AN ANALYSIS OF THE GALLEY WARE
FROM A NINTH-CENTURY SHIPWRECK AT BOZBURUN, TURKEY

A Thesis

by

DOREEN MARIE DANIS

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

August 2002

Major Subject: Anthropology
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ABSTRACT

An Analysis of the Galley Ware from a Ninth-century Shipwreck

at Bozburun, Turkey. (August 2002)

Doreen Marie Danis, B.A. Boston College

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Dr. Frederick Hocker

In the summer of 1995, the Institute of Nautical Archaeology began the
evacuation of a ninth-century Byzantine shipwreck off the southwestern coast of Turkey.
In the area of the galley, an assemblage of 17 ceramic and copper vessels was recovered.
This galley ware assemblage contributes important data about the following: first,
shipboard life, including crew size and methods of meal preparation; second, degree of
similarity with galley ware assemblages from other Byzantine shipwrecks (i.e., Yassi
Ada and Serçe Limanı shipwrecks) and with kitchen ware assemblages from terrestrial
sites (e.g., Byzantine Shops at Sardis); and chronology, in that the Bozburun shipwreck
and its cargo can be dated precisely to 875, a period poorly documented in the
archaeological record. At this time, the eastern Mediterranean economy, shattered by
the Arab conquest of the mid-seventh century, began the recovery that would lay the
groundwork for the economic explosion of the eleventh and twelfth centuries.
ACKNOWLEDGEMENTS

The completion of this thesis would not have been possible without the generous support and assistance provided by numerous individuals. Special thanks are due to Dr. Fred Hocker, Director of the Bozburun Shipwreck Excavation. His tireless ability to teach, both in the field and in the classroom, is exemplary. For the hours of input and editorial comments provided on my behalf, I thank also Dr. George Bass. Over the course of three years of excavation and subsequent research, Dr. Hocker’s and Dr. Bass’ combination of expertise and inspiration have greatly assisted me in my research.

I am indebted also to the staff at the Institute of Nautical Archaeology in Bodrum, especially Sheila Matthews, Netia Piercy, and Dr. Fred van Doorninck, Jr.; Sheila, for her tireless transatlantic assistance in providing measurements and description data of the Bozburun galley ware; Netia, whose beautiful artifact illustrations inspired me to draw my own; and “Uncle Fred” for his Byzantine bibliographic genius. To the staff at the Bodrum Museum of Underwater Archaeology, Oğuz Alpözen, Kathy Hall, Esra Altinan-Göksu, and Asaf Oron, I am extremely grateful for the use of the laboratory facilities and their assistance in the assemblage analysis.

At Texas A&M University, I am grateful to Olga Martinez for her assistance in all of the administrative affairs related to this thesis, and to Matthew Harpster who served as my Bozburun contact in College Station, the Bozburun hull expert, and steadfast friend.
My parents, Harold and Dorothy Danis, have offered tremendous support throughout my academic pursuits, for which I am forever thankful. And to my husband, Tristan, my best friend and Editor-in-Chief, \textit{maximas gratias}. 
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ABBREVIATIONS

AA Archäologischer Anzeiger
AASOR Annual of the American Schools of Oriental Research
ADAJ Annual of the Department of Antiquities, Jordan
AJA American Journal of Archaeology
AnSt Anatolian Studies
BAR British Archaeological Reports
BCH Bulletin de correspondance hellénique
BSA Annual of the British School at Athens
DOP Dumbarton Oaks Papers
INA Institute of Nautical Archaeology
IJNA International Journal of Nautical Archaeology
IstMitt İstanbuler Mitteilungen
JOAIBeibl Jahreshefte des österreichischen archäologischen Institutes, Beiblatt
MIA Materealy e Essledovaniya
PEQ Palestine Exploration Quarterly
QDAP Quarterly of the Department of Antiquities in Palestine
SovArch Sovetskaja Arjeologija
INTRODUCTION

THE SHIPWRECK AT BOZBURUN

In the summer of 1995, a professional staff comprised of members of the Institute of Nautical Archaeology (INA), other specialists of underwater archaeology, and students of the field, began the excavation of a ninth-century Byzantine shipwreck off the southwestern coast of Turkey near the town of Selimiye on the Bozburun (Gray Cape) Peninsula. The wreck was chosen from among over 100 known along the Turkish coast because of its significance for a study of medieval economics, technology, and international relations. The ship dates to a period when the eastern Mediterranean economy, shattered by the Arab conquest of the mid-seventh century, began the recovery that would lay the groundwork for the economic explosion of the eleventh and twelfth centuries. The period is also marked by the resurgence of Byzantium, after two centuries of military defeat, culminating in the struggle for naval dominance of the Mediterranean Sea between the Byzantine Empire and the last united Islamic government, the Abbasid Caliphate (Figure 1).

