POTS AS PACKAGING: THE SPANISH OLIVE JAR AND ANDALUSIAN TRANSATLANTIC COMMERCIAL ACTIVITY, 16TH-18TH CENTURIES

by

GEORGE AVERY

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1997

ACKNOWLEDGMENTS

I am grateful for financial assistance from the following organizations: various teaching and administrative assistantships from the University of Florida; a travel grant to Spain to participate in a geological survey from The Tinker Foundation; a partial scholarship from the Foundation for Field Research to participate in a geological survey in southern Spain; and a three-month stipend to conduct archival research in Spain from The Florida-Spain Alliance Exchange Program.

My committee members — Frank Blanchard (retired), David Clark, Murdo MacLeod, Jerald Milanich, and Prudence Rice — are acknowledged for their inspiration in the classroom and their guidance. I am especially grateful to Kathleen Deagan, my committee chair, for her continued support and encouragement, and for making all the arrangements for my defense. Maurice Williams of the Florida Museum of Natural History was most helpful in facilitating all the critical administrative requirements. Other professors at the University of Florida whose classes or association contributed to the ideas formulated in this dissertation include Bruce Chappell, Anthony Oliver-Smith, and Gerald Murray.

My thanks go to the staffs of the *Archivo General de Indias* and the *Archivo Municipal* in Sevilla, Spain, and also to the following professors from the University of Sevilla: Alfonso Pleguezuelo Hernández, Antonio Miguel Bernal, and Antonio Collantes de Terán Sánchez. Fernando Amores Carredano and Nieves Chisvert Jiménez of the *Cartuja de Santa María de Las Cuevas* project in Sevilla were very accommodating in several tours of the site of Expo '92. Steven Mitchell's direction of geological survey in southern Spain is acknowledged, and the hard work of project members Joanne Dumene, Jean Morrissey, and Beverly Shea resulted in extensive coverage in only two weeks.

I am indebted to Mitchell Marken — the reigning olive jar guru — for long discussions on olive jars, and for demonstrating in his book that much can be learned from olive jars.

Olive jar fragments in the following repositories were examined, and I express my gratitude to the individuals listed in association with the repository for all of their help with the collections: Museo de las Casas Reales, Santo Domingo — Luisa de Peña D.; Florida Bureau of Archaeological Research, Tallahassee — James Levy and Frank Gilson; Seahawk Deep Sea Ocean Technology, Tampa — Jennette Flow; Mel Fisher Maritime Heritage Society, Key West — Corey Malcom and David Moore; Emanuel Point Shipwreck Project, Pensacola — Roger Smith and Debra Wells; and Concepción de la Vega, Dominican Republic — Serafin Vásques. Billy Ray Morris made available olive jar rims from the wreck of the *Galgo*.

Helen Martin of the Graduate School's Editorial Office is to be commended for her timely and thorough review of a manuscript much in need of editorial assistance. Karen Jones, the virtual "dean" of all anthropology graduate students was a great help in getting me through the final administrative challenges.

Finally, the continued support of my family throughout this whole thing is gratefully acknowledged.

TABLE OF CONTENTS

LIST OF TABLES

Table

LIST OF FIGURES

Figure

Figure

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

POTS AS PACKAGING: THE SPANISH OLIVE JAR AND ANDALUSIAN TRANSATLANTIC COMMERCIAL ACTIVITY, 16TH-18TH CENTURIES

By

George Avery

August 1997

Chairperson: Dr. Kathleen Deagan
Major Department: Department of Anthropology

This study will integrate the methods of four disciplines — archaeology, history, geology, and material sciences — within an anthropological framework to investigate the effects of the American market on colonial period production strategy in 16th-18th century Andalusia. The focus will be on the 350 year story of an artifact which was manufactured explicitly for the Habsburg transatlantic commercial venture — the Spanish olive jar. The Spanish olive jar was the maritime transport container for wine and olive oil and, as such, is a part of the amphora tradition. Studies of the amphoras antiquity will be reviewed to generate a model of ceramic packaging production associated with the maritime transport of liquid commodities. The data base will be generated from the following: 1. survey of historical documents to investigate olive jar production levels, organization of labor, and marketing/commercial use; 2. mineralogical analysis of olive jar sherds and comparison to geological survey data from Spain to determine olive jar production locality; and 3. technological analysis to investigate method of olive jar manufacture. Olive jars represent both an important production industry and a commodity at the beginning of the 16th-century are a central element in the transatlantic trade that developed during the 16th-18th

centuries. They are also abundant in both the archaeological and documentary records, and thus provide a uniquely appropriate data base for this study.

CHAPTER 1
INTRODUCTION

Pottery has been central to commerce for millennia, serving as packaging for the maritime transport of liquids and other commodities by Mediterranean societies from at least 5000 B.C. to the present. The classic Greek and Roman amphoras, preceded by the Canaanite and Phoenician Jars, served the various maritime powers of the ancient Mediterranean and comprise what has been called the "amphora tradition" (Figure 1). Even though all of the "amphora tradition" vessel forms are the product of literate societies, documentary data alone have not been sufficient for understanding amphora economics. Much of what has been learned about these containers has come from archaeologists using methods of both the prehistorian and physical scientist in conjunction with the documentary record. This multidisciplinary approach has been fruitful for understanding the nature of amphora production and use, in addition to identifying distribution patterns of maritime commerce in antiquity.

The Spanish olive jar is a representative of the amphora tradition in the modern age, and during the 16th through 18th-centuries was a popular container for transporting wine, olive oil, and a number of other commodities from Spain to the colonies across the Atlantic. In spite of a richer documentary record, less is known about Spanish olive jar production or function than Greek or Roman amphora production and function. Numerous Roman amphora production sites in Spain have been investigated by archaeologists, and others have been hypothesized based on mineralogical analysis, but to date, no such sites have been located for Spanish-manufactured olive jars. Technological changes in Greek

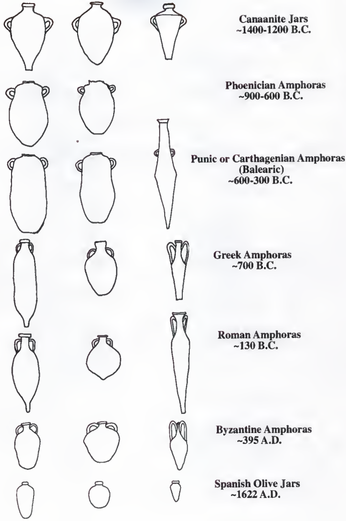


FIGURE 1. Composite of amphora tradition (scales vary).

amphora manufacture have been related to functional requirements, but as yet, the relationship between Spanish Olive jar manufacture, form, and function has not been as systematically investigated.

The goal of the present study is to investigate the nature of olive jar production and function by employing the multidisciplinary approach used for Greek and Roman amphoras. A multidisciplinary approach is used as historical, archaeological, geological, and material sciences analyses are employed to generate data regarding olive jar production levels, labor organization, marketing strategies, production location, manufacturing technique, and function. Shipping manifests and related documents were examined in archives located in Sevilla, olive jar fragments from shipwreck and terrestrial assemblages were investigated, and petrographic thin sections of olive jar sherds were analyzed. It is hoped that this study might contribute to a greater understanding of the historical role of commodity container production in an emerging capitalist world system.

Historical Setting

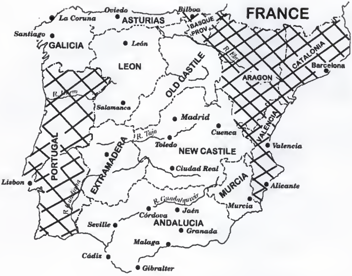
Florence and Robert Lister's (1987:276) monumental work on the pottery of southern Spain from 200 B.C. to 1700 note that olive jars were required in great numbers for the shipping of wine, olive oil, and various other goods to the Americas. Unlike other sectors of the Spanish economy which did not respond successfully to the demands of the American market, the manufacture of olive jars was not highly regulated, and olive jar producers were able to dramatically increase their output and become one of the top producing sectors of 16th-century Sevilla. Olive jar producers are described as "capitalist" by the Lister's, largely due to the high volume of production, although no argument is made for the development of capitalism in 16th to 18th-century Spain. Capitalism has come to dominate the world political economic system and the transition toward capitalism has been a central theme for many modern historical thinkers in their efforts to understand the post-1500 world. The "rise of capitalism" literature is extensive (e.g. Smith 1884, Marx 1974, Weber 1958, Hamilton 1929a, Wallerstein 1974, Wolf 1983, Braudel 1985, 1986a, 1986b) and while there exist variations concerning the definition and mechanism of capitalist development, there is consensus that capitalism did not emerge in the Iberian peninsula during the 16th-18th-centuries.

The transatlantic commercial activity of southern Spain from 1500 to 1850 is associated with the transition from mercantilism toward capitalism in Western Europe (e.g., Hamilton 1929a, Wallerstein 1974, Wolf 1983, Braudel 1985, 1986a, 1986b). This transition is a complicated process involving a number of social, political, economic, and ideological factors, and the primacy of any one factor has been the subject of much scholarly work. Some have focused on the social relations of production (Marx 1974; Wolf 1983), and others have emphasized the importance of distribution or trade (e.g. Wallerstein 1974). Ideology or "mind-set" is also considered to be a prime mover in the development of capitalism (e.g. Weber 1958). This study will focus on production, but the transatlantic commercial activity and the ideological context will also be discussed as the aim is not so much to test one model against the other, but rather to gain an understanding of the role of olive jar production in an emerging capitalist world system by whatever means available.

Traditional economic histories of 16-18th-century Spain have emphasized the Spanish disdain for manual labor, mania to acquire titles of nobility, unwillingness to take investment risks, and the lack of prestige attached to commercial ventures. A well-known Spanish economic historian has described the Spanish character as "anti-economic" (Vicens Vives 1969:28-9), while others suggest that the Spanish resistance to economic innovation is a result of "endless pride" (e.g. Ortega y Gasset 1937:153). Others point out that viable economic reforms were introduced in the early 1600s, but were unsuccessful due to "a whole social system and a psychological attitude which . . . blocked the way to radical reform" (Elliot 1963:65-66). One researcher has gone so far as to suggest that the economic problems of present-day Latin America are the result of transplanting the 16th-century Spanish mind-set into Latin America (Harrison 1985).

The reasons cited for the Spanish decline are many, and some have emphasized that it was adherence to mercantilist policies which prevented Spain from competing successfully with the less restricted political economies of other European countries. Until relatively recently, historical investigations of the decline far outnumbered those focused on the rise of the 16th-century Spanish empire. J.H. Plumb (1966:22) writes "How a relatively backward, poor and isolated country of Europe achieved such a mastery and such security is a problem as yet unsolved by historians." The traditional focus on the 17th-century decline is part of a general trend, by Spanish and non-Spanish historians alike, to emphasize the abnormality or backwardness of Spanish history when compared to the rest of Europe. Part of this seeming overemphasis on the negative aspects of Spanish history might be attributed to the Black Legend — a propaganda campaign initiated by the English and Dutch during the 16th and 17th-centuries which was intended to smear and undermine Spanish authority. The Black Legend paints a picture of brutal religious fanatics, inept rulers, and a citizenry inclined to sloth. A modern historian [Henry Kamen (1978)] has pointed out the effects of the Black Legend on the writing of the history of Spain, and also points out the fallacy of the whole notion of a "decline" of Spain.

Henry Kamen (1978), in an article which has been described as "controversial" (Parker 1984:43), states that for there to be a "decline" of Spain, there must have been a "rise" of Spain, and then goes on to demonstrate that there was, in fact, no "rise." First of all, it is very misleading to talk of Spain as a unified entity. Even today, descriptions of Spain speak of the "many Spains" — intense regionalism has been a defining characteristic of the Iberian peninsula throughout much of its modern history. The "Spain" which administered the interaction with the Americas was modern day Castile and Andalusia, although this entire area was called Castile during the 16th-18th-centuries (Figure 2).



[adapted from Elliot (1963:16) and Kamen (1991:280)]

FIGURE 2. Hapsburg Spain, 16th-17th century.

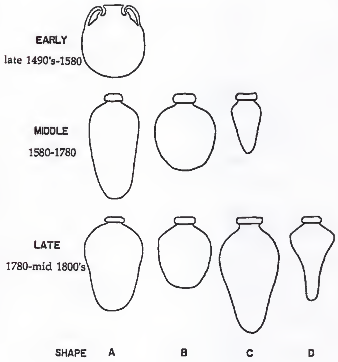
More important than this geographical note is the true nature of Castile's involvement in the Americas during this time. Many Spanish historians consider Ferdinand and Isabel, the Catholic monarchs, as the last true Spanish rulers. Through untimely deaths and the questionable mental health of Juana (daughter of Isabel and Ferdinand), the Catholic monarchs were unable to produce a direct heir. Juana was married to a Habsburg, and it was their son, Charles, who would be king of Castile and Holy Roman Emperor. Charles was raised in the Netherlands and spoke no Castilian when he assumed the Castilian crown at age 15. He was accompanied by his entourage of Flemish advisors when he arrived in Castile in 1517, and his allegiance to concerns beyond the boundaries of Castile was made apparent when he was elected Holy Roman Emperor in 1517 at age 19. The following year, the Castilians demonstrated their opposition to this foreigner in the form of a revolt. The *communeros* revolt was unsuccessful — Flemish troops put it down — and Castile assumed an active role in the development of the Habsburg Empire. Castile fought the wars against the Protestants in Europe, Castile conquered and administered the American colonies, Castile took the risks of transatlantic commercial ventures, Castile brought back the silver and gold, but it was the Habsburg Empire and even the rest of Europe which benefited. Castile paid the price of Empire, but did not, for the most part, reap the rewards. In fact, the massive capital outlay necessary for maintaining a military force crippled the domestic economy of Castile. When viewed as part of a larger system, 16th-century Castile was not an independent nation-state, but rather the military/commercial arm of the Habsburg Empire. When Western Europe went into economic recession in the 17th-century, Castile — particularly Andalusia — suffered the most because its domestic economy was structured more for the support of transatlantic activity and less for self-sufficiency (Kamen 1978).

Kamen's work suggests that the underdeveloped domestic economy of Castile was more a case of the development of underdevelopment from outside forces — much like modern day underdevelopment in "third world" countries caused, in part, by U.S. political-economic imperialism. So it is possible that the Habsburg Empire, and not "Spain", might represent the proto-type for the hegemonic endeavors of Britain, France, the United States, and the Soviet Union. Just as Kamen has suggested revisions as to how 16th-18th-century "Spain" is perceived and understood, so too have numerous other studies suggested revisions to all of the traditional reasons given for the "decline" of "Spain." These contributions will be discussed further in Chapter 3. It is within this context of revision that I propose to address the following question: How did the Habsburg Empire respond to the demands of the American market? Did these responses represent a lack of the capitalist mind-set? I propose to investigate the effects of the American market on colonial period production strategy in Andalusia by focusing on the 350-year story of an artifact which was manufactured explicitly for the Habsburg transatlantic commercial venture — the Spanish olive jar.

The Spanish Olive Jar

"The Spanish Olive Jar, An Introductory Study" by John Goggin (1960) remains the primary reference for what has been called the "five gallon oil can" of Spanish colonial period transatlantic commerce (1500-1850). Goggin describes three styles of olive jar; Early, Middle and Late (Figure 3). The Early style is spherical with handles, while the spherical and elongate Middle and Late Styles have no handles. Historically, the Early Style corresponds to the period of Spanish conquest (1500-1580), while the Middle Style olive jars reflect a period of imperial consolidation of the Spanish American colonies (1580-1780). The Late Style olive jars (1780-1850) are associated with the fragmentation of the Spanish colonial empire and independence of the various colonies.

To summarize, a basic chronology for olive jars has been established and a number of additional vessel forms have been identified, but as yet, little is known about the nature of olive jar production and technology. The basic challenge of this work is to develop a



(adapted from Goggin 1964:283)

FIGURE 3. John Goggin's typology for the Spanish Olive Jar.

strategy which will "squeeze" more information out of an artifact that is so common at Spanish colonial sites. Information, in particular, which will inform the understanding of evolving colonial economies and the rise of capitalism. At present, olive jar sherds have been used as temporal markers - with few exceptions, olive jar studies have focused on identifying attributes which might be temporally sensitive (e.g. vessel form, rim form, glazing, wall thickness). Given the ubiquity of olive jar sherds on archaeological sites, it seems profitable to attempt to ask questions in addition to chronology. It seems fair to say that the limits of traditional archaeological analysis have been approached with concern to the Spanish olive jar. This is evident in the fact that Goggin's 1960 study has only seen minor revisions in thirty years. In order to get more information out of this artifact, it is necessary to seek and integrate the methods and techniques of disciplines outside of archaeology.

A Multidisciplinary Approach

Florence and Robert Lister's (1987) "Andalusian Ceramics in Spain and New Spain" is an excellent example of understanding and learning from material culture within a multidisciplinary framework. The Listers discuss the historical development of Andalusian ceramics in relation to the social, political, economic and ideological contexts. Their treatment entails technological discussions and documentary work, when available. This multidisciplinary approach is necessary when asking questions beyond chronology from the material remains of past societies. The Listers point out the lack of precise knowledge of olive jar production location in Spain, and suggest possible locales. Another example of a successful multidisciplinary approach for understanding pottery production is the work on Greek and Roman amphorae (e.g. Vandiver and Koehler 1986; Peacock 1987).

The Spanish olive jar is a representative of the amphora tradition in the modern age, and in spite of a richer documentary record, less is known about the nature of olive jar production than is known about the Greek and Roman amphora. Technological studies of

Greek amphorae demonstrate that investigations of physical properties can reveal information regarding variation in vessel manufacture, form, and function (Vandiver and Koehler 1986). This study also revealed variation in permeability through time, which suggests variation in vessel contents. Peacock's (1987) mineralogical analysis of petrographic thin sections of Roman amphora has led to the identification of amphora production locales and, in turn, the reconstruction of trade routes. Numerous Roman amphora production sites in Spain have been investigated by archaeologists, and others have been hypothesized based on mineralogical analysis, but to date, no such sites have been located for Spanish-manufactured olive jars. The goal of the present study is to investigate the nature of olive jar production by using the interdisciplinary approach used for Greek and Roman amphora.

Amphora studies have incorporated mineralogical analysis for determining production locales, materials science analytical techniques to investigate amphora manufacture and function, documentary information to determine what goods were shipped, and traditional archaeological typology to establish chronologies. It is important to note that techniques from any one of these disciplines are not sufficient to understand amphora economics. At present, the chronology/typology of Spanish olive jars has been established, and there have been several technological studies, but provenience/mineralogical studies have not been undertaken, and documentary work has not been systematically approached.

This study generated 3 data sets: 1. History — study of historical documents to investigate olive jar production levels and the organization of labor, in addition to showing the extent to which ceramic packaging was favored over other forms, 2. Archaeology — study of olive jar sherds from both shipwreck and terrestrial proveniences to note any formal variation, and 3. Technology — "fingerprinting" of olive jar sherds by mineralogical analysis and comparison to geological survey data in Spain in order to determine production locality, materials sciences discussion of olive jar manufacture. In all, this study integrates the methods of four disciplines — history, archaeology, geology, and material sciences — within an anthropological framework to describe the nature of olive jar production in Andalusia and understand this organization in the context of an emerging capitalist world system.

CHAPTER 2

METHODS AND MODELS: HISTORICAL ARCHAEOLOGY AND ITS MULTIDISCIPLINARY APPROACH

Introduction

Multidisciplinary studies of archaeological assemblages have become commonplace during the last twenty five years. Natural science applications for dating and provenience studies are now a regular part of archaeological research programs, and archival and other documentary information is incorporated into research by Historical archaeologists in the Americas, and Classical, Medieval, and Post-Medieval archaeologists in the Old World. Ethnographic reports and oral traditions are other data sources utilized by archaeologists. The argument no longer has to be made for the usefulness of multidisciplinary studies - much more can be learned when data are generated from more than one source. Even when data from different sources are inconsistent or contradictory the results can be revealing. These so-called "anomalies" or "incongruities" allow for epistemological assessments of the various data sets and reveal their interpretive strengths and weaknesses. The multidisciplinary "sharing" of research methods and associated techniques has not been without its difficulties, but overall, there has been a spirit of cooperation, and the mass of published multidisciplinary work is testament to the successful articulation and collaboration of historians, archaeologists, and natural scientists.

The production of Spanish olive jars is investigated here by incorporating methods from the fields of history, archaeology, geology, and materials sciences. Spanish documents such as shipping manifests, ordinances, guild rosters, bills of sale, civil complaints and price lists, combined with a mass of secondary sources, comprise the source from which olive jar production data are generated. These data include olive jar production levels, packaging/marketing strategy, production location, and labor organization. Shipwrecks will be the primary archaeological source for generating data regarding changes in olive jar morphology and distribution pattern. Mineralogical and technological analyses of the archaeological materials from contexts spanning the 16th, 17th, and early 18th-centuries allow for identification of changes in olive jar production location, manufacture, and function. The methods and data sources from each discipline will be discussed as related to archaeology, after which the test implications of a proposed model for Spanish olive jar production will be presented.

Historical Methods and Historical Archaeology

The principal source data for many historians are the written documents, and when an archaeologist utilizes documents written contemporaneously with the material remains under study to aid in their identification and interpretation, the result might be referred to as classical archaeology, medieval archaeology, post-medieval archaeology, historical archaeology, documentary archaeology, or text-aided archaeology depending on the place and time period of the materials in question, and/or the perspective of the investigator.

Classical archaeology focuses on materials from the ancient world - Assyrian, Egyptian, Greek, Roman, and others. In Western Europe, the "rediscovery" of the works of the ancient world during the Middle Ages, and the realization that much of value could be learned from the ancient texts was accompanied by an increased interest in the associated material remains. By the late 15th-century, Greek and Roman artifacts were widely recognized as prized art objects and there are even examples of "cultural resources management" at this time. "As early as 1462 Pope Pius II passed a law to preserve ancient buildings in the papal states and in 1471 Sixtus IV forbade the export of stone blocks or statues from his domains (Weiss 1969:99-100)" (Trigger 1989:36). As the texts of the Assyrian cuneiform and Egyptian hieroglyphics were translated in the early nineteenth-century, classical archaeology was in its formative period. The archaeology of societies for which there existed no written documents also was developing during the Renaissance, but this antiquarianism was more in line with the development of the natural sciences in its empirical approach. Bruce Trigger (1989:40) suggests that some classical archaeologists "helped to point the way towards a more purely archaeological study of prehistoric times" (Trigger 1989:40). This was particularly true of Egyptologists and Assyriogists, who unlike the Greek and Roman archaeologists had to excavate to retrieve the documents and therefore were well aware of the information that artifacts and context could yield.

Medieval archaeology, post-medieval archaeology, and historical archaeology are post-World War II developments in Europe and the United States respectively, and all are in the process of establishing their own identities. The medieval period begins with the collapse of the Roman Empire and ends with the formation of the modern world system in the early 16th-century. Historical archaeology as defined in the U.S. concerns itself with the post-1500 effects of European contact in the Americas and elsewhere. The archaeology of this same period in Europe is called post-medieval archaeology. Medieval, post-medieval and historical archaeology have strong developmental ties to history and much of their soul searching of the last thirty years has focused on developing an identity distinct from (but obviously related to) history.

Historical archaeology can and has produced its own research framework with its associated research questions over the last twenty years (e.g. Fairbanks 1977; South 1977, 1988; Schmidt 1983; Deetz 1987; Cleland 1988; Deagan 1982, 1988; Honercamp 1988; Leone 1988; Mrzowski 1988; Schuyler 1979, 1988). The views are varied as to precisely what constitutes the "questions that count" in historical archaeology, but all agree that the agenda can be set by historical archaeologists and produce meaningful results. Two of the more recent examples of development in Historical Archaeology are Mary Beaudry's (1990) "Documentary Archaeology" and Barbara Little's (1992) "Text-Aided Archaeology." Beaudry's book is an explicit statement to the effect that archaeologists *can* use documents to inform archaeology and produce meaningful results without adopting the entire theoretical perspective within which the methods are employed by historians. Barbara Little (1992) echoes this sentiment and suggests a broader conception of the idea of documents - that most all of archaeology done today is text-aided in that archaeologists rely on site reports and other archaeological "texts" in the interpretation of the work in progress. Neither Beaudry's or Little's positions are antagonistic toward history, but simply reflect a growing awareness that Historical archaeology does not need to rely on history to establish a research agenda.

While historical archaeology appears to have moved beyond the discussions concerning it being only a "handmaiden of history", the break from history has not been as complete in medieval archaeology. David Austin (1990:9) writes ". . . nearly all the available literature on medieval archaeology is constituted to deal with problems and ideas generated not within the discipline of archaeology itself but within that of history", and Austin and Thomas (1990:43) suggest "we must drop the requirement for our medieval archaeologists to be well versed in the methodologies and data of documentary history." It appears that much of medieval archaeology might be considered more archaeological history than historical archaeology, and some medieval archaeologists have referred to this as the "tyranny of the historical record" (Champion 1990). The general concensus of recent discussions regarding the identity of medieval archaeology (Austin and Alcock 1990; Tabaczynski 1993) is much the same as for American historical archaeology. Medieval archaeology can make unique contributions towards a greater understanding of the human endeavor, and while these contributions might incorporate the methods and techniques of other disciplines, the theoretical framework and associated research questions can be developed by medieval archaeologists.

It has been suggested that the investigation of the intricacies of the formation of capitalism, with all its social, political, ideological, as well as economic ramifications, is a "unifying force" in the discipline of Historical archaeology (e.g., Leone and Potter

1994:14-15). The research question which the present work addresses is in fact set in the context of several major historical topics, including the rise of/transition towards capitalism, the formation of the "Modern World System", the "decline" of Spain; as well as anthropological concerns such as dependency relations, the development of underdevelopment, and technological areas such as manufacture and function of pottery transport containers. The present study is uniquely informed and organized by having both a material and documentary focus. It is expected that an investigation of Spanish olive jar production from these perspectives might inform the broader topic regarding the evolution of the maritime container industry, a topic which currently has not attracted much attention from either historians or archaeologists.

Archaeological Methods and Historical Archaeology

Olive jar sherds dominate most Spanish colonial ceramic assemblages, and this is most apparent on Spanish shipwrecks where intact examples of olive jars are not uncommon. Shipwreck proveniences are preferred both due to the presence of intact or reconstructable olive jars and also due to their precision in dating. Precisely dated assemblages from shipwrecks dating to the 16th-century are not common and so land site assemblages were used. The shipwrecks were caused by severe storms or hurricanes, and 2 of the 3 land sites used in this study were also destroyed by natural disasters. A precise end date is therefore known for almost all these sites. It is ironic that natural disasters, so painful for those involved, serve as excellent contexts for archaeologists.

Discussions of archaeological investigations on Spanish shipwrecks in the Americas can be found in a number of general works and monographs (McKee 1968:164-190; Peterson 1972a:85-92; Peterson 1972b; Arnold 1978; Rogers 1987; Smith 1987, 1993; Throckmorton 1987), as well as in the *Journal of Nautical Archaeology,* and the series *Underwater Archaeology Proceedings* from the Society for Historical Archaeology Conference (1987-1995).

Technological Methods in Archaeology

Technological studies of artifacts provide information concerning the method of manufacture, origin of raw materials, performance capabilities, and use of artifacts. Such information allows investigation of the production, distribution, and consumption (use) of goods, and therefore, technological studies are well suited to answer questions related to economic pursuits. At present, technological studies related to Spanish colonial period artifacts are relatively few and focus primarily on ceramics. What follows is a general discussion of the role of technological studies in archaeology as well as a summary and evaluation of existing technological studies of the Spanish-American contact period. Finally, suggestions for further technological studies of Spanish colonial artifacts are offered.

It is no surprise that technological analysis of artifacts has been an integral part of archaeology ever since it became a formal field of study in the 19th-century (Bower 1986). Archaeology focuses on the material remains of past human behavior and part of understanding these remains includes investigating how they were made and used. The technological studies of the 19th and early 20th-centuries were largely descriptive. Advances in chemical characterization techniques in the 1930's and 1940's allowed technological studies to be more experimental. In the 1950's, there developed a specialized sub-field of chemistry - archaeological chemistry. The last 20 years have witnessed a dramatic increase in technological studies. These studies have been published by the American Chemical Society (Beck 1974; Carter 1978; Lambert 1984; Allen 1989a), the American Ceramic Society (Kingery 1985,1986,1990), and the Materials Research Society (Sayre et al. 1988; Vandiver et al. 1992). In addition to *Archaeometry,* the following journals were started to meet the expanded need to publish archaeological investigations with natural sciences applications - *Journal of Archaeological Science* (1973 to present), *Science and Archaeology, Geoarchaeology* (1985 to present), *Archeomaterials* (1986 to present), in addition to a number of independently-produced edited volumes (e.g. Allibone

1970; Brothwell and Higgs 1970; Berger 1970; Brill 1971; Olin and Franklin 1982; Slater and Tate 1988).

The major emphasis in these studies was the dating of archaeological materials through the use of chronometric techniques (e.g. radiocarbon, thermoluminescence). Characterization techniques (e.g. neutron activation analysis, x-ray diffraction, x-ray fluorescence) were also widely employed in provenience and authenticity studies. Citing Brill (1971), Beck (1974:iv) observed that archaeological chemistry was ". . . emerging from the phase of a service science to the field archaeologist and the museum curator into a discipline of its own." Later Carter (1978:ix-x) echoed this sentiment, but allowed that archaeological chemistry has problems to overcome (such as standardized procedures for data reporting and storage, specimen processing and testing) before it can ". . . earn the distinction of being a mature field of chemistry." Lambert's (1984:xi) observation on the status of archaeological chemistry is particularly telling when he states:

> Archaeological chemists subject artifacts and other materials from archaeological or historical sources to the scrutiny of modern instrumental analysis. Workers in this field find these investigations always intensely interesting, seldom financially renumerative, and *sometimes archaeologically useful*. (emphasis added)

It should be pointed out that Lambert (1984) is referring primarily to non-chronometric analyses; studies related to the dating of artifacts are generally helpful to archaeologists.

Lambert's (1984) comments reflect a general criticism of non-chronometric natural sciences applications in archaeology which is that while they are good science, they are not always meaningful in the context of significant archaeological research questions. The solution to this criticism is increased collaboration between the natural scientist and archaeologist. In the context of natural sciences applications in ceramic analysis, Tite (1988:14) observes that with few exceptions, archaeologists tend to *underuse* their scientific data or make naive interpretations, and likewise, the science-trained archaeometrist tends to draw conclusions which are archaeologically naive. Again, the solution is closer collaboration between technical specialist and archaeologist. In the 1989 edition of "Archaeological Chemistry," Allen (1989a, 1989b:3) calls for increased collaborative efforts when he states: "Archaeological chemistry is a marriage between two disciplines and requires ongoing cooperation and interaction."

Toward a Descriptive Model of Spanish Olive Jar Production — Hypotheses and Their Test Implications

The goal of this study is to better understand Spanish olive jar production, and it is hoped that some generalizations might be offered for the development of maritime container production. The empirical studies, which involve the testing of hypotheses with data generated from documentary, archaeological, and technological sources, are designed to develop a descriptive model of Spanish olive jar production. After this descriptive model of olive jar production is put in perspective with similar models of Canaanite, Phoenician, Greek, Roman, and Byzantine amphora production, empirical generalizations regarding maritime container production will be offered.

The first hypothesis regarding olive jar production was derived from the observation that capitalist pottery production in the northeastern United States involved the transition from a large number of widely scattered, small-scale producers to a smaller number of more centrally-located, large-scale producers (Turnbaugh 1985).

H1 - Spanish olive jar production location shifted from a large number of widely scattered locales at individual vineyards and olive groves in the 15th and early 16th-centuries, to a smaller number of more centralized production locales with the increased demand for wine and olive oil in the mid 16th-century to early 17th-centuries and later.

The test implications of this hypothesis are as follows:

1 - The mineralogical signatures of the late 15th to early 16th-century olive jars will be highly varied, while the mineralogical signatures of the mid 16th-century and later olive jars will be more homogenous. **Data Source** - Archaeological/Technological: petrographic analysis of olive jar sherds

2 - Vessel size and shape will become more standardized through time because there are fewer (albeit larger) producers involved. **Data Source** - Archaeological: olive jar vessel and rim morphology

Florence and Robert Lister (1987) described the Spanish olive jar producers as capitalists and the following hypothesis is an elaboration of this idea:

H2 - The shipping activity which created the increased demand for wine and oil in Sevilla starting in the mid 15th-century transformed the Spanish olive jar producers into "capitalists" by the mid to late 16th and early 17th-centuries.

Test implications of the Lister hypothesis are as follows:

1 - Olive jar producers were wage laborers who specialized in making maritime ceramic packaging. **Data Sources** - Documentary: tax rolls, guild rosters, bills of sale for olive jars

2 - Packaging became more standardized and regulated with the greater need for quality assurance of large consignments of wine and olive oil. **Data Sources** - Documentary: packaging ordinances, olive jar terminology in shipping manifests. Archaeological: - volumetric studies of olive jar capacities. Technological: olive jar fabric

3 - Innovations in manufacture such as the use of molds occurred in order to increase work efficiency. **Data Source** - Archaeological: mold marks or tooling marks on olive jars

4 - Shortcuts (i.e., improper wedging, shorter firing time, less attention to aesthetics) or other "illicit" activity becomes more common as part of an effort to keep up with demand. **Data Sources** - Documentary: complaints regarding faulty olive jars. Archaeological/Technological: defects such as warping, blistering and bloating on olive jars

5 - Competition between olive jar producers occurred, olive jar price and production levels was determined by the market, and not by guild restrictions. **Data Sources** - Documentary: price information from shipping manifests and price lists

6 - Marketing strategies change to compete in the growing competitive world market as measures are taken to promote individual products. **Data Sources** - Documentary: shipping manifests with descriptions of special packaging for wine and olive oil from certain regions. Archaeological: distinguishing shapes, colors, or markings on the olive jars to identity individual products.

The following chapter is an attempt to provide the historical background for understanding olive jar production in 16th-18th century Andalusia. Chapter 4 will present a review of amphora studies with the intent of developing a model of Spanish olive jar production. Chapters 5 and 6 discuss the archaeological and technological data sets, respectively. Chapters 7 and 8 present the results of investigations of historical sources, both secondary and primary. And Chapter 9 consists of a discussion of the results of the archaeological, technological, and documentary investigations, as well as conclusions.

CHAPTER 3

SPANISH POLITICAL ECONOMY IN A GLOBAL CONTEXT: THE HISTORICAL UNIQUENESS OF SPAIN

Introduction

An understanding of the development of Andalsuian olive jar production strategy during the 16th-18th-centuries requires an understanding of the historical development of that which has come to be known as "Spain." The history of Spain is characterized by a continued interaction with the "other" — by a succession of invading cultural groups interacting with local societies on a landscape compartmentalized by mountains and valleys resulting from the tectonic collision of the African and European plates. The tectonic processes are somewhat symbolic of the historical processes as the invasion of Muslims from North Africa and their seven centuries of political presence in the Iberian peninsula shaped a former Roman colony into a social-political-economic mosaic unlike any other former colony of the Roman Empire.

The regionalism of Spain which has resulted from the interplay of geo-physical and cultural forces one to speak of the many "Spains," of which Andalusia is just one. The historical development of the Iberian peninsula is unlike any other geographically defined entity — Spain was different — Spain *is* different. The goal of this chapter is to provide the reader with sense of this difference — with a sense of Spain. What follows is not so much a concisely integrated narrative of the history of Spain, but rather a collection of selected historical/geophysical/cultural bits and pieces which illuminate the uniqueness of Spain, and thereby hopefully facilitate an understanding of the Spanish experience.

The "Rise of Capitalism" and the "Decline of Spain"

> "The discovery of America, and that of a passage to the East Indies by the Cape of Good Hope, are the greatest and most important events recorded in the history of mankind." . . . [Adam Smith, "Wealth of Nations"]
>
> . . . This statement may be — doubtless is — an exaggeration; but had he spoken of the effect of these two events upon the origin of modern capitalism, one of the most important developments of history, his contention would have been incontrovertible. (Hamilton 1929a:338)

So opened Earl J. Hamilton's 1929 paper "American Treasure and the Rise of Capitalism (1500-1700)." Capitalism and Columbus — Hamilton saw a connection, but was quick to point out that the gold and silver from the Indies was only one of a number of factors involved in the development of capitalism. From a '90's perspective, this paragraph has its irony. Hamilton's paper was published when American capitalism was at the beginning of its darkest hour and Columbus was still considered somewhat of a hero. In 1997, American capitalism is (arguably) experiencing a prouder moment, and Columbus is now a villain. The dissolution of the Soviet Union has demonstrated that American capitalism is at present the most successful strategy for maintaining the huge outlay of military hardware necessary for sustaining a world power, and Columbus has received considerable bashing and blame for the large-scale dying of native American peoples and for allegedly bringing slavery to the Americas. A further irony is that some would argue that capitalism *did not* have its initial florescence in the very country that sponsored the voyages of Columbus and opened transatlantic trade. In fact, it was again Hamilton who was to write one of the defining works on the negative effects of American treasure on the 17th-century Spanish economy in his 1938 paper "The Decline of Spain."

The "rise of capitalism" literature is extensive, and while some trace the conceptual "roots" of capitalism back to Greek and Roman thought (e.g. Michelman 1983), most see the process starting in Western Europe during the 14th-century, and emerging as a competitive world-wide force with the industrial revolution of the 19th-century (Cox

1987:51; Abercrombie et al. 1986:86). Defining capitalism has also been the subject of much debate, but the basic definition involves the private ownership of the factors of production (land, labor, capital) operating in a relatively unrestricted market system governed by supply and demand. Land and labor become commodities, and money is used to transform these commodities into more money. This transformation process is called "capital". "Capital is therefore not a material thing but a process that uses material things as moments in its continuously dynamic existence" (Heilbroner 1985:36-37). The role of the state is also important in capitalist development. It is the state that provides the infrastructure (i.e., law enforcement — protecting the rights of property, public works — transportation networks) which both protect and encourage economic activity (Heilbroner 1985:78-106).

The mechanism of capitalist development is also subject for debate as some suggest that exchange is the key (e.g. Wallerstein 1974), while others argue that ideology or "mind-set" plays the critical role (e.g. Weber 1958), and still others focus on production and class conflict (Braudel 1985, 1986a, 1986b; Wolf 1983). The beginning of capitalist development varies according to the choice of mechanism. Those who focus on exchange identify a merchant capitalism beginning in the 15th-century; the Protestant Reformation of the 16th-century is viewed as being the foundation of capitalist development by Weber; and those who focus on labor and labor relations point to the agrarian capitalism of 17th-century northern Europe as the beginning of capitalism. An approach influenced by Marxist thought — which focuses on the modes of social relations of production — views capitalism not as a static thing which has an historical beginning and end point, but as a dynamic entity still in the process of becoming. For example, in the modern world, the subsistence mode and the peasant-lord mode of precapitalist times still exist side-by-side with the enterprise labor market mode. The former are not dominant, but their persistence shapes the development of new modes. This point of view, therefore, investigates the transition *toward* capitalism.

While there is disagreement as to the mechanism of this transition toward capitalism, there is general agreement that capitalism did *not* develop in 16th-17th-century Spain, and the basic question of this chapter is, *why* not? The seeds of capitalism were germinating in Western Europe (especially England) by the first half of the 17th-century, and the agrarian capitalism which had developed in England would provide the material basis for English hegemony in the 18th and 19th-centuries.

Some scholars, Spanish and non-Spanish alike, have suggested that part of the reason for the decline of Spain was due to the lack of a "capitalist spirit" among the 15th and 16th-century Spaniards:

> Spain defiantly rejected the puritan capitalist ethic, and the wealth from the American colonies was frittered away with little or no concern to generate new resources and capabilities. (Graham 1985:44)
>
> . . . they despised and deferred labor, but they bore hardships stoically; they were lazy, but they conquered half the New World. (Durant 1957, vol. 6:198)

This position seems to suggest that while the material base for capitalism was present, the lack of an entrepreneurial mind-set resulted in a missed opportunity for capitalism to develop. In addition to the ideological elements in the decline of Spain, there are a number of political, economic and social factors which have been listed as players in Spain's decline.

The economic decline of Spain in the 17th-century has been the focus of much scholarly work (see Parker 1984 and Phillips 1987 for a review). Historical research indicates that the 17th-century Spanish political economists were keenly aware of the problems of their day and also offered viable solutions which were largely unheeded (Hamilton 1938; Grice-Hutchinson 1978). Studies of the decline identify a long list of ills: "Aridity, deforestation, insufficient harvests, emigration, expulsions; spread of mortmain [perpetual church ownership of land], alms-giving and ecclesiastical vocations; vagabondage, disdain for work, mania to acquire titles of nobility, *mayorazgos*, high prices, upward movement of wages, taxes, wars; weakness of royal favorites and of the sovereigns themselves . . ." (Vicens Vives 1969:411). However, some recent revisionist work turns attention away from any internal Spanish decadence.

Henry Kamen (1978, 1988, 1991) suggests that Spain, specifically Castile, was really a military/commercial "colony" of the Habsburg Empire. Castile organized the American treasure fleets and fought the Protestants in the Netherlands and the Turks in the Mediterranean. Very little of the treasure stayed in Castile; it was funneled into the rest of Europe, and the roughly 100 year period of fighting in the Netherlands would severely deplete Castile's resources. Kamen refers to the Netherlands as Castile's "Vietnam."

J.H. Elliot (1961, 1984), like Kamen, acknowledges that Castile was ill-equipped for world domination, but suggests that Castile attained temporary dominance only because France, a country of greater natural resources, was involved in religious-based conflicts from 1559-1629. France recovered more quickly than Spain from the general 17th-century European recession and would be a power in the 18th-century. So it appears that it is not some internal decadence which caused the decline, but rather external factors. "Without the prolonged paralysis of France, the largest state in western Europe, the dismembership of Charles V's empire would have surely occurred long before 1700. Such an 'extrinsic' explanation of Spain's rise and decline may be less spectacular than the traditional one; but for precisely that reason it is a more convincing one" (Parker 1984:44).

Histories and historians of the late 19th to mid 20th-centuries have been somewhat less than kind in their dealing with seventeenth-century Spain. Terms such as "decadence," "backward," "abnormal" can be found in the writings of foreign and Spanish historians alike when describing the historical trajectory of Spain. History is many things, but perhaps at the most basic level it is the interpretation of the past in the context of the present, and at the beginning of the 20th-century, the "present" of Spanish historians was pretty gloomy. Spain had just lost a war with the United States (1898) and was forced to give up its last colonial holdings in the Caribbean and Pacific (Cuba and the Philippines).

Political unrest during the early 20th-century heightened until the country was torn apart by civil war from 1936 to 1939. Even though the prevailing autocratic regime had fascist leanings, the country was too enfeebled to participate in the Second World War. A number of Spanish scholars, now referred to as the "generation of '98", focused on the "Spanish character" in their attempts to understand what they perceived as a historical failure of empire.

But today, just as Spain's internal and international status is markedly improving, some of the old saws about Spain are also being revised. The second half of the twentieth-century witnessed the peaceful transition from dictatorship to democracy in 1975. Spain joined NATO in 1981 and became a provisional member of the European Economic Community in 1986. In 1992 — the quincentenary of the first voyage of Christopher Columbus — Spain played host to the world's fair and Olympic Games. One of the themes of the world's fair was "*¡Imagínate!*" — Imagine! — which reflected a look to the future, but at the same time there was a sense of the past. One advertisement for the Fair depicted the three ships of Columbus along side an astronaut and spaceship. It is within this context of renewal and rejuvenation that a modern Spanish historian has called for a revision of the traditional histories of Spain as he allows that yes, Spain *was* different, but this does not necessarily mean backward; Spain must be understood first in its own terms, and then placed in context with Europe, Africa, the Mediterranean, and the Americas (Marías 1990).

The purpose of this chapter, then, is to explore this Spanish "difference". A section on the geology and geography of the Iberian Peninsula will be followed by a summary of the history of the Peninsula. Discussion will relate the physical setting and history of the Peninsula to the themes of capitalist development, the "decline" of Spain, and the Spanish "character". The result will form the background for more specific discussions of amphora/olive jar economics in Chapter 3.

Geology and Geography — The Uniqueness of Spain

> Fundamental to any understanding of Iberian history is an appreciation of the role played by geology and climate. (Lovett 1986:3)

> Spain is haphazardly cut into regions as if the creative forces of nature had gone berserk, blindly slashing the surface of the land. (Arango 1985:1)

> A Peninsula separated from the continent of Europe by the mountain barrier of the Pyrenees - isolated and remote. A country divided within itself, broken by a high central table-land that stretches from the Pyrenees to the southern coast. No natural centre, no easy routes. Fragmented, disparate, a complex of different races, languages, and civilizations - this was, and is, Spain. (Elliot 1963:13)

Much is made of the physical setting of the Iberian Peninsula — it is an interface between Europe and Africa, between the Mediterranean and the Atlantic — it is mountainous, arid, disconnected, compartmentalized — there is marked cultural as well as geographic regionalism. The topography of the Iberian peninsula is characterized by rugged mountains and unconnected drainage systems which result in geographic compartmentalization (Figure 4). The soils are generally good, but the dry climate makes agriculture difficult in upland areas. In general, the volume of the rivers is small and irregular, at times leading to massive flooding. The abruptness of many of the river banks and irregular, often steep courses inhibit widescale irrigation and transportation (Vicens Vives 1969:12-17; Tamanes 1986:1-3). Elliot's remark (cited above), along with the statements — "Europe begins at the Pyrenees" (Alexandre Dumas 1928; cited in Jordon 1988:14), and, Spain is "Outside the southern door of Europe (James A. Michener 1968; cited in Jordon 1988:14) — seems rather curious. At a glance, these statements appear to be in some way geographically incorrect. The Iberian peninsula is certainly part of the same continent as Europe, in a geological sense at least.

FIGURE 4. Map of the Iberian Peninsula showing major mountain ranges and drainages.

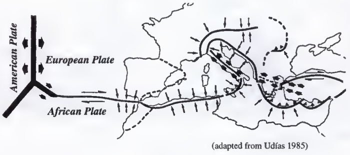


FIGURE 5. Tectonic map of the Mediterranean region.

The Iberian peninsula is part of the Euroasian plate and Africa is part of the African plate (Figure 5). Europe and Africa have been on a geological collision course ever since Pangaea began to split up roughly 173 million years ago and Spain appears to be a terrestrial "pivot" point of this tectonic collision (Skinner and Porter 1989:375). The convergence of the Eurasian and African plates has resulted in folding and buckling of the Iberian landscape. The result is a series of plateaus formed by uplift, and a number of roughly east-west oriented mountain ranges and basins which determine the location of the major drainages of the peninsula (Figure 4, Anderson 1978:115-118,198-200). In time, Europe and Africa will become one, the Mediterranean Sea will be closed, and geographers will have to rethink this new united continent. But geologists estimate that we have some 30-40 million years before this occurs (Smith and Livermore 1985:84-96).

It seems that geography is not necessarily determined by geology. Some geographers suggest "There is no rule that forbids a continent from abutting its neighbours — and by what other name could we describe so distinctive a unit as Europe?" (Mellor and Smith 1979:1). Another geographer points out that Europe is not a continent afterall, and the fact that it is called a continent is the result of the incorrect observation of the Greeks — who thought the world was composed of three separate land masses — Europe, Africa, and Asia. Jordon (1988) writes that the Romans "were fighters, not mapmakers," and the idea of three continents was passed on to the modern age:

> Although Europe is not a continent and lacks physical geographical individuality, the idea that Europe is a separate entity persists . . . The explanation for this lies deeper than the mere perpetuation of a classical Greek misconception. In short, Europe is a human entity rather than a physical one, and its distinctiveness is to be sought in the character of the peoples who occupy it rather than in its physical environment. Europe is a *culture* that occupies a *culture area.* (Jordon 1988:6)

The boundaries of culture areas change over time, and therefore, it is no surprise that the boundaries of the culture area of Europe have also changed over time. "Europe" in 1000 BC was the eastern Mediterranean, at the birth of Christ it was the Roman Empire, and in

1000 AD only the northernmost region of the Iberian Peninsula was considered Europe. From 1300-1600, Europe meant Christendom (Jordon 1988:8). But just as the Iberian peninsula was to completely rejoin Europe in 1492 with the conquest of Granada, the definition of Europe was to change — religion, which had been a central defining characteristic since Roman times, now was secondary to more secular concerns — progress, freedom, and creativity (Jordon 1988:1-19).

Thus the cultural and geographic concept of Europe is fluid —the core has moved — and in the 1990's, Spain is not considered to be at the core of Europe (Jordon 1988:14). In fact, all of southern Europe (Spain, Portugal, Italy, and Greece) is considered periphery, although Williams (1984:1) writes: "Before the 1950's it was appropriate to ask, 'why is southern Europe underdeveloped?' But this has now been supplanted by the question, 'why has southern Europe developed so rapidly?'" Lewis (1987:112) entitles a chapter "Iberia: Spain and Portugal Return to Europe". Part of this return has to with the "defeating" of geography, that is, the building of an improved transportation network connecting all parts of the peninsula. "Europe's most mountainous country after Switzerland, Spain has always been dreadfully connected with its own capital and, cut off by the Pyrenees, with the rest of the continent. This is changing" (The Economist 1992:7).

Invasion and Regionalism

According to Fuentes (1992), with the possible exception of Russia , the Iberian peninsula has been the most invaded area of Europe (see Appendix 1). With its history characterized by invasion and colonialism, and the associated multiculturalism, an understanding of the economic system which prevailed in 16th-18th-century Spain requires consideration of the contributions of the Phoenicians, Greeks, and Romans of the ancient world, and the Visigoths and Muslims of the medieval period who all shaped, defined, and became part of that cultural entity which has come to be known as "Spanish."

The regionalism of modern Spain is a reflection both of the variety of historical "invaders" and also the topography of the peninsula. The eastern and southern coastal areas were most accessible, and therefore these areas were influenced most by the invaders from outside (Phoenicians, Greeks and Romans). The northwest and interior were more isolated so they retained a more independent bearing. The origin of the native Iberians is unknown. The Celts entered the peninsula sometime around 2000 BC and were followed by the Phoenicians, Greeks, Carthaginians, Romans, Vandals, Alani, Suevi, Byzantines, Visigoths, Moors, Franks. The Celts settled in the northwest, the Iberians were on the eastern and southern coastal areas, and the interior was an interaction zone referred to as "Celtiberian." The Phoenicians and Greeks had mainly commercial relations with the native Celts and Iberians, (8th-6th-century B.C.), while the Carthaginians (5th-3rd century B.C.) placed greater emphasis on colonization. They were replaced by the Romans (3rd century B.C. to 5th-century A.D.), who followed the more extractive pattern of the Phoenicians and Greeks. The Vandals, Alani, and Suevi were the first of the eastern Germanic peoples who brought about the downfall of the Roman Empire to enter the Iberian peninsula (5th-century A.D.), and were followed by the Byzantines and Visigoths. In the early 8th-century A.D., Islamic peoples from North Africa conquered much of the Iberian Peninsula and maintained a political presence until the late 15th-century (see Aubet 1993, Curchin 1991, Fletcher 1991, Harrison 1988, Keay 1988, Bendiner 1983, Boardman 1980, Glick 1979, Thompson 1969, Altamira y Crevea 1964, Arribas 1964).

This diversity of population and region are reflected in the linguistic patterns of the modern Iberian peninsula where five languages are spoken — Portuguese, Castilian, Galician, Basque, and Catalan. Castilian is the language of central and southern Spain, while Galacian and Basque are spoken in the northeast and northwest regions, respectively. Catalan is spoken in the eastern Iberian peninsula (Figure 6). Vicens Vives (1969) discusses the regionalism of modern Spain by identifying four "nuclei" — 1. Northern, 2. Catalan, 3. Castilian, and 4. Andalusian.

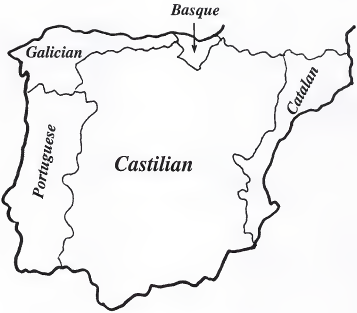


FIGURE 6. Language Map of the Iberian Peninsula.

Northern. This region is comprised of modern day Galicia, Asturias, Navarre, the Basque country, and Aragón. The initial defeat of the Moors was in Asturias, located in the northwest part of the Iberian peninsula, and it was here that the 800 year "reconquest" of the peninsula began. But even in the early Middle Ages, the people of these northern kingdoms regarded each other as foreigners. The reconquest was not a group effort - there was little cooperation among the Basques, Castile, and Aragón (Salmon 1971:27).

Catalan. Catalonia and Valencia constitute this region where the Catalan language has been spoken since the 8th-century. During the Middle Ages, Catalonia had more relations with the Mediterranean than with the rest of the Peninsula. It was only after 1400, when Catalonia was in decline, that relations with the peninsula dominated (Fontana 1991). Unlike the mountainous Northern regions, Valencia possessed both a strong agrarian base - especially along the coast - and a manufacturing industry during the Middle Ages (Cuco 1991:252). After the Christian kingdoms occupied Valencia in 1238 AD, a substantial number of *Mudejares* — Muslims living in Christian-controlled territories — remained, later to become *Moriscos* — Muslims who had converted to Christianity, in the 16th-century.

Castile. "The history and language of Castile are without any doubt the key factor in the whole of Spanish history and culture; so much so that 'Castilian' has often been used to mean the same as 'Spanish' " (Garcia Sanz 1991). The name originated from Moorish references to the "land of castles" which the king of Asturias built along the southern frontier of that kingdom. Castile would grow as the Moors were pushed to the south, and therefore its geographic designation would change over time to cover almost the entire area of modern Spain and include "Castile and León, Cantabria, La Rioja, Castilla, La Mancha, Madrid and Estremadura" (Garcia Sanz 1991:247).

Andalusia. "The southernmost region of the Iberian peninsula has always had a strongly individual character, which has enriched the whole of Spain. At the same time, it has also been a link with the outside world, sometimes receiving influences from abroad, sometimes becoming a source of influences radiating out on a global scale" (Dominguez Ortiz 1991:254). Andalusia consists of three regions — the Guadalquivir river valley, the low-lying Sierra Morena mountains to the north, and the higher mountainous area of Granada. Andalusia presents an antithesis to the warrior image of Castile — "In Andalusia, contrary to the custom in Castile, it is the warrior who has always been despised, and the countryman, the rustic, the master of the farmhouse who has been esteemed above all others. . . . As a consequence of this disdain for war, Andalusia has played little part in the bloody history of the world. . . . Andalusia has fallen into the hands of all the violent peoples of the Mediterranean, and always in twenty-four hours, so to speak, without even offering resistance" (Ortega y Gasset 1937:94-95).

The Iberian Peninsula and the Ancient World: Political Economy

Spain has been called the "Mexico" of the ancient world (Elton 1882:9-10), referring to the fact that its rich mineral resources (gold, silver, iron, copper, tin, lead, mercury) and fertile river valleys in the south (producing grain, olive oil, and wine) were all exploited to varying degrees by the Phoenicians, Greeks, Carthaginians, and Romans. Curchin (1991:8) suggests that the terrain was a major obstacle to invaders, and further ". . . the warlike background and tribal ethos of the indigenous peoples." In fact, the Celtiberians and Iberians served as mercenaries for the Carthaginians, (possibly) Greeks, and Romans (Curchin 1991:100).

Much of what is known about the Celts, Celtiberians, and Iberians in Spain is from Greek and Roman writings. Largely pastoral peoples, the Iberians have been divided into 4 geographic divisions — Catalonia, the Ebro Valley, the Spanish Levant (east coast area), and Upper and Lower Andalusia. Arribas (1964:152) writes that aside from the alphabet, there was no unifying factor among the four areas.

The Phoenicians are important in that they were the first to include the Iberian Peninsula in the Eastern Mediterranean interaction sphere. The word "Phoenician" is what the ancient Greeks called the people from Canaan, a land located in the area of modern day Lebanon. The Phoenicians had established maritime relations in the eastern Mediterranean during the second millennium BC, and due to a series of aggressive acts on the part of its neighbors, the country of Canaan had lost much of its hinterland and been "reduced to a narrow coastal territory" by 1100 BC (Aubet 1993:15). This lost hinterland had provided much of the agricultural support for the more densely populated coastal areas, and so the Phoenicians had to turn westward to find a way to feed their people. The Phoenicians had for a long time been supplying interior peoples (especially the Assyrians) with metals - copper, tin, iron, lead, silver, and gold, and the mineral wealth of southern Spain was known to the Phoenicians. It was probably a search for new sources of metals which prompted the Phoenician endeavor in the Iberian Peninsula. Silver had come to be the metal standard of commercial activity in the eastern Mediterranean during the first millennium BC, and by 720-650 BC the Phoenicians were extracting great quantities of silver from southern Andalusia (Aubet 1993:15-64).

The Phoenicians are said to have introduced the grape and the olive into the Iberian peninsula. Much Phoenician olive oil entered the southern peninsula which supports the idea that the Tartesians (the Iberian group in southwestern part of the peninsula) received oil and gewgaws (trinkets) in exchange for metals, as reported in Greek sources (Aubet 1993:243). "The heavy importation of wine and oil in the early period of colonization gradually disappeared (except for high grade brands) as planting of vineyards and olive groves developed around the outskirts of the colonies" (Vicens Vives 1969:52).

The Phoenicians left Spain at the beginning of the 6th-century BC. There does not appear to have been any military conflict associated with this withdrawal and it is likely that its cause might have been due to Babylonian invasions of Canaan in the 570's BC (Curchin 1991:22)

The Greeks made visits to the Iberian Peninsula early in the 6th-century BC, and possibly earlier in the 7th-century BC (Arribas 1964:52). The Greek's main influence was on the east coast, while Phoenicians were mostly in the south (Curchin 1991:20), and some degree of interaction between the two is suggested by the recovery of Greek finewares and amphoras in southern Spain (Harrison 1988:69,71). Greek organization came to characterize both areas, and "Iberian towns in southern and eastern Spain were already on the way to urbanism under Greek influence before the Romans arrived" (Curchin 1991:104).

The Carthaginians entered the peninsula in the 5th-century BC and ". . . inherited the Phoenician trade network in southern Spain" (Curchin 1991:24). Like the Phoenicians earlier, the Greeks and Carthaginians also encouraged the Iberians to grow grapes and olives for wine and oil, which were exported, along with salt, dried fish, fish sauce, and the metals — copper, tin, iron, silver, gold, and lead (Vicens Vives 1969:45-52). Carthaginian expansion resulted in the First Punic War (264-241 BC) between Carthage and Rome. Twenty five years after the peace of the First Punic war, Rome allowed Carthage to occupy large areas in Spain. It was a strategic move as the occupation was permited with the understanding that the Carthaginians would not unite with the Celts (Herm 1976:20). The second Punic War began in 218 BC when Hannibal crossed the alps with his elephants. By 206 BC, the Carthaginians had been expelled from the Iberian peninsula by Rome, and the Roman occupation was limited to the eastern and southern coastal areas. When it became clear that the Romans were not going to leave, the Iberians started guerrilla activities (Herm 1976:165-166). The Roman conquest of the Iberian peninsula took 200 years, in comparison to the conquest of Gaul, which took only 10 years. The Carthaginians were expelled from the Iberian peninsula in 206 BC, but from 218 BC to 16 BC the peninsula was a war zone.

The Romans were not present in great numbers in the Iberian peninsula, but they organized the Iberians for export production. The central area of the peninsula, referred to as the *Meseta,* was an important grain producer for the Romans. But even before the interior was Romanized, much grain was being produced for export. In 203 BC ". . . when the Romans [occupied] only a coastal strip of the Peninsula, imported Hispanic cereals caused prices on the Roman market to be reduced" (Arribas 1964:119). Vicens Vives (1969:63-81) writes that wine and olive oil were also major exports. Wines from the Iberian peninsula flooded the Italian market and by AD 65 further planting of vineyards was prohibited in Spain - although enforcement was uneven, and in time, new varieties of grape were introduced. In general, Iberian wines were much-enjoyed in Rome (Smith 1965:9-10). The export of olive oil was not restricted and Spain and North Africa became the main olive oil producers of the Roman Empire. The Romans continued mining the same metals as the Phoenicians, Greeks, and Carthaginians. Other exports included weapons of Bilbilis, cord and rope from the Levant, fish sauce from the coast; lesser exports were linens from Saetabis and woolens from Baetica (southern peninsula).

The Romans built some 13,000 miles of roads, and initiated a " . . . policy of almost total commercial freedom in contrast to the state of affairs which had prevailed in Egypt and the Hellenistic world" (Vicens Vives 1969:71). ". . . the transition from Republic to Principate involved the change from a feudal capitalism, developed by the great Republican landowners, to an urban capitalism, Hellenic in origin, based on trade, industry, and systematic agriculture (high point of grape and olive cultivation in Spain), which got its start as a result of the decay of the aristocracy's great fortunes" (Vicens Vives 1969:60). Roman Spain was, nevertheless, basically agrarian and ". . . in regions of advanced economic development, the rural population outnumbered the urban by a ratio of at least ten to one" (Curchin 1991:126). The relationship between towns and rural areas is described as symbiotic rather than exploitative. Much emphasis has been placed on the large rural agricultural production units known as Roman villas. "However, it would be a mistake to assume a complete transformation from subsistence economy to villa economy in Roman Spain. Even in the rich agricultural zone of the lower Guadalquivir valley with its proliferation of magnificent villas manufacturing their own shipping amphoras and crushing their own olives, the intensive field surveys of Michel Ponsich have revealed a large number of small farms . . . rural settlement involved a hierarchy of sites rather than a homogeneous 'villa culture' " (Curchin 1991:126-127).

By A.D. 382 Rome had made peace with a number of Eastern Germanic groups including the Greutungi, Ostrogoths, Terninigi, and Vesi (Heather 1991:310). Attacks on these groups by the Huns in the late 3rd century caused the formation of two alliances in A.D. 291 — the Greutungi-Ostrogothic of the eastern Roman Empire and the Tervinigi-Vesi group of the western Roman Empire. Later, a chronicler would refer to these alliances as the Ostrogoths and "Visigoths" (Wolfram 1988:24). These two groups were given political and military autonomy in AD 382, which reflected the growing inability of the Roman empire to assimilate conquered peoples (Heather 1991:310).

The Iberian Peninsula and the Fall of the Roman Empire: Political Economy

Roman Spain in the 3rd and 4th-centuries was in a state of anarchy. Demographic decline, "peasant" revolts. and attacks and invasions by a number of Eastern Germanic peoples (Vandals, Alani, Suevi) resulted in the Visigoths being called in to pacify warring factions in 414 AD. "The Vandals overran the entire country but settled mostly in southern Spain, hence the name Andalusia (Vandalusia, or land of the Vandals)" (Crow 1963:35; c.f. Glick 1979:). The Vandals were pushed out of Spain by the Visigoths, and the Suevi and Alani formed a weak alliance and moved to the northwest. Eventually, the Visigoths were to exert their own independence, sack Rome, and move into the Iberian peninsula to stay. This may have been a reaction to the threat of invasion of the peninsula from the Franks (Wolfram 1988:191), who in fact had invaded in the northeast 507-31 AD (Collins 1983:32-36). The Visigoths took Sevilla from the Spanish Romans in 549 AD, but the greater part of Baetica was Byzantine or Spanish Roman. The Byzantine presence in Spain was more important for securing their holdings in North Africa than conquering

Spain (Collins 1983:38), and they were expelled by the Visigoths in AD 642. The Visigoths made migrations into the Iberian peninsula and displaced Hispano-Roman power during the late 5th-century AD. But while there was a replacement of political hegemony, there was *not* a removal of people — "Italy, Gaul and the Iberian peninsula were under populated; these areas could therefore maintain a much higher population and it was generally unnecessary for the Germanic settlers to confiscate the lands of the Romano-provincial inhabitants" (Hodget 1972:5).

The Visigothic presence in Spain is described as a "displacement" in that it was more intrusion than invasion because the Visigoths preserved much of the Hispano-Roman traditions and after 587A.D., had assimilated into Romanized Spain, giving up both their language and religion (Wolfram 1988:170-191; Salmon 1971:14; Vicens Vives 1969:83).

The Visigoth period in Spain is thus viewed more as an appendage to the Roman Period than as a beginning of the Feudal Period. The Visigoths, numbering roughly 200,000, were initially located in only one region in the interior, that of Segovia, which was part of old Castile. They were only a small percentage of the 6 million Hispano-Roman occupants, and there were roughly 100,000 Suevi in northwest Spain. Except for the introduction of artichokes and spinach, agricultural products of the Visigoth period remained the same as in Roman Spain (Vicens Vives 1969:83-92).

The Visigothic economic pattern of stockbreeding, probably mining, and some trade (metals, salt, wine, vinegar, olive oil, and honey), followed that of the Roman period (Vicens Vives 1969:83-92). There seems to have been a great deal of movement between southern and eastern Spain (e.g. Cartagena, Sevilla, Barcelona), and Constantinople. There was much Byzantine influence in southern Spain during the period 552-624 (Thompson 1969:21-22, 152).

When the Visigothic prince of Baetica converted to Christianity, Sevilla revolted against the Visigothic King and declared the converted Christian Prince their king in AD 579. The king attacked Sevilla and restored his power, but Christianity became the religion of the Visigothic state in AD 589. Conversion was not total among the Visigoths — the conversion is seen as an attempt to bring conciliation between Visigoths and Spanish Romans (Altamira y Crevea 1964:159-193). But this was widening the gap between Jews and Visigoths. In 694 there was an accusation that the Jews were helping the Muslims to invade Spain. A decree followed which stated that ". . . all the Jews in the Peninsula should be reduced to slavery and their goods confiscated . . ." (Altamira y Crevea 1964:181). Muslims had obtained territory in North Africa in the 7th-century and launched two unsuccessful invasions of the Iberian Peninsula in late 7th-century and early 8th-centuries.

The Iberian Peninsula and the Middle Ages: Political Economy

In AD 711, yet another invasion force of Arab and Berber Muslims from North Africa, collectively referred to as Moors, landed on the southern shores of Andalusia. Internal dissent in many cities resulted in little or no resistance, and sometimes accommodation to the Moorish invaders. Bertrand and Petrie (1971:31) suggest that the initial intent of these invaders was not so much to occupy the land, but rather to take booty and slaves and return to North Africa — a raid rather than a conquest. Raiding did become an occupation, but the original inhabitants were allowed to continue practicing their religion. Bendiner (1983:25) suggests that the Moors ". . . were so sure of their power that they could enjoy the antics of Christians and Jews". After defeating the Visigoth King Rodrigo, the Moorish leader Tariq occupied Toledo and moved north. After the defeat of the Rodrigo, many cities capitulated, until the critical battle in Asturias. As military encounters go, it was only a small affair, but it ensured that the northwest corner of the peninsula would not fall to the Moors. Some point to the Asturuias battle as the beginning of the reconquest — a reconquest that took almost 800 years.

The Moorish conquest of the peninsula took only four years. Fletcher (1992:21-24) attributes this ease of conquest, in part, to the what was basically the centralized

Roman organization of the Iberian Peninsula altered little by the Visigoths — strike a blow to the center and the rest will fall. It was the Umayyad dynasty, together with Berber troops, which had initiated the invasion of the Iberian Peninsula, but their presence in Spain was brief. "After a period of civil war in Syria and Iraq, the Umayyad dynasty was overthrown and the Caliphate replaced by a new dynasty — the Abbasids. The centre of power was shifted from Syria to Iraq. The symbol of this change was the foundation of the imperial capital of Bagdad in 762." (Ahmed 1991:7).

The Moorish presence in Spain produced great cultural florescence, especially at the city of Córdova, which had a population of one million in AD 900. The prosperity of al-Andalus under the Umayyad and Abbasid dynasties had allowed them to pay the Christian kingdoms of the north not to attack, but there were other economic relations as well. The chief market for al-Andalus exports of textiles, olive oil, and arms was north Africa, but this demand came to be exceeded by Christian Spain. "It could well be said that for five centuries northern Spain was a colony for the export of Moslem products" (Vicens Vives 1969:111-120). Wine was still important in al-Andalus and consumed by Muslims despite prohibition from the Koran (Vicens Vives 1969:108). In the Christian kingdoms, there was much demand for wine — ". . . the Benedictine rule specified that monks should drink approximately one litre of wine per day" (Glick 1979:94). During the 9th and 10th-centuries Mozárabes — Christians living in Islamic-controlled lands, were forced to emigrate north. "When the Mozárabes became established in the towns and cities of the Christian Kingdoms, they introduced certain arts, trades, and an economic concept which the Christians did not possess, or rather, one which they had neglected for a long time" (Vicens Vives 1969:127).

The 8th-century invasion of the Moors added Arab and Berber elements to the existing Jewish and Romano-Gothic-Celtic-Iberian ethnic influences. Jews were an accepted part of Roman period Spain, but the Visigoths were less tolerant. A Jewish revolt was planned in 694, but it was crushed before it began (Bendiner 1983:33). The early centuries of Moorish occupation were times of religious tolerance toward Christians and Jews. Christians viewed Jews and Muslims as deniers of the one true Christ, but Islam views both Christianity and Judaism as "people of the Book" — "whose incomplete systems of belief nonetheless allowed them to know and venerate God, to understand and obey His commandments, and to merit eternal salvation" (Cruz Hernández 1991:20). "Judaism has never interrelated more closely or more fruitfully with another culture than it did with the Islamic civilization of Al-Andalus" (Zafrani 1991:35).

The periods of AD 711-1086 in Andalusia and 1085-1370 in Christian era have been described as " golden ages" of social and cultural interaction and coexistence (Cruz Hernández 1991:20; see also Dodds 1992). The Moors in Spain are credited with transferring Greek thought to Europe (Vernet 1991). Arabic words entered the Iberian language in the Middle Ages in the areas of ". . . irrigation, fortification, civics, urban life, commerce, botany, and food" (Arié 1991). "Craftsmen, shopkeepers, merchants and small landowners of the Mozarabic and Jewish communities were able to maintain their traditional way of life without much difficulty. Obviously, though, this process of convergence broke down whenever religious disputes arose" (Cruz Hernández 1991:22). The aristocracy and merchants seemed to have no problem with co-existence but the ". . . masses, on the other hand, found it hard to live alongside Mozarabs and Jews" (Cruz Hernández 1991:21). As the Reconquest progressed in the 11th-13th-centuries, so did the growth of religious intolerance. Increasing numbers of Mozárabes (Christians living in Moslem territories) and Jews migrated to the Christian kingdoms where they were well-received. Moslems living in reconquered areas, referred to as Mudejares, were also tolerated by the Christians. In general, the Jews were urban business people, while many of the Mudejares were agricultural laborers. Another significant social group during the 11-13th-centuries were the foreigners from western Europe who were attracted by the "crusading" character of the wars and economic opportunities (Chapman 1918:87). By the 13th-century there was a mosaic of ethnic and religious groups on the peninsula.

Some writers, while not denying the “incredible Moorish Legacy” in Spain, have presented the coexistence of Muslims, Jews, and Christians in the 12 and 13th-centuries as more related to demographic/economic/political factors, and not so much the result of social/ideological accord (Fletcher 1992:2,135), adding that the coexistence, while indeed long-lasting, was not always harmonious. Fletcher (1991:144) goes on to explain that it was a low population density and lack of colonists, rather than some enlightened social ideological concern that resulted in the policy of allowing the conquered peoples to remain in areas of Muslim or Christian control. The distribution of *Mudejares* varied as many Muslims in reconquered territories exercised their option to leave (especially in Castile and Portugal), while in other areas they generally chose to remain (i.e., Aragón, Valencia, and Andalusia).

Internal unrest and attacks from the Christian kingdoms and the Berbers had begun to gradually whittle away at the Muslim holdings by the 11th-century. The Almoravids, a fundamentalist Islamic sect from North Africa who came initially as allies of the *taifa* rulers, turned against them and took over all of Al-Andalus in the late 11th-century. The Almoravids disapproved of allowing Christians and Jews to continue practicing their religion. The payments paid to the northern Christian kingdoms by the Abbasid dynasty stopped. The resulting internal strife and attacks from the Christian kingdoms weakened the Almoravids, and the Almohads - another fundamentalist sect from North Africa - invaded and conquered al-Andalus in 1171-73. "By this time the three major Christian powers - Léon-Castile, Aragón-Catalonia and the new kingdom of Portugal - were formidably strong." (Fletcher 1992:105). The first half of the 13th-century saw most of al-Andalus fall to these three Christian kingdoms. Córdoba was taken in 1236, Valencia in 1238, and Sevilla in 1248.

The Christian kingdom of Castile came to be a dominant force by the end of the 13th-century with the addition of Córdoba, Valencia, and Sevilla. "Castile did not exist in the year 800, by the year 1000 it was a modest county of the kingdom of León, by 1300 it was the largest state in Europe. "Al-Andalus" included nearly the whole of the peninsula in the eighth-century, but by the late thirteenth it meant the tiny principality of Granada" (Fletcher 1992:9-10).

Political economy in Muslim areas of the Iberian peninsula prior to 1212 was characterised by *laissez faire* economic policies, with general participation by the political leadership, and few restrictions regarding exports or imports the Christian kingdom to the north and countries in the Mediterranean. After the mid-13th-century, when much of the peninsula was in under Christian rule, olive oil, spices, mercury, leather, furs, and ceramics continued to be major exports. There was a decline in the export of silk products and timber, and while the slave trade continued to the end of the 13th-century, it was Muslim instead of Christian slaves who were the commodities. The export of wool greatly increased after the mid-13th-century, and there were also increases in the export of honey, sugar, salt, grain, iron and alum, a product used in the leather and textile industries. Wine, whose consumption was prohibited by Islam, became a major export for Christian Spain, and there were restrictions on wine imports to promote the consumption of Spanish wine. The Christian political leaders were less directly involved commercial activity than the previous Muslim leadership, but the Christians imposed more regulations and restrictions, including papal prohibitions on trading with Muslim contries, resulting in commercial activity which was less capable of adjusting to market demand (Remie Constable 1994:209-258).

Demographic trends in the Iberian Peninsula followed the general trends in the rest of Europe. There was population growth in the twelfth and thirteenth-centuries, but the poor harvests and widespread famine in the early fourteenth-century created a weakened populace which was devastated by ". . . the shattering visitation of the Black Death, initially in the years 1346-50, then in recurrent later outbreaks" (Fletcher 1992:146).

The Jews fared no better than the Muslims in Christian Spain after the 13th-century, as increasing restrictions were placed on them and large-scale massacres occurred in Sevilla and Barcelona in 1391. The 14th and 15th-centuries were a time of economic decline following the Black Death and the Jews became a target due, in part, to their industry and wealth. Restrictions were also imposed on Mudejares, but enforcement was generally lax until the reign of the Catholic monarchs. The union of Castile and Aragón, and the fall of Granada intensified the religious conviction that all of Spain be Christian. This culminated in the expulsion of the Jews in 1492, and of the Moors in 1502. There were massive conversions before the expulsions, but converted Jews (*Marranos* or *Conversos—*) and converted Moslems (*Moriscos*) were identified as such throughout the 16th-century.

It is the opinion of some that the Inquisition was aimed primarily at the *Conversos—* because of their wealth (Kamen 1975:18). The Inquisition was established in Castile in 1478, but was most active during the last half of the 16th-century; its power and influence subsided as the economy worsened at the end of the 16th-century. Ill-treatment of *Moriscos* led to revolts in 1499 and 1568-70 in Granada. The latter resulted in the dispersal of *Moriscos* to Castile. Between 1609 and 1614, almost 300,000 *Moriscos* were expelled from Spain. The expulsion of the *Moriscos* was deliberately chosen to coincide with the 1609 truce with the Dutch so that "the humiliation of peace with the Dutch would be overshadowed by the glory of removing the last trace of Moorish dominance from Spain, and 1609 would be ever memorable as a year not of defeat but of victory" (Elliot 1963:301). The peninsula was experiencing depopulation, and the expulsion of 4% of the population simply exacerbated an existing trend (Phillips 1987). The impact was felt most in areas with a substantially high Morisco population such as Valencia and Aragón where they comprised 30% and 20% respectively. (Kamen 1991:221-222).

