 GOUDA PIPE BOWL, STAMPED WITH CREST AND CIPHER MARK "69"
003A GOUDA KAOLIN PIPE BOWL, STAMPED WITH CROWN/FISH/WAVE
003B KAOLIN PIPE STEM TO 003A
003C KAOLIN PIPE STEM TO 003A
0004 POLYCHROME FAIENCE BOWL, ESTIMATED D 10
0005 REDWARE CUP, LEAD GLAZED INTERIOR, D 13, FILLED WITH PITCH
0006 REDWARE "COALPOT", LEAD GLAZED INTERIOR/EXTERIOR
0007 SMALL STONEWARE STORAGE POT, GREY SALT GLAZE, 1-HANDLE
0008 REDWARE CUP, SLIP DECORATION, PITCH RESIDUE ON CUP
0009 REDWARE COOKPOT, SLIP DECORATION, D 14.5
0010 BROKEN REDWARE COOKPOT, D 14.5
0011 REDWARE ASHPOT, LEAD GLAZED EXTERIOR, H 22.2, FIRE BLACKENED
0012 REDWARE STORAGE POT, LEAD GLAZED INTERIOR, H 28, D 32.8
0013 REDWARE JAR, LEAD GLAZED INTERIOR/EXTERIOR, H 31
0014 TIGERWEAR PITCHER, H 27.8
0015 REDWARE SKILLET, LEAD GLAZED INTERIOR/EXTERIOR, D 19.2
016A REDWARE CHAMBERPOT, SLIP DECORATED, ESTIMATED D 18
016B RIM FRAGMENT TO 16A
016C BASE FRAGMENT TO 16A
0017 REDWARE SIEVE, LEAD GLAZED INTERIOR/EXTERIOR, D 32.5
0018 REDWARE MILKBOWL, LEAD GLAZED INTERIOR/EXTERIOR, D 21
0019 REDWARE MIXING BOWL, LEAD GLAZED INTERIOR/EXTERIOR
0020 REDWARE TILE, UNGLAZED, 22 SQUARE, T 3.2
0021 IDEM
0022 IDEM
0023 YELLOW BRICK, L 15.6, W 7.6, T 3.6
0024 YELLOW BRICK, L 15.4, W 7.2, T 3.6
025A YELLOW BRICK, TOTAL SIZE L 16, W 7, T 3.7
025B 1/2 YELLOW BRICK, TO 25A
0026 WRITING SLATE, L 39.3, W 26.8, BROKEN INTO 26 PC. A-L
0027 DARK GREY WHETSTONE, HEAVILY GROOVED
0028 TAN POLISHING STONE, WORN SMOOTHLY
0029 RED POLISHING STONE, BROKEN, WORN SMOOTHLY
0030 WHITE CHALKY LIMESTONE, CRYSTALLINE INCLUSIONS
0031 GREEN WINE BOTTLE, STRING FINISH, H 20.2
0032 GREEN WINE BOTTLE, STRING FINISH, H 16.2
033A GREEN WINE BOTTLE, STRING FINISH, H 19.4
033B NECK TO 33A
0034 SHARD OF GREEN WINE BOTTLE
0035 IDEM
0036 IDEM
0037 IDEM
0038 IDEM
0039 IDEM
0040 IDEM
0041 SHARDS OF GLASS TO MORE THAN 1 VESSEL
0042 SMALL GREEN VIAL, H 2.3
043A SMALL GREEN BOTTLE, BASE/BODY, TOTAL MINIMUM H 7.5
043B NECK TO 43A
0044 SMALL BLUE BEAD, D 1.1
045A WINDOW FRAME, MORTISE/TEEN JOINTS, WOODEN PEGS
045B WINDOW GLASS FROM UPPER LEFT PANE
045A WINDOW FRAME, MORTISE/TENN JOINTS, WOODEN PEGS
045B WINDOW GLASS FROM UPPER LEFT Pane
045C WINDOW GLASS FROM UPPER RIGHT Pane
045D WINDOW GLASS FROM LOWER LEFT Pane
045E WINDOW GLASS FROM LOWER RIGHT Pane
046 BLACK WIDE TOOTH COMB, MADE FROM SABLEN
047 BROWN, BONE, FINE TOOTH LICE COMB
048 BROWN, BONE SPINDLE FRAGMENT, POSSIBLY FROM HAIR PIN
049 LARGE, BROWN, BONE, LATHE TURNED BUTTON, D 2.7
050 IDEM
051 IDEM, D 2.8
052 IDEM, D 2.7
053 IDEM, D 2.6
054 IDEM, D 2.7
055 IDEM, D 2.7
056 IDEM, D 2.6
057 SMALL, BROWN, BONE, LATHE TURNED BUTTON, D 1.9