Despite the wealth of historical sources available for this period, especially from the Arab world, there is little direct evidence concerning the structure, scale, and changing technology of overseas commerce. Land archaeology related to this period adds little to our understanding of Middle Byzantine international trade. The Bozburun shipwreck, through an analysis of its cargo of wine, offers a unique opportunity to evaluate the resuscitation of long-distance trade after the Arab conquests of the seventh

This thesis follows the style and format of the American Journal of Archaeology.
century, and to assess the scale and structure of a sector of the eastern Mediterranean economy during the ninth century: for example, the storage jars reveal much concerning the source and ownership of the cargo, which, in turn, can be used to investigate patterns of distribution within the eastern Mediterranean economy. In addition, further provenience testing such as petrographic and Neutron Activation Analysis could potentially identify the region of manufacture.

The Bozburun wreck, through an analysis of the hull remains, also provides important data regarding resource utilization and technological innovation. In the first millennium AD there were drastic changes in the conceptual basis of ship-building, which greatly affected: 1) timber usage in a period of high demand for natural resources; 2)
increasing independent mercantilism; and 3) commerce. Two other medieval Mediterranean shipwrecks, namely, the seventh-century Yassı Ada wreck and the eleventh-century Serçe Limanı wreck help to map out these conceptual changes. However, there is a gap of 400 years between the two. Chronologically, the Bozburun wreck falls between these wrecks — a period poorly documented in the archaeological record. The wreck at Bozburun, therefore, provides valuable data against which hypotheses generated by the analysis of the Yassı Ada and Serçe Limanı wrecks can be tested.

Finally, the Bozburun site helps to illuminate the relationship between the Byzantine and Islamic worlds in a border zone. Not only did the ship sink in an area haunted by Moslem pirates based in Crete between 824 and 961, but it also may have been involved in trade with Arab-controlled areas. Examination of possible personal possessions, for example, can provide important information about the level of cultural interchange among seafarers, one of the most mobile socioeconomic groups in any society.

The shipwreck at Bozburun had been known to the Institute of Nautical Archaeology for many years. Located at the base of a cliff called Kılıçiven Burnu at the mouth of the large natural harbor of Selimiye, the wreck was first shown to Dr. George Bass and his survey team in 1973 by Mehmet Aşkın, a sponge diver from the nearby town of Bozburun. The wreck appeared to the survey team as a low mound of amphoras approximately 20 m long and 8 m wide, oriented almost directly north-south, with the stern lying at a depth of 26 m and the bow at 36 m. Over the course of three more
surveys, three amorphas of pyriform shape were raised for identification; these provided a preliminary date for the wreck in the ninth or early tenth century. It was surmised that this may have been a merchantman engaged in supplying one of several naval stations along the Byzantine coast at the time of its sinking.⁵ Noting the excellent state of preservation and the overall importance of this wreck, INA began excavation in the summer of 1995.

Four seasons of excavation have generated considerable data concerning the vessel, its contents, and its date.⁶ The hull, of which 30–40% of the starboard side from the keel to the bilge is preserved, is currently undergoing reconstruction and analysis.⁷ More than 1,000 amphoras have been recovered (of which 970 were sufficiently intact for analysis of form and capacity), 205 with graffiti, providing a substantial data set for the analysis of the economic aspects of the site.⁸ Extensive analysis of the botanical remains and residue collected from the clay containers has provided valuable information for the reconstruction of Medieval subsistence.⁹ The galley ware assemblage, which includes both ceramic and copper vessels, is described at great length below. The Greek graffiti found on a number of artifacts, and the amphora parallels found at Medieval sites in Turkey, Greece, Italy, and the Crimea provide an approximate date in the ninth century. The dendrochronological analysis of the hull yields a *terminus post quem* date of 874 A.D. which corresponds to the felling year of the keel.¹⁰