The Muslim occupation of Spain resulted in a different social development compared to western Europe, and the result was that Feudalism was only weakly developed in Castile. Castile was most affected by the Moslem invasion and free peasants were granted access to the sparsely populated zone between the Christian kingdoms and Al-

Andaluz (Vitale 1968:35). The 13th-century saw the advance of a middle class involved in export commerce (primarily wool). Serfdom had ended by the late 13th-century in Castile, and the lack of peasant revolts during the 14th and 15th-centuries ". . . is evidence of the comparatively satisfactory condition of the rural classes (Chapman 1918:137). But outside of Castile, serfdom and serf uprisings continued in the kingdoms of Aragón and Catalonia during the 14th and 15th-centuries. In parts of western Europe the nobility grew progressively stronger in relation to royalty, but in Spain, the 700 year period of fighting the Moors " . . . impeded the consolidation of the nobles, [thereby] strengthening the centralizing tendency of the kings" (Vitale 1968:35). The development of strong, independent kings and subordinate nobility in medieval Spain resulted in kingdoms that viewed each other as foreigners, even after the union of the Catholic monarchs. Castile was clearly in charge in 16th-century Spain, but Aragón maintained separate laws and institutions. Early 16th-century Spain was united only by ". . . a common religion, a common gold coinage, and two monarchs who regarded [each kingdom] as separate compartments of family patrimonies" (McAlister 1984:61).

Castile in the 15th-17th-centuries: Political Economy

The 15th-century was a time of demographic recovery, and when the fall of Granada in 1492 made the reconquest complete under the Catholic monarchs — Isabela of Castile and Ferdinand of Aragón - the peninsula was "unified" for the first time since the Roman Empire. The Reconquest had not been a unified effort on the part of the Christian kingdoms, and even though there was some political unity under the Catholic monarchs, the peninsula was still very much a collection of separate kingdoms in the late 15th-century.

The 16th-century Spanish agrosystem, based on surpluses of grain, olive oil, wine, and purebred stock or animal products (e.g. wool and hides) had its basis in the Hispano-Roman agrosystem prior to AD 500. The Visigoth era saw mostly domestic production, but there is evidence that Roman agricultural practices regarding plowing, fertilizing, and fallow were still being practiced, as well as some intensive, commercial production of wheat and olive oil. The Islamic invasion would have found the basics of the Romano-Hispanic agrosystem in operation, and even though a number of new crops (sorghum, four fruit trees, rice, sugar, and cotton) and improved technology (soil fertilization, tree grafting, extensive irrigation networks) were introduced, this development is seen as "evolutionary, rather than revolutionary" (Butzer 1988:101-102). By the late 15th century, the quality of the natural resources of Iberian peninsula had been greatly reduced compared to the time of the ancient world, and difficulties resulted from inadequate irrigation, extreme climate variation, inequitable land distribution, and poor soil quality (Kamen 1991:48). Kamen (1991:48) adds that Spain ". . . suffered primitive agrarian methods, poor investment, and bad communications made worse by political and customs barriers. . . . Spain's poverty did not make it easy to support an ambitious imperial policy, and the enterprises of the Catholic Kings were carried out in conditions of constant debt."

Elliot (1963:55) nevertheless writes: "The discovery and conquest of the New World was, in reality, very far from being a lucky accident for Spain. In many respects the Iberian peninsula was the region of Europe best equipped for overseas expansion at the end of the fifteenth-century." The Catalans and Aragonese had been involved in Mediterranean commerce throughout the medieval period, the Basques were expert shipbuilders, and the Castilians had been exporting wool to northern Europe since the 12th-century. The vineyards and olive groves of Andalusia again assumed their Hispano-Roman role as exports, this time to the colonial holdings of Spain. By 1611, 60% of Spanish shipping was involved in Mediterranean (20%) and northern European commerce (40%), while 40% of the ships left for the Americas (Usher 1932:210).

Ferdinand and Isabela had failed to produce a competent heir, and upon their passing the peninsula was to be ruled by a foreigner. Juana, the daughter of the Catholic monarchs, was adjudged incompetent to rule and so it was Charles, Juana's son from her marriage to the Habsburg son of Maximilian I of the Holy Roman Empire, who would be king of Spain. Charles was raised in Flanders and spoke no Castilian when he took the throne in 1516 as Charles I of Spain, and became Charles V of the Holy Roman Empire in 1519. Spain bore much of the burden of empire during the reign of Charles V, which included financing five wars with the French, a continuous fight with the Turks from 1521 to 1556, and battles against the Protestants in the Netherlands (Salmon 1971:67). Charles V abdicated the Spanish throne to his son Philip in 1556, who would reign until 1598. The northern European and American trade was controlled by Castile and any discussion of the Spanish economic decline will most likely focus on the two important commodities which dominated these two commercial ventures - Castilian wool and American treasure, respectively.

Earl Hamilton's (1932) classic work on the effects of American treasure on the Spanish economy employs quantity theory to explain the dramatic rise in prices during the 16th-century. The quantity theory holds that when money is scarce, commodities are worth less, and conversely, when money is abundant, the price for commodities will be high. Hamilton demonstrated that the fourfold rise in prices during the 16th-century coincided with comparable increases in imports of American bullion. Hamilton's (1932) thesis has been criticized on two main points. First, it is widely known that contraband trade in bullion was rampant, so it is unlikely that the official bullion figures are accurate. And second, Hamilton's thesis asserts that American bullion was injected into the Andalusian economy and created ". . . a widening circle of rising prices as the silver moved outwards from Andalusia and spread through Spain and then through other parts of Europe" (Elliot 1963:190). There is evidence to suggest that most of the manufactured goods of the American trade were produced outside of Spain, therefore casting doubt on the assertion that the bullion to pay for these goods would remain in Spain. The primary cause of the price revolution is uncertain (Elliot 1963:191).

This leads to the question of why the development of manufactured goods languished in 16th-century Spain. One possible answer lies in the strength of the Mesta -

the powerful organization which advocated advantages for wool producers in Castile. The first known Mesta charters are from 1273 and some have suggested that the organization rose to prominence as a result of the Black Death of 1348-50, when depopulation created large expanses of unused land. The Mesta owned no sheep and was not directly involved in the marketing of sheep products, but the organization fought for expanding pasturage and maintaining migration routes, to the detriment of grain production. Wool became the primary commodity of the mercantile program of the Catholic monarchs and enjoyed certain privileges (tax and duty exemptions) which broke down the many local medieval restrictions inhibiting other commodities (Klein 1920).

The power of the Mesta in the first half of the 16th-century was such that some have suggested that the agricultural expansion required to feed a growing population was thwarted. "It has long been accepted as an obvious fact that Castilian agriculture was destroyed by the Mesta. . . Yet the decline of agriculture was largely due to the tradition the country, which despised tilling of the land as a menial occupation fit only for serfs and *Moriscos* " (Davies 1965:20). The high food prices which resulted inhibited the development of local industry due to the lack of a home market; food prices were too high to allow the wage-earner to buy ". . . anything more than the bare minimum required for their housing, fuel, and clothing" (Elliot 1961:62). The Castilian government tended to favor luxury industries (e.g. silverworking, luxury clothing and leather goods) and it is likely that the money-making potential in the northern European wool trade, and the colonial oil and wine market led to the conversion of farmland to pasturage, vineyards and olive groves. By the end of the 16th-century Castile was dependent on foreign producers for its grain supply and many manufactured goods (Elliot 1961:65).

Kamen (1991:52-53) presents an alternative view. He documents renewed interest in agricultural development during the mid-15th-century to early 16th-century and argues that Spain simply could not grow enough grain. Certain areas did unusually well — the southern meseta and Andalusia, but production was less constant in Galicia, Asturias, the

Basque country, and Aragón. Unfortunately, surpluses in one area could not always be sent to other needy areas, owing to export restrictions and customs barriers. But the Catholic Monarchs were aware of the problems and took steps to correct them. The Catholic Monarchs decreed that peasants could change allegiance to their lords and the export restrictions were reduced in 1500, with the payment of a tax. Wheat was a major export crop for Andalusia, but Valencia and Castile had to import wheat from outside the Iberian peninsula on several occasions during the late 15th/early 16th-centuries (Kamen 1991:53). Given the generally poor agricultural productive capabilities of the 16th and 17th-century in the peninsula, it is remarkable that Castile was able to dominate at all.

By 1540 the emperor turned to Castile for support, and was able to levy taxes with less resistance than in the Netherlands, and was also able to tap the income generated by the trade with the Indies (Kamen 1991:86). But the emperor had embarked on deficit spending — by 1534 the revenues for the next 6 years had mostly been spent. In all, Charles left the Spanish monarchy a debt which they would never re-pay (Kamen 1991:89-90). Charles resigned from the Netherlands in 1555, and from Castile in 1556, and his son, Philip II, would continue to fight his father's "enemies" — the Protestants in the Netherlands and the Turks in the Mediterranean. Philip fought the Turks until 1580, then turned attention to the British Isles and the Netherlands.

The organization of armadas in 1588, 1596, 1597 resulted in failed invasions of the British Isles (Kamen 1991:134). These invasions were related to the Protestant war in the Netherlands. As losses mounted, public opinion grew increasingly hostile to involvement in Flanders. In 1624 an official of the council of the Indies wrote:

> "if the Dutch wish to remain in unbelief, why should we have to pursue such a harmful and ruinous war that has lasted for sixty-six years? Christ never ordered conversions by force of gun, pike or musket. Nobody doubts, " summed up the distinguished bishop Juan de Palafox in 1650, "that the wars in Flanders have been the ruin of this monarchy." (Kamen 1991:139)

Was Spain really in control in the Indies? Kamen argues that this control was more apparent than real. The long distance which orders travelled resulted in colonial officials assuming more autonomy. The principle 'I obey but do not comply' (*Obedezco pero no cumplo*) was often evoked by colonial officials when mandates from the crown were thought to be inapproapriate or misinformed. The Spanish military presence in the colonies was not adequate to defend its interests, and foreigners were trading at will with the Spanish colonies (Kamen 1991:161).

Under Charles V, Spanish involvement in military investment as measured by troop numbers was never great, but this was to change under Philip. Philip increased troops to 67,000 in 1572, from 43,000 troops in 1570. Between 1567-1574, 43,000 troops fought in Italy and in 1587, it is estimated that Philip had over 100,000 troops under his command (although not all were from the Iberian peninsula). "Military expenditure rose accordingly: The money spent on Spain's internal forces tripled between 1578 and 1594, armament spending tripled between 1581 and 1595" (Kamen 1991:162). Prior to 1528, the peninsula had no real naval force, but between 1560-1574 about 300 galleys were built. After 1580, Philip started work on an Atlantic navy and by 1587 there were 104 ships in the Atlantic (Kamen 1991:160-163).

Someone had to pay for all of this and between 1559 and 1598, taxes increased by 430 percent but wages increased only 80 percent. Castile declared bankruptcy in 1557, 1560, 1576, and 1596 (Kamen 1991:167). In 1566, foreign financiers were granted permission to export bullion from the Indies trade as their was little incentive to invest in Castile with its record of bad credit. The Castilian debt and lack of foreign investment in Castile during the latter 16th century resulted in a situation where Castile was not in control of its own future (Kamen 1991:171). Castile had become ". . . a nation whose economic fate was dictated by international capitalism. . . . The most glaring example of foreign control was the commerce of Sevilla" (Kamen 1991:171).

Philip III became king at 28 years of age and ruled from 1598-1621. In 1604, peace with the English was gained with peace treaty of London, and in 1609 a twelve year truce was signed with Flanders, but by 1618 hostilities had renewed (Kamen 1991:205-

210). Philip III died in 1621. His successor, Philip IV, became king at age 16 and reigned from 1621-1665 — the period of Spain's greatest crisis. In 1635 France declared war on Spain, and in 1640, there were revolts in Catalonia and Portugal. The Thirty Years War ended in 1648, and in 1659 the war with France ended with the Treaty of the Pyrenees. This marked the end of Spanish hegemony in Europe, which lasted from 1560 to 1660. "Spain's financial situation was exceptionally bad as a result of the unprecedented effort by Philip II to make the country into a great power . . ." (Kamen 1991:214). When Philip IV died in 1665, the treasury was empty, and the Portuguese rebellion remained unsubdued.

During the 17th century, much of western Europe was experiencing an economic depression, characterized by " frequent epidemics, harvest failures and wars, with a consequent impact on demography, while population decline in its turn affected production and the economy" (Kamen 1991:223). Throughout the 16th-century Spain had a hard time feeding its growing population. Much of the land was either too high or too arid, and climatic variation made even the more productive areas of the north as well as the eastern and southern coastal areas, undependable for feeding the rest of the country (Kamen 1991:225). The Spanish economy was in serious decline by the beginning of the 17th-century, and the political economists of the time recognized the problems and offered solutions: "The tax system must be overhauled, special concessions be made to agricultural labourers, rivers must be made navigable, and dry lands irrigated" (Elliot 1963:65). The opportunity to employ these ideas came in 1609 with the truce with the Dutch, but the years of peace were passed in ". . . senseless gaiety . . ." due to ". . .a whole social system and a psychological attitude which . . . blocked the way to radical reform" (Elliot 1963:65-66). It was also at this time that one of the more unfortunate events of Spanish history took place — the expulsion of the *Moriscos* .

Intolerance of Ethnic Diversity and the "Decline" of Spain

The expulsion of the Jews, Moors, and *Moriscos,* and the persecution of *Conversos* are often included into explanations for the decline of 17th-century Spain. The expulsion of the Jews in 1492 did cause several decades of irregularity in the financial management of internal and external commerce, but more importantly, many of the Jews were replaced by Flemings, Germans, and Genoese who would facilitate the flow of wealth to destinations outside of the peninsula (Elliot 1963:108). The Indies was not completely in the hands of foreigners as there is evidence of Sevillian merchants and financiers, and the merchants in one large 16th-century Castilian city (Burgos) were all native Spaniards. In addition, many of the Genoese and other foreign merchants in Sevilla were permanent residents with Spanish citizenship (Phillips 1987:536; Pike 1972,1966; Reitzer 1960:213,216). Most of the large-scale merchants in Sevilla, however, were indeed foreigners (Kamen 1991).

Likewise, the expulsion of the *Moriscos* (who were rural and urban laborers and artisans) is traditionally viewed as contributing to the decline of Spain by depriving areas (especially Valencia) of a significant portion of its labor force. Phillips (1979,1987) advocates a Malthusian interpretation of the 16th and 17th-century Spanish economic situation in that periods of decline were caused by overpopulation. The expulsion of the *Moriscos* is viewed as part of a demographic adjustment to a declining resource base faced with population growth. Failure to intensify agricultural production (e.g. improve irrigation systems), and unusually dry years are cited as reasons for the decline in the resource base. Recent demographic studies indicate that Spain experienced strong population growth beginning about 1450 to the late 16th-century. The epidemics of 1597-1602 can be attributed to the inability of the economy to either increase agricultural output or buy enough food. The result was an enfeebled population susceptible to disease (Phillips 1979, 1987).

While the decline in the Spanish merchant class in the late 16th-century is viewed by some (Phillips 1987:544) as the result of astute business people cutting their losses and pursuing other alternatives (such as finance, landownership, officeholding, or other business ventures) the traditional explanation is that Castilians lacked the "capitalist spirit." (Elliot 1961:66). They strove, instead, to attain titles of nobility if not from military success (which was preferred, but increasingly rare as the 16th-century progressed), then by purchasing it. Positions in the Church were also prestigious and therefore desirable callings. Servile occupations (which included manual labor and commercial pursuits) were not seen as proper callings for individuals with aspirations of attaining nobility or entering the clergy, and the role of this ideology in the Spanish decline should be considered.

Ideology and the "Decline" of Spain: Santiago, El Cid, and the Spanish "Character"

In 1898, the last remnants of the Spanish "empire" had been lost as Cuba and the Phillippines became possessions of the United States following the Spanish American War. The 19th-century had been characterized by political instability and the early 20th-century was no different for Spain. It was during this time that Spanish intellectuals focused on the Spanish "character" to account for the predicament which faced the Spanish people. Some modern historians dismiss this emphasis on "character" as being inappropriate for historical explanation (e.g. Fletcher 1989), but the attribution of the so-called "decline" of Spain to a lack of the capitalist "spirit," among other things, and the fact that the Spanish themselves considered "character" to be associated with their future as a nation, suggests that considerations of writings concerning the Spanish "character' and/or "spirit" are indeed appropriate to gain an understanding of Spain.

In AD 845 a church was built on the site of the discovery of the remains of the Apostle St. James in what is now the province of Galicia. "In 844 a fierce battle took place at Clafijo in the Ebro valley. According to legend victory was achieved for the Christians by the miraculous intervention of St. James, mounted on a white charger and putting to the sword all the Moors in his path. He was then hailed as 'Santiago Matamoros' (the Moor-slayer) and was recognized throughout the country as the patron saint of Spain" (Marshall-Cornwall 1981:46-47). Over 700 years after his death, St. James was reinvented and became a symbol for Christian identity in the Iberian Peninsula of the Middle Ages.

At the end of the Middle Ages, the Catholic Monarchs would again sieze on this militaristic religious theme as incentive/justification for invading Granada, the last tiny remnant of Muslim political control. Initially, the conquest of Granada appeared to follow the earlier medieval pattern of coexistence, but this changed as conversion to Christianity became a requirement of continued residence in Granada, and a 1499 revolt was the result. Unlike her medieval predecessors, Isabela supported forced conversions which resulted in another revolt in 1500 (Kamen 1991:36). The Reconquest was not an example of great military prowess (after all, it took over 700 years), and the economic gains were not overwhelming, so perhaps it is not surprising that the Catholic monarchs emphasized the religious more than the military aspect of the invasion of Granada. This was a defining moment as it wasn't until the late 15th-century, at the strong persuading of the Catholic Monarchs, that Christians in Spain ". . . acquired for the first time the conscious zeal for the faith which became the distinguishing characteristic of the Spaniard . . ." (Salmon 1971:37). This new-found religious zeal formed the rationale for the Inquisition, the expulsion of the Jews and later, the *Moriscos* . Ideology had transformed what originally was a nationalistic conflict between Christian and Muslim states, into an ethnic conflict between Spanish citizens.

St. James became transformed into *Santiago matamoros* during the 8th-century some 700 years after his death, and in the late 19th-century, another long-since-dead Christian, Rodrigo Díaz de Vivar (?1043-1099), was re-introduced to the Spanish as "El Cid" and portrayed as representing the ideal Spaniard. *"El Cid"*, or "leader", as he may have been called, played a key role in expelling the Moors from Valencia (although only for a short time). Roughly 800 years after the death of *El Cid,* Spain was on the brink of civil war and a Spanish historian would point to *El Cid* as an example of a true Castilian - concerned with the unity of the Peninsula in the face of an invading force. *El Cid* was presented in order to remind the Spanish people that as "ideal" or "true" Spaniards, like *El Cid,* their response to the growing unrest of the time should be unity in the face of adversity. The fact that Rodrigo Díaz de Vivar, as a true mercenary, fought for both Christian and Muslim alike, was not emphasized.

At the end of the 15th-century, it was the monarchy who influenced the religious fervor which was to characterize the Spanish presence in the Americas, but at the end of the 19th-century, it was the intellectual community who looked to the past to find remedies for problems in the present. The "present" of Spanish intellectuals at the end of the 19th-century was one of failed empire (made even worse by the military loss to the U.S. in 1898), and increasing political unrest which would lead to three years of civil war and the success of a dictator. Writers such as Unanamo, Ramón Menéndez Pidál, and José Ortega y Gasset chose to focus on the Spanish character in their attempts to understand their situation. Unanamo, considered the leader of this group which is referred to as the generation of '98, felt that the Spanish character was best represented by the Christian kingdoms of the Middle Ages —

> . . . Unanamo all his life was obsessed by the Spain of the Middle Ages. 'I feel that my soul is mediaeval,' he cries, 'and that the soul of my country is mediaeval: I feel that it has passed perforce through the Renaissance, the Reformation, the Revolution, learning from them but never letting its soul be touched; and Spanish Quixotism is nothing but the despairing struggle of the Middle Ages against the Renaissance' ["El Sentimiento Trágico de la Vida," Madrid, 1913] . (Menéndez Pidál 1950:13)

Ramón Menéndez Pidál would glorify a figure from the Middle Ages *(El Cid)* as the model Castilian, but he looked further back to define the Spanish character — "The greater localism of Spain does not depend upon a multitude of ethnic-geographic reasons, but on the contrary, on a uniform psychological condition; it depends upon the original exclusive character of the Iberians, already noted by the authors of antiquity . . ." (Menéndez Pidál 1950:179). Menéndez Pidál called it "sober austerity," for Unanamo it was a ". . . harsh, dry spirit . . . with its lack of the sense of compromise" (Menéndez Pidál 1950:119). But for José Ortega y Gasset, the Spanish character was exemplified by pride — endless pride — pride which prevented the acceptance of anything different, regardless of the beneficial consequences:

> [Spaniards] . . . are such haters of novelty and innovation. To accept anything new from the outside would humiliate us, because it would be equivalent to recognizing that we were not previously perfect, that something good could be discovered outside ourselves. To the true Spaniard, all innovation seems frankly a personal offence. (Ortega y Gasset 1937:153)

The Spanish character, as described even by the Spanish economic historian, Jaime Vicens Vives, was not well-suited for commercial enterprise, as he asserts that "Spain's genius is anti-economic . . ." (Vicens Vives 1969:28-29). Almost a century earlier, the German historian Wilhelm Roscher (1885:2) elaborated on this theme:

> The character of the Spanish people has, from the beginning, been prone to indolence and pride. All thrifty activity was regarded as despicable. Every tradesman and manufacturer sought only to make enough money to enable him to live on the interest of it or to establish a trust fund for his family. If he was successful he either entered a cloister or went to another province in order to pass for a noble.

Roscher's statement is reflected in the traditional discussions of the decline of Spain, which assert that the desire for titles of nobility (i.e., the aversion for manual labor) and positions in the Church created increased numbers of non-producers (the nobility) and decreased fertility due to the abstinence vow of the Church. As a broader picture of 17th-century western Europe is attained through additional historical investigations, it has been demonstrated that the general economic decline was not isolated to Spain; and further, that "idleness" or underemployment - a symptom of economic backwardness, was common in the rest of 17th Europe (Elliot 1963:55). Further, there were few *hidalgos,* or nobles in Andalusia; most were in central and northern Castile (Defourneaux 1979:82). Phillips (1987) maintains that increased numbers of clergymen had little effect on the population. The rising population and failure of the provisioning resource base to keep pace left few employment opportunities (there was always the Church); decreased reproduction might be viewed as a logical response for a population which had outgrown its food supply (e.g. Phillips 1987).

Discussion

Changing social and political climates lead to new interpretations of historical processes and events, but more importantly, the continual searching and re-searching of the mountains of historical documents allows historians to learn more and re-interpret what is already known even after many histories are written. This is particularly apparent in regard to interpretations related to the "decline" of Spain. In the first half of the 17th-century, it was fashionable for the elites of European countries to take the "Spanish Tour" (Defourneaux 1979:6). Travelers observed an economy in ruins and a dispirited people, so it is no wonder that ideas such as the "lack of a capitalistic spirit" took hold in narrative histories. If the Spanish Tour had begun a century earlier, a much different view of Spain may have resulted. The work of historians has shown that the early 16th-century Iberian economy was growing and there were numerous commercial entrepreneurs. The capitalistic spirit did, in fact, exist in 16th-century Spain, and after a general economic decline hit Europe, these entrepreneurs weathered the storm in safer, less conspicuous ventures [(as suggested by Phillips (1987)].

The work of such modern historians as Henry Kamen (1978,1988,1991) and J.H. Elliot (1961,1963,1991) provide convincing arguments that the problems of 17th-century Spain were *not* caused by any attitude which the Spanish had toward commercial activity. Instead, it seems that the causes of Castile's economic decline lie in a series of internal and external political and economic factors. The weakness of Visigothic feudalism, coupled with a strong maritime and military tradition, created a situation whereby a king who was unable to speak Castilian could drag Castile into a military/commercial role for which it was ill-prepared. This precarious political formation would operate on an ultimately unreliable resource base defined largely by Castilian wool production and extraction of American treasure.

Conclusions

It appears that the image of mid-seventeenth-century Spain as a failed attempt at empire can be replaced with that of a once-rich peninsula whose resources had been continually extracted by a series of invaders since ancient times — the most recent "invaders" being the Holy Roman Empire and its obsession with stamping out disbelievers. There was no decline of Spain, only a general economic recession experienced by all of Europe after fighting with itself for over one hundred years. This conflict would continue for the next three and a half centuries, although it would not be for religious reasons; Spain would be involved, but only as a minor player.

Castile appears to be an early example of economic dependency in the post-1500 world, and in effect functioned as a "colony" of the Holy Roman Empire. Its domestic economy was organized to support the commercial and military activities of the Holy Roman and Habsburg Empires under Charles V, and even though Philip II was politically no longer a part of either empire, he continued to fight the Protestants in Flanders to the detriment of Castile. Foreign merchants and financiers had gained a foothold in Castile during the time of Charles V and continued during the time of Philip II. This involvement of foreign commercial and financial interests meant that the wealth of the Indies was not re-invested in Castile to develop its own manufacturing sector, but rather funneled to the rest of Europe. As a result, Castile became dependent on the rest of Europe for many of its manufactured goods.

Dependency of a different sort has even been reflected in the writing of Spanish history. Julián Marías (1990:xi), for example, writes:

> One of the greatest difficulties is that the history of Spain has usually been written - and, to be sure, by Spaniards themselves - from the viewpoint of other European countries, from an angle that might be adequate for understanding them . . . , but which is not adequate for understanding the Spanish reality. A good part of the impression of 'strangeness' that Spain has aroused comes from this, as when it is discovered that a certain fish is most peculiar until we realize that it is not a fish at all, but a bird.

Marías suggests that the perception of the "strangeness" presented by foreign historians is due, in part, to the fact that the Spanish have had a long tradition of interaction with the "other" — the Phoenicians, Greeks, Carthaginians, Romans, Visigoths, and Moors all came to the Iberian Peninsula and contributed to the cultural traditions manifested in sixteenth and seventeenth-century Castile.

The "others" came to the Iberian peninsula to extract wealth in one form or another. The Phoenicians introduced commodity production in support of extractive industries to the Iberian peninsula with production of pottery containers for the maritime transport of wine and olive oil. The Greeks, Romans, and Moors would continue the extractive tradition in the Iberian peninsula, and in the 16th-18th-century, it was the Spanish who brought this extractive tradition to the New World. The Iberian peninsula is therefore an ideal test case for the investigation of the development of support commodity production in the post-1500 world. Chapter 4 will focus on one such example of support commodity production - the production of pottery containers in the Iberian Peninsula for the maritime transport of wine and olive oil.

CHAPTER 4

A REVIEW OF AMPHORA STUDIES: APPROACHING A MODEL FOR SPANISH OLIVE JAR PRODUCTION AS AN EXAMPLE OF SUPPORT COMMODITY PRODUCTION

Introduction

The study of amphoras/olive jars has had an uneven development, but within the last 20 years, advances in both recovery techniques and methodological approach have allowed a more complete picture of one of the longest pottery traditions known to archaeologists. The development of more advanced underwater investigative capabilities during World War II (i.e., the self-contained underwater breathing apparatus) led to the increased underwater exploration of shipwrecks after the 1960s. The integration of shipwreck archaeology and historical documents with terrestrial archaeology, as well as with natural science techniques for determining provenience, function, and method of manufacture, has created a research strategy capable of generating data beyond chronology which can address research questions related to political-economic-social concerns.

Prior to the development of underwater archaeology, archaeologists had to rely on the oftentimes fragmentary remains of amphora/olive jars recovered from land sites, but exemplary work was nonetheless produced. The pioneering work of the German scholar Heinrich Dressel in the late nineteenth-century resulting in a typological system for Roman amphoras which is still incorporated into the most recent works on amphora typology (e.g. Peacock and Williams 1986; Sciallano and Sibella 1994). The distinctive amphora shapes produced by the various Greek city states allowed Greek amphoras to be used as a chronological tool, but this has been more closely linked to classical than to economic studies. Most notable is the summary work by Virginia Grace first published in 1961, which is still cited by studies of Greek amphoras today. John Goggin's classic "introductory" work on Spanish olive jars published in 1960 used what little shipwreck material available at the time, but relied primarily on excavated material from land sites. The result is still the most comprehensive study of olive jars which has received only minor revisions in thirty years.

A review of amphora studies of antiquity illustrates the fruitful results that are obtainable when more than one data base is used. Studies of Greek and Roman amphoras integrate the data bases from archaeology (both terrestrial and underwater) with historical documents, writings of the classical authors, and technological studies of composition (petrology), method of manufacture, and function. These data are then used to answer economic questions of production, distribution and consumption. Most of the work has been related to distribution, but newer studies are using shipwreck data to investigate production, for example, in Roman Spain (Curchin 1991:130). Most notable is the work by K. Greene (1986) summarizing 78 Roman Spanish shipwrecks during the first two centuries A.D (Curchin 1991:130). Vessel contents are associated with specific forms, and production levels of wine, olive oil, and salted marine products can be inferred from the proportions of the specific amphora on the shipwrecks. After the 7th-century AD, amphoras were not widely used. There appears to have been a general decline in commercial activity in the western Mediterranean, and it is also suggested that there was a shift to use of barrels (Unger 1980:51-52). The amphora tradition is documented in the eastern Mediterranean during this time period and there is evidence for recycling of Byzantine amphoras on two wrecks - one from the 7th-century and the other from the 11th-century (van Doornick 1989:256). Byzantine amphoras continue to be used in small numbers in the Eastern Mediterranean until the 14th-century, when they finally disappear (Bakirtzis 1989).

This chapter briefly reviews the work on amphoras to form the context for understanding olive jar production in 16th-18th-century Castile. The direct lineage of the

Spanish olive jar cannot be determined in an unbroken sequence from Late Roman amphora to olive jar, but it is clear that the second half of the 16th, as well as 17th and 18th-centuries saw a marked increased in the use of olive jars as indicated by the large quantities recovered by archaeologists in both Northern Europe and the Americas.

The Canaanite Jar (1800 B.C. - 1200 B.C.)

The first pottery maritime transport container to be used on a large scale in the Mediterranean was the Canaanite jar. The Canaanite jar was present in the Middle Bronze age at the beginning of the second millennium B.C. in the north Lebanese-Syrian coastal area. The pointed or rounded base is considered to represent a "technological revolution" as mechanical stresses from impact are dissipated more effectively with a rounded as opposed to flat base (Parr 1973). It is suggested that the occurrence of this shape represents a transport container which would be subjected to more bumps than a domestic storage container. The earlier Canaanite Jar forms are oval shaped with short necks, thickened rims, and small loop handles just below the shoulder. Later forms have a much more angular shoulder and conical body shape (Grace 1956; Amiran 1970). The jars described in detail by Virginia Grace (1956:101-109) are unglazed, apparently coil-built rather than fast wheel thrown, and range in capacity from 22,575 cm3 to 6,495 cm3 (volume determined with wheat). There is no mention of slip or other interior lining. Documentary evidence indicates that incense, sefet oil, and olive oil were most commonly transported in the jars; "honeyed wine" was less commonly transported (Grace 1956:98). Stamps and incised marks are found on the handles and shoulders of the jars. Canaanite jars are found in the areas of Bronze Age Egyptian and Greek empires where they were copied.

A late Bronze Age shipwreck located near Ulu Burun, Turkey, dating to the 14th-century B.C., carried a cargo of close to 150 Canaanite jars filled with pitch, in addition to copper, tin and glass ingots. The jars come three sizes ranging from 59 cm to 50 cm in height, and 24 cm to 39.5 cm in diameter. There is evidence that potsherds were used as stoppers. Organic material such as small bones and snail shells suggests that the jars had carried other commodities before being reused as pitch containers (Pulak 1988).

Phoenician and Punic Amphoras (1200 B.C. - 200 B.C.)

After the beginning of the Iron Age in Canaan (ca. 1200 B.C.), the people of that region are referred to as "Phoenicians". Even though there were no qualitative changes in the make-up of the Canaanite people, the Canaanites became Phoenicians in the eyes of scholars after 1200 B.C., in part because it creates a division (albeit an arbitrary one) between the Late Bronze Age and Iron Age in Canaan, and also because there was a shrinking of territory of the Canaanite territory as described in Chapter 2. When the Phoenicians in Spain moved east out of the peninsula some time in the beginning of the 6th-century B.C., and Carthage established dominance, the Phoenicians who settled and lived in Carthage are referred to as Punic or Carthaginian. But this Carthaginian hegemony did not occur until the end of the sixth-century B.C., and so the Phoenicians in Spain from the period between 1200 B.C. and 600 B.C. are referred to as Phoenician (Aubet 1993:5-12). In sum, terminology for the Near Eastern line of pottery maritime transport container (amphora) is as follows:

from 1800 B.C. to 1200 B.C. — Canaanite Jar;
from 1200 B.C. to 600 B.C. (in the west) — Phoenician amphora;
from 600 B.C. to 333 B.C. (in the west) — Punic or Carthaginian amphora.

Phoenician amphora in Spain and Morocco during the 8th-century B.C. are more bulbous than the sharp-shouldered, conical Canaanite jars of the Late Bronze Age, and the 8th-century Phoenician amphora in Carthage and Malta resemble the oval-shaped 15th-century B.C. Canaanite Jars (Bartolini 1988b). Bartolini (1988b:499) states that the pattern of amphora development in the west is the exact opposite in the east. Both the oval and conical forms were introduced in the west, but in the east the conical sharp-shouldered form came to predominate, while in the west the oval form was much more common. Vessel capacity ranges from 20 to 25 liters (5.3 to 6.6 gallons) - very similar to the Canaanite Jar. Archaeological evidence indicates that the Phoenician amphora carried "grain, fish and bits of meat preserved wine" (Bartolini 1988a:84). The transport of wine and olive oil is presumed, although there is no direct evidence for it. Ribera Lacomba (1982) describes Iberian imitations of Phoenician amphoras in the region of present day Valencia. Recycling of Phoenician wine amphoras is found in Herodotus — amphoras exported from Syria to Egypt were emptied of their contents (wine) and filled with water for use on the desert road to Syria (Grace 1961:4; Mallowan 1939:87). The large elongate Punic amphora were used as "ossuaries and sepulchral urns for children" (Bartolini 1988b:492).

"It is significant that in western Andalusia the 8th and 7th-centuries B.C. witnessed a spread of the use of iron, and of the potter's wheel" (Aubet Semmler 1988:228). Aubet Semmler (1988:232) describes "industrial districts" in eastern Phoenician Spain dedicated to metal working and pottery production at the end of the 8th-century B.C. In one city, Toscanos (in eastern Andalusia), the remains of a large warehouse have been investigated. Amphoras and jars for the transport of wine, oil and wheat were found inside. Greek amphoras from the city states of Attica, Rhodes, and Corinth have been found in 7th-century B.C. contexts at Toscanos. In Spain "During the entire 7th-century B.C. goods were delivered to Phoenician ports from the East, from Cyprus, eastern Greece, Pithekoussa and even Etruria, probably in exchange for wheat, oil, and wine" (Aubet Semmler 1988:236). The Phoenicians left Spain during the 6th-century B.C., and Greek influences have been identified in formerly Phoenician areas of western Andalusia.

The beginning of the Punic period in Spain is marked by the arrival of the Carthaginians during the 6th-century B.C. "The Punic period reflected a new socio-economic situation in which the old Phoenician mercantile ports were replaced by urban centres . . ." (Aubet Semmler 1988:237). There is also more indication of rural settlements in the interior areas of eastern Spain where there was commodity production of wine, and oil in contrast to the primarily coastal agricultural pattern of the Phoenicians. The beginning of the 6th-century B.C. starts a trend toward larger, more elongate amphoras in Carthage. "Production seems to have taken place at several centres. A kiln is known at Knouass in Morocco (Ponsich 1967), while production is well documented on Ibiza (Ramón 1981) and has been postulated for the Carthage region and Tripolitania (van der Werff 1978)" (Peacock and Williams 1986:22).

Greek Amphoras (700 B.C. - 86 B.C.)

Virginia Grace (1961) suggests that the development of the Greek amphora, which first appeared during the 7th-century B.C., was inspired by the Canaanite Jar. The Greek city states manufactured amphora in distinct forms so it is readily apparent if an amphora was manufactured in Rhodes, Corinth, Knidos, Thasos, Chios, etc. (Peacock and Williams1986:22). Petrological work has shown that the fabrics of the various city states might be distinguished petrographically (Whitbread 1986). Classical documents indicate that amphoras had standardized sizes within the Greek city states (Wallace 1986:87), although these standards varied between the different states and also through time (Grace 1961:11). Archaeological work on both landsites and Greek shipwrecks has generally verified this standardization (Grace 1961; Koehler and Wallace 1987).

The stamps on Greek amphora handles may indicate the origin of the amphora either by mentioning the specific state or leader; sometimes the month is given. On the island of Thasos in the late 5th-century B.C. a decree stated ". . . if someone buys wine in wine jars, the purchase shall be valid if (the seller) has stamped a seal on the jars" (Meijer and van Mijf 1992:111). Grace (1961:11) states ". . . the chief purpose may have been to fix more closely the responsibility for their being containers of standard capacity, while one effect must have been to date the contents, identifying for instance the age or special vintage of the finer kinds of wine, and the freshness of the cheaper which were not worth drinking after a year." The name of the potter and dating official occur on one type of Greek amphora. Counting of the stamps has been used to investigate change of production locales and levels through time, but such studies have received criticism as not all handles were stamped while sometimes one handle was stamped and sometimes both were stamped (Garlan 1983; Peacock and Williams 1986:22-23).

Grace (1961:1) suggests that wine was the commodity most often transported in Greek amphora, while olive oil, preserved fish, and pitch were common, but secondary to wine. The Greek wine amphoras, like the Phoenician wine amphoras, were also recycled by the Egyptians for use as water containers along the desert road to Syria. Documentary evidence indicates that the amphoras from the various city states were referred to by using their name of origination, for example, so many "Knidians" or "Rhodians" of wine. There is also documentary evidence that Greek amphoras were used as weapons. A defending Greek force is said to have dug a large hole, filled it with amphoras, and covered it with dirt and grass to simulate natural ground cover. When the advancing army came upon the trap, the weight of the horses broke the amphoras, causing the horses to fall and break their legs (Grace 1961:5).

One good example of a multidisciplinary approach to the study of Greek amphoras is the work of Pamela Vandiver and Carolyn Koehler (1986) on Corinthian amphoras. Koehler's (1978, 1979) descriptive work on Corinthian amphoras investigated the distribution patterns of Corinthian amphora in the Mediterranean world. From 700 B.C. to 150 B.C. there exist two types of Corinthian amphora - Type A and Type B. Type A bad a globular body with elongate neck, thick rim and stirrup handles, while Type B has a more conical base and thinner rim. The stamps that sometimes occur on the handles are not precisely understood - they may represent makers' marks, or perhaps verification of vessel capacity. Resinous lining found on some Type B amphoras suggests that this type might have held wine. The stamps alone were not sufficient to determine vessel contents. But with the addition of technological studies, Vandiver and Koehler (1986) present evidence that Type A carried olive oil and Type B carried wine.

Type A amphoras were handbuilt, had coarse temper, and were fired to higher temperatures than Type B amphoras. These higher temperatures, along with the addition of potash flux and a redox firing schedule (part oxidizing, part reducing firing atmosphere) resulted in the formation of a glassy phase on the surfaces and thus rendered the Type A vessels impermeable. Type B amphoras were fast wheel thrown, had smaller aplastic inclusions, and were permeable. It is suggested that the higher firing temperature required coarse temper in order to maintain vessel shape during firing. The coarse temper necessitated handbuilding as the larger temper particles would make fast-wheel throwing a painful experience for the potters. Both Types were manufactured in stages, with the major part of the body being made upside down.

After 300 B.C., Type A1 replaces Type A. Type A1 is fast-wheel thrown, fired at lower temperatures than Type A, and permeable. Several interpretations are suggested. Type A1 may represent a cost-cutting move in manufacture. Handbuilding requires more time than fast-wheel throwing, and the higher firing temperatures requires both a longer firing schedule and more fuel. The change may also indicate changes in vessel contents. One possible interpretation not mentioned is the fact that reuse was no longer a concern. The Type A impermeable amphora could be reused for olive oil transport. It is possible that the Shift to Type A1 represents the production of a one-way only olive oil container.

Circumstantial evidence for workshop production is offered. Even though the forms are not particularly uniform, there is evidence that many amphoras were made at one time. Little effort was expended in smoothing production marks, and corrective measures indicative of rapid drying are observed. Whatever the case, the addition of technological studies to Greek amphora has allowed archaeologists to obtain more information of the sherds.

A Hellenistic shipwreck at Serçe Limani, Turkey dating between 280-275 B.C. (based on the amphora stamps) contained a cargo of over 600 amphoras. With few exceptions, the amphora have been tentatively identified as Knidian (Pulak and Townsend 1987). Resinous linings and grape seeds found in some of the jars suggest that they contained wine. No evidence of stoppers was recovered. Two sizes were identified and the volume of 89 large amphoras and 24 small amphoras was measured. The large jars have an average capacity of 38.0 liters (range 34.6 to 42 liters) and the small jars average 10.87 liters (range 9.3 - 11.3 liters) (Koehler and Wallace 1987). These measurements cannot be taken as representing the amount of product transported. Wine is generally given "head space" to allow space for expansion. U.S. standards require 5-8% "head space" (Mair 1983:102). The variation within the two general sizes might be explained by the differing amounts of resin lining remaining in each amphora. But since amphora are not mold-made, some degree of variation is to be expected even with a potter's best efforts at standardization. The important thing is the ratio of the large to small capacities. The Knidian standard measure is not known and it is hoped that continued capacity studies might lead to determining the size of the standard measures of Kouass.

Roman Amphoras (130 B.C. - A.D. 395)

Greek influences in Italy during the 4th and 3rd centuries B.C. led to the development of Greco-Roman amphoras, the forerunners of the Roman amphora which developed sometime around 130 B.C. (Peacock and Williams 1986:23-24). D.P.S. Peacock has made significant contributions in the area of using a multi-disciplinary approach to the study of Roman amphora production as his work integrates petrographic analysis, social factors, and economic models to understand production and distribution patterns in the Roman world. Much of the following discussion of Roman amphoras will draw on Peacock's work (Peacock 1977,1982; Peacock and Williams 1986).

In amphora studies or "amphorology" the Roman amphora were the first to receive comprehensive treatment. The work of Heinrich Dressel on the stamps and forms in the late nineteenth-century is still referred to today. Recent compilations of amphora forms and distributions (e.g. Peacock and Williams 1986; Sciallano and Sibella 1994) still use many of Dressel's identifications.

The uses of Roman amphoras are numerous:

> Callender (1965) lists the following functions for Roman amphorae: their use as hearths, paving, water butts, flower pots, money chests, acoustic pots, store cupboards, war weapons, boundary marks, burials, sanitary vessels; and as containers for chalk, lime, olives, fish sauce, salted fish, fruits, dried fruits, nuts, pepper, beans, lentils, honey, grain, flour, unguents, hair remover, milk, water, vinegar, urine, medicines and potters clay! Sir Mortimer Wheeler (in a lecture) quoted a site in Romania where amphorae had been found with nails inside. (Rahtz 1974:100)

1,350,000 Roman amphoras containing finely washed potters clay were found at Turin (White 1975:123). But wine and olive oil were the principle commodities transported in Roman amphoras (Sealy 1985:9). Wine was carried in the large, cylindrical Roman amphora, while olive oil was carried in the globular amphora. A third size, the "carrot" shape, probably carried honey, valued fruit, or unguents and perfume. White (1975:124) notes references in the classical texts to fiber-covered amphora for both wine and oil, and suggests that this covering is for protection during use on the farm. Others have suggested that such coverings — possibly esparto weaves — were also for the protection of amphora during transport.

Like Greek amphoras, Roman amphoras were marked. These marks included stamps on the handles, spike or body, incised writing on the shoulder, and painted writing - *titula picta* on the shoulder. The meaning of the stamps is not precisely known, they might represent potter's marks, place of manufacture, or the name of the owner of the operation. Although the painted inscriptions are fairly rare, they are very valuable as they can provide information about the date, in addition to the origin and description of the contents. The painted inscriptions have indicated that wine was transported in a cylindrical amphora (specifically Dressell 2-4), and olive oil was transported in the globular forms (specifically Dressel 20) (Peacock and Williams 1986:2, 9-16). *Titula picta* on Haltern 70 amphora recovered from a shipwreck indicated that the contents were *defrutum* — a sweet, non-alcoholic viscous substance ". . . obtained by boiling must (grape juice) . . . used to conserve fruit, to improve the taste of bitter or unpleasant wine, to make up a drink for slaves, to feed bees, and for various medical and other purposes" (Parker and Price 1981:223).

The technique of Roman amphora manufacture appears to have involved a stepped process of fast-wheel throwing, and paddle and anvil. Josine Schuring (1984) suggests that the cylindrical amphora were thrown in sections — four cylinders thrown separately were joined together to form the body. Drops of clay on the interior of the shoulder indicate that the base was closed while the vessel was upside down. Peacock and Williams (1986:46) relate that the manufacture technique might incorporate stages of wheel throwing and coil building at spaced intervals to allow the body to stiffen and thereby provide a solid base to add additional coils, which then would be wheel smoothed. Sciallano and Siballa (1994:12) present a technically less precise scenario, but one that is possibly more accurate in terms of what can be interpreted from visual examination. Upside down throwing/handbuilding for both the cylindrical and globular forms was quite likely. Schuring (1984:61) states that the joins between cylinders which form the body are not visible and infers that they have been smoothed away. White (1975:123) writes:

> Some amphorae were made entirely on the wheel, as may be proved by the typical 'rills' made in the process of building up. Others were hand-thrown, perhaps around a rope core, Many extant specimens show evidence of having been made in two sections, an upper and a lower, which were afterwards joined together. Callender (p. 42) cites evidence of visible finger-marks made by the potter kneading in the joints.

Whatever the manufacture process, there can be little doubt that the most expedient technique was preferred given the large quantities of amphora that were produced.

Preparation of the amphora paste is not well known, and given the presence of aplastic particles it is unclear if these aplastics were added intentionally or if clay sources with such inclusions were selected for use. Studies of Catalan wine amphora (Dressel 2-4) indicate that there was a minimum of clay processing as clay sources with coarse aplastic inclusions occur naturally. Such inclusions are required for structural reasons during the forming, drying, and firing of large pottery vessels. The presence of these coarse inclusions make amphora sherds well suited for petrographic analysis of thin sections taken from amphora fragments. Peacock was able to make major contributions by applying petrology to amphora studies (Sealy 1985:4). The Catalan Dressel 2-4 and other amphora forms have an external white-colored surface which resembles a slip but is actually the result of a bleaching action by soluble salts during firing (Peacock and Williams 1986:44-45). Peacock and Williams (1986:45) have reproduced the effect experimentally by adding salt to the fabric. It is unknown if the effect was intentional or if there was naturally occurring salt in the water used for clay preparation.

The location of numerous amphora kiln sites is known, but few have received intensive archaeological treatment. The amphora kilns that have been investigated do not appear to be standardized beyond being large, updraught and generally round, ranging from 3.5 to 5.5 meters in diameter (Peacock and Williams 1986:47). Peacock and Williams (1986:67-77) list the known probable amphora kiln sites; the breakdown is as follows:

Britain — 1 So. France — 40 Italy — 14 Lybia — 3
Portugal — 2 Spain — 30+ Yugoslavia — 1

Many of these sites are amphora waster dumps - the presence of a nearby kiln is inferred, but has not been field verified. In Spain and France, as can be expected, the great majority of the amphora production areas are associated with the areas of agriculture, arboriculture, and fisheries — along the coast line and in the major river valleys. One exception is located in France well away from the Mediterranean. In some areas amphora production is associated with brick manufacture and coarse earthenwares associated with handling liquids, but not with the production of fine wares.

Condamin et al. (1976) were able to determine if an amphora sherd held olive oil by directly analyzing the fabric of the amphora through the technique of gas chromatography. The lack of resinous sealant on the interior of olive oil amphora is verified in the classical documents: ". . . Columella (De Re Rustica 12.49.11) warns not to line vessels with pitch if they were destined to store olives preserved in their oil" (Heron and Pollard 1982). Roman olive oil amphora which carried oil from Spain to Rome were permeable and unlined. The oil soaked into the fabric of the amphora and rendered the vessels unusable after they had transported their contents. A huge mound (50 meters high) of broken amphora was the result (Will 1977; Keay 108:103). The resinous interior sealing observed on some amphoras has been identifed as pine resin (Heron and Pollard 1988; Beck et al. 1989). The presence of resin on the interior has generally been interpreted as the sealant associated exclusively with wine transport, but contents other than wine have been found in such amphora (Heron and Pollard 1988:430). Heron and Pollard used gas chromatology-mass spectrometry in their analysis of Roman amphora, and as did Beck et al. (1989), who also used IR spectroscopy, and thin layer chromatography in their analysis of a collection of amphora sherds recovered from the harbor of Carthage. The collection analyzed by Beck et al. (1989) included Punic, Greek, Greco-Italian, Roman, and Byzantine (4-7th-century) amphora sherds. The collection consisted of thousands of sherds, but only small percentages from each period had evidence of a sealant.

Amphora studies have done much to clarify the Roman Spanish economy and its relationship to the rest of the Roman world. Sealy (1985) reports that at Colcester Sheepen, amphora-borne imports during the first century A.D. Roman era were predominantly from Spain. Imports of olive oil, salted fish products, and *defrutum* came exclusively from Spain, and of all Spanish imports in amphoras, olive oil was the most dominant — more so than wine. Williams (1981) reports high densities of Spanish-produced amphoras in some Late Iron Age, pre-conquest sites in southern Britain. Italian amphoras are also recovered from these sites. Williams suggests that this area of Britain may not have been "anti-Roman" in the immediate pre-conquest period. Riley (1981) emphasizes that Roman pottery production is characterized by three organizational processes: 1. agricultural-related production (i.e., amphora, bulk containers, storage jars), 2. commercial-related production (i.e., fine pottery), and 3. utilitarian wares (coarse, undecorated functional wares). He also mentions brick and tile production as related to the building industry. Riley (1981) notes that amphora and fine pottery production rarely coincide and therefore the traditional focus on fine pottery neglects certain portions of the overall organizational character of pottery production.

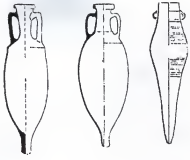
In the ancient world, transport by water was by far the most cost efficient mode of transport — one researcher suggests that the cost ratios for sea transport, inland waterway transport, and land transport was 1:4.9:28-56 for the Roman period. The archaeological distribution of amphoras bears this out as amphora fragments are overwhelmingly found in close proximity to coastal areas. The manufacture locale must also be thought of in terms of transportation costs. Peacock and Williams (1986:39) begin this discussion with the presumption that it would be most efficient to package the wine or olive oil in amphoras at the site where the commodities were produced and thus hypothesizes estate production of amphoras. Estate amphora production appears to occur in North Africa as neutron activation analysis of amphora sherds indicates a large number of "small clusters of amphorae with similar chemical composition which is exactly the pattern one might expect from relatively small-scale production on scattered estates" (Peacock and Williams 1986:41-42). Peacock and Williams (1986:42) also find evidence for estate production of amphoras in Gaul and around Barcelona. But the pattern in the Guadalquivir River valley is different in that production appears to be centralized. Amphora kiln sites with up to 25 stamps at a single kiln site indicate that one kiln might produce amphora for a number of estates. The location of the kilns along a water transportation feature further suggest that the high cost of transporting the bulky (and heavy) amphoras by land might be reduced by manufacturing and filling the amphoras next to a river. A clearer case of specialization in amphora production is seen in the production of garum or fish sauce in the Cádiz area where "huge waste heaps . . . composed almost exclusively of amphorae" have been located (Peacock and Williams 1986:43). The organization of amphora production appears to vary, perhaps as the scale of production varies. The large scale production of olive oil and garum in Baetica may have required the services of potters devoted solely to the production of amphoras, while the amphora needs of smaller estates could be met by on-site amphora production.

Shipwreck archaeology has also contributed much to the understanding of the Roman Iberian economy. Leonard Curchin (1991) summarizes both terrestrial and underwater archaeology during the Roman period in Spain. The nature of Spanish production is reflected in the amphora of Roman shipwrecks of Spanish origin. From 78 such shipwrecks dating from 50 B.C. to A.D. 250, ". . . the cargoes consisted of 66 percent *garum* (fish paste), 16.5 percent olive oil, and 7.5 percent metals; however in the last century of this period, oil amphoras outnumbered those containing *garum*" (Curchin 1991:130-131). At a Roman seaport in Italy - Ostia - the pattern of imports from Roman colonies can be compared by comparing the origins of the various amphora. Spain clearly dominated in the first century A.D., and was co-leader with Gaul in the second century, but in the 3rd and 4th-centuries, North Africa was dominant and Spain and Gaul were much reduced (Curchin 1991:131). Curchin (1991:152) suggests that the predominance of North Africa in the 3rd and 4th-centuries might be related to the type of amphora. Dressel 20, which held just 77 liters, was the standard olive oil container for Baetica. "African oil producers developed a cylindrical amphora which was lighter and more closely packable that the clumsy globulars. By the mid-third century Africa had supplanted Baetica as the main supplier of oil to Rome, and by the late third, she had also become the main supplier of Hispania. . . Baetican production never stopped, but exports were reduced to a trickle"

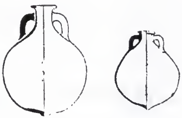
(Curchin 1991:152-153). Olive oil was Spain's main export - mainly from Guadalquivir River Valley, wine was produced for export along the eastern coast. The coastal area around Cádiz was a major production area for salted fish products. Sciallano and Sibella's (1994) distribution map for Dressel 20 (the olive oil amphora), Dressel 2-4 (the wine amphora), and Haltern 70 (salted fish products) demonstrate this regional differentiation in oil versus wine production, and salted fish product production. Figure 7 shows various amphora forms and their respective contents.

Archaeological field surveys have found a complete absence of Dressel 20 amphora east of Córdoba - an important olive oil production region. Curchin (1991:135) suggests that since the Guadalquivir is not navigable east of Córdoba, and the Dressel 20 amphoras were too bulky to transport long distances by land, oil from upstream of Córdoba was transported in skins (wood for barrels was scarce). These skins of wine may have been transported by either carts or mules. It is estimated from medieval records that ". . . a cart could cover, at most, 25 miles a day in central Spain." (Curchin 1991:135). One mule could carry a 300 lb. load. Roman merchant ships ranged from 100 to 500 tons and "one well-preserved vessel discovered off the south coast of France could have held between 5,800 and 7,800 amphora, arranged in three or four layers" (Curchin 1991:135-136). Wooden barrels (said to be of Gallic origin) came into use at the end of the Early Roman Empire (Rougé 1981:71). It has been suggested that 500 ton ships and elaborate port facilities were rare, and that 100 ton ships, and beaching and offloading into smaller boats were more common, respectively (Houston 1988).

WINE



OLIVE OIL



(adapted from Sciallano and Sibella 1994:115-116)

SALTED FISH PRODUCTS

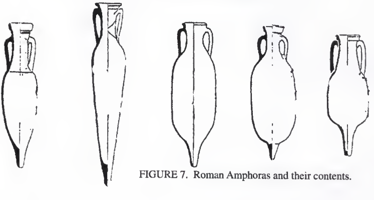


FIGURE 7. Roman Amphoras and their contents.

Byzantine Amphoras (A.D. 395-1453)

The Byzantine or Eastern Roman empire was formed with the collapse of the western Roman empire in the late 4th-century A.D. Much less work has focused on the Byzantine amphora, but the last ten years has seen an increase in Byzantine amphora studies. Byzantine amphoras are widely distributed from the 5th through 7th-century as Byzantines controlled much of the coastal area of the Mediterranean, including southern Spain. Amphora production seems to have been principally in the eastern Mediterranean. There was an apparent decline in amphora production after the 7th-century, but production continued at a smaller scale until into the 12th-century. No Byzantine amphora kiln sites which date after the 7th-century have been identified. This may indicate a shift in container preference as one port city known for amphora production in Roman times, Campania, became a prolific producer of wooden barrels in the later middle ages (Arthur 1989:88). The increasing use of barrels seen by the 7th-century is described as a " revolutionary change in shipping" (Unger 1980:51; Lewis 1978:3). Barrels can be stowed more efficiently than amphoras, and further, the barrel comprises 10% of the cargo while an amphora makes up 40% of the cargo. Therefore a smaller ship can transport the same amount of cargo in barrels as a ship 30% bigger transporting cargo in amphora (Unger 1980:52). But wine transported in a sealed amphora will keep much better than wine in a barrel, which is not air tight, and the wines shipped in barrels during the later middle ages had to be consumed shortly after arriving at their destinations (Unwin 1991:165). Regarding amphora production locale, ". . . aside from a limited number of major production centres, amphorae were produced in small quantities literally over most of the Mediterranean wherever surpluses of agricultural products were available for re-distribution (Arthur 1986, 1989).

Although three major amphora forms appear to have continued, the "transition" from late Roman to Byzantine amphorae is characterized by the loss of the long spike on elongate forms. By the 9th-century there was an elongate form, a globular form, and a small "carrot"-shaped form (Bakirtzis 1989). The elongate and globular forms have been identified as early as the 7th-century (Bass and van Doorninck 1982). In some areas these forms continue into the 12th-century (Bjelajac 1989), while in other areas these Roman-like forms were abandoned after the 10th-century and replaced by "butterfly" handles and more variation in shape. Stamp impressions no longer occur after the 11th-century. Byzantine amphora production seems to have ceased some time in the 14th-century (Bakirtzis 1989).

Archaeological excavations at two Byzantine shipwrecks dating to the 7th and 11th-century have provided large assemblages of amphoras (Bass and van Doorninck 1978,1982; van Doorninck 1989). The cargo from the 7th-century wreck located near Yassi Ada is estimated to have included between 850-900 amphoras. Both the elongate and globular types are represented, and four subtypes of the globular type were described. Of the 822 vessels examined, 162 are the elongate variety, 641 are large globular and 78 are small globular (Bass 1982).

Earlier work on measuring the capacity of Byzantine amphoras had concluded that standardization did not exist (Wallace 1986), but later analysis determined that 80% of the globular forms could be divided into four sub types, and it was found that standardized forms did in fact exist within the various subtypes. The remaining 20% of the globular amphora were categorized into some 40 distinct subtypes on the basis of handle morphology decoration. Regarding paste, all of the four main subtypes have the same paste, and roughly half of the other 40 subtypes also share this same fabric. Incised marking is rare on both the elongate and the four main subtypes of globular amphora, but very common on the 40 subtypes of globular forms. Only one stamped amphora was recovered and it was interpreted as an earlier form, along with most of the 40 subtypes of globular amphora (van Doorninck 1989). Grape seeds and olive pits were recovered from the amphora and it is concluded that all the amphoras contained wine (olives were sometimes shipped in wine).

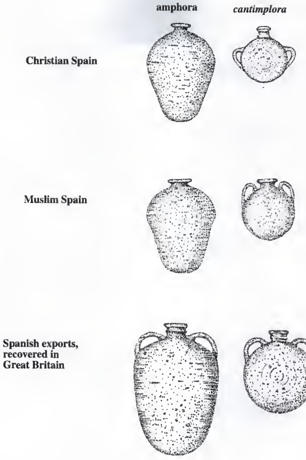
The 11th-century shipwreck at Serçe Liman, Turkey also contained amphoras, as well as broken Islamic glass pieces and Islamic glass scraps or cullet (Bass and van Doorninck 1978). Eighty-nine piriform amphoras were recovered, and although their contents are not certain, wine is suggested. One subtype represented by 50 amphora could be divided into three distinct sizes with capacities ranging from 9-14 liters, 12-15 liters, and 17-19 liters, respectively. Another subtype is represented by 22 small piriform amphora, and the remaining 27 amphora represent another 6 subtypes. There is a high percentage of incised markings on all the amphorae of this wreck, and some vessels have up to six different marks. This is interpreted as reuse (van Doornick 1989:256). Other evidence for reuse is rim damage from removing the stopper. This ship was headed back to Greece from Syria. van Doorninck (1989:256) surmises that the amphora were being recycled and attributes this to a probable decrease in the availability of new amphora as popularity of wooden transport containers increased. It appears that skins were the preferred transport container in Fatimid maritime commercial activity.

Medieval Amphoras in Spain

The amphora tradition in the eastern Mediterranean survived into the 13th-century in the Byzantine empire, but the sequence is not as clear in the west. Lister and Lister (1987:25) suggest that the Roman amphora tradition was continued for local use in rural areas during the Visigothic times and also for export during the Islamic period, even though ". . . neither local factories nor foreign deposits of discarded Spanish Muslim amphorae are known, as they are in the Roman horizon" (Lister and Lister 1987:25; cf. Bazzana and Montmessin 1985:31). Unger (1980:52) writes "In general, Arab policy was to leave the indigenous political and economic arrangements intact." If this applies to choice of transport containers as well, then it is likely that the Roman amphora tradition may have been allowed to continue in Islamic Spain even though the Islamic pattern of maritime transport does not appear to include the manufacture of pottery transport containers.

Amphora production was not identified in a study of an early Islamic (800-1100 A.D.) pottery production site at Al-Basra, Morocco (Benco 1987), or at a late 13th through mid 15th Islamic pottery production site at Qsar es-Seghir on the Moroccan coast (Meyers 1984). Meyers (1984:198) states that ceramic containers were not used in maritime transport in Islamic North Africa: "The preferred containers were, in declining order of popularity, leather bottles, cloth sacks, and glass containers protected by basketry (Goiten 1967:109)". Goiten's (1967) observations are the result of documentary investigations on what are referred to as the Geniza documents - paper scraps (commercial notes, letters, contracts) which accumulated in a trash heap from the 10th through 13th-century in a synagogue in Cairo (Meyers 1984:177-178).

The medieval Spanish amphora forms which are illustrated in medieval Islamic contexts and 15th-century Christian contexts by Lister and Lister (1987:26,100) are virtually the same, and both bear strong resemblance to the Type A olive jar of the 16th-century (Figure 8). The documents indicate that olive oil was again being produced for export in the Sevilla region by the 11th-century and it is hypothesized that pottery containers were used as transport vessels (Lister and Lister 1987:38,56). A late 13th - early 14th-century elongate amphora from Spain recovered in Great Britain is similar to the 16th-century Type A olive jar in body, but is distinguished by its two shoulder handles and longer neck, both of which bear some resemblance to the piriform 11th-century Byzantine amphora. Early 15th-century amphoras recovered from architectural contexts on the Island of Mallorca have two general shapes — elongate and roughly spherical (Gonzáles Gonzalo 1987). The stamps, painted markings, and inscriptions indicate a Catalan origin and probably represent the strong Catalonian commercial presence in the Mediterranean during the later middle ages. These Catalan amphoras are flat bottomed, thin-rimmed, and appear to have been thrown upright. They are distinct from the "piriform" amphoras which were thrown upside down, with rilling all the way to the center of the base. These Catalan amphoras do, however, resemble some of the elongate Late Style olive jars illustrated in



(compiled from Lister and Lister 1987:26,79,100)

FIGURE 8. Medieval amphoras and *cantimploras* from the Iberian Peninsula.

Goggin (1964). It is possible that these elongate Late Style olive jars might represent Catalonian wine allowed to be traded to the Americas during the 18th-century.

In sum, the evidence for amphora production during the medieval period in Spain is sketchy as best. Late medieval period sites in northern Europe have yielded both finewares and coarse earthenwares from Spain (e.g. Platt and Coleman-Smith 1975:28-29,171-179; Hurst 1981; Hurst and Neal 1982; Hurst et al. 1986). Liquid containers referred to as costrels (the same as *cantimplora* or Early Style olive jar) appear to outnumber amphoras. It is possible that the costrels are themselves a commodity rather than a container. Three types of costrel are described — standing, globular hanging, barrel hanging (Beckman 1974). The costrel appears to be a general western European form. The globular costrel is most similar to the Early Style olive jar and at least two different manufacturing techniques have been described for these costrels. One technique is similar to the two-part body construction suggested by Goggin for the Early Style olive jar (Pryor and Blockly 1978:49), but another suggests a one piece construction of the body. In this second technique, the body of the hanging globular costrel is formed by throwing a roughly spherical closed form and placing this form on its side so that the bottom of the thrown body becomes one of the sides (Freke 1979:101). The body of another non-Spanish postmedieval form - the flask - was thrown in the same manner as for the globular hanging costrel (Mynard 1969:36-37).

Discussion

Even though the direct archaeological connection between the Roman amphora and the Spanish olive jar has not been identified in the ground, such a connection is undeniable. A major unanswered question is why pottery maritime transport containers, which appeared to have been displaced by wooden barrels during the "container revolution" of the early medieval period, would again be used in great quantities for maritime transport toward the end of the Middle Ages. A general shortage of timber in the Mediterranean and particularly in Spain is commonly offered as explanation, (e.g. Fairbanks 1972), but even Fairbanks (1972:143) states "I have no good explanation for the Spanish cultural bent for shipping and storing a wide variety of materials in these small mouthed jars". The choice of container may reflect a trade-off between cost efficiency in bulk transport and maintaining the quality of the product. An olive jar might have a longer "shelf life", but a barrel of wine is less expensive to transport. Barrels appear to bave been a valued commodity — When Drake was raiding Cádiz in 1589 he took barrels of wine, and upon finding no wine to loot in Portugal, he took barrel staves (Francis 1972:45). Regarding function, the post-medieval olive jar pattern appears to mirror the Roman pattern. As with the Roman amphoras, a laundry list of commodities were shipped in olive jars but the primary contents were wine and olive oil. Olive jar shapes were also associated with contents - elongate for wine, globular for olive oil.

Pottery was the material of choice for the packaging of wine, olive oil, and a number of lesser exports transported on the Mediterranean Sea from the 2nd millennium B.C. to the 6th-century A.D. During the period of most intense commercial activity it was not unusual for a merchant ship to be carrying upwards of 1,000 amphoras, and sometimes more. Wooden barrels were more cost efficient and generally replaced pottery containers after the 7th-century A.D. It is possible that this shift in container choice also reflected a shift in wine consumption, from high quality (aged) wine consumption by the elites to the lesser quality, but more large-scale wine consumption by commoners. The use of pottery maritime transport containers is associated with the increased maritime commercial activity of the Iberian peninsula during the 15th -18th-centuries. In fact, during the early phase of transatlantic commercial activity, empty olive jars were often shipped with large barrels of wine. Further documentary work is needed to determine more precisely the container pattern for Spanisb colonial shipping, and this is considered in the next chapter.

The general association of form with contents is remarkably similar throughout the amphora tradition, and other external markings (i.e., stamps; painted and incised marks) are also common, but vary through time. It appears that the amphora as a package not only contained and transported the specific commodity, but also informed the merchant or consumer of the origin, identity, and in some instances quality of the commodity. In all, the attributes required for consumer choice could be viewed by the potential wine buyer - origin, date of vintage. Did the same pattern hold for olive jars? How large a role did "consumer choice" play in the olive jar packaging of wine, olive oil, and other commodities shipped to the colonies?

Regarding production, how similar is the Roman model of amphora production in Baetica to the Castillian model of olive jar production in the lower Guadalquivir River Valley? In the former, an imperialist entity — Rome — promoted the production of an export commodity (olive oil,wine) which could be consumed in Rome and elsewhere in the Roman empire (e.g. Britain). In the latter, an imperialist entity — the Hapsburg Empire — promoted the production of export commodities (wine and olive oil) which could be used to provision the transatlantic fleets and to provision the colonies in the Americas. The working hypothesis which will be presented in the next chapter is that both situations represent a situation similar to "banana" production in the so-called "Banana Republics" of the late nineteenth and twentieth-centuries. Bananas — or melons, grapefruit, etc. — do not need pottery containers for their transport, but if they did, there would most probably be a specialized group of producers organized to fit the needs of "banana" transport. This would not be pottery for domestic or household use, and therefore the organizational strategy for production would be geared for the needs of the "banana plantation" and not the needs of the household. Amphora were used for the long distance transport of *export* commodities and as such, the organization of amphora production is related more to external demand than local consumption. The working hypothesis is that the same holds for olive jar production. Bonnie McEwan's (1989) work on domestic assemblages in 16th-century Sevilla clearly demonstrates that olive jars were not part of a household assemblage, unless they were part of the house. Roman influence has been demonstrated in the organization of Spanish colonies (e.g. city planning) (Crouch 1991), and therefore it appears that Roman models of amphora productions might also be suitable for understanding olive jar production.

To summarize, amphora studies have demonstrated that a multidisciplinary approach integrating archaeological, documentary, and technological methods has allowed researchers to address questions beyond chronology. It is concluded that such an approach is indeed appropriate for understanding Spanish olive jar production in the 16-18th-centuries, and the strategy for implementing a multidisciplinary approach will be discussed in the next chapter.

CHAPTER 5

THE ARCHAEOLOGY DATA SET: SPANISH OLIVE JAR TERMINOLOGY, TECHNOLOGY, CHRONOLOGY, FORM, AND FUNCTION

The Spanish Olive Jar — Terminology

Archaeologists use a variety of terms to refer to olive jars (Figure 9). The first column shows labels used by archaeologists and the second presents a sample of olive jar terms found in Spanish shipping records. Goggin writes that it was William Henry Holmes who was the first to use the term "olive jar" in print; this was a 1903 Bureau of American Ethnology publication entitled "Aboriginal Pottery of Eastern North America." In this publication, Holmes (1903:129-130) writes only two pages about olive jars and does not explain the origin of the term other than to say that olives were carried in the jars. Studies of Spanish shipping documents have revealed that olives were indeed transported in olive jars, and they were also used to carry wine, olive oil, vinegar, water, honey, beans, chick peas, capers, almonds, dates, pitch, and gun powder. Goggin recognized that olive jars carried more than just olives, and when he chose the term "olive jar" he emphasized that the term should be considered a type name, and not a functional or ethnographic label.

> In summary, it appears almost impossible to discover any Spanish term that will adequately and precisely refer to the type of vessel under consideration and to no other. For this reason it seems best to use the term olive jar as the equivalent to a "type name" with no local ethnographic or linguistic significance. This can be translated into jarra de aceite when needed. (Goggin 1964:255)

Olive Jar Terminology

(Archaeological)	(Documentary)
Olive Jar	*Botija*
Jar	*Botija perulera*
Tinaja	*Botija regular.*
Anfora	*Botija de arroba y quarta*
Anforita	*Botija de media arroba*
Botija	*Botija de a quarta*
	Botijuela

FIGURE 9. Spanish olive jar terminology.

It is important to note that Goggin chose the term "olive jar" not because it was a perfect description of the containers in question, but because it was the first type name in print and should therefore be given priority as is the protocol for any other type name.

Regarding other terms for olive jar used by archaeologists, the term "Jar" (Beaudry et al. 1991) is an accurate, though not very precise term, while the term "*Tinaja*" is precise but not accurate. *Tinaja* refers to the large storage jars which were sometimes used to store ships' provisions of water and tomatoes, and which were also used to store wine at bodegas in both Spain and Peru. *Tinajas* for wine range in size from 40 to 80 gallons, while the olive jar for wine held less than 5 gallons.

Florence and Robert Lister (1987) use the Spanish word for amphora — *ánfora* — because of the fact that the olive jar is related the Greek and Roman amphorae. The Listers (1987) suggest that what Goggin (1964) refered to as "olive jars" actually consist of two vessel forms — *cantimploras* and *ánforas.* The *cantimplora*, a form of Spanish canteen dating at least to Roman times, corresponds to Goggin's Early Style olive jar, while it is the Middle and Late Style olive jars which are the descendants of the *ánforas* or amphoras of antiquity. The term amphora means "carried from both sides" and implies a two handled vessel. This certainly describes the Greek and Roman amphorae, (Figure 1), but the 16th-18th-century ánforas described by the Listers have no handles. Some Spanish archaeologists use the term anforita or "little amphora" to describe olive jars. This is accurate in that olive jars are indeed smaller than the amphorae of antiquity, but like the Listers' use of *ánfora*, *anforita* reflects modem usage. Figure 9 indicates that only one of the terms used by archaeologists today — the term *botijas* — was also used by the colonial period Andalusians. The term *botijas* is commonly found in Spanish colonial period shipping documents, and the modem usage of "*botijas*" in Spain refers to a pottery canteen (e.g. Llorens Artigas and Corredor Matheos 1974:37,160) — or what the Listers would call a *cantimplora.* This apparent inconsistency indicates that more research into the historical and modern ethno-taxonomy of Spanish pottery forms is desirable to better understand the meaning of pottery terms used by the 16th-18th century Andalusians.

There is more logic to the names found in the ships' registries than Goggin may have realized (this will be discussed further in Chapter 4), but the fact remains that all of the contemporary terms used to describe these vessels are the product of archaeologists and therefore might all be described as type names. As such, all of the terms used by archaeologists are legitimate and although the present study will follow Goggin's choice, this in no way negates the validity of the other terms. All have their own historical development — it is more important to understand that all of these terms mean the same thing than it is to quibble about which one is the best.

Spanish Olive Jar — Summary of Previous Investigations

Most of the work on olive jars is in New World colonial contexts outside of Spain. Olive jar fragments are ubiquitous at most Spanish sites in the Americas and are found as far north as Fort Raleigh and Jamestown. Olive jar sherd distributions seem to be concentrated around port cities and decrease in frequency as distance from port cities increases. This might explain why olive jar fragments are not found in large quantities in the American Southwest (Fairbanks 1972:142). After performing their initial intended function of transporting various commodities to the Americas, olive jars were reused as storage jars or architectural elements. A ten year life span is hypothesized (Fairbanks 1972). At St. Augustine there is higher olive jar percentage in the sixteenth-century compared to eighteenth-century which suggests a shift from Spanish storage vessels to their Native American counterparts (Deagan 1978; King 1984).

Sixteenth-century Nueva Cadiz has same olive jar percentage as sixteenth-century St. Augustine, however 15% of olive jars at sixteenth-century St. Augustine are glazed while the figure is higher for 16th-century Nueva Cadiz. It is suggested that glazing on olive jars might be useful for determining chronology (Deagan 1978). In the Southeast, there are higher percentages of glazed olive jar fragments in the more remote areas, which suggests a general preference for glazed forms for overland transport (Fairbanks 1975).

An unpublished contribution to olive jar studies is Joan Ling's (1977) analysis which suggests that the white slip identified by Goggin (1964) is actually a by-product from the firing of calcareous clays. Diana Walker's (1983) refiring experiments indicate that Goggin's Early and Middle Style olive jars were contemporeneous during the mid to late 16th-century. Other work focusing on olive jars is Stephen James' (1988) analysis of over 300 complete vessels from two 1724 shipwrecks. James identified a new Middle Style form, and suggests slight revisions to Goggin's chronology. Petrographic analysis of eleven thin sections from the four major vessel forms indicates a single clay source, and volumetric studies demonstrate much variation within the four vessel olive jar forms (James 1988). Russell Skowronek (1987) presents a reanalysis of olive jar sherds from the 1554 Padre Island wrecks and describes a "transitional" rim form between Early and Middle Style olive jars. In light of the new information on early 16th-century olive jars, the rim shown in Skowronek (1987) is more likely a shape A or B Middle Style olive jar rim. As the Listers indicated, there can be no "transition" between Early and Middle Style olive jars — the two are separate, contemporaneous forms.