058 IDEM, D 1.7
059 IDEM, D 1.7
060 IDEM, D 1.6
061 IDEM, D 1.7
062 IDEM, D 1.7
063 IDEM, D 1.8
064 1/2 SMALL, BROWN, BONE, BUTTON, D 1.9
065 SMALL, BROWN, BONE BUTTON, D 1.9
066 SMALL, BROWN, BONE BUTTON
067 LEATHER WASHER, D 8, HOLE D 1.8
068 IDEM, D 7.8, HOLE D 1.7
069 KNIFE SHEATH, STAMPED FLORAL DECORATION, L 22.8
070A SHOE FRAGMENT, INSOLE
070B SHOE FRAGMENT, HEEL/UPPER
070C SHOE FRAGMENT, WELTING
071 LEATHER FRAGMENT TO BAG
072 TURNED WOODEN NEEDLE CASE, L 8.1, D 1.5, INT. L 6.1, D 0.7
073 DECORATED SAW HANDLE WITH BRASS FERRULE
074 SMALL, WOODEN, LATHE TURNED BOTTLE, H 4.7, BODY D 4.5
075 SMALL DECORATED MAST FINIAL, H 12, 5 GRADUATED TIERS
076 KNOB TO PUNTING POLE, POLE D 2.1
077 KNOB TO BRACE WITH PIN, PIN D 1.5
078 COG FROM UNDERSIDE OF PUMP, HOLE D 2
079 SMALL BARREL, H 14.6, BODY D 15.8, 13 DEEP
080 IRONWOOD SHEAVE, D 10.6, T 1.8
081 IDEM, D 11, T 1.5
082 IDEM, D 15.4, T 2.5
083 IDEM, D 12.8, T 1.7
084 IDEM, D 14.9, T 2.7
085 IDEM, D 11.8, T 1.9
086 IDEM, D 12.4, T 2.3
087 IDEM, D 15.1, T 2.5
088A IDEM, D 8.4, T 1.6
088B LEATHER STRAP LINING SHEAVE HOLE, T 0.6
089 IDEM, D 8.4, T 1.8
090 IDEM, D 11.9, T 2.2
091 IDEM, D 8.1, T 1.9
092 IDEM, D 11.2, T 1.7
093 IDEM, D 12.4, T 1.7
094 IDEM, D 12.4, T 1.8
095 IDEM, D 10.4, T 1.6
096 IDEM, D 11.2, T 1.7
097 IDEM, D 10.8, T 1.5
PIN FROM BLOCK SHEAVE, D 2.1, L 13.1
FIDDLE BLOCK WITH KNOB
SINGLE BLOCK, XII CARVED ON ONE SURFACE
SINGLE BLOCK WITH IRON STRAPPING
DEAD EYE WITH IRON STRAPPING
IDEM
DEAD BLOCK WITH IRON STRAPPING
SMALL TACKLE BLOCK
OAK LADDER RUNG
PINE LADDER RUNG, L 28.5, D 2.8
BRACE WITH BIT, L 36.5, BIT D 0.5
SEAMAN'S CHAIR FROM BARREL STAVE
KNOB TO FUNTING POLE
CORK
SNOTNEUS OIL LAMP
WICK SPOUT
BASE
SEGMENT TO ZIG-ZAG FOLDING RULE, 16" MAXIMUM EXTENSION
SHELL SHAPED ORNAMENT
FISH HOOK
TOP OF FISH HOOK
BOTTOM TO FISH HOOK
9 STRAIGHT PINS WITH HEADS OF COILED WIRE, A-I
CLOTHING FASTENER-EYE
CLOTHING FASTENER-EYE
ROUND, PEWTER SPOON, CROWN/ROSE TOUCHMARK
OVAL PEWTER SPOON, NO TOUCHMARK
COIN FROM MONACO, DATED 1653, DENOMINATION FULL ECU
FARTHING FROM UTRECHT, DATED 1760
FARTHING FROM HOLLAND, DATED TO THE 18TH-CENTURY
LIGHTHOUSE TOKEN, DATED 1783
LEAD SEAL, "82" CIPHER STAMPED ON IT
28 LEAD LINE/NET WEIGHTS
3 SMALL BULLETS
SMALL SPOON BIT FOR BRACE, D 0.6
SMALL SPOON BIT FOR BRACE, D 0.6
GUDGEON, L 39.7, W STAMPED ON ONE EDGE
HOOK WITH FLUKE END
HOOK, POINTED END WITH HOLE
U-SHAPED CRAMP
IDEM
BROKEN FORELOCK BOLT
SMALL NAIL
IDEM
NAIL
IDEM
IDEM
NAIL-TYPE FASTENER WITH HOLE
FISH HOOK
LONG BOLT WITH GROOVED HOLE, POSSIBLY FOR THE MAST
APPENDIX II. List of artifacts for the A 71