The most recent, and easily the most comprehensive study of olive jars since Goggin's classic work is Mitchell Marken's (1994:41-138) chapter on olive jars in his book on pottery recovered from Spanish shipwrecks. Marken (1994:105-110) presents convincing evidence which indicates that the body of all olive jar shapes is thrown in one piece; contrary to the two-piece construction hypothesized by Goggin. Discussions of vessel form and contents from documentary sources demonstrate that Goggin's shape A olive jar commonly held wine, and the shape B olive jar was a container for olive oil (Marken 1994:45-50). Line drawings of both whole olive jars and rim profiles from shipwreck contexts which span the Spanish colonial period make Marken's (1994) study the most inclusive study of olive jars to date. Marken's (1994) work further refines the chronology of Goggin's scheme, but the basic sequence is unaltered.

Archaeological investigations of both Spanish colonial land sites and shipwrecks have also done much to complement Goggin's olive jar typology and chronology. Middle style olive jar fragments, for example, have been documented in contexts prior to 1580 (Deagan 1987:32-33). The work of Colin Martin (1979) on wrecks from the Spanish armada of 1588 is an example of the fruitful integration of shipwreck archaeology and historical documents, as he was able to correlate olive jar form with function. Martin found that olive oil was shipped in Goggin's Shape B olive jar.

The work of Prudence Rice on the Spanish colonial wineries of the Moquegua River valley in Peru was the first to identify an olive jar production site in the Americas (Rice 1994,1996a,1996b; Rice and Van Beck 1993; Rice and Smith 1989; Van Beck 1991). Rare Spanish olive jar sherds were identified at Torata Alta, a probable *reducción* site in the upper valley, and the Peruvian olive jars or *botijas* are distinguished from their Spanish counterparts by the absence of a white surface coloring and greater wall thickness (Smith 1991:99). Rice (1990) makes the important distinction between industrial and domestic ceramics when discussing the pottery recovered in the survey. No one would question that bricks and roof tiles should be considered industrial ceramics, as their ties to the building industry are quite obvious, but it is also important to consider that certain classes of pottery vessels were also industrial ceramics. Rice describes *tinajas* and olive jars as industrial ceramics because they are related to the viticulture industry, and they do not have domestic use as their primary function. Secondary functions of olive jars might include that of storage containers in a domestic setting, but their primary function is not in a domestic or household setting.

Spanish Olive Jar Form and Chronology

Goggin (1964) described one shape for Early Style olive jar, but recent work in Sevilla (Amores Carredano and Chisvert Jimenez 1990) has identified four shapes dated to the first half of the 16th-century. Investigations of a 1554 wreck have tentatively identified a short-necked, handle-less olive jar, which appears to be an early form of Middle Style olive jar (Skowronek 1987). Skowronek (1987) hypothesizes that the mid-16th-century shift to narrower-hulled ships made the thin rimmed, handled Early Style olive jars less desirable as forms with a sturdier rim (shortened and thickened) and vessels with no handles could be packed more efficiently in the narrow-hulled ships.

Recent work on three early 16th-century Spanish shipwrecks (Malcolm n.d., Smith n.d., Gonsales n.d.), and at the site of Concepción de la Vega has identified two previously unknown Middle Style olive jar forms. These forms (Figure 10) appear to represent shapes A and B, but the rims are different from the later olive jars. The shape A rim is only slightly thickened and is not the "doughnut" form of later olive jars, but the vessel wall thickness is similar to the later forms. The shape B rim is virtually indistinguishable from the *cantimplora* rim; vessel wall thickness is also very similar. The only apparent distinguishing features of the early 16th-century shape B olive jar is that that they have no handles, and the rilling (finger marks from wheel throwing) is horizontal, while *cantimploras* have handles and vertical rilling. These early shape A and B olive jars appear to be contemporaneous with the *cantimplora.* Florence and Robert Lister (1987) have demonstrated that the *cantimplora* and *ánfora* have existed side by side ever since the Roman occupation of the Iberian Peninsula, but it appears that after the 16th-century, the *cantimplora* was not used in the Americas. It is possible that alternative materials (such as animal skins, gourds, or metal) were used for canteens in the colonies during the 17th and 18th-centuries. *Cantimploras* also saw domestic use in terrestrial settings in Andalusia, but *ánforas* were manufactured explicitly for maritime commerce.

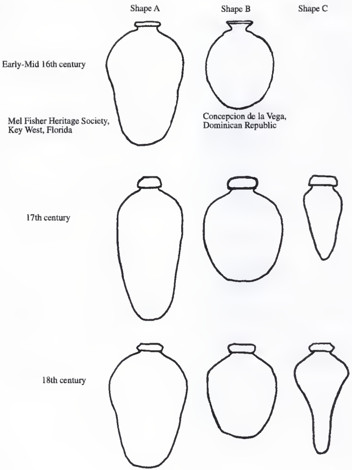


FIGURE 10. New early-mid 16th-century forms incorporated into Goggin's classification.

Stephen James' (1988) work on the 1724 shipwrecks of the *Conde de Tolosá* and the *Nuestra Senora de Guadelupe* located in the Dominican Republic focuses on the largest assemblage of olive jars existing in the Americas. James recognized four forms, three of which were identified in Goggin's classification. James' Forms I, II, and IV correspond to Goggin's shapes A, B, and C; James' form III is a new flat-bottomed olive jar form. Over 600 whole olive jars were recovered from these wrecks, and James measured the volume of 18 Type A, 44 Type B, and 20 Type D olive jars. Eleven examples of a previously undescribed concave base form (Form III) were also measured. The volumetric results will be presented below, but James (1988) concludes that while there appears to be documentary evidence for standardized units of shipping wine and olive oil, the volumetric variation observed in his subsample of olive jars from the two 1724 sites does not reflect this standardization.

All 602 olive jars were visually examined for glazing, the results are below:

Form	nonglazed	glazed (interior and/or exterior)
I (n=129)	28.5%	71.5%
II (n=442)	6.3%	93.7%
III (n=11)	0	100%
IV. (n=20)	100%	0

James (1988:59) notes that the frequency of glazing of olive jars has been suggested to be a temporal marker; in general, it has been observed that glazing decreases over time (e.g. Deagan 1978:35). The high percentage of glazed olive jars on the Conde de Tolosa and Guadelupe lead James to question this use of glazing as a temporal marker. James (1988) also measured vessel height, maximum diameter, volume, empty weight, external and internal rim diameter, and rim height and width for a subsample of olive jars. James concluded that volumetric standards were not rigorously enforced as volume varied considerably within each form. Volume of each form is shown below in liters:

	form I (liters)	form II (liters)				form III (liters)	form IV (liters)	
	20.1	7.2	5.6	5.1	4.1	10.2	3.8	3.2
	20.0	6.7	5.5	5.0	4.0	10.2	3.8	3.1
	19.1	6.5	5.5	4.9	3.9	10.0	3.8	3.0
	19.0	6.2	5.5	4.8	3.8	9.1	3.7	
	18.8	5.9	5.5	4.8	3.3	8.5	3.7	
	18.7	5.9	5.5	4.6	3.3	8.0	3.75	
	18.4	5.7	5.5	4.6		4.95	3.5	
	18.3	5.7	5.4	4.6		4.5	3.35	
	18.2	5.7	5.3	4.5		4.1	3.3	
	18.0	5.6	5.2	4.3			3.25	
	15.0	5.6	5.2	4.2			3.25	
	16.0	5.6	5.1	4.2			3.2	
range	15.0-20.1	3.3-7.2				4.1-10.2	3.0-3.8	
median	-	5.5				10.2	3.8	
mean	18.3	5.12				7.7	3.4	

Petrographic examination of thin sections from each of the four olive jar forms indicated a similar clay source.

All in all, James' (1988) study offers only minor revisions to Goggin's (1964) scheme. The addition of one form and the absence of another form recognized by Goggin indicates that not all Middle Style olive jar forms span the entire period between 1575-1780. Further, the similarity of James' form I to Goggin's Late Style shape A (see Figure 3, chapter 1) suggests that Goggin's Middle Style shape A body form was not present throughout the entire Middle Style period. James' criticism of the idea that glazing decreases over time should be viewed with caution. The *Tolosá* and *Guadalupe* olive jar assemblage is a wonderful collection both in its size and preservation (it is probably the largest of its kind in the Americas), but it is, in fact, a slice of time and one must be careful when using such data alone to evaluate trends that span 200 years. In addition, not every ship to the Americas carried mercury, so it is possible that the quicksilver wrecks may be anomalous in the rest of their cargo. Caution must also be exercised with the term *"arroba."* James interprets the *arroba* as a measure of volume, when in fact it is a measure of weight: one *arroba* equals 25 pounds. Therefore, part of the volumetric variation observed within the various forms may reflect the varying density of the transported materials. For example, the volume of one arroba of olive oil is greater than the volume of one arroba of olives. It is possible that if a weight per unit volume (density) measure were determined for all of the goods transported in olive jars, the wide volumetric variation observed by James may be seen to reflect the wide variety of goods transported in olive jars. James' (1988) study demonstrates the usefulness of shipwreck proveniences for studying change in olive jars; Goggin (1964) relied primarily on proveniences from terrestrial sites.

Spanish Olive Jars — Technological Studies

John Goggin's (1964) introductory study is still the most comprehensive technological description of Spanish olive jars. Subsequent studies have presented new olive jar forms and suggested chronological adjustments to Goggin's classification (e.g. Walker 1983; Deagan 1987; Skowronek 1987; James 1988; Amores Carredano and Chisvert Jiménez 1990), but very little new technological information has been forthcoming. In fact, much of the basic descriptive work of ceramic technology, such as that done for non-European ceramics by Smith (1986) and Cusick (1989), has yet to be undertaken for all styles of olive jar.

Diana Walker (1983) provided a descriptive technological study of 16th-century olive jars. This study consists of a cluster analysis of technological attributes from 16th-century context olive jars, including sherds from Puerto Real (Haiti), St. Augustine, and Nueva Cádiz (Venezuela). The sherds from Puerto Real and Nueva Cadiz are described as Early Style, while the St. Augustine sherds are thought to be Middle Style. Walker (1983) states:

> Paste textural variables, in terms of kinds, quantities, and size of aplastics were most crucial for cluster formation, with paste density, refired color, and sherd thickness of secondary importance . . . Porosity, hardness and the presence or absence of minor mineral inclusions were the least important variables involved in cluster formation.

Walker's cluster analysis identified 4 clay categories: 1. yellowish red to red-firing calcareous paste, 2) light-firing calcareous paste, 3) yellowish red to red-firing noncalcareous paste, and 4) light-firing noncalcareous paste. The site breakdown is as follows:

	Early Style *Nueva Cadiz* (1498-1545)	Early Style *Puerto Real* (1503-1590)	Middle Style *St. Augustine* (1566-)
red calcareous	54%	40%	58%
red noncalcareous	0	54%	6%
light calcareous	46%	4%	30%
light noncalcareous	0	2%	4%

Walker (1983:15) notes that the Nueva Cádiz (Early Style) and Puerto Real (Early Style) clusters are "quite dissimilar," whereas Nueva Cádiz sherds are similar to St. Augustine (Middle Style). The technological similarity of Nueva Cádiz "Early Style" olive jar sherds and the St. Augustine Middle Style olive jar sherds leads Walker (1983:16) to conclude that "Early and Middle Style olive jars were contemporaneously produced rather than being sequential stylistic variations." Walker (1983) also points out that the Early Style olive jar is a form of Spanish canteen or *cantimplora*, while the Middle and Late Styles are related to the Roman amphora, and this taxonomic difference is further evidence that the two may have been used simultaneously.

Olive Jar Manufacture

It appears that the body of the cantimploras were probably thrown all in one piece, and the rim and handles added afterwards (Figure 11), and not in two pieces as suggested by Goggin (see Figure 12). No seams have been observed on the interior of cantimploras and while it would be possible to erase the exterior indications of a seam, such smoothing

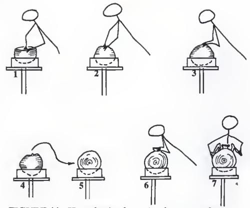
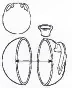


FIGURE 11. Hypothesized *cantimplora* manufacture.



(adapted from Goggin 1964:259)

FIGURE 12. Goggin's hypothesized *cantimplora* manufacture.

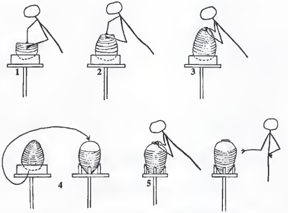


FIGURE 13. Hypothesized Shape A Olive Jar manufacture.

would be impossible on the interior, and therefore the lack of interior seam suggests that the body was thrown all in one piece. This is not without precedence for a round form. Post-medieval French flasks, the rough equivalent to the Spanish *cantimplora*, were manufactured in this manner (Mynard 1969:36-38). Marken (1994) hypothesizes a similar technique for olive jars (Figure 13 shows shape A, but the same technique would also be used for shapes B and C), again suggesting that Goggin's hypothesized two-piece construction technique for shape A olive jars was not the case. The joins hypothesized by Goggin for Shape A olive jars have simply not been observed when the interiors of large fragments of olive jars were investigated. Throwing the body all in one piece at one time is a much more expedient technique than luting together separate pieces, and therefore it is not surprising that such a technique was practiced. But a modern-day art potter was skeptical of throwing the body all at once, even after examining numerous examples of broken olive jars which showed no signs of joins on the body.

Martin describes mold marks on the base of one olive jar and infers that the forms were thrown upright in a rounded "moulding dish, probably of biscuited clay" (Martin 1979:282). It is important to point that the sample of large olive jar fragments upon which the upside-down throwing hypothesis is based were from a shipwreck dating to 1622 or 1625. The armada wrecks date to 1588, and it is possible that a right-side-up throwing technique was employed at this time. But a more likely scenario is that the mold marks observed an the armada olive jar are the result of placing the already thrown olive jar body in a form in order to add the rim (see Figure 13).

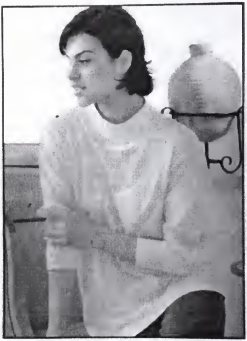
Spanish Olive Jar Function

While the direct origins of the form of the Spanish olive jar have not as yet been determined with precision, the function appears to have been similar to the Greek and Roman patterns. The large elongate Greek and Roman amphora were used primarily for wine and the more rounded shape was used for olive oil. This is also the same pattern for the Spanish olive jars. Several studies of Spanish shipping records (e.g. Martin 1979:283; Chapter 5, this volume) found that when wine was shipped in a pottery container, it was almost always the shape A olive jar. Olive oil was almost always shipped in the shape B Olive jar, and honey was commonly shipped in the shape C olive jar. Martin (1979) identified numerous fragments of Type B olive jar, and the one whole jar recovered from the excavations has a volume of 6.25 liters, which is roughly half of the Castillian *arroba* for olive oil. The shipping manifests for the armada ships indicate that wine was carried in *pipas* — large barrels — and Martin interprets the type B olive jar as the container for the stores of olive oil. Martin's (1979) general conclusion about olive jar production was that a standardized shape and volume was the goal, and he surmises that such standardization might not occur in military contexts which were not regulated by the Spanish House of Trade - the *Casa de Contratación.*

Secondary uses of Spanish olive jars include architectural use in building construction as structural support, primarily in vaulted ceilings. Spanish olive jars were also buried in the floors of sturctures in Spain to function as a sort of "dehumidifier", but otherwise have not been recorded in domestic contexts in Andalusia (McEwan 1988). The most recent secondary use for a Spanish olive jar was as background for an advertisement for women's turtlenecks in the Gainesville Sun (December 9, 1994) (Figure 14).

Olive Jar Rim Morphology

An unambiguous pattern for olive jar rim morphology does not emerge until sometime during the late 16th or early 17th-century when the Shape A olive jars (the elongate form) have angular rims, and the Shape B olive jars (the round form) had rounded rims (Figure 15). This pattern was apparent on the unidentified 1622or25 *patache* associated with the 1622 wrecks of the *Atocha* and *Santa Margarita.* The whole olive jars on this *patache* clearly show that the angular rims are on the shape A olive jars, and the rounded rims are on the shape B olive jars. Further, rims for shape A and C olive jars are



(The Gainesville Sun, December 9, 1994)

FIGURE 14. Twentieth-century Spanish olive jar function.

angular from the late 16th-century through the 18th-century, and rims for shape B olive jars are rounded for the same time period. Figure 15 shows rims for shapes A, B, and C drawn from complete olive jars which were recovered from the 1622or25 wreck salvaged by Seahawk Deep Sea Technology of Tampa, Florida.

Sixteenth-century olive jar rims are shown in Figures 16-17, and additional whole examples were shown above (Concepción de la Vega) (Figure 9, chapter 1). A problem for archaeological samples is that rim and body fragments from cantimploras will be virtually indistinguishable from those of shape B olive jars. The only way to distinguish the two is from a sherd which has portions of both the rim and body. If the rilling on the body is parallel to the rilling on the rim, the vessel is an olive jar; but if the rilling on the body is perpendicular to the rilling on the rim, the vessel is a cantimplora. Goggin did not recognize this difference consequently, because there were no sherds of the first kind in the collections which he looked at. He was looking at sherds of cantimploras and defined cantimploras as olive jars due to their similarly in paste, body thickness, and rim morphology. It is only after the recovery of the whole, shape B olive jar from Concepción (shown above) that this distinction between a shape B olive jar and a *cantimplora* can be made. Unfortunately, if one has only rim sherds with no portion of the body, there is no analytical technique to determine if one has a cantimplora or shape B olive jar. But the chronological utility remains as both the cantimplora and the shape B olive jar with their similar rim and wall thickness both date to the early/mid 16th-century.

The shape A olive jar in the mid16th-century appears to have a rounded rim, similar to the rounded rims of 17th-century type B olive jars. The whole shape A olive jars from Santa Elena and from the unidentified Mel Fisher Heritage Society wreck both have rounded rims. Angular rims are present in the late 16th-century as they occur on the 1588 armada wrecks. The shape B olive jar from the Spanish armada wrecks has a subangular/quasi-rounded rim (Martin 1979). Figure 17 shows rims of similar morphology on the 1590 wreck of the Rosario in Cuba.

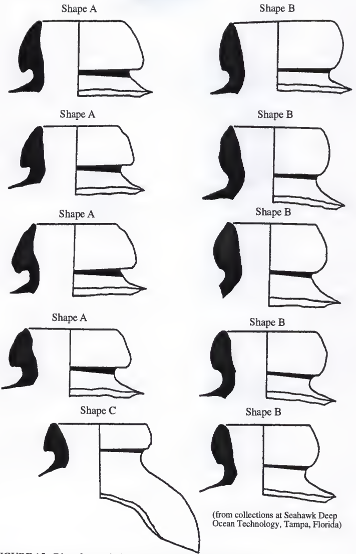
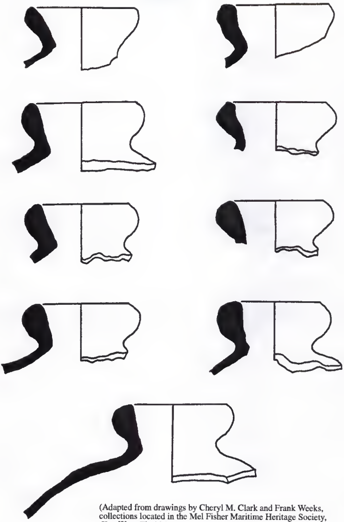


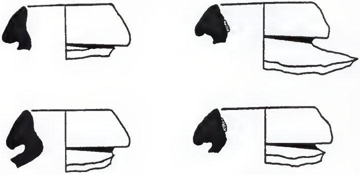
FIGURE 15. Rims from whole olive jars, 1622 wreck (scale 1:2).



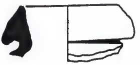
(Adapted from drawings by Cheryl M. Clark and Frank Weeks, collections located in the Mel Fisher Maritime Heritage Society, Key West, Florida)

FIGURE 16. Olive jar rims from mid 16th century wreck (scale 1:2).

UID mid 16th century wreck



(from collections located in the Florida Bureau of Archaeological Research, Tallahassee, Florida)



El Rosario, 1590

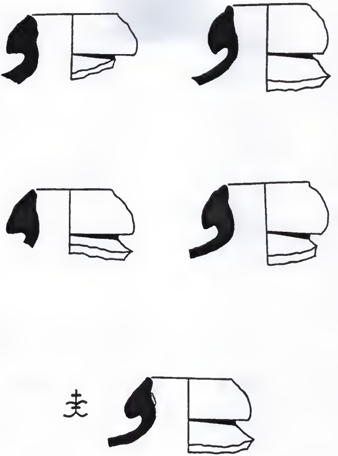
FIGURE 17. Olive jar rims from 16th century wrecks (scale 1:2).

Seventeenth-century Shape A olive jar rims increase in size and shift from triangular to rectangular in profile section. Figures 18-20 show that shape A olive jar rims from 1618 and 1622 shipwrecks are triangular. By 1641 (Figure 21) more rectangular rim forms appear, and by the 18th-century, the triangular forms are completely replaced by the more rectangular forms. Shape B olive jar rims continued to be rounded throughout the 17th and into the 18th-century, but there was a reduction in size by the 18th-century. In the 18th-century, there is a trend toward reduction in rim size of both shape A and Shape B olive jar rims (Figures 22-24).

Figure 25 summarizes the changes in olive jar rim morphology for shape A rims. As noted before, the 16th-century is somewhat more variable than later periods, but the trends from the early 17th-century on are pretty solid. It should be noted that the small triangular rim profile shown for the 16th-century was observed into the early 17th-century on the UID 1622 wreck, which had a number of whole shape A olive jars with this rim form. it should be noted, however, that these olive jars comprised only 6% of the total, and therefore might represent some of the last of their style.

Figure 26 shows the various measurements taken on the olive jar rims and Appendix 2 presents the results of measurements on olive jar rims from the following contexts: whole vessels from the Seahawk wreck (1622or25), wreck of the *Concepción* (1641), and wrecks of the *Guadalupe* and *Tolosá* (1724); and rims from the wrecks of the *Santa Margarita* and *Atocha* (1622), and various terrestrial sites - St. Augustine, Florida; Los Obispos Cubagua, Venezuela; Wrights Landing, Florida; Panama Vieja, Dominican Republic; and Sevilla, Spain. The rim height measurement was not taken due to the difficultly in taking a precise measurement.

Table 1 summarizes the results of rim measurements taken from whole vessels from four shipwrecks — the unidentified Seahawk wreck (1622), the *Concepción* (1641), and the quicksilver wrecks, *Guadalupe* and *Tolosá* (1724). The interior throat dimension for both Shapes A and B remains remarkably unchanged; and the throat dimension for Shape B



(from collections located in the Florida Bureau of Archaeological Research, Tallahassee, Florida)

FIGURE 18. Olive jar rims from the wreck of the *San Martín,* 1618 (scale 1:2).

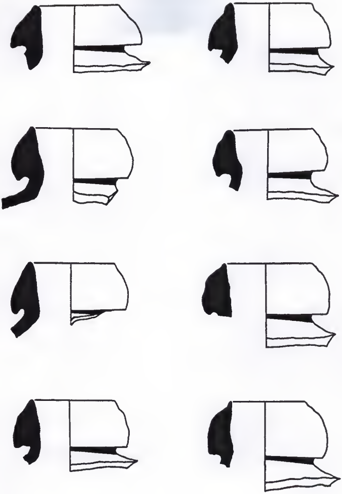


FIGURE 19. Olive jar rims from the wreck of the *Santa Margarita*, 1622 (scale 1:2).

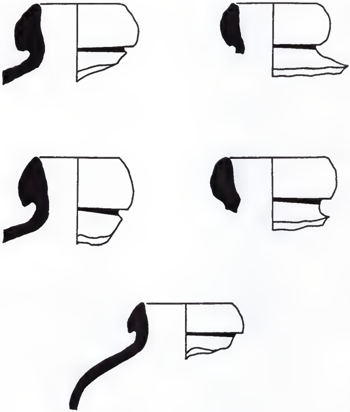
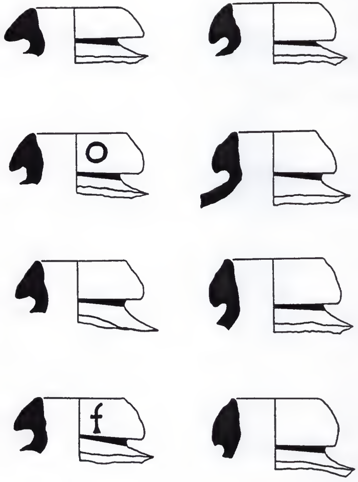
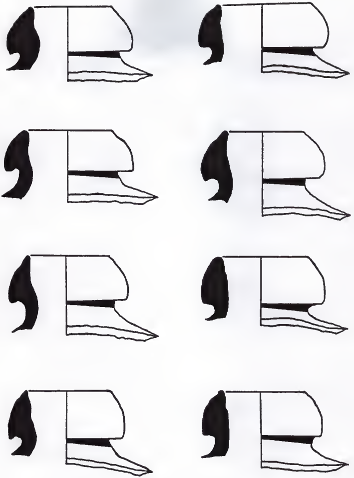


FIGURE 19(cont.).



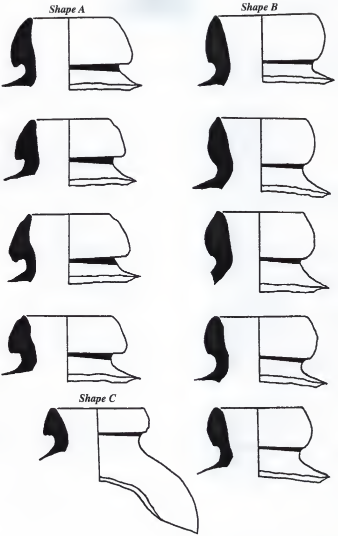
(from collections at Seahawk Deep Ocean Technology, Inc., Tampa, Florida)

FIGURE 20. Shape A olive jar rims from 1622 wreck (scale 1:2).



(from collections at Seahawk Deep Ocean Technology, Inc., Tampa, Florida)

FIGURE 20(cont.).



(from collections at Seahawk Deep Ocean Technology, Inc., Tampa, Florida)

FIGURE 20(cont.).

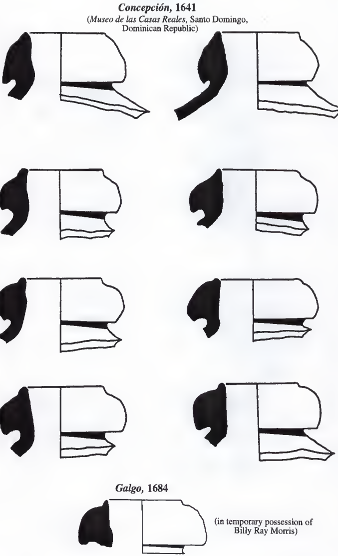
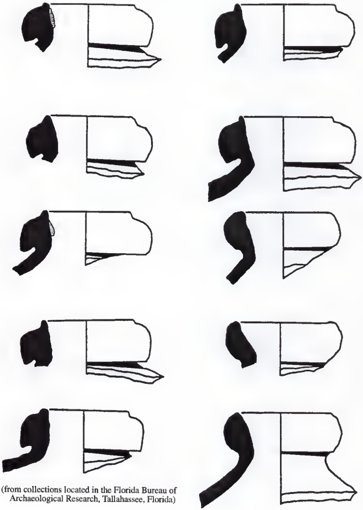


FIGURE 21. Olive jar rims from the *Concepción,* 1641, and *Galgo,* 1684 (scale 1:2).



(from collections located in the Florida Bureau of Archaeological Research, Tallahassee, Florida)

FIGURE 22. Olive jar rims from the plate fleet wrecks, 1715 (scale 1:2).

(from collections located in the *Museo de las Casas Reales,*
Santo Domingo, Dominican Republic)

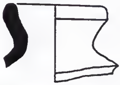
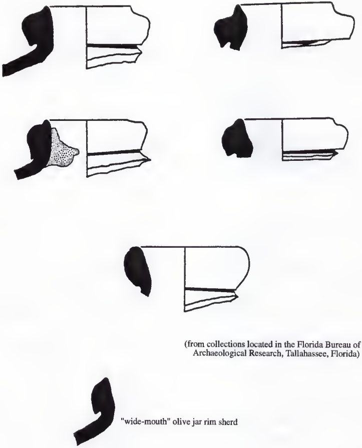


FIGURE 23. Olive jar rims from the wrecks of the *Guadalupe* and *Tolosá,* 1724
(scale 1:2).



(from collections located in the Florida Bureau of Archaeological Research, Tallahassee, Florida)

FIGURE 24. Olive jar rims from the plate fleet wrecks of 1733 (scale 1:1).

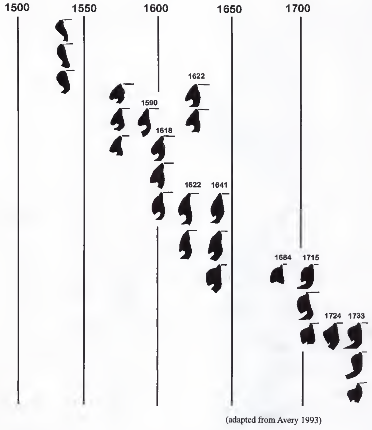


FIGURE 25. Chronological framework for Shape A Middle Stlye Olive Jar rims.

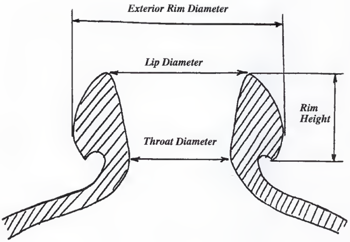


FIGURE 26. Olive jar rim measurements.

is slightly, but consistently smaller than the throat dimension for Shape A. The shape A rim measurements from the 17th-century wrecks are quite similar, while there are slight increases in the lip and maximum diameters for Shape A rims from the 18th-century wrecks compared to the 17th-century wrecks. The measurements do not indicate any significant changes in the Shape B rim form, and Marken's (1994:135) drawings of whole Shape B olive jars from the same time-span also show little chronometric variation.

The olive jar rim measurement analysis demonstrated more change in Shape A rim forms than Shape B rim forms. This was observed in the study of the rim profiles as well where noticable changes appear in the Shape A rim morphology, and little change in observed for the Shape B rim forms. The continuity in throat measurement for both Shape A and B rim forms may indicate that the size of the cork used to seal the olive jars did not vary signigicantly. The slight, but consistent size difference between Shape A and Shape B throat diameters may indicate that either different sizes or perhaps different types of stopper were used for each type of olive jar, but cork stoppers recovered from both Shape A and Shape B olive jars of the unidentified Seahawk wreck suggest that corks of similar maximum diameter were used.

A number of cork stoppers were recovered from the unidentified Seahawk wreck. Eight of the thirteen stoppers were recovered from inside olive jars. The increase in pressure at the great depth of the Seahawk wreck caused the stoppers to be sucked into the olive jars. The stoppers are disk-shaped and slightly tapered; measurements are given in Table 2. The average "top" diameter measurement for corks found in both Shape A and B olive jars is very similar, whereas the average "bottom" measurement for the Shape B corks is slightly smaller, just as the average throat measurement for Shape B olive jars is also slightly smaller that the average throat measurement for Shape A olive jars. It is possible that the act of being pressed into a smaller throat diameter compressed the cork to a slightly greater extent for Shape B olive jar corks.

Table 1. Comparison of Rim Measurements on Whole Olive Jars, UnidentifiedSeahawk Wreck (1622)

(all measurements in cm)

	Shape A Olive Jar			Shape B Olive Jar		
	interior, throat diameter	lip diameter	maximum diameter	interior, throat diameter	lip diameter	mazimum diameter
mean	4.89	5.81	9.43	4.67	6.30	8.56
range	3.76-5.55	5.23-6.62	8.80-10.81	4.20-5.39	5.85-7.28	7.90-9.42
***Concepción* (1641)**						
	Shape A Olive Jar			Shape B Olive Jar		
	interior, throat diameter	lip diameter	maximum diameter	interior, throat diameter	lip diameter	maximum diameter
mean	4.97	5.79	9.72	4.62	6.02	8.85
range	4.5-5.9	5.19-7.00	8.89-10.52	4.40-4.84	5.7-6.33	8.85
***Guadalupe* and *Tolosá* (1724)**						
	Shape A Olive Jar			Shape B Olive Jar		
	interior, throat diameter	lip diameter	maximum diameter	interior, throat diameter	lip diameter	maximum diameter
mean	5.19	6.58	10.35	4.60	6.49	9.00
range	4.78-5.50	5.81-7.13	9.78-10.51	3.63-5.35	4.82-7.51	8.12-10.00

Table 2. Measurement of Cork Stoppers for Olive Jars from the unidentified Seawreck Shipwreck (1622)

Provenience	Ave. Top Diameter(cm)	Ave. Bottom Diameter(cm)	Maximum Thickness(cm)	
F 12005.0015	4.01	3.5	2.98	(dry)
F 22004.0001	5.85	5.08	1.55	(wet)
F 22004.0002	5.37	4.97	1.82	(wet)
F 3335.0001	5.1	4.51	2.29	(wet)
Shape A Olive Jars				
798	4.68	4.17	1.90	
678	4.51	4.51	1.29	
678	4.61	4.61	1.49	
673	5.26	4.76	1.68	
average	**4.77**	**4.51**		
Shape B Olive Jars				
693	5.27	4.29	2.3	
559.1	4.66	4.00	1.46	
675	4.34	4.34	1.0	
average	**4.76**	**4.21**		
Shape of Olive Jar unknown				
500.1	5.8	4.72	2.25	
677	5.05	4.14	2.26	

The Archaeological Data Set - Shipwreck and Terrestrial Assemblages

The following describes the archaeological contexts for olive jar fragments used in this study. With one exception, the archaeological contexts are from sites which experienced "catastrophic" events. Eleven of the thirteen sites are shipwrecks, and earthquakes destroyed the habitation areas at two of the three terrestrial sites. When the precise date of any given catastrophe is known, the utility of archaeological sites associated with catastrophic events is excellent for establishing chronologies, among other things. Shipwrecks, in particular, are virtual time capsules, and their potential for generating data for research questions covering a wide range of topics is immense.

Concepción de la Vega (Dominican Republic) - **1495-1562**

A gold-mining and sugar-producing settlement located in central Dominican Republic. Destroyed by an earthquake in 1562 (Deagan 1987:6-7). John Goggin (1960) used a number of Early Style olive jar rim sherds from this site in his work on olive jars. [Collections are located at the Florida Museum of Natural History, Gainesville, Florida.]

Puerto Real (Haiti) - **1503-1578**

A cattle raising and hide-producing settlement located on the north coast of Haiti, near Cap Haitien. The town was forcibly dismantled and moved to another location in 1578 when other efforts to stop illicit trade with foreigners had failed (Deagan 1995). Both Early Style and Middle Style olive jar rim fragments have been recovered from Puerto Real (Willis 1984:162,167). [Collections are located at the Florida Museum of Natural History, Gainesville, Florida.]

Nueva Cádiz (Venezuela) - **1515-1541**

A prosperous pearl-fishing station on the island of Cubagua off the coast of Venezuela, the site was destroyed by an earthquake in 1541 (Deagan 1987:8). Early Style olive jar rim sherds from Nueva Cádiz are illustrated in John Goggin's (1960) olive jar study. [Collections are located at the Florida Museum of Natural History, Gainesville, Florida.]

Emanuel Point Shipwreck (Pensacola, Florida) - **1559 (?)**

Possibly one of the Spanish ships belonging to the Tristán de Luna expedition which left Mexico in 1559 and sank in a hurricane in Pensacola Bay. Seven of the eleven ships in the fleet were wrecked by the storm - some had not been unloaded. The mid 16th-century date is based on architectural features of the ship and artifact assemblages (Smith 1994). Olive jar rim fragments which resemble those of the 1555 Cuban wreck (Alessandro López Pérez 1994, personal communication), and the 1554 Padre Island wrecks confirm a mid 16th-century date (Wells nd). [Collections are located at the laboratory facilities of the Pensacola Shipwreck Survey, Pensacola, Florida.]

Unidentified Spanish Shipwreck (Florida, 8Mo142) - **late 16thcentury**

Located in the vicinity of the 1733 plate fleet wrecks, the anchor and olive jar rims recovered from this site are mid-late 16th-century. [Collections are located at the Florida Bureau of Archaeological Research, Tallahassee, Florida.]

Nuestra Señora del Rosario (Cuba) - **1590**

The ship *Nuestra Señora del Rosario* had delivered a cargo of wine to Vera Cruz and was travelling toward Havana with the ship *Nuestra Señora de la Victoria* when both were attacked by two British pirate ships on July 18, 1590. The *Rosario* managed to escape the pirate ships but sank as a result of the attack. Salvage efforts initiated from the port of Havana were unsuccessful (López Pérez y Sansón 1993). [The olive jar rim used in this study is located at the Florida Bureau of Archaeological Research, Tallahassee, Florida.]

San Martín (Florida, 8IR22) - **1618**

Also known as the Green Cabin Wreck, the *San Martín* was wrecked in the same area as the 1715 plate fleet wrecks near the Atlantic coast of Florida. According to archival research done by Dr. Eugene Lyon, the *San Martín* was part of the little known Honduran fleet and was carrying a cargo composed primarily of indigo, cochineal, and hides, along with small amounts of gold and silver when it sank in a storm. Archaeological investigations were conducted by Cobb Coin Company, under the direction of R. Duncan Mathewson III (Moore and Muir 1987). [Collections are located at the Florida Bureau of Archaeological Research, Tallahassee, Florida.]

Santa Margarita (Florida) - **1622**

The *Santa Margarita* sank in a hurricane near the Florida Keys along with the galleon *Nuestra Señora de Atocha* in 1622. The *Santa Margarita* carried large quantities of gold, silver, copper, indigo, and tobacco (Lyon 1982). A specialized study of olive jar rims recovered from the *Santa Margarita* and the *Atocha* was conducted by Keith McIntyre (1983). [Collections are temporarily being stored at the Florida Museum of Natural History, Gainesville, Florida.]

Unidentified Spanish Shipwreck (Dry Tortugas) - **1622**

This wreck was salvaged by Seahawk Deep Ocean Technology (Tampa, Florida) from a depth of 1500 feet using a remote controlled recovery apparatus guided by video cameras and a sonar positioning system. It is thought that this wreck might either be part of the same fleet as the Sant*a Margarita* and *Atocha*, or perhaps a salvage vessel sent out in 1625. Over 100 intact olive jars were recovered, and the systematic recovery of artifacts has resulted in the most completely represented olive jar assemblage recovered from any Spanish shipwreck (Jenette Flow, personal communication). [Collections are located at Seahawk Deep Ocean Technology, Tampa, Florida.]

Nuestra Señora de la Concepción (Dominican Republic) - **1641**

The Concepción is an example of a known wreck which had been salvaged during the late 17th-century. Olive jars from this wreck are illustrated in Marken (1994:90). [Collections are located at *El Museo de Las Casas Reales*, Santo Domingo, Dominican Republic.]

Galgo (Bermuda) - **1684**

Also referred to as the Stonewall wreck, the initial date was determined to be mid-17th-century based on majolica. The eleven complete olive jar rims recovered resembled shape A Middle Style (Dethlefsen et al. 1977). Subsequent work suggested that the wreck was later and that the wreck might be the *Galgo* which sunk off the northwest of Bermuda in 1685.

Santo Cristo de San Román (Florida, 8Ir19) - **1715**

Also known as "Corrigan's Wreck site", One of the 11 Spanish ships carrying silver, gold, and other goods to Spain which sank in 1715 during a hurricane off the Atlantic coast of Florida (Weller 1987:4,18-19). A shape A olive jar from the *San Roman* is illustrated in Marken (1994:97). [Collections are located at the Florida Bureau of Archaeological Research, Tallahassee, Florida.]

Nuestra Señora de Guadalupe **and** *El Conde de Tolosá*
(Dominican Republic) - **1724**

Also referred to as the Quicksilver Galleons, these two ships were carrying mercury from Spain to Mexico when they sank in a storm off the north coast of the Dominican Republic. The *Guadalupe* alone carried 250 tons of mercury. The *Tolosá* was positively identified in part by matching a merchant's identification mark from a barrel fragment with the corresponding mark and entry in the Manifest of the *Tolosá* (Borrell 1983). Over 600 intact olive jars (mostly shape B) were recovered from these wrecks and represents the largest known assemblage of intact olive jars in the Americas (James 1988). Illustrations of intact olive jars from both wrecks can be found in James (1988) and Marken (1994). [Collections are located at *El Museo de las Casas Reales*, Santo Domingo, Dominican Republic.]

Plate Fleet Wrecks (Florida, 8Mo101) - **1733**

Twenty-three ships sank in a storm along the Florida Keys in 1733. Three were refloated and another 15 which could not be refloated were burned (Skowronek 1982:23-25). Even though the excavations of many of the wrecks were not systematic, Russel Skowronek (1982) demonstrated the potential for interpreting the data sets when he compared the assemblages of 7 of the 1733 plate wrecks with temporally comparable assemblages from St. Augustine. It was found that the ship assemblages resembled higher status assemblages in St. Augustine, and in general, the shipwreck assemblage fit a "frontier" pattern. John Goggin (1964:294) illustrates four shape B olive jars from one of the 1733 plate fleet wrecks in his olive jar study. [Collections are located at the Florida Bureau of Archaeological Research.]

Discussion

Archaeological studies of the Spanish olive jar have identified three major vessel forms during the 17th and 18th-centuries, and have established the basic chronology for these three forms. It has also been suggested that rim morphology for 17th and 18th-century Shape A olive jars is temporarily sensitive. The olive jars of the 16th-century are not as well known, and it is hoped that recent interest in 16th-century Spanish shipwrecks will generate more data in this regard. Research at several 16th-century underwater and terrestrial sites has demonstrated the existence of two 16th-century olive jar forms unknown to John Goggin, and have reinforced the idea that Goggin's "Early Style Olive Jar" is actually a form of canteen, and not in the amphora tradition. The widespread use of these canteens in the 16th-century is no less a fact, and the choice to use these containers, as well as their function, are matters for further research.

The manufacture of olive jars was expedient, and there is no evidence for use of molds or the piecing of body sections together. The rims were added separately, but the body portion of olive jars appears to have been thrown in one piece. Spanish olive jar form appears to be associated with function. The function of the three major Spanish olive jar forms reflects the pattern established by the Greeks and Romans, with specific containers being used to transport wine, olive oil, and honey (or other condiments such as fish sauce in Roman times).

Much is known about the location of Roman-period amphora production in Spain, but at present, no post-medieval olive jar production sites have been recorded. The next chapter will address the issue of production locality by an survey of the natural resources involved in olive jar manufacture (i.e., clay) and a mineralogical examination of olive jar fragments from the contexts described above.

CHAPTER 6

THE TECHNOLOGICAL DATA SET

Technological Studies of the Spanish Colonial Period

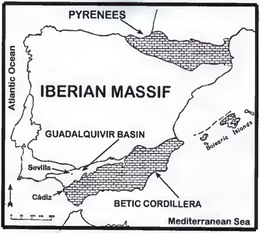
The focus of many of the technological studies of Spanish Colonial artifacts has been on ceramics. Studies of non-European pottery have considered technological attributes for the classification of new types (e.g. Smith 1986) and also to assess the effects of European contact on indigenous pottery manufacture (e.g. Cusick 1989; García-Arevalo 1990). Studies of function include descriptive analysis of structural ceramics (Ruhl 1987) and experimental studies of surface treatment and cooking efficiency (Herron 1986). Physical and chemical analyses have been employed in provenience studies of non-European pottery (Steadman and Reed 1989:67-68), Spanish majolicas (Warren 1973; Vaz and Cruxent 1975; Olin et al. 1978; Maggetti et al. 1984; Jornet et al. 1985; Olin and Blackman 1989; McEwan 1989; Myers et al. 1992), and Spanish olive jars (Walker 1983; James 1988).

Florence and Robert Lister (1987) present the most comprehensive discussion of pottery technology in Andalusia from the Roman period through the 17th century. Two clays were identified — a red-firing clay acquired from islands in the Guadalquivir River, or from pits in the meadows of Triana or Tablada; and a light-firing clay which was extracted from the banks of the Guadalquivir (Lister and Lister 1987:256). The light-firing clay was calcareous, which has technological implications for the degree of vitrification and the surface color. The presence of calcium in a clay body can act as a flux, thereby lowering the temperature of vitrification and resulting in a denser body than non-calcareous clay bodies fired at the same temperature (Lister and Lister 1987:102-103). The breakdown of calcium carbonate during firing and the migration of calcium ions to the surface can result in a surface discoloration if the calcium ions react with any sulfur contaminates in the firing atmosphere (Shepard 1956:21). This surface discoloration is generally a dull yellowish white efflorescence, and has been incorrectly described by archaeologists as a slip (Lister and Lister 1987:102-103; James 1988:52; c.f., Goggin 1964). A "white external skin" has also been observed on some amphoras and is attributed to a reaction between calcium carbonate and sodium chloride (Peacock and Williams 1986:45). White "scumming" can also be the result of a reaction between chloride salts and iron in the clay body (Matson 1971:66).

The present study involves an examination of the technological attributes of clay samples collected from Andalusia. Workability, shrinkage, and performance during firing will be assessed for each clay sample. The study will also include the analysis of thin sections of the clay samples from Andalusia and also of olive jar sherds spanning the colonial period.

Geology of Andalusia — A Brief Summary

The Iberian peninsula is dominated by an uplifted series of folded deposits called a massif which formed before the Mesozoic Era (Figure 27). The Pyrenees to the north and the Betic Cordillera at the southern edge of the peninsula were formed later as a result of a tectonic "collision" between the African and European plates (Ager 1980:3,275-76) (Figures 4-5). The Guadalquivir basin or depression resulted from the presence of a tectonic fault line which separates the Iberian massif and the Betic Cordillera (Lumsden 1992:28; Comité National Français de Géologie 1980:32-33) (Figure 5). Sediments weathering from the Iberian massif, in particular the Sierra Morena (see Figure 4), and the Betic Cordillera were deposited in the Guadalquivir depression during Miocene and Quaternary times, and thereby provided the raw materials for pottery manufacture.



(compiled from Anderson 1978:116 and Ager 1980)

FIGURE 27. Geological map of the Iberian peninsula.

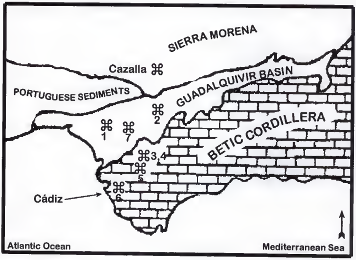


FIGURE 28. Geological map of Andalusia showing location of clay samples 1-7 and Cazalla.

Geological Survey

In the summer of 1990, Dr. Steven Mitchell of California State University at Bakersfield conducted a geological survey to identify the mineralogy of the sediments and clays used to make the pottery for Columbus' first voyage to the New World (Mitchell n.d.). The survey area included much of Andalusia and the sampling strategy involved collecting a sample of sediments in the major drainages of the area. The work has not been published (to my knowledge), and therefore, the present analysis cannot use this work as a reference. Seven clay samples were collected by the author during this survey (Figure 28). The survey strategy might accurately be called a "windshield" survey as the samples were taken from road cuts, clay pits for brick manufacture, and the banks of drainages — all observed from the road. Although the sample size is small and the sampling strategy was restricted to areas accessible by paved roads, the areal extent is such that comparisons can be made between the region surrounding Sevilla and Jérez, which were two major Andalusian wine-producing areas during the 16th-18th centuries.

Clay Analysis

Central to any technological study of pottery manufacture is the investigation of the properties of raw materials. The performance of a clay body during forming, drying, and firing are all investigated to determine the suitability of a particular clay sample. Properties which are important for a clay sample during the forming of pottery include workability, plasticity, shrinkage, and grittiness. During the drying stages of pottery manufacture, shrinkage is the most critical variable to control. Shrinkage is also an important element to control during the firing of pottery, in addition to the firing atmosphere, firing temperature, and the chemical composition of any aplastic inclusions in the clay body (Rice 1987).

A total of seven clay samples from Andalusia were examined for this study (Table 3). These samples were collected as part of geological survey conducted by Steven Mitchell (n.d.) in the summer of 1990. Only one of the Spanish clay samples was collected from an archaeological site (the Cartuja in Sevilla), and this was from a construction pit. Two of the Spanish clay samples were collected from areas of active use by either brick, tile, or pottery makers. The remaining four Spanish clay samples were collected from road cuts. The seven samples were evaluated and the results are presented next.

Table 3. Clay Samples

Sample 1 - Monzanilla, Spain. Recovered from the bank of a road cut leading to a clay extraction pit. No samples were taken from the pit proper; this sample was taken 3 meters below ground surface in the access road cut.

Sample 2 - 50-75 cm below surface, from a 5 m cut in the bank of Arroyo Galapagar, roughly 5 km north of Villanueva del Rio y Minas — appears to have been previously mined, but not for large-scale commercial use.

Sample 3 - yellow clay road cut of CA 403, roughly 1 km north of N342, roughly 4 km west of Villamartín

Sample 4 - red/yellow mixed clay in same general location as Sample 3.

Sample 5 - road cut south of Utrera - white "clay"

Sample 6 - Jérez road cut - white "clay"

Sample 7 - Sample excavated roughly 1 m below surface at the Cartuja - hole was part of construction for the World's Fair.

Clay Sample Preparation

The examination of attributes of the clay samples was conducted in the Ceramic Technology Laboratory of the Florida Museum of Natural History, Gainesville, Florida. Each clay sample was allowed to dry thoroughly and 200 grams of each sample was selected, crushed, and sieved through 1/8" hardware cloth to remove any large aplastics (see Table 4). Each 200 g sample was formed into a small conical mound and distilled water was added to the center of the mound in small amounts and allowed to soak into the clay. Additional water was added until no more water soaked into the clay. The mixture was then worked by hand into a pliable mass suitable for pottery manufacture. The amount of water added to create the desired workability was measured by weighing the amount of water added. The water and container were weighed before and after the addition of water to the clay. The final weight was subtracted from the beginning weight, and the difference was the water added to make the clay plastic, or the water of plasticity. The weight of the water of plasticity divided by the weight of the clay sample (200 g in all cases) is the water of plasticity percentage.

Workability is the overall, somewhat subjective assessment of a clay sample in the plastic state. Workability is determined by the individual potter and reflects the ease with which a clay body is manipulated in either hand building or wheel throwing. Even though workability is a subjective assessment, at least one variable - plasticity - can be measured and therefore allow a more detached comparison between clay samples. Plasticity can be measured by determining the %water of plasticity - the amount of water required to render the clay body plastic, and a number of performance variables - such as the coil bend, the needle roll, and the squeeze. A roughly 2 cm coil is rolled and bent and the degree of cracking at the bend is noted. No cracking indicates a very plastic clay body, while severe cracking indicates that the clay body is not very plastic. The needle and squeeze are assessed in much the same way. If a 2 mm or less diameter "needle" of clay can rolled the clay body is very plastic and if a ball of the clay sample does not crack at the edges when squeezed, the sample is quite plastic. The bite test, whereby a sample is literally bitten by the researcher, gives a subjective assessment of grittiness. The plastic sample was then put in a tightly wrapped plastic bag and allowed to sit over night. The sample bars were formed the next day. Table 5 presents the results of the clay sample attribute analysis

The sample bars were made by first dividing the sample into two parts and rolling two coils of roughly seven inches in length. The coils were then flattened to a width of roughly one inch, and lines were scored at one inch intervals. A sliding calipers set at 10 cm was then impressed into the each of the two 7" bars and the bars were allowed to dry for two weeks. The distance between the caliper-impressed marks was measured and the percentage of shrinkage was determined by dividing the "dry" distance of the caliper marks by 10, and then subtracting this from 1.00. For example, a "dry" distance of 7.5 cm, divided by 10 cm equals .75, subtracted from 1.00 equals .25 or 25% shrinkage.

Table 4. Clay Sample Preparation Notes.

Sample 1 - **Monzanilla** - This sample was very hard to dry screen and was very workable after water was added. Very few aplastic inclusions.

Sample 2 - **Arroyo Galapagar** - This sample was the hardest to dry screen and like Sample 1, was quite workable. Very few aplastic inclusions.

Sample 3 - **~Villamartín greenish yellow** - This sample had a flake-like consistency when dry. When plastic, the sample had a greasy feel - the sample was very plastic— too plastic; aplastics would definitely be required to render this sample workable.

Sample 4 - **~Villamartín yellowish red** - same as Sample 3.

Sample 5 - **Utrera** - This sample crushed easily and had the same general feel as Sample 6, although Sample 5 was slightly harder to crush than Sample 6. The plastic sample was sticky, not very workable.

Sample 6 - **Jérez** - crushed very easily, probably does not contain much clay. When water was poured into the sample it created a mess — a mustard-like consistency was created with relatively small amounts of water. It was clear that Sample 6 was not suitable for making pottery and therefore no further tests on the sample were undertaken.

Sample 7 - **Cartuja** - two <1/4" snail shells were picked from the sample during crushing; the sample crushed fairly easily. 57 g of water were required to achieve plasticity. The plastic sample had a silty feel — doesn't appear that there is an abundance of clay in this sample.

Firing

After two weeks of drying, the bars were broken into small test samples and fired in the Ceramic Technology laboratory of the Florida Museum of Natural History in a Thermolyne 10500 Muffle Furnace. All tiles from one clay sample were placed in the furnace. The furnace was set at 275^0 with the door propped slightly open to allow gases from organics to escape. The temperature was held at 275^0 for 15 minutes, after which the door was closed and the temperature selector was set at 300^0. The temperature was held at 300^o for 15 minutes, the tile marked "300^o" was removed, the door was closed and the temperature was set at the next temperature setting. This procedure was followed for firings at 400^0, 500^0, 575^0, 700^0, 750^0, 800^0, 850^0, 900^0, 950^0, 1000^0, and 1050^0. 575^0 was chosen instead of 600^0 because this is the temperature at which quartz conversion occurs — a 15 minute soaking at this temperature allows safe quartz conversion. This entire procedure took 4 hours to fire and 4 hours for the furnace to cool down, therefore, each firing cycle required 8 hours. At this rate, it would have required 15 firing episodes, all of which would range from 300^0 to 1050^0, so it would take 15 x 8 hours, or 120 hours to fire all 15 clay samples. The procedure was altered so that instead of firing one sample at all temperature intervals, all samples were fired at each temperature interval. The lower temperature firings required much less than the 4 hour cooling period, and the furnace was spared the work of being fired to 1050^0 15 times. Instead, the furnace was fired at this high temperature only once. All 15 samples were fired comfortably over a four day period. Table 6 presents a summary of the firing of the clay samples.

Table 5. Results of Andalusian Clay Attribute Analysis

Sample	Coil	Needle	Squeeze	Bite	Odor	Color (dry)
1	cracks	good	cracks	v. fine grit	none	10YR7/4 very pale br.
2	cracks	good	cracks	no grit	none	10YR8/3 very pale br.
3	cracks	bad	cracks	no grit	none	5YR6/2 light olive gr.
4	cracks	bad	cracks	no grit	none	2.5YR4/4 reddish br.
5	cracks	good	cracks	gritty	none	10YR8/1 white
6	unsuitable, no tests made					
7	sev. crack	bad	sev. crack	v. gritty	none	10YR6/3 pale brown

Sample	Water of Plasticity %	Overall Workability Assessment	Shrinkage %
1	29.5	good	5.2
2	36.0	good	8.7
3	50.0	poor	12.5
4	52.0	poor	11.9
5	28.0	poor	4.3
6	unsuitable, no tests made		
7	28.5	poor	3.3

Table 6. Results of Firing of Andalusian Clay Samples

°C	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 7
unfired	10YR7/4	10YR8/3	5YR6/2	2.5YR4/4	10YR8/2	10YR6/3
300	10R7/4	5YR7/4	blew up	blew up	10YR8/2	5YR6/4
400	10R7/4	5YR7/4			10YR8/3	5YR6/4
500	10R7/4	5YR6/6			10YR8/3	5YR6/6
575	2.5YR7/4	5YR6/6			10YR8/3	5YR6/6
700	5YR8/4	5YR7/4			10YR8/2	5YR6/6
750	5YR8/4	5YR7/4			10YR7/2	5YR6/6
800	7.5YR8/2	5YR7/4			10YR7/3	5YR6/4
850	10YR8/3	2.5YR6/6			10YR7/3	5YR6/4
900	10YR7/4	2.5YR7/6			10YR7/3	5YR6/4
1000	10YR7/4	2.5YR8/4			10YR7/3	7.5YR7/4
1050	10YR7/4	2.5YR8/4			10YR7/3	7.5YR7/4

Sample 1 — Monzanilla

This sample contains very little iron or organics. The unfired dry test tile was a very pale brown, and the 300⁰ to 575⁰ test tiles became slightly pinkish, which lessens in the 700⁰ and 770⁰ tiles, and disappears by 800⁰. Above 800⁰ the tiles are again a pale brown, with a very slight pinkish tinge becoming visible at 1000⁰ and 1050⁰. Like Sample 5 - Utrera, Sample 1 - Monzanilla also contains calcium carbonate fragments, but a much lower frequency. The few larger calcium carbonate fragments caused localized cracks, but only at 1050⁰ was the cracking severe enough to cause breakage. The problems caused by the calcium carbonate can be alleviated by a number of techniques, including fine sieving the clay to remove the larger calcium carbonate particles, grinding the clay sample to reduce the size and therefore the deleterious effect of the calcium carbonate particles, and by adding sodium to the clay body (Laird and Worcestor 1956).

Sample 2 — Arroyo Galapagar

This sample contained low to moderate amounts of iron and organics. A hint of organics was apparent in the 300⁰ and 400⁰ tiles, but all organics had burned out by 500⁰ when the tiles took on a uniform reddish yellow color, which turned to pink from 700⁰ to 800⁰, and red at 850⁰. After 850⁰, the tile colors ranged from light red again to pink. A slight amount of micaceous material is evident; no cracking occurred on any of the samples. This sample performed the best in the firing.

Samples 3 and 4 — ~Villamartín

These samples blew up during the 300^0 firing, and therefore no attempt was made to fire them at higher temperatures.

Sample 5 — Utrera

The color of Sample 5 - Utrera changed very little as temperature was increased. In fact, after 750^0 virtually no change was observed, which indicates that almost no organics were present in this sample. The unfired dry sample is almost white - a very pale brown, and only the slightest pink is observed from 300^0 to 575^0 indicating that this sample contains very little iron. The sample does contain significant amounts of calcium carbonate, and as a result, post-firing lime spalling occurred on all tiles above 750^0. At 800^0, the damage resulting from lime spalling caused only the surface to exfoliate, but at 850^0 and higher, lime spalling was severe and the tiles were reduced to piles of small fragments. This clay sample performed very poorly in the firing and it is very unlikely that it would have been used for pottery.

Sample 7 — Cartuja

This sample underwent only slight changes as temperature increased. The slight lightening in color between 400^0 and 500^0 is probably due to the organics being burned away. The 500^0 to 750^0 tiles became slightly reddish yellow, which turned to a light reddish brown after 750^0, and finally pink between 1000^0 and 1050^0. This sample has moderate to low amounts of iron and a very low percentage of organics. A moderate density of micaceous flecking is readily apparent on the fired tile surfaces. A moderate amount of surface cracking occurred on the 850^0 tile. This surface cracking is very slight on the 900^0 tile, and absent from the 950^0-1050^0 tiles. The cause of this cracking is not readily apparent. It might be the result of fine grained calcium carbonate.

Discussion of Performance Attribute Analysis of Clay Samples

The results of the performance attributes of clay samples collected in Spain were somewhat disappointing. Only two of the seven samples, samples 1 and 2, were found to be suitable for pottery making. Samples 3 and 4 were simply too plastic, had high shrinkage, and blew-up during the 300^0 firing. Samples 5 and 6 were very chalky and probably contained very little clay. Sample 7 had poor workability, low shrinkage, but performed reasonably well during firing. It is interesting to note that the two best samples, Samples 1 and 2, were taken from areas which appear to have been chosen by local clay-product manufactures. Sample 1 was collected in the close vicinity of an active clay pit for brick manufacturing, and Sample 2 was taken from an area where others had also collected clay. Sample 7 was shown to a brickmaker in Sevilla who still made bricks in the traditional way. Aside from the use of a truck to deliver the clay, the manufacturing process was probably little changed from that of hundreds of years ago. This brickmaker was asked to evaluate Sample 7. He hesitated as he crumbled the sample between his fingers, and unfortunately, I told him that the sample was from the island with the Carthusian monastery before he gave his own opinion. Upon hearing that the sample was from the Carthuja, he immediately declared that it was suitable for making bricks. This supports the documentary reports that clay was acquired from the islands in the Guadalquivir River (e.g., Lister and Lister 1987:256), and also suggests that clay which might not be suitable for making pottery, might work just fine for bricks.

Thin Section Analysis

Thin sections of Clay Samples 1,2, 7 and seventeen olive jar sherds were prepared by Pioneer Petrographics. The process involves impregnating the samples with epoxy resin in a heated vacuum. The sample is cut and one of the freshly cut surfaces is ground smooth and glued to a glass slide. The sample glued to the glass slide is then ground to a thickness of 0.03 mm (Neese 1986:293). Clay samples 1 and 2 were chosen because they had the best performance characteristics; sample 7 was chosen because it came from a source area mentioned in the documents [i.e., the islands in the Guadalquivir River (Lister and Lister 1987:256]. The thin sections were placed on a mechanical stage of a polarizing microscope (courtesy of Dr. Frank Blanchard), and were examined by describing the feature, be it inclusion or matrix, at the intersection of the cross-hairs every 2 mm. A 1 mm interval could not be employed because with one exception, all the thin sections had some inclusions which were greater than 1mm. Unfortunately, the number of points counted and described for each slide was not very high. The olive jar contexts and the number of points described for each thin section are presented in Table 7. The results of the thin section analysis are presented in Tables 8 and 9.

Table 7. Contexts of Thin Sections of Olive Jar Sherds

Date	*Site*	*#Points Described*
1503-1578	Concepción de la Vega, Dominican Republic	59
1495-1562	Puerto Real, Haiti	
1515-1541a	Nueva Cádiz, Venezuela	74
1515-1541b	Nueva Cádiz, Venezuela	54
mid-1500'sa	UID mid-1500's shipwreck, Florida	65
mid-1500'sb	UID mid-1500's shipwreck, Florida	33
1590	wreck of the *Nuestra Señora del Rosario,* Cuba	68
1618	wreck of the *San Martín,* Florida	68
1641a	wreck of the *Nuestra Señora de la Concepción,* Dominican Republic	67
1641b	wreck of the *Nuestra Señora de la Concepción,* Dominican Republic	67
1641c	wreck of the *Nuestra Señora de la Concepción,* Dominican Republic	67
1715a	wreck of the *Cristo San Román,* Florida	80
1715b	wreck of the *Cristo San Román,* Florida	93
1724a	wreck of the *Tolosá,* Dominican Republic	97
1724b	wreck of the *Tolosá,* Dominican Republic	93
1733a	wreck of the *San José,* Florida	116
1733b	wreck of the *San José,* Florida	106

Table 8. Results of Thin Section Analysis of Clay Samples
(figures are percentages rounded to the nearest whole number)

	Sample 1 - Monzanilla	Sample 2 - Galapagar	Sample 7 - Cartuja
matrix	72	56	38
monocrys. quartz	9	17	45
polycrys. quartz	0	0	0
plagioclase	0	0	+
muscovite	0	+	1
biotite	1	1	2
chert	0	0	0
pyroxene	0	0	0
amphibole	0	0	0
Fe lumps	1	1	5
$CaCO_3$ frags.	15	17	8
empty voids	-	-	-
$CaCO_3$ voids	-	-	-
grog	-	-	-
bioclasts	2	8	1
UID rock	0	0	0
Points Described	210	224	232

Table 9. Results of Thin Section Analysis of Olive Jar Sherds.
(figures are percentages rounded to the nearest whole number)

DATE	1503-1578	1495-1562	1515-1541a	1515-1541b	mid 1500'sa	mid 1500'sb	1590	1618
matrix	89	61	79	54	69	67	59	66
monocrys. quartz	2	12	5	20	9	15	24	13
polycrys. quartz	0	2	3	7	6	+	3	3
plagioclase	0	3	+	+	+	0	+	0
muscovite	1	+	+	0	3	0	2	0
biotite	0	0	0	0	0	+	0	0
chert	+	+	+	2	3	3	0	+
pyroxene	0	0	0	0	0	0	0	0
amphibole	0	0	0	0	0	0	+	4
Fe lumps	4	5	+	2	2	+	+	0
$CaCO_3$ frgs.	0	3	4	+	2	+	7	6
empty voids	5	7	1	9	5	15	2	0
$CaCO_3$ voids	0	+	3	+	0	0	2	2
grog	0	3	3	0	+	+	+	2
bioclasts	0	0	0	0	0	0	+	+
UID rock	0	3	1	6	2	0	3	4

Table 9. (cont.)

YEAR	1641a	1641b	1641c	1715a	1715b	1724a	1724b	1733a	1733b
matrix	73	61	70	56	58	70	70	68	66
monocrys. quartz	10	14	22	16	20	10	4	14	9
polycrys. quartz	5	2	0	4	2	3	4	8	1
plagioclase	+	0	0	+	1	+	0	+	+
muscovite	0	0	+	0	0	0	1	0	0
biotite	0	0	0	+	+	0	0	0	0
chert	+	+	0	1.3	+	+	2	+	3
pyroxene	0	0	0	0	0	0	0	0	0
amphibole	0	0	0	0	0	2	+	0	0
Fe lumps	3	0	2	0	2	2	+	+	1
$CaCO_3$ frags.	3	11	2	5	1	3	1	2	7
empty voids	0	6	+	0	2	0	0	0	3
$CaCO_3$ voids	2	0	0	1.3	4	5	9	1	7
grog	2	+	0	9	2	3	4	5	+
bioclasts	0	0	+	0	0	0	0	+	+
UID rock	2	6	5	8	6	3	3	3	4

Discussion of Thin Section Analysis — Clay Samples

Samples 1, 2, and 7 are very similar, in a qualitative sense. Aside from muscovite and plagioclase, all three samples contain the same inclusions. The size of inclusions is also the same for all three clay samples — all inclusions are less than 0.5 mm. Quartz, calcium carbonate fragments, and bioclasts are the most common aplastic inclusions. Sample 2 contains more quartz inclusions and bioclasts compared to Sample 1. The high incidence of quartz in Sample 7 explains the silty feel in the workability tests.

Samples 1 and 2 can be described as light-firing/calcareous, and Sample 7 is "red"-firing/calcareous, using the Lister and Lister (1987) distinctions between Andalusian clays. No efflorescence occurred on any of the fired clay samples, which indicates that further manipulation is required to attain the whitish surface color.

All three clay samples were collected in the Guadalquivir basin, which accounts for their qualitative similarities. The differences between the Guadalquivir Basin and Betic Cordillera clay samples to the south was demonstrated in the workability testing, and the differences between the clay samples of the Guadalquivir Basin and the Sierra Morena to the north were also examined. A pottery roof tile from Cazalla (see Figure 28) made from local clay was examined because Cazalla was a rich wine-producing area in Andalusian during the 16th-18th-centuries. The clay from this area is immediately distinguishable from the clays of the Guadalquivir basin. A thin section of this roof tile revealed a high proportion of plagioclase-feldspars, pyroxene, and ferrugenous lumps. Quartz was represented only in very small amounts. As mentioned earlier, many of the sediments in the Guadalquivir Basin were weathered from the Sierra Morena, and the comparatively large proportion of quartz and small proportions of plagioclase and pyroxene in the Guadalquivir Basin clay samples might be explained by the differential hardness of the minerals in question. Quartz is 7 on Moh's scale of hardness; while pyroxene and plagioclase are 5.5 and 6, respectively (Klein and Hurlbut 1977:203,401,454). It appears that the harder minerals such as quartz will remain relatively unaltered in a context of weathering and redeposition, while the softer minerals might alter to some other form (e.g., weathered feldspar alters into clay minerals) and therefore will not be represented in proportions equal to those found in the source area.

Discussion of Thin Section Analysis — Olive Jar Sherds

The size of the inclusions in the olive jar thin sections (ranging from 0.1 to 1.8 mm) was larger, and more angular than the inclusions observed in the clay sample thin sections (less than 0.3 mm). This suggests the intentional addition of aplastics to the olive jar clay body, and the angular nature of many of the inclusions suggests some sort of grinding of aplastics to obtain a size not represented in the natural clay. The observation of grog in many of the olive jar thin sections further supports the idea of intentional addition of aplastics.

Quartz was found in all thin sections and is the most abundant aplastic mineral. Other minerals which occur far less frequently and do not occur in all samples include plagioclase, muscovite/biotite, chert and amphibole. Calcium carbonate fragments are found in all samples. Voids occur in all samples and calcium carbonate crystals occur in voids of some of the samples from both land and underwater contexts. The occurrence of such crystallization is likely post-depositional. Grog is a common, though not abundant constituent of all but three samples. Bioclasts are found in only five of the samples.

The predominance of quartz, and the small proportions of plagioclase and pyroxene in the olive jar thin sections suggests a clay source in the Guadalquivir basin. All in all, there were only minor differences between the olive jar sherd thin sections, and no obvious chronological "trends" were observed in the results of the thin section analysis. The technological indicators — grog and voids — suggest that grog was, on average, slightly more prevalent in the 18th-century olive jars, but the frequency of voids varies all through the colonial period. The thin section analysis suggests that a clay source within the Guadalquivir valley was used throughout the colonial period. It is important to point out that this sample - 17 sherds - is exceedingly small as millions of olive jars were produced during the colonial period.

An examination of more samples from a single provenience (Avery n.d.a, n.d.b.) revealed additional patterns. The examination of thin sections of olive jar rim sherds from the Santa Margarita (1622) indicated that there were minor paste differences between rim forms for shape A and shape B olive jars, but geologically, all the thin sections were similar. The main differences were that the shape A rim forms had grog, and the shape B forms did not. Also, the shape B forms had bioclasts, while the shape A forms did not.

Summary and Conclusions

The technological analyses revealed several important things about olive jar production which included information about the clay, composition of paste, and location of manufacture. The clay survey, limited as it was, indicated that the area of Jérez, Utrera, and Cádiz does not have an abundance of usable pottery clay. The chalky white subsoil in the area is excellent for growing the grapes used for the famous sherries of southern Spain, but these same soils are not so good for making pottery. Good clay sources were located both west and east of Sevilla.

The most dramatic result of the thin section analysis was related to the examination of the pottery roof tile from Cazalla. Cazalla, located in the Sierra Morena area to the north of Sevilla, was quite distinct geologically. This is the area of large scale wine production during the colonial period, and is one of Lister and Lister's (1987) hypothesized olive jar production areas outside of Sevilla. In fact, when wine from Cazalla is mentioned the shipping records it is most often shipped in olive jars. But the thin section of the pottery roof tile from Cazalla was quite distinct from the thin sections of the olive jar sherds, so it seems that olive jars were not being produced in Cazalla.

Unfortunately, the production locality of olive jar manufacture was only narrowed down by the results of this study. Cazalla as a potential candidate for olive jar production can be ruled out. The geological differences are so distinct that olive jars made in Cazalla would be immediately recognizable by their deep red color. No such olive jars were observed in any of the collections examined in this study. The thin section analysis indicated a basic similarity of olive jar paste with sediments which are associated with the Guadalquivir River drainage.

Pinpointing the production to Sevilla and Sevilla alone might not be possible with mineralogical analysis, but it is important that the technological analyses ruled out the Cazalla and Jérez areas as olive jar manufacture areas. These two areas were the two main wine producing areas for the Carrera de las Indias, in addition to the area west of Sevilla. Documentary evidence can shed further light on the locale of olive jar production, and this will be considered in the next chapter.

CHAPTER 7

THE DOCUMENTARY DATA SET I: TRANSPORT AND COMMERCE

Introduction

During the 16th-century, Castile was faced with an array of obstacles in the extraction of wealth from its American colonies, not the least of which was the sea itself. The new colonies initially required much of their provisioning from home, and preparing the fleets of ships that would carry the foundations of Mediterranean culture (i.e., wine, wheat, olive oil, along with manufactured goods) to the colonies, and more importantly return with precious metals, was a monumental task, the scale of which had not been witnessed since the days of the Roman Empire. Much has been written on the *Carrera de Indias,* or the commerce of the Indies, and while the earlier work emphasized imports from the Americas and the impact of American goods on the European economy, more recent work has focused on what was being shipped to the colonies. The discussion begins with a general summary of the secondary and primary sources consulted, followed by an overview of the development of the maritime tradition of Sevilla and the *Carrera de Indias,* with a focus on the Spanish exports and their associated packaging needs. The organization of the production of ceramic packaging in Sevilla from the 16th through 18th-centuries will then be considered in this context.

Historical Studies of the Spanish Late Medieval and Colonial Period Economy

The amount of historical work discussing the Spanish colonial period is considerable, and the literature regarding the domestic setting in the Iberian Peninsula has grown appreciably in the last 20 years. What follows is not intended to be a comprehensive review of historical literature related to the present study, but rather is simply a brief presentation of the sources which were found to be helpful for this study.

The economic relations between Spain and the Americas has received much attention by historians [Haring 1918(1964); Chaunu 1955-60; Morales Padrón 1955; Shafer 1958; Vicens Vives 1961; García Fuentes 1979; Fontana 1982; Parry 1990; Ballestreros Gaibrois 1992:179-219; de Bordejé Morencos 1992; Comellas 1992; Eiras Roel y Rey Castelao 1992:44-49,126-154; Eascondell Bonet 1992:315-344; Hernández Sánchez-Barba 1992:187-213; Morales Padrón 1992:77-149; Ruiz de Azúa 1992:191-213]. Until relatively recently, more was known about the imports which flowed through Sevilla than the products which Spain sent to the colonies. The magnificent 8 volume work of Pierre and Huguette Chaunu mentioned Spanish exports by total tonnage, and not specifics. Recent work has done much to describe the Spanish exports (Guimerá Ravina 1977; Pérez-Mallaina Bueno 1979; López Cantos 1979; Lorenzo Sanz 1979-80; García Fuentes 1980; Suárez Grimón 1982; Oliva Melgar 1987; García-Baquero Gonzales 1988; Phillips 1990).

There are a lesser number of works on maritime activity which include discussions of Spanish ships and shipping and their medieval origins (Usher 1932; Lewis 1951, 1978; Morales Padrón 1970; Peterson 1975; Unger 1980, 1981; Lewis and Runyan 1985; Thomazi 1985; Phillips 1986; Pérez Turrado 1992; Walton 1994), as well as the institutions and ordinances which regulated the fleet system, including the Spanish House of Trade or *Casa de Contratación*, and the Spanish Guild Merchant or *Consulado* (Veitia Linage 1981[1672]; Smith 1940; Gil-Bermejo García 1973; Heredia Herrera 1970). Less attention has focused on the economic relations between Spain and European or Mediterranean countries during the 16-18th-centuries (Girard 1932; McLachlan 1940; Childs 1977;). Also useful for comparative purposes are works which describe the internal Latin American commercial activity (Hussey 1934; Moreyra y Paz-Soldán 1944;

Stampa 1949; Cobb 1949; Arcila Farías 1950; Palanco Martinez 1950; Borah 1954; Arellano Moreno 1960; Macleod 1973 ; Comision par escribir la Historia Marítima del Perú 1977; Andrews 1978; Clayton 1986; Ward 1993).

Sevilla was the focal point for transatlantic activity for over two hundred years (Montoto 1938; Domínguez Ortiz 1946, 1986; Pike 1961, 1966, 1972; Bernal y García-Baquero Gonzalez 1976; Gil-Bermejo García 1976; Collantes de Terán Sánchez 1977; Trueba 1988; Aguilar Piñal 1989; Morales Padrón 1989; Caballera Bonald 1991;). Within the last 20 years, work has also focused on the histories of the regions involved with Indies trade - areas around Sevilla and Cádiz - from the late Middle Ages to the Modern era (Gonzales Jimenez 1973; Gil-Bermejo 1977, 1980; Herrera García 1981; Borrero Fernandez 1983; Ponsot 1986; Traverso Ruiz 1986; Montes Romero-Comacho 1989).

Journals which contain archival studies related to the Spanish Colonial economy include the *Archivo Hispalense, Hispanic American Historical Review, Historia, Instituciones, Documentos* (a University of Sevilla publication), *Ibero-Amerikanisches Archiv*, and *Revista de Indias*. Unfortunately, while the importance of wine and olive oil for the Indies trade is commonly mentioned, there does not exist an intensive study of the organization of production and associated industries. Tim Unwin's (1991) *Wine and the Vine, An Historical Geography of Viticulture and the Wine Trade,* is an excellent overview and provides the general perspective so necessary for understanding specific manifestations. There are also a number of monographs and journal articles which mention Spanish wine production (Simon 1906, 1907, 1909; Allen 1961; Francis 1973; Steckley 1980; Pascual Guasch 1984; Carré 1987). The journal *Wines & Vines* is a also a source for articles on Spanish wine.

Much of the work on the Spanish colonial economic situation is based on documents housed in the Archivo General de India (AGI) and Protocolos, both located in Sevilla, Spain. The AGI contains documents from the *Casa de Contratación*, and *Consulado*, as well as documents from the *Audiencias* from the various colonial capital cities. The shipping manifests in the AGI are particularly useful for this study. Other archives in Sevilla of use are the *Archivo Municipal de Sevilla* and the University of Sevilla archives. These archives hold documents such as guild rosters, notary records, ordinances, price lists, and tax lists (especially those on wine and olive oil) and provide information on how Sevilla coped with being the commercial capital of the Indies trade. Archival work was conducted for three months in the fall of 1990. Time constraints allowed only visits to archives in Sevilla, and*Protocolos* was closed as it was being moved the building which housed the *Archivo Municipal de Sevilla.*

Development of Maritime Tradition in Andalusia

Continuity in maritime tradition in Andalusia can be traced to the Roman period. The Visigoths were not sailors, and the surviving remnants of the Roman empire which came to be known as Byzantine retained a maritime presence in the Mediterranean and in southern Spain. Even the initial impact of the Arab conquest in the Mediterranean had little effect on maritime commercial activity. The Arabs were desert Bedouin conquerors, not long-distance traders, and this they left to those who had previous controlled it - the Christian Graeco-Syrians of Alexandria and the seaport cities of Syria (Lewis 1951:78-79). Arab holdings in north Africa and the Iberian Peninsula were especially isolated - the long distance and lack of effective naval capabilities prevented provisioning of these areas from the homeland in Syria. The Muslims in Spain made alliances with the Byzantines to fight the Franks in the late 700's, and also participated in commercial relations with both England and Rome in the 800's. (Lewis 1951:103,117), so it appears that there was some degree of continuity between the Byzantine and Muslim presence in Sevilla. The Muslims controlled the Mediterranean by the 900s and had built up maritime strength - an attack on Cadiz and Sevilla by Vikings was repulsed in 944, and later in 966 and 971, where an earlier attack in 844 resulted in the sacking of Sevilla (Lewis 1951:147,151-152,197). In the 12th-century the Italians came to dominate commercial activity in the Mediterranean, due in part to the Turks fighting the Byzantines, the Petcheniks fighting the Russians, and the Olmoravids fighting the Omyads (Lewis 1951:225).

Prior to the end of the 12th-century, the Iberian peninsula had been the object of "passive" trade as outside traders, primarily the Italians. In the 12th-century the Catalans would begin to take the initiative in commercial relations, following the example set by the Italians, and while Andalusian ports experienced increases in trade during this period, it is still considered passive trade as much of the shipping was organized by foreigners (Verlinden 1940:50-53). Olive production flourished during the Muslim presence in the Iberian Peninsula as there were Islamic prohibitions against consuming pork and pork products (lard) (Morales Padrón 1992:78-79), and while there were Islamic prohibitions against consuming wine, grapes and raisins remained a popular food item, and therefore the vineyards also prospered during the 10th-12th-centuries. After the Christian "re-conquest" of Sevilla in 1248, exports of wine increased (Lewis and Runyan 1985:131), and by the late 13th-century, Andalusian exports included wine, honey, olive oil, figs, raisins, skins, wax and leather (Childs 1977:104). Olive oil was used in cooking, but its most widespread use in Britain was for soaking wool prior to carding which rendered the wool less likely to break during combing and spinning. Other materials could be used (rancid butter or pig fat) but olive oil was preferred (Childs 1977:109). Spanish wines were exported from the thirteenth-century onwards to France, Flanders and England (Childs 1977:126). The Black Death in the 14th-century increased the need for bulk carriers to bring subsistence goods to areas where labor shortages mitigated against crop production (Unger 1980:188-189). The export of Spanish wines to England increased during the mid-14th-century with the disruption of the wine trade from its Gascony holdings in modern-day France, and increased even more with the 15th-century loss of Gascony (Childs 1977:136). Of the 15th-century Spanish wine exports to England, those from Andalusia were clearly dominant during the last quarter of the 15th-century, accounting for almost 90% of the total Spanish wine exports(Childs 1977:133).

Significant changes in the warships and cargo ships of northern Europe took place during the period between 1066 and 1377 (Lewis and Runyan 1985:135). These changes were influenced in large part by the demands for bulk shipping of wine and wool. The development of the cog, a 250 ton, flat-bottom, single-masted ship with keel and rudder in place of oars created a ship that was both larger and more maneuverable in the ocean than previous bulk carriers. The cog was widely used in the English wine trade (Lewis and Runyan 1985:136). In the Mediterranean, there were two major classes of ship - the oared galley and transport ship. Both were carvel-built with more than one mast, generally lateen -rigged and had steering oars. During the 13th-century, cogs began to appear in the Mediterranean, and the oared galley design began to be copied in North Atlantic ports (Lewis 1978a:21-25). The galleys became to be used more as warships, and the so-called "round ships" were less maneuverable, but designed more as bulk carriers, and their capacity came to be measured in the number of wine casks they could carry, which attested to the popularity of the barrel (Unger 1980:127). Special facilities to load and unload casks of wine were present at most major ports by the mid 13th-century (Unger 1980:146).

By the 15th-century, the intermingling of Mediterranean and Atlantic designs resulted in the development of the carrack and the caravel ". . . both of which were better adapted to oceanic travel than any of their predecessors" (Lewis 1978a:21-25). The carrack design resembled the cog with its stern rudder, and fore and aft castles, and had a carvel system of planking (Lewis 1978a:25). "The caravel, which may originally have been designed by Atlantic-based Moors of Spain and Morocco, was . . . slender, had a carvel-built construction, lateen-rigged with a stern rudder and several masts" (Lewis 1978a:26). Both the carrack and caravel were also armed with cannons during this period. (Lewis 1978a:26). "By 1480, caravels were from 150 to 200 tons. Length-to-breadth ratios also fell, probably in to the range of 4:1 and 3:1." The caravels were designed for bring goods to the north Atlantic and to West Africa (Unger 1980:214).

Guns had been in use on ships prior to the 15th-century, but shortcomings in their range, accuracy, and reliability had limited their importance until the late 15th-centuries and 16th-centuries, when they became essential for military vessels, and transformed ship battles to more than just boarding affairs (Unger 1980:231). It has been suggested that the improvements in weaponry used on warships from 1400 to 1500 had more of an impact on the political and social milieu of the Mediterranean and Atlantic worlds than did the introduction of full rig on cargo ships (Unger 1980:235).

From the 14th-16th-centuries, there was no great structural distinction between cargo ships and warships (Unger 1980:252). Mid-sized cargo ships became more common in the 16th-century — 300-500 tons, even though cargo ships as large as 2,000 tons could be built. The high operating costs and concentration of risk of the larger ships were two factors in favor of using smaller vessels. (Unger 1980:265). The 17th-century introduction of the Dutch fluyt cargo ship with its 4:1 and later 5:1 length:width ratio was easily distinguished from the galleon and Spanish cargo ships 3-3.5:1 ratio (Usher 1932:195). The fluyts did not draw as much water, and had a greater floor to depth ratio (Usher 1932:201-202). The better performance of the fluyts, increased their demand but their 5:1 length:width ratio meant that more wood was needed for their construction (Unger 268-269). The improvements in bulk shipping design led to reduced shipping costs, which stimulated the commercial production of bulk goods, in particular agricultural production, and also stimulated the production of manufactured goods, as the costs of shipping raw material to the factories was reduced (Unger 1980:274).

During the 16th-century two trade routes were dominated by the Iberian Peninsula — the *Carrera de Indias* and the Lisbon East Indies route. The size of the ships readily distinguishes the two routes. The ships of the Carrera were much smaller — with few ships being over 500 tons at the end of the 16th-century although even 400 ton ships could not pass easily over the sandbar at San Lucar de Barrameda. Larger ships became common in the Carrera during the second half of the 17th-century. These larger ships, sometimes as large as 700-1000 tons, could no longer pass over the sandbar at the mouth of the Guadalquivir and became a contributing factor in moving the administrative institutions from Sevilla to Cádiz in the early 18th-century.

The *Carrera de Indias*

The transport problems in the shipping of bulk commodities posed by the transatlantic commerce in the 16th-century had been addressed and resolved during the middle Ages in the Mediterranean and north Atlantic, including the shipping of Spanish wine, wheat, and olive oil. The two annual fleets which sailed from northern Spain to northern Europe during the Middle Ages served as the model for the two fleet system of Sevilla during the 16th-century (Reitzer 1960:219). Therefore, the maritime tradition necessary for the shipment of large quantities of goods and people across the Atlantic was already in place in late 15th-century Sevilla.

The history of the *Carrera* can be summarized as a period of general expansion from 1504 to 1562, a great increase from 1562 to 1592 followed by a plateau to 1622, a great depression from 1623-1650 (Lynch 1969:160,184), and a subsequent period of slow recovery by the end of the 17th-century and into the 18th-century. During the first half of the 16th-century, agricultural products dominated the exports to the Indies, but by the early 1560's, there were proportionally more manufactured goods than agricultural products (Parry 1990:123). The average size of ship increased from 70 tons in 1504 to 391 tons in 1641-45 (Lynch 1969:162), with an average of 400 tons in the 18th-century. "Since the outbound cargoes were usually more bulky than the valuables returned to Spain, the returning fleets were generally smaller than the outgoing. This led to the practice of buying up old ships good for one more voyage and sending them to the Indies with a cargo. At their destinations they were scrapped and the hulks burned for the metal fittings" (Peterson 1975:66).

The *Carrera* — Administration

Initially, trade with the Indies was restricted to Cádiz, but by 1503 this had changed to Sevilla (Salmon 1971:119). In this same year, the *Casa de la Contratación de las Indias* or Indies House of Trade was established in Sevilla. The *Casa* registered both outgoing and incoming cargo, collected duties, licensed passengers to the Indies, fitted out and inspected the ships, licensed and instructed navigators, and arbitrated legal cases (Parry 1990:56-57). In the early 16th-century, Sevilla was a good choice as administrative center for the Carrera, even though Cádiz had a better harbor. Located upriver away from the coast, Sevilla was not as open to attack, and more protected from rough weather. Sevilla also had better access to provisions as those intended for the fleets at Cádiz were transported to the ships mostly by water (Parry 1990:55). Some have suggested that the choice of Sevilla over Cadiz in the early days was yet another example of Spanish "indifference" to the whole economic venture, but Parry suggests that Sevilla was superior to Cádiz and easier to control (Parry 1990:54). During the period 1529-1573 other Spanish ports were allowed to participate in the Indies trade. Ships from the ports of Bilboa, San Sebastián, La Coruña, Bayone, Avilés, Laredo, Cartagena, Cádiz and Málaga could make direct trips to the Indies, but had to return to Sevilla (Ruiz de Azúa 1992:191). Foreign goods were never excluded from the Indies, just foreign merchants and their ships (Madariaga 1947:65).

In 1543 the *Consulado* or Merchant Guild was formed and performed many of the functions of the Casa, which had acquired an untenable workload (Parry 1990:125). The objective of the *Consulado* was to protect and advance the economic status of the merchants; it was part of town government, but not intended to supplant it. The *Consuldo* was formed by Royal decrees, and consisted of a court led by a prior and two consuls elected by a body of merchants. The court heard civil cases related to the Indies trade such as bankruptcies and collection of debts. These cases were formerly heard by the*Casa*, but by the mid-16th century, the *Casa* was no longer able to handle the great increase in judicial matters related to the *Carrera.* The *Casa* regulated the warehouses for assessing taxes and registration of cargoes, inspected ships for seaworthiness, issued licenses for pilots and shipmasters, presented navigation and mapping courses, and heard civil and criminal cases (Hussey 1929:4-5; Smith 1940:91). The *Consulado* could also serve as *escribano* and *alguacil* of the House of Trade (Heredia Herrera 1970:223). The *Consulado* left Sevilla with the *Casa* in 1717; a *Diputación de Comercio* remained in the *Casa Lonja* in Sevilla.

The 1556 Ordinances defined the functions and regulated the activities of the Consulado - and these ordinances would continue into the 18th-century (Morales Padrón 1992:126). The transfer to Cádiz did not bring about immediate changes in the administration of the *Carrera* as shipping ordinances were not modified until 1734, and these modifications had not been drawn up by 1794 (Heredia Herrera 1970:230-231). In 1780 the *Casa* was shut down (Parry 1990:317), and in 1784, the *Consulado* of Sevilla was created (Heredia Herrera 1970:226).

In 1797, after losing a maritime war with the British, all Spanish colonial ports were opened to foreigners. "Spanish control of the Indies trade effectively ended in 1797, and was never recovered." (Parry 1990:346). In 1808, Napoleon invaded Spain and the British sent troops to fight the French in Spain (Parry 1990:348). The French invasion of Spain sparked rebellions in the colonies. "Between 1808 and 1812 almost every province in the Indies was shaken by revolutionary movements of one kind or another" (Parry 1990:350). Between 1814-1816 Spanish power was largely restored by force, but the period 1816-1825 witnessed revolt again in South America and Mexico.

In 1802, one day had 27 ships leave Cádiz for the Americas. In the years 1826-1828 there were only 26, 22, and 33 ships, respectively for each year, which left for the Indies (Heredia Herrera 1970:234).

The Fleet System — 16th and 17th-centuries

In 1526, merchant ships were ordered by the King ". . . to travel in convoys, and in 1536 and 1543 the crown issued detailed ordinances about the ships, officers, and sailing orders for the merchant fleets" (Phillips 1986:10). Perhaps one of the larger fleets of the early 16th-century was the second voyage of Columbus - 16 ships in all, which required 5 months preparation (Parry 1990:47). Travel in groups was largely for protection and after 1542 ". . . it was forbidden to leave for the Indies in fleets of less than ten "(Parry 1990:133). From 1543 to 1554, a single convoy would leave from Sevilla and split in the Caribbean where part would go the New Spain (Mexico), and the other to Tierra Firme (northern Southern America) and the other to Panamá (Phillips 1986:10). In 1554 a petition to the *Consulado* requested the two fleet system, but it was not until 1564 that the system was in effect (Morales Padrón 1992:127). In 1561 the two annual fleet system was mandated (Comellas 1992:177) and became established from 1564 and after as the New Spain fleet and the Tierra Firme fleet. Each fleet would leave at a different time of the year from Spain, winter in the Indies, and if possible return together to Spain.

The New Spain fleet bound for Vera Cruz, Honduras and the islands would leave in May and the Isthmus fleet bound for south American ports and Nombre de Dios would leave in August. After wintering, the Isthmus fleet would leave for Havana in January, and in February, the New Spain would leave for Havana where both would meet and travel back together before the hurricane season in early summer (Parry 1990:134-135). "The two fleets returned together only fourteen times during the reign of Philip II in the late sixteenth-century, although combined fleets would become the norm in the seventeenth. As one pair of fleets prepared to leave the New World, another pair prepared to leave Spain" (Phillips 1986:130). This was what was prescribed, but research by the Chaunus has found that the New Spain fleet generally left around July 1 and arrived in the Caribbean sometime in August, and the Mexican coast sometime in September (Phillips 1986:11). "Reasonably regular sailings were maintained for a century and a half" (Parry 1990:135).

The Chaunus point out the two year cycle of the fleets; the average turnaround time for the two fleets was 14-15 months. "The two-year cycle of preparation, sailing, loading, unloading, and waiting time usually involved 16.5-18.5 months in ports and only 5.5 months of effective navigation. Thus, in ordinary times, there were two sets of fleets functioning at once, one the winter over in the Indies, and one that wintered over in Spain . . ." (Phillips 1986:104; Comellas 1992:181). The trip from Sevilla took 3-4 weeks, 8-10 days to the Canaries (Comellas 1992:181). From 1520 to 1561 the Lesser Antilles were the first stopping point, later the flotas would first stop at Santo Domingo and Cuba, then go on to Vera Cruz. The Galeones or Tierra Firma fleet still stopped first in the Lesser Antilles, then went on to Cartagena and Nombre de Dios - Puerto Belo (Comellas 1992:183). During the 16th-century, 40% of trade went to Tierra Firme, 40% to New Spain, and 20% to the islands. During the first quarter of the 17th-century, Peru rose to 51%, while New Spain dropped to less than 30% (Lynch 1969:187).

The fleet system started in 1552 and trade fairs were held at Nombre de Dios from 1575-1597, and thereafter at Puerto Belo. Puerto Belo was the most important of the fairs in the Indies as the most merchandise was handled there, both in volume and value (Loosely 1933:316). The fairs were very important for merchants as this was the locale where American treasure was acquired by the European merchants. At first the fairs had no fixed schedule. In 1634 they were limited to two weeks, but this was increased to 30 days in 1685, and to 40 days in 1735 (Loosely 1933:318).

The ships in the Tierra Firme fleet were generally smaller that the New Spain fleet and this is explained by the predominance of dry goods on the Tierra Firme ships. The addition of large amounts of wine and fruits, as well dry goods, required larger ships for the New Spain fleet (Usher 1932:209). Usher (1932:210-211) estimated that the Indies involved 10% of all Spanish shipping during the 16th-century.

By the mid 16th-century, the area from Sevilla to Cadiz was dotted with loading and maintenance facilities (Parry 1990:126). "Most of the wine consumed in America was loaded at Cádiz" (Parry 1990:126). The important mid-16th-century colonial ports included Santo Domingo for the Islands, Vera Cruz for Mexico, and Nombre de Dios for Peru - these three ports accounted for 90% of all Spanish commercial activity in the Americas (Parry 1990:128). Neither Vera Cruz or Nombre de Dios were much beyond ports - they were virtually abandoned between fleets (Parry 1990:129-130). Acapulco was much the same (Parry 1990:132). The large fairs were held in Nombre de Dios (later Portobello), Jalapo, Acapulco, Vera Cruz, but smaller fairs were held in all major cities (Hernández Sánchez-Barba 1992:196).

Both the New Spain and Tierra Firme fleets were referred to as *"flotas"*, but during the 17th-century the Tierra Firme fleet was regularly accompanied by warships or galleons, and this fleet came to be known simply as the *galeones,* while the New Spain fleet was known as the *flotas* (Phillips 1986:14). The *avería* was imposed upon the merchants and shippers to pay for the defense of the fleets, and included paying for the men and arms of the galeones (Heredia Herrera 1970:255). Wars with the Dutch in the 1620's and the French in 1635 had a major impact on the Carrera. In 1635, only one convoy sailed to the colonies (Parry 1990:258-261). Although there was much variation from year to year, the general trend of total tonnage shipped to and from the Indies showed a steady decline from 1600 to 1720. The total number of ships involved in the Carrera also declined during the same period with a slight increase from 1665 to 1680 (García-Baquero Gonzalez 1983:537,539). The death of Charles II in 1700 left the Castilian throne with no heir, and the War of Spanish Succession was fought to determine who would rule Spain.

The Fleet System — 18th-century

The war of Spanish Succession resulted in no convoys sailing out of Andalusia from 1701 to 1706 (Parry 199:285). Much of the shipping traffic during the late 17th-century and early to mid-18th-century had not been in convoys, but rather by *sueltos* - or single vessels. From 1684 to 1754, only 13% of cargo shipping had been in convoys - the rest had been *sueltos* (Comellas 1992:288). The sueltos were a major benefit for trade. Increased competition resulted in lower prices as the big fairs were replaced with a new class of smaller-scale merchants (Comellas 1992:288). The New Spain flotas were restored in 1754, but in 1789 the convoy system was abandoned altogether (Parry 1990:286). The Bourbons made some modifications to the convoy system with mandates that the New Spain fleet leave in June, and the Tierra Firme leave in September (Comellas 1992:287), but there was no great effort to restore a system that had already been largely discontinued before the arrival of the Bourbons. The further breakdown of the convoy system under the Bourbons ". . . meant an increased freedom of trade, in the sense that an increasing share of the lawful trade was carried in 'register ships', which sailed singly and achieved a more repaid and efficient turnover" (Parry 1990:286). But there was still the rule of the *Consulado,* and various attempts at a collective approach were related to specific ports such as in 1728 the Caracas Company (est. 1728); the Galacia company (est. 1734); the Havana company (est. 1740); and the Barcelona company (est. 1755). The Caracas company lasted until 1785 — the others were not as long-lived.

Toward the latter 17th-century, Cádiz had assumed more and more responsibilities as chief center for the Indies trade. Cádiz grew from a city of 2000 at the beginning of the 17th-century, to 40,000 at the end of the 17th-century (García Fuentes 1980:65). The Bourbon reforms related to the *Carrera* included moving the administrative center from Sevilla to Cádiz in 1717. "The quantities of native Andalusian products exported to the Indies had steadily dwindled; more and more the trade consisted of the re-export of manufactured goods brought in to Cádiz by sea; more and more it was confined to a small number of big ships" (Parry 1990:285).

The *Carrera* — The Merchants

Spanish merchants have been described as "unenterprising" (Trevelyan 1954:107, cited in Reitzer 1960:215) but Reitzer points out that "English traders may well have learned double-entry book-keeping in Spain, and that the French merchants . . . probably acquired the practice of drawing bills of exchange from Spaniards . . ." (Reitzer 1960:216). In Sevilla, nobles defied the idea that they shouldn't engage in commerce (Reitzer 1960:216). But the overall pattern of long distance commercial activity in Castile was little changed in the 16th-century. During the Middle Ages ". . . Castile had been predominantly an importer of finished articles and an exporter of raw materials, this situation remained basically unchanged during the sixteenth-century " (Reitzer 1960:217). "Castile adhered to her medieval heritage which stressed the interests of the consumer over those of the producer and prevented an adequate economic reorganization in response to the requirements of the modern era" (Reitzer 1960222).

In 1704, the Consulado of Sevilla reported that even though the Spanish were the only legally sanctioned participants in the Carrera de las Indias, they controlled only one sixth of the commercial activity (Hernández Sánchez-Barba 1992:193). The make-up of the 18th-century the mercantile community in Cádiz was as follows: 4.7% Gaditana, 41.8% Andaluza, 14.9% Vasca, 14% Castellana, 8.7% Navarra (Eiras Roel y Rey Castelao 1992:127-128). La Nobleza, or the nobility were not numerous in Sevilla, so there wasn't socio-economic distinctions between large proportions of the population - "pude decirse que formaba una verdadera democracia" (Domingues Ortiz 1946:49).

Bernal and García Baquero's (1976) important study focuses on the social context of economic relations and emphasized the lack of studies of the domestic economy of Sevilla. They focused on the social standing of the merchants - men of commerce - and the domestic Spanish economy. The men of commerce who participated in the Carrera include the following (Bernal and García Baquero 1976:73):

nobles - nobility
cargadores - shippers
hacendados - land holders
cosecheros - crop grower
comercientes - merchants
comerciente cargadores - shipper merchants
fabricantes - manufacturers

Their analysis of the period 1720-23 indicated that there was not much nobility participation. Foreigners constituted only 15% - but this 15% controlled 50% of the volume. A look at those who went bankrupt (las quiebras) included 152 people from 1784 to 1829 - of these, none are potters, most are comercientes (n=53), the next highest are mercaderes (n=21)

The Manifests — *Registros*

The *registros*, or shipping manifests were prepared by the *escribanos* of the *Consulado* and *Casa*, and gave information such as the owner of the ship, captain (maestro), size, and origin of manufacture of the ship. Other information included lists of merchandise, description of equipment, rations, ship's crew, and passengers. In the lists of merchandise, the name and general social standing of merchant is given, the quantity, destination, and fiscal rights regarding customs are given. By the mid 16th-century, there is a regular format to the *registros*, during the second half of the 17th-century to the 3rd quarter of the 18th-century the *registros* are most complicated from an administrative point of view - they have 7 parts:

1. Admission/acceptance of ship and certification of ownership
2. Name of the *maestro* and his surety/collateral
3. Description of ship - tonnage
4. List of merchandise and payments of the duties
5. Inspection of leaving - that there is sufficient provisions, arms
6. Inspection of returning to Spain
7. Certifying the *registros* - that they reached their appropriate destinations

(Pérez-Mallaina Bueno y Babio Walls 1979:73-80)

The *registros de ida* in the Archivo General de Indias from 1680 to 1700 are originals, from 1650 to 1680 they are copies ; the *registros de venida* are all copies for this period. There is a book of *registros*, but this must be used with caution. García Fuentes (1980:13) observes that the book of *registros* is incomplete in some instances, in others there exist more *registros* than listed in the book, and the voyages from the Canaries are not listed. The *escribanos de naos* and *escribanos de raciones y veedor de las flotas* who were responsible for drafting the *registros* were members of the Consulado (García Fuentes 1980:25). "Several copies of the cargo manifest were prepared, two being forwarded in ships other than that which carried the treasure, one going with the treasure, and another remaining behind" (Peterson 1975:93).

The *Carrera* — Provisioning the Ships

Provisioning of the fleets in Sevilla and Cádiz was a major undertaking and generally included both royal officials and private contractors. For the most part, the purchasing of the provisions in Spain was confined to the territory within carting distance of Sevilla, but ". . . as early as 1617 salt pork was being bought from Flanders and salt beef from Ireland" (Hamilton 1929b:431). At times the price of meat in the Indies fell below levels in Sevilla so it was bought in the Indies, but most provisions cost twice as much and more in the Indies (Hamilton 1929b:432-433). The cost of provisioning 6 warships in the early seventeenth-century was 26% of the total preparation costs, and probably would account for an even greater percentage for merchant ships (30% of the costs for the 6 warships were for artillery and gunners) (Phillips 1986:90,93). Eight months food and four months water were loaded in Sevilla (Phillips 1986:96). It was common practice to take more provisions than necessary to provide a safeguard against unfavorable sailing conditions which would prolong the trip, so it would not be unusual for ships returning to Sevilla to have a considerable excess of provisions. But it was not uncommon for ships returning to Spain to come in with only 4-5 days provisions left (Phillips 1986:101). At least two of the colonial ports — Havana and Cartagena — could not support the fleets with sufficient rations and therefore required that additional provisions be acquired in Sevilla (Phillips 1986:114). Daily provisions would be on each ship, but items such as cheese might be all on one ship (Phillips 1986:102). Water was sometimes carried in huge wooden barrels — 5.5 ft. tall, which held 6 *pipas* — called *pipotes*. The first of these huge barrels appear in 1613 regulations (Phillips 1986:163). The mainstay of the daily diet was biscuit (1.5 pounds per day) and wine (half azumbre — 2 pints per day). Figure 29 gives the weekly menu for the frigate *Jesús Nazareno* which sailed for St. Augustine, Florida in 1731.

The *Carrera* — Commodities

In the 16th-century, wine was second in value and first in volume in the Carrera — cloth was first in value (Lorenzo Sanz 1979:427). Textile production was allowed in the Americas after 1548 (Lorenzo Sanz 1979:437), and French cloth dominated the cloth sent to the Americas from Europe during the reign of Felipe II (Lorenzo Sanz 1979:445). It is estimated that 20,000 *pipas* of wine went to the Indies annually during the late 16th-century (Lorenzo Sanz 1979:468).

In the late 16th-century and 17th-century, Spain's main exports were wool, wine, olive oil, iron, and cochineal (re-export from America), and they imported textiles, linens, hardware, naval stores, paper, and grain (Lynch 1969:153). Lynch (1969:149) describes the situation as follows:

> Virtually every sector of Spanish industry was depressed in the seventeenth-century, though the depression was more serious in the major sectors - textiles, metallurgy and shipbuilding - than in light industries supplying local markets. The worst victim was the once-booming textile industry, embracing the woolen cloth of Segovia, Toledo and Cuenca, and the silks of Granada, Malaga, Sevilla and Toledo. While none of these centers actually ceased production, all of them suffered severe recession, unemployment, and loss of export markets. (Lynch 1969:149)

In the 18th-century, textiles from Galicia were exported to the Indies. From 1717 to 1765, 224 *naos de aviso* were sent from Galicia — these were essentially messenger ships, but some suspect that goods were also transported, but not reported (Eiras Roel y Rey Castelao 1992:128-130). In 1764 the *Correo Marítimo* was established (Eiras Roel y Rey Castelao 1992:131). The major export from Galicia was textiles and textile products in the 18th-century (Eiras Roel y Rey Castelao 1992:143).

[illegible]ion de la forma en que se han de subministrar y distribuir las Raziones de alimentos de la Armada en los siete dias de la semana, los quatro de carne, dos de bacallao, y uno de queso en la forma siguiente. . . . . .

Domingo, Lunes, Martes, y Jueves.

De Carne.

Viscocho diez y ocho onzas.
Vino un quartillo y medio.
Tozino cinco onzas en cada uno de los dos dias primeros, y ocho onzas de carne salada, en cada uno de los dias ultimos; Menestra de Arroz y Garbanzos por mitad dos onzas; y de estos generos se daran dos dias de los quatro referidos, y los dos restantes de frixoles, Chicharos, ó Havas, á el respecto de tres onzas, y en falta de alguno de estos generos supliran los otros bajo las mismas reglas. . . . .
Agua una Azumbre. . . . .
leña rasada libra y media. . . . .
Sal, un zelemin por cada mil raziones. . . . .

Miercoles y Viernes
de Bacallao.

Viscocho diez y ocho onzas. . . . .
vino un quartillo y medio. . . . .
bacallao cinco onzas. . . . .
Azeite una onza. . . . .
vinagre una sexta parte de un quartillo. . . . .
Menestra la misma que se señala en los dias de carne. . .
Agua una azumbre. . . . .
leña rasada libra y media. . . . .
Sal, un zelemin a cada mil raziones. . . . .

Sabado Queso.

Viscocho diez y ocho onzas. . . . .
vino quartillo y medio. . . . .
Queso seis onzas. . . . .

(AGI *Contratación* 1453)

FIGURE 29. Weekly menu for the frigate *Jesus Nazareno* bound for St. Augustine, Florida, 1733.

In 1784 an English traveler noted that Sevilla had fallen to 6th place among Spanish ports in the trade with the Americas with 93,257 £, compared to Cádiz with 3,621,443£ (Aguilar Piñal 1989:204) Prior to 1756, the two main Spanish exports were wool and silk, followed by iron, cork, esparto, wheat, wine and brandy (Aguilar Piñal 1989:202). The major export from Sevilla was olive oil (Aguilar Piñal 1989:208).

Basque participation in the Carrera in 1506 included 35 ships, and in 1550 — 215 ships (Ruiz de Azúa 1992:193). During the 18th-century Basque merchants living in Cádiz shipped lard, capers, wine, beer, brandy, gunpowder, tar, olive oil, and raisens (Ruiz de Azúa 1992:195-202). Baleares participation was indirect as their wine and olive oil were shipped, but not on their ships (Escandell Bonet 1992:315). But after 1782 they shipped brandy, wine and olive oil until 1818 (Escandell Bonet 1992:324). From 1824 to 1828 aguardiente dominated the goods shipped from Baleares - with smaller amounts of almonds, olive oil, wine, and soap (Escondel Bonet 1992:333). From Valencia, indirect commerce included silk, paper, wine, and brandy (Ballesteros Gaibrois 1992:183-197). Competition included the *aguardiente de caña* (brandy from sugar) made in Mexico (Ballesteros Gaibrois 1992:198). Direct commerce on one ship from Alicante (Valencia) included in 1786 303 barrels of wine, 77 barrels of aguardiente, 8 barrels of almonds (Ballesteros Gaibrois 1992:203). Wine and rice were primary exports to the Americas during the second half of the 19th-century from Valencia (Ballesteros Gaibrois 1992:211). There are no documents indicating participation of Gallego ports during the 16th-century (Eiras Roel y Rey Castelao 1992:47).

Soap and gunpowder were produced on a large scale in Sevilla during the 16th-century, but most non-agricultural products exported from Sevilla were produced in areas other than Sevilla (Pike 1961:4,21). Grape and olive production areas in the regions adjacent to Sevilla were the richest on the peninsula (Pike 1961:22). *Manzanilla* was considered the best type of olive, and *Gordal* olives, the finest variety of *manzanilla*, grew close to Sevilla. Dark or purple-colored olives called *Moradas* ". . . were consumed locally or converted into an inferior oil" (Pike 1961:22). Olive oil was used in the manufacture of soap and made since Muslim times in Sevilla (Pike 1961:23). "The largest market for both native and imported wine was the Indies, but she also exported to England and Flanders. In fact, the majority of the Spanish wines received in Antwerp during the sixteenth-century arrived from southern ports, particularly Sevilla" (Pike 1961:23). Little is known about the non-Indies trade from Sevilla during the 16th-century (Pike 1961:23).

The *Carrera* — Commodities — Wine, Wheat, and Olive Oil

Wine, wheat and olive oil accounted for the largest proportion of agricultural products exported from Andalusia. These three foodstuffs, sometimes called "the eternal trinity of the Mediterranean" (Braudel 1972:236), were in great demand during the first half of the 16th-century, and concerted efforts were made to establish production areas in the colonies. "Vineyards and olive groves proved difficult to establish in the Indies — vines and olive trees also being naturally slow to come into bearing — and the only places where wine and olives were produced in quantity in the sixteenth-century were the irrigated valleys of coastal Peru" (Parry 1990:103). 1551 was the first grape harvest of significance, and olive groves were established in the 1560's, but did not produce much oil until the late 16th-century. In 1602, further expansion of vineyards and olive groves was prohibited, although apparently the prohibition against planting new vines and olive groves was generally not carried out (Madariaga 1947:59,128-129). In contrast, wheat was produced at a large scale in the 1540's, especially in the Puebla valley southeast of Mexico City (Parry 1990:103). Other areas of wheat production included New Granada and Oaxaca (Parry 1990:104), as well as Peru (Madariaga 1947:136). These areas were important for the provisioning of the fleets for the trip home, and Peru was important for provisioning the silver mines at Potosí. The first taxed wine production in Peru was in 1551, and by 1555 grapes were being successfully produced in Chile, and Brazil was producing wine by 1601. In the 17th-century, Chile became the largest wine producer in

South America, supplanting Peru. In 1614 and 1615 there were prohibitions on shipping wine and olive oil out of Peru to other colonial ports, and in 1718 this prohibition was replaced by a 30,000 *botija* limit (Miskin 1975:85-86, 91-92).

Wine and Olive Oil production in Sevilla and Vicinity

In the late 15th-century, the following areas contributed to the production of wine (in arrobas) consumed in Sevilla:

	1491	1494
Ciudad de Sevilla	6.23%	5.70%
La Campiña	13.50%	14.56%
Ribera, Aljarafe y Tejada	12.45%	10.92%
Area de Jérez	25.05%	20.60%
Area de Niebla	27.35%	25.41%
Sierras	13.64%	21.13%
total arrobas	1,111,287	1,597,422

These figures are derived from the *diezmo del vino* records for wine in Sevilla for 1491 and 1494 (Ladero Quesada 1981:43,51).

The *Sierras* includes Cazalla, a rich wine-producing area north of Sevilla and the source of much of the more expensive wine for the Carrera (Figure 30). In 1569, Tomas de Mercado's treatise on the Andalusian economy discussed *precio justo* - just price - for wine from Cazalla as 2 reales per arroba, but the same wine sold in the Indies for 5 reales per arroba (Mercado 1985:110). Another 1569 document describes a vineyard in Cazalla owned by Gonzalo and Gaspar Jorge which produced 12-16,000 arrobas of must. They also had a bodega where they made tinajas, and a kiln where they fired them (Lorenzo Sanz 1979:298). These same two individuals owned a finca de Alamedilla where they grew olives and pressed them to make oil (Lorenzo Sanz 1979:297).

FIGURE 30. Map of Alarafe region and selected cities in southern Spain.

The other areas mentioned in the 1491 and 1494 *diezmo* records for wine include La Campiña, Ribera, Aljarafe and Tejada which are all areas in the vicinity of Sevilla and produced wines of lesser quality than either Cazalla or Jérez (Figure 30). During the late 16th-century (1593), the following were allowed to participate in the Carrera as they possessed *"licencias concedidas por la Casa de la Contratación"* - Cazalla, Santiponce, Camas, Manzanilla, Quema, Alcalá de Guardaira, Ginés, Villanueva del Ariscal, Utrera, Serrezuela, Constantin, Paternilla, Mairenilla and Castilleja de la Cuesta (Figure 30). A notable omission from this list is Jérez de la Frontera, which certainly participated in the *Carrera* (Lorenzo Sanz 1979:465).

Cultivated fields increased through out the Hapsburg period, partly at the expense of land dedicated to olive groves and vineyards. Wheat and barley were the main cereals (Herrera García 1981:93-94). In Aljarafe there was a decline of percentage of land dedicated to olive groves from the late medieval period through the 17th-century (Herrera García 1981:78-79). The price of oil increased, however, from 2 reales at the beginning of the 16th-century and to more than 20 reales by the end of the 18th-century (Herrera García 1981:85). Some of the best quality olive oil which was shipped to the Indies was produced in Écija (fig.). In 1624, 800,000 arrobas of olive oil were produced in Écija. One olive tree produces 15-20 arrobas of oil in one harvest (Gil-Bermejo García 1977:138). Before 1688 there were only low levels of agricultural exports from Cádiz, but this area was important for provisioning the fleets to the Indies after the Casa moved to Cádiz.

Eighteenth-century Aljarafe vineyards were located in Umbrete, Banacazón, Sanlúcar, Tomares, Villanueva del Ariscal, Castilleja de Guzmán, Gines (Figure 30). Average annual wine production during the 18th-century was 170,000 arrobas a year (Herrera García 1981:91-92). From 1630 to 1662 there was a drastic reduction in the areas of vineyards and olive groves around Sevilla. These areas would have had preferred status in the trade to the Indies, so this reduction is somewhat curious. The reduction of wine production around Sevilla might be explained by the better quality wines of Jérez, El Puerto, and Sanlúcar (Domínguez Ortiz 1986:119-120).

The influence of the American market on the domestic economy of Andalusia was uneven, as the region known as the Alarafe (just west of Sevilla) experienced a boom in agricultural proguction, but the impact on the domestic economy of the region around Cádiz was not as great. Wine was the major export in this area, olive oil to a much lesser degrees, and grains were exported only in years of surplus (Traverso Ruiz 1987:34-36). Livestock was important in the domestic economy of the Cádiz region and a study of the *diezmo* for this area indicated that from 1598 to 1646 livestock accounted for 30-45%, while wine was 12-18%, and olive oil was roughly 1% (Traverso Ruiz 1987:103-105). From 1717 to 1778 agricultural products accounted for 45.6% of exports from Cadiz, and of this, wine and brandy accounted for 90% (Comellas 1992:292).

There was demographic decline in Sevilla, Cordoba, and Huelva during the mid 17th-century, but the population of Cádiz rose from the mid 17th-century to the beginning of the 18th-century. Is there a relationship between the Carrera and the demographics of these cities? Likely for Sevilla and Cádiz, but not known for Cordoba and Huelva (García-Baquero Gonzalez 1983:547). The *Carrera* created an agricultural boom in parts of Andalusia, but this was not an indigenous capitalist development as it was based primarily on the American market, and included reliance on foreigners for inexpensive manufactured goods. With the decrease in demand from the American market, and [increase in investment in the Americas] this relationship was broken, and left Andalusian agriculture in a bad position (García-Baquero Gonzalez 1983:).

Wine during the 16th-century did not stay fresh for much more than a year, and given the demand, peak commercial activity occurred when the new wines were first available, which was during the first two weeks of October in Sevilla. There was a "wine fair" in Sevilla during this time (Braudel 1972:257). Much of the wine consumed in the northern European market (and the Americas too) was new wine - "For wine did not keep well from one year to the nest: it turned sour. And clarifying, bottling and the regular use of corks were still unknown in the sixteenth-century and possibly even in the seventeenth" (Braudel 1985:234). The Romans aged wine, but this was not apparently widespread in Europe again until the 18th-century when aged wines again became luxury products (Braudel 1985:235-236). A *pipa* of wine that in 1588 would be valued at some 6000 mrs would sell for 27000 mrs in Veracruz - this includes profit as well the 7.5% *almojarifazgo de salida hacia Indias,* the 10% *entrada,* transport to Sevilla, freight charge of the ships, the *averia,* etc. Not to mention the freight charges in Mexico which were double those of Sevilla. In 1575 an arroba of *añejo* or aged wine in Sevilla sold for 375 mrs, *nuevo* or new wine sold for 204 mrs (Lorenzo Sanz 1979:467). Sometimes wine would not sell well in the Indies due to abundant supply, and also an increasingly competitive atmosphere. Ships traveling alone, oftentimes from the Canaries, would get to the fairs ahead of the fleets and get the best price for their wine. Even though there was a prohibition in 1582 of ships from the Canaries traveling alone, there are records that they did so in this same year. There was also strong competition from Peru (Lorenzo Sanz 1979:467). Fraud was a widespread occurrence, especially for wine and olive oil. Much wine was not registered, an example of which involves one captain who had 325 *pipas* and 400 *botijas* of wine, and 200 *botijas* of olives and 1000 *botijas* of olive oil which were not registered (Lorenzo Sanz 1979:468). "Wine export during the period from 1650 to 1700 amounted to one-quarter of all peninsular foreign trade, although the volume declined toward the end of the century" (Lister and Lister 1987:165). In the 18th-century, Sevilla used 2,500 tuns of wine a year for religious services (Francis 1972:165).

The *aguardiente* or brandy produced in Andalusia was distilled wine and became an export in the *Carrera* during the mid-17th-century. The origins of the distillation of wine date back to the ancient world, but are not clear. Distilled wine was used primarily as a medicine until the late 15th-century when general consumption was reported in Nuremberg. It appears that the northern countries, having received imported wine of sometimes limited shelf-life, were the first to try to render this wine into a more stable beverage. Distilled wine had 8 or 9 times the alcoholic content of wine. Produced initially in the Netherlands and France in the 16th-century, the Spanish were producing large amounts by the end of the 17th-century (Unwin 1991:236-240)

The following shows that there was a dramatic increase in the amount of olive oil and aguardiente shipped to the Indies from the late 17th-century until after the Bourbons took control in Spain; wine showed only a slight increase:

Years	1690-99 *(arrobas)*	1720-29 *(arrobas)*
Wine and Vinegar	273,341	290,458
Olive Oil	78,541	115,328
Brandy	62,177	292,960

(García-Baquero Gonzalez 1983:540)

The Wine and Olive Oil Trade — Europe

The British import of Portuguese, Spanish and Italian wines was not great in the early Middle Ages — they were usually a part of other cargo, whereas entire fleets of Gascon, Poitevin, and Rhenish wines came to Britain (Simon 1906:264). In the 15th-century, two thirds of Castile was in pasture and wool was the main product for export, followed by honey (Suárez Fernández 1972:83). Trade between Spain and England during the later middle ages also included ". . . iron, hides, wines, fruits, and other products . . ." (Phillips 1983:264).

There is much less written on the non-Indies commerce which originated from Sevilla during the colonial period. An example of ships leaving Sevilla for destinations other than the Indies during the late 16th/early 17th-centuries includes the following:

1597 - 94 ships - 38 to Germany, 23 were French, 21 Scandinavian, and the rest Scotch, Irish, and Flemish.
1605 - 27 French, 19 English, 6 Scotch, 2 Dutch, 1 Flemish.
1606 - 229 ships left for France, 87 for England, 52 for other Spanish ports, 34 for Italy, 14 for the Canaries and the rest for Madeira, Angola, the Philippines, Germany, Brazil, and the Azores (Comellas 1992:167-168).

Wine production in England was never very successful, but the demand for wine was much greater historically than during modern times as during the medieval period, 31% of England's imports were wine, and in 1930 only 1% were wine (Francis 1972:6,10). Most of the wine exported to England in the 15th and 16th-century was coming out of Jérez (Simon 1907:211). The Jérez wines remained the most popular of all Spanish wines during the 17th-century, although wines from the Canaries were gaining popularity in England, and wine was also imported from Galacia, Malaga, Navarre, and Barcelona (Simon 1909:338-339). The 16th-century trade between Spain and England became less important for the two countries than during medieval times (Francis 1972:45), in part a result military conflict, although there are notable occurrences of Spanish wine "extraction." Drake's 1587 raid on Cádiz brought back 2,900 pipes of wine (Simon 1907:209). The 17th-century witnessed a substantial increase in trade between England and Spain (Francis 1972:45). In the 18th-century, wine imports from Canaries to England declined, while Cádiz remained the most important, with the new Malaga production of sweet wines in the early 18th-century a strong second (Francis 1972:161-163). The wine trade between England and Spain was " largely in the hands of Englishmen at both ends" (Phillips 1983:265).

During the 18th-century, trade between Spain and Great Britain was largely in Britain's favor - the British sold considerably more goods than they bought from the Spanish, especially after 1730, with breaks for times of war 1741-6, and 1762 (McLachlan 1974:1). British woolens were in demand in Spain, also salted cod, "lead, tin, silk, and worsted stockings, butter, tobacco, ginger, leather and beeswax" (McLachlan 1974:6-7). The Spanish shipped wool and olive oil (the Andalusian wool was the lesser quality compared to that of interior Castile) (McLachlan 1974:8-16). The Spanish wines and fruits ". . . were looked upon as undesirable luxuries which could only be tolerated in view of the other characteristics of the Spanish trade" (McLachlan 1974:10). During the 18th-century, Spain did most of its trade with England, France and Germany - all of which sold roughly twice as much as than they bought from Spain. With one exception, all the other ten trade partners had a similar asymmetry of trade (McLachlan 1974:17). The Spanish trading partners in Europe apparently valued their commercial relations with Spain more for the acquisition of bullion, and less for obtaining Spanish goods. In modern times, the wines of Jérez - the famous 'sherry' - are still a major export commodity and generate far more foreign currency than any other Spanish wine (Tamanes 1986:62). Andalusia has the greatest capacity for olive oil production in Spain, but not the best oil (Tamanes 1986:61). In 1986, Spain was the world's leading olive oil producer and exporter. Almost half of the olive oil today is transported " . . . in barrels or drums and bottled once it reaches its destination. Thus foreign buyers benefit from this system, selling the merchandise under their own labels and rarely mentioning that the product is Spanish" (Tamanes 1986:67).

The Wine and Olive Oil Trade — Europe — Containers

During the 4th and 5th-centuries, 90% of the Mediterranean commerce was in bulk goods - wheat, olive oil, fish, salt, timber metals, wool, and hides it was during this time that there was "the beginnings of a container revolution which substituted light wooden barrels and casks for heavy pottery *amphora* in transporting liquid bulk cargoes by sea" (Lewis 1978b:1,3). The origins of barrel-making are generally attributed to the Gauls (Allen 1961:146). By the 7th-century barrels had become popular as the dominant shipping container, especially in the north, although amphoras continued to be used. With amphoras, 40% of the transport was taken up by the container — compared to 10% for barrels — therefore more product could be shipped on the same sized vessel than before, or smaller ships with barrels could carry the same amount of product as ships 30% larger carrying amphoras (Unger 1980:51-52).

It appears that much of the Spanish wine exported to England in the late 17th-century was shipped in wooden containers — there is no mention of pottery containers.

The following is a list of Spanish sherry imported into England during 1694-95 (Simon 1909:345-346):

5,581	butts
3,143	pipes
443	hogheads
344	casks
138	tuns
1	tierce

Wooden container sizes were standardized in England during the 15th-century when a 1423 statute of the English king declared that a tun of wine measure 252 gallons, a pipe of wine 126 gallons, a tierce of wine 84 gallons, and a hogshead of wine 63 gallons (Simon 1907:62-67). The Spanish measured their containers in *arrobas,* which is actually a weight measure (about 25 pounds), and one *arroba* of wine was set at 16.133 liters (Marken 1994:122). The Spanish pipe used in the *Carrera* was 27.5 arrobas, or 115.5 gallons, and therefore was slightly smaller than the pipe used in the wine trade to Britain, as indicated by the following measures for Spanish wines entering England which were established in 1483:

tun	252 gallons
pipe	126 gallons
puncheon	84 gallons
hogshead	63 gallons
tierce	42 gallons

It should be noted that in Spain during the 15th and 16th-century, the pipe for the domestic economy was 175 gallons, and the puncheon was 58 gallons, and there are records of litigation in 1595 of the importing of Spanish wine in pipes which were not 126 gallons (Simon 1907:62-67). The keeping of wine was a problem in England and as early as 1539 the observation that wine kept longer in flagons and bottles than hogsheads is documented (Simon 1907:165-166). In 1728, the importing of wine in bottles to England (except from Italy) was prohibited (Francis 1972:146-147).

The Carrera — Containers

The twenty ships manifests from the 1509 convoy of Diego Colon to the Dominican Repulica provides a baseline for packaging patterns for the 16th-18th-centuries (Otte 1964). Table 10 is a summary of the packaging of goods which were transported in *botijas*, or olive jars, along with the packaging for *harina*, or wheat flour. In addition to *botijas*, The packaging pattern for wine includes *jarras, jarretas, botas, pipas, barriles,* and *cuartos,* with the most common being *jarras, botas,* and *pipas.* When sizes are given, the size of the *pipas* were most often 25 *arrobas*, and sometimes 22 and 27 *arrobas*. The size of the *botijas* of wine is given as *media arroba.* The pattern for olive oil is quite distinct as *botijas* are most common, with *botas, pipas*, and *cuartos* much less common. The size of *botijas* for olive oil is one, one-half, and one-quarter *arroba.* No size is given for the *botas* or *barriles* of olive oil. Much of the olive oil - 1,618 *arrobas* - is listed without reference to the type of container, although one such reference is as follows - 2.5 *quintales de aceite en botijas.* Most notable are the relatively large numbers of *jarras* of raisens and honey. The *jarra* transported 12 different commodities while*botijas* were used for only five commodities.

It is presumed here that the *jarra* is some type of pottery container which is distinct from a *botija.* It appears that *jarras* were used primarily as wine containers, and *botijas* were intended for olive oil containers. But the majority of wine is shipped in wooden containers. No size is given for the *jarra* for wine (a *jarra* for raisens was half *arroba,* a *jarro* for honey was *"hasta 1 azumbre")* but it seems unlikely that they were over two *arrobas*. The packaging preference for shipping wheat is clearly wooden containers. This packaging distinction between the three major Mediterranean subsistence exports appears to have already been established during the late medieval period. The preference for a pottery container for olive oil, and the preference for a wooden container — especially the *pipa* — for wheat and wine. The *pipa* seems had a slight edge for wine packaging, and the *barril* was much more frequently used for wheat than wine during the early 16th century. So the

Table 10. Summary of Packaging from Diego Colon's *flota* of 1509 (Otte 1964).

	Jarra	*Botija*	*Bota*	*Media Bota*	*Pipa*	*Baril*	*Cuarto*	*Jarreta*
vino	356	8	89	0	996	2	10	4
vinagre	30	188	0	0	7	0	0	5
aceite	0	1318	11	0	2	3	4	0
aceitunas	85	353	0	0	1	6	0	18
harina	1	0	191	0	759	75	14	2
garbanzos	1	0	8	0	2	1	2	0
pasas	98	0	7	0	0	8	0	0
higos y pasas	14	0	2	1	1	27	0	0
higos	0	0	0	0	0	17	0	1
almendras	1	0	0	0	0	0	0	0
almendras, higos, pasas	2	0	0	0	0	13	0	0
pasas, pargas, higos	0	0	0	1	0	2	0	0
aceitunas, barejanas	4	0	0	0	0	0	0	0
higos, almendras	0	0	0	0	0	5	0	0
jabón	0	0	1	0	0	1	1	0
miel	393	13	0	0	0	5	0	0
arroz	70	0	0	0	0	0	0	0
mostaza	0	0	0	0	0	1	0	0
alcaparras	0	0	0	0	0	1	0	0
cirueles de pasas	0	0	0	0	0	1	0	0
alquitrán	0	0	0	0	0	0	0	20
avellanas	0	0	0	0	0	0	4	0
aceite y aceitunas	0	0	0	0	0	0	2	0

	cajas	*cantarita*	*costales*	*cahiz*	*fuste grande*	*cuarterones*	*barriletes*
aceitunas	0	10	0	0	0	0	0
harina	0	0	202	0	0	0	22
trigo	0	0	0	1	0	0	0
garbanzos	0	0	2	0	0	0	0
higos	0	0	0	0	0	6	0
pasas	0	0	0	0	1	0	0

	sacos	*sacas pequenas*	*barrilejo*
harina	2	4	0
alcaparras	0	0	1

only difference in the early 16th century compared to the later 16th century is the appearance of a pottery form other than a *botija* for wine transport — the *jarra*.

In 1543, ordinance 131 of the Casa de Contratación standardizes the types of containers used in the Carrera and set the relationship between the type of container and the corresponding number of tons or toneladas (Table 11). This relationship allowed shippers to get an idea of how much cargo could be loaded on any given ship, where the total capacity or tonnage was known. The computing of a ship's tonnage appears to have varied between countries and over time as different measuring techniques would result in differing tonnages (Laughton 1958; Lane 1964).

Table 11 presents the tonnage equivalencies for wine and olive oil containers, and establishes a pattern which would last for much of the 16th and 17th-centuries. The 1.25 arroba size for a *botija*for wine and the 0.5 arroba *botija* for olive oil were present throughout the 16th-18th-centuries. It appears that the *"Botijas de las que llevan al Perú vacías"* are *botijas peruleras*. When olive jars came into popular use for transporting wine during the mid-16th-century, there were often shipped empty with pipas of wine (Lister and Lister 1987:135). The *registro* analysis in this chapter indicates that the term *"botija perulera"* does not occur in shipping records prior to 1542. A one *arroba* olive oil *botija* is mentioned in ordinance 131, but this was not observed in the *registro* analysis. The separate listing of *Jarros* in ordinance 131 further suggests that a *jarro* is a distinct form from the *botija*.

By 1550, there was some degree of standardization for containers in the Carrera (Phillips 1986:96). It was very important to know the weight to volume conversion of containers of various commodities in order to pack and plan with as much efficiency as possible and an ordinance of 1542, which was later reprinted in the recopilacion of 1681 gave the tonelada amounts for the various containers used in the Carrera (Table 11). Table 11 lists only the containers for commodities which at times were shipped in olive jars.

Table 11. Portions of Ordinance 131 of the Casa de Contratación, 1543.

1543 - Ordinance 131 of the *Casa de Contratación* regarding tonnage
(Libro VIIII, Título Treinta y Uno, Ley I, de la Recopilación de las Leyes de Indias del año 1681)

1	*Botas, cinco en tres toneladas*
2	*Pipas, dos hagan una tonelada*
14	*Barriles pequeños de aceytuna de á tres almudes, quarenta una tonelada, y así de los que tuvieren mas, ó ménos, al respecto.*
15	*Botijas de vinagre, y botijas de arroba y media de vinagre, enseradas, cincuenta y seis arrobas en una tonelada*
16	*Ochenta arrobas de aceyte en botijas de arroba, y media arroba, quarenta una tonelada.*
17	*Botijas de las que llevan al Perú vacías, de arroba, y quarta, cincuenta una tonelada: y se fueren llenas, quarenta y seis: y si fueren mayores, ó menores, al respecto.*
18	*Jarros de miel, de azumbre, trecientos y cincuenta una tonelada.*
20	*Jarros vacíos, cincuenta vasos hacen una tonelada.*

A 1.5 arroba olive jar for vinegar is listed, along with olive jars of 0.5 and 1.0 arroba for olive oil, and 1.25 arroba olive jars which are carried to Peru empty or full of wine. "As random and chaotic as the long list of containers and sizes might seem, the capacities and weights of each of them were well known and helped the individuals who had to keep track of the crucial allotment of daily rations" (Phillips 1986:103).

The Royal Ordinances of 1552, *"impresas en 1553"*, limited the use of large pottery containers or *tinajas* for the transport of a ship's provision of water. At least 2/3 of the water was to be shipped in *pipas* which had not held wine previously (Trueba 1988:142). In time, the legislation allowed the use of "tinajuelas" for storing water (Trueba 1988:143).

José Torre Revello's (1943) review of a sample of *registros* of the 16th-century list the following goods which were shipped to the Indies from Spain in *pipas* and *botijas*:

Botijas de alcaparra
Botijas de aceitunas gordal medio peruleras
Botijas peruleras con aceituna manzanilla
Botijas peruleras de aceitunas moradas
Botijas peruleras con habas
Botijas peruleras con garbanzos
Pipas de vino nuevo
Pipas de vino nuevo de Aljarafe
Pipas de vino nuevo de Jérez
Pipas de vino nuevo de Villalba, Vino de Cazalla

This lists indicates that olive jars were used to transport capers, olives of various types, dates, and chick peas. Wine was shipped in pipas, but empty olive jars shipped along the full pipas of wine also appear in Torre Revello's (1943) list of merchandise.

Much of the merchandise listed by Torre Revello (1943) would not preserve in the archaeological record. Of the goods listed above, it is possible that the pits of olives might survive, but the only physical remains of the other goods which might be preserved in the archaeological record would be the bits and pieces of their packaging. For an archaeologist, it is therefore very important to make connections between the packaging and the goods, so that inferences regarding the goods might be made from the fragments of packaging recovered in an archaeological context. Chapter 8 is an attempt to illucidate these connections between packaging and commodities, especially between olive jars and the goods which they carried. Shipping manifests represent the composite of Spanish material culture which was being transfered to the Americas, and as such, represent the material contribution of the Spanish to the transculturation with the Native American peoples.

CHAPTER 8

THE DOCUMENTARY DATA SET II:
THE CONTAINERS AND THE ORGANIZATION OF PRODUCTION

Introduction

This chapter will focus on the pottery packaging of the Carrera and the organization of their production. The first part of the chapter will present a brief overview of pottery packaging patterns for the commercial between the various Spanish colonies and the results of the examination of Spanish shipping manifests or registros. The second part of the chapter will summarize what is known about the manufacture of olive jars from the documentary record, and include brief discussions of the guilds in Sevilla. The purpose of this chapter is to investigate any relationships between the technological attributes (i.e., method of manufacture, form, and function) discussed in chapter 6, and the organization of olive jar production.

Interareal Trade in the Indies — Containers

There were two routes across the Isthmus of Panama - a river route and a land route. The river route was less expensive, but more susceptible to pirates until the building of a fort in the 17th-century, making the land route more desirable. Still, the river route did have land portions. Parts of the road on the land route were quite narrow — "only two or three feet wide" — with drops of over 400 feet on either side (Ward 1993:58). Mules were the transport of choice (Ward 1993:56-60). The list of merchandise traded through Panama from 1701 to 1704 shows no wooden containers for wine, aguardiente, olive oil, vinegar; all are in "bottles" (Ward 1993:74) - probably *botijas*. "Mules revolutionized the transport of the Americas" (Parry 1990:104). Royal Order on Mule Loads of 1614 declared that the mule load limit from Puerto Belo to Panama should be 8 arrobas (200 pounds) - but this was relaxed to 9 arrobas for silver (Gibson 1968:169).

By 1539 Peru was exporting wheat to Panama and Venezuela (Morales Padrón 1992:76). In 1531, the Crown ordered all ships to the Indies to carry wines and olives (Morales Padrón 1992:77). But the vineyards of Nazca, Ica, Paspaya and Arequipa were so successful that Philip II prohibited further planting of vines in the Americas (Morales Padrón 1992:78). 17th century distribution of Peruvian wines was at times restricted to local consumption as trade between New Spain and Peru was prohibited from 1631 to 1774 (Parry 1990:317) [although 1,347 *botijas* of wine from Callao were shipped to New Spain in 1676 (Arcila Faría 1950:253)]. But the "local" market included the silver mines at Potosí, from which there was considerable demand for provisions.

The Potosí mines were located deep in the mountains and required pack trains to transport provisions through the rough terrain (Cobb 1949:25). "From the valleys of Uruba, Chaqui, Puna, and Mataca the mines received wheat, maize, and wine. In the Orincata Valley more than 200,000 jugs of wine and vinegar were produced each for Potosí" (Cobb 1949:30). Prices paid at Potosí were exorbitant as one arroba of the cheapest wine was 100 *castellanos* or 544 *maravedís* (Cobb 1949:26). A year's supply of provisions for Potosí around 1603 included 50,000 *botijas* of wine at ten pesos each, 2,000 *botijas* of cane syrup at eight pesos each, 25,000 botijuelas of lard at four pesos each, 2,000 botijuelas of olives, 3,000 *botijas* of olives at eight pesos each (Cobb 1949:32). "Llama mortality was so high in these pack trains that one half the total number needed for the entire load was added to the pack to be used as replacements for the fatalities of the trip" (Cobb 1949:40). "Other parts of the Indies suffered a dearth of merchandise because merchants preferred to sell their wares at Potosí, where 1,000 per cent profit was not unusual" (Cobb 1949:45).

Packaging information from other Spanish colonies indicates that St. Augustine received pipes of flour, casks of wine, jugs of oil, and earthen jars of oil, lard, and vinegar

(Bushnell 1981:56). Exports of pitch from New Spain to Caracas and Maracaibo in 1756 were shipped in *botijas* (Arcila Farías, Eduardo 1950:99). Appendix 3 lists other examples of packaging in the Spanish colonies.

In 1765, free trade was allowed among the Spanish colonies, and by 1789, trade to New Spain was opened to all Spanish ports. In 1780, the *Casa* was shut down and signalled the end of restricted trade with the colonies (Parry 1990:317). "Throughout the 1780's and 1790's trade between Spain and the Indies steadily increased. Detailed statistics are lacking, but all contemporary writers on the subject agreed upon the fact on increase, and even the most conservative estimated a fourfold growth between 1778 and 1788" (Parry 1990:317). Catalonia benefited most from the trade with the colonies, and even though Cádiz was to continually protest the participation of other Spanish ports in the colonial trade, their share nonetheless increased until the early 19th-century (Comellas 1992:289).

Packaging Patterns — Results of Archival Work

A total of 32 legajos in the Contratación section of the Archivo General de las Indias were examined in this study, the results are presented in Appendix 4. These legajos included manifests from a total of 258 ships — 129 from the South American fleets and 129 from the New Spain fleets (see Table 12). The intent was to get a sample of at least 5 ships from each fleet at 20 year intervals over the entire colonial period (1500-1800). This simply was not possible for much of the 16th-century as many documents have been destroyed, but there was reasonable success for the 17th and 18th-centuries. The sample of shipping manifests took 2.5 months to generate, but represents less than 1% of the total amount of Carrera shipping. Additional archival work was also conducted at the Archivo Municipal de Sevilla to investigate the potters' guilds and domestic patterns of packaging (Table 13).

All occurrences of "*botijas*" were recorded and included the name of merchant, social standing of merchant (if given), merchants mark (if given), and the name, quantity, value, and origin of commodity. In addition, if a commodity was ever known to be shipped in an olive jar, the packaging of these commodities was recorded even if it was not in an olive jar to get an idea of the frequency of olive versus wooden container use. Therefore, packaging information was recorded for wine, olive oil, vinegar, brandy, honey, olives, raisins, capers, almonds, dates, pitch, soap, and gun powder. Appendices 4 and 5 present the data from which the results of the *registro* analysis were derived.

Table 12. Documents examined from Archivo General de Indias, Contratación

Legajo#	Date	# of ships New Spain	# of ships South America
1079	1523-1557	8	14
1080	1583	4	1
1081	1584	3	0
1082	1586	0	5
1089	1590	0	3
1121	1596-7	0	5
1126	1597-8	9	0
1159	1613	1	7
1162	1615	10	1
1178	1630-1	4	8
1179	1633	0	15
1180	1634	5	0
1193	1647	14	6
1194	1648	1	5
1229	1678	0	10
1618	1660-1667	0	12
1231	1678	6	0
1258	1695	4	0
1264	1699	0	5
1288	1720	0	7
1291	1721	12	0
1453	1586-1731	13	0
1361	1737	12	0
1371	1739	0	1
1372	1739	14	6
1373	1739	0	3
1396	1760	0	1
1397	1760	0	1
1398	1760	0	1
1656	1760	5	0
1588	1778	0	5
1674	1778-9	4	0
	Total	129	129

Table 13. Documents Examined in *Archivo Municipal de Sevilla*

Sección I *Privilegios*
Carpeta 15, *no.* 20 — Ordinances for the *Toneleros,* 1609
pipa is 27.5 *arrobas*

Sección III *Escribanias del Cabildo, siglo* XVI
Tomo 20, *no.* 45 — wine entering Sevilla, 1575

Sección IV *Escribanias del Cabildo siglo* XVII

Tomo 1, *no.* 11-16	*Aceite, 1685*
Tomo 25, *no.* 141	*Olleros, 1616*
Tomo 43, *nos.* 28-29	*Vino*

Sección V *Escribanias de Cabildo, siglo* XVIII

Tomo 9, *no.* 4	*sacando barro, alfareros, 1733*
Tomo 9, *no.* 5	*sacando barro, alfareros, 1738*
Tomo 9, *no.* 6	ordenances for *ladrillos and tejas, 1768*
Tomo 9, *no.* 8	formation of guild for *ladrillo* and *teja makers, 1783*
Tomo 22, *no.* 5	requests to get clay from the *isletas* of the river, *1764*
Tomo 22, *no.* 6	about getting clay, *1782*
Tomo 30, *no.* 42	charges against potters for digging clay in forbidden area, 1746
Tomo 219, *no. 1*	ecclesiastical wine in Sevilla from various vineyards, 1712
Tomo 219, *no.* 25	wine from Cazalla entering Sevilla, 1720
Tomo 220, *no.* 17	*juzgado de vino* from Cazalla and Constantina

Sección XVI, Varios Antiguos

no. 142	*Comercio*
no. 314	*Gremios,* 1812
no. 328	*Ordenenzas*
no. 343	*Vino,* 17th-18th-century

Sección XI
Tomo 59 *en folio, no.* 29 — Owners of vineyards of Alarafe complain against the toneleros of Sevilla regarding the manufacture of *pipas,* 1665

The following information was recorded from each *registro*:

Year
Name of Ship
Destination of ship
Maestro of ship
Ship's provisions

Containers — Commercial Wine

The analysis of the registros indicated that the following containers were used for shipping wine:

Wooden Containers for Commercial Wine
Bota — 29 *arrobas*
Pipa — 27.5 arrobas
Quarto — half *pipa*, 13.75 *arrobas*
Quarterola — 3.5 *barriles*; 15.75 *arrobas*
Barril — 4.5 *arrobas*
Barrilito — 2.5 *arrobas*

Glass Containers for Commercial Wine
Botella
Limeta

Pottery Containers for Commercial Wine
Botijas — 1.25 *arrobas*
Botijas de 1.3 *arrobas*
Botijas de 1.5 *arrobas*
Botijas perulera — 1.25 *arrobas*
Botijas regular — 1.25 *arrobas*
Botijuela

Wooden containers appear to have been the preferred maritime transport containers for wine during the first half of the 16th-century. When *botijas* were first used on a large scale, they were shipped empty along with full *pipas* or *quartos* (half *pipas*) of wine. By 1583, this practice had stopped and wine was shipped in *botijas*. But from 1583 to 1633 wine shipped in *botijas* accounted for only roughly 1/4 of the total wine shipped. The overwhelmingly preferred wooden shipping container was the *pipa* of 27.5 arrobas. Quartos, or half *pipas*, and *botas* (29 arrobas) account for less than 1% of all wine shipped during this period. In fact, only one example of *quarto* or *bota* use was noted after 1586. But from 1634-1704, the use of *botijas* increased to 44% of all wine shipped. The *pipa* was still by far the most popular wooden shipping container for wine, and the barrel (4.5 arrobas) came into use, although it accounted for less than 1% of all wine shipped. From 1720-1778, the use of wooden containers increased to 65%, but the popularity of the *pipa* decreased as the barrel accounted for 43% of all wine shipped. Other containers were introduced during this period - the *quarterola, limeta, frasquera* and *botella*.

Containers — Olive Oil

During the late middle ages in Aljarafe there were *"contractos de servicios"* related to the seasonal labor requirements of livestock raising, and agricultural pursuits, which included the preparation/maintenance of fields/vineyards/groves, as well as the harvesting, processing and transporting of the product. In 1507 the estimated cart load for transporting the harvested olives to silos was 10 *fanegas*. *Contratos* for the transportation of the oil suggest that packmules were regularly used. In 1461 a single packmule transported 8 *arrobas* from San Lúcar la Mayor to Aracena, and in 1479 a citizen of Sevilla arranged for the transport of oil to Sevilla using his own packmules and *cueros* or skins. It is presumed that wine was transported in a similar manner (Borrero Fernández 1987:202-203). Olive pressing occurs from November through January (Borrero Fernández 1987:224).

botijas peruleras — AGI Contratación 1121, 1596,
Nra Sra de la Esperanza.
"... quatro *botijas* peruleras de azeite ..."
the only time I saw oil shipped in *botijas* peruleras

1/3 *arroba botijas* — AGI Contratación 1264, 1699, Nra Sra de las Remedios y San Francisco Xavier
"... ducientos y setenta y ocho botijuelas de tres en arroba."

1/3 *arroba botijas* — AGI Contratación 1588, 1778, San Cristoval
"6 botijas de aceyte con 2 arrobas"
These two entries were the only mention of 1/3 *arrobas* for olive oil

0.4 *arroba botijas* — AGI Contratación 1288, 1720, La Reina de los Angeles
"trescientos y uno botijuelas de aceite de cinco en dos arroba"
"ochocientos arrobas de azeite en dos mil botijuelas de a cinco en dos arrobas"

0.4 *arroba botijas* — AGI Contratación 1288, 1720, La Reina de los Angeles
"mil botijuelas de aceite regul.^s de cinco en dos arrobas ..."

0.4 *arroba botijas* — AGI Contratación 1288, 1720, La Santissima Trinidad
"tres mil votijuelas de azeite de cinco botijuelas en dos arrobas"
"quinientos votijuelas de aceite regulares de a cinco en dos arrobas"

0.4 *arroba botijas* — AGI Contratación 1291, 1721, San Francisco Xavier
"trescientos botijas de aceite de cinco en dos arrovas"

0.4 *arroba botijas* — AGI Contratación 1291, 1721, El Angel de la Guarda
120 "arrobas en botixuas de cinco en dos arrobas"

1.5 *arroba botijas* — AGI Contratación 1079, 1530, Santa Maria de Concepción
"octenta arrobbas de azeyte en botixas de arroba y media y maxtoro(?)"

These are all the instances of the *botija* for olive oil other than the common 0.5 *arroba* size. The 0.4 *arroba* size is described as "cinco *botijas* en dos arrobas." The *media arroba botija* is clearly the dominant container for olive oil throughout the colonial period. This is the only container pattern to be so consistent. Olive oil appears to have never, or at least very rarely, been shipped in wooden containers to the Indies from the mid-16th to the end of the 18th-centuries. The size of the container also varies little — almost always 1/2 *arroba;* the 0.4 *arroba botijas* of the eighteenth-century are the only significant exception. Other exceptions are the 1/3 *arroba botija* and the 1.5 *arroba botija.* The 0.4 *arroba botijas* for olive oil appear after the Bourbons assumed the Spanish crown.

But there are instances which indicate that there was certain lack of precision regarding the volume of the *botija* for aceite. It seems that during the 16 and 17th-centuries it was common for olive oil to be listed in *arrobas* only, without mention of the number of *botijas*; occasionally, it would be so many arrobas of aceite *"en botijas*, or *botijuelas".* But in the 18th-century the number of *botijas* is almost always given along with the number of *arrobas.* Sometimes it is apparent that the *botijas* are not of standard size — for example:

420 *arrobas* of *aceite* in 1500 *botijas*
(AGI Contratación 1291; 1721, El Angel de la Guarda)

170 *arrobas* of *aceite* in 400 *botijas*
(AGI Contratación 1291; 1721, El Señor San Joseph)

1000 *arrobas* of *aceite* in 2880 botijuelas
(AGI Contratación 1588; 1778, San Joseph)

325 *arrobas* of *aceite* in 750 *botijas*; 1350 *arrobas* of *aceite* in 2738 *botijuelas*
(AGI Contratación 1588; 1778, Nra Sra de Begona)

600 *arrobas* of *aceite* in 1500 *botijuelas*
(AGI Contratación 1674; 1778, La Fortuna)

Unlike the other major Spanish exports of wine, vinegar, olives, and brandy, the packaging pattern for commercial olive oil was most consistent during the entire colonial period. No mention of containers other *botijas* for transporting olive oil was encountered in the registro sample. There were numerous entries which gave only the amount of oil (usually in arrobas) without mentioning the container, and therefore it is possible that containers other than *botijas* were used. The size of the *botija* was also fairly consistent. A half arroba *botija* was the standard container for transporting oil during the 16th and 17th-centuries with few exceptions — listed above. A 0.4 arroba *botija*, or the five in two arrobas *botija* occurs in the shipping documents from 1720 and 1721, and may be related to the new Bourbon presence in Castile. This 0.4 arroba *botija* is absent in the later manifests as the half arroba *botija* again predominates.

Containers — Commercial Vinegar

The following containers carried vinegar according to the analysis of *registros*:

pipa — 27.5 *arrobas* (AGI Contratación 1361; 1737, Nra Sra de Velen, San Francisco, San Antonio)

20 *pipas* regulares de vinagre
quarto — half *pipa*
barril — 4.5 *arrobas*
barril de tres arrobas
botijas — 1.25 *arrobas* (AGI Contratación 1288; 1720, La Reina de los Angeles)

botijas de media arroba
botijas perulera — 1.25 *arrobas*
(AGI Contratación 1453; 1594, Santiago)

"80 botijas peruleras de vinagre en que hay 100 arrobas"
botijas grande — size not specified

The *botija* is the dominant shipping container for commercial vinegar during the 15th and 16th-centuries. Eighty percent of commercial vinegar was shipped in *botijas* during the 16th-century, and this increased to 91% during the 17th-century (Appendix 5). This pattern changed dramatically during the 18th-century as wooden containers carried more than half (55%) of the commercial vinegar. This included 34% in *pipas* and 21% in barrels, and 45% in *botijas.* The increased use of wooden containers, particularly barrels, is especially marked in the second half of the 18th-century.

Appendix 5 summarizes the packaging and production patterns for vinegar. Information from three ships which sailed in 1523 indicates that wooden containers predominated. The overwhelming bulk (80%) of 16th-century commercial vinegar was transported in *botijas* after 1523. This rises to 91% in the 17th-century, and drops to 45% in the 18th-century. After 1737 the use of wooden containers is clearly on the increase, especially with the more widespread use of the *barril.* Shipments of vinegar averaged roughly 125 arrobas per ship during much of the 16th-century, but this rose significantly from 1590 to 1633.

Containers — Brandy

No brandy was noted for any of the ships in this sample prior to 1634. It was during this time that wine and vinegar exports were in decline. From 1634 to 1704, 47% of all brandy was shipped in *botijuelas*, 45% in wooden containers (43% in *pipas* and 2% in *bariles*), and 9% was shipped in *frasqueras.* From 1720-1778, the use of *bariles* increased dramatically to 82% of all brandy shipped to the Americas. Pottery containers (*botijas* and *botijuelas*) account for less than 1%. *Botellas* were used to ship 9%, and *pipas* and half *pipas* together accounted for 6%. *Botas*, *quarterolas*, and *limetas* together account for less than 1% of all brandy (Appendix 5).