L=length  D=rim diameter  
W=width  T=thickness  
H=height  (all measurements are in centimeters)

0001 GOUDA PIPE, HEEL CREST AND STAMP WITH CIPHER MARK "77"
0002 GOUDA PIPE, HEEL STAMP "S" INDICATING COMMON QUALITY
0003 BLUE AND WHITE MAJOLICA PLATE, MINIMUM D 20
0004 "BLACK WARE" BOWL, 2 HANDLES, BLACK GLAZE, D 18.5
0005 REDWARE BOWL WITH SPOUT, SLIP DECORATED, D 13.5
0006 REDWARE BOWL, SLIP DECORATED, D 12.7
0007 REDWARE BOWL, SLIP DECORATED, D 13.5
0008 RHENISH PLATE, SLIP DECORATED, D 17
0009 REDWARE PLATE, LEAD GLAZED, D 22.7
0010 RHENISH PLATTER, SLIP DECORATED, D 32
0011 REDWARE BATTER BOWL, LEAD GLAZED, D 21.5
0012 TIGERWARE PITCHER, H 23.5
0013 GREEN LEAD GLAZED POT WITH SPOUT
0014 BROWN AND GREEN LEAD GLAZED BOWL, EST. BASE D 10
0015 CREAMWARE CUP FRAGMENT, D 9.5
0016 REDWARE BOWL RIM FRAGMENT, ESTIMATED D 13, LEAD GLAZED
0017 HEARTH TILE, L 22, W 22, T 3, NAIL THROUGH CENTER
0018 IDEM
0019 IDEM, 4 PCS
0020 1/2 HEARTH TILE
0021 HEARTH TILE FRAGMENT
0022 IDEM
0023 RED BRICK FRAGMENT
0024 GREY BRICK FRAGMENT
0025 SMALL SLATE FRAGMENT
0026 IDEM
0027 ONION BOTTLE, STRING FINISH, H 23
0028 SMALL MAMMAL LEG BONE
0029 LEATHER SHOE TONGUE, ROLLED UP
0030 LEATHER WASHER, D 6, HOLE D 1.3
0031 CAULKING FROM PLANT FIBERS–MOSS
0032 IDEM
0033 HEATHER BRUSH, BRISTLES ESTIMATED L 12
0034 WOODEN HEADSTICK, D 5, L 24.5 GROOVE TO GROOVE
0035 SMALL WOODEN DISC, D 10, PEG THROUGH CENTER
0036 SINGLE BLOCK, IRON STRAPPED, L 21.5
0037 SINGLE BLOCK, IRON STRAPPED, L 16.5
0038 WOODEN KNIFE HANDLE, L 10.5, 3 IRON FASTENINGS
0039 COPPER PLATE WITH ROLLED EDGE, D 11.6, HOLE IN CENTER
0040 COPPER WATER MEASURE, 835 CC CAPACITY, BALE FASTENINGS
0041 STRIP OF COPPER MOLDING, L 78, POSSIBLY TO HEARTH
0042 FARTHING FROM ZEELAND, DATED 175*
0043 FARTHING, POOR CONDITION
0044 PEWTER SPOON WITH ROUND BOWL, CROWN/ROSE TOUCH, INITIALS LA
0045 IDEM, INITIALS KW
0046 SMALL PEWTER SPOON WITH ROUND BOWL, CROWN/ROSE TOUCH
0047 SMALL CAST-PEWTER OBJECT WITH FLORAL DECORATION
0048 LEAD STRIP WITH 2 HOLES, W 2.8, HOLES 9.5 APART
0049 NET WEIGHT, L 8.4, D 1.8, WITH ROPE FRAG
0050 U-SHAPED CRAMP
0051 FRAGMENT OF SMALL IRON BOX, POSSIBLY FOR SNUFF
0052  IRON DRIFT PIN FRAGMENT
0053  IRON THIMBLE FOR THIN ROPE
0054  IRON THIMBLE
0055  2 FRAGMENTS OF IRON FASTENING, MINIMUM L 16.5
0056  IRON THIMBLE FOR THIN ROPE
0057  IDEM
0058  IRON MARLIN SPIKE, L 20, BUTTON HEAD
0059  IRON LOADING HOOK WITH FLUKE END, HAMMER MARKS
0060  IRON LOADING HOOK WITH EYE
0061  IRON FRAGMENT TO A U-SHAPED BUCKLE
0062  IRON STRIP, ONE END SPIKED, L 34, WITH 3 HOLES-5.5 APART
0063  IRON FRAGMENT, POSSIBLY FROM FASTENING
0064  IRON EYE FOR RIGGING ATTACHMENT
0065  IRON HOOK WITH FLUKE END, POSSIBLY FOR RIGGING
0066  IRON THIMBLE FOR THIN ROPE
0067  BENT IRON NAIL, L 7
0068  IDEM, MINIMUM L 7
0069  SPIKE, L 21.5, D 1.8
0070  SPIKE, L 21.5, D 1.7
0071  SPIKE, L 17, D 1.3
0072  SPIKE, MINIMUM L 16, D 1.3, BARBED END.
0073  FRAGMENT OF IRON FASTENING
0074  U-SHAPED IRON STRAP TO PUMP
0075  CAST-IRON COOKPOT, 3 LEGS, BALE, D 23.5
0076  1/2 CAST-IRON HEARTHPLATE, L 71, ESTIMATED W 45
0077  IRON PANCAKE PAN, D 23, BOTTOM SHOWS REPAIR
0078  IRON HINGE, MINIMUM L 21, W 9
0079  NAIL FRAGMENT
0080  FASTENING
VITA

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PROFESSIONAL INTERESTS:

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1989 Texas A&M, College of Liberal Arts Graduate Student Research Grant.
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EXPERIENCE:

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