Containers — Other Commodities

Honey

A marked preference for pottery containers was observed for honey as 21 of 24 entries noted in this study used pottery containers for shipping honey (Appendices 4 and 5). The three instances of wooden container were barrels, the size given for one *barril* entry was 3.5 *arrobas*. The pottery containers included olive jars of 1/4 *arroba*, *jarros* and *botijas* of one *azumbre*, and *botijas* of 1/2 *arroba*. Of the pottery containers where size was given, the *botija* of 1/4 *arroba* was most common for honey.

Olives

The packaging pattern for commercial olives was varied, but favored wooden containers as 25 of 37 entries were for olives shipped in either barrels or *cunetes* - a type of small wooden tub (Appendices 4 and 5). *Cunetes* replace barrels as the wooden container for shipping olives in the 18th-century. The following sizes were given for barrels: 1/2 *fanega*, 1/2 *quintal*, 2 *almudes*, 4 *almudes*, 6 *almudes*, and 10 *almudes*. The olive jars were also varied in size — 1/2 *arroba*, 1.25 *arroba*, 1/2 *almud*, and 1 *almud*.

Almonds

The packaging pattern for almonds was similar to olives in that wooden containers were favored in 29 of 44 entries, and were also dominant during the 18th-century. The sizes of wooden containers for almonds varied as follows: 3 *arrobas*, 3.5 *arrobas*, 4 *arrobas*, 27 *arrobas*, 1/2 *quintal*, 1 *quintal*, and 2 *quintales*. Olive jars sizes represented were 1.25 *arrobas* and 1.5 *arrobas*.

Capers

Packaging for capers followed the general pattern observed for olives and almonds as 23 of 34 entries indicated wooden shipping containers. One bota (29 *arrobas*), several sizes of barrel (1/4 *arroba*, 1 *arroba*, 1/2 *quintal*, 1 *quintal*), and olive jars (1/4 *quintal* and 1/2 *arroba*). Only *cunetes* are observed in the four 18th-century entries for commercial capers.

Garbanzos, Hazelnuts, Rice, Tuna, Myrrh, Oils

Only 1 of the 6 entries for commercial garbanzos list olive jars as the shipping container (1.25 *arrobas*), the rest include a *pipa*, bota (3.5 *fanega*), and barrel (1 *quintal*). 3 of the 7 entries for commercial hazelnuts indicate a pottery shipping container (olive jar of 3 *almudes*); wooden containers include a *quarto* (1/2 *pipa*) and barrels (1 *fanega*, 1 *quintal*). Three entries for commercial rice included one shipped in olive jars of 1/2 *arroba*, and the others shipped in barrels of 2 *arrobas* and 1 *quintal*. Two entries for tuna included an olive jar and small barrel both of unspecified size. One entry for *goma* - possible gum resin of some sort - was shipped in olive jars (1/2 arrobas), as was one entry for *myra* - possibly myrrh (aromatic gum resin), which was shipped in olive jars of unspecified size. Various types of oils, including aceite de linaza (linseed oil), aceite de mata (?), and aceite de almendras dulces (oil of sweet almonds?), were all shipped in olive jars.

Containers — Ship's Provisions

The results of the *registro* survey related to ships provisions is presented in Appendix 4. Unfortunately, no information regarding ships' provisions was found in the *registros* prior to 1583. In each *registro*, the ships' provisions would be listed separately from the commercial goods under *bastimentos* for the late 16th and 17th-centuries, and under *rancho* in the 18th-century. It is possible the ships' provisions may have been miscounted during the analysis as commercial goods for the *registros* prior to 1583. The 18th-century documentation for ship's provisions is much more detailed than that observed in earlier times as *registros* of the late 16th and 17th-centuries would list only the water, wine, vinegar, and olive oil under ship's provisions. Several documents included with

18th-century *registros* indicated that ships' provisions of wine, brandy, and olive was being shipped from Sevilla to Cádiz. There is also mention of empty olive jars, *limetas*, *frasqueras*, and barrels being shipped from Sevilla to Lebrija and Cádiz to be filled with water and wine for ships' provisions (AGI Contractión 1453; AGI Contratación 1361) (Figure 31). The packaging patterns will be discussed for each of the major commodities where olive jars were used for ships' provisions.

Water

The container pattern for water is primarily *botijas* in the late 16th and 17th-centuries, and wooden containers become slightly more popular during the 18th-century. There is no variation in the size of water container, or at least no indication of variation, as only *pipas* and *botijas* are listed. In the late 17th and 18th-centuries additional containers include quarterolas, *barriles* (3 *arrobas*), and *tinajas* occur. A distinct shift occurs in the 18th-century as wooden containers become more popular — 31 of 43 ships examined used wooden containers to carry the ship's provisions of water.

Wine

The container pattern for ships' provisions of wine is similar than that for water, except more pronounced as there is a low frequency of *pipa* use during the late 16th and early 17th-centuries, but *botijas* are almost exclusively used during the 17th-century. A wider variety of wooden containers is evident in the 18th-century and include *botas, pipas, media pipas*, and *barriles*. Of these 18th-century wooden containers for wine, barrels are the most common and the use of bottles is documented for one 18th-century ship.

Vinegar

The packaging pattern for ship's provisions of vinegar is similar to that of wine, as olive jars predominate during the late 16th-century and are used almost exclusively during

+

Sr. Presidente.

Dn. Antonio Rouvero de Azpilcue
ta y Aburria Maestre del Navío Sn.
Jorse Nra. Sra. del Carmen y Sn. Antonio de
Padua, puesto á la obediencia de V.S. Dize Que
necessita hazer venir de Sevilla, ó sus Con
tornos Setecientas Botixuelas Varias de
á media arroba, y conducirlas al Puerto
de Sta. María para llenarlas de Azeite y
Vinagre para el Rancho del dho. Navío;
y assi mismo tiene Comprado treinta y
quatro Varas de medio Damasco Carr
mesí en esta Ciudad para la Carroza del
Bote de dho Navío que se ha de haz
zer en el Puerto de Sta. Ma. y para poderla
Conducir

(AGI *Contratación* 1361)

FIGURE 31. Dispatch for shipping empty *botijas* from Seville to Santa Marta to be filled with olive oil and vinegar, for provisions on the *San Jorge Nra Sra del Carmen* and *San Antonio de Padua*, 1736.

the 17th-century. *Pipas* were used infrequently during the late 16th-century, and when wooden containers come to be more popular in the 18th-century, the *barril* is most common, with the *pipa* and *bota* occurring with lesser frequency.

Olive Oil

When packaging was mentioned for ship's provisions of olive oil, it was always a *botija* or olive jar. But for most entries, there was no indication of container type for olive, only the amount usually expressed in *arrobas* (see Appendix 4). It is presumed that olive oil was so commonly shipped in olive jars that there was no need to indicated the type of container. The only size indication for olive jars carrying ship's provisions of olive oil during the late 16th and 17th-centuries was 1/2 *arroba*. The 1/2 *arroba* olive jar is also mentioned in the 18th-century and there is one ship which carried olive jars of oil which were 2 *arrobas* in 5 olive jars.

Other Comestibles and Non-Comestibles

A variety of other edible materials were packaged in olive jars for consumption during the journey and included garbanzos, olives, anise, pickles, honey, mustard, capers, and sugar. The following of the goods packed in olive jars were also found in wooden containers: olives, anise, and capers. Detailed information about ship's provisions was only observed in *registros* of the 18th-century. The *registros* of the late 16th and 17th-centuries would list only the water, wine, vinegar, and olive oil under ship's provisions. *Alquitran* (tar, pitch) and *grassa* (grease) for use on board a ship appear to have been commonly packed in olive jars, although wooden containers (*barriles, barricas*) are also mentioned, but all mention of *grassa* is contained in an olive jar.

Projecting Production levels

Table 14 summarizes the *registro* analysis results by wooden vs. pottery container for wine and brandy. For example, prior to 1583 much of the wine was shipped in wooden containers, mostly *pipas* of 27.5 arrobas, even though empty *botijas* often accompanied the full *pipas*. After 1583, there is no more mention of empty olive jars being shipped with full *pipas* of wine.

Table 14. Wooden vs. Pottery Container Patterns for Commercial Wine and Brandy

wine	wooden container %	olive jar %		number of registros examined
1523-1557	96	4		
1583-1598	72	28		
1600-1650	65	35		
1651-1719	68	32		
1720-1778	65	35		
brandy	**wooden container %**	**olive jar %**	**glass container %**	
1523-1633	none	none	none	
1633-1704	45	47	9	
1720-1778	88	0.5	10	

It appears that wooden containers carried most of the wine during the peak years of the late 16th-century, but a shift occurs in the early 17th-century as olive jars are used in larger proportions. The pattern of wooden vs. pottery container stays pretty much the same throughout the rest of the colonial period for wine. For the brandy the pattern is quite different. When it first occurs in the Carrera, it is transported equally in wooden and pottery containers, with a small percentage of glass containers. But after 1720, olive jars are rarely used while the percentage of wooden containers jumps dramatically. Glass container usage for brandy remains the same. The Bourbon reforms apparently had no effect on the amount of wine being shipped in olive jars, although it is known that smaller wooden containers came to dominate — the barrel of 4.5 *arrobas* became much wider in use over the *pipa* of 27.5 *arrobas* during the 18th-century. But something had a dramatic effect on the shipping of brandy after 1720 when olive jars are hardly used at all.

Table 15 gives projected totals for number of olive jars needed for the *Carrera* - data for total *arrobas* comes from García Fuentes (197?, 1980), and García-Baquero Gonzales (1988). The total olive jar figure for wine is reached by multiplying the total *arrobas* by the olive jar percentage from the table above, and then dividing this by 1.25 — the size of the olive jar for wine. It is easier to compute total olive jars for olive oil as the total *arrobas* of olive oil is simply multiplied by two — olive jars for olive oil are generally 0.5 *arrobas*.

Table 15. Projected Olive Jar Totals for Commercial Wine and Olive Oil

Wine	total arrobas	*estimated* total olive jars
1588-1589	5,114,215	1,145,584
1650-1700	1,676,039	429,065
1720-1739	325,161	91,045
1750-1778	271,862	69,596

Olive Oil	total arrobas	*estimated* total olive jars
1588-1589	not available	
1650-1700	283,359	566,718
1720-1739	159,835	319,670
1750-1778	61,844	123,688

All this seems to indicate that the demand for olive jars in Spain decreased fairly dramatically after the boom period of the late 16th/early 17th-century. Although, there was an increased use of olive jars in ships provisions during the 17th-century.

I had hoped to be able to project more of the 16th and early 17th-century levels, but the projections for periods of known amounts (listed above) were very erratic (sometimes high, sometimes low, sometimes very close to correct). I'm not exactly sure why the projections were so far off, but it is probably related to the small size of the sample. It might have been better to sample an entire fleet for any given year. The proportion of goods carried on a single ship was generally not the same as the proportion of goods represented in the entire fleet. For example, sometimes specific ships would only carry provisions, or maybe all of a specific commodity.

Olive Jar Miscellaneous

The terms for olive jar vary as discussed in Chapter 1, but in general, *botija* is the "genus" term for olive jar, and the "species" terms include *perulera* and *regular* for wine, and *de a media arroba, de tercer arroba*, and *de cinco en dos arrobas* for olive oil. These specific terms for olive jars vary over time (Figure 32). The term *botija perulera* is used only during the 16th and early 17th-century for both wine and vinegar. No specific term for olive jars for wine is used in the second half of the 17th-century, and *botija* regular is used for wine olive jars in the 18th-century. The term *botija* de tercer arroba for olive oil olive jars is used only in the second half of the 17th-century, and the term *botija* de cinco in dos arrobas comes into use during the 18th-century. *Botija* de a media arroba is used throughout the colonial period for olive oil olive jars.

Figures 33-37 show examples of entries in the shipping manifests which describe olive jar packaging. The stamps on olive jar rims appear to represent the merchant who owns the contents of the olive jar, rather than the producer of the olive jar. The stamps are often the initials of the merchants, sometimes with elaboration to distinguish different lots of goods owned by the same merchant. Sometimes the merchants mark was painted on the rim (AGI Contratación 1288), but more often was painted on the *estera* - or esparto matting which covered the olive jar, much like a Chianti bottle is wrapped in woven fibers. There are some instances of olive jars stamped on the rims, with one mark, while a different mark was painted on the esparto matting (AGI Contratación 1080). Merchant's marks stamped in the rim are found only in the 16th and early 17th-centuries, after which the practice apparently goes out of favor. The merchants marks also occurred on wooden containers. Appendix 3 is a collection of packaging notes from both primary and secondary sources.

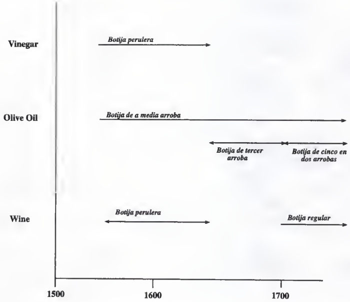
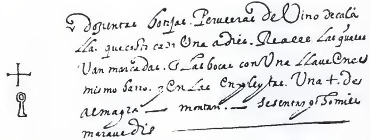


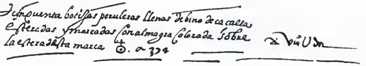
FIGURE 32. Chronology of "specialized" names for olive jars used for commercial wine, olive oil, and vinegar.



(AGI *Contratación* 1081, portion of *registro* from *La Trinidad*, 1583)

dozientos botijas peruleras de vino de caça
lla que costo cada una a dies realles las quales
van marcadas en las bocas con una llave en el
mismo barro. y en las empleytas Una + de
almagra — montan —sesentas y ocho mill
maravedis

two hundred *botijas peruleras* of wine from Caza
lla that cost each one ten *reales* which
go marked in the rims with a key in the
same clay. And on the plaited strands of bass matting a + of
almagra — total — sixty eight thousand
maravedis

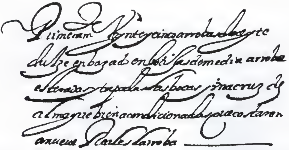


(AGI *Contratacion* 1081, portion of registro from Nra Sra de la Candelaria, 1584)

Cincuenta botijas peruleras llenas de vino de caçalla
esteradas y marcadas con almagra colorada sobre
la estera desta marca

Fifty *botijas peruleras* filled with wine from Cazalla
matted and marked with colored *almagra* on
the matting with this mark

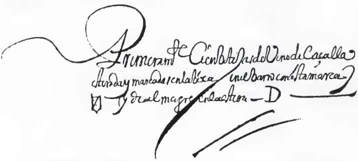
FIGURE 33. Late sixteenth century examples of entries describing olive jar packaging.



(AGI *Contratación* 1159, portion of *registro* from the *San Joseph,* 1613)

Primeramente veynte y cinco arrobas de aceyte
dulze enbazado in botijas de media arroba
esteradas y tapadas las bocas y una cruz de
almagre bien condicionadas que costaron
a nueve reales la arroba

First, twenty five *arrobas* of sweet olive oil
sweet contained in *botijas* of half *arroba.*
matted and corked rims and a cross of
almagre well conditioned that cost
nine *reales* each *arroba*

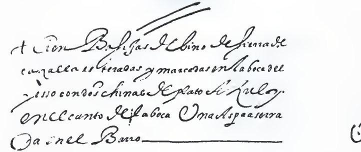


(AGI *Contratación* 1159, portion of *registro* from the *San Joseph,* 1613)

Primeramente cien botijas de vino de Caçalla
esteradas y marcadas en la boca en el barro con esta marca
y de almagre en la estera — D —

First, one hundred *botijas* of wine from Cazalla
matted and marked on the rim in the clay with this mark
and of *almagre* on the estera — D —

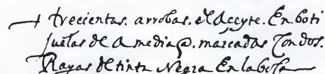
FIGURE 34. Early 17th century examples of entries describing olive jar packaging.



(AGI *Contratación* 1162, portion of *registro* from the *San Francisco de Jesus,* 1615)

Cien botijas de vino de Sierra de
Cazalla esteradas y marcadas en la boca del
yesso con dos chinas de plato azules
en el canto de la boca un aspa a serva
da en el barro

Pne hundred *botijas* of wine from Sierra of
Cazalla matted and marked on the mouth of the
plaster with two *chinas*(?) of blue metal
on the side of the rim a serrated(?) cross
in the clay

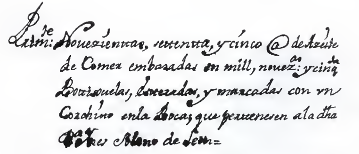


(AGI *Contratación* 1179, portion of *registro*
from the San *Juan Bautista y Santa Clara,* 1633)

trecientos arrobas de aceyte en boti
jas de a media arroba marcadas con dos
rayas de tinta negra en la boca

three hundred *arrobas* of olive oil in
botijas of half *arroba* marked with two
lines of black paint on the rim

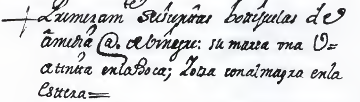
FIGURE 35. More Early 17th century examples of entries describing
olive jar packaging.



(AGI *Contratación* 1288, portion of *registro* from the *Santissima Trinidad*, 1720)

Primeramente: novezientos, setenta, y cinco arrobas de aziete de comer embaradas en mill, novecientos y cinquenta botixuelas, esteradas, y marcadas con un corchitto en la boca, que pertenesen a la dha 'Dona Ines Solano de Leon

Primeramente: nine hundred seventy five *arrobas* of olive oil contained in one thousand nine hundred fifty *botijuelas*, matted and marked with a *corchito*(?) on the rim that pertains(?) to the said Doña Ines Solano de Leon

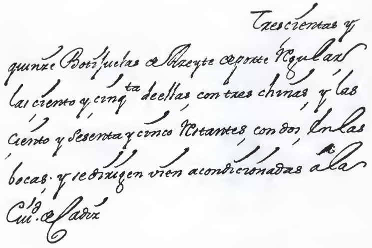


(AGI *Contratación* 1288, portion of *registro* from the *Santissima Trinidad,* 1720)

Primeramente seiscientos botijuelas de a media arroba de vinagre: su marca una U a tinta en la boca; y otra con almagra en la estera

First six hundred *botijuelas* of half *arroba* of vinegar: their mark a U painted on the rim; and other with a cross on the matting

FIGURE 36. Early 18th century examples of entries describing olive jar packaging.



(AGI *Contratación* 1371, portion of *registro* from the *Santa Teresa*, 1740)

Trescientas y
quince botijuelas de azeyte deporte regular
las ciento y cinquenta de ellas con tres chinas y las
ciento y sesenta y cinco restantes con dos en las
bocas y se diregen vien acondicionadas a la
ciudad de Cadiz

Three hundred
fifteen *botijuelas* of olive oil [common]
one hundred and fifty with three *chinas* and
one hundred and sixty with two on the
rims and addressed well prepared to the
city of Cadiz

FIGURE 37. Mid-18th century example of entry describing olive jar packaging.

There was price fluctuation in wine prices as examples from 1584, 1590, and 1591 list an olive jar of wine from Cazalla as 10, 8, and 9 reales respectively (AGI Contratación 1081, 1089, 1094). In 1591, one merchant listed the price of olive jars for wine at 40 mrs each (AGI Contratación 1094). The cost of *esparto* matting for each olive jar was listed as 10 maravedís in 1591 (AGI Contratación 1094). Therefore, the cost of an olive jar for wine and its esparto matting was 50 maravedís in 1591, and if the cost of the olive jar filled with wine was 9 reales, or 306 maravedís, the cost of the packaging was 16.3% of the price of wine.

The analysis of *registros* indicated that there while there was a conceptual standardization spelled out in ordinance 131 of the Casa de Contratación for wine and olive oil pottery containers, some of the entries indicate that adjustments were made for olive jars which were not quite the standard size. The analysis also indicated that the packaging patterns for commercial goods and ships' provisions were different; the mid to late 17th-century packaging patterns for ships' provisions of wine and water seemed to be affected more by the economic decline as there was a shift to the cheaped olive jars, while the pattern for commercial goods remained unchanged throughout the 17th century. It appears that any expense in packaging for commercial goods could be passed along to the consumers in the colonies, while the ship owners appeared to have shifted to olive jars for ships' provisions of water and wine rather than continue to pay higher prices for wooden containers. The end of the 17th century into the 18th century witnessed a resurgence in commercial activity in Sevilla, but this was nowhere near the levels of the mid to late-16th centuries. Olive jars continued to carry wine and olive oil to the Indies during the 18th century, but the demand for olive jars decreased during the second half of the 18th century.

The analysis of the shipping manifests has provided a sense of the demand for olive jars during the 16th-18th-centuries, and the following will consider the potters who made the olive jars and their organization of production.

Organization of Labor and Production

The various craftsmen in the cities of Moorish Spain were segregated by streets or wards according the specific craft (Klein 1932:164). The Romans had also set up colegia ". . . or corporate groups of craftsmen" which regulated, among other things, pottery making (Klein 1932:166). But the Roman system of craft organization does not appear to have survived during the subsequent Visigothic period, and it is under Moorish influence that the beginnings of the Spanish guilds of the Medieval period developed (Klein 1932:164; González Arce 1990:54-55). A separate, but related organization which developed along with the guilds was the *cofradía.* The *cofradía* served more as a health insurance plan for the various collections of craftsmen as it allowed for care of the sick, funeral benefits, and also religious and civic ceremonies. The *cofradía* had no regulatory power over the actual production (Klein 1932:171). *Cofradías* developed during the early 12th-century, and by the 13th-century these craft groups were assuming economic roles like that of a true guild, with all its regulatory control and classification of workers - masters, journeyman, apprentices, in addition to the social and religious functions (Klein 1932:174,182). "By the end of the fourteenth-century, however, obligatory membership and artisan classifications were evident in all parts of the peninsula" (Klein 1932:178).

There is also mention of 14th-century Sevilla city ordinances (not guild) related to the inspection of potters, ironworkers, brick makers, and conditions of the selling of wine (González Arce 1990:52). During the 14th-century, there was a general segregation between the social/religious functions and economic functions and the distinction between *cofradía* and *gremio* appears at the end of the 14th-century (Klein 1932:182). In general, guild development was first along the Mediterranean coast and followed somewhat later in Castile.

Guilds in medieval Spain followed the general chronology of the rest of Europe — first occurring in a scattered fashion during a period of economic expansion in the 11-12th-centuries, and multiplying most rapidly during the 14th and 15th-centuries — often in areas of declining population, trade difficulties and economic decline. Seaports and towns of 1000-2000 were the least favored locations for guild development, and towns of 10,000 — middle-sized towns — were the most likely candidates for guild development (Thrupp 1963:230-231). This does not hold for the Iberian peninsula as guilds first developed in Catalonia at large port cities. In 13th-century Italy, authority was with the lords, while in Spain it was the crown who had the power (Thrupp 1963:240). In 15th-century England individuals within the guilds practiced the "putting-out" of certain types of manufacturing - pins, wire and spurs - by non-guild labor (Thrupp 1963:255). Thrupp claims that guilds were too weak to be blamed for backwardness in the economy - medieval labor was very mobile so if guilds restricted membership, they would just set up shop outside the guild (Thrupp 1963:279-280).

Guilds first appear in the Iberian Peninsula during the 12th-century in Aragon, and were not introduced to Castile (including Andalusia) until King Ferdinand of Aragon married Queen Isabela of Castile. The guilds resembled the former Muslim craft organizations in Sevilla which had *mu 'allim* - masters, *sani'* - journeymen, and *muta 'allim* — apprentices, but otherwise the influence for guilds in Sevilla appears to be from eastern Christian Spain — that is, Aragon. All guild applicants had to submit purity of blood documents showing that they were "old" Christians and not recent converts. The lack of records for a potters' guild in the late 15th and 16th-centuries may reflect the large number of Morisco potters who otherwise would not be allowed to join a guild, but whose expertise was certainly needed (Lister and Lister 1987:288-290).

The 15th-century witnessed the decline of the guild system as external attacks weakened the commercial relations of Aragon after 1458. The uniting of Castile and Aragon with the marriage of Ferdinand and Isabela further weakened the guild system as the Crown took measures which increased its control over of the guilds. One such measure was to insist that all craftsmen belong to a guild, and further, that guild membership was restricted to Old Christians. As a result, Jews, Moors, slaves, and converts were no longer admitted as apprentices in spite of their previous important involvement (Klein 1932:184). Klein maintains that this regulation by the crown was perhaps well-intended as the goal was uniformity in production, price control, and trade, but the result was ". . . an endless stream of edicts, charters, and ordinances, which buried the industry and trade of the country under a stifling avalanche of regulatory and restrictive mandates" (Klein 1932:187-188). Guilds were in decline in Spain during the 17th-century, although guilds in the colonies, established in the late 16th-century in the big cities, remained "vigorous" (Parry 1990:113,173). In 1834, all Spanish guilds were outlawed (Lister and Lister 1987:291).

The Guilds in Sevilla

Of the 60 guilds in 16th-century Sevilla, the largest produced luxury goods - embroideries, painters, silversmiths, engravers, and sculptures (Pike 1972:131). In 1554-5 the *alcabala* - tax on sales - was highest for the cordage makers, shoemakers, potters, and leather workers (Pike 1972:139). *Conversos—* were widely represented in most guilds with the majority in silversmiths, clothiers, and pharmacists (Pike 1972:143). *Moriscos* were concentrated in Triana. In 1610, 7,503 *Moriscos* were expelled from Sevilla (Pike 1972:168). Economically the expulsion did not hurt Sevilla as much as other areas of Spain (especially Valencia) as there were other marginal groups that took their place such as slaves and displaced peasants (Pike 1972:170). Slaves were not allowed to join guilds, but masters were not prohibited from hiring them. Pike states that through false genealogies, many *Conversos* rose to nobility and participated actively in the transatlantic trade. In fact, Pike asserts that these families influenced the church and local government, and were the largest number of titled professionals. "With the stigma of their origins carefully hidden under false genealogies and their lives and ideas patterned along the lines of the official ideology of religious orthodoxy and *limpieza de sangre,* these aristocrats and traders directed the destinies of their city, and it is to them that Sevilla owed its period of greatness and prosperity in the sixteenth-century" (Pike 1972:213-214).

Potters in Sevilla

When Sevilla was taken by the Christians in 1248, Muslims were forced to leave and among those leaving included potters (Lister and Lister 1987:67). But the Christian King Alfonso encouraged religious tolerance, and it appears that not all Muslim potters left Sevilla, and the result was a continuity between the Muslim and Christian pottery tradition in Sevilla (Lister and Lister 1987:72). Pottery in Sevilla was produced in a workshop/household combination in the later Middle Ages (Collantes de Terán Sánchez 1977:130). During the 15th-century, the following *"artesania del barro"* were represented in Sevilla: *olleros, ladrilleros, tejeros, tinajeros* and *jarreros.* Of all these, the *olleros* were most numerous by the second half of the 15th-century. During the period 1483-89 there were 31 *officiales olleros* and by 1533 there were 83 *officiales olleros* (Collantes de Terán Sánchez 1977:335). The *olleros* had a stamp or seal, like the other guilds in the 16th-century, and they also had a fraternal organization or *hermandad* and a hospital (Montoto 1938:165).

The pottery production unit in 16th-century Sevilla was the small family workshop under little state regulation aside from taxation. Guilds existed, but there is no evidence of guild ordinances. The potters' workshops were not concentrated in one area of Sevilla [or Mexico City, but in Puebla there was a potters' quarter (Lister and Lister 1987:254)]. Pottery production was not ". . . a craft that required a great capital investment" (Lister and Lister 1987:279), at least during the colonial period, and the profession of potter was not one of the more lucrative occupations in Spain. "Beds of potting clays on the west bank of the Guadalquivir opposite Sevilla probably had attracted craftsmen to the locality from the earliest times" and kilns have been found along the river bank (Roman kilns at Orripa - others not identified) (Lister and Lister 1987:73). Clay sources near Triana included meadows, islands in the river, and a place called Castilleja de la Cuesta (Lister and Lister 1987:73).

At the end of the 15th-century, a traveler in Sevilla commented on the great production of pottery containers for the transport of wine and olive oil. In the mid-16th-century, Pedro de Medina reported 50 talleres Trianeros de loza. In 1599 - a German traveler reported almost 50 tiendas de loza. In 1628 there were prohibitions against guild members from Triana and Humerus about getting clay from the isleta de la Cartuja y margen del río, frente a San Jerónimo. Unlike other industries in Sevilla, the ceramic industry did not fall into ruin - in 1747 there were 50 masters de loza and more than 1,000 workers (this does not include bricks and tejas). In 1817, there were 67 kilns in Triana (Domínguez Ortiz 1946:14-15).

The work of Bernal et al. (1978) is probably the most comprehensive on the guilds in Sevilla. No ordinances from a potters' guild have been located for the 16th or 17th-centuries. In 1533 one report indicates that 91 citizens of Sevilla were involved in some sort of pottery manufacture - ranging from brick and roof tile manufacture, unglazed and glazed pottery, and glazed tiles (Bernal et al. 1978:187). Another report in 1628 indicates that 5000 people were involved in the various pottery manufactures; Bernal (et al. 1978:189) suggests that this is probably exaggerated. More data exist for the 18th-century, especially the ordinances for the alfareros (which includes makers of bricks and roof tiles), and also guild rosters of potters. The following summarizes the information for potters' guilds in the 18th and early 19th-century (Bernal et al. 1978:205).:

	masters	journeymen	apprentices
1714	52	32	84
1753	59	158	-
1760	71	147	61
1821-2	67	-	-

There is a slight increase in potters by the mid-18th-century, and a decrease in the early 19th-century. These 18th-early 19th-century levels are nowhere near the projected 5000 people in the early 17th-century, but they are still more than the 1533 numbers. 7500 *Moriscos* left Sevilla between 1609 and 1614 with the expulsion of the *Moriscos* from

Spain (Lister and Lister 1987:270-272), but the number of potters among them is not known.

The following is a compilation of bits and pieces of information related to pottery production in Sevilla throughout the colonial period.

1554-5 — *Rentas de las alcavalas* for the years 1554 and 1555 for 52 *gremios* of Sevilla. *Ollerías sin el ramo de vidrio* rank 9th out of 52, and *ollerías del vidrio* rank 41st of 52 (Domíngues Ortiz 1946103-104).

1550's — 50 kilns in mid 16th-century Triana (Trueba 1989:143).

1628 — 5000 involved in *alfería* (Valazquez y Sánchez "Annales Epidemicos . . . de Sevilla" 1886, Sevilla).

1721 — the Marques de Torreblanca reports that there were 82 pottery kilns employing 346 people (Gestoso y Pérez 1904:334).

1747 — 50 masters and over 1000 *"obreros de loza"* are reported (A.M.S. siglo XVIII, tomo 113, Escribanias de Calbilda).

1747 — 50 masters involved in *fabrica de loza* with more than 1200 people involved in the *fabrica* (A.M.S. Seccion V, tomo 113, no. 9, 1747).

1785 — a traveler named Ponz reported 23 *maestros y caudaleros* with another 12 *maestros blanqueros* (Gestoso y Pérez 1904:334).

1779 — 370 masters, journeymen, and apprentices in potters' guild in Sevilla — 14 of the 55 masters are *botijeros*; 92 of the 370 are involved in making ***botijas*** (A.M.S. Seccion XI, Especial, Tomo 14 en folio, no. 17)

1791 — 346 *alfareros* and 50 kilns *"para loza fina, olleros y **botijeros**"* in Sevilla (Aguilar Piñal 1989:135,194). During the 18th-century, annual consumption of wine in Sevilla was 200,000 *arrobas* and 85,000 *arrobas* of olive oil (Aguilar Piñal 1989:176).

1791 — 86 kilns for *loza y vidriado* who employed 346 people in Sevilla (Tornero Tinajero 1975:62).

1794 — 298 alfareros in Triana - representing 9.33% of the working population (Tornero Tinajero 1975:57).

1817 — there were 62 pottery kilns of all classes in Sevilla (Gestoso y Pérez 1904:334).

The term *"alfarero"* is Arabic in origin and means simply "the potter" (Gestoso y Perez 1904:99), but in Sevilla it appears to also have referred specifically to the makers of unglazed clay products (including pottery, bricks, and roof tiles), while *"ollero"* referred to the makers of glazed or *"fino"* wares (Morales Padrón 1989:154).

Clay was obtained near the potters' workshops in Sevilla. There were two kinds, a red firing and a light firing clay, the first of which was gathered from near Triana, and the other was obtained from the Castilleja de la Cuesta (Lister and Lister 1987:256). The following is related to clay extraction:

1557 — a petition by potters of Sevilla complained that "outsiders" were taking clay from the Castilleja de la Cuesta (Lister and Lister 1987:347).

1693 — the *fabricantes del barro* who are *vecinos* of San Juan de Alfarache continued getting clay from Tamarguillo. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1696 — permission for 8 boat loads of clay to be taken from the arroyo of Tamarguillo to San Lucar. Permission granted to the master potter of the guild of *alfareros* in San Lucar de Barrameda. But they had taken clay from the same spot three years before without a license. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1707 — statement to the effect that it is alright to take clay from the Cuesta de Castilleja. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 37)

1733 - *". . . barro, para la fabrica de la **Bottixería** . . ."* the potters are digging clay where they are not supposed to, and it appears that they were digging clay primarily for ***botijas***. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1733 — May, 17 - don't dig clay from the site of Sn. Telmo on the river. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1733 — May 22 - *". . . barcos q trafican en sacar barro para el abasto del gremio de Alfahareros deste ciudad q labran botijas y otros generos de lo basto en el arroyo q llaman de Tamarguillo a la boca del rio del, y nunca se a dado dhas lizs para otras partes ni para un lado ni otro del dicho aroyyo . . . este barco nunca se resumen las **botijas** q se labran con el asi pª azeytes, vinos y agua q sellenan pª Indias . . ."* (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1733 — June 1 - *". . . y sacar el barro, que se nesecitaria para la fabrica de dhas **bottixas** . . ."* (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1733 — June 2 - mentions the 1693 and 1695 cases against the barreros from San Lucar and San Juan de Alfarache. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1733 — October 1 - *"fabricar prinzipalmente botixas"* prohibit both outsiders and barreros from Sevilla to dig clay at el arroyo de Tamarguillo y Cuesta de Castilleja. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1736 — May 16, Complaint by *fabricantes de botixas* that they have not been able to make ***botijas*** for the last ten months since they are not allowed to take clay from the banks of the river from the caño de Tamarguillo to Pena de Lazanes. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 4)

1738 — Alfarero maestros ask that no outsiders be allowed to get clay from the Arroyo de Tamarguillo and Cuesta de Castelleja. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 9, no. 5)

1743 — a petition of 6 masters of the potters guild of Sevilla against a master potter of Cádiz for taking clay where the others were not permitted to do so (Gestoso y Pérez 1904:453).

1746 — case against 11 who were continuing to take clay from the Cuesta de Castilleja. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 30, no. 42)

1747 — Architects charging that the digging of clay at the Cuesta de Castilleja is ruining the usability of the area for dragging ships on land and servicing them. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 30, no. 42)

1782 — related to the digging of clay at the *Tablada*. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 22, no. 6)

1783 — related to the digging of clay at Tamarguillo. (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 22, no. 5)

The importance of an accessible clay source is evident in the continued litigation regarding the digging of clay by local potters in prohibited places such as the Cuesta de Castilleja, and the presence of potters from San Lucar de Barrameda at these clay extraction areas in Sevilla. In some cases, the potters claimed that they needed the clay to make *botijas*. A reference to potters gathering raw materials from the islands in the Guadalquivir indicates that they were extracting *arena*, or sand, which may have been used as temper (A.M.S. Seccion V, Escribanias de Cabildo del siglo XVIII, tomo 22, no. 5).

Summary and Discussion

The results of the analysis of registros indicated that wine and olive oil were by far the most common items transported in olive jars, and that the olive jar for wine generally held 1.25 *arrobas*, and the olive jar generally held 0.5 *arrobas*. The 1.25 arroba olive jar for wine and the 0.5 arroba olive jar for olive oil clearly correspond to Goggin's Shape A and Shape B olive jar. Goggin's Shape C olive jar is probably the 0.25 arroba olive jar which commonly transported honey. Unfortunately, the projections for total numbers of olive jars based on the registro sample were not very accurate. This was probably due to the small sample size of *registros*, but is probably also an indication that the "ship" cannot be used as a unit of measure. Within any given convoy, goods were not represented in equal proportions on each ship. Perhaps a more meaningful unit of measure might have been the entire convoy.

The projection of olive jar production levels was a failure, but important information regarding the packaging patterns of the major commodities was learned from this study. Olive oil was virtually always shipped in olive jars. Wine was shipped in both olive jars and wooden containers, but wine shipped to Nombre de Dios (later Puerto Belo) and Honduras was shipped primarily in olive jars, while wine shipped to Vera Cruz and the Islands was generally shipped in wooden containers. This packaging variation might be explained by the nature of transportation features in the colonies. Wine shipped to Nombre de Dios was transported to Panama via packmules on roads which could not accommodate wheeled vehicles. The *pipas* and barrels of wine were probably simply too large to put on a mule, but the 1.25 arroba olive jars of wine could be carried on mules, with their capacity of 8 arrobas, or 200 lbs. It is possible that land transportation features leading out of Honduras might also have been more easily travelled by mules than by wheeled vehicles.

The information concerning the organization of labor and pottery production in 16th-18th-century Andalusia which was accumulated added little to the wonderful synthesis provided by Lister and Lister (1987). Pottery production, particularly olive jar production, was greatest during the late 16th- and early 17th-centuries, although disputes regarding clay extraction appear throughout the 16th-18th centuries, and it appears that potters from San Lucar de Barrameda were coming up to Sevilla in search of clay. But little was learned about any changes in the size or capacity of the olive jar kilns, or about the organization of production. The names of olive jar manufactures are present in a number of sources, and it is recommended that these names be investigated in a broader context (i.e., a search for these names in other types of documents). The exact nature of the olive jar manufacturers' response to the increased demand for olive jars during the mid-16th through early 17th-centuries is not clearly known, other than it appears that they were successful in meeting the requirements for pottery packaging.

CHAPTER 9

SUMMARY AND CONCLUSIONS

Overview

This study focused on the historical development of a Mediterreanean pottery packaging tradition — the amphora tradition — which had its roots in the Near East during the 6th century B.C. and has continued into the 20th-century. Pottery was a popular choice for the maritime transport of wine and olive oil in the ancient world, but wooden containers came to dominate maritime transport packaging in much of the Mediterrean and North Atlantic maritime commercial actvity during the medieval period. In mid-16th century Andalusia, the amphora would again be selected to transport wine and olive oil, but this time it was to the New World. The amphoras of post-medieval Andalusia — referred to by some archaeologists as Spanish olive jars — were produced in large amounts to meet the container demand of the transatlantic market during the 16th-18th-centuries. The description of olive jar producers as "capitalists" (e.g., Lister and Lister 1987:276) suggested that the container industry in Sevilla may represent at least one sector in the Andalusian economy which was transformed by the emerging capitalist world system, while much of the Andalusian economy retained a more mercantilist character. A multi-disciplinary approach integrated a review of secondary historical sources and archival work, with both formal and technological analyses of olive jar fragments from Spanish colonial sites.

Secondary Sources

The review of secondary sources of the history of Castile indicated revisions of the view that the economic hardship experienced by Spain in the early and mid-17th-century was a "decline," and caused, in part, by an "anti-economic" mind-set or lack of the "capitalist spirit." *All* of Europe was, in fact, experiencing an economic recession during the first half of the 17th-century, and given the Castilian ties (via the Hapsburgs) to the Holy Roman Empire, the so-called "decline" of Spain was really the decline of the Holy Roman Empire. Castile had not risen alone to hegemony, but rather through the collective efforts of the Hapsburg-dominated Holy Roman Empire. Unfortunately, Castile appeared to have paid a high price for the ascendancy by playing a primary role in the military campaigns against the Protestants and Turks, and provisioning and organizing the fleets that brought the treasure which financed the military operations.

The idea that somehow the Spanish "character" was a factor in the economic problems of the 17th-century can be found even in the works of Spanish writers. What is interesting is that there was no lacking in "character" observed during the 16th-century in Castille when Sevillanos actively participated in the Carrera de Indias. Again, the 17th-century economic problems were experienced by all of Europe, and are probably related to demographic factors [i.e., population outgrowing its food resources, malnutrition, and disease (e.g. Phillips 1987)] than to any vagaries in national character. Castile and its allies were the first to dominate the modern world system, and those that followed — Holland, France, Britain, and the Soviet Union — lasted no longer as a dominant power than Castile as the strain of maintaining a strong military presence in the far-flung corners of the world resulted in the crippling of their respective domestic economies.

The 16th-century Hapsburg-dominated Holy Roman empire was the first "superpower" of the modern age. This was also the age of the printing press, and the propaganda which it was capable of reproducing was at a rate previously unknown. All subsequent superpowers were "villainized" through the print media, and being the first to receive such treatment, an understanding of Castile must include an awareness of the "Black Legend", the negative portrayal of Castile which was propagated by the British and Dutch. The passing of time has allowed the history of Spain to be considered in a more dispassionate light by "outsiders" and there seems to be a growing awareness among Spanish historians that yes, Spain *was* different — Spain *is* different, but it was not this difference which caused the economic problems of the 17th-century. Instead, it appears that during the 16th and 17th-centuries, Castile was dealing with problems common to *all* subsequent superpowers - ethnic diversity and mistreatment of minority groups, military expansion and crippling defense budgets, economic imperialism and the creation of economic dependency. These problems are the problems of empire - and are not problems caused by any shortcoming of "character."

Primary Sources

The archival work provided information concerning olive jar production, form, function, and use patterns. Guild records from the 18th-century indicated that there were masters called *botijeros* who specialized in the making of *botijas.* The tabulation of olive jars from ships' manifests and bills of sales for the purchase of olive jars for the early 17th century construction of the *Consulado* building in Sevilla allowed a better approximation for olive jar production levels. A 1627 price list from Sevilla, shipping ordinances regarding the stowing of various containers (including olive jars), and the ships manifests indicate that there were a wide range of *botijas,* or olive jars, and that certain sizes were used for certain commodities. The various names and associated descriptions of olive jars found in the shipping records reflect three general sizes, which correspond to Goggin's shapes A, B, and C. The shipping manifests indicated that wine and olive oil were the primary contents of olive jars; wine was shipped only in Shape A olive jars, olive jar was shipped only in Shape B olive jars, and honey was the most common item shipped in Shape C olive jars. The manifests also demonstrated that the packaging patterns differed for commercial goods and ship's provisions. The pattern for wine indicated that the proportions of wine shipped in pottery versus wooden containers varied little from 1540 to 1780, while there was a marked increase in the use of olive jars for ships' wine provisions in the 17th-century, presumably related to the higher cost of wooden containers. Destination was also a factor in the type of packaging used for some commodities - specifically wine. Wine shipped to Nombre de Dios/Puerto Belo and Honduras was generally shipped in olive jars, while wine shipped to New Spain and the Islands was generally shipped in wooden containers. It is possible that olive jars were used to transport wine where terrestrial transportation features prohibited the use of wheeled vehicles capable of carrying large wooden containers, and necessitated the use of packmules or some other domestic animal. This terrestrial transportation hypothesis to account for the use of olive jars to transport wine to certain colonial ports does not account for the observation that olive oil was almost always shipped in olive jars.

Archaeological Analysis

Examination of the archaeological assemblages revealed that during the 17th and 18th-centuries, the rim form for the Spanish olive jars for wine - Shape A - was angular, while the rim form for the olive jars for olive oil - Shape B -was rounded, and therefore, the contents of an olive jar might be known if a rim fragment was recovered. In addition, the rim form for the Shape A olive jars changed over time from a triangular to rectangular profile. The technological studies suggested that olive jars were not produced with raw materials from the wine producing areas of Cazalla or Jérez, but were probably produced within the Guadalquivir Valley. Examination of large basal fragments of olive jars supported Markin's idea that the olive jar body was thrown upside down. Lister and Lister (1987) had pointed out that Goggin's Early Style olive jar was not in the amphora lineage, but rather a *cantimplora* or canteen. A new form of Middle Style Shape B olive jar dating to the first half of the 16th-century was recorded from Concepción de la Vega in the

Dominican Republic and a new form of Middle Style Shape A olive jar had been previously reported from an early 16th-century shipwreck (Corey Malcom, personal communication). It was suggested that Goggin's Middle Style period be extended from 1554 to 1733. Olive jars appear to have been in use prior to 1554 (see Lister and Lister 1987), but apparently not for shipping goods to the New World.

Discussion of Hypotheses

The first hypothesis regarding olive jar production was derived from the historical development of pottery manufacture in the northeastern United States (Turnbaugh 1987) where the transition to capitalism in the pottery industry was characterized by a shift from a large number of widely scatter, small-scale producers to a lesser number of more centralized, large-scale producers:

> **H1** - Spanish olive jar production location shifted from a large number of widely scattered locales at individual vineyards and olive groves in the 15th and early 16th-centuries, to a smaller number of more centralized production locale with the increased demand for wine and olive oil in the mid 16th-century to early 17th-centuries and later.

The test implications of this hypothesis are as follows:

> 1 - The mineralogical signatures of the late 15th to early 16th-century olive jars will be highly varied, while the mineralogical signatures of the mid 16th-century and later olive jars will be more homogenous. **Data Source** - Archaeological/Technological: petrographic analysis of olive jar sherds
>
> 2 - Vessel size and shape will become more standardized through time because there are fewer (albeit larger) producers involved. **Data Source** - Archaeological: olive jar vessel and rim morphology

The mineralogical signatures of the early 16th-century olive jars were not highly varied, and there appears to have been relative standardization of vessel form at least by 1540. There is nothing to suggest a shift from a widely scattered more centralized production during the 16th-century, it appears that production of olive jars was *already* confined to the Guadalquivir Valley. But this does not necessarily imply that olive jar production followed the same developmental trajectory as the pottery production in the NE United States, or even that it represents a similar process. Upon further reflection, it appears that it was wrong to think of olive jar production in the same way as pottery production in the NE United States. Spanish Olive jar production represents production for export and generally *not* for domestic consumption, while pottery production in the NE United States was production for domestic consumption, and not for export. The Roman amphora exhibited the same production pattern as olive jars — production areas were located close to transportation features. It appears, then, that production of support commodities for an export market would have a developmental history different from the production of household commodities for a domestic market.

The second hypothesis is derived from Florence and Robert Lister (1987) description of the Spanish olive jar producers as capitalists:

> **H2** - The shipping activity which created the increased demand for wine and oil which occurred in Sevilla starting in the mid 15th-century transformed the Spanish olive jar producers into "capitalists" by the mid to late 16th and early 17th-centuries.

Test implications of the Lister hypothesis are as follows:

> 1 - Olive jar producers were wage laborers who specialized in making maritime ceramic packaging. **Data Sources** - Documentary: tax rolls, guild rosters, bills of sale for olive jars

Unfortunately, the assessment of the degree to which the lives of olive jar producers was transformed by the organization of olive jar production will require the research of a true historian. The documents reviewed for this study indicate that olive jar producers were one of the more productive sectors in Sevilla during the second half of the 16th-century, and estimates of 5000 people involved in the pottery industry at the beginning of the 17th-century are probably fairly accurate. This was the time of peak export activity and the demand for olive jars would have been also at its peak. The 18th-century demand for olive jars was much less, and the correspondingly fewer numbers of potters during this time is therefore not unusual.

> 2 - Packaging became more standardized and regulated with the greater need for quality assurance of large consignments of wine and olive oil. **Data Sources** - Documentary: packaging ordinances, olive jar terminology in shipping manifests. Archaeological: - volumetric studies of olive jar capacities. Technological: olive jar fabric

A study of olive jar terminology indicates that when wine was shipped in olive jars, they were generally 1.25 arrobas (Goggin's Shape A), and commercial olive oil was almost always shipped in 0.5 arroba olive jars (Goggin's Shape B). Honey was commonly shipped in the 0.33 arroba olive jar (Goggin's Shape C). This pattern dates back to Greek and Roman times, although the amphoras of antiquity were larger. No ordinance was found which dictates that this pattern be maintained, but a tonnage ordinance gave the numbers of how many of each type of olive jar made a tonelada. Some of the manifests suggest that there was variation in the volume of each type of olive jar and volumetric studies of olive jars from archaeological assemblages confirm this lack of precision in volume control. No significant technological variation is observed in the paste of the olive jar fragments over the 16th through 18th-centuries. Olive jars made in the Guadalquivir Valley continue to have a surface efflorescence, while olive jars of New World manufacture and possibly other areas in Spain do not have this efflorescence. To summarize, the olive jar tradition of the 16th-18th-centuries is simply a continuation of the amphora tradition of antiquity and does not represent a special unique response in the container industry to an emerging capitalist world system.

> 3 - Innovations in manufacture such as the use of molds occurred in order to increase work efficiency. **Data Source** - Archaeological: mold marks or tooling marks on olive jars

Molds were not used to manufacture olive jar. There doesn't appear to have been any innovations in olive jar manufacture from examination of the olive jar fragments. There is the possibility that kiln modifications may have been made, similar to the shift from two story to three story kilns observed in modern times (e.g. Mossman and Selsor 1987), but no references were found to suggest this.

> 4 - Shortcuts (i.e., improper wedging, shorter firing time, less attention to aesthetics) or other "illicit" activity becomes more common as part of an effort to keep up with demand. **Data Sources** - Documentary: complaints regarding faulty olive jars. Archaeological/Technological: defects such as warping, blistering and bloating on olive jars

No documents regarding sub-standard olive jars were encountered. The blistering observed on some olive jars appears to represent an attempted "short-cut" in the manufacturing process, but it is probably not the result of inadequate wedging as suggested by some. Rather, it is more likely the result of too rapid a firing schedule where the surface begins to vitrify before all the gases have had a chance to escape. This might reflect fuel shortages — a longer firing requires more fuel. The blistering is most marked in early 17th-century contexts (e.g. the unidentified 1622 patache, the 1622 Santa Margarita) and is less common in 16th and 18th-century contexts (the 1559 de Luna wreck, the 1724 quicksilver wrecks).

> 5 - Competition between olive jar producers occurred, olive jar price and production levels was determined by the market, and not by guild restrictions. **Data Sources** - Documentary: price information from shipping manifests and price lists.

No indications of price competition between olive jar producers was encountered. There were complaints regarding olive jar producers from San Lucar who were taking clay from Sevilla and transporting it back to San Lucar, and certain areas were specified for clay extraction in Sevilla.

6 - Marketing strategies change to compete in the growing competitive world market as measures are taken to promote individual products. **Data Sources** - Documentary: shipping manifests with descriptions of special packaging for wine and olive oil from certain regions. Archaeological: distinguishing shapes, colors, or markings on the olive jars to identity individual products.

This test implication concerns the possible origins of "consumer choice" which was to manifest itself in a most pronounced way during the 19th-century. Packaging, particularly labeling, was used to lure the consumer to buy one particular brand of the same product over another brand. The wines from Cazalla were certainly the most expensive, and the wines of the Cádiz region were considered superior to those of the Sevilla region. But were these various wines distinguished by their packaging? Both wooden and pottery containers were pretty well standardized for all variety of export wines from Andalusia, and the only distinguishing characteristics might have been painted markings which might not be preserved in the archaeological record.

To summarize, the results of the testing of the two hypotheses suggest that olive jar production levels were indeed high during the 16th and early 17th-centuries, but the organization of production may not that of capitalist production. Instead, it appears to be some sort of support commodity production similar to the production of the pottery containers for the export products of antiquity. Just like the Roman amphora production areas in Andalusia, the location of shipping container manufacture will be close to transportation features. This "support commodity" production pattern for olive jar production in 16-18th-century Sevilla appears to have an analog in modern capitalist systems in what is known as the "informal sector."

The informal sector, generally unregulated, or only lightly regulated, is an important segment in Spain's modern economy as it provides goods necessary to the function of the system at a price the system can afford, but nevertheless the production is outside of the "system" itself (Benton 1990). It is not the easiest thing to study, but it appears to be a common component of other industrial economies in southern Europe and

Latin America. At least one person who has written about the informal sector warns not to view it in a developmental sense - that somehow producers in the informal sector will evolve into "legitimate" businesses, or even want to do so (Benton 1990). As such, the informal sector is not a model of emergent capitalism, but rather an example of how the capitalist system allows for the "correction" of its own inadequacies. Informal sectors certainly evolved as capitalist systems evolved, but it is possible that the informal sector might also occur in pre-capitalist market systems.

The Phoenician, Greek, and Roman amphora producers of the Iberian peninsula might be thought of as examples of the informal sector in a pre-capitalist market system. Is the container industry as a whole an example of such an informal sector? Possibly for pottery containers, more work is needed to get the entire picture and include wooden containers. We do know that the olive jar producers were taxed (not unlike other informal sectors of today, oddly enough), but they did not seem to be regulated like some of the other craft guilds. So, are olive jar producers an example of emergent capitalism in 16-17th-century southern Spain? Probably not. More likely, olive jar producers are an example of the informal sector associated with the *Carrera de Indias*. Just as the amphora producers of Roman *Hispania* met an immediate need for packaging in as expedient a manner as possible (kiln sites near water features, one kiln for many landowners), so too did the olive jar producers of Sevilla provide the pottery containers for the *Carrera.*

Conclusions and Suggestions for Further Research

"Spain" refers not so much to a people as it does to a place — a place defined by a distinct and readily identifiable geomorphologic feature, but characterized by cultural diversity. The origin of "Spain" is colonial — it is derived from the Roman designation *"Hispania"* which referred to what we now know as the Iberian peninsula. The Phoenicians and Greeks preceded the Romans in the Iberian peninsula, but their intentions were similar. Spain has been described as the "America" of the ancient world as it was a land rich in natural resources which the powers of the ancient world extracted and removed to generate wealth in their respective homelands. It was these colonial powers of the ancient world - the Phoenicians, Greeks, Carthaginians, and Romans - who introduced the technology and organizational structure of large-scale wine and olive oil production in eastern and southern Spain. And since the product had to be transported back home, it was these same imperial powers who introduced the maritime transport technology to Spain which included a pottery container which has come to be known as the amphora. The Germanic peoples who removed the Romans from power in *Hispania* were not empire-builders and were largely absorbed into the Iberian cultures which the Romans had for so long dominated. The Muslim peoples who entered the Iberian peninsula in the 8th-century again introduced extractive pursuits and created a civilization whose florescence created centers of learning unequaled in other parts of Europe. The Muslims were not allowed to consume wine (although some did), but there did not seem to any prohibitions against producing and selling it to non-believers, that is the Christians to the north. Wine and olive oil production flourished in southern (Muslim) and eastern (Christian) Spain. The "reconquest" of Spain removed the Muslims from political power, but transculturation between Christian and Muslim peoples over a 700 year period resulted in much economic continuity.

It seems that throughout its history, Sevilla was the focus of considerable maritime activity, but there was always much external control and involvement. This was so in ancient times with the Phoenicians, Greeks, Carthaginians, and Romans; and continued to be the case throughout the middle ages with both Muslim and Christian control. The Catalan shippers took an active role in maritime commercial activity in Sevilla after the Christian conquest, and the Italians, first established in the 12th-century, continued their presence in Sevilla. So by the 16th-century, there was a long tradition of external forces at work in the maritime commercial activity of Sevilla. This historical development enhanced a situation in 16th-18th-century Andalusia where the wealth of the Indies was funneled through Castile to the rest of Europe. Sevilla was largely a "passive" port during the ancient and medieval periods, and while native Sevillanos certainly did participate in the Carrera, the large interests were controlled by foreigners.

The boom-bust export economy of Andalusia based on the exports and provisioning of the fleet was not a healthy development for the local economy. Initial impact of the *Carrera* seems to have been positive for Sevilla and other towns of southern Andalusia as there was increased production of wine, oil, wheat, leather goods, pottery, and textiles. Both after the mid-16th-century, when demand shifted from foodstuffs to manufactured goods, Andalusian industry could not keep up. The high prices which the goods could fetch in the Indies drove the local prices higher than many Andalusians could afford, in spite of efforts to control rises in prices. Wages lagged behind prices, and while fortunes were made in the Indies, and to be sure by Sevillanos as well as foreigners, the majority paid the price, but did not reap the benefits of an export economy.

The Castillian monarchy represented a last gasp of the medieval order based on the Holy Roman Empire and is arguably the first modern example of dependency — the development of underdevelopment. It may not have been a conscious exploitation, but the seating of an "emperor" with interests outside of Spain resulted in the use of Spain as the military/commercial arm of empire. There was an empire, but it was essentially the Hapsburg-dominated Holy Roman empire, and not a true *Castillian* empire. Castile became dependent on the rest of Europe for manufactured goods, and ultimately for subsistence goods. American treasure fueled the manufacturing economies in England, but it was agrarian capitalism which formed the organizational infrastructure. The lack of such in Andalusia meant the lack of capitalist development in the domestic economy.

Olive jar production was clearly production for export and therefore it cannot be understood by examining examples of pottery production for domestic consumption. Also, olive jars are examples of pottery packaging for maritime transport and are best understood when considered with other forms of maritime transport packaging, and not with other forms of pottery. The following is an attempt to understand olive jars in the context of the evolution of maritime transport packaging, an area of study which has not been the major focus of any work to date.

One of the major questions which has come out of the present study relates to the choice of packaging for the bulk commodities required in the Indies. The development of ships and shipping in the Mediterranean and Atlantic from the time of the Phoenicians, Greeks, and Romans had, by the middle ages, generally selected wood has the material of choice and barrels as the container of choice for transporting bulk commodities of wheat and wine, - the choice for olive oil is not as clear. The initial expeditions to the Indies took barrels and pipes of bulk commodities, but later, the trade to certain areas would use the container first associated with maritime transport - the amphora. The choice of olive jars to transport wine appears to be related to the condition and nature of transportation to the final destination. Wine shipped to Peru and other ports in the Pacific had to be transported by mule across the Isthmus of Panama which precluded the use of barrels. Fairbanks' suggestion that olive jars were the answer in a wood-poor country appears to explain the increased use of olive jars for ships provisions during the 17th-century, but the pattern of commercial olive jar use remains little changed throughout the history of the Carrera.

The effect of the value of the contents on the choice of packaging is not readily apparent. Brandy was initially shipped in olive jars when it first became popular during the mid-late 17th-century, but there was a shift to barrels in the 18th-century. Olive oil was almost always shipped in olive jars. As stated earlier, the main factor for wine packaging appears to be determined by the nature of transportation features in the New World. It appears, then, that the 16th-18th-century Castillian choice of packaging was determined more by the logistics of transportation and distribution, than by the value of the contents, or by any desire to manipulate the consumer into buying one "brand" of commodity over another. "Consumer choice" does not appear to be a factor in the choice of maritime transport packaging with regards to the Spanish colonial market. Of course, any re-packaging of Spanish commodities in the Americas might indicate attempts to manipulate consumer choice. One possible example of the choice of packaging being determined by consumer choice is the undeniable pattern of olive oil almost always being shipped in olive jars. Is this choice of packaging some sort of statement, possibly a early form of brand recognition? — *Spanish* olive oil could be recognized instantly as it was almost always shipped in *Spanish* olive jars. Bottles began to replace olive jars for transporting wine in the 18th-century, and by the mid-19th-century, olive jars were apparently no longer used.

The potential for studying the evolution of packaging is great for the Spanish colonial period as both the documentary and archaeological records are potentially rich data bases, particularly the ships manifests and the wrecks of the ships themselves. The present study demonstrated the utility of a multi-disciplinary approach. John Goggin's classic study set forth the basic typology and chronology of the Spanish olive jar. The study of the shipping manifests demonstrated that Goggin's typology was basically right: there were three basic sizes of olive jar or *botijas* used in the Spanish Colonial trade, and further, that these three shapes held, for the most part, specific contents. Analysis of olive jars from dated shipwrecks revealed that two of these three shapes could be distinguished by rim form, and further that one of the rim forms changed through time and was therefore temporally diagnostic. It is therefore possible to get an idea of the contents of an olive jar by examining a rim fragment. The technological studies indicated that olive jars were not produced in the rich wine producing area of Cazalla, but were probably produced in the vicinity or within the city of Sevilla. The results of each discipline by themselves are important, but it is only after all results are considered as a whole that the power of multidisciplinary research is realized.

REFERENCES CITED

Abercrombie, N.; S. Hill and B.S. Turner
1986 *Sovereign Individuals of Capitalism.* Allen & Unwin, London.

Ager, Derek V.
1980 *The Geology of Europe.* John Wiley andSons, New York.

Aguilar Piñal, Francisco
1989 *Historia de Sevilla. Siglo XVIII.* 3ª edición. Colección de Bolsillo Número 90. Universidad de Sevilla, Sevilla.

Ahmed, Akbar S.
1991 Spain's Islamic legacy. *History Today.* October, 41:7-9.

Allen, H. Warner
1961 *A History of Wine. Great Vintage Wines from the Homeric Age to the Present Day.* Faber and Faber, London.

Allen, R.O., ed.
1989a *Archaeological Chemistry IV* Advances in Chemistry Series 220. American Chemical Society, Washington, D.C.

1989b The role of chemists in archaeological studies. In *Archaeological Chemistry IV.* Advances in Chemistry Series 220, pp. 1-17. American Chemical Society, Washington, D.C.

Allibone, T.E., ed.
1970 *The Impact of the Natural Sciences on Archaeology.* The Oxford University Press, London.

Altamira y Crevea, R.
1964 Spain under the Visigoths. *The Cambridge Medieval History.* 2:159-193.

Amiran, Ruth
1970 *Ancient Pottery of the Holy Lands.* Rutgers University Press, New Brunswick, New Jersey.

Amores Carredano, Fernando; y Nieves Chisvert Jimenez
1990 Sevilla y America: Interpretacion del Hallazgo de un grupo de formas de azucar del siglo XVI en la Cartuja de Santa Maria de Las Cuevas (Sevilla). unpublished manuscript.

Anderson, J.G.C.
1978 *The Structure of Western Europe.* Pergamon Press, Oxford.

Andrews, Kenneth R.
1978 *The Spanish Caribbean. Trade and Plunder 1530-1630.* Yale Unversity Press, New Haven.

Anonymous
1941 The white oak barrel as a container for wine. *Wines & Vines.* 22(4):20-21.

Anonymous
1952 Background for Selling. *Wines & Vines.* 33:31-34.

Anonymous
1975 Over the centuries, Jérez, Spain, has received many thins from visiting Phoenicians, Romans, and Europeans and in return it gave its name to a wine and its wine to the world. *Wines & Vines.* 56:20-21.

Anonymous
1934 Spanish Almeria Imports. *California Grape Grower.* 15(11):15.

Anonymous
1975 Over the centuries, Jérez, Spain, has received many thins from visiting Phoenicians, Romans, and Europeans and in return it gave its name to a wine and its wine to the world. *Wines & Vines.* 56:20-21.

Arango, E. Ramón
1985 *Spain: From Repression to Renewal.* Westview Press, Boulder and London.

Arcila Farías, Eduardo
1950 *Comercio entre Venezuela y México en los Siglos XVII y XVIII.* El Colegio de México, México.

1946 *Economía colonial de Venezuela.* Fonde de Cultura Economía, Mexico.

Arellano Moreno, A.
1960 *Orígenes de la Economía Venozolana.* 2do edicíon. Ediciones EDIME, Madrid. [first published in 1946]

Arié, Rachel
1991 Singular and plural: The heritage of al-Andalus. *The UNESCO Courier.* December, 44:15-19.

Arnold, J. Barto III
1978 *The Nautical Archaeology of Padre Island: The Spanish Shipwrecks of 1554.* Academic Press, New York.

Arribas, Antonio
1964 *The Iberians.* Volume 36 in the series *Ancient Peoples and Places,* edited by Glynn Daniel. Frederick A. Praeger, New York.

Arthur, Paul
1989 Aspects of Byzantine economy: An evaluation of amphorae evidence from Italy. In V. Déroche and J.-M. Spieser, editors, *Recherches sur la Céramique Byzantine,* pp. 79-93. École Française d'Athènes, Athènes.

Arthur, Paul
1986 Amphorae and the Byzantine world. In J.-Y. Empereur and Y. Garlan, editors, *Recherches sur les Amphores Greques.* pp. 654-659. École Française d'Athènes, Athènes.

Aubet Semmler, Maria Eugenia
1993 *The Phoenicians and the West. Politics, Colonies and Trade.* Cambridge University Press, Cambridge.

1988 Spain. In Sabatino Moscati, editor, *The Phoenicians,* pp. 226-242. Bompiani, Milan.

Austin, David
1990 The 'proper study' of medieval archaeology. In David Austin and Leslie Alcock, editors, *From the Baltic to the Black Sea. Studies in Medieval Archaeology,* pp. 9-42. Unwin Hyman, London

Austin, David and Leslie Alcock, eds.
1990 *From the Baltic to the Black Sea. Studies in Medieval Archaeology.* Unwin Hyman, London.

Austin, David and Julian Thomas
1990 The 'proper study' of medieval archaeology: A case study. In David Austin and Leslie Alcock, editors, *From the Baltic to the Black Sea. Studies in Medieval Archaeology,* pp. 43-78. Unwin Hyman, London

Avery, George
1993 A Chronological Framework for Middle Style Olive Jar Rims. Paper presented at the Florida Anthropological Society Annual Meeting, Clearwater, Florida, May 7-9, 1993.

n.d.a. Investigating the relationship between Spanish Olive Jar rim form and Vessel form through petrographic analysis of thin sections. Supervised research with Dr. Frank Blanchard, spring 1990.

n.d.b. The examination of seven thin sections from Early and Middle Style Olive Jars of the Spanish Colonial Period. Supervised research with Dr. Frank Blanchard, fall 1989.

Bakirtizis, Ch.
1989 Byzantime amphorae. In V. Déroche and J.-M. Spieser, editors, *Recherches sur la Céramique Byzantine,* pp. 73-77. École Française d'Athènes, Athènes.

Ballesteros Gaibrois, Manuel
1992 *Valencia y América.* Editorial MAPFRE, Madrid.

Barrerio Mallon, Baudilio
1983 El comercio Asturiano con los puertos del Atlántico peninsular. El componente Andaluz. En *Actas II Coloquios Historia de Andalucia. Andalucia Moderna. Tomo I,* pp. 571-592. Publicaciones del Monte de Piedad y Caja de Ahorros de Córdova, Córdova.

Bartoloni, Piero
1988a Commerie and industry. In Sabatino Moscati, editor, *The Phoenicians.* pp. 78-85. Bompiani, Milan.

1988b Pottery. In Sabatino Moscati, editor, *The Phoenicians.* pp. 492-510. Bompiani, Milan.

Bass, George F.
1983 A plea for historical particularism in Nautical Archaeology. In Richard A. Gould, ed., *Shipwreck Anthropology,* pp. 91-104. University of New Mexico Press, Albuquerque.

Bass, George F.
1982 The pottery. In George F. Bass and Frederick H van Doorninck, editors, *Yassi Ada. Volume I. A Seventh-century Byzantine Shipwreck,* pp. 155-165. Texas A&M University Press, College Station.

Bass, George F. and Frederick H. van Doorninck, Jr, editors.
1982 *Yassi Ada. Volume I. A Seventh-century Byzantine Shipwreck.* Texas A&M University Press, College Station.

Bass, George F. and Frederick H. van Doorninck, Jr.
1978 An 11th-century shipwreck at Serçe Liman, Turkey. *The International Journal of Nautical Archaeology and Underwater Exploration.* 7(2):119-132.

Bazzana, André and Yves Montmessin
1985 *La Ceramique Islamique de Musee Archaeologique Provincial de Jaen (Espagne).* Publications de la Casa de Velazquez, Madrid.

Beaudry, Mary C.
1990 *Documentary Archaeology in the New World.* Cambridge University Press, Cambridge.

Beck, Curt W.; Christopher J. Smart and Doreen J. Ossenkop
1989 Residues and linings in ancient Mediterranean transport smphoras. In R.O. Allen, editor, *Archaeological Chemistry IV.* Advances in Chemistry Series 220. pp. 369-379. American Chemical Society, Washington, D.C.

Beck, C.W., ed.
1974 *Archaeological Chemistry.* Advances in Chemistry Series 138. American Chemical Society, Washington, D.C.

Beckman, Bernhard
1974 The first four production periods of Sieburg. In V.I. Evison, H. Hodges, J.G. Hurst, editors, *Medieval Pottery from Excavations,* pp. 183-220. St. Martin's Press, New York.

Benco, Nancy L.
1987 *The Early Medieval Pottery Industry at al-Basra, Morocco.* BAR International Series 341.

Bendiner, Elmer
1983 *The Rise and Fall of Paradise.* G.P. Putnam & Sons, New York.

Benton, Lauren
1990 *Invisible Factories: The Informal Economy and Industrial Development in Spain.* State University of New York, Binghamton.

Berger, R., ed.
1970 *Scientific Methods in Medieval Archaeology.* University of California Press, Berkeley.

Bernal, Antonio-Miguel, y Antonio Collantes de Terán Sánchez, y Antonio García Baquero
1978 Sevilla: De los gremios a la industrialización. *Estudios de Historia Social.* 2-3(5-6):7-307.

Bernal, Antonio-Miguel y Antonio García-Baquero
1976 *Tres Siglos del Comercio Sevillano (1598-1868). Cuestiones y Problemas.* Cámara Oficial de Comercio, Industria y Navegación de Sevilla, número 3, Sevilla.

Bertrand, Louis and Sir Charles Petrie
1971 *The History of Spain: From the Musulmans to Franco.* 2nd edition. Collier Books, New York.

Bjelajac, Ljiljana
1989 Byzantine amphorae in the Serbian Danubian area in the 11th-12th-centuries. In V. Déroche and J.-M. Spieser, editors, *Recherches sur la Céramique Byzantine.* pp. 109-118. École Française d'Athènes, Athènes.

Boardman, John
1980 *The Greeks Overseas. Their Early Colonies and Trade.* Thames and Hudson, London.

Bond, Jack Embert
1984 Prices drop as package size increases. *Wines & Vines.* 65:21.

de Bordejé Morencos, Fernando
1992 *Tráfico de Indias y Políticas Oceánica.* Editorial MAPFRE, Madrid.

Borrell, Pedro J.
1983 *The Quicksilver Galleons. The Salvage of the Spanish Galleons Nuestra Señora de Guadalupe and El Conde de Tolosa.* The Underwater Archaeological Recovery Commission, Santo Domingo.

Borrero Fernández, Mercedes
1986 Los contrato de servicios agrarios y el mercado de trabajo en el campo Sevillano Bajomedieval. *Historia. Instituciones. Documentos.* 14:181-224.

1983 *El Mundo Rural Sevillano en el Siglo XV: Aljarafe y Ribera.* Sevilla.

1982 Ordenanzas del Aljarafe (siglo XVI). *Historia. Instituciones. Documentos.* 9:425-451.

Bower, J.
1986 *In Search of the Past An Introduction of Archaeology.* Dorsey Press, Chicago.

Braudel, Fernand

1986a *The Wheels of Commerce. Civilization & Capitalism, 15th-18th-century. Volume 2.* Harper & Row, New York.

1986b *The Perspective of the World. Civilization & Capitalism, 15th-18th-century. Volume 3.* Harper & Row, New York.

1985 *The Structures of Everyday Life. Civilization & Capitalism, 15th-18th-century. Volume 1.* Harper & Row, New York.

1972 *The Mediterranean and the Mediterranean World in the Age of Philip II. Vol. I.* Harper & Row, New York.

Braun, David P.

1983 Pots as tools. In *Archaeological Hammers and Theories,* ed. J.A. Moore and A.S. Keene, 107-34. Academic Press, New York.

Brill, R.H., ed.

1971 *Science in Archaeology.* MIT Press, Cambridge.

Bronitsky, Gordon

1986 The use of materials-science techniques in the study of pottery construction and use. In *Advances in Archaeological Method and Theory,* ed. M.B. Schiffer, 9:209-76. Academic Press, Orlando, Florida.

Brothwell, D. and E. Higgs, eds.

1970 *Science in Archaeology.* Praeger Publishers, New York.

Bushnell, Amy

1981 *The King's Coffer: Proprietors of the Spanish Florida Treasury, 1565-1702.* University Presses of Florida, Gainesville.

Butzer, Karl.W.

1988 Diffusion, adaptation, and evolution of the Spanish Agrosystem. In the *Transfer and Transformation of Ideas and Material Culture,* P.J. Hugill and D.B. Dickson, eds., pp. 91-109. Texas A&M University Press, College Station.

Cabalerro Bonald, José Manuel

1991 *Sevilla en Tiempos de Cervantes.* Planeta, Barcelona.

Callander, M.H.

1965 *Roman Amphorae.* Oxford University Press, London.

Cambi, Nenad

1989 Anfore Romane in Dalmazia. In *Amphores Romaines et Histoire Économique: Dix Ans de Recherche,* pp. 311-337. École Francaise de Rome, Palaise Farnèse.

Carter, G.F., ed.

1978 *Archaeological Chemistry II.* Advances in Chemistry Series 171. American Chemical Society, Washington, D.C.

Chaunu, Pierre; with Huguette Chaunu

1955-60 *Séville et l'Atlantique, 1504-1650.* 8 volumes in 12. Paris.

Champion, Timothy C.
1990 Medieval archaeology and the tyranny of the historical record. In David Austin and Leslie Alcock, editors, *From the Baltic to the Black Sea. Studies in Medieval Archaeology,* pp. 79-95. Unwin Hyman, London

Chapman, Charles E.
1965 *A History of Spain.* New York: Macmillan Company. (Condensed from Rafael Altamire y Crevea's 1900-1911, 4 volume *Historia de España y de la Civilización Española,* Barcelona.)

Chejne, Anwar G.
1974 *Muslim Spain: Its History and Culture* The University of Minnesota Press, Minneapolis.

Childs, Wendy R.
1977 *Anglo-Castilian Trade in the Later Middle Ages.* Manchester University Press, Rowman.

Cipolla, Carlo M.
1965 Guns, Sails, & Empires: Technological Innovation and the Early Phases of European Expansion, 1400-1700. Pantheon Books, New York.

Clausen, Carl J.
1965 *A 1715 Spanish Treasure Ship.* Contributions of the Florida State Museum, Social Sciences 12. University of Florida, Gainesville.

Cleland, Charles E.
1988 Questions of substance, questions that count. *Historical Archaeology.* 22(1):13-17.

Cobb, Gwendolin
1949 Supply and transportation for the Potosí mines 1545-1640. *Hispanic American Historical Review* 29(1):25-45.

Collantes de Terán Sánchez, Antonio
1991 Los mercados de abasto in Sevilla: Permanencias y transformaciones (siglos XV y XVI). *Historia, Institutiones, Documentos.* 18:57-69.
1977 *Sevilla en la Baja Edad Media. La Ciudad y sus Hombres.* Sevilla.

Comellas, José Luis
1992 *Sevilla, Cádiz, y América. El Trasiego y el Tráfico.* Editorial MAPFRE, Madrid.

Comité National Français de Géologie
1980 *Géologie des Pays Européens. Espagne, Grèce, Italie, Portugal, Yougoslavie.* Dunod.

Condamin, J.; M.O. Metais Formenti, M. Michel and P. Bland
1976 The application of gas chromatagraphy to the tracing of oil in ancient amphorae. *Archaeometry.* 18(2):195-201.

Collins, Roger
1983 *Early Medieval Spain. Unity in Diversity 400-1000.* St. Martin's Press, New York.

Cox, Robert W.
1987 *Production, Power, and World Order. Social Forces in the Making of History.* Columbia University Press, New York.

Crouch, Dora P.
1991 Roman models for Spanish colonialization. In D.H. Thomas, editor, *Columbian Consequences Vol. III, The Spanish Borderlands in Pan-American Perspective,* pp. 21-35. Smithsonian Institution Press, London and New York.

Crow, John A.
1963 *Spain: The Root and the Flower.* 3rd edition. Harper & Row, New York.

Cruz Hernández, Miguel
1991 The roots of coexistence: The social and historical backcloth to the process of cultural give-and-take in al-Andalus. *The UNESCO Courier.* December, 44:20-23.

Cucó, Alfons
1991 Valencia. In *The Spanish World. Civilization and Empire, Europe and the Americas, Past and Present.* edited by J.H. Elliot, pp. 252-253. Harry N. Abrams, Inc., Publishers, New York.

Curchin, Leonard A.
1991 *Roman Spain. Conquest and Assimilation.* Routledge, London and New York.

Cumbaa, Stephen L.
1975 Patterns of Resource Use and Cross-Cultural Dietary Change in the Spanish Colonial Period. Ph.D. dissertation, University of Florida, Gainesville.

Curchin, Leonard A.
1991 *Roman Spain: Conquest and Assimilation.* Routledge, New York.

Cusick, J.G.
1989 Change in pottery as a reflection of social change: A study of Taino pottery before and after contact at the site of En Bas Saline, Haiti. M.A. Thesis, Dept. of Anthropology, University of Florida, Gainesville.

Deagan, Kathleen A.
1995 *Puerto Real: A 16th-century Spanish Town in Hispaniola.* University Presses of Florida, Gainesville.

1988 Neither history nor prehistory: The questions that count in Historical Archaeology. *Historical Archaeology.* 22(1):7-12.

1987 *Artifacts of the Spanish Colonies of Florida and the Caribbean Vol. 1: Ceramics, Glassware, and Beads.* Smithsonian Institution Press, Washington, D.C.

1982 Avenues of inquiry in historical archaeology. In M.B. Schiffer, ed., *Advances in Archaeological Method and Theory,* Vol. 5, pp. 151-177. Academic Press, New York.

Deagan, Kathleen A.
1978 The material assemblage of 16th-century Spanish Florida. *Historical Archaeology.* 12:25-50.

Davies, R. Trevor
1967 *The Golden Century of Spain, 1501-1621.* St. Martin's Press, New York.

1961 *Spain in Decline 1621-1700.* Macmillan & Co. Ltd., London.

Deetz, James
1987 American historical hrchaeology: Methods and results. *Science.* 239:362-367.

Defourneaux, Marcelin
1979 *Daily Life in Spain in the Golden Age.* Stanford University Press, Stanford, California.

Dethlefsen, Edwin S.; Ellen Davison and D. Lynn Buchman
1977 The Stonewall wreck. Interim report on a 17th-century Spanish vessel wrecked off Bermuda. *The International Journal of Nautical Archaeology and Underwater Exploration.* 6(4):315-329.

Dodds, Jerrilyn D., editor
1992 *Al-Andalus: The Art of Islamic Spain.* Metropolitan Museum of Art, New York.

Domínguez Ortiz, Antonio
1991 Andalusia. In *The Spanish World. Civilization and Empire, Europe and the Americas, Past and Present.* edited by J.H. Elliot, pp. 254-264. Harry N. Abrams, Inc., Publishers, New York.

1986 *Historia de Sevilla. La Sevilla del siglo XVII.* Universidad de Sevilla, Coleccion de Bolsillo numero 93, Sevilla.

1946 *Orto y Ocaso de Sevilla. Estudio sobre la Prosperidad y Decandencia de la Ciudad durante los Siglos XVI y XVII.* Sevilla.

Durant, Will
1957 *The Reformation. A History of European Civilization from Wyclif to Calvin: 1300-1564.* Part 6 of*The Story of Civilization*, pp. 197-226. Simon and Schuster, New York.

The Economist
1992 A survey of Spain: After the fiesta. *The Economist.* April 25, 323(7756):1-20, insert.

Eiras Roal, Antonio; y Ofelia Rey Castelao
1992 *Los Gallegos y América.* Editorial MAPFRE, Madrid.

Elkington, George
1933 *The Coopers: Company and Craft.* Sampson Low, Marston & Co., London.

Elliott, J.H.
1991 Introduction, In J.H. Elliott, ed., *Spain and its World 1500-1700 Selected Essays.* Yale University Press, New Haven and London.

Elliott, J.H.
1984 *Richelieu and Olivares*. Cambridge University Press, New York.

1963 *Imperial Spain 1469-1716.* St. Martin's Press, New York.

1961 The decline of Spain. *Past and Present* 20:52-75.

Elton, Charles
1882 *Origins of English History* Quaritch, London.

Escandell Bonet, Bartolomé
1992 *Baleares y América.* Editorial MAPFRE, Madrid.

Esper, Thomas
1967 Review of Guns, Sails, & Empires: Technological Innovation and the Early Phases of European Expansion, 1400-1700, by Carlo M. Cipolla. *Technology and Culture*. 8(2):220-222).

Fairbanks, Charles H.
1977 Backyard archaeology as a research strategy. *Conference on Historic Sites Archaeology Papers.* 11(2):133-139.

1975 Spanish artifacts at the fortress of Louisborg, Cape Breton Island. *Conference on Historic Archaeology Papers.* 9:30-59.

1972 The cultural significance of Spanish ceramics. In Ian M.G. Quimby, editor, *Ceramics in America,* pp. 141-174. The University Press of Virginia, Charlottesville.

1964 Underwater historic sites on St. Marks River. *Florida Anthropologist.* 17(2):44-49.

Fletcher, Richard
1992 *Moorish Spain.* Weidenfield & Nicholson, London.

1989 *The Quest for El Cid.* Hutchinson, London.

Fontana, Josep
1991 Catalonia. In *The Spanish World. Civilization and Empire, Europe and the Americas, Past and Present,* edited by J.H. Elliot, pp. 243-245. Harry N. Abrams, Inc., Publishers, New York.

1982 Introducción: Comercio colonial y crecimiento economico: Revisiones e hipotesis. En Josep Fontana, editor, *La Economia Española al Final del Antiguo Régimen. Vol. 3 Comercio y Colonias*, p. xiii-xxxix. Banco de España, Alianza Editorial, Madrid.

Francis, A.D.
1972 *The Wine Trade.* T. & A. Constable Ltd., Edinburgh.

Freke, D.J.
1979 The excavation of a 16th-century pottery kiln at Lower Parrock, Hartfield, East Sussex, 1977. *Post-Medieval Archaeology.* 13:79-125.

Fuentes, Carlos
1992 *The Buried Mirror. Reflections on Spain and the New World.* Houghton Mifflin Company, Boston.

García-Arevalo, Manuel
1990 Transculturation in contact period and contemporary Hispaniola. In *Columbian Consequences*, Vol. 2. ed. D.H. Thomas, pp. 269-280. Smithsonian Institution Press, Washington D.C.

García-Baquero Gonzales, Antonio
1988 *Cádiz y el Atlántico (1717-1778) (El Comercio Colonial Española Bajo el Monopolio Gaditano).* Tomo I-II. 2do edicíon. Cádiz.

1983 Andalucia y los problemas de la carrera de Indias en la crisis del siglo XVII. In *Andalucia Moderna Tomo I,* paginas 533-552. Publicaciones del Monte de Piedad y Caja de Ahorros de Córdoba, Córdoba.

García Fuentes, Lutgardo
1980 *El Comercio Español con América 1650-1700.* Excma. Diputación Provincial de Sevilla. Escuela de Estudios Hispanoamericanos, Sevilla.

1979 En torno a la reactivación del comercio indiano en tiempos de Carlos II. *Anuario de Estudios Americanos.* 36:251-286.

García Sanz, Angel
1991 Castile. In *The Spanish World. Civilization and Empire, Europe and the Americas, Past and Present,* edited by J.H. Elliot, pp. 246-251. Harry N. Abrams, Inc., Publishers, New York.

Garlan, Yvon
1983 Greek amphorae and trade, In P. Gransey, K. Hopkins and C.R. Whittaker, editors, *Trade in the Ancient Economy.* pp. 27-35. Chatto and Windus, London.

Gestoso y Perez, José
1904 *Historia de los Barros Vidriados Sevillanos.* Sevilla.

Gibson, Charles, Editor
1968 *The Spanish Tradition in America.* University of South Carolina Press, Columbia, South Carolina.

Gil-Bermejo García, Juana
1980 Osuna en 1640. *Archivo Hispalense.* 190:127-145.

1977 Écija en el siglo XVII: Aspectos socio-demográficos y economicos. *Archivo Hispalense.* 183:127-144.

1976 Mercaderes Sevillanos (Una Nomina de 1637). *Archivo Hispalense.* 181:25-197.

1973 La Casa de Contratación de Sevilla (Algunos aspectos de su historia). *Anuario de Estudios Americanos.* 30:

Gillaspie, William R.
1961 Juan de Ayala y Escobar, Procurador and Entrepeneur: A Case Study of the Provisioning of Florida, 1683-1716. Ph.D. dissertation. University of Florida, Gainesville.

Girard, Albert
1932 *Le commerce français à Séville et Cadiz au temps des Habsbourg.* Paris.

Glick, Thomas F.
1979 *Islamic and Christian Spain in the Early Middle Ages.* Princeton University Press, Princeton, New Jersey.

Goggin, J.M.
1968 *Spanish Majolica in the New World: Types of the Sixteenth to Eighteenth-centuries.* Yale University Publications in Anthropology, Publication No. 72. New Haven, Connecticut.

1964 The Spanish Olive Jar, reprinted in *Indian and Spanish Selected Writings of John H. Goggin*, pp. 253-298. University of Miami Press, Coral Gables.

Goiten, S.D.
1967 *A Mediterranean Society, Economic Foundations.* University of California Press, Berkeley.

González Arce, José Damián
1990 Sobre el origen de los gremios Sevillanos. *Archivo Hispanense.* 73(222):45-65.

González Gonzalo, Elvira
1987 La cerámica bajomedieval de la Catedral de Mallorca. In *Arqueologia Medieval Española Tomo III: Communicaciones,* pp. 469-482. Madrid.

Gonzales Jiménez, Manuel
1973 *El Consejo de Carmona a Fines de la Edad Media (1464-1523).* Sevilla.

Grace, Virginia R.
1961 *Amphoras and the Ancient Wine Trade.* American School of Classical Studies at Athens, Princeton, New Jersey.

1956 The Canaanite Jar. In S.S. Weinbery, editor, *The Aegean and the Near East; Studies Presented to Hetty Goldman,* pp. 80-109. Agustin, New York.

Graham, Robert
1985 *Spain: Change of a Nation.* Michael Joseph, London.

Greene, K.
1986 *The Archaeology of the Roman Economy.* Batsford, London.

Grice-Hutchinson, Marjorie
1978 *Early Economic Thought in Spain. 1177-1740.* George Allen & Unwin, London.

Gual Camarena, Miguel
1981 *El Primer Manual Hispanico de Mercaderia (siglo XIV).* Consejo Superior de Investigaciones Cientificas, Insitituto de Geografia, Etnologia e Historia, Barcelona.

Guash, Ricardo Pascual
1984 The Catalan wine trade in the Roman empire. *Nautical Archaeology.* 13(3):245-248).

Guimerá Ravina, Agustín
1977 ¿Por qué comercia Canarias con Indias en el siglo XVI? Incentivos y obstáculos. En Francisco Morales Padrón, ed., I *Coloquio de Historia Canario-Americano* (1976), pp. 87-104. Ediciones del Excelentisimo Cabildo Insular de Gran Canaria.

Hamilton, Earl J.
1938 The decline of Spain. *Economic History Review.* 1st Series, 8:168-179.

1934 *American Treasure and the Price Revolution in Spain, 1501-1610.* Harvard University Press, Cambridge.

1929a American treasure and the rise of modern capitalism. *Economica.* 9:338-357.

1929b Wages and subsistence of Spanish treasure ships, 1503-1660. *The Journal of Political Economy.* 37:430-450.

Haring, C.H.
1964 *Trade and Navigation between Spain and the Indies in the Time of the Hapsburgs.* P. Smith, Glouchester, Mass. [first published in 1918]

Harrison, Lawrence E.
1985 *Underdevelopment Is a State of Mind, The Latin American Case.* The Center for International Affairs, Harvard University, Cambridge.

Harrison, Richard J.
1988 *Spain at the Dawn of History. Iberians, Phoenicians and Greeks.* Thames and Hudson, London.

Heather, P.J.
1991 *Goths and Romans, 332-489.* Clarendon Press, Oxford.

Heilbroner, Robert L.
1985 *The Nature and Logic of Capitalism.* W.W. Norton & Co., New York.

Hernández Sánchez-Barba, Mario
1992 *Castilla y América.* Editorial MAPFRE, Madrid.

Heredia Herrera, Antonia
1970 Apuntes para la historia del Consulado de la Universidad de cargadores a Indias, en Sevilla y en Cádiz. *Anuario de Estudios Americanos.* 27:219-279.

Herm, Gerhard
1976 *The Celts.* St. Martin's Press, New York.

Heron, C. and A.M. Pollard
1988 The analysis of natural resinous materials from Roman amphoras. In E.A. Slater and J.O. Tate, editors, *Science and Archaeology Glasgow 1987.* pp. 429-447. BAR British Series 196, vol. 2.

Herrera García, Antonio
1981 *El Aljarafe Sevillano durante el Antiguo Régimen.* Colecciones Paralelas, Historia 3. Excma. Deputación Provincial de Sevilla, Sevilla.

Herron, Mary H.
1986 A formal and functional analysis of St. Johns Series Pottery from two sites in St. Augustine. In *Ceramic Notes No. 3, Occasional Publications of the Ceramic Technology Laboratory,* ed. P.M. Rice, pp. 31-46. Florida State Museum, Gainesville.

Hiaring, Sandy
1975 Wines & Vines pays a visit to an island of wine. *Wines & Vines.* 56:22-23.

Hodget, Gerlad A.J.
1972 *A Social and Economic History of Medieval Europe.* Harper & Row, New York.

Holm, Olaf
1970 La cerámica colonial del Ecuador (Un ensayo priliminar). *Boletín de la Academia Nacional de Historia.* 116:265-278.

Honercamp, Nicholas
1988 Questions that count in archaeology. Plenary session, 1987 meeting of the Society for Historical Archaeology Conference on Historical and Underwater Archaeology, Savannah, Georgia. *Historical Archaeology* 22(1):5-6.

Houston, George W.
1988 Ports in perspective: Some comparative materials on Roman merchant ships and ports. *American Journal of Archaeology.* 92:553-564.

Hurst, J.G.
1986 Late medieval Iberian pottery imported into the Low Countries. *Segundo Coloquio Internacional de Cerámica Medieval en el Mediterráneo Occidental.* pp. 347-351. Toledo.

Hurst, J.G. and D.S. Neal
1982 Late Medieval Iberian pottery imported into the Low Countries. In J.G.N. Renaud, editor, *Rotterdam Papers IV, A Contribution to Medieval Archaeology.* pp. 83-110. Rotterdam.

Hurst, John G.; David S. Neal and H.J.E van Beuningen
1986 *Rotterdam Papers VI. Pottery Produced and Traded in Northwest Europe 1350-1650.* Stichting 'Het Nederlandse Gebruiksvoorwerp,' Rotterdam.

Hussey, Roland Dennis
1934 *The Caracas Company 1728-1784.* Harvard University Press, Cambridge.

1929 Antecedents of the Spanish monopolistic overseas trading companies (1624-1728). *The Hispanic American Historical Review.* 9(1):1-30.

James, Stephen R.

1988 A reassessment of the chronological and typological framework of the Spanish olive jar. *Historical Archaeology.* 22:43-66.

Jordon, Terry G.

1988 *The European Culture Area. A Systematic Geography.* 2nd edition. Harper & Row, New York.

Jornet, A.; M.J. Blackman, and J.S. Olin

1985 13th to 18th-century ceramics from the Paterna-Manises area (Spain). In *Ceramics and Civilization. Vol. I Ancient Technology to Modern Science,* ed. W.D. Kingery, pp. 235-255. The American Ceramic Society, Colombus, Ohio.

Kamen, Henry

1991 *Spain 1469-1714. A Society of Conflict,* 2nd edition. Longman, New York.

1988 *Golden Age Spain.* Humanities Press International, New Jersey.

1978 The decline of Spain: An historical myth? *Past and Present.* 81:24-50.

1965 *The Spanish Inquisition.* Weidenfeld and Nicolson, London.

Keay, S.J.

1988 *Roman Spain.* University of California, Berkeley.

Keith, D.H.; J.A. Duff, S.R. James, T.J. Oertling, and J.J. Simmons

1984 The Molasses Reef wreck, Turks and Caicos Islands, B.W.I.: A preliminary report. *The International Journal of Nautical Archaeology and Underwater Exploration.* 13(1):45-63.

King, Julia

1984 Ceramic variability in 17th-century St. Augustine, Florida. *Historical Archaeology.* 18:75-82.

Kingery, W.D., ed.

1990 *The Changing Roles of Ceramics in Society: 26,000 B.P. to the Present Ceramics and Civilization,* Vol. 5. The American Ceramic Society, Westerville, Ohio.

1986 *Technology and Style Ceramics and Civilization,* Vol. 2. The American Ceramic Society, Columbus, Ohio.

1985 *Ancient Technology to Modern Science Ceramics and Civilization,* vol. 1. American Ceramic Society, Columbus, Ohio.

Kingery, W.D.; H.K. Bowen, and D.R. Uhlman

1976 *Introduction to Ceramics,* 2nd edition. John Wiley, New York.

Klein, Julius

1932 Medieval Spanish guilds. *In Facts and Factors in Economic History,* pp. 164-188. Harvard University Press, Cambridge.

1920 *The Mesta.* Cambridge: Harvard University Press.

Klein, Cornelis; and Cornelius S. Hurlbut, Jr.
1977 *Manual of Mineralogy.* 20th edition. John Wiley & Sons, New York.

Koehler, Carolyn G.
1979 Transport amphoras as evidence for trade. *Archaeology News.* 8(213):54-61.

1978 Evidence around the Mediterranena for Corinthian export of wine and oil. In J. Barto Arnold III, editor, *Beneath the Waters of Time: The Proceedings of the Ninth Conference on Underwater Archaeology.* pp. 231-239. Texas Antiquities Committe, Publication No. 6.

Koehler, Carolyn G. and Malcolm B. Wallace
1987 Appendix. The transport amphoras: Description and capacities. *American Journal of Archaeology.* 91:49-57.

Ladero Quesado, Miguel Angel
1981 Dos cosechas del viñedo Sevillano. 1491 y 1494. *Archivo Hispanense.* 63(193-194):40-57.

Laird, R.T. and W. Worcestor
1956 The inhibiting of lime blowing. *Transactions of the British Ceramic Society.* 55:545-563.

Lambert, J.B., ed.
1984 *Archaeological Chemistry III.* Advances in Chemistry Series 205. American Chemical Society, Washington, D.C.

Lane, Fredric C.
1964 Tonnages, medieval and modern. *The Economic History Review*, second series 27(2):213-233.

Latham, J. Derek
1991 The rise of the Umayyad dynasty in Spain: How an exiled prince and his successors created a unique meeting point between Orient and Occident. *The UNESCO Courier.* December, 44:24-27.

Laughton, L.G. Carr
1958 English and Spanish tonnage in 1588. *Mariners Mirror* 44(2):151-154.

Leone, Mark
1988 The relationship between archaeological data and documentary record: Eighteenth-century gardens in Annapolis, MD. *Historical Archaeology.* 22(1):29-35.

Leone, Mark P.; and Parker B. Potter
1994 Historical archaeology of capitalism. *Society for American Archaeology Buletin.* 12(4):14-15.

Levinson, Marc
1992 The hand wringers. *Newsweek.* October 26, page 44.

Lewis, Archibald R.

1978a The Medieval background of American Atlantic maritime development, in Archibald R. Lewis, *The Sea and Medieval Civilizations. Collected Studies,* pp. 19-39. Variorum Reprints, London.

1978b Mediterranean maritime commerce, A.D. 300-1100. Shipping and trade. In Archibald R. Lewis, *The Sea and Medieval Civilizations. Collected Studies,* pp.1-21. Variorum Reprints, London.

1951 *Naval Power and Trade in the Mediterrean. A.D. 500-1100.* Princeton University Press, Princeton.

Lewis, Archibald R. and Timothy J. Runyan

1985 *European Naval and Maritime History. 300-1500.* Indiana University Press, Bloomington.

Lewis, Flora

1987 *Europe. A Tapestry of Nations.* Unwin Hyman, London.

Lister, F.L. and R. Lister

1987 *Andalusian Ceramics in Spain and New Spain A Cultural Register from the Third Century B.C. to 1700.* The University of Arizona Press, Tucson.

1982 *Sixteenth-century Majolica Pottery in the Valley of Mexico* Anthropological Papers of the University of Arizona, No. 3. University of Arizona Press, Tucson:.

1978 The first Mexican majolicas: Imported and locally produced. *Historical Archaeology.* 12:1-24.

1974 Majolica in colonial Spanish America *Historical Archaeology.* 8:17-52

Little, Barbara J.

1992 *Text-Aided Archaeology.* CRC Press, Boca Raton, Florida.

Livermore, Harold V.

1958 *A History of Spain.* George Allen & Unwin Ltd., London.

Lloren Artigas, J.; y J. Corredor Matheos

1974 *Spanish Folk Ceramics.* Editorial Blume, Barcelona.

Loosely, Allyn

1933 The Puerto Bello fairs. *The Hispanic American Historical Review.* 13(3):314-335.

López Cantos, Angel

1979 El tráfico comercial entre Canarias y América durante el siglo XVII. En Francisco Morales Padrón, ed., *Il Coloquio de Historia Canario-Americano* (1977). Tomo I, pp. 301-372. Ediciones del Excelentisimo Cabildo Insular de Gran Canaria.

López Pérez, Alessandro; y César Alonso Sansón
1993 *1590: La Nao Nuestra Señora del Rosario, Estudio de su Estructura.* Departmento de Arqueología, Carisub.

Llorens Artigas, J.; and J. Corredor-Matheos
1974 *Spanish Folk Ceramics of Today.* Editorial Blume, Barcelona.

Lorenzo Sanz, Eufemio
1979 *Comercio de España con América en la época de Felipe II. Tomo I. Los Mercaderes y el Tráfico Indiano.* Institución Cultural Simancas, Simancas.

Lorenzo Sanz, Eufemio
1979-80 *Comercio de España con América en la Época de Felipe II.* Tomo I-II. Valladolid.

Lovett, A.W.
1986 *Early Habsburg Spain 1517-1598.* Oxford University Press, New York.

Lumsden, G. Innes, editor
1992 *Geology and the Environment in Western Europe.* Clarendon Press, Oxford.

Lynch, John
1969 *Spain under the Hapsburgs.* New York University Press, New York.

Lyon, Eugene
1982 Santa Margarita. Treasure from the ghost galleon. *National Geographic.* 161(2):229-243.

MacLeod, Murdo J.
1973 *Spanish Central America. A Socioeconomic History 1520-1720.* University of California Press, Berkeley.

Madariaga, Salvador de
1947 *Rise of the Spanish Empire.* Macmillan Co., New York.

Maggetti, M.; H.W. Westly and J.S. Olin
1984 Provenance and technical studies of Mexican Majolica using elemental and phase analysis. In *Archaeological Chemistry III.* Advances in Chemistry Series 205, ed. J.B. Lambert, pp. 151-191. The American Chemical Society, Washington, D.C.

Mair, Francis
1983 The history of wine packaging. *Wines & Vines.* 64:101-102.

Malefakis, Edward E.
1970 *Agarian Reform and Peasant Revolution in Spain. Origins of the Civil War.* Yale University Press, New Haven.

Mann, Michael
1988 European development: Approaching a historical explanation. In *Europe and the Rise of Capitalism,* edited by Jean Baechler, John A. Hall, and Michael Mann, pp. 6-19. New York: Basil Blackwell, Inc.

Marías, Julián
1990 *Understanding Spain.* University of Michigan Press, Ann Arbor.

Marken, Mitchell W.
1994 *Pottery from Spanish Shipwrecks, 1500-1800.* University Press of Florida, Gainesville.

Marshall-Cornwall, James
1981 The myth of Santiago. *History Today.* March, 31:46-47.

Martin, Colin J.M.
1979 Spanish Armada pottery. *The International Journal of Nautical Archaeology and Underwater Exploration.* 8(4):279-302.

Martin, Colin and Geoffrey Parker
1988 *The Spanish Armada.* W.W. Norton and Co., London

Marx, Karl
1974 *Capital.* Edited by Frederick Engels; translated by Samuel Moore and Edward Aveling. Lawrence and Wishart, London.

Matson, F.R.
1971 A study of the temperatures used in firing ancient Mesopotamian pottery. In R.H. Brill, editor, Science and Archaeology, pp. 65-79. The MIT Press, Cambridge, Massachusetts.

McAlister, Lyle
1984 *Spain and Portugal in the New World 1492-1700.* University of Minnesota Press, Minneapolis.

McEwan, Bonnie G.
1989 An Archaeological Perspective of Sixteenth-century Spanish Life in the Old World and the Americas. Ph.D. dissertation, University of Florida, Gainesville.

McIntyre, Keith A.
1983 Analysis of olive jar rims from the Nuestra Señora de Atocha and the Santa Margarita: A step towards detecting change through time in olive jar rim forms. Ms. on file, Florida Museum of Natural History, Gainesville.

McKee, Alexander
1968 *History Under the Sea.* E.P. Dutton & Co., Inc., New York.

McLachlan, Jean O.
1974 *Trade and Peace with Old Spain, 1667-1750. A Study of the Influence of Commerce on Anglo-Spanish Diplomacy in the First Half of the Eighteenth-century.* Octagon Books, New York. [first published in 1940]

Meijer, Kif and Onno van Nijf
1992 *Trade, Transport and Society in the Ancient World. A Sourcebook.* Routledge, London and New York.

Mellor, Roy E.H. and E. Alister Smith
1979 *Europe: A Geographical Survey of the Continent.* Columbia University Press, New York.

Menéndez Pidál, Ramón
1950 *The Spaniards in Their History.* Hollis & Carter, London.

Mercado, Tomas de
1985 *La Economia en la Andalucia del Descubrimiento.* Biblioteca de la Cultura Andaluza, Editoriales Andaluzas Unidas, Sevilla. [originally published in 1569]

Merriman, Roger B.
1962 *The Rise of the Spanish Empire. Volume IV. Philip the Prudent.* Cooper Square Publishers, New York.

Meyers, Joseph Emlen
1984 The Political Economy of Ceramic Production: A Study of the Islamic Commonware Pottery of Medieval Qsar Es-Seghir. Ph.D. dissertation, Dept. of Anthropology, State University of New York at Binghamton.

Michelman, Irving S.
1983 *The Roots of Capitalism in Western Civilization: A Socioeconomic Assessment.* Frederick Fell Publishers, Inc., New York.

Miskin, David J.
1975 *The American Colonial Wine Industry: An Economic Interpretation.* Arno Press, New York.

Montes Romero-Camacho, Isabel
1989 *El Paisaje Rural Sevillano en la Baja Edad Media.* Excma. Diputación Provincial de Sevilla, Sevilla.

Montoto, Santiago
1938 *Sevilla in el Imperio. Siglo XVI.* Sevilla.

Molinas, César and Leandro Prados de la Escosura
1989 Was Spain different? Spanish historical backwardness revisited. *Explorations in Economic History.* 26:385-402.

Moore, David D.; and Bill Muir
1987 The archaeology of the San Martín. *Seafarers Journal of Maritime Heritage.* 1:188-194.

Morales Padrón, Francisco
1992 *Andalucía y América.* Editorial MAPFRE, Madrid.

Morales Padrón, Francisco
1989 *Historia de Sevilla. La Ciudad del Quinientos.* Universidad de Sevilla, Colección de Bolsillo número 58, Sevilla.

1982 Fondos existentes en el Archivo de Indias sobre las Islas Canaries. *En V Coloquio de Historia Canario-Americana,* páginas 105-184. La Excma. Mancomunided de Cabildos de Las Palmas y del Excmo. Cabildo Insular de Gran Canaria.

1955 *El Comercio Canario-Americano (Siglos XVI, XVII y XVIII).* Escuela de Estudios Hispano-Americano, Sevilla.

Moreyra y Paz-Soldán, Manuel
1944 *Estudios sobre el Tráfico Marítimo en el Época Colonial.* Lima.

Mossman, Deal M. and Marcia Selsor
1986 The three story wood-fired kilns of Agost, Spain. Paper presented at the 86th Annual meeting of the American Anthopological Association, Chicago, Illinois.

Mrosowski, Stephen A.
1988 Historical Archaeology as Anthropology. *Historical Archaeology.* 22(1):18-24.

Myers, J. Emlen; Fernando de Amores Carredano, Jacqueline S. Olin and Alfonso Pleguezuelo Hernández
1992 Compositional identification of Sevilla majolica at overseas sites. *Historical Archaeology.* 26(1):131-147.

Mynard, D.C.
1969 A group of post-medieval pottery from Dover castle. *Post-Medieval Archaeology.* 3:31-46.

Nadal, Jordi; y Gabriel Tortello, eds.
1975 *Agricultura, Comercio Colonial y Crecimiento in España.* Barcelona.

Neese, William D.
1986 *Introduction to Optical Mineralogy.* Oxford University Press, New York.

Olds, Dorris L.
1976 *Texas Legacy from the Gulf: A Report on 16th-century Shipwreck Material from the Texas Tidelands.* Texas Memorial Museum Miscellaneous Papers 5, Texas Antiquities Committee Publication 2, Austin.

1962 Some highlights in the history of Fort St. Marks. *The Florida Anthropologist.* 15(2):33-64.

Olin, J.S. and M.J. Blackman
1989 Compositional classification of Mexican ceramics of the Spanish colonial period In *Archaeological Chemistry IV* Advances in Chemistry Series 220, ed. R.O. Allen, pp. 87-112. The American Chemical Society, Washington, D.C.

Olin, J.S. and A.D. Franklin, eds.
1982 *Archaeological Ceramics.* Smithsonian Institution, Washington, D.C.

Olin, J.S. G. Harbottle and E.V. Sayre
1978 Elemental compositions of Spanish and Spanish-colonial majolica ceramics in the identification of provenience. In *Archaeological Chemistry II* Advances in Chemistry Series 171, ed. G.F. Carter, pp. 200-229. The American Chemical Society, Washington, D.C.

Oliva Melgar, José María
1987 *Cataluña y el Comercio Privilegiado con América en el Siglo XVIII. La Compañía de Comercio de Barcelona a Indias.* Universitat de Barcelona, Barcelona.

Ortega y Gasset, Jose
1937 *Invertebrate Spain.* W.W. Norton, New York.

Otte, Enrique
1964 La flota de Diego Colón. Españoles y Genoveses in el comercio trasatlantico de 1509. *Revista de Indias.* 24(97-8):475-503.

Parker, A.J. and Jennifer Price
1981 Spanish exports of the Claudian period: The significance of the Port Vendres II wreck reconsidered. *The International Journal of Nautical Archaeology and Underwater Exploration.* 19(3):221-228.

Parker, Geoffrey
1984 The decline of Spain. *History Today.* April, 34:42-44.

Parr, P.J.
1973 The Origin of the Canaanite Jar. In D.E. Strong, editor, *Archaeological Theory and Practice,* pp. 172-181. Seminar Press, New York.

Parry, J.H.
1990 *The Spanish Seaborne Empire.* University of California Press, Berkeley. [first published 1966]

Peacock, D.P.S.
1982 *Pottery in the Roman World: An Ethnoarchaeological Approach.* Longman, London.

Peacock, D.P.S., editor
1977 *Pottery and Early Commerce: Characterization and Trade in Roman and Later Ceramics.* Academic Press, London.

Peacock, D.P.S. and D.F. Williams
1986 *Amphorae and the Roman Economy. An Introductory Guide.* Longman, London.

Pérez-Mallaina Bueno, Pablo Emilio
1979 La navigacion Canaria a Indias y la Junta de Restablecimiento del comercio. 1700-1789. En Francisco Morales Padrón, editor, *Coloquio de Historia Canario-Americana, tomo 1,* paginas 375-426. Ediciones del Excelentisimo Cabildo Insular de Gran Canaria.

Pérez-Mallaina Bueno, Pablo Emilio; y Manuel Babio Walls
1979 El registro de embarcaciones como fuente para la historia naval de la carrera de las Indias. En *Documentation y Archivos de la Colonizacion Española. tomo II,* pp. 73-90. Madrid.

Pérez Turrado, Gaspar
1992 *Armadas Españoles de Indias.* Editorial MAPFRE, Madrid.

Peterson, Mendel
1975 *The Funnel of Gold.* Little, Brown and Company, Boston.

1972a *Underwater Archaeology. A Nascent Discipline.* UNESCO, Paris.

Peterson, Mendel
1972b Traders and privateers across the Atlantic: 1492-1733. In George F. Bass, editor, *A History of Seafaring Based on Underwater Archaeology,* pp. 253-280. Walker and Company, New York.

Phillips, Carla Rahn
1990 The growth and composition of trade in the Iberian empires, 1450-1750. In James D. Tracy, ed., *The Rise of Merchant Empires. Long Distance Trade in the Early Modern World, 1350-1750,* pp. 34-101. Cambridge University Press, Cambridge.

1987 Time and duration: A model for the economy of early modern Spain *American Historical Review* 92:531-62.

1986 *Six Galleons for the King of Spain. Imperial Defense in the Early Seventeenth-century.* Johns Hopkins University Press, Baltimore.

1983 Spanish merchants and the wool trade in the sixteenth-century. *Sixteenth-century Journal.* 14(3):259-282.

1979 *Ciudad Real 1500-1750: Growth, Crisis and Readjustment in the Spanish Economy* Harvard University Press, Cambridge.

Pike, Ruth
1972 *Aristocrats and Traders: Sevillian Society in the Sixteenth-century.* Cornell University Press, Ithaca, New York.

1966 *The Genoese in Sevilla and the Opening of the New World.* Cornell University Press, Ithaca, New York.

1961 Sevilla in the sixteenth-century. *Hispanic American Historical Review.* 41:1-30.

Platt, Colin and Richard Coleman-Smith
1975 *Excavation in Medieval Southampton 1953-1969, Vol. 2.* Leiscester University Press.

Plumb, J.H.
1966 Introduction, in J.H. Parry *The Spanish Seaborne Empire,* pp. 13-25. University of California Press, Berkeley.

Ponsich, M.
1967 Kounass, port antique et carrefour de voies de la Tingitane. *Bull. d'Archéologie Marocaine.* 7:369-405.

Pryor, Slvia and Kevin Blockley
1978 A 17th-century kiln site at Woolwich. *Post-Medieval Archaeology.* 12:30-85.

Pulak, Cemal
1988 The Bronze Age shipwreck at Ulu Burun, Turkey: 1985 campaign. *American Journal of Archaeology.* 92:1-

Pulak, Cemal and Rhys F. Townsend

1987 The Hellenistic shipwreck at Serçe Limani, Turkey: Preliminary Report. *American Journal of Archaeology.* 91:31-57.

Quintanilla Raso, María Concepción

1986 La reglamentacion de una villa de señorio en el transito de la Edad Media a la Moderna. Ordenanzas de Cartaya (Huelva) (Fines s. XV-primera mita s. XVI). *Historia Instituciones Documentos.* 13:189-232.

Rahtz, Philip

1974 Pottery in Somerset, A.D. 400-1066. In V.I. Evison, H. Hodges, J.G. Hurst, editors, *Medieval Pottery from Excavations.* pp. 95-126. St. Martin's Press, New York.

Ramón, J.

1981 *La Producción Anfórica Púnico-Ebusitana.* Ibiza.

Reitzer, Ladislas

1960 Some Observations on Castilian commerce and finace in the sixteenth-century. *The Journal of Modern History.* 32(3):213-223.

Remie Constable, Olivia

1994 *Trade and Traders in Muslim Spain. The Commercial Realignment of the Iberian Peninsula, 900-1500.* Cambridge University Press, London.

Rice, Prudence M.

1996a Peru's colonial wine industry and its European background. *Antiquity* 70(270):785-800.

1996b The archaeology of wine: The wine and brandy haciendas of Moquegua, Peru. *Journal of Field Archaeology* 21(2):187-204.

Rice, Prudence M.

1994 The kilns of Moquegua, Peru: Technology, Excavations, and Functions. *Journal of Field Archaeology* 21(2):325-344.

1990 *Colonial Ceramics of Moquegua.* University of Florida.

1987 *Pottery Analysis: A Sourcebook.* Chicago: University of Chicago Press.

Rice, Prudence M.; and Donna L. Ruhl

1989 Archaeological survey of the Moquegua bodegas. In Don S. Rice, Charles Stanish and Phillip R. Scarr, editors, *B.A.R. International Series* S545:479-503. Oxford, England.

Rice, Prudence M; and Greg C. Smith

1989 The Spanish colonial wineries of Moquegua, Peru. *Historical Archaeology* 23:41-49.

Rice, Prudence M.; and Sara L. Van Beck

1993 The Spanish colonial kiln tradition of Moquegua, Peru. *Historical Archaeology* 27(4):65-81.

Riley, J.A.
1981 The Late Bronze Age Aegean and the Roman Mediterranean. In Hilary Howard and Elaine L. Morris, editors, *Production and Distribution: A Ceramic Viewpoint,* pp. 130-142. BAR International Series 120.

Read, Jan
1975 *The Moors in Spain and Portugal.* Rowman and Littlefied, Totowa, New Jersey.

Reitzer, Ladislas
1960 Some observations on Castilian commerce and finance in the sixteenth-century. *Journal of Modern History.* 32:213-223.

Rogers, Stephen
1987 Spanish treasure ships. In Peter Throckmorton, editor, *The Sea Remembers. Shipwrecks in Archaeology,* pp. 183- . Weidenfeld and Nicolson, New York.

Roscher, Wilhelm
1885 *The Spanish Colonial System.* Translated by Edward Gaylord Bourne from a chapter in Roscher's *Kolonien, Kolonialpolitik und Auswandering.* G.E. Stechert & Co.

Rougé, Jean
1981 *Ships and Fleets of the Ancient Mediterranean.* Wesleyan University Press, Middleton, Connecticut.

Ruhl, Donna L.
1987 Wattle they think of next? or a little daub will do ya: A ceramic technological and paleoethnobotanical analysis of some thermally altered clay from three Spanish mission sites in La Florida. Paper presented at the 1987 Southeastern Archaeology Conference.

Ruiz de Azúa, Estíbaliz
1992 *Vascongadas y América.* Editorial MAPFRE, Madrid.

Salmon, Edward Dwight
1971 *Imerial Spain: The Rise of the Empire and Dawn of Modern Sea Power.* Green Press, Westport, Connecticut.

Sayre, E.V.; P.B. Vandiver, J. Druzik and C. Stevenson, eds.
1988 *Materials Issues in Art and Archaeology Materials Research Society Symposium Proceedings, vol. 123.* Materials Research Society, Pittsburgh, Pennslyvania..

Schiffer, Michael B.
1990 Technological change in water-storage and cooking pots: Some predictions from experiment. In *Ceramics and Civilization . Vol. 5 The Changing Roles of Ceramics in Society: 26,000 B.P. to the Present.* ed. W.D. Kingery, pp. 119-136. The American Ceramic Society, Westerville, Ohio.

Schmidt, Peter
1983 An alternative view to a strictly materialist perspective: A review of historical archaeology, ethnoarchaeology and symbolic approaches in African archaeology. *American Antiquity.* 48(1):62-79.

Schuring, Josine M.

1984 Ceramic analysis as an approach to Roman amphorae. In H.A.G. Brijder, editor, *Ancient Greek and Related Pottery. Proceedings of the International Vase Symposium*, pp. 59-62. Allard Pierson Series, vol. 5, Amsterdam.

Schuyler, Robert L.

1988 Archaeological remains, documents and anthropology: A call for a new culture history. *Historical Archaeology.* 22(1):36-42.

Schuyler, Robert L., ed.

1977 *Historical Archaeology: A Guide to Substantive and Theoretical Contributions.* Baywood, Farmingdale.

Schäfer, Von Ernst

1938 Spaniens koloniale warehausfuhr nach einer preisliste des 16. Jahrunderts. *Ibero-Amerikanisches Archiv.* 12(3):313-332.

Sciallano, Martine and Patricia Sibella

1994 *Amphores. Comment les Identifier?* Édisud.

Sealy, Paul R.

1985 *Amphoras from the 1970 Excavations at Colchester Sheepen.* BAR British Series 142.

Shafer, Robert Jones

1958 *The Economic Societies of the Spanish World (1763-1821).* Syracuse University Press, Syracuse.

Shepard, Anna O.

1956 *Ceramics for the Archaeologist.* Carnegie Institution (Pub. No. 609), Washington, D.C.

Simon, André L.

1909 *The History of the Wine Trade in England. Volume III. The Wine Trade in England during the Seventeenth-century.* Wyman & Sons, ltd., London.

1907 *The History of the Wine Trade in England. Volume II. The Progress of the Wine Trade during the Fifteenth and the Sixteenth-centuries.* Wyman & Sons, ltd., London.

1906 *The History of the Wine Trade in England. Volume I. The Rise and Progress of the Wine Trade in England from the Earliest Times until the close of the Fourteenth-century.* Wyman & Sons, ltd., London.

Skinner, Brian J. and Stephen C. Porter

1989 *The Dynamic Earth. An Introduction to Physical Geology.* John Wiley & Sons, New York.

Skowronek, Russel K.

1987 Ceramics and commerce: The 1554 flota revisited. *Historical Archaeology* 21(2):101-111.

1982 Trade Patterns of Eighteenth-century Frontiers New Spain. The 1733 Flota and St. Augustine. unpublished M.A. Thesis, Florida State University, Tallahassee.

Slater, E.A. and J.O. Tate, eds.
1988 *Science and Archaeology Glasgow* BAR British Series 196, vol. 1.

Smith, Adam
1884 *An Inquiry in the Nature and Causes of the Wealth of Nations.* T. Nelson and Sons, London.

Smith, Alan G. and Roy A. Livermore
1985 Some boundary conditions for the evolution of the Mediterrean region. In Daniel Jean Stanley and Forese-Carlo Wezel, eds., *Geological Evolution of the Mediterranean Basin.* pp. 83-98. Springer-Verlag, New York.

Smith, Greg C.
1991 *Heard it through the Grapevine: Andean and European Contributions to Spanish Colonial Culture and Viticulture in Moquegua, Peru.* Ph.D. dissertation, University of Florida, Gainesville.

1986 Non-European pottery at the sixteenth-century Spanish site of Puerto Real, Haiti. M. A. Thesis, Dept. of Anthropology, University of Florida, Gainesville.

Smith, Rhea Marsh
1965 *Spain, a Modern History.* University of Michigan Press, Ann Arbor.

Smith, Robert Sidney
1940 *The Spanish Guild Merchant. A History of the Consulado 1250-1700.* Duke University Press, Durham, North Carolina.

Smith, Roger C.: James Spirek, John Bratten, and Della Scott-Ireton
1995 *The Emanual Point Ship: Archaeological Investigations, 1992-1995, Preliminary Report.* Bureau of Archaeological Research, Division of Historical Resources, Florida Department of State, Tallahassee.

Smith, Roger C.
1994 The ship at Emanuel Point: An Examination of Florida's earliest shipwreck. In Robyn P. Woodward and Charles D. Moore, eds., *Underwater Archaeology, Proceedings from the Society for Historical Archaeology Conference.* pp. 14-18. Society for Historical Archaeology.

1993 *Vanguard of Empire. Ships of Exploration in the Age of Columbus.* Oxford University Press, New York.

1987 Trade and piracy in the West Indies. In Peter Throckmorton, ed., *The Sea Remembers. Shipwrecks in Archaeology,* pp. 174-182. Weidenfeld & Nicolson, New York.

South, Stanley
1991 *Archaeology at Santa Elena. Doorway to the Past.* The University of South Carolina, South Carolina Institute of Archaeology and Anthropology, Columbia.

1988 Whither pattern? *Historical Archaeology.* 22(1):25-28.

1977 *Method and Theory in Historical Archaeology.* Academic Press, New York.

Stampa, Manuel Carrera
1949 The evolution of weights and measures in New Spain. *Hispanic American Historical Review.* 29(1):2-24.

Steckley, George F.
1980 The wine economy of Tenerife in the seventeenth-century: Anglo-Spanish partnership in a luxery trade. *Economic History Review.* 33:335-350.

Stradling, R.A.
1981a *Europe and the Decline of Spain: A Study of the Spanish System.* George Allen & Unwin, London.

1981b The planet king: Philip IV and the survival of Spain. *History Today.* March, 31:16-23.

Suárez-Fernández, Luis
1972 The kingdom of Castile in the fifteenth-century. In Roger Highfield, editor, *Spain in the Fifteenth-century, 1369-1516,* pp. 80-113. Macmillan, London.

Suárez Grimón, Vicente
1982 Construción naval y tráfico marítimo en Gran Canaria en la segunda mitad del siglo XVIII. In Francisco Morales Padrón, ed., *IV Coloquio de Historia Canario-Americano* (1980), Vol. II, pp. 783-880. Ediciones del Excelentisimo Cabildo Insular de Gran Canaria.

Tabaczynski, Stanislaw
1993 The relationship between history and archaeology: Elements of the present debate. *Medieval Archaeology* 37:1-14.

Tamanes, Ramón
1986 *The Spanish Economy. An Introduction.* St. Martin's Press, New York.

Thomas, D.H., ed.
1991 *Columbian Consequences. Vol. 3. The Spanish Borderlands in Pan-American Perspective.* Smithsonian Institution Press, Washington, D.C.

1990 *Columbian Consequences. Vol. 2.Archaeological Historical Perspectives on the Spanish Borderlands East.* Smithsonian Institution Press, Washington D.C.

1989 *Columbian Consequences. Vol. 1. Archaeological and Historical Perspectives on the Spanish Borderlands West.* Smithsonian Institution Press, Washington, D.C.

Thomazi, Augusto
1985 *Las Flotas del Oro. Historia de los Galeones de España.* Swan, Avantos & Hakeldama, Madrid.

Thompson, E.A.
1969 *The Goths in Spain.* Clarendon Press, Oxford.

Throckmorton, Peter
1987 The Age of Discovery. Introduction. In Peter Throckmorton, editor, *The Sea Remembers. Shipwrecks and Archaeology,* pp. 172-173. Weidenfeld & Nicolson, New York.

Thrupp, Sylvia L.
1963 The guilds, In Poston, M.M.; E.E. Rich and E. Miller, Eds., *The Cambridge Economic History of Europe. Vol. III. Economic Organization and Policies in the Middle Ages,* pp. 230-280. The University Press, Cambridge.

Tite, M.S.
1988 The study of ancient ceramic technologies: Past achievements and future prospects. *Science and Archaeology Glasgow,* vol. 1, pp. 9-25. BAR British Series 196.

Tornero Tinajero, Pablo
1975 *La Poblacion de Triana in 1794.* Real Academia Sevillana de Buenas Letras, Sevilla.

Torre Revello, José
1943 Meschandise brought to America by the Spaniards (1534-1586). *The Hispanic American Historical Review.* 23:773-781.

Traverso Ruiz, Francisco M.
1986 *Riqueza y Producción Agraria en Cádiz durante los Siglos XVI y XVII.* Catedra Adolfo de Castro, Fundación Municipal de Cultura, Cádiz.

Trevelyn, George M.
1942 *A Shortened History of England.* Longmans, Green & Co, New York.

Trigger, Bruce G.
1989 *A History of Archaeological Thought.* Cambridge University Press, Cambridge.

Trueba, Eduardo
1988 *Sevilla, Tribunal de Océanos (Siglo XVI).* Gráficas del Sur - Becas, Sevilla.

Turnbaugh, Sarah Peabody
1985 *Domestic Pottery of the Northeastern United States, 1625-1850.* Academic Press, Orlando, Florida.

Udías, Agustin
1985 Seismicity of the Mediterranean Basin. In Daniel Jean Stanley and Forese-Carlo Wezel, eds., *Geological Evolution of the Mediterranean Basin,* pp. 55-64. Springer-Verlag, New York.

Unger, Richard W.
1981 Warship and cargo ships in medieval Europe. *Technology and Culture.* 22(2):233-252.

1980 *The Ship in the Medieval Economy, 600-1600.* McGill-Queens University Press, Toronto.

Unwin, Tim
1991 *Wine and the Vine. An Historical Geography of Viticulture and the Wine Trade.* Routledge, London.

Upham, Steadman and L.S. Reed
1989 Regional systems in the central and northern Southwest: Demography, Economy, and sociopolitics preceding contact. In *Columbian Consequences* vol. 1. Archaeological and Historical Perspectives on the Spanish Borderlands West. ed. D.H. Thomas, pp. 57-76. Smithsonian Institution Press, Washington, D.C.

Usher, Abbott Payson
1932 Spanish ships and shipping in the sixteenth and seventh-centuries. In *Facts and Factors in Economic History*, pp. 189-213. Harvard University Press, Cambridge.

Uztariz, Geronymo de
1742 *Theorica, y Practica de Comercio, y de Marina.* Aguilar, S.H. de Ediciones, Madrid. [reprinted in 1968]

Van Beck, Sara L.
1991 Spanish Colonial Kilns of Moquegua, Peru. M.A. thesis, University of Florida, Gainesville.

Van der Werff, J.H.
1978 Amphores de tradition punique à Uzita. *Babesch.* 52(3):171-200.

Van Doorninck Jr., Frederick H.
1989 The cargo amphoras on the 7th-century Yassi Ada and 11th-century Serçe Limani shipwrecks: Two examples of a reuse of Byzantine amphora transport jars. In V. Déroche and J.-M. Spieser, editors, *Recherches sur la Céramique Byzantine,* pp. 247-257. École Française d'Athènes, Athènes.

Vandiver, Pamela B; James R. Druzik, George Segan Wheller, Ian C. Freestone, editors
1992 *Materials Issues in Art and Archaeology III.* Materials Research Society, Pittsburgh, Pennslyvania.

Van Diver, P.B. and C.G. Koehler
1986 Structure, processing, properties, and style of Corinthian transport amphoras. In W.D. Kingery, editor, *Ceramics and Civilization, Vol. II. Technology and Style,* pp. 173-215. The American Ceramic Society, Columbus, Ohio.

Van Vlack, L.
1964 *Physical Ceramics for Engineers.* Addison-Wesley, Reading, Massachusetts.

Vaz, J.E. and J.M. Cruxent
1975 Determination of the provenience of Majolica pottery found in the Caribbean area using its gamma-ray induced thermoluminescence. *American Antiquity* 40(1):71-82.

Verlinden, Charles
1940 The rise of Spanish trade in the Middle Ages. *Economic History Review.* 10:44-59.

Vernet, Juan
1991 The pursuit of learning: A bridge between cultures, al-Andalus transmitted to Europe Arab science and philosophy as well as the work of Aristotle and other elements of ancient Greek thought. *The UNESCO Courier.* December, 44:38-39.

Vicens Vives, Jaime
1970 The decline of Spain in the seventeenth-century. In Carlo M. Cipolla, ed., *The Economic Decline of Empires.* pp. 121-167. Methuen & Co. Ltd., London.

1969 *An Economic History of Spain* Princeton: Princeton University Press.

Vicens Vives, Jaime, dirigida
1961 *Historia de España y América.* Tomo I-III. Editorial Vicens Vives, Barcelona

Vitale, Luis
1968 Latin America: Feudal or Capitalist? in *Latin America: Reform or Evolution* James Petras and Maurice Zeitlin, eds., pp. 32-43. Fawcett Publications, Inc., Greenwich, Conn.

Walker, Diana H.
1983 Technological analysis of sixteenth-century Spanish olive jars. Paper presented at the 1982 Southeastern Archaeological Conference.

Wallace, Malcolm B.
1986 Progress in measuring amphora capacities. In J.-Y. Empereur and Y. Garlan, editors, *Recherches sur les Amphores Greques,* pp. 87-94. École Française d'Athènes, Athènes.

Wallerstein, Immanuel
1974 *The Modern World System I.* Academic Press, New York.

Walton, Timothy R.
1994 *The Spanish Treasure Fleets.* Pineapple Press, Sarasota.

Ward, Christopher
1993 *Imperial Panama. Comerce and Conflict in Isthmian America, 1550-1800.* University of New Mexico Press, Albuquerque.

Warren, A.H.
1973 Majolica. New World or Old? Petrographic notes on the aplastic inclusions of majolica sherds from Middle American and Spain. Paper presented at Gran Quivira Conference, Rio Rico, Arizona.

Weber, Max
1958 *The Protestant Ethic and the Spirit of Capitalism.* Charles Scribner & Sons, New York.

Weller, Robert "Frogfoot"
1987 *Sunken Treasure on Florida Reefs: The 1715 Spanish Plate Fleet.* Florida Treasure Brokers, West Palm Beach, Florida.

Wells, Debra
n.d. Analysis of the Ceramic Assemblage: 8Es1980, Emanuel Point Wreck. Unpublished manuscript.

Whitbread, Ian K.
1986 The application of ceramic petrology to the study of ancient Greek amphorae. In J.-Y. Empereur and Y. Garlan, editors, *Recherches sur les Amphores Greques.* pp. 95-101. École Française d'Athènes, Athènes.

White, K.D.
1975 *Farm Equipment of the Roman World.* Cambridge University Press, Cambridge.

Will, Elizabeth Lyding
1977 The ancient commercial amphora. *Archaeology.* 30(4):264-270.

Williams, Alan M.
1984 Introduction. In Alan M. Williams, ed., *Southern Europe Transformed. Political and Economic Change in Greece, Italy, Portugal and Spain.* pp. 1-29. Harper & Row, London.

Williams, D.F.
1981 The Roman amphora trade with Late Iron Age Britain. In Hilary Howard and Elaine L. Morris, editors, *Production and Distribution: A Ceramic Viewpoint.* pp. 123-132. Bar International Series 120.

Willis, Raymond F.
1984 Empire and Architecture at 16th-century Puerto Real, Hispaniola: An Archaeological Perspective. Ph.D. dissertation, Dept. of Anthropology, University of Florida, Gainesville.

Wolf, Eric R.
1983 *Europe and the People Without History.* University of California Press, Berkeley.

Wolfram, Herwig
1988 *History of the Goths.* University of California Press, Berkeley.

Zafrani, Haïm
1991 Convergent streams: In contact with Arab thought, Jewish scholars of the al-Andalus broadened their mystic, philosophical, poetic and scientific horizons and also enriched Andalusian Civilization. *The UNESCO Courier.* December, 44:35-37.

APPENDIX 1

TIME LINE

~1800 B.C.	Canaanite Jars begin, influenced development of amphoras of antiquity and medieval times, and the Spanish olive jar of the colonial period
~1200 B.C.	Phoenician amphoras begin
700's B.C.	Phoenician presence in southern Iberian Peninsula, leave early 500.s B.C.
~700 B.C.	Greek amphoras begin
600's B.C.	Greek presence in Iberian Peninsula
400's B.C.	Carthaginian presence in Iberian peninsula, expelled in 206 B.C.
206 B.C.	Roman occupation of Iberian peninsula, 200 years to conquer entire peninsula
~130 B.C.	Roman amphoras begin
395 A.D.	Byzantine amphoras begin
409	Vandals and other tribes invade the Iberian Peninsula
414	Visigoths invade Iberian Peninsula
549	Visigoths conquer Sevilla
642	Visigoths expel Byzantines from southern Spain
711	Moorish troops defeat Gothic king Roderick
844	Victory achieved by Christians in the Ebro Valley by intervention of St. James, later called the moor slayer - *Santiago matamoras*
912-961	Abderrahman III: golden age of caliphate of Córdoba
1040's	Rodrigo Díaz de Vivar, *El Cid*, is born
1146	Almohades invade Spain from North Africa
1236	Córdova is conquered by Christian troops
1238	Valencia is conquered by Christian troops
1248	Sevilla is conquered by Christian troops

1348	Black Death enters Iberian Peninsula
1480	The Inquisition is established
1492	Expulsion of Jews from Castile, many conversions — converts called *Conversos*
1492	Columbus sails for China
1502	Muslims remaining in Spain given choice of conversion or expulsion, massive conversions — converts called *Moriscos*
1503	*Casa de Contratación de las Indias* is formed in Sevilla
1516-55	Reign of Charles I of Spain who is also Charles V of Holy Roman Empire
1520's	Gold becomes exhausted in Hispaniola, sugar and pastoral products take its place
1521	Castille at war with French, until 1529
1522	Ships of less than 80 *toneladas* are prohibited in the Carrera de Indias
1524	The *Consejo de Indias* or Council of the Indies is formed
1529	Iberian ports in addition to Sevilla are allowed to participate in the *Carrera de Indias*
1543	The *Consulado* is established in Sevilla, At least ten ships required in convoys to the Americas
1544	Ships of less than 100 *toneladas* are prohibited in the *Carrera de Indias*
1551	First grape crop picked in Peru
1553	War with French privateers, until 1559
1588	Defeat of Spanish Armada
1560's	Olive groves established in Peru
1564	Two annual convoy system mandated; New Spain *(flotas)* and South American *(galeones)*
1596	Treaty of the Hague - French, British, and Dutch unite against the Spanish
1598	France withdraws from Treaty of the Hague
1602	Legislation prohibiting further extension of vineyards and olive groves in the Americas
1604	British make peace with the Spanish
1609	Spanish and Dutch truce

1609-11	Expulsion of *Moriscos* from Castile
1631	Trade between Peru and New Spain is prohibited
1640	Rebellions in Portugal (until independence in 1668) and Cataluña
1655	War with England until 1670
1683	War with France until 1684
1689	War with France until 1697
1700	Death of Charles II
1701-6	No convoys sail to the Americas
1706-13	Convoy system revived
1713	End of War of Spanish Succession, Bourbons are new monarchy in Spain
1717	*Casa de Contratación* moved to Cádiz
1739	War with England until 1748
1754	The bi-annual fleet system is restored
1761	Spain entered Seven Years War with the French against the British (French and Indian War)
1762	Havana and Manila fall to the British
1774	Trade between Peru and New Spain, prohibited in 1631, is now allowed
1778	Free trade decree
1789	Convoy system is abandoned, trade to New Spain and Venezuela opened to major Spanish ports
1790	*Casa de Contratación* is closed
1796	Spain enters war against the British
1797	Spanish colonial ports opened to neutral ships
1808	Napoleon invades Spain
1813	British troops defeat Napoleon in Spain
1808-14	Widespread revolts in Spanish colonies
1816	Northern part of South America again under Spanish rule
1823	French troops invade Spain, withdraw in 1828

1819	Venezuela and New Granada (Colombia) win independence
1818	Chile wins independence
1811	Paraguay wins independence
1824	Mexico wins independence
1834-9	First Carlist War
1873-74	The first Spanish Republic
1936-39	The Spanish Civil War
1939-1975	Rule of General Francisco Franco
1975	Peaceful transition from dictatorship to democracy
1981	Spain joins NATO
1986	Spain becomes provisional member of the European Economic Community
1992	Spain hosts World's Fair and Summer Olympics

APPENDIX 2

RIM MEASUREMENTS FROM WHOLE OLIVE JARS

Shipwreck	Field #	Year	"Throat" Diameter (cm)	"Lip" Diameter (cm)	Max. Exterior Diameter (cm)	Glaze	Rim Form	Shape
Seahawk wreck	678	1622	4.97	6.18	9.88	none	ang.	A
Seahawk wreck	693	1622	4.54	6.65	8.35	none	ang.	C
Seahawk wreck	796	1622	4.85	5.69	9.65	none	ang.	A
Seahawk wreck	798	1622	5.42	6.10	9.48	none	ang.	A
Seahawk wreck	799	1622	4.68	5.58	8.87	none	ang.	A
Seahawk wreck	800	1622	4.46	6.00	9.18	none	ang.	A
Seahawk wreck	801	1622	4.85	6.00	9.66	none	ang.	A
Seahawk wreck	993	1622	4.65	5.52	9.46	none	ang.	A
Seahawk wreck	995	1622	4.66	5.50	9.42	none	ang.	A
Seahawk wreck	1088	1622	4.65	6.26	8.75	int.	rnd.	B
Seahawk wreck	1099	1622	5.21	5.53	9.17	none	ang.	A
Seahawk wreck	1208	1622	.06	5.75	9.75	none	ang.	A
Seahawk wreck	1296	1622	5.45	5.96	10.08	none	ang.	A
Seahawk wreck	1297	1622	4.85	6.3	10.55	int.	ang.	A
Seahawk wreck	1681	1622	5.55	6.07	9.28	none	ang.	A
Seahawk wreck	1832	1622	4.96	5.55	9.30	none	ang.	A
Seahawk wreck	1896	1622	4.84	6.23	8.95	none	ang.	A
Seahawk wreck	1950	1622	5.00	5.74	9.56	none	ang.	A
Seahawk wreck	1962	1622	4.84	5.65	9.56	int.?	ang.	A
Seahawk wreck	1963	1622	4.62	5.96	8.89	none	ang.	A
Seahawk wreck	1966	1622	5.06	5.84	9.15	int.?	ang.	A
Seahawk wreck	1993	1622	4.86	5.17	9.29	none	ang.	A
Seahawk wreck	2880	1622	4.60	5.23	9.25	none	ang.	A
Seahawk wreck	2794	1622	4.63	6.50	8.35	int.	rnd.	B
Seahawk wreck	2850	1622	4.40	5.57	9.54	none	ang.	A
Seahawk wreck	2851	1622	4.46	5.61	8.80	none	ang.	A
Seahawk wreck	2852	1622	5.19	5.85	9.27	none	ang.	A
Seahawk wreck	2878	1622	4.21	5.85	7.90	int.	rnd.	B
Seahawk wreck	2879	1622	4.95	5.83	9.94	none	ang.	A
Seahawk wreck	2881	1622	5.32	5.85	9.63	int.	ang.	A
Seahawk wreck	2884	1622	4.95	5.65	9.66	none	ang.	A
Seahawk wreck	2885	1622	5.33	5.93	9.71	none	ang.	A
Seahawk wreck	2886	1622	5.14	5.97	9.51	none	ang.	A
Seahawk wreck	2887	1622	4.78	5.43	8.84	int.?	ang.	A
Seahawk wreck	2888	1622	4.95	6.62	10.12	int.	ang.	A
Seahawk wreck	2889	1622	4.95	5.79	9.42	none	ang.	A
Seahawk wreck	2891	1622	5.03	5.88	10.09	none	ang.	A
Seahawk wreck	2892	1622	5.39	7.28	9.42	int.	ang.	B
Seahawk wreck	2894	1622	5.02	6.05	9.70	int.?	ang.	A

Shipwreck	Field #	Year	"Throat" Diameter (cm)	"Lip" Diameter (cm)	Max. Exterior Diameter (cm)	Glaze	Rim Form	Shape
Seahawk wreck	3255	1622	5.15	6.00	9.30	none	ang.	A
Seahawk wreck	3332	1622	4.65	5.59	9.66	none	ang.	A
Seahawk wreck	3333	1622	4.97	5.65	9.66	none	ang.	A
Seahawk wreck	3334	1622	4.40	5.73	9.94	none	ang.	A
Seahawk wreck	3335	1622	3.76	5.68	8.66	none	ang.	A
Seahawk wreck	30	1622	4.53	5.91	9.85	none	ang.	A
Seahawk wreck	500	1622	5.53	6.03	9.50	none	ang.	A
Seahawk wreck	469	1622	4.89	5.51	9.39	int.?	ang.	A
Seahawk wreck	10	1622	4.62	5.68	9.45	none	ang.	A
Seahawk wreck	409	1622	4.75	5.47	8.81	none	ang.	A
Seahawk wreck	228	1622	5.03	6.23	9.41	none	ang.	A
Seahawk wreck	147	1622	4.57	5.58	9.60	none	ang.	A
Seahawk wreck	55	1622	5.30	6.10	10.81	none	ang.	A
Seahawk wreck	54	1622	5.15	6.28	9.46	none	ang.	A
Seahawk wreck	44	1622	4.73	6.01	9.48	none	ang.	A
Seahawk wreck	31	1622	5.20	6.18	9.27	int.?	ang.	A
Seahawk wreck	29	1622	4.77	5.58	8.90	none	ang.	A
Seahawk wreck	28	1622	4.91	5.36	9.44	none	ang.	A
Seahawk wreck	24	1622	5.49	6.38	10.00	none	ang.	A
Seahawk wreck	23	1622	5.76	6.27	9.96	int.?	ang.	A
Seahawk wreck	22	1622	4.80	5.74	9.72	int.?	ang.	A
Seahawk wreck	21	1622	4.75	5.70	9.49	none	ang.	A
Seahawk wreck	12	1622	5.02	6.01	9.63	none	ang.	A
Seahawk wreck	675	1622	4.62	5.68	9.56	none	ang.	A
Seahawk wreck	631	1622	4.35	5.38	9.18	none	ang.	A
Seahawk wreck	559	1622	4.94	6.04	8.31	int.	rnd.	B
Seahawk wreck	668	1622	4.37	5.57	8.96	none	ang.	A
Seahawk wreck	669	1622	4.40	5.23	9.50	none	ang.	A
Seahawk wreck	670	1622	4.48	5.63	9.55	none	ang.	A
Seahawk wreck	671	1622	4.40	5.59	8.83	none	ang.	A
Seahawk wreck	673	1622	5.40	6.30	9.54	none	ang.	A
Seahawk wreck	676	1622	5.03	6.15	9.58	none	ang.	A
Seahawk wreck	405/406	1622	4.20	5.88	8.60	int.	rnd.	B
Concepción wreck	-	1641	5.90	7.00	10.52	none	ang.	A
Concepción wreck	-	1641	5.56	6.69	10.22	none	ang.	A
Concepción wreck	-	1641	4.95	6.42	9.87	none	ang.	A
Concepción wreck	-	1641	4.73	5.30	9.92	none	ang.	A
Concepción wreck	-	1641	4.96	5.55	9.14	none	ang.	A
Concepción wreck	-	1641	5.06	5.73	9.93	none	ang.	A
Concepción wreck	-	1641	5.32	6.64	10.30	paint?	ang.	A
Concepción wreck	-	1641	4.63	5.45	9.72	none	ang.	A
Concepción wreck	-	1641	4.40	5.70	8.85	none	rnd.	B
Concepción wreck	-	1641	4.84	6.33	8.85	none	rnd.	B
Concepción wreck	-	1641	4.95	5.57	10.29	none	ang.	A
Concepción wreck	-	1641	4.65	5.19	8.89	none	ang.	A
Concepción wreck	-	1641	4.50	5.19	9.40	none	ang.	A
Concepción wreck	-	1641	4.83	5.52	9.20	none	ang.	A
Concepción wreck	-	1641	4.74	5.50	9.27	none	ang.	A
Concepción wreck	-	1641	4.75	5.36	9.40	none	ang.	A
Guadalupe wreck	-	1724	5.87	6.73	10.64	indeter.	ang.	A
Guadalupe wreck	-	1724	5.05	6.82	10.56	indeter.	ang.	A
Guadalupe wreck	-	1724	5.44	6.83	10.51	none	ang.	A

Shipwreck	Field #	Year	"Throat" Diameter (cm)	"Lip" Diameter (cm)	Max. Exterior Diameter (cm)	Glaze	Rim Form	Shape
Guadalupe wreck	-	1724	5.50	6.35	9.78	none	ang.	A
Guadalupe wreck	-	1724	5.19	6.94	10.50	indeter.	ang.	A
Guadalupe wreck	-	1724	4.91	5.81	10.35	none	ang.	A
Guadalupe wreck	-	1724	4.86	6.80	10.42	indeter.	ang.	A
Guadalupe wreck	-	1724	4.78	7.13	10.19	none	ang.	A
Guadalupe wreck	-	1724	5.11	6.32	10.35	none	ang.	A
Guadalupe wreck	-	1724	5.40	6.82	10.45	none	ang.	A
Guadalupe wreck	-	1724	5.15	6.70	10.33	none	ang.	A
Guadalupe wreck	-	1724	5.20	6.38	10.45	indeter.	ang.	A
Guadalupe wreck	-	1724	4.95	5.96	9.96	indeter.	ang.	A
Tolosá/Guadalupe wrecks	-	1724	4.40	6.59	9.57	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.05	6.71	9.55	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.88	6.55	8.96	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.87	7.26	9.67	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.74	6.62	9.26	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.25	6.71	9.07	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.55	7.03	9.35	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	3.78	6.33	8.69	none	rnd	B
Tolosá/Guadalupe wrecks	-	1724	4.64	6.41	8.63	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.06	7.00	9.60	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.58	6.57	9.33	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.47	6.38	9.10	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.27	6.49	9.04	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.07	6.02	8.76	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.20	6.84	9.40	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.78	6.30	9.10	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.55	6.25	8.61	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.74	6.48	8.60	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.65	6.38	8.70	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.78	5.88	9.55	none	ang.	B
Tolosá/Guadalupe wrecks	-	1724	4.20	6.23	8.55	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.73	6.76	9.17	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.63	6.95	9.37	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.10	6.79	9.80	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.35	6.13	8.61	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.35	6.39	8.80	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.06	6.70	9.22	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.41	7.07	9.31	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.75	6.05	8.56	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.45	7.51	9.63	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.62	6.32	8.43	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.45	7.22	10.00	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.05	6.95	9.36	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.75	6.72	9.15	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.46	6.17	8.74	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.60	5.48	8.74	none	ang.	B
Tolosá/Guadalupe wrecks	-	1724	4.86	6.52	9.10	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.06	6.46	8.12	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.75	7.25	9.35	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.80	6.81	9.22	int./ext.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.91	6.58	9.04	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.67	7.05	8.60	none	rnd.	B

Shipwreck	Field #	Year	"Throat" Diameter (cm)	"Lip" Diameter (cm)	Max. Exterior Diameter (cm)	Glaze	Rim Form	Shape
Tolosá/Guadalupe wrecks	-	1724	4.68	7.04	9.43	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.22	6.39	8.88	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.25	6.53	9.22	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.33	6.21	8.52	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.12	6.60	9.43	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.35	7.25	9.87	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.75	7.23	9.67	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.85	6.32	9.02	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.66	6.91	9.18	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.00	7.41	9.73	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.25	6.40	8.50	int.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.63	6.81	9.58	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.10	7.16	9.40	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	3.63	6.18	9.51	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.60	5.91	8.69	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.65	6.66	9.23	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.43	7.22	9.00	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.80	6.25	9.72	none	ang.	B
Tolosá/Guadalupe wrecks	-	1724	4.78	7.35	9.30	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.65	6.86	8.90	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.25	7.01	9.36	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.86	7.21	9.40	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.11	6.12	8.63	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.58	7.11	9.48	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.61	6.75	8.81	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.10	6.45	9.12	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.95	6.82	9.37	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.58	7.10	9.12	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.65	5.63	8.22	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	5.13	6.86	9.25	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.26	6.02	8.39	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.44	6.38	9.14	int./ext.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.35	6.47	9.25	int./ext.	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.27	5.71	8.28	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.65	4.82	9.49	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.43	6.06	8.37	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.94	4.85	9.06	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.63	6.64	9.07	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.72	6.31	8.60	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.38	6.45	8.76	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.40	6.46	8.80	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.43	5.95	8.45	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.95	7.33	9.42	none	ang.	B
Tolosá/Guadalupe wrecks	-	1724	4.38	5.92	8.39	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.82	6.82	9.53	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.59	6.67	9.07	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.49	6.27	8.22	none	rnd.	B
Tolosá/Guadalupe wrecks	-	1724	4.85	7.10	9.53	none	rnd.	B

APPENDIX 3

PACKAGING PATTERNS AS FOUND IN PRIMARY AND SECONDARY SOURCES

The purpose of this appendix is to present the results of a survey of packaging patterns for both the *Carrera*, non-*Carrera* long distance, and domestic commercial activity in Spain during the 16th-19th-centuries. As might be expected, the packaging for the Castillian domestic commercial activity is highly varied, compared to the more standardized *Carrera* trade. Olive jars are not commonly mentioned in the non-*Carrera* trade as wooden containers appear to be most popular.

Roman Period Reports of 30 kiln sites for Roman amphora in the Catalan wine trade - "The largest concentration of kilns was around Barcelona, and also to the north and south, but never far from the coast" (Guasch 1984:245)

note: Amphora production areas near navigable water source.

1300s describing packaging of trade between Catalonia and Italy, *tonel* for wine; *matar, tinaja,* and *barcada* for olive oil

(Gual Camarena 1981:41)

notes: The pattern of wooden container for wine, and pottery container for olive oil.

1579 document (Schäfer 1938)

Prices of goods sold in Sevilla in 1579.

Commodity	Amount	Price (*maravedís*)
almendras largas	*el quintal*	*3430*
Almendrón	*el quintal*	*2746*
aceite	*el arroba*	*381*
aceitunas	*botijas medias Peruleras*	*153*
aceitunas	*botijas Peruleras*	*305*
Alcaparras	*el barril*	*172*
Avellanas	*la fanega*	*980*
Alquitrán	-	-
Botas para vino	*la docena*	*1373*
Botijas de vino de Cazalla y Cádiz	*la botijas*	*551*
Botijas de vino de las islas y del Aljarafe	*la botijas*	*456*
Lentejas	*el almud*	*114*
Loza de Talavera	*la docena*	*182*
Loza de Pisa	*la docena*	*260*
Loza de Sevilla, de la Puerta de Goles que es como la de Pisa	*la docena*	*260*
Loza de Triana	*la docena*	*43*
Miel	*la botijuela*	*130*
Sardinas	*el millar*	*860*
Vino blanco de Cazalla en pipas	*cada pipa*	*10878*
Vino tinto de El Puerto	*cada pipa*	*11450*
Vino de las islas	*cada pipa*	*8588*
Vinagre	*cada pipa*	*4580*
Xabón	*el quintal*	*3890*

Notes: Prices indicate that wine from Sevilla is less expensive than wine from Cazalla and Cádiz. Cazalla was located in a rich wine-producing region north of Sevilla. As is fairly common, no container is given for olive oil. It might be that since the *botija* was invariably used to hold olive oil, that there was no need to mention the container. The container for *miel* or honey was a *botijuela.*

1548 — packaging of wine from Jérez - *botas* (Barrerio Mallon 1983:580).

1582 — wine to England - *botas* (Barrerio Mallon 1983:580).

1534-1586 goods from Spain to Indies (Torre Revello 1943:781)

from the 33 ships' manifests that still survive in the AGI

Aceites
Baúles de alcaparra
Botijas de alcaparra
Botijas de aceitunas gordal medio peruleras
Botijas peruleras con aceituna manzanilla
Botijas peruleras de aceitunas moradas
Botijas peruleras con habas
Botijas peruleras con garbanzos
Pipas de vino nuevo
Pipas de vino nuevo del Aljarafe
Pipas de vino nuevo de Jérez
Pipas de vino nuevo de Villalba
Vinagre
Vino blanco añejo
Vino de Cazalla
Barril vizcochero
Botijas
Botijas peruleras

Note: Again, no mention of container for olive oil. Both new and aged wine are mentioned.

1605 — *Botijas* of olives and barrels of capers from Sevilla (Barrerio Mallon 1983:584).

1609 — Ordinances of the guild of *toneleros*

about *pipas* for wine - **27.5 *arrobas*** "*. . . como lo mandan las hordenancas . . .*"

(A.M.S. Seccion I, Carpeta 15, Numero 20, año 1609)

1627 — *Tassa de los Precios a que se an de vender en esta Ciudad de Sevilla* — This is a 170+ page document of all the merchandise sold in Sevilla in 1627 and is basically a failed attempt to control the rise of prices.

Madera de Flandes

Cada pipa de a veyntisiete arrobas y media, treynta y seys reales.
Cada quarto que es media pipa, veintidos reales.

Cada barril vizcochero quintaleño, diez reales.
El barril de a dos arrobas estancos para passas a siete reales.
Cada barril de aceytunas de a dos almudes, dos reales.
El barrilete para conserva y agua de olor, real y tres quartillos.

Platos Bastos

Cada jarro de a tres en vasso, a treynta maravedis
Cada jarro de cinco en vasso, diez y seys maravedis.
Cada jarra de ocho en vasso, a diez maravedis
Cada jarro mas pequeño, a seys maravedis.
Cada olla de media libra, doze maravedis.
Cada olla de dos libra, treynta y dos maravedis.
Cada olla de a quatro libras, cincuenta maravedis.
Cada olla de seys libras, ciento y dos maravedis.
Cada cantaro de arroba, treynta y quatro maravedis.
El cantaro de a media arroba, veynte y quatro maravedis.
Cada cantaro perrengue, quatro maravedis.
Cada jarra de mostear, treynta y quatro maravedis.
Cada botija perulera, a treynta y quatro maravedis.
Cada botija de media arroba de aceyte, a diez y seys maravedis.
Cada botija de aceytunas pequeñas, a ocho maravedis.
Cada tinaxa de una carga de agua, cinco reales.
Cada tinaxa de dos cargas, a ocho reales.

Alcarraças

Cada jarro pequeño de alcarraça para agua, a quatro maravedis.
Cada jarro mediano, a ocho maravedis.

Carpinteros de lo blanco

Una caxa perulera de vara y media de largo dos tercias de álto y ancho con su cerradura y llave, setenta reales

Torneros

Cada cubo para cantimplora de dos açubres, seys reales, y al respeto.

Loça basta

Cada jarro pintado de frayle de dos asa un real.

Cada jarro pintado de suelo ancho de a dos en vaso, dos reales y medio
Un jarro grande de pico pintado para medidor, dos reales, y los menores al respeto.
Cada botija de seis en vaso, vidriada por dentro y fuera, veynte maravedis.
Cada botija de a ocho en vaso, vidriado por dentro y fuera catorze maravedis.
Cada botija de a tres en vaso, un real.
Cada botija a de a quatro en vaso, veyntiocho maravedis.

Botigeria

Cada botija de arroba y media, paco mas, o menos, empegada, un real y quartillo.
Cada botija de boca ancha para almendra, un real.
Cada botija de dos arrobas para aceyte, dos reales.
Cada botija redonda de arroba para aceyte un real.
Cada botija grande para aceytuna, treynta maravedis.
Cada botija pequeña para alcaparras ocho maravedis.
Cada botija de migajuela empegada para vino, diez y seys maravedis.
Cada botija para alquitran catorze maravedis.
Cada jarra para açucar candi, a diez y seys maravedis.
Sinos para refinar azuçar a sestena maravedis.
Jarras para polvora a real cada una.

Barro basto

Un cantarillo de quarta, ocho maravedis.

Toneleros

Un barril de cabidaa de diez a doze arrobas, a diez y seys reales.
Un barril de seys a ocho arrobas, doze reales.
Un barril de cinco a seis arrobas, a diez reales.
Un barril de tres a quatro arrobas, ocho reales.
Un barril para azeyte que quepa ocho arrobas, catorze reales.
Cada barril de tres a quatro almudes e cabida de azeytuna, tres reales.
Un barril para azogue, un real.
Cada jarra para mostear un quatro arcos de hierro, y asa de hierro, catorze reales.
(Biblioteca Universitaria de Sevilla. Sign. 188/84)

notes.: A distinction is made between *jarro, olla, cantaro, tinaxa, and botija..*

1665 — Regarding the Owners of the *Heredades de vinas* in Alarafe, "*y vanda Morsica, con Los veedores del oficio de los Toneleros*"

(A.M.S. Seccion XI, Tomo 59 en folio, Numero 29, Año 1665)

there is some sort of mark which indicates that the ***pipa* is 27.5 *arrobas***

1673 — regarding the shipment of 48 *botas* of wine without a dispatch to Cádiz - "*para el consumo de Cadiz*"

(A.M.S. Seccion IV, Tomo 43, no. 29)

37 *botas* of wine and *34 "quarteloras de a diez arrobas de vino cada quartelora que hazen las dhas quarenta y ocho botas."*

quarterlora is a quarter cask, but the computation is 30.9 arrobas for each *bota* —

34 *quarterloras* (340 *arrobas*) + 37 *botas* = 48 *botas*

340 *arrobas* = 11 *botas*

30.9 *arrobas* = 1 *bota*

1712 — wine entering the city of Sevilla

(A.M.S. Seccion 5, Tomo 219, no. 25)

Type and size of container (in arrobas) from various regions around Sevilla

San Juan de Alfarache				Umbrete			
pipa	*bota*	*tonel*	*tinaja*	*pipa*	*bota*	*tonel*	*tinaja*
20	30	30	50	18	30	50	45
6		20	110	26	27	30	55
		10	90	25	30	25	
		6	60	16	25		
		40	100	20			
		50	30				
		16					
		8					

Notes: This shows the wide variety of sizes of both pottery containers and wooden containers. One interesting thing is the large size of the *tinajas* — up to 110 *arrobas*! These clearly are not olive jars, and therefore, the term *tinaja* should not be used for olive jars. Since 1.25 *arrobas* is roughly 5 gallons, that would mean that the biggest *tinajas* hold over 500 gallons of wine!

1720 — wine entering the city of Sevilla

(A.M.S. Seccion 5, Tomo 219, no. 25)

Notes: This is a huge list - mostly listing total *arrobas* of wine in a certain amount of *cargas* or loads, the number of *arrobas* per *carga* is either 4 or 7 *arrobas*. When packaging is mentioned, it is *pieles, carros,* and *carrettas.*

1742 — Uztariz, Practice and Theory of Commerce and Marina

not so helpful - but does give indication of awareness of pottery terms -

"Los Platos, Jarros, Escudillas, Xicaras, Azulejos, y otros generos de Losa de Sevilla, de Talaver, y de otras partes, estén pintados, ó no, podrán salir tambien para fuera del Reyno, pagando el dos y medio por ciento, en cuya regla se pueden incluir las Tinajas, Cantaros, Tiestos, Texas, Ladrillos, y demás cosas de barro."

Notes: He makes a distinction between *tinajas* and *cantaros* - no mention of *botijas* - This is somewhat odd, given that the term *botija* is certainly the preferred term in the *registros* examined in Chapter 8.

1759 — wine from Andalusia - *pipas* (Barrerio Mallon 1983:580).

1760 — The Caracas Company

List of Brandy, wine and olive oil available in 1760 (Hussey 1934:188)

Commodity	Unit	# on hand, 1759	# sent to Venezuela in 8 ships in 1760
Aguardiente	Bbls.	2700	3541
Wine	Bbls.	162	322
Wine(white)	Jugs(*botijas*)	3220	6013
Olive oil	small jars (botijuelas)	4600	9000
Olives	small jars	1700	1500

1762 — olive oil production and some sort of tax

(A.M.S. Seccion XI Seccion Especial, siglo XVIII, tomo 1 en folio, no. 9)
23 "extractores" 3,553 pipas 1 barril 1,575 botijas
79,145 reales 19 vellon

This appears to be one year's production of olive oil and the tax paid.

754 *reales* was paid on 34 *pipas*, this is 754 *mrs/pipa* and 18.61 *mrs/arroba*, presuming a 40.5 *arroba pipa* ----

7.023 *mrs* are paid per *botijas* - so they are probably half *arroba botijas*

Note: this is all olive oil coming into the city of Sevilla to be either consumed in the city, or be exported. It is interesting that wooden containers dominate in the transport of olive oil from the olive groves to Sevilla, but there might be some production of *botijas* outside the city.

1762 — olive oil production and some sort of tax

(A.M.S. Seccion XI Seccion Especial, siglo XVIII, tomo 1 en folio, no. 10)

short document explaining that each *pipa* of olive oil is 40.5 *arrobas*

--also includes charges for filling and transporting 100 *pipas* (of olive oil), and paying to take the oil from *tinajas* and put it into *pipas*. Also charges for 100 corks, *valpilleras* (?), 100 *alas*(?) *de lata a* 4 *mrs*, and 1000 *fachuelas*

Notes: This is pretty interesting as oil is brought into Sevilla from outlying areas in *tinajas* and then put into *pipas* of standard size.

1767 — price list for Sevilla for "abastos"

(A.M.S. Seccion XI, Especial Sig. XVIII, Tomo 62 en folio, no. 11)
el quartill de Azeyte
el quartillo de Vinagre

Notes: no mention of wine, brandy, or olives

Undated, unsigned copy of 18th-century letter from Sevilla to the King
about the size of *pipa* for transporting olive oil, wine, and vinegar
(A.M.S. Especial Sig. XVIII, Tomo 66 en folio, no. 30)
requests that the *pipas* hold no more than 40 *arrobas*, and the *pipas* for wine and vinegar hold no more than 27 *arrobas*.
mentions 34 *arroba pipas* of olive oil

Notes: There is a change in the size of the wine *pipa* sometime in the 17th-century from 27.5 arrobas to 27.0 arrobas. The pipa is not used as much during the 18th-century, as the barrel becomes the wooden container of choice. The standard size of the barrel for wine is 4.5 *arrobas*, and these wine barrels are often described as "*seis en pipa*"

Goods sent from Spain to Venezuela

(Arcila Farias 1946:188)

Aceitunas	*749*	*botijuelas*
Aceite	*1864*	*botijuelas*
Aguardiente	*2417*	*barriles*

The Barcelona Company (Oliva Melgar 1987:268)

cuñetes anchoas - containers of wine, oil, brandy not given

"Profits" (?) for 18th-century Zaragoza (Nadal y Tortello 1975:43)

1721-1725 - "*rentas episcopales de la corona de Aragón*"

1,657 cántaros de vino a una libra

note - this book has good information, but most times it is condensed, and the particular type of packaging is not given

1760 — *Pipas* and *cántaras* of sardines from Catalonia (Barrerio Mallon 1983:583).

1768 — wine from Galicia, Catalonia, Malaga - *pipas*. But a *botella* of each had to presented for comparison (Barrerio Mallon 1983:580); much of this wine was going to England.

1799 — Importation of wine to Asturias — more than 312,000 cántaras (~50,000 Hl.) — most is from Galacia; since the 16th-century, lesser amounts from Castile, Andalusia, and Portugal. Cider is made locally, but wine is scarce (Barreiro Mallon 1983:577-588). Mentions the transfer of wine from skins to pipas - when wine is brought from the interior to ports - like Pontevedra - suggests that terrestrial transport is in skins and maritime transport is in *pipas* (Barrerio Mallon 1983:578).

Note: Are *botijas* and *cántaros* the same thing?

Intra-colonial commercial Packaging patterns
(Moreya y Paz-Soldan 1944:34-42)

1630 — description of goods brought to Lima
from Pisco — each year more than 150,000 *botijas*
from Lanasca — more than 100,000
from Yca — much more
200,000 *botijas* of wine consumed in Lima each year, and they export another 200,000 *botijas* of wine to Panamá, Nicaragua, Quito, Loxa, Cuenca, and other places (Holm 1970:271).

Botijas dominate the packaging of goods shipped out of the port of Calloa during the early 18th-century - only one barril is listed in the goods out of Calloa. Barriles of goods are listed under "Mercaderia de Castilla" - even empty barrils are listed, though not in large numbers. The following lists goods from Calloa to the ports of Arica, Coquimbo, Valparaíso, Concepción, Valdivia, and Chiloé during the years **1701-1704.**

botijas de aguardiente	1,691
botijas de vino	530
botijas de vino Nasca	2
botijas de vino de Pisco	17
botijas de aceite	789
odres de aceite	4
botijas de miel	6,491
zurrones de miel	2
botijas de vinagre	11
botijas de aceitunas	13
botijas de escabeches	2
costal de arroz	4
botijas de arroz	2
petacas de pasas	8
petacas de higos	2
petacas de jabón	173
botijas de yeso	6
Petacas de brea	2,154
zurrones de brea	105
panes de brea	24
quintales de brea	62
zurrones de alquitrán	13
botijas de pólvora	696
fardos de pólvora	64
botijas vacías	100
barriles de colasción	1

The following goods are headed north to Saña, Casma, Trujillo, Guayaquil, Panamá, and Sonsonate.

botijas de aguardiente	46,361
botijas de vino	34,006
botijas de vino de Nazco	230
botijas de aceite	8,352
odres de aceite	12
botijas de miel	40
botijas de manteca	12
botijas de vinagre	2,372
botijas de aceitunas	1,145
costales de garbanzos	26

botijas de semilla	12
petacas de pasas	443
petacas de higos	19
zurrones de almendra	17
tercios de almendra	2
petacas de jabón	65
botijas de pólvora	301

Exports from Venezuela (Arellano Moreno 1960)

1599
4 *botijuelas de manteca*

1701
75 *botijas* de miel
30 *arrobas de manteca*

1757 — go0ds on a ship from Bahia to Lisbon (Amaral Lapa 1968:257)

4	baricas	tabaco em folha
30	barris grandes	açúcar
2	barris	farinha
3	barris	mel
13	barris	de sementhlhas
1	frasqueira	aguardiente de cana

1757 — goods on a ship (Amaral Lapa 1968:258)

7	baricas	tabaco
1	barril	açúcar
15	barris	mel e de farinha

1758 — goods on a ship from Bahia to Lisbon (Amaral Lapa 1968:259).

45	pipas	vinho
21	barricas	vinho
15	barris	açúcar
20	barris	mel
60	barris	farinha

1868 — 47,068 barrels of Jérez exported (Anonymous 1975:21).

1934 — import of Spanish Almeria grapes (Anonymous 1934:15)
three steamers -
1. 4,732 barrels
2. 8,700 barrels
3. 26,573 barrels and 145 half barrels

1975 — Madeira shipping pattern, The Madeira Wine Association shiped 50% of the islands production, of this 30% was in bottles, the rest was in casks (Hiaring 1975:22)

APPENDIX 4

RESULTS OF *REGISTRO* ANALYSIS

Commercial Wine

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	unknown	unknown (no. 10)	3	*pipa*	1523
1079	the Indias	*Santa María*	214	*pipa*	1523
1079	New Spain	*Santa María* Cor? *Blanca*	97	*pipa*	1523
1079	Santo Domingo	unknown (no. 2)	67	*pipa*	1523
1079	Santo Domingo	unknown (no. 9)	1	*quarto*	1523
1079	Santo Domingo	unknown (no. 9)	35	*pipa*	1523
1079	Santo Domingo	*San Vicente*	29	*pipa*	1523
1079	Santo Domingo	*Santa María*	10	*bota*	1523
1079	Santo Domingo	*Santa María*	74	*pipa*	1523
1079	Santo Domingo	*Santa María de la Ynerila*	189	*pipa*	1523
1079	Santo Domingo	*Santa María de la Ynerila*	5	*quarto*	1523
1079	Santo Domingo	*La Trinidad*	2	*bota*	1524
1079	Santo Domingo	*La Trinidad*	36	*pipa*	1524
1079		unknown (no. 1)	1	*barril*	1526
1079		unknown (no. 1)	12	*pipa*	1526
1079	Santo Domingo	unknown (no. 2)	3	*botija*	1526
1079	Santo Domingo	unknown (no. 2)	69	*pipa*	1526
1079	Santo Domingo	*Santa María de la Concepción*	10	*pipa*	1530
1079	Santo Domingo	*Santa María de la Concepción*	4	*quarto*	1530
1079	Nombre de Dios	*Santa Aqueda*	47	*pipa*	1542
1079	Nombre de Dios	*Santa Aqueda*	650	*botija (v)*	1542
1079	Cuba	*María de Guadalupe*	27	*pipa*	1545
1079	New Spain	*La Vitoria*	30	*pipa*	1545
1079	Nombre de Dios	*La Concepción*	290	*botija(v)*	1545
1079	Nombre de Dios	*La Concepción*	45	*pipa*	1545
1079	Nombre de Dios	*San Bartolome*	267	*botija(v)*	1545
1079	Nombre de Dios	*San Bartolome*	50	*pipa*	1545
1079	Nombre de Dios	*San Juan*	604	*botija(v)*	1545
1079	Nombre de Dios	*San Juan*	84	*pipa*	1545
1079	Nombre de Dios	*Sant Antonio*	330	*botija(v)*	1454
1079	Nombre de Dios	*Sant Antonio*	30	*botija*	1545
1079	Nombre de Dios	*Sant Antonio*	31	*pipa*	1545
1079	Nombre de Dios	*Santa María de la Luz*	400	*botija(v)*	1545
1079	Nombre de Dios	*Santa María de la Luz*	44	*pipa*	1545
1079	Nombre de Dios	*Santa María de la Luz*	70	*botija(v)*	1545
1079	Puerto Rico	*San Bartolome*	13	*botija(v)*	1545
1079	Puerto Rico	*San Bartolome*	139	*pipa*	1545
1079	Puerto Rico	*San Bartolome*	500	*botija(v)*	1545
1079	Santo Domingo	*San Antonio*	2	*quarto*	1545
1079	Santo Domingo	*San Salvador*	54	*pipa*	1545

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	*Santa Espiritus*	75	*pipa*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	70	*pipa*	1545
1079	Vera Cruz	*San Salvador*	98	*pipa*	1545
1079	Vera Cruz	*Santa Cruz*	306	*pipa*	1545
1079	Honduras	*Los Tres Reyes Magos*	1	*quarto*	1557
1079	Honduras	*Los Tres Reyes Magos*	1691	*botija (v)*	1557
1079	Honduras	*Los Tres Reyes Magos*	300	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	313	*pipa*	1557
1080	Nombre de Dios	*San Miguel*	184	*pipa*	1583
1080	Nombre de Dios	*San Miguel*	8565	*botija*	1583
1080	South America	*El Espiritu Santa*	75	*bota (v)*	1583
1080	South America	*El Espiritu Santa*	7532	*botija*	1583
1080	South America	*El Espiritu Santa*	94	*pipa*	1583
1081	Nombre de Dios	*La Santisimma Trinidad*	1345	*botija*	1584
1081	Nombre de Dios	*La Santisimma Trinidad*	6	*pipa*	1584
1081	Nombre de Dios	*Nra Sra de la Candalaria*	1705	*botija*	1584
1081	Nombre de Dios	*Nra Sra de la Candalaria*	20	*pipa*	1584
1082	New Spain	*La María*	205	*pipa*	1586
1082	New Spain	*La María*	45	*botija*	1586
1082	New Spain	*Sant Joan*	93	*pipa*	1586
1082	New Spain	*Santa Catalina*	306	*pipa*	1586
1082	New Spain	*Santa Catalina*	97	*botija*	1586
1082	New Spain	*Santa Isabel*	157	*pipa*	1586
1082	New Spain	*Santa Isabel*	9	*quarto*	1586
1082	New Spain	*Santa María de Bogonia*	195	*pipa*	1586
1082	New Spain	*Santa María de Bogonia*	2	*quarto*	1586
1082	New Spain	*Santa María de Bogonia*	4	*quarto*	1586
1082	New Spain	*Santa María de Bogonia*	539	*botija*	1586
1543	Florida	*Nra Sra de la Esperanza*	200	*botija*	1586
1543	Florida	*Nra Sra de la Esperanza*	90	*pipa*	1586
1089	Havana	*Nra Sra de la Vitoria*	200	*botija*	1590
1089	Havana	*Nra Sra de la Vitoria*	89	*pipa*	1590
1089	Honduras	*Sant Francisco*	2244	*botija*	1590
1089	Honduras	*Sant Francisco*	6	*pipa*	1590
1089	New Spain	unknown	10	*pipa*	1590
1089	New Spain	*La Concepción*	405	*pipa*	1590
1089	New Spain	*La Concepción*	50	*botija*	1590
1089	New Spain	*San Juan*	43	*botija*	1590
1089	New Spain	*San Juan*	463	*pipa*	1590
1089	New Spain	*San Juan*	96	*botija*	1590
1089	New Spain	*Santa Ana y Santa Catalina*	150	*pipa*	1590
1089	New Spain	*Santa Catalina*	246	*pipa*	1590
1089	New Spain	*Santa Susana*	248	*pipa*	1590
1089	Santo Domingo	*Santa Ana*	1	*quarto*	1590
1089	Santo Domingo	*Santa Ana*	1020	*botija*	1590
1089	Santo Domingo	*Santa Ana*	8	*pipa*	1590
1094	Nombre de Dios	*San Francisco*	2904	*botija*	1591
1094	San Juan	*Nra Sra de Concepción*	46	*pipa*	1591
1094	South America	*La Encarnación*	34	*pipa*	1591
1094	South America	*La Encarnación*	7430	*botija*	1591
1094	South America	*San Pedro*	10773	*botija*	1591
1094	South America	*Santo Antonio*	12	*pipa*	1591

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1094	South America	*Santo Antonio*	2464	*botija*	1591
1453	Florida	*Santa Catalina*	24	*pipa*	1592
1453	Florida	*Santiago*	16	*pipa(v)*	1594
1453	Florida	*Santiago*	200	*botija(v)*	1594
1453	Florida	*Santiago*	56	*pipa*	1594
1453	Florida	*Santiago*	700	*botija*	1594
1121	Havana	*Los Tres Reyes*	490	*botija*	1596
1121	Havana	*Santa Ana*	100	*botija*	1596
1121	Havana	*Santa Ana*	98	*pipa*	1596
1121	New Spain	*Nra Sra de la Esperanza*	402	*pipa*	1596
1121	New Spain	*Nra Sra de la Esperanza*	595	*botija*	1596
1453	Florida	*Santa Ana*	118	*botija*	1596
1453	Florida	*Santa Ana*	137	*pipa*	1596
1121	New Spain	*La Esperanza*	209	popa	1597
1121	New Spain	*La Esperanza*	450	*botija*	1597
1121	New Spain	*La María*	1086	*botija*	1597
1121	New Spain	*La María*	390	*pipa*	1597
1121	New Spain	*Sant Juan Bautista Colorado*	150	*botija*	1597
1121	New Spain	*Sant Juan Bautista Colorado*	828	*pipa*	1597
1126	South America	*La Trinidad*	11	*pipa*	1597
1126	South America	*La Trinidad*	615	*botija*	1597
1126	South America	*Nra Sra de la Agustias*	14	*pipa*	1597
1126	South America	*Nra Sra de la Agustias*	700	*botija*	1597
1126	Margarita	*Nra Sra del Rosario*	1350	*botija*	1598
1126	Margarita	*Nra Sra del Rosario*	9	*pipa*	1598
1126	Santa Marta	*El Espiritu Santo*	16	*pipa*	1598
1126	Santa Marta	*El Espiritu Santo*	704	*botija*	1598
1126	South America	?	10	*pipa*	1598
1126	South America	?	1893	*botija*	1598
1126	South America	*Nra Sra del Rosario*	1300	*botija*	1598
1126	South America	*Nra Sra del Rosario*	49	*pipa*	1598
1126	South America	*Nra Sra de la Concepción*	20	*pipa*	1598
1126	South America	*Nra Sra de la Concepción*	500	*botija*	1598
1126	Venezuela	*San Antonio*	10	*pipa*	1598
1126	Venezuela	*San Antonio*	750	*botija*	1598
1126	Venezuela	*Sant Pedro*	850	*botija*	1598
1453	Florida	*Nra Sra del Rosario*	106	*pipa*	1607
1159	Cuimate	*Santa Ana* y *San Antonio*	14	*pipa*	1613
1159	Cuimate	*Santa Ana* y *San Antonio*	75	*botija*	1613
1159	Honduras	*San Joseph*	2796	*botija*	1613
1159	New Spain	*El Espiritu Santo*	165	*pipa*	1613
1159	New Spain	*San Pedro*	1	*quarto*	1613
1159	New Spain	*San Pedro*	100	*botija*	1613
1159	New Spain	*San Pedro*	242	*pipa*	1613
1159	Santo Domingo	*Nra Sra de la Candelaria*	82	*pipa*	1613
1159	Venezuela	*Santa María del Rosario*	30	*pipa*	1613
1159	Xamazla	*San Antonio*	150	*pipa*	1613
1159	Xamazla	*San Antonio*	775	*botija*	1613
1162	Cartegena	*San Juan Bautista*	2160	*botija*	1615
1162	Cartegena	*San Juan Bautista*	30	*pipa*	1615
1162	Cartegena	*San Lorenzo*	18	*pipa*	1615
1162	Cartegena	*San Lorenzo*	810	*botija*	1615

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1162	Margarita	*Nra Sra de Consulación*	1120	*botija*	1615
1162	Nueva Cordova	*Sant Pedro*	3148	*botija*	1615
1162	Nueva Cordova	*Sant Pedro*	60	*pipa*	1615
1162	Santa Marta	*Nra Sra de Buen Viaje*	1260	*botija*	1615
1162	Santo Domingo	*Santa Ana y María*	1000	*botija*	1615
1162	South America	*Nra Sra de la Remedios*	300	*botija*	1615
1162	South America	*Nra Sra de la Remedios*	60	*pipa*	1615
1162	South America	*Nra Sra de la Guia y Guadalupe*	2705	*botija*	1615
1162	South America	*San Francisco*	1100	*botija*	1615
1162	South America	*San Francisco*	30	*pipa*	1615
1162	South America	*San Francisco de Buen Jesus*	4800	*botija*	1615
1162	South America	*San Martín*	2280	*botija*	1615
1162	South America	*San Martín*	40	*pipa*	1615
1162	South America	*Santa Ana María del Rosario*	400	*botija*	1615
1179	Campeche	*Nra Sra del Rosario*	640	*pipa*	1633
1179	Campeche	*Nra Sra del Rosario*	750	*botija*	1633
1179	Campeche	*Nra Sra de la Limpia Concepción*	1200	*botija*	1633
1179	Campeche	*Nra Sra de la Limpia Concepción*	142	*pipa*	1633
1179	Honduras	*Nra Sra de la Candelaria*	34	*pipa*	1633
1179	Honduras	*Nra Sra de la Candelaria*	4534	*botija*	1633
1179	Honduras	*Nra Sra de la Candelaria*	890	*botija**	1633
1179	New Spain	*Jesus, María y José*	3666	*botija*	1633
1179	New Spain	*Jesus, María y José*	387	*pipa*	1633
1179	New Spain	*Nra Sra de Iciar*	1090	*botija*	1633
1179	New Spain	*Nra Sra de Iciar*	712	*pipa*	1633
1179	New Spain	*Nra Sra de la Candelaria*	1450	*botija*	1633
1179	New Spain	*Nra Sra de la Candelaria*	3	*barril*	1633
1179	New Spain	*Nra Sra de la Candelaria*	694	*pipa*	1633
1179	New Spain	*Nra Sra de Regla*	2000	*botija*	1633
1179	New Spain	*Nra Sra de Regla*	287	*pipa*	1633
1179	New Spain	*San Buena Ventura*	100	*botija*	1633
1179	New Spain	*San Buena Ventura*	136	*pipa*	1633
1179	New Spain	*San Esteban*	125	*pipa*	1633
1179	New Spain	*San Esteban*	60	*botija*	1633
1179	New Spain	*San Juan Bautista*	100	*botija*	1633
1179	New Spain	*San Juan Bautista*	766	*pipa*	1633
1179	Puerto Rico	*San Diego*	200	*botija*	1633
1179	Puerto Rico	*San Diego*	36	*pipa*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*	200	*botija*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*	710	*pipa*	1633
1180	Margarita	*San Onofre*	4500	*botija*	1634
1180	Santa Marta	*Nra Sra de Candelaria y San Francisco*	1800	*botija*	1634
1180	South America	*Nra Sra de la Encarnación*	1300	*botija*	1634
1180	South America	*Jesus, María y José*	1600	*botija*	1634
1180	South America	*Jesus, María y José*	40	*pipa*	1634
1180	Venezuela	*Nra Sra de la Encarnación*	3200	*botija*	1634
1453	Florida	*La Encarnación y San Bernardo*	2500	*botija*	1646
1193	Buenos Aires	*Nra Sra de Buen Sucejo*	49	*pipa*	1647
1193	Buenos Aires	*Nra Sra de Buen Sucejo*	950	*botija*	1647
1193	Buenos Aires	*Sanctissima Trinidad*	1500	*botija*	1647
1193	Campeche	*Nra Sra del Rosario* y *San Antonio*	975	*botija*	1647
1193	Caracas	*El Porfeta*	20	*pipa*	1647

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1193	Caracas	*El Porfeta*	420	*botija*	1647
1193	Caracas	*San Francisco de Asis*	3	*pipa*	1647
1193	Caracas	*San Francisco de Asis*	300	*botija*	1647
1193	Cuba	*Nra Sra del Rosario*	1570	*botija*	1647
1193	Guayana	*San Francisco de Paula*	1400	*botija*	1647
1193	Havana	*Nra Sra de la Incarnación*	10	*pipa*	1647
1193	Havana	*Nra Sra de la Encarnación*	400	*botija*	1647
1193	Havana	*Nra Sra de los Reyes y San Francisco*	1400	*botija*	1647
1193	Havana	*Nra Sra de los Reyes y San Francisco*	20	*pipa*	1647
1193	Honduras	*La Santissima Trinidad*	300	*botija#*	1647
1193	Honduras	*La Santissima Trinidad*	6200	*botija*	1647
1193	Puerto Rico	*San Cosme y Sandamian*	1000	*botija*	1647
1193	Puerto Rico	*San Cosme y Sandamian*	31	*pipa*	1647
1193	South America	*El Triunfo de la Cruz*	900	*botija*	1647
1193	South America	*Nra Sra de Copa Cabana*	36	*pipa*	1647
1193	South America	*Nra Sra de la Estrella*	800	*botija*	1647
1193	South America	*Nra Sra del Rosario*	1000	*botija*	1647
1193	South America	*Nra Sra del Rosario*	16	*pipa*	1647
1193	South America	*San Joseph*	1500	*botija*	1647
1193	South America	*San Joseph*	6	*pipa*	1647
1194	New Spain	*Nra Sra del Rosario*	1700	*botija*	1648
1194	New Spain	*Nra Sra del Rosario*	50	*pipa*	1648
1194	New Spain	*San Francisco*	400	*botija*	1648
1194	New Spain	*San Lenaro*	121	*pipa*	1648
1194	New Spain	*San Lenaro*	50	*botija*	1648
1194	New Spain	*San Nicolas de Corta Barria*	60	*pipa*	1648
1194	Venezuela	*Cristo Santo Alto de San Román*	2100	*botija*	1648
1453	Florida	*La Encarnación y San Bernardo*	2500	*botija*	1648
1618	South America	*Jesus, María, y Joseph*	600	*botija*	1660
1618	South America	*Nra Sra de la Soledad*	1000	*botija*	1662
1618	South America	*La Santissima Trinidad*	1500	*botija*	1664
1618	South America	*Nra Sra del Rosario*	400	*botija*	1666
1618	South America	*Nra Sra del Carmen*	1400	*botija*	1672
1618	South America	*Nra Sra del Carmen*	48	*pipa*	1672
1618	South America	*El Rey Niño*	700	*botija*	1673
1618	South America	*Santo Cristo de Lezo*	50	*pipa*	1673
1618	South America	*Santo Cristo de Lezo*	500	*botija*	1673
1618	South America	*El Rey David*	3500	*botija*	1674
1618	South America	*Santa Ana*	350	*botija*	1674
1618	South America	*Nra Sra del Rosario*	600	*botija*	1677
1229	New Spain	*El Francisco de Paula*	82	*pipa*	1678
1229	New Spain	*El Gran San Pablo*	200	*botija*	1678
1229	New Spain	*El Gran San Pablo*	264	*pipa*	1678
1229	New Spain	*El Nms, Sacramento*	30	*pipa*	1678
1229	New Spain	*El Nms, Sacramento*	3550	*botija*	1678
1229	New Spain	*Jesus Nazareno*	254	*pipa*	1678
1229	New Spain	*Nra Sra de Regla*	154	*pipa*	1678
1229	New Spain	*Nra Sra del Rosario, San Nicolas*	212	*pipa*	1678
1229	New Spain	*Nra Sra del Rosario y Animas*	100	*botija*	1678
1229	New Spain	*Nra Sra del Rosario y Animas*	124	*pipa*	1678
1229	New Spain	*San Ignacio de Loyola*	80	*pipa*	1678
1229	New Spain	*Santa Cruz*	166	*pipa*	1678

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1229	New Spain	*Santa Cruz*	36	*barril*	1678
1229	New Spain	*Santa Theresa*	12	*barril*	1678
1229	New Spain	*Santa Theresa*	164	*pipa*	1678
1229	New Spain	*Nra Sra de la Asunción*	150	*pipa*	1678
1231	South America	*Nra Sra de Populo*	900	*botija*	1678
1231	South America	*Nra Sra de la Antigua*	275	*pipa*	1678
1231	South America	*Nra Sra de la Antigua*	350	*botija*	1678
1231	South America	*Nra Sra de la Concepción*	1680	*botija*	1678
1231	South America	*Nra Sra de la Concepción*	500	*botija#*	1678
1258	South America	*La Santissima Trinidad*	200	*botija*	1695
1258	South America	*Nra Sra de Guadalupe*	474	*botija*	1695
1258	South America	*Nra Sra del Rosario*	950	*botija*	1695
1264	New Spain	*El Santo Cristo del Buen Viaje*	40	*barril*	1699
1264	New Spain	*El Santo Cristo del Buen Viaje*	50	*pipa*	1699
1264	New Spain	*Nra Sra de la Soledad*	6	*barril*	1699
1264	Vera Cruz	*Jesus, María y Joseph*	46	*pipa*	1699
1264	Vera Cruz	*Jesus, María y Joseph*	72	*barril*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	50	*barril*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	68	*pipa*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	90	*botija*	1699
1453	Florida	*Nra Sra de la Concepción*	875	*botija*	1704
1453	Florida	*Nra Sra de Gracia*	200	*botija*	1705
1288	New Spain	*La Reina de los Angeles*	1	*barril*	1720
1288	New Spain	*La Santa Familia*	261	*barril*	1720
1288	New Spain	*Nra Sra de la Regla*	5	*pipa*	1720
1288	Vera Cruz	*La Santissima Trinidad*	33	*pipa*	1720
1288	Vera Cruz	*La Santissima Trinidad*	500	*bota*	1720
1288	Vera Cruz	*La Santissima Trinidad*	842	*barril*	1720
1291	Cartegena	*San Juan Bautista, Santa Polonia*	1178	*botija*	1721
1291	Cartegena	*San Juan Bautista, Santa Polonia*	20	*barril*	1721
1291	South America	*El Angel de la Guarda*	420	*botijuela*	1721
1291	South America	*El Angel de la Guarda*	4990	*botija*	1721
1291	South America	*El Angel de la Guarda*	7	*barril*	1721
1291	South America	*El Santo Cristo de San Román*	1750	*botija*	1721
1291	South America	*El Señor San Joseph*	500	*botija*	1721
1291	South America	*Nra Sra de la Begona San Antonio*	3410	*botija*	1721
1291	South America	*Nra Sra de los Milagros*	100	*botija*	1721
1291	South America	*Nra Sra del Rosario San Cristoval*	860	*botija*	1721
1291	South America	*San Francisco Xavier*	128	*barril*	1721
1291	South America	*San Francisco Xavier*	675	*botija*	1721
1361	?	*Nra Sra del Rosario*	500	*botija*	1737
1361	San Juan	*Nra Sra de la Canidad*	100	*barril*	1737
1361	South America	*El Infante Phelipe*	650	*botija*	1737
1361	South America	*Nra Sra de Velem, San Francisco*	150	*botija*	1737
1361	South America	*Nra Sra del Rosario*	1750	*botija*	1737
1361	South America	*San Francisco de Paula*	1000	*botijuela*	1737
1361	South America	*San Francisco de Paula*	2035	*botija*	1737
1371	Vera Cruz	*Santa Theresa*	234	*pipa*	1739
1371	Vera Cruz	*Santa Theresa*	30	*quarterola*	1739
1371	Vera Cruz	*Santa Theresa*	891	*barril*	1739
1372	New Spain	*San Joseph (alias El Oriente)*	1	*pipa*	1739
1372	New Spain	*San Joseph (alias El Oriente)*	150	*barril*	1739

Commercial Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1396	Vera Cruz	*La Purissima Concepción*	22	*pipa*	1760
1396	Vera Cruz	*La Purissima Concepción*	747	*barril*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	1232	*barril*	1760
1398	Vera Cruz	*La Nueva España*	35	*quarterola*	1760
1398	Vera Cruz	*La Nueva España*	775	*barril*	1760
1656	Cartegena	*La Concepción*	20	*barril*	1760
1656	Cartegena	*Nra Sra del Buen Viaje*	5498	*botija*	1760
1656	Cartegena	*Nra Sra del Buen Viaje*	575	*barril*	1760
1656	Cartegena	*Nra Sra del Buen Viaje*	990	*limeta*	1760
1656	Cartegena	*San Pedro*	150	*frasquera*	1760
1656	Cartegena	*San Pedro*	16	*pipa*	1760
1656	Cartegena	*San Pedro*	2360	*botija*	1760
1656	Cartegena	*San Pedro*	590	*barril*	1760
1588	New Spain	*La Concepción*	1044	*barril*	1778
1588	New Spain	*La Concepción*	2	*barrilito*	1778
1588	New Spain	*La Concepción*	20	*pipa*	1778
1588	New Spain	*Nra Sra del Rosario*	10 cajitas	*botella*	1778
1588	New Spain	*Nra Sra del Rosario*	2	*pipa*	1778
1588	New Spain	*Nra Sra del Rosario*	2490	*barril*	1778
1588	New Spain	*San Cristoval*	796	*barril*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	625	*barril*	1778
1674	Cartegena	*La Fortuna*	36	*barrilito*	1778
1674	Cartegena	*La Purisima Concepción*	38	*barril*	1778
1674	Cartegena	*La Purisima Concepción*	5000	*botija*	1778

Commercial Olive Oil

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1079	?	unknown (no. 10)		40	*botija*	1523
1079	Cuba, Santo Domingo	*San Vicente*		250		1523
1079	Las Indias	*Santa María*		144		1523
1079	New Spain	*Santa María Cor? Blanca*		13		1523
1079	Puerto Rico	unknown (no. 2)		183		1523
1079	Puerto Rico	unknown (no. 2)		100	*botija*	1523
1079	*San Juan*, Santo Domingo	*Santa María*		32		1523
1079	*San Juan*, Santo Domingo	*Santa María*		80		1523
1079	*San Juan*, Santo Domingo	*Santa María*		40	*botija*	1523
1079	*San Juan*, Santo Domingo	*Santa María*		80	*botija*	1523
1079	*San Juan*, Santo Domingo	*Santa María*	1		*botija*	1523
1079	*San Juan*, Santo Domingo	*Santa María*	6		*botija*	1523
1079	Santo Domingo	unknown (no. 9)		50		1523
1079	Santo Domingo	*Santa María de la Ynerila*		250	*botija*	1523
1079	Santo Domingo	*Santa María Madelena*	1		*? de mq*	1523
1079	Santo Domingo	*Santa María Madelena*	1		*? de q*	1523
1079	Santo Domingo	*Santa María Madelena*		80	*botija*	1523
1079	Santo Domingo	*Santa María Madelena*	8	199	*botija*	1523
1079	Santo Domingo	*Santa María Madelena*	12		*botija mar*	1523
1079	Santo Domingo	unknown (no. 2)	8		*botija*	1523
1079	Santo Domingo	unknown (no. 2)	10		*botija*	1523
1079	Santo Domingo	unknown (no. 2)		30	*botija mar*	1523
1079	Santo Domingo	*Santa María de la Concepción*			*botija 1.5*	1523
1079	Nombre de Dios	*Santa Aqueda*		50		1530
1079	Nombre de Dios	*Santa Aqueda*	120	60	*botija*	1542
1079	Cuba	*María de Guadalupe*		65		1545
1079	Cuba	*María de Guadalupe*	30		*botija mar*	1545
1079	El Cabo *de* lor Velor?	*La Vitoria*		100		1545
1079	El Cabo *de* lor Velor?	*La Vitoria*		100	*botija*	1545
1079	El Cabo *de* lor Velor?	*La Vitoria*		100	*botija mar*	1545
1079	Nombre de Dios	*San Bartolome*		80		1545
1079	Nombre de Dios	*San Juan*	100	50	*botija*	1545
1079	Nombre de Dios	*San Juan*	180	80	*botija*	1545
1079	Nombre de Dios	*San Juan*		40	*botija mar*	1545
1079	Nombre de Dios	*Sant Antonio*		50		1545
1079	Nombre de Dios	*Sant Antonio*		80	*botija mar*	1545
1079	Nombre de Dios	*Sant Antonio*	84	42	*botija mar*	1545
1079	Nombre de Dios	*Sant María de la Luz*		140		1545
1079	Nombre de Dios	*Sant María de la Luz*		70	*botija*	1545
1079	Nombre de Dios	*Sant María de la Luz*	220		*botija mar*	1545
1079	Puerto Rico	*San Bartolome*		100		1545
1079	Puerto Rico	*San Bartolome*	80	40	*botija mar*	1545
1079	Santo Domingo	*San Antonio*		40		1545
1079	Santo Domingo	*San Antonio*		80		1545
1079	Santo Domingo	*San Antonio*	60	30	*botija*	1545
1079	Santo Domingo	*San Antonio*		199	*botija mar*	1545
1079	Santo Domingo	*San Salvador*		470		1545
1079	Santo Domingo	*San Salvador*		80	*botija*	1545
1079	Santo Domingo	*San Salvador*		40	*botija mar*	1545
1079	Santo Domingo	*Santa Espiritus*		10		1545

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1079	Santo Domingo	*Santa Espiritus*		70	*botija mar*	1545
1079	Santo Domingo	*Santa Espiritus*	120		*botija mar*	1545
1079	Santo Domingo	*Santa María de Guadalupe*		100	*botija*	1545
1079	Santo Domingo	*Santa María de Guadalupe*		180	*botija*	1545
1079	Vera Cruz	*San Salvador*	740	370	*botija mar*	1545
1079	Vera Cruz	*Santa Cruz*		180		1545
1079	Vera Cruz	*Santa Cruz*	120	60	*botija*	1545
1079	Vera Cruz	*Santa Cruz*		50	*botija mar*	1545
1079	Vera Cruz	*Santa Cruz*	100	50	*botija mar*	1545
1079	Vera Cruz	*Santa Cruz*	200	100	*botija mar*	1545
1079	Honduras	*Los Tres Reyes Magos*		4		1557
1079	Honduras	*Los Tres Reyes Magos*		10		1557
1079	Honduras	*Los Tres Reyes Magos*		20		1557
1079	Honduras	*Los Tres Reyes Magos*		40		1557
1079	Honduras	*Los Tres Reyes Magos*	20	10	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	25	16	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	30	15	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	40	20	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	120	60	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	6		*botija mar*	1557
1079	Honduras	*Los Tres Reyes Magos*	20		*botija mar*	1557
1079	Honduras	*Los Tres Reyes Magos*	50		*botija mar*	1557
1079	Honduras	*Los Tres Reyes Magos*	160		*botija mar*	1557
1080	Cartegena	*San Miguel*	100	50	*botija*	1583
1080	Cartegena	*San Miguel*	100	50	*botija mar*	1583
1080	Cartegena	*San Miguel*	100	50	*botijuela m*	
1080	Nombre de Dios	*San Miguel*		50		1583
1080	Nombre de Dios	*San Miguel*		100		1583
1080	Nombre de Dios	*San Miguel*		150		1583
1080	Nombre de Dios	*San Miguel*		50	*botija*	1583
1080	Nombre de Dios	*San Miguel*	160	80	*botija*	1583
1080	Nombre de Dios	*San Miguel*	200		*botija*	1583
1080	Nombre de Dios	*San Miguel*	500		*botija*	1583
1080	Nombre de Dios	*San Miguel*		25	*botija mar*	1583
1080	Nombre de Dios	*San Miguel*		160	*botija mar*	1583
1080	Nombre de Dios	*San Miguel*	292	146	*botija mar*	1583
1080	New Spain	*San Miguel*		30		1583
1080	New Spain	*San Miguel*	200	100	*botija*	1583
1080	South America	*El Espiritu Santo*		100		1583
1080	South America	*El Espiritu Santo*		200		1583
1080	South America	*El Espiritu Santo*	6	3	*botija*	1583
1080	South America	*El Espiritu Santo*	80	40	*botija*	1583
1080	South America	*El Espiritu Santo*	100	50	*botija*	1583
1080	South America	*El Espiritu Santo*	200	100	*botija*	1583
1080	South America	*El Espiritu Santo*	458	229	*botija*	1583
1080	South America	*El Espiritu Santo*	30		*botija mar*	1583
1080	South America	*El Espiritu Santo*	160	80	*botija mar*	1583
1080	South America	*El Espiritu Santo*	230		*botija mar*	1583
1080	South America	*El Espiritu Santo*	292	146	*botija mar*	1583
1080	South America	*El Espiritu Santo*	400	200	*botija mar*	1583
1080	South America	*El Espiritu Santo*	500		*botija mar*	1583

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1080	South America	*El Espiritu Santo*	200	100	*botijuela*	1583
1081	Nombre de Dios	*La Santissima Trinidad*	12	6	*botija*	1584
1081	Nombre de Dios	*La Santissima Trinidad*	20	10	*botija*	1584
1081	Nombre de Dios	*La Santissima Trinidad*	400	200	*botija*	1584
1081	Nombre de Dios	*Nra Sra de la Candelaria*		25		1584
1081	Nombre de Dios	*Nra Sra de la Candelaria*	120	60	*botija*	1584
1082	New Spain	*La María*		200	*botija mar*	1586
1082	New Spain	*Sant Joan*	500	250	*botija mar*	1586
1082	New Spain	*Santa Catalina*	400	200	*botija*	1586
1453	Florida	*Nra Sra de la Esperanza*		50		1586
1089	Havana, Campeche	*Nra Sra de la Victoria*		30		1590
1089	Honduras	*San Francisco*	20	10	*botija*	1590
1089	Honduras	*San Francisco*	40	20	*botija*	1590
1089	Honduras	*San Francisco*		15	*botija mar*	1590
1089	New Spain	?		97	*botija*	1590
1089	New Spain	*La Concepción*	400	200	*botija mar*	1590
1089	New Spain	*San Juan*		144		1590
1089	New Spain	*San Juan*		40	*botija mar*	1590
1089	New Spain	*Santa Ana y Santa Catalina*		30	*botija*	1590
1089	New Spain	*Santa Ana y Santa Catalina*		68	*botija*	1590
1089	New Spain	*Santa Catalina*	150	71	*botija mar*	1590
1089	New Spain	*Santa Catalina*	140	35	*botija qa*	1590
1089	New Spain	*Santa Susana*		300	*botija mar*	1590
1089	Santo Domingo	*Santa Ana*		10		1590
1089	Santo Domingo	*Santa Ana*		15		1590
1089	Santo Domingo	*Santa Ana*	40	20	*botija*	1590
1089	Santo Domingo	*Santa Ana*		10	*botija mar*	1590
1089	Santo Domingo	*Santa Ana*		30	*botija mar*	1590
1089	Santo Domingo	*Santa Ana*	100	50	*botija mar*	1590
1094	Nombre de Dios	*San Francisco*		80		1591
1094	Nombre de Dios	*San Francisco*		200	*botija*	1590
1094	San Juan	*Nra Sra de Concepción*		200		1591
1094	San Juan	*Nra Sra de Concepción*	120	60	*botija mar*	1591
1094	South America	*La Encarnación*	200	100	*botija*	1591
1094	South America	*La Encarnación*		50	*botija mar*	1591
1094	South America	*La Encarnación*	400	200	*botija mar*	1591
1094	South America	*San Pedro*		100		1591
1094	South America	*San Pedro*		20	*botija*	1591
1094	South America	*San Pedro*	346	173	*botija*	1591
1094	South America	*San Pedro*	160	80	*botija mar*	1591
1094	South America	*San Pedro*	320		*botija mar*	1591
1094	South America	*San Pedro*	1739		*botija mar*	1591
1094	South America	*San Pedro*		80		1591
1094	South America	*Santo Antonio*		70		1591
1094	South America	*Santo Antonio*		200	*botija mar*	1591
1094	South America	*Santo Antonio*	50		*botija mar*	1591
1094	South America	*Santo Antonio*	400	200	*botija mar*	1591
1453	Florida	*Santa Catalina*		50		1592
1453	Florida	*Santiago*		500	*botija mar*	1594
1453	Florida	*Santiago*	726	373	*botijuela*	1594
1121	Havana	*Los Tres Reyes*		50		1596

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1121	Havana	*Los Tres Reyes*	200	100	*botija*	1596
1121	Havana	*Los Tres Reyes*		60	*botija mar*	1596
1121	Havana	*Santa Ana*		30	*botija*	1596
1121	New Spain	*Nra Sra de la Esperanza*		100		1596
1121	New Spain	*Nra Sra de la Esperanza*		200		1596
1121	New Spain	*Nra Sra de la Esperanza*		130	*botija mar*	1596
1121	New Spain	*Nra Sra de la Esperanza*	100	50	*botija mar*	1596
1121	New Spain	*Nra Sra de la Esperanza*	200	100	*botija mar*	1596
1121	New Spain	*Nra Sra de la Esperanza*	400	200	*botija mar*	1596
1121	New Spain	*Nra Sra de la Esperanza*	4		*botija p*	1596
1121	New Spain	*Nra Sra de la Esperanza*		50	*botijuela*	1596
1453	Florida	*Santa Ana*		500		1596
1453	Florida	*Santa Ana*		270	*botija*	1596
1453	Florida	*Santa Ana*		400	*botija*	1596
1453	Florida	*Santa Ana*	400	200	*botija*	1596
1121	New Spain	*La Esperanza*		100	*botija mar*	1597
1121	New Spain	*La María*		248	*botija mar*	1597
1121	New Spain	*Sant Juan Bautista Colorado*	100	50	*botija*	1597
1121	New Spain	*Sant Juan Bautista Colorado*		80	*botija mar*	1597
1121	New Spain	*Sant Juan Bautista Colorado*	400	200	*botija mar*	1597
1126	South America	*La Trinidad*		100		1597
1126	South America	*La Trinidad*		40	*botija*	1597
1126	South America	*La Trinidad*	200	100	*botija*	1597
1126	South America	*La Trinidad*		30	*botija mar*	1597
1126	South America	*La Trinidad*	200	100	*botija mar*	1597
1126	South America	*Nra Sra de la Agustia*		388		1597
1126	South America	*Nra Sra de la Agustia*	200	100	*botija*	1597
1126	Margarita	*Nra Sra del Rosario*		10		1598
1126	Margarita	*Nra Sra del Rosario*		28		1598
1126	Margarita	*Nra Sra del Rosario*		50		1598
1126	Margarita	*Nra Sra del Rosario*	30	9	*botija*	1598
1126	Margarita	*Nra Sra del Rosario*		5	*botija mar*	1598
1126	Santa Marta	*Espiritu Santo*	120		*botija mar*	1598
1126	Santa Marta	*Espiritu Santo*	200		*botija mar*	1598
1126	South America	*Nra Sra de la Concepción*		120	*botija mar*	1598
1126	South America	*Nra Sra del Rosario*		100		1598
1126	South America	*Nra Sra del Rosario*		108		1598
1126	Venezuela	*Sant Pedro*		20		1598
1453	Florida	*Nra Sra del Rosario*		600	*botija mar*	1607
1453	Florida	*Nra Sra del Rosario*	600	300	*botija mar*	1607
1159	Cuimate	*Santa Ana y San Antonio*		150		1613
1159	Cuimate	*Santa Ana y San Antonio*		100	*botija mar*	1613
1159	Honduras	*San Joseph*		25	*botija mar*	1613
1159	Honduras	*San Joseph*		55	*botija mar*	1613
1159	Honduras	*San Joseph*		80	*botija mar*	1613
1159	New Spain	*San Pedro*		200	*botija*	1613
1159	New Spain	*San Pedro*		200	*botija mar*	1613
1159	Santo Domingo	*La Majestad de los Remedios*		20	*botija mar*	1613
1159	Santo Domingo	*Nra Sra de la Candelaria*	700	350	*botija mar*	1613
1162	Cartegena	*San Juan Bautista*	200	100	*botijuela*	1613
1162	La Margarita	*Nra Sra de Consulación*		110	*botija mar*	1615

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1162	Nueva Cordova	*Sant Pedro*		160	*botija mar*	1615
1162	South America	*San Francisco*		100	*botija mar*	1615
1162	South America	*San Francisco*	400	200	*botija mar*	1615
1162	South America	*San Francisco*	100	50	*botija mar*	1615
1162	South America	*San Francisco de Buen Jesus*		240	*botija mar*	1615
1162	South America	*San Martín*		160	*botija mar*	1615
1162	South America	*San Martín*	400	200	*botija mar*	1615
1162	South America	*Santa Ana María del Rosario*		70	*botija mar*	1615
1179	Campeche, Venezuela	*Nra Sra del Rosario*		100	*botija mar*	1633
1179	Honduras	*Nra Sra de la Candelaria*		70		1633
1179	New Spain	*Jesus, María y José*		700	*botija mar*	1633
1179	New Spain	*Jesus, María y José*		800	*botija mar*	1633
1179	New Spain	*Jesus, María y José*	200	100	*botija mar*	1633
1179	New Spain	*Nra Sra de Iciar*		10		1633
1179	New Spain	*Nra Sra de Iciar*		200		1633
1179	New Spain	*Nra Sra de Iciar*		100	*botija mar*	1633
1179	New Spain	*Nra Sra de Iciar*	1000	500	*botija mar*	1633
1179	New Spain	*Nra Sra de Iciar*	3000	1150	*botija mar*	1633
1179	New Spain	*San Buena Ventura*		120	*botija mar*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*		8	*botija*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*		500	*botija*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*	400	200	*botija mar*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*		300	*botijuela m*	1633
1180	Margarita	*San Onofre*	200	100	*botija mar*	1634
1180	South America	*Jesus, María y José*	12	6	*botija*	1634
1180	Venezuela	*Nra Sra de la Encarnación*		10		1634
1180	Venezuela	*Nra Sra de la Encarnación*		20		1634
1180	Venezuela	*Nra Sra de la Encarnación*		50		1634
1453	Florida	*La Encarnación y San Bernardo*	1000	500	*botijuela*	1646
1193	Cuba	*Nra Sra del Rosario*		50		1647
1193	Guayana	*San Francisco de Paula*	200	100	*botijuela*	1647
1193	Havana	*Nra Sra de Los Reyes*		100		1647
1193	South America	*Nra Sra del Rosario*	100		*botija mar*	1647
1193	South America	*San Joseph*	200	100	*botijuela m*	1647
1194	New Spain	*San Lenaro*	100	50	*botijuela m*	1647
1194	New Spain	*San Nicolas de Corta Barria*		400	*botija mar*	1648
1194	New Spain	*San Nicolas de Corta Barria*		50	*botijuela m*	1648
1194	New Spain	*San Nicolas de Corta Barria*		1500	*botijuela m*	1648
1453	Florida	*La Encarnación y San Bernardo*		250		1648
1618	South America	*Jesus, María y Joseph*		100		1660
1618	South America	*Sant Antonio*		300	*botijuela m*	1672
1618	South America	*El Rey David*		500	*botija*	1674
1618	South America	*Nra Sra del Rosario*		200	*botijuela*	1677
1229	New Spain	*El Francisco de Paula*		400	*botijuela*	1678
1229	New Spain	*El Francisco de Paula*	400	200	*botijuela*	1678
1229	New Spain	*El Francisco de Paula*	300	150	*botijuela m*	1678
1229	New Spain	*El Gran San Pablo*		100	*botija*	1678
1229	New Spain	*El Gran San Pablo*		400	*botija*	1678
1229	New Spain	*El Gran San Pablo*		100	*botijuela*	1678
1229	New Spain	*El Gran San Pablo*		250	*botijuela*	1678
1229	New Spain	*Nra Sra del Regla*		150	*botijuela*	1678
1229	New Spain	*Nra Sra del Regla*	200	100	*botijuela*	1678

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1229	New Spain	*Nra Sra del Rosario*		250	*botijuela*	1678
1229	New Spain	*Nra Sra del Rosario*		350	*botija*	1678
1229	New Spain	*Nra Sra del Rosario*		100	*botija*	1678
1229	New Spain	*Nra Sra del Rosario*	1000	500	*botijuela*	1678
1229	New Spain	*Nra Sra del Rosario*		125	*botijuela m*	1678
1229	New Spain	*San Ignacio de Loyola*		150	*botijuela m*	1678
1229	New Spain	*Santa Cruz*		8082	*botijuela m*	1678
1229	New Spain	*Santa Theresa*		91	*botija*	1678
1229	New Spain	*Nra Sra de la Asunción*		300	*botijuela*	1678
1229	New Spain	*Nra Sra de la Asunción*	1000	500	*botijuela*	1678
1231	South America	*Nra Sra de la Antigua y las Animas*		200	*botijuela m*	1678
1231	South America	*Nra Sra del Pilar de Zaragoza*		600		1678
1258	South America	*Nra Sra del Rosario y Las Animas*	400		*botijuela m*	1695
1264	New Spain	*El Santo Cristo del Buen Viaje*		50	*botijuela m*	1699
1264	New Spain	*Nra Sra de la Soledad*	325		*botijuela*	1699
1264	New Spain	*Nra Sra de la Soledad*		250	*botijuela m*	1699
1264	New Spain	*Nra Sra de la Soledad*		700	*botijuela m*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	278		*botijuela3*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*		300	*botijuela m*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	1500		*botijuela m*	1699
1453	Florida	*Nra Sra de la Concepción*		200	*botijuela m*	1704
1288	New Spain	*La Reina de los Angeles*	301		*botijuela5*	1720
1288	New Spain	*La Reina de los Angeles*	2000	800	*botijuela5*	1720
1288	New Spain	*La Reina de los Angeles*	200	100	*botijuela m*	1720
1288	New Spain	*La Reina de los Angeles*	300	150	*botijuela m*	1720
1288	New Spain	*La Santa Familia y San Francisco*	1000		*botijuela5*	1720
1288	New Spain	*La Santa Familia y San Francisco*		500	*botijuela m*	1720
1288	South America	*Nra Sra de Regla, San Francisco*	300	120	*botijuela q*	1720
1288	Vera Cruz	*La Santissima Trinidad*	420	200	*botijuela*	1720
1288	Vera Cruz	*La Santissima Trinidad*	500	200	*botijuela*	1720
1288	Vera Cruz	*La Santissima Trinidad*	1950	975	*botijuela*	1720
1288	Vera Cruz	*La Santissima Trinidad*	300		*botijuela5*	1720
1288	Vera Cruz	*La Santissima Trinidad*	500		*botijuela5*	1720
1291	South America	*El Angel de la Guarda*		120	*botija 5*	1721
1291	South America	*El Angel de la Guarda*	200		*botija r*	1721
1291	South America	*El Angel de la Guarda*	200	80	*botijuela*	1721
1291	South America	*El Angel de la Guarda*	500	200	*botijuela*	1721
1291	South America	*El Angel de la Guarda*	1500	420	*botijuela*	1721
1291	South America	*El Angel de la Guarda*		450	*botijuela m*	1721
1291	South America	*El Santo Cristo de San Román*	550		*botija mar*	1721
1291	South America	*El Santo Cristo de San Román*		120	*botijuela5*	1721
1291	South America	*El Señor Joseph*	400	170	*botija*	1721
1291	South America	*El Señor Joseph*	3000		*botija mar*	1721
1291	South America	*El Señor Joseph*	1000	500	*botijuela m*	1721
1291	South America	*Nra Sra de la Begoña, San Antonio*	600	300	*botijuela m*	1721
1291	South America	*Nra Sra de los Milagros*	24		*botija mar*	1721
1291	South America	*San Francisco* Xavier	300		*botija 5*	1721
1361	San Juan	*Nra Sra de la Canidad y las Animas*	200		*botija 5*	1737
1361	South America	*San Francisco de Paula*	500		*botija mar*	1737
1361	South America	*San Francisco de Paula*	1000		*botijuela m*	1737
1371	Vera Cruz	*Santa Theresa*	400		*botija*	1739

Commercial Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1371	Vera Cruz	*Santa Theresa*	500		*botija*	1739
1371	Vera Cruz	*Santa Theresa*	315		*botijuela*	1739
1371	Vera Cruz	*Santa Theresa*	1200		*botijuela*	1739
1371	Vera Cruz	*Santa Theresa*	1300		*botijuela*	1739
1371	Vera Cruz	*Santa Theresa*	2600		*botija*	1739
1372	New Spain	*San Joseph (alias el Oriente)*	400	200	*botija*	1739
1373	New Spain	*La Divina Pastora*	400	200	*botija mar*	1739
1396	Vera Cruz	*La Purissimma Concepción*	171		*botijuela m*	1760
1396	Vera Cruz	*La Purissimma Concepción*	252		*botijuela m*	1760
1396	Vera Cruz	*La Purissimma Concepción*	459		*botijuela m*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	100		*botijuela m*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	396		*botijuela m*	1760
1398	Vera Cruz	*La Nueva España*	246		*botija mar*	1760
1398	Vera Cruz	*La Nueva España*	441		*botija mar*	1760
1398	Vera Cruz	*La Nueva España*	26		*botijuela m*	1760
1398	Vera Cruz	*La Nueva España*	300		*botijuela m*	1760
1398	Vera Cruz	*La Nueva España*	387		*botijuela m*	1760
1398	Vera Cruz	*La Nueva España*	531		*botijuela m*	1760
1398	Vera Cruz	*La Nueva España*	566		*botijuela m*	1760
1656	Cartegena	*La Concepción*	6		*botija*	1760
1656	Cartegena	*San Pedro*	500	250	*botijuela m*	1760
1656	Cartegena	*San Pedro*	700	350	*botijuela m*	1760
1656	Cartegena	*San Pedro*	1500		*botijuela m*	1760
1588	Vera Cruz	*La Concepción*	800		*botijuela m*	1778
1588	Vera Cruz	*La Concepción*	4000		*botijuela m*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	8000		*botijuela m*	1778
1588	Vera Cruz	*San Cristoval*	6	2	*botija*	1778
1588	Vera Cruz	*San Cristoval*	100		*botijuela m*	1778
1588	Vera Cruz	*San Cristoval*	2000		*botijuela m*	1778
1588	Vera Cruz	*San Cristoval*	3000		*botijuela m*	1778
1588	Vera Cruz	*San Joseph*	2880	1000	*botijuela*	1778
1588	Vera Cruz	*San Joseph*	20		*botijuela m*	1778
1588	Vera Cruz	*San Joseph*	1000		*botijuela m*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	750	325	*botijuela*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	1000	500	*botijuela*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	1200	600	*botijuela*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	2738	1350	*botijuela*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	4000	2000	*botijuela*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	20		*botijuela m*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	1200		*botijuela m*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	1300		*botijuela m*	1778
1674	Cartegena	*La Fortuna*	1500	600	*botijuela*	1778
1674	Cartegena	*La Purissima Concepción*	100		*botijuela m*	1778

Commercial Vinegar

Legajo	Destination	Name of Ship	Qty	Container	Year
1079	Cuba, Santo Domingo	*San Vicente*	8	*botija*	1523
1079	Cuba, Santo Domingo	*San Vicente*	4	*pipa*	1523
1079	New Spain	*Santa María Cor? Blanca*	4	*pipa*	1523
1079	Santo Domingo	*Santa María Madelena*	12	*botija mar*	1523
1079	Santo Domingo	*Santa María Madelena*	2	*pipa*	1523
1079	Santo Domingo	*Santa María Madelena*	1	*quarto*	1523
1079	Santo Domingo	unknown (no. 2)	30	*botija*	1526
1079	Nombre de Dios	*Santa Aqueda*	50	*botija*	1542
1079	Nombre de Dios	*Santa Aqueda*	50	*botija p*	1542
1079	Cuba	*María de Guadalupe*	30	*botija*	1545
1079	Nombre de Dios	*San Juan*	45	*botija p*	1545
1079	Santo Domingo	*San Antonio*	45	*botija*	1545
1079	Santo Domingo	*San Antonio*	50	*botija p*	1545
1079	Santo Domingo	*Santa Espiritus*	145	*botija p*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	152	*botija p*	1545
1079	Vera Cruz	*Santa Cruz*	294	*botija p*	1545
1079	Honduras	*Los Tres Reyes Magos*	2	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	24	*botija p*	1557
1082	New Spain	*La María*	90	*botija p*	1586
1082	New Spain	*Sant Joan*	50	*botija p*	1586
1089	New Spain	*San Juan*	77	*botija*	1590
1089	New Spain	*San Juan*	107	*botija p*	1590
1089	Santo Domingo	*Santa Ana*	25	*botija p*	1590
1094	South America	*San Pedro*	303	*botija*	1591
1453	Florida	*Santiago*	80	*botija p*	1594
1453	Florida	*Santiago*	4	*pipa*	1594
1121	New Spain	*Nra Sra de la Esperanza*	50	*botija*	1596
1121	New Spain	*Nra Sra de la Esperanza*	10	*botija p*	1596
1121	New Spain	*Nra Sra de la Esperanza*	5	*pipa*	1596
1126	Santa Marta	*El Espiritu Santo*	300	*botija*	1598
1126	South America	*Nra Sra de Rosario*	200	*botija*	1598
1453	Florida	*Nra Sra del Rosario*	6	*pipa*	1607
1162	La Margarita	*Nra Sra de Consulación*	75	*botija p*	1615
1162	Santo Domingo	*Santa Ana y María*	200	*botija*	1615
1179	Honduras	*Nra Sra de la Candelaria*	30	*botija mar*	1633
1179	New Spain	*Jesus, María y José*	1200	*botija*	1633
1179	New Spain	*Nra Sra de la Candelaria*	300	*botija*	1633
1179	New Spain	*San Juan Bautista*	2200	*botija*	1633
1179	Vera Cruz	*San Juan Bautista y Santa Clara*	500	*botija*	1633
1180	South America	*Jesus, María y José*	6	*botija*	1633
1453	Florida	*La Encarnación y San Bernardo*	200	*botija*	1636
1193	Buenos Aires	*Nra Sra de Buen Sucejo*	50	*botija*	1647
1193	Caracas	*El Porfeta*	25	*botija*	1647
1193	Caracas	*San Francisco de Asis*	100	*botija*	1647
1193	South America	*San Joseph*	170	*botija*	1647
1453	Florida	*La Encarnación y San Bernardo*	200	*botija*	1648
1194	New Spain	*San Francisco*	400	*botija*	1648
1194	New Spain	*San Lenaro*	50	*botija*	1648
1194	New Spain	*San Lenaro*	10	*pipa*	1648
1618	unknown	*Santo Cristo de Lezo*	50	*barril 3a*	1673
1258	South America	*Nra Sra del Rosario*	500	*botija*	1695

Commercial Vinegar (cont.)

Legajo	Destination	Name of Ship	Qty	Container	Year
1264	Vera Cruz	*Nra Sra de los Remedios*	6	*barril*	1699
1288	New Spain	*La Reina de los Angeles*	240	*botija*	1720
1288	New Spain	*La Santa Familia*	20	*botija*	1720
1288	Vera Cruz	*La Santissima Trinidad*	200	*botija*	1720
1291	South America	*Nra Sra de la Begoña San Antonio*	100	*botija*	1721
1291	South America	*San Francisco Xavier*	100	*botija*	1721
1656	South America	*Nra Sra de* Velem, *San Francisco*	20	*pipa*	1737
1656	Cartegena	*La Concepción*	1	*botija gr*	1760
1397	Cartegena	*San Pedro*	18	*barril*	1760
1588	Vera Cruz	*Nra Sra de Buen Consejo*	5	*barril*	1760
1588	Vera Cruz	*La Concepción*	100	*barril*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	37	*barril*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	5	*pipa*	1778

Commercial Brandy

Legajo	Destination	Name of Ship	Quantity	Container	Year
1179	New Spain	*San Buena Venture*	300	*botija*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*	180	*botija*	1633
1180	Venezuela	*Nra Sra de la Encarnación*	20	*botijuela*	1634
1435	Florida	*La Encarnación y San Bernardo*	200	*botijuela*	1646
1193	Campeche	*Nra Sra del Rosario*	80	*pipa*	1647
1193	Caracas	*San Francisco de Asis*	1	*pipa*	1647
1193	Guayana	*San Francisco de Paula*	600	*botijuela*	1647
1193	Honduras	*La Santissima Trinidad*	500	*botijuela*	1647
1193	South America	*El Triunfo de la Cruz*	150	*botijuela*	1647
1193	South America	*Nra Sra del Rosario*	100	*botija*	1647
1193	South America	*San Joseph*	200	*botijuela*	1647
1194	New Spain	*San Francisco*	230	*botijuela*	1648
1194	New Spain	*San Nicolas de Corta Barria*	600	*botijuela$*	1648
1194	Venezuela	*Cristo Santo Alto de San Román*	200	*botijuela$*	1648
1618	South America	*Nra Sra de la Soledad*	600	*botijuela$*	1662
1618	?	*El Rey David*	300	*botijuela$*	1674
1229	New Spain	*El Gran San Pablo*	120	*barril*	1678
1229	New Spain	*El Gran San Pablo*	400	*botijuela*	1678
1229	New Spain	*Santa Theresa*	600	*botijuela*	1678
1231	South America	*Nra Sra de Popula*	1031	*botijuela*	1678
1231	South America	*Nra Sra de la Antigua*	60	*barril 3a*	1678
1231	South America	*Nra Sra de la Antigua*	20	*pipa*	1678
1264	New Spain	*El Santo Cristo del Bien Viaje*	135	*frasquera*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	115	*frasquera*	1699
1453	Florida	*Nra Sra de la Concepción*	375	*botijuela$*	1704
1288	New Spain		315	*barril*	1720
1288	New Spain	*La Santa Familia*	416	*barril*	1720
1288	New Spain	*Nra Sra de Regla*	296	*barril*	1720
1288	New Spain	*Nra Sra de Regla*	24	*frasquera*	1720
1288	New Spain	*Nra Sra de Regla*	22	*pipa*	1720
1288	Vera Cruz	*La Santissima Trinidad*	457	*barril*	1720
1288	Vera Cruz	*La Santissima Trinidad*	1	*frasquera*	1720
1288	Vera Cruz	*La Santissima Trinidad*	1300	limetta	1720
1288	Vera Cruz	*La Santissima Trinidad*	1	*pipa*	1720
1291	Cartegena	*La Santissima Trinidad*	300	*botija*	1720
1291	Cartegena	*San Juan Bautista, Santa Polonia*	26	*frasquera*	1721
1291	South America	*El Angel de la Guarda*	68	*barril*	1721
1291	South America	*El Angel de la Guarda*	4	*frasquera*	1721
1291	South America	*El Angel de la Guarda*	420	*botijuela*	1721
1291	South America	*El Santo Cristo de San Román*	200	*barril*	1721
1291	South America	*El Señor San Joseph*	200	*botijuela*	1721
1291	South America	*Nra Sra de la Begoña, San Antonio*	78	*barril*	1721
1291	South America	*San Francisco* Xavier	43	*barril*	1721
1291	South America	*San Francisco* Xavier	30	*botija mar*	1721
1291	South America	*San Francisco* Xavier	22	*frasquera*	1721
1453	Florida	*Jesus Nazareno*	12	*barril*	1731
1453	Florida	*Jesus Nazareno*	2	*bota*	1731
1453	Florida	*Jesus Nazareno*	8	*pipa*	1731
1361	Cumana	*San Antonio de Paula*	352	*barril*	1737
1361	Cumana	*San Antonio de Paula*	35	*frasquera*	1737
1361	San Juan	*Nra Sra de la Canidad*	4524	*botella*	1737
1361	San Juan	*Nra Sra de la Canidad*	64	*frasquera*	1737

Commercial Brandy (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1373	New Spain	*La Divina Pastora*	94	*barril*	1739
1372	New Spain	*San Joseph (El Oriente)*	256	*barril*	1739
1371	Vera Cruz	*Santa Theresa*	37	*barril*	1739
1656	Cartegena	*Nra Sra del Buen Viaje*	100	*barril*	1760
1656	Cartegena	*Nra Sra del Buen Viaje*	4000	*botella*	1760
1656	Cartegena	*Nra Sra del Buen Viaje*	12	*frasquera*	1760
1656	Cartegena	*San Pedro*	61	*barril*	1760
1656	Cartegena	*San Pedro*	7580	*botella*	1760
1656	Cartegena	*San Pedro*	100	*frasquera*	1760
1396	Vera Cruz	*La Purissima Concepción*	1312	*barril*	1760
1398	Vera Cruz	*La Nueva España*	1700	*barril*	1760
1398	Vera Cruz	*La Nueva España*	10	*quarterola*	1760
1397	Vera cruz	*Nra Sra de Buen Consejo*	1980	*barril*	1760
1397	Vera cruz	*Nra Sra de Buen Consejo*	235	*media pipa*	1760
1397	Vera cruz	*Nra Sra de Buen Consejo*	24	*pipa*	1760
1588	Vera Cruz	*La Concepción*	4392	*barril*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	2645	*barril*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	10 cajitas	*botella*	1778
1588	Vera Cruz	*San Cristoval*	3471	*barril*	1778
1588	Vera Cruz	*San Joseph*	600	*barril*	1778
1674	Cartegena	*La Fortuna*	8	*barril*	1778
1674	Cartegena	*La Fortuna*	3960	*limeta*	1778
1674	Cartegena	*La Purissima Concepción*	308	*barril*	1778
1674	Cartegena	*La Purissima Concepción*	3000	*limeta*	1778
1588	Vera Cruz	*Nra Sra de Begoña*	535	*barril*	1778

Commercial Olives

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	*San Vicente*	2	*barril*	1523
1079	Santo Domingo	*Santa María*	10	*barril*	1523
1079	Santo Domingo	*Santa María*	1	*quarto*	1523
1079	Santo Domingo	*Santa María*	3	*barril*	1523
1079	Santo Domingo	*Santa María de la* Ynerlia	13	*barril*	1523
1079	Santo Domingo	*Santa María Madelena*	5	*jarra*	1523
1079	Santo Domingo	*Santa María de la Concepción*	1	*mazto*	1530
1079	New Spain	*La Vitoria*	2	*quarto*s	1545
1079	Cuba	*María de Guadalupe*	28	*barril*	1545
1079	Santo Domingo	*San Antonio*	2	*barril mf*	1545
1079	Santo Domingo	*San Antonio*	28	*botija mp*	1545
1079	Santo Domingo	*San Antonio*	3	*pipa*	1545
1079	Santo Domingo	*San Antonio*	4	*quarto*	1545
1079	Santo Domingo	*San Antonio*	12	*barril 8*	1545
1079	Santo Domingo	*San Antonio*	3	*barril*f	1545
1079	Santo Domingo	*San Antonio*	100	*barrilito*	1545
1079	Nombre de Dios	*San Bartolome*	19	*barril mf*	1545
1079	Nombre de Dios	*San Bartolome*	59	*botija*	1545
1079	Nombre de Dios	*San Juan*	4	*barril*	1545
1079	Nombre de Dios	*San Juan*	12	*barril 2*	1545
1079	Nombre de Dios	*San Juan*	10	*barril 3*	1545
1079	Vera Cruz	*San Salvador*	16	*barril*	1545
1079	Vera Cruz	*San Salvador*	10	*barril* f	1545
1079	Vera Cruz	*San Salvador*	12	*botija* 2	1545
1079	Nombre de Dios	*Sant Antonio*	13	*barril* 2	1545
1079	Vera Cruz	*Santa Cruz*	10	*barril 5*	1545
1079	Vera Cruz	*Santa Cruz*	101	*barril 2*	1545
1079	Vera Cruz	*Santa Cruz*	31	*barril f*	1545
1079	Vera Cruz	*Santa Cruz*	12	*barril 3*	1545
1079	Vera Cruz	*Santa Cruz*	12	*barril 3f*	1545
1079	Santo Domingo	*Santa Espiritus*	8	*barril f*	1545
1079	Santo Domingo	*Santa Espiritus*	8	*barril mf*	1545
1079	Santo Domingo	*Santa Espiritus*	48	*barril 3*	1545
1079	Santo Domingo	*Santa Espiritus*	2	*quarto*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	2	*barril*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	14	*barril 2*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	11	*quarto*	1545
1079	Nombre de Dios	*Santa María de la Luz*	35	*barril*	1545
1079	Nombre de Dios	*Santa María de la Luz*	188	*botija ma*	1545
1079	Honduras	*Los Tres Reyes Magos*	20	*barril*	1557
1079	Honduras	*Los Tres Reyes Magos*	35	*barril* 2	1557
1079	Honduras	*Los Tres Reyes Magos*	4	*botija*	1557
1079	Honduras	*Los Tres Reyes Magos*	56	*botija mp*	1557
1079	Honduras	*Los Tres Reyes Magos*	24	*botija p*	1557
1079	Honduras	*Los Tres Reyes Magos*	4	*barril f*	1557
1079	Honduras	*Los Tres Reyes Magos*	6	tonele *p*	1557
1080	South America	*El Espiritu Santo*	401	*botija*	1583
1080	South America	*El Espiritu Santo*	217	*botija mp*	1583
1080	South America	*El Espiritu Santo*	5	*botija p*	1583
1080	Nombre de Dios	*San Miguel*	362	*botija*	1583
1080	Nombre de Dios	*San Miguel*	40	*botija 2*	1583

Commercial Olives (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1080	New Spain	*San Miguel*	240	*botija mp*	1583
1082	New Spain	*La María*	10	*barril mp*	1586
1082	New Spain	*Sant Joan*	195	*botija mp*	1586
1082	New Spain	*Santa Catalina*	25	*barril*	1586
1082	New Spain	*Santa Catalina*	371	*botija*	1586
1082	New Spain	*Santa Isabel*	96	*botija mp*	1586
1082	New Spain	*Santa María de Begoña*	1	*barril*	1586
1082	New Spain	*Santa María de Begoña*	54	*botija mp*	1586
1082	New Spain	*Santa María de Begoña*	1	*botija*	1586
1453	Florida	*Nra Sra de la Esperanza*	150	*botija*	1586
1082	New Spain	*La Concepción*	107	*barril*	1590
1089	New Spain	*La Concepción*	200	*botija 1.5*	1590
1089	New Spain	*La Concepción*	150	*botija mp*	1590
1089	New Spain	*La Concepción*	2	*barril mq*	1590
1089	Havana	*Nra Sra de la Vitoria*	48	*botija*	1590
1089	Santo Domingo	*Santa Ana*	4	*quarto*	1590
1089	Santo Domingo	*Santa Ana*	9	*botija*	1590
1094	Santo Domingo	*Santa Ana*	121	*botija mp*	1590
1094	South America	*La Encarnación*	494	*botija*	1591
1094	South America	*La Encarnación*	45	*botija mp*	1591
1094	*San Juan*	*Nra Sra de Concepción*	110	*botija*	1591
1094	South America	*San Pedro*	229	*botija mp*	1591
1094	South America	*San Pedro*	48	*barril*	1591
1094	South America	*Santo Antonio*	8	*barril*	1591
1094	South America	*Santo Antonio*	100	*botijuela*	1591
1094	South America	*Santo Antonio*	50	*botijuela 1*	1591
1121	Havana	*Los Tres Reyes*	10	*barril*	1596
1121	Havana	*Los Tres Reyes*	231	*botija*	1596
1121	New Spain	*Nra Sra de la Esperanza*	54	*botija*	1596
1121	New Spain	*Nra Sra de la Esperanza*	100	*botija mp*	1596
1121	New Spain	*Nra Sra de la Esperanza*	17	*botija 1.5*	1596
1121	New Spain	*Nra Sra de la Esperanza*	90	*botijuela*	1596
1121	Havana	*Santa Ana*	100	*botija*	1596
1121	Havana	*Santa Ana*	81	*botijuela*	1596
1121	Havana	*Santa Ana*	44	*botija 2*	1596
1121	New Spain	*La Esperanza*	150	*botija*	1597
1121	New Spain	*La Esperanza*	35	*barril mf*	1597
1121	New Spain	*La Esperanza*	10	*barril*	1597
1121	New Spain	*La María*	3	*barril*	1597
1121	New Spain	*La María*	510	*botija*	1597
1121	New Spain	*La María*	18	*botija mp*	1597
1121	New Spain	*La María*	160	*botija mar*	1597
1121	New Spain	*La María*	42	*botija mp*	1597
1121	New Spain	*La María*	3	*barril q*	1597
1121	New Spain	*Sant Juan Bautista Colorado*	19	*barril* mf	1597
1121	New Spain	*Sant Juan Bautista Colorado*	200	*botija*	1597
1126	South America	*La Trinidad*	30	*botija*	1597
1126	South America	*La Trinidad*	10	*botija* mp	1597
1126	Santa Marta	*El Espiritu Santo*	114	*botija*	1598
1126	Santa Marta	*El Espiritu Santo*	50	*botijuela*	1598
1126	South America	*Nra Sra de la Concepción*	100	*botija*	1598
1126	La Margarita	*Nra Sra del Rosario*	352	*botija*	1598

Commercial Olives (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1126	Venezuela	*San Antonio*	250	*botija*	1598
1159	New Spain	*El Espiritu Santo*	278	*barril*	1613
1159	Santo Domingo	*La Majestad de los Remedios*	24	*barril*	1613
1159	Honduras	*San Joseph*	769	*barril*	1613
1159	New Spain	*San Pedro*	10	*barril mf*	1613
1159	New Spain	*San Pedro*	800	*botija ma*	1613
1159	New Spain	*San Pedro*	20	*barril mq*	1613
1159	Cuimate	*Santa Ana y San Antonio*	100	*botijuela 1*	1613
1162	South America	*Nra Sra de la Guia, Guadalupe*	200	*botijuela*	1615
1162	Santo Domingo	*Santa Ana y María*	12	*barril 10*	1615
1179	New Spain	*Jesus, María y José*	6	*barril*	1633
1179	New Spain	*Jesus, María y José*	87	*barril 2*	1633
1179	New Spain	*Nra Sra de Iciar*	64	*barril*	1633
1179	New Spain	*Nra Sra de Iciar*	73	*botija p*	1633
1179	New Spain	*Nra Sra de Iciar*	4	*barril q*	1633
1179	Honduras	*Nra Sra de la Candelaria*	9	*barril*	1633
1179	Honduras	*Nra Sra de la Candelaria*	1	*barrilito*	1633
1179	New Spain	*Nra Sra de la Candelaria*	234	*barril 6*	1633
1179	New Spain	*San Buena Ventura*	290	*barril*	1633
1179	Vera Cruz	*San Juan Bautista* y *Santa Clara*	86	*barril*	1633
1180	South America	*Nra Sra de la Encarnación*	46	*barril*	1634
1180	Rio del Macha	*San Miguel Arcangel*	200	*botijuela*	1634
1180	Margarita	*San Onofre*	31	*barril 4*	1634
1180	Margarita	*San Onofre*	80	*botijuela**	1634
1193	South America	*San Joseph* y *Nra Sra de Mercedes*	88	*barril*	1647
1194	New Spain	*San Francisco*	40	*barril*	1648
1618	?	*El Rey David*	100	*botija*	1674
1229	New Spain	*Nra Sra del Rosario*	100	*botija*	1678
1258	South America	*Nra Sra del Rosario*	150	*botija*	1695
1264	New Spain	*El Santo Cristo de Buen Viaje*	70	*cuñete*	1699
1288	New Spain	*La Santa Familia y San Francisco*	220	*cuñete*	1720
1288	Vera Cruz	*La Santissima Trinidad*	378	*cuñete*	1720
1291	South America	*Nra Sra de los Milagros*	12	*cuñete*	1721
1291	South America	*Nra Sra del Rosario, San Cristoval*	200	*cuñete*	1721
1291	South America	*San Francisco* Xavier	50	*cuñete*	1721
1588	Vera Cruz	*Nra Sra de Begoña*	25	*botija*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	60	*cuñete*	1778
1588	Vera Cruz	*San Joseph*	1000	*botijuela*	1778

Commercial Capers

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	*La Trinidad*	1	*bota*	1524
1079	Nombre de Dios	*San Juan*	2	*barrilete*	1545
1079	Vera Cruz	*Santa Cruz*	1	*barril*	1545
1079	Honduras	*Los Tres Reyes Magos*	24	*barril*	1557
1080	South America	*El Espiritu Santa*	3	*barril*	1583
1080	Nombre de Dios	*San Miguel*	349	*botija*	1583
1080	New Spain	*San Miguel*	30	*botijuela*	1583
1089	Santo Domingo	*Santa Ana*	3	*botija*	1590
1121	New Spain	*Nra Sra de la Esperanza*	20	*barril*	1596
1121	New Spain	*Sant Juan Bautista Colorado*	50	*barrilete*	1597
1126	South America	*La Trinidad*	90	*barril*	1597
1126	South America	*La Trinidad*	39	*botija*	1597
1126	Santa Marta	*El Espiritu Santo*	20	*botija*	1598
1126	South America	*Nra Sra de la Concepción*	20	*botija*	1598
1126	South America	*Nra Sra del Rosario*	20	*barrileto*	1598
1126	Venezuela	*San Antonio*	100	*barril*	1598
1126	Venezuela	*San Antonio*	20	*botija pe*	1598
1159	Honduras	*San Joseph*	1	*barril* mq	1613
1159	Honduras	*San Joseph*	24	*botija pq*	1613
1159	New Spain	*San Pedro*	60	*botijuela m*	1613
1159	New Spain	*San Pedro*	13	*barril mq*	1613
1159	New Spain	*San Pedro*	200	*barril p*	1613
1159	New Spain	*San Pedro*	300	*botijuela*	1613
1179	New Spain	*Jesus, María y José*	20	*barril p*	1633
1179	New Spain	*Nra Sra de Iciar*	1	*barril*	1633
1179	New Spain	*Nra Sra de Iciar*	6	*barril q*	1633
1179	Honduras	*Nra Sra de la Candelaria*	1	*barril*	1633
1179	Honduras	*Nra Sra de la Candelaria*	12	*botijuela*	1633
1179	Vera Cruz	*San Juan Bautista*	6	*barril*	1633
1180	South America	*Nra Sra de la Encarnación*	25	*barril la*	1634
1288	New Spain	*La Santa Familia*	30	*cuñete*	1720
1471	Vera Cruz	*Santa Theresa*	200	*cuñete*	1739
1373	New Spain	*La Divina Pastora*	100	*cuñete*	1739
1656	Cartegena	*La Concepción*	3	*cuñete*	1760

Commercial Honey

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	*Santa María de la Concepción*	3	*barril 3.5a*	1530
1079	Santo Domingo	*Santa María de la Concepción*	50	*jarro az*	1530
1079	Nombre de Dios	*Santa Aqueda*	48	*botija* qa	1542
1079	Nombre de Dios	*Santa Aqueda*	11	*botija mar*	1542
1079	Nombre de Dios	*San Bartolome*	82	*botija* qa	1545
1079	Nombre de Dios	*San Juan*	4	*barril*	1545
1079	Nombre de Dios	*San Juan*	7	*botija*	1545
1079	Nombre de Dios	*Sant Antonio*	45	*botija qa*	1545
1079	Nombre de Dios	*Santa María de la* Luz	20	*botija qa*	1545
1079	Puerto Rico	*San Bartolome*	100	*botijuela*	1545
1079	Puerto Rico	*San Bartolome*	100	*jarra*	1545
1079	Santo Domingo	*Santa Espiritus*	40	*botija*	1545
1079	Santo Domingo	*Santa Espiritus*	73	*jarro*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	2	*barril*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	205	*jarra*	1545
1080	New Spain	*San Miguel*	4	*botija mar*	1583
1080	South America	*El Espiritu Santa*	100	*botija* az	1583
1080	South America	*El Espiritu Santa*	40	*botijuela*	1583
1081	Nombre de Dios	*Nra Sra de la Candelaria*	200	*botijuela q*	1584
1089	Santo Domingo	*Santa Ana*	20	*botija qa*	1590
1094	South America	*Santo Antonio*	300	*botija az*	1591
1126	Santa Marta	*El Espiritu Santo*	100	*botijuela*	1598
1126	South America	*Nra Sra del Rosario*	200	*botijuela a*	1598
1159	Santo Domingo	*Nra Sra de la Candelaria*	8	*botija a*	1613

Commercial Almonds

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	unknown (no. 9)	2	*barril*	1523
1079	Nombre de Dios	*Santa Aqueda*	1	*barril 3.5a*	1542
1079	Santo Domingo	*San Antonio*	1	*pipa*	1545
1079	Nombre de Dios	*San Bartolome*	2	*barril*	1545
1079	Nombre de Dios	*San Juan*	1	*barril*	1545
1079	Nombre de Dios	*San Juan*	27	*botija p*	1545
1079	Nombre de Dios	*Sant Antonio*	20	*botija*	1545
1079	Vera Cruz	*Santa Cruz*	6	*barril*	1545
1079	Santo Domingo	*Santa Espiritus*	4	*barril 3a*	1545
1079	Santo Domingo	*Santa María de Guadalupe*	2	*barril*	1545
1079	Honduras	*Los Trs Reyes Magos*	6	*barril mq*	1557
1079	Honduras	*Los Trs Reyes Magos*	1	*botija*	1557
1079	Honduras	*Los Trs Reyes Magos*	13	*botija p*	1557
1080	New Spain	*San Miguel*	16	*barril q*	1583
1094	South America	*La Encarnación*	16	*barril mq*	1591
1094	South America	*San Pedro*	56	*botija*	1591
1121	New Spain	*Nra Sra de la Esperanza*	12	*botija p*	1596
1121	New Spain	*Nra Sra de la Esperanza*	7	*botija p1.5*	1596
1159	New Spain	*El Espiritu Santo*	5	*barril*	1613
1159	New Spain	*El Espiritu Santo*	22	*botija*	1613
1159	Honduras	*San Joseph*	20	*botija p*	1613
1159	New Spain	*San Pedro*	16	*botija*	1613
1159	Venezuela	*Santa María del Rosario*	2	*barril*	1613
1162	South America	*San Francisco*	3	*barril 4a*	1615
1162	South America	*San Francisco*	54	*botija*	1615
1162	South America	*San Martín*	20	*botija p*	1615
1179	New Spain	*Jesus, María y José*	100	*botija*	1633
1179	New Spain	*Nra Sra de Iciar*	2	*barril*	1633
1179	Honduras	*Nra Sra de la Candelaria*	1	*barril*	1633
1179	Honduras	*Nra Sra de la Candelaria*	161	*botija*	1633
1179	Vera Cruz	*San Juan Bautista*	1	*barril*	1633
1180	South America	*Nra Sra de la Encarnación*	21	*botija*	1634
1180	South America	*Jesus, María y José*	5	*barril*	1634
1258	South America	*Nra Sra de Guadalupe*	3	*barril 2q*	1695
1264	New Spain	*Nra Sra de la Soledad*	10	*barril q*	1699
1264	New Spain	*Nra Sra de la Soledad*	5	*barril q*	1699
1291	South America	*San Francisco* Xavier	24	*barril q*	1721
1291	South America	*San Juan Bautista, Santa Polonia*	3	*barril*	1721
1588	?	*Nra Sra del Rosario*	21	*barril*	1778
1588	?	*San Cristoval*	37	*barril*	1778

Commercial Garbanzos

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Las Indias	*Santa María*	1	*pipa*	1523
1079	Santo Domingo	*Santa María de la Concepción*	1	*bota 3.5f*	1530
1079	Nombre de Dios	*San Juan*	27	*botija p*	1545
1079	Honduras	*Los Tres Reyes Magos*	1	*barril q*	1557
1079	Nombre de Dios	*Nra Sra de la Candelaria*	4	*barril*	1584

Commercial Hazelnuts

Legajo	Destination	Name of Ship	Quantity	Container	Year
1079	Santo Domingo	*Santa María de la Concepción*	1	*quarto*	1530
1079	San Juan	*San Juan*	27	*botija*	1545
1079	Honduras	*Los Tres Reyes Magos*	28	*botija*	1557
1082	New Spain	*Santa Catalina*	40	*botija 3*	1586
1121	New Spain	*Nra Sra de la Esperanza*	4	*barril f*	1596
1179	New Spain	*Jesus, María y José*	1	*barril q*	1633
1179	New Spain	*Nra Sra de Iciar*	1	*barril*	1633

Commercial Miscellaneous

Legajo	Destination	Name of Product	Quantity	Container	Year
1079	Honduras	rice	4	*botija mar*	1557
1080	New Spain	linseed oil	1	*botija mar*	1583
1080	New Spain	dates	1	*botija mar*	1583
1080	New Spain	*goma* — gum rubber(?)	1	*botija mar*	1583
1080	New Spain	myrhh	3	*botija*	1583
1089	New Spain	sweet oil	97	*botija*	1590
1094	Nombre de Dios	*aceite de mata* — hair oil?	1	*botija*	1590
1121	New Spain	sweet oil	300	*botija*	1596
1126	Santa Marta	tuna	12	*botija*	1598
1453	Florida	pitch	50	*botija*	1612
1159	Honduras	sweet oil	50	*botija mar*	1613
1180	Venezuela	pitch	10	*botija*	1634
1291	South America	almond oil	22	*botija mar*	1721

Provisions — Wine

Legajo	Destination	Name of Ship	Quantity	Container	Year
1080	South America	*El Espiritu Santa*	1000	*botija*	1583
1080	South America	*El Espiritu Santa*	6	*pipa*	1583
1080	Nombre de Dios	*San Miguel*	870	*botija*	1583
1080	Nombre de Dios	*San Miguel*	7	*pipa*	1583
1081	Nombre de Dios	*La Santissima Trinidad*	500	*botija*	1584
1081	Nombre de Dios	*Nra Sra de la Candelaria*	450	*botija*	1584
1082	New Spain	*La María*	400	*botija*	1586
1082	New Spain	*Sant Joan*	200	*botija*	1586
1082	New Spain	*Santa Catalina*	230	*botija*	1586
1082	New Spain	*Santa Isabel*	200	*botija*	1586
1082	New Spain	*Santa María de Begoña*	200	*botija*	1586
1094	South America	*La Encarnación*	400	*botija*	1591
1094	South America	*La Encarnación*	43	*pipa*	1591
1094	South America	*María Magdalena*	450	*botija*	1591
1094	South America	*María Magdalena*	6	*pipa*	1591
1094	South America	*San Pedro*	400	*botija*	1591
1094	South America	*San Pedro*	20	*pipa*	1591
1094	South America	*Santo Antonio*	150	*botija*	1591
1094	South America	*Santo Antonio*	10	*pipa*	1591
1453	Florida	*Santa Catalina*	12	*pipa*	1592
1453	Florida	*Santiago*	50	*pipa*	1594
1451	Florida	*Santa Ana*	400	*botija*	1596
1126	South America	?	1800	*botija*	1598
1126	South America	?	40	*pipa*	1598
1453	Florida	*Nra Sra del Rosario*	80	*botija*	1607
1159	Santo Domingo	*La Majestad de los Remedios*	300	*botija*	1613
1159	Santo Domingo	*Nra Sra de la Candelaria*	300	*botija*	1613
1159	Xamazla	*San Antonio*	150	*botija*	1613
1159	New Spain	*San Josefe*	600	*botija*	1613
1159	New Spain	*San Josefe*	1000	*botija*	1613
1159	Honduras	*San Joseph*	600	*botija*	1613
1159	New Spain	*San Miguel*	800	*botija*	1613
1159	New Spain	*San Pedro*	700	*botija*	1613
1159	Cuimate	*Santa Ana* y *San Antonio*	350	*botija*	1613
1159	Venezuela	*Santa María del Rosario*	50	*botija*	1613
1162	South America	*Nra Sra de la* Guia	100	*botija*	1615
1162	*Santa* Marta	*Nra Sra de Buen Viaje*	120	*botija*	1615
1162	Margarita	*Nra Sra deConsulación*	100	*botija*	1615
1162	Margarita	*Nra Sra de Consulación*	3	*pipa*	1615
1162	South America	*Nra Sra de los Remedios*	300	*botija*	1615
1162	South America	*San Francisco*	200	*botija*	1615
1162	Cartegena	*San Juan Bautista*	400	*botija*	1615
1162	Cartegena	*San Lorenzo*	200	*botija*	1615
1162	South America	*San Martín*	400	*botija*	1615
1162	Nueva Cordova	*Sant Pedro*	400	*botija*	1615
1162	South America	*Santa Ana María del Rosario*	50	*botija*	1615
1162	Santo Domingo	*Santa Ana y María*	300	*botija*	1615
1178	South America	*Nra Sra de la Anunciación*	800	*botija*	1630
1178	South America	*Nra Sra de la Candelaria*	400	*botija*	1630
1178	New Spain	*Nra Sra de la Concepción*	250	*botija*	1630
1178	South America	*Nra Sra de la Vitoria*	200	*botija*	1630

Provisions — Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1178	New Spain	*Nra Sra del Buen Suerte*	500	*botija*	1630
1178	New Spain	*San Antonio*	600	*botija*	1630
1178	New Spain	*Santiago*	300	*botija*	1630
1178	New Spain	*Nra Sra del Juncar*	500	*botija*	1631
1178	New Spain	*Nra Sra del Juncar*	800	*botija*	1631
1178	New Spain	*Nra Sra del Pilar*	30	*botija*	1631
1178	New Spain	*Nra Sra de la Citalaya*	300	*botija*	1631
1178	New Spain	*Nra Sra de la Concepción*	600	*botija*	1631
1179	South America	*El Conde Santo*	200	*botija*	1633
1179	New Spain	*Jesus, María y José*	800	*botija*	1633
1179	New Spain	*Nra Sra de Iciar*	700	*botija*	1633
1179	Campeche	*Nra Sra del Rosario*	200	*botija*	1633
1179	New Spain	*Nra Sra del Rosario*	500	*botija*	1633
1179	Honduras	*Nra Sra de la Candelario*	300	*botija*	1633
1179	Honduras	*Nra Sra de laCandelario*	400	*botija*	1633
1179	South America	*Nra Sra de la Concepción*	300	*botija*	1633
1179	Campeche	*Nra Sra de la Limpia Concepción*	400	*botija*	1633
1179	New Spain	*San Buena Ventura*	500	*botija*	1633
1179	New Spain	*San José*	800	*botija*	1633
1179	New Spain	*San Juan Bautista*	1000	*botija*	1633
1179	Vera Cruz	*San Juan Bautista*	500	*botija*	1633
1179	South America	*San Pedro*	500	*botija*	1633
1179	New Spain	*Santa Barbara*	700	*botija*	1633
1180	Santa María	*Nra Sra de la Candelaria*	400	*botija*	1634
1180	Venezuela	*Nra Sra de la Encarnación*	300	*botija*	1634
1180	South America	*Jesus, María y José*	400	*botija*	1634
1180	Río de Macha	*San Miguel* Arcangel	200	*botija*	1634
1180	Margarita	*San Onofre*	300	*botija*	1646
1453	Florida	*La Encarnación y San Bernardo*	300	*botija*	1647
1193	South America	*El Leonpardo*	400	*botija*	1647
1193	Caracas	*El Porfeta*	600	*botija*	1647
1193	South America	*El Triunfo de la Cruz*	300	*botija*	1647
1193	Havana	*Nra Sra de los Reyes*	350	*botija*	1647
1193	South America	*Nra Sra del Rosario*	300	*botija*	1647
1193	South America	Nra Sra de los Reyes	300	*botija*	1647
1193	Campeche	*Nra Sra del Rosario* y *San Antonio*	400	*botija*	1647
1193	Puerto Rico	*San Cosme y Sandamian*	600	*botija*	1647
1193	Caracas	*San Francisco de Asis*	400	*botija*	1647
1193	?	*San Juan y Armas de Polonia*	500	*botija*	1647
1193	Buenos Aires	*Sanctissima Trinidad*	1000	*botija*	1647
1194	New Spain	*Nra Sra del Rosario*	400	*botija*	1648
1194	New Spain	*San Lenaro*	1500	*botija*	1648
1194	New Spain	*San Nicolas de Corta Barria*	400	*botija*	1648
1194	New Spain	*Santa Teressa de Jesus*	400	*botija*	1648
1453	Florida	*La Encarnación y San Bernardo*	200	*botija*	1648
1618	South America	*Jesus, María, y Joseph*	300	*botija*	1660
1618	South America	*Nra Sra de la Soledad*	600	*botija*	1662
1618	South America	*Nra Sra del Rosario*	200	*botija*	1662
1618	South America	*La Santissima Trinidad*	100	*botija*	1664
1618	South America	*Nra Sra de la Concepción*	150	*botija*	1666
1618	South America	*Santo Cristo de Lesso*	300	*botija*	1670
1618	South America	*Nra Sra de la Estrella*	400	*botija*	1671

Provisions — Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1618	South America	*Nra Sra de Carmen*	600	*botija*	1672
1618	South America	*San Antonio*	30	*botija*	1672
1618	South America	*El Rey Niño*	500	*botija*	1673
1618	South America	*Santo Cristo de Lezo*	500	*botija*	1673
1618	South America	*Santa Ana*	100	*botija*	1674
1258	South America	*La Santissima Trinidad*	300	*botija*	1695
1258	South America	*Nra Sra de Guadalupe*	300	*botija*	1695
1258	South America	*Nra Sra de la Concepción*	300	*botija*	1695
1258	South America	*Nra Sra del Rosario y Animas*	300	*botija*	1695
1264	Vera Cruz	*El Santo Cristo de San Román*	200	*botija*	1699
1264	New Spain	*El Santo Cristo de Bien Viaje*	500	*botija*	1699
1264	Vera Cruz	*Jesus, María y Joseph*	200	*botija*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	500	*botija*	1699
1264	New Spain	*Nra Sra de la Soledad*	50	*botija*	1699
1453	Florida	*Nra Sra de la Concepción*	175	*botija*	1704
1453	Florida	*Nra Sra de* Gracia	200	*botija*	1705
1291	South America	*El Angel de la Guarda*	50	*botija*	1721
1291	Cartegena	*San Juan Bautista, Santa Polonia*	60	*barril*	1721
1453	Florida	*Jesus Nazareno*	12	*barril*	1731
1361	South America	*El Infante Phelipe*	30	*barril*	1737
1361	South America	*El Infante Phelipe*	300	*botija*	1737
1361	South America	*El Infante Phelipe*	8	*pipa*	1737
1361	South America	*Nra Sra de Velem, San Francisco*	30	*barril*	1737
1361	South America	*Nra Sra de Velem, San Francisco*	800	*botija*	1737
1361	Cuba	*Nra Sra de Buen Ayre*	16	*bota*	1737
1361	*San Juan*	*Nra Sra de la Charidad*	25	*barril*	1737
1361	*San Juan*	*Nra Sra de la Charidad*	150	*botija*	1737
1361	*San Juan*	*Nra Sra de la Charidad*	8	*pipa*	1737
1361	South America	*Nra Sra de la Soledad*	6	*bota*	1737
1361	South America	*Nra Sra de los Dolores*	200	*barril*	1737
1361	South America	*Nra Sra de los Dolores*	6	*pipa*	1737
1361	South America	*Nra Sra de los Dolores*	250	*barril*	1737
1361	South America	*Nra Sra de los Dolores*	200	*botija*	1737
1361	South America	*Nra Sra del Rosario*	350	*barril*	1737
1361	South America	*Nra Sra del Rosario*	200	*botija*	1737
1361	Cumana	*Nra Sra de Paula*	1	*barril*	1737
1361	Cumana	*Nra Sra de Paula*	250	*botija*	1737
1361	Cumana	*Nra Sra de Paula*	400	*botija*	1737
1361	Cumana	*Nra Sra de Paula*	1	*media pipa*	1737
1361	South America	*San Francisco de Paula*	300	*barril*	1737
1361	South America	*San Francisco de Paula*	2	*pipa*	1737
1361	South America	*San Jorge*	6	*pipa*	1737
1361	Vera Cruz	*San Joseph, Nra Sra de Carmen*	250	*barril*	1737
1372	New Spain	*San Joseph (alias El Oriente)*	4	*pipa*	1739
1373	New Spain	*La Divina Pastora*	224	*barril*	1739
1373	New Spain	*La Divina Pastora*	2	*pipa*	1739
1373	New Spain	*La Divina Pastora*	4	*pipa*	1739
1397	Vera Cruz	*Nra Sra de Buen Consejo*	3	*barril*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	54	*barril*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	300	*barril*	1760
1656	Cartegena	*La Castilla*	6	*barril*	1760
1656	Cartegena	*La Castilla*	500	*botija*	1760

Provisions — Wine (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1656	Cartegena	*La Castilla*	3	*pipa*	1760
1656	Cartegena	*La Concepción*	75	*barril*	1760
1656	Cartegena	*La Concepción*	500	*botella*	1760
1656	Cartegena	*San Pedro*	900	*botija*	1760
1588	?	*Nra Sra del Rosario*	20	*barril*	1778
1674	Cartegena	*La Fortuna*	30	*barril*	1778

Provisions — Water

Legajo	Destination	Name of Ship	Quantity	Container	Year
1080	Nombre de Dios	*San Miguel*	508	*botija*	1583
1080	Nombre de Dios	*San Miguel*	900	*botija*	1583
1080	South America	*El Espiritu Santa*	1000	*botija*	1583
1081	Nombre de Dios	*La Santissima Trinidad*	800	*botija*	1584
1081	Nombre de Dios	*Nra Sra de la Candelaria*	300	*botija*	1584
1082	New Spain	*La María*	500	*botija*	1586
1082	New Spain	*Sant Joan*	2	*pipa*	1586
1082	New Spain	*Sant Joan*	200	*botija*	1586
1082	New Spain	*Santa Catalina*	300	*botija*	1586
1082	New Spain	*Santa María de Begonia*	300	*botija*	1586
1453	Florida	*Nra Sra de la Esperanza*	9	*pipa*	1586
1094	South America	*La Encarnación*	1000	*botija*	1591
1094	South America	*María Magdalena y Sant Vicente*	500	*botija*	1591
1094	South America	*Santo Antonio*	500	*botija*	1591
1453	Florida	*Santa Catalina*	300	*botija*	1592
1453	Florida	*Santa Catalina*	9	*pipa*	1592
1453	Florida	*Santiago*	16	*pipa*	1594
1453	Florida	*Santiago*	200	*botija*	1594
1453	Florida	*Santa Ana*	440	*botija*	1596
1453	Florida	*Nra Sra del Rosario*	275	*botija*	1607
1453	Florida	*Nra Sra del Rosario*	10	*botija*	1612
1453	Florida	*Nra Sra del Rosario*	12	*pipa*	1612
1159	Cuimate	*Santa Ana* y *San Antonio*	150	*botija*	1613
1159	Honduras	*San Joseph*	1000	*botija*	1613
1159	New Spain	*San Josefe*	800	*botija*	1613
1159	New Spain	*San Josefe*	900	*botija*	1613
1159	New Spain	*San Miguel*	1500	*botija*	1613
1159	New Spain	*San Pedro*	1000	*botija*	1613
1159	Santo Domingo	*La Majestad de los Remedios*	10	*pipa*	1613
1159	Santo Domingo	*La Majestad de los Remedios*	200	*botija*	1613
1159	Santo Domingo	*Nra Sra de la Candelaria*	400	*botija*	1613
1159	Venezuela	*Santa María del Rosario*	160	*botija*	1613
1159	Venezuela	*Santa María del Rosario*	2	*pipa*	1613
1159	Xamazla	*San Antonio*	300	*botija*	1613
1162	Cartegena	*San Juan Bautista*	700	*botija*	1615
1162	Cartegena	*San Lorenzo*	500	*botija*	1615
1162	Cartegena	*Nra Sra de Consulación*	250	*botija*	1615
1162	Nueva Cordova	*Sant Pedro*	750	*botija*	1615
1162	Santa Marta	*Nra Sra de Buen Viaje*	2	*pipa*	1615
1162	Santa Marta	*Nra Sra de Buen Viaje*	300	*botija*	1615
1162	Santo Domingo	*Santa Ana y María*	4	*pipa*	1615
1162	Santo Domingo	*Santa Ana y María*	400	*botija*	1615
1162	South America	*Nra Sra de la Guia*	200	*botija*	1615
1162	South America	*Nra Sra de los Remedios*	1	*pipa*	1615
1162	South America	*Nra Sra de los Remedios*	250	*botija*	1615
1162	South America	*San Francisco*	700	*botija*	1615
1162	South America	*San Martín*	700	*botija*	1615
1162	South America	*Santa Ana María del Rosario*	200	*botija*	1615
1178	New Spain	*Nra Sra de la Concepción*	400	*botija*	1630
1178	New Spain	*Nra Sra de Buen Suerte*	1000	*botija*	1630
1178	New Spain	*San Antonio*	800	*botija*	1630
1178	New Spain	*Santiago*	1100	*botija*	1630

Provisions — Water (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1178	South America	*Nra Sra de la Vitoria*	200	*botija*	1630
1178	South America	*Nra Sra de la* Anunción	900	*botija*	1630
1178	South America	*Nra Sra de la Candelaria*	500	*botija*	1630
1178	New Spain	*Nra Sra del Juncar*	1300	*botija*	1631
1178	New Spain	*Nra Sra del Juncar*	1800	*botija*	1631
1178	New Spain	*Nra Sra del Pilar*	40	*botija*	1631
1178	New Spain	*Nra Sra de la Citalaya*	630	*botija*	1631
1178	New Spain	*Nra Sra de la Concepción*	1200	*botija*	1631
1179	Campeche	*Nra Sra del Rosario*	300	*botija*	1633
1179	Campeche	*Nra Sra de la Limpia Concepción*	500	*botija*	1633
1179	Honduras	*Nra Sra de la Candelaria*	500	*botija*	1633
1179	New Spain	*Jesus, María y José*	1200	*botija*	1633
1179	New Spain	*Nra Sra de Iciar*	500	*botija*	1633
1179	New Spain	*Nra Sra del Rosario*	600	*botija*	1633
1179	New Spain	Nra Sar *de la Candelaria*	1300	*botija*	1633
1179	New Spain	*San Buena Ventura*	1000	*botija*	1633
1179	New Spain	*San José*	1200	*botija*	1633
1179	New Spain	*San Juan Bautista*	1350	*botija*	1633
1179	New Spain	*Santa Barbara*	400	*botija*	1633
1179	South America	*El Conde Santo*	400	*botija*	1633
1179	South America	*Nra Sra de la Concepción*	400	*botija*	1633
1179	South America	*San Pedro*	400	*botija*	1633
1179	Vera Cruz	*San Juan Bautista*	1100	*botija*	1633
1180	Margarita	*San Onofre*	200	*botija*	1634
1180	Río del Macha	*San Miguel Arcangel*	200	*botija*	1634
1180	Río del Macha	*San Miguel Arcangel*	4	*pipa*	1634
1180	Santa Marta	*Nra Sra de la Candelaria*	400	*botija*	1634
1180	South America	*Jesus, María y José*	900	*botija*	1634
1180	Venezuela	*Nra Sra de la Encarnación*	260	*botija*	1634
1453	Florida	*La Encarnación y San Bernardo*	500	*botija*	1646
1193	?	*San Juan* y Armas *de Polonia*	800	*botija*	1647
1193	Buenos Aires	*Nra Sra de Buen Sucejo*	2000	*botija*	1647
1193	Buenos Aires	*Nra Sra de Buen Sucejo*	6	*pipa*	1647
1193	Buenos Aires	*Sanctissima Trinidad*	1000	*botija*	1647
1193	Caracas	*El Porfeta*	750	*botija*	1647
1193	Cuba	*Nra Sra del Rosario*	300	*botija*	1647
1193	Guayana	*San Francisco de Paula*	350	*botija*	1647
1193	Havana	*Nra Sra de los Reyes*	700	*botija*	1647
1193	Havana	*Nra Sra de la Encarnación*	2	*pipa*	1647
1193	Havana	*Nra Sra de la Encarnación*	600	*botija*	1647
1193	Honduras	*La Sanctissima Trinidad*	1200	*botija*	1647
1193	Puerto Rico	*San Cosme y Sandamian*	800	*botija*	1647
1193	South America	*El Leonpardo*	800	*botija*	1647
1193	South America	*Nra Sra de Alto Gracia*	700	*botija*	1647
1193	South America	*Nra Sra de Copa Cavana*	500	*botija*	1647
1193	South America	*Nra Sra de los Reyes*	800	*botija*	1647
1193	South America	*Nra Sra del Rosario* y *San Francisco*	800	*botija*	1647
1193	South America	*San Joseph* y *Nra Sra de las Mercedes*	1600	*botija*	1647
1193	South America	*Santa Cruz y San José*	1200	*botija*	1647
1194	New Spain	*Nra Sra del Rosario*	600	*botija*	1648
1194	New Spain	*San Lenaro*	1600	*botija*	1648
1194	New Spain	*San Nicolas de Corta Barria*	1300	*botija*	1648

Provisions — Water (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1194	New Spain	*Santa Theressa de* Jesus	1400	*botija*	1648
1453	Florida	*La Encarnación y San Bernardo*	500	*botija*	1648
1618	South America	*Jesus, María, y Joseph*	1000	*botija*	1660
1618	South America	*Nra Sra del Rosario*	900	*botija*	1662
1618	South America	*Nra Sra de la Soledad*	700	*botija*	1662
1618	South America	*La Santissima Trinidad*	250	*botija*	1664
1618	South America	*Nra Sra del Rosario*	400	*botija*	1666
1618	South America	*Nra Sra del La Concepción*	200	*botija*	1666
1618	South America	*Santo Cristo de Lesso*	700	*botija*	1670
1618	South America	*Nra Sra de la Estrella*	150	*botija*	1671
1618	South America	*Nra Sra de la Estrella*	56	*pipa*	1671
1618	South America	*San Antonio*	200	*botija*	1672
1618	South America	*El Rey Niño*	400	*botija*	1673
1618	South America	*Santo Cristo de Lezo*	200	*botija*	1673
1618	South America	*Santo Cristo de Lezo*	4	*pipa*	1673
1618	South America	*Santo Cristo de Lezo*	4	*quarterola*	1673
1618	South America	*Santo Cristo de Lezo*	40	*barril 3a*	1673
1618	South America	*Santa Ana*	350	*botija*	1674
1618	South America	*Santa Ana*	4	*pipa*	1674
1258	South America	*La Santissima Trinidad*	1500	*botija*	1695
1258	South America	*Nra Sra del Rosario y Las Animas*	1500	*botija*	1695
1264	New Spain	*El Santo Cristo del Bien Viaje*	1500	*botija*	1699
1264	New Spain	*Nra Sra de la Soledad*	5	*pipa*	1699
1264	New Spain	*Nra Sra de la Soledad*	700	*botija*	1699
1264	Vera Cruz	*El Santo Cristo de San Román*	1000	*botija*	1699
1264	Vera Cruz	*Jesus, María, y Joseph*	4	*pipa*	1699
1264	Vera Cruz	*Jesus, María, y Joseph*	800	*botija*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	12	*quarterola*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	2000	*botija*	1699
1264	Vera Cruz	*Nra Sra de los Remedios*	3	*pipa*	1699
1453	Florida	*Nra Sra de la Concepción*	400	*botija*	1704
1453	Florida	*Nra Sra de* Gracia	12	*barril*	1705
1453	Florida	*Nra Sra de* Gracia	4	*tinaja*	1705
1453	Florida	*Nra Sra de* Gracia	600	*botija*	1705
1453	Florida	*Jesus Nazareno (alias La Florida)*	12	*barril*	1731
1361	Cuba	?	300	*botija vidriado*	1737
1396	Vera Cruz	*La Purissimma Concepción*	150	*pipa*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	12	*pipa*	1760

Provisions — Olive Oil

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1080	Nombre de Dios	*San Miguel*		30		1583
1080	Nombre de Dios	*San Miguel*		30	*botija*	1583
1080	South America	*El Espiritu Santo*		50		1583
1081	Nombre de Dios	*La Santissima Trinidad*		25	*botija*	1584
1081	Nombre de Dios	*Nra Sra de la Candelaria*		28		1584
1082	New Spain	*La María*		50		1586
1082	New Spain	*Sant Joan*		50		1586
1082	New Spain	*Santa Isabel*		12		1586
1082	New Spain	*Santa María de Begonia*		30		1586
1453	Florida	*Nra Sra de la Esperanza*		12		1586
1094	South America	*La Encarnación*		60		1591
1094	South America	*San Pedro*		50		1591
1094	South America	*Santo Antonio*		15		1591
1094	South America	*María Magdalena* y *Sant Vicente*	80	40	*botija*	1591
1453	Florida	*Santa Catalina*		25		1592
1453	Florida	*Santiago*		363		1594
1453	Florida	*Santa Ana*		20		1594
1126	South America	?		96		1598
1453	Florida	*Nra Sra del Rosario*		12		1607
1453	Florida	*Nra Sra del Rosario*		10		1607
1159	Cuimate	*Santa Ana y San Antonio*		15		1613
1159	Honduras	*San Joseph*		100		1613
1159	New Spain	*San Josefe*		150		1613
1159	New Spain	*San Miguel*		100		1613
1159	New Spain	*San Pedro*		150		1613
1159	Santo Domingo	*La Majestad de los Remedios*		20		1613
1159	Santo Domingo	*Nra Sra de la Candelaria*		35		1613
1159	Venezuela	*Santa María del Rosario*		20		1613
1159	Xamazla	*San Antonio*		14		1613
1162	Cartegena	*San Juan Bautista*		100		1613
1162	Cartegena	*San Lorenzo*		80		1615
1162	La Margarita	*Nra Sra de Consulación*		50		1615
1162	Nueva Cordova	*Sant Pedro*		16		1615
1162	Santa María	*Nra Sra de Buen Viaje*		15		1615
1162	Santo Domingo	*Santa Ana y María*		70		1615
1162	South America	*Nra Sra de la* Guia		10		1615
1162	South America	*Nra Sra de los Remedios*		40		1615
1162	South America	*San Francisco*		60		1615
1162	South America	*San Martín*		100		1615
1162	South America	*Santa Ana María del Rosario*		30		1615
1178	New Spain	*Nra Sra de la Concepción*		60		1630
1178	New Spain	*Nra Sra del Buen Suerte*		130		1630
1178	New Spain	*San Antonio*		100		1630
1178	New Spain	*Santiago*		40		1630
1178	South America	*Nra Sra de la Anunción*		60		1630
1178	South America	*Nra Sra de la Candelaria*		40		1630
1178	South America	*Nra Sra de la Vitoria*		16		1630
1178	South America	*Nra Sra de la Citalaya*		50		1631
1178	South America	*Nra Sra de la Concepción*		60		1631
1178	South America	*Nra Sra del Juncar*		150		1631
1178	South America	*Nra Sra del Pilar*	3		*botija*	1631

Provisions — Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1179	Campeche	*Nra Sra de la Limpia Concepción*		50		1633
1179	Campeche, Venezuela	*Nra Sra del Rosario*		30		1633
1179	Honduras	*Nra Sra de la Candelaria*		150		1633
1179	New Spain	*Jesus, María y José*		100		1633
1179	New Spain	*Nra Sra de Iciar*		100		1633
1179	New Spain	*Nra Sra de la Candelaria*		30		1633
1179	New Spain	*San Buena Ventura*		100		1633
1179	New Spain	*San José*		100		1633
1179	New Spain	*San Juan Bautista*		100		1633
1179	New Spain	*Santa Barbara*		100		1633
1179	South America	*El Conde Santo*		50		1633
1179	South America	*Nra Sra de la Concepción*		50		1633
1179	South America	*San Pedro*		50		1633
1179	Vera Cruz	*San Juan Bautista y Santa Clara*		100		1633
1180	Margarita	*San Onofre*		25		1634
1180	Río de Macha	*San Miguel Arcangel*		20		1634
1180	Santa Marta	*Nra Sra de la Candelaria*		40		1634
1180	South America	*Jesus, María y José*		50		1634
1180	Venezuela	*Nra Sra de la Encarnación*		25		1634
1453	Florida	*La Encarnación y San Bernardo*		50		1646
1193	?	*San Juan* y *Armas de Polonia*		60		1647
1193	Buenos Aires	*Sanctissima Trinidad*		200		1647
1193	Campeche	*Nra Sra del Rosario*		40		1647
1193	Caracas	*El Porfeta*		100		1647
1193	Caracas	*San Francisco de Asis*		40		1647
1193	Havana	*Nra Sra de Los Reyes*		30		1647
1193	Puerto Rico	San *Cosme y Sandamian*		100		1647
1193	South America	*El Leonpardo*	160		*botija mar*	1647
1193	South America	*El Triunfo de la Cruz*		50		1647
1193	South America	*Nra Sra del Rosario*		50		1647
1193	South America	*Nra Sra de* los Reyes		50		1647
1194	New Spain	*Nra Sra del Rosario*		80		1647
1194	New Spain	*San Lenaro*		200		1647
1194	New Spain	*San Nicolas de Corta Barria*		50		1648
1194	New Spain	*Santa Teressa de Jesus*		50		1648
1453	Florida	*La Encarnación y San Bernado*		30	*botijuela*	1648
1618	South America	*Nra Sra del Rosario*	100		*botijuela*	1662
1618	South America	*Nra Sra de la Soledad*		200		1662
1618	South America	*La Sanctissima Trinidad*		20		1664
1618	South America	*Nra Sra del Rosario*		30		1666
1618	South America	*Nra Sra de la Concepción*		40		1666
1618	South America	*Santo Cristo de Lesso*	50		*botijuela*	1670
1618	South America	*Nra Sra de la Estrella*		90		1671
1618	South America	*San Antonio*	30		*botijuela*	1672
1618	South America	*El Rey Niño*	50		*botijuela*	1673
1618	South America	*Santo Cristo de Lezo*		50		1673
1618	South America	*Santa Ana*		20		1674
1258	South America	*La Santissima Trinidad*		150	*botijuela*	1695
1258	South America	*Nra Sra de Guadalupe y las Animas*		200	*botijuela*	1695
1258	South America	*Nra Sra de la Concepción*	300		*botijuela m*	1695
1258	South America	*Nra Sra del Rosario y las Animas*		150	*botijuela*	1695

Provisions — Olive Oil (cont.)

Legajo	Destination	Name of Ship	Qty	Arro.	Container	Year
1264	New Spain	*El Santo Cristo del Buen Viaje*		200		1699
1264	New Spain	*Nra Sra de la Soledad*		100	*botijuela*	1699
1264	Vera Cruz	*El Santo Cristo de San Román*	700		*botijuela*	1699
1264	Vera Cruz	*Jesus, María y Joseph*	400		*botijuela*	1699
1453	Florida	*Nra Sra de la Concepción*		100		1704
1453	Florida	*Nra Sra de la Concepción*		50	*botijuela m*	1704
1453	Florida	*Nra Sra de Gracia*	100		*botijuela*	1705
1291	South America	*San Juan Bautista, Santa Polonia*	250		*botijuela 5*	1721
1291	South America	*El Angel de la Guarda*	20		*botijuela*	1721
1453	Florida	*Jesus Nazareno (alias La Florida)*	100	50	*botijuela*	1731
1361	South America	*La Sanctissima Trinidad*	300		*botijuela m*	1737
1361	South America	*La Sanctissima Trinidad*		22		1737
1361	South America	*Nra Sra de la Soledad*		100		1737
1361	South America	*Nra Sra de los Dolores*	500		*botijuela m*	1737
1361	South America	*Nra Sra de los Dolores*		202		1737
1361	South America	*Nra Sra de los Dolores*	400	200	*botijuela*	1737
1361	South America	*Nra Sra del Rosario* y *San Francisco*	125		*botija*	1737
1361	South America	*San Jorge*	50		*botijuela*	1737
1361	Cuba	*Nra Sra del* Buen Ayre y *San Francisco*		200	*botijuela*	1737
1361	Cumana	*San Antonio de Paula*	700		*botijuela*	1737
1361	Cumana	*San Antonio de Paula*		6		1737
1361	San Juan	*Nra Sra de la* Charidad	180		*botijuela*	1737
1361	South America	*El Infante Phelipe*	400		*botija mar*	1737
1361	South America	*El Infante Phelipe*	80		*botijuela*	1737
1361	South America	*Nra Sra de Velem, San Frencisco*		170		1737
1361	South America	*Nra Sra del Rosario* y *San Francisco*	800	400	*botijuela*	1737
1361	South America	*San Francisco de Paula*	600		*botijuela*	1737
1361	South America	*San Francisco de Paula*		10		1737
1361	Vera Cruz	*San Joseph, Nra Sra de* Carmen		150		1737
1372	New Spain	*San Joseph (alias el Oriente)*		40		1739
1373	New Spain	*La Divina Pastora*		350		1739
1396	Vera Cruz	*La Purissimma Concepción*	2000		*botijuela*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*	315		*botijuela m*	1760
1397	Vera Cruz	*Nra Sra de Buen Consejo*		50		1760
1656	Cartegena	*La Castilla*	120		*botijuela m*	1760
1656	Vera Cruz	*La Concepción*	200		*botijuela m*	1778
1588	Vera Cruz	*Nra Sra del Rosario*	60		*botijuela m*	1778

Provisions — Vinegar

Legajo	Destination	Name of Ship	Quantity	Container	Year
1080	South America	*El Espiritu Santa*	70	*botija*	1583
1080	Nombre de Dios	*San Miguel*	50	*botija*	1583
1081	Nombre de Dios	*Nra Sra deCandelaria*	20	*botija*	1584
1082	New Spain	*La María*	50	*botija*	1586
1082	New Spain	*Sant Joan*	2	*pipa*	1586
1082	New Spain	*Santa Isabel*	8	*botija*	1586
1082	New Spain	*Santa María de Bogonia*	12	*botija*	1586
1094	South America	*María Magdalena y San Vicente*	51	*botija*	1591
1094	South America	*Santo Antonio*	15	*botija*	1591
1453	Florida	*Santa Catalina*	40	*botija*	1592
1453	Florida	*Santiago*	100	*botija*	1594
1453	Florida	*Santa Ana*	30	*botija*	1596
1126	South America	?	2	*pipa*	1598
1453	Florida	*Nra Sra del Rosario*	12	*botija*	1607
1453	Florida	*Nra Sta del Rosario*	1	*botija*	1612
1159	Santo Domingo	*La* Majestad *de las Remedios*	30	*botija*	1613
1159	Santo Domingo	*Nra Sra de la Candelaria*	40	*botija*	1613
1159	Xamazla	*San Antonio*	20	*botija*	1613
1159	New Spain	*San Josefe*	2	*pipa*	1613
1159	Honduras	*San Josefe*	50	*botija*	1613
1159	New Spain	*San Miguel*	200	*botija*	1613
1159	New Spain	*San Pedro*	100	*tiza*	1613
1159	Cuimate	*Santa Ana* y *San Antonio*	20	*botija*	1613
1159	Venezuela	*Santa María del Rosario*	6	*botija*	1613
1162	Santa Marta	*Nra Sra de Buen Viaje*	12	*botija*	1615
1162	Margarita	*Nra Sra de Consulación*	50	*botija*	1615
1162	South America	*Nra Sra de la Guia*	30	*botija*	1615
1162	South America	*Nra Sra de los Remedios*	30	*botija*	1615
1162	South America	*San Francisco*	30	*botija*	1615
1162	Cartegena	*San Juan Bautista*	100	*botija*	1615
1162	Cartegena	*San Lorenzo*	50	*botija*	1615
1162	South America	*San Martín*	30	*botija*	1615
1162	Nueva Cordova	*Sant Pedro*	130	*botija*	1615
1162	South America	*Santa Ana María del Rosario*	30	*botija*	1615
1162	Santo Domingo	*Santa Ana y María*	100	*botija*	1615
1178	South America	*Nra Sra de la Anunción*	100	*botija*	1630
1178	New Spain	*Nra Sra de la Concepción*	40	*botija*	1630
1178	South America	*Nra Sra de la Vitoria*	40	*botija*	1630
1178	New Spain	*Nra Sra del Buen Suerte*	200	*botija*	1630
1178	New Spain	*San Antonio*	500	*botija*	1630
1178	New Spain	*Santiago*	200	*botija*	1630
1178	New Spain	*Nra Sra de la Citalaya*	100	*botija*	1631
1178	New Spain	*Nra Sra de la Concepción*	100	*botija*	1631
1178	New Spain	*Nra Sra del Juncar*	100	*botija*	1631
1178	New Spain	*Nra Sra del Pilar*	3	*botija*	1631
1179	South America	*El Conde Santo*	100	*botija*	1633
1179	New Spain	*Jesus, María y José*	100	*botija*	1633
1179	New Spain	*Nra Sra de Iciar*	50	*botija*	1633
1179	Honduras	*Nra Sra de la Candelaria*	50	*botija*	1633
1179	Honduras	*Nra Sra de la Candelaria*	100	*botija*	1633
1179	South America	*Nra Sra de la Concepción*	50	*botija*	1633

Provisions — Vinegar (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1179	Campeche	*Nra Sra de la Limpia Concepción*	50	*botija*	1633
1179	Campeche	*Nra Sra del Rosario*	50	*botija*	1633
1179	New Spain	*Nra Sra del Rosario*	100	*botija*	1633
1179	New Spain	*San Buena Ventura*	100	*botija*	1633
1179	New Spain	*San José*	100	*botija*	1633
1179	New Spain	*San Juan Bautista*	200	*botija*	1633
1179	South America	*San Pedro*	80	*botija*	1633
1179	New Spain	*Santa Barbara*	100	*botija*	1633
1180	*Santa* Marta	*Nra Sra de la Candelaria*	50	*botija*	1634
1180	Venezuela	*Nra Sra de la Encarnación*	25	*botija*	1634
1180	South America	*Jesus, María y José*	50	*botija*	1634
1180	Río del Macha	*San Miguel Arcangel*	20	*botija*	1634
1180	Margarita	*San Onofre*	20	*botija*	1634
1453	Florida	*La Encarnación y San Bernardo*	30	*botija*	1646
1193	South America	*El Leonpardo*	50	*botija*	1647
1193	Caracas	*El Porfeta*	100	*botija*	1647
1193	South America	*El Triunfo de la Cruz*	100	*botija*	1647
1193	Havana	*Nra Sra de* los Reyes	100	*botija*	1647
1193	South America	*Nra Sra del Rosario*	150	*botija*	1647
1193	Campeche	*Nra Sra del Rosario y San Antonio*	100	*botija*	1647
1193	South America	*Nra Sra de* los Reyes	100	*botija*	1647
1193	Puerto Rico	*San Cosme y Sandamian*	100	*botija*	1647
1193	Caracas	*San Francisco de Asis*	100	*botija*	1647
1193	?	*San Juan y Armas de Polonia*	60	*botija*	1647
1193	South America	*Sanctissima Trinidad*	150	*botija*	1647
1453	Florida	*La Encarnación y San Bernardo*	20	*botija*	1648
1194	New Spain	*San Lenaro*	30	*botija*	1648
1618	South America	*Jesus, María, y Joseph*	50	*botija*	1660
1618	South America	*Nra Sra de la Soledad*	50	*botija*	1662
1618	South America	*Nra Sra del Rosario*	50	*botija*	1662
1618	South America	*La Sanctissima Trinidad*	25	*botija*	1664
1618	South America	*Nra Sra del Rosario*	50	*botija*	1666
1258	South America	*La Sanctissima Trinidad*	50	*botija*	1695
1258	South America	*Nra Sra de la Concepción*	150	*botija*	1695
1258	South America	*Nra Sra del Rosario y las Animas*	50	*botija*	1695
1264	Vera Cruz	*El Santo Cristo de San Román*	150	*botija*	1699
1264	New Spain	*El Santo Cristo de Buen Viaje*	100	*botija*	1699
1264	Vera Cruz	*Jesus, María y Joseph*	100	*botija*	1699
1264	New Spain	*Nra Sra de la Soledad*	20	*botija*	1699
1618	South America	*Santo Cristo de Lesso*	30	*botija*	1670
1618	South America	*Nra Sra de la Estrella*	54	*botija*	1671
1618	South America	*San Antonio*	7	*botija*	1672
1618	South America	*El Rey Niño*	28	*botija*	1673
1618	South America	*Santo Cristo de Lezo*	8	*barril 5a*	1673
1453	Florida	*Nra Sra de la Concepción*	12	*botija*	1704
1453	Florida	*Nra Sra de* Gracia	25	*botija*	1705
1291	South America	*El Angel de la Guarda*	30	*botija*	1721
1291	Cartegena	*San Juan Bautista, Santa Polonia*	100	*botija*	1721
1361	South America	*El Infante Phelipe*	2	*barril*	1737
1361	South America	*El Infante Phelipe*	18	*barril*	1737
1361	South America	*Nra Sra de* Velem, *San Francisco*	30	*barril*	1737
1361	Cuba	*Nra Sra del Buen Ayre*	2	*bota*	1737

Provisions — Vinegar (cont.)

Legajo	Destination	Name of Ship	Quantity	Container	Year
1361	San Juan	*Nra Sra de la Charidad*	16	*barril*	1737
1361	San Juan	*Nra Sra de la Charidad y Animas*	25	*barril*	1737
1361	?	*Nra Sra de los Dolores (Rayo)*	200	*botija*	1737
1361	?	*Nra Sra de los Dolores (Princesa)*	30	*barril*	1737
1361	South America	*Nra Sra del Rosario y San Francisco*	50	*barril*	1737
1361	?	*Nra Sra del Rosario y S F Xavier*	6	*barril*	1737
1361	Cumana	*San Antonio de Paula*	60	*botija*	1737
1361	Cumana	*San Antonio de Paula*	30	*botija*	1737
1361	South America	*San Francisco de Paula*	40	*barril*	1737
1361	South America	*San Francisco de Paula*	1	*pipa*	1737
1361	?	*San Jorge*	10	*barril*	1737
1361	Vera Cruz	*San Joseph, Nra Sra de Carmen*	6	*pipa*	1737
1372	New Spain	*San Joseph (alias El Oriente)*	4	*pipa*	1739
1373	New Spain	*La Divina Pastora*	30	*barril*	1739
1373	New Spain	*La Divina Pastora*	4	*pipa*	1739
1397	Vera Cruz	Nre Sra *de Buen Consejo*	15	*barril*	1760
1656	Cartegena	*La Castilla*	26	*botija*	1760
1656	Cartegena	*La Concepción*	6	*barril*	1760

Provisions — Miscellaneous

Legajo	Destination	Provisions	Quantity	Container	Year
1082	New Spain	chick peas	12	*botija*	1586
1618	South America	olives	200	*botija*	1670
1618	South America	brandy	40	*botijuela*	1670
1229	New Spain	*grassa* — grease	48	*botija*	1678
1229	New Spain	*alquitran* — tar	6	*botija*	1678
1264	Vera Cruz	*alquitran* — tar	70	*botija*	1699
1264	Vera Cruz	*grassa* — grease	25	*botija*	1699
1453	Florida	olives	50	*botija*	1704
1453	Florida	olives	25	*cuñete*	1704
1453	Florida	capers	4	*cuñete*	1704
1453	Florida	sugar	2	*botija verde*	1704
1288	New Spain	*grassa* — grease	20	*botija*	1720
1288	New Spain	*grassa* — grease	8	*botija*	1720
1291	Cartegena	brandy	4	*barril*	1721
1291	Cartegena	capers	24	*cuñete*	1721
1291	Cartegena	*grassa* — grease	80	*botija*	1721
1291	South America	*alquitran* — tar	40	*barril*	1721
1291	South America	*grassa* — grease	40	*botija*	1721
1361	South America	olives	50	*botija*	1737
1361	South America	olives	50	*barril*	1737
1361	South America	olives	150	*botija*	1737
1361	South America	olives	50	*botijuela*	1737
1361	South America	olives	80	*cuñete*	1737
1361	South America	brandy	23	*barril*	1737
1361	South America	brandy	56	*barril regular*	1737
1361	South America	capers	2	*barril*	1737
1361	South America	capers	193	*cuñete*	1737
1361	South America	almonds	10	*barril*	1737
1361	South America	*alquitran* — tar	30	*barrica*	1737
1361	South America	*alquitran* — tar	8	*barril*	1737
1361	South America	anchovies	12	*cuñete*	1737
1361	South America	anis	10	*barril*	1737
1361	South America	anis	8	*botija*	1737
1361	South America	*brea* — pitch	50	*barrica*	1737
1361	South America	*brea* — pitch	40	*botija*	1737
1361	South America	*brea negra* — black pitch	20	*barrica*	1737
1361	South America	*brea rubia* — blond(?) pitch	10	*barrica*	1737
1361	South America	pickles	6	*botija*	1737
1361	South America	*grassa* — grease	40	*botija*	1737
1361	South America	*ensalada* — salad?	6	*botija*	1737
1361	South America	honey	1	*botija*	1737
1361	South America	mustard	4	*botija*	1737
1361	South America	tomatoes	2	*tinaja*	1737
1361	Cuba	olives	36	*botija*	1737
1361	Cuba	olives	12	*cuñete*	1737
1361	Cumana	brandy	4	*bota*	1737
1361	Cumana	olives	50	*botijuela*	1737
1361	Cumana	brandy	1	*barril*	1737
1361	Cumana	brandy	1	*medio barril*	1737
1361	Cumana	capers	50	*botijuela*	1737
1361	Cumana	pickles	12	*botijuela*	1737

Provisions — Miscellaneous (cont.)

Legajo	Destination	Provisions	Quantity	Container	Year
1361	Cumana	*grassa* — grease	2	*botija*	1737
1361	San Juan	brandy	8	*frasquera*	1737
1361	San Juan	*grassa* — grease	40	*botija*	1737
1361	San Juan	*vorras de aceite* — ?	20	*botija*	1737
1361	South America	olives	330	*cuñete*	1737
1361	South America	olives	100	*botija*	1737
1361	South America	brandy	71	*barril*	1737
1361	South America	capers	2	*barril*	1737
1361	South America	capers	140	*cuñete*	1737
1361	South America	almonds	22	*barril*	1737
1361	South America	anchovies	40	*cuñete*	1737
1361	South America	anis	42	*botija*	1737
1361	South America	*brea* — pitch	20	*barrica*	1737
1361	South America	*grassa* — grease	54	*botija*	1737
1361	South America	*grassa* — grease	50	*botijuela*	1737
1361	South America	mustard	4	*botija*	1737
1361	South America	mustard	1	*botijuela*	1737
1361	South America	tomatoes	2	*tinaja*	1737
1361	Vera Cruz	olives	300	*cuñete*	1737
1361	Vera Cruz	brandy	6	*pipa*	1737
1372	New Spain	*grassa* — grease	124	*botija*	1737
1373	New Spain	olives	100	*botija*	1739
1373	New Spain	brandy	12	*barril*	1739
1373	New Spain	Spanish capers	100	*cuñete*	1739
1373	New Spain	fine capers	2	*barril*	1739
1373	New Spain	*grassa* — grease	4	*botija*	1739
1373	New Spain	vinegar for pickling	2	*pipa*	1739
1396	Vera Cruz	fruit	500	*barril*	1760
1396	Vera Cruz	*grassa* — grease	4	*botija*	1760
1397	Vera Cruz	olives	50	*cuñete*	1760
1397	Vera Cruz	brandy	55	*barril*	1760
1397	Vera Cruz	caper	75	*cuñete*	1760
1397	Vera Cruz	almonds	7	*barril*	1760
1397	Vera Cruz	*grassa* — grease	4	*botija*	1760
1398	Vera Cruz	*grassa* — grease	4	*botija*	1760
1656	Cartegena	olives	30	*botija*	1760
1656	Cartegena	olives	20	*cuñete*	1760
1656	Cartegena	brandy	75	*barril*	1760
1656	Cartegena	capers	24	*cuñete*	1760
1656	Cartegena	almonds	3	*barril*	1760
1656	Cartegena	anchovies	6	*cuñete*	1760
1656	Cartegena	*grassa* — grease	4	*botija*	1760

Key to Container Types and Units of Measure

wine containers

botija	1.25	arrobas
botija *	1.3	arrobas
botija#	1.5	arrobas
botija(v)		empty botija
bota	29	arrobas
pipa	27.5	arrobas
quarto		half pipa
barril	4.5	arrobas
barrilito	2.5	arrobas

other containers

botija qa	.25	arrobas
botija mar	.5	arrobas
botija a	1.0	arroba
patija p	1.25	arrobas
botijap 1.5	1.5	arrobas
botija gr	?	grande
botija pe	?	pequeño
botija 1.5	1.5	almudes
botija 2	2.0	alumudes
botija 3	3.0	almudes
botija az	1.0	azumbre
botijuelaa	1.0	azumbre
botijuelaq	0.25	arroba
botijuela$	0.33	arroba
botijuelam	0.5	almud
botijuela1	1.0	almud
frasquera	2.25	arrobas
quarterola	3.5	barriles
quarto	3.5	barriles (dates)
barrilite	.25	arrobas
barril 2a	2.0	arrobas
barril 3a	3.0	arrobas
baril 3.5a	3.5	arrobas
barril 5a	5.0	arrobas
barril 8a	8.0	arrobas
barril 10a	10.0	arrobas
barrilito	2.0	almudes
barril 2	2.0	almudes
barril 3	3.0	almudes
barril 4	4.0	almudes
barril 5	5.0	almudes
barril 6	6.0	almudes
barril 8	8.0	almudes
barril 10	10.0	almudes
barril mf	0.5	fanega
barril f	1.0	fanega
barril 3f	3.0	fanega
barril mq	0.5	quintal
barril q	1.0	quintal
barril 2q	2.0	quintales
bota	3.5	fanegas

2000 botellas equal 22 barriles, which are 1090 arrobas

tonelep	6.5	cargas

Units of Measure

arroba	25	pounds
quintal	100	pounds
fanega	1.5	bushel
almud	4.65	liters
azumbre	4.0	pints

APPENDIX 5

SUMMARY OF *REGISTRO* ANALYSIS

Commercial Wine Summary

(number of containers given for each year, number of ships in parentheses)

year	(7) 1523	(1) 1524	(2) 1526	(1) 1530	(1) 1542	(10) 1545	(1) 1557	(2) 1583	(2) 1584	(6) 1586	(8) 1590
pipa	708	36	81	4	47	1053	313	591	26	1046	1625
bota	10	2	0	0	0	0	0	75	0	0	0
quarto	1	0	0	4	0	2	1	0	0	15	1
barril	0	0	1	0	0	0	0	0	0	0	0
botija	0	0	3	0	0	30	300	16097	3059	881	3653
botija(v)	0	0	0	0	650	2474	1691	0	0	0	0

year	(5) 1591	(1) 1592	(1) 1594	(3) 1596	(5) 1597	(6) 1598	(1) 1607	(7) 1613	(11) 1615	(11) 1633
pipa	92	24	56	637	2753	114	106	683	238	4669
bota	0	0	0	0	0	0	0	0	0	0
quarto	0	0	0	0	0	0	0	1	0	0
barril	0	0	0	0	0	0	0	0	0	0
botija	23571	0	700	1302	3001	7347	0	3746	21083	16240

year	(4) 1634	(1) 1646	(14) 1647	(6) 1648	(1) 1660	(1) 1662	(1) 1664	(1) 1666	(1) 1672	(2) 1673
pipa	40	0	191	231	0	0	0	0	48	50
bota	0	0	0	0	0	0	0	0	0	0
quarto	0	0	0	0	0	0	0	0	0	0
barril	0	0	0	0	0	0	0	0	0	0
botija	12400	2500	20615	6750	600	1000	1500	1400	1200	7000

year	(2) 1674	(1) 1677	(14) 1678	(2) 1695	(4) 1699	(1) 1704	(1) 1705	(4) 1720	(8) 1721	(6) 1737
pipa	0	0	1955	0	164	0	0	58	0	0
bota	0	0	0	0	0	0	0	500	0	0
barril	0	0	0	48	168	0	0	1104	155	100
barrilito	0	0	0	0	0	0	0	0	0	0
quarto	0	0	0	0	0	0	0	0	0	0
botija	7000	600	7280	1424	90	875	200	0	14011	6085

year	(2) 1739	(5) 1760	(5) 1788		(2) 1739	(5) 1760	(5) 1788
pipa	235	38	22	*quarterola*	30	35	0
bota	0	0	0	*limeta*	0	990	0
barril	1041	3939	4993	*frasquera*	0	150	0
barrilito	0	0	36	*botella*	0	0	10 *cajitas*
quarto	0	0	0	*botija*	0	7858	5000

Commercial Olive Oil Summary

(number of containers given for each year, number of ships in parentheses)

	(9)	(1)	(1)	(10)	(1)	(2)	(2)	(4)	(9)	(1)
year	**1523**	**1526**	**1542**	**1545**	**1557**	**1583**	**1584**	**1586**	**1590**	**1591**
botija	3102	78	220	6886	626	6083	602	1400	2179	5885
botija mar	0	0	0	0	0	0	0	0	150	0
botija qa										

	(1)	(1)	(4)	(5)	(4)	(1)	(5)	(7)	(6)	(3)
year	**1592**	**1594**	**1596**	**1597**	**1598**	**1607**	**1613**	**1615**	**1633**	**1634**
botija	100	1746	3120	3042	1218	1800	2360	2780	10406	372
botija mar	0	0	1660	0	0	0	0	0	0	0

	(1)	(4)							
year	**1646**	**1647**	**1648**	**1660**	**1672**	**1674**	**1677**	**1678**	**1695**
botija	1000	800	3375	200	600	1000	0	2882	0
botija mar	0	0	0	0	0	0	0	0	0
botijuela	0	0	0	0	0	0	400	22814	400

		(1)	(4)	(6)	(2)	(3)	(5)	(7)
year	**1699**	**1704**	**1720**	**1721**	**1737**	**1739**	**1760**	**1778**
botija	0	0	0	564	0	400	0	0
botija mar	0	0	0	400	0	1300	6	0
botijuela	4375	0	2870	2200	0	5415	0	14068
botijuela m	0	400	1500	1500	200	0	4078	21540
botijuela 3	278	0	0	0	0	0	0	0
botijuela 5	0	0	6801	24	0	0	0	0
botijuela q	0	0	300	0	0	0	0	0
botija 5	0	0	0	24	0	0	0	0
botija r	0	0	0	200	0	0	0	0
botija $	0	0	0	0	0	0	0	6
botija m	0	0	0	4000	1600	0	2497	0

Commercial Vinegar Summary

(number of containers given for each year, number of ships in parentheses)

year	(3) **1523**	(2) **1526**	(1) **1542**	(7) **1545**	(1) **1557**	(2) **1586**	(2) **1590**	(1) **1591**	(1) **1594**	(1) **1596**
pipa	6	0	0	0	0	0	0	0	4	5
quarto	20	0	0	0	0	0	0	0	0	0
barril	0	0	0	0	0	0	0	0	0	0
botija	1	30	100	761	26	140	209	303	80	60

year	(2) **1598**	(1) **1607**	(2) **1615**	(4) **1633**	(1) **1634**	(1) **1646**	(4) **1647**	(3) **1648**	(1) **1673**
pipa	0	6	0	0	0	0	0	10	6
barril	0	0	0	0	0	0	0	0	50
botija	500	0	275	4230	6	200	245	650	0

year	(1) **1695**	(1) **1699**	(3) **1720**	(2) **1721**	(1) **1737**	(3) **1760**	(3) **1778**
pipa	0	0	0	0	20	0	5
barril	0	6	0	0	0	23	137
botija	500	0	640	200	0	1	0

Commercial Brandy Summary

(number of containers given for each year, number of ships in parentheses)

	(1)	(1)	(2)	(1)	(1)	(7)	(3)	(1)	(1)	(4)
year	**1583**	**1613**	**1633**	**1634**	**1646**	**1647**	**1648**	**1662**	**1674**	**1678**
pipa	0	0	0	0	0	81	0	0	0	20
barril	0	0	0	0	0	0	0	0	0	23
botija	0	0	0	0	0	100	0	0	0	0
botijuela	0	0	0	20	200	1450	1030	600	300	2032

	(2)	(1)	(4)	(7)	(1)	(2)	(3)	(5)	(6)
year	**1699**	**1704**	**1720**	**1721**	**1731**	**1737**	**1739**	**1760**	**1778**
pipa	0	0	23	0	8	0	0	24	0
media pipa	0	0	0	0	0	0	0	235	0
barril	0	0	1484	389	12	352	387	5153	7567
bota	0	0	0	0	2	0	0	0	0
quarterola	0	0	0	0	0	0	0	10	0
botija	0	0	0	330	0	0	0	0	0
botijuela	0	375	0	620	0	0	0	0	0
frasquera	250	0	25	48	0	99	0	112	0
botella	0	0	0	0	0	4524	0	9580	10 *cajitas*
limeta	0	0	1300	0	0	0	0	0	6960

Commercial Olives Summary
(number of containers given for each year)

year	1523	1530	1545	1557	1583	1586	1590	1591	1596	1597	1598
pipa	0	0	3	0	0	0	0	0	0	0	0
tonele	0	0	0	6	0	0	0	0	0	0	0
quarto	1	0	19	0	0	0	4	0	0	0	0
barril	28	0	85	20	0	26	107	56	10	13	0
barril 2	0	0	127	35	0	0	0	0	0	0	0
barril 3	0	0	70	0	0	0	0	0	0	0	0
barril 5	0	0	41	0	0	0	0	0	0	0	0
barril 8	0	0	12	0	0	0	0	0	0	0	0
barril q	0	0	0	0	0	0	0	0	0	3	0
barril mq	0	0	0	0	0	10	2	0	0	0	0
barril f	0	0	11	4	0	0	0	0	0	0	0
barril mf	0	0	29	0	0	0	0	0	0	54	0
barril 3f	0	0	12	0	0	0	0	0	0	0	0
barrilito	0	0	100	0	0	0	0	0	0	0	0
botija	0	0	59	4	762	522	57	604	385	890	816
botija mp	0	0	28	56	457	345	271	274	100	70	0
botija 2	0	0	12	0	40	0	0	0	44	0	0
botija ma	0	0	188	0	0	0	0	0	0	160	0
botija p	0	0	0	24	5	0	0	0	0	0	0
botija 1.5	0	0	0	0	0	0	200	0	17	0	0
botijuela	0	0	0	0	0	0	0	100	171	0	50
botijuela1	0	0	0	0	0	0	0	50	0	0	0
mazto	0	1	0	0	0	0	0	0	0	0	0
jarra	1	0	0	0	0	0	0	0	0	0	0

year	1613	1615	1633	1634	1647	1648	1674	1678	1695	1699
pipa	0	0	0	0	0	0	0	0	0	0
barril	1071	0	455	46	88	40	6	0	0	0
barril q	0	0	4	0	0	0	0	0	0	0
barril mf	10	0	0	0	0	0	0	0	0	0
barril mq	20	0	0	0	0	0	0	0	0	0
barril 2	0	0	87	0	0	0	0	0	0	0
barril 4	0	0	0	31	0	0	0	0	0	0
barril 6	0	0	234	0	0	0	0	0	0	0
barril 10	0	12	0	0	0	0	0	0	0	0
barrilito	0	0	1	0	0	0	0	0	0	0
cuñete	0	0	0	0	0	0	0	0	0	70
botija	0	0	0	0	0	0	100	100	150	0
botija p	0	0	73	0	0	0	0	0	0	0
botija ma	800	0	0	0	0	0	0	0	0	0
botijuela	0	200	0	200	0	0	0	0	0	0
botijuela 1	100	0	0	0	0	0	0	0	0	0
*botijuela **	0	0	0	80	0	0	0	0	0	0

Commercial Olives Summary

(number of containers given for each year)

year	1720	1721	1778
barril	0	0	0
botija	0	0	25
botijuela	0	0	1000
cuñete	598	272	60

BIOGRAPHICAL SKETCH

The author was born on January 1, 1957 in Geneva Illinois and graduated from Wheaton Central High School in 1975. He received a B.A. in anthropology from Marquette University in 1979, an M.A. in anthropology from Southern Illinois University at Carbondale in 1983, and a Ph.D. in anthropology from the University of Florida in 1997. His current residence is Natchitoches, Louisiana, where he is the Los Adaes Station Archaeologist and adjunct professor of anthropology at Northwestern State University of Louisiana.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Kathleen Deagan

Kathleen Deagan, Chair
Distinguished Research Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Jerald T Milanich

Jerald Milanich
Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Prudence M. Rice

Prudence Rice
Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Murdo MacLeod

Murdo McLeod
Graduate Research Professor of History

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

David Clark

David Clark
Professor of Material Sciences and Engineering

This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 1997

Dean, Graduate School

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Kathleen Deagan

Kathleen Deagan, Chair
Distinguished Research Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Jerald Milanich

Jerald Milanich
Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Prudence M. Rice

Prudence Rice
Professor of Anthropology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Murdo J. MacLeod

Murdo McLeod
Graduate Research Professor of History

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

David Clark

David Clark
Professor of Material Sciences and Engineering

This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 1997

Dean, Graduate School