In the stern of the wreck on the starboard side were the galley and hearth, the limits of which were defined by the distribution of the hearth tiles, galley artifacts, as well as a deposit of charcoal (Figure 2). Twelve square stone tiles rested on top of a layer of
stone, some of it roughly dressed (probably ballast). Amongst the tiles, six round-bottomed cooking pots with one and two handles (as well as fragments of others) were recovered, along with two braziers or collar stands. An additional pot was found farther
aft near the centerline of the ship. Except for this last pot, all were found in a line perpendicular to the keel, suggesting the former existence of a bulkhead or storage rack. Four pitchers, plus fragments of at least two more, and four juglets, all of various sizes and shapes, were recovered to starboard and forward of the main concentration of pots. One more pitcher was found farther aft, on the port side. These vessels were also found in a line running more or less parallel to the keel. In addition to ceramic wares, two jugs made of beaten copper sheets, cold hammered together and bearing a triangular diadem, were found in the area of the galley.¹¹

The vessels described above are included in the galley ware assemblage for the following reasons: 1) they were found in the area of the vessel considered to have been the galley; 2) they were presumably used for food preparation or storage; 3) most vessels were similar in terms of form, size, and fabric within a subgroup (e.g., cooking pots) and, moreover, some vessels in different subgroups shared the same fabric (e.g., cooking pots and pot stands). Function and context were the determining factors in defining this assemblage; therefore, both ceramic and copper vessels are included.

It is this galley ware assemblage from the Bozburun shipwreck that is the subject of my thesis. In the pages to follow, first I will discuss the scholarship pertaining to Byzantine coarse table wares; then I will describe the individual vessels and provide comparanda from underwater and land sites; and, finally, I will reconstruct shipboard life based on the conclusions I have drawn from my analysis of the galley ware.
THE HISTORY OF SCHOLARSHIP

The study of the Byzantine ceramic repertoire has long been in the shadow of its more famous forebear, classical archaeology. This disparity in research was in part a function of the textual tradition: literary golden ages attract the attention of archaeologists, for example Homer's influence on the keen interest in the Aegean Bronze Age and the Hebrew Bible's influence on ancient Near Eastern archaeology. The study of Byzantine coarse wares was slow to mature: at first, all Byzantine Period pottery was discarded; next, fine wares were retained and deemed worthy of study; finally, coarse wares were considered a worthy topic of study in their own right.

At the outset of archaeological investigation into the Byzantine period in Turkey, much attention was lavished on the churches of Hagia Sophia and Hagia Eirene, whereas the material culture of the civilization that produced these works was consistently overlooked. Classical archaeologists, driven by research interests and constrained by lack of time and money, would rush through more recent strata in pursuit of earlier periods. As aptly put by Charles H. Morgan: "Plates and bowls, fragmentary and whole, were consigned to the dump, their bright green or yellow glazes signaling them for oblivion as Medieval rubbish." The first treatment of Byzantine ceramic table wares was J. Ebersolt's review of the glazed and decorated vessels recovered from the Hippodrome prior to 1910. In similar fashion, R.M. Dawkins and J.P. Droop published only the glazed wares from Sparta. This trend continued until 1928, when David T. Rice, in the second report on the excavations at the Hippodrome, introduced a new category of ceramics, the unglazed wares. In this publication is the first real discussion, albeit brief,
of unglazed, unslipped ceramics. Rice did not revisit this category, however, in what has been deemed the first systematic treatment of Byzantine ware, namely, his *Byzantine Glazed Pottery* of 1930. A focused study of Byzantine unglazed wares did not appear again until 1942 when Charles Morgan listed them as one of four main categories in his publication of the Byzantine pottery from Corinth.\(^{16}\) Up to this point, all of these classifications were based primarily on typological considerations (*i.e.*, ware color, surface treatment).

This new appreciation for Byzantine material culture, however, was not without pitfalls: the intricately incised vessels and elaborately painted wares had all made their way into the ceramic catalogs and museum displays devoted to Byzantium. Indeed, the "finewares" had contributed immensely to the overall Byzantine relative chronology. The domestic coarse wares, on the other hand, had not fared as well: despite the fact that they constituted a major part of the excavated material, they had been given short shrift. A new era in Byzantine ceramic analysis began with R.B.K. Stevenson's classification, which was based on both typology and archaeological context, in the 1947 report on the *Great Palace of the Byzantine Emperors*.\(^{17}\) He separated the pottery into five chronological stages based on excavation area and presented all types of pottery collectively according to stage: "the material is treated concurrently, not separately, in order to preserve their association."\(^{18}\) Twenty years later, Hector W. Catling employed a similar approach in his report on the early Byzantine pottery factory at Dhioros on Cyprus.\(^{19}\)
In the Levant, an altogether different system of classification was utilized. In 1950, Fr. Hilary Schneider classified the Byzantine pottery from Siyagh (Mount Nebo) according to form in addition to providing fabric and surface descriptions.\textsuperscript{20} This method was adopted by Fr. S.J. Saller in his treatment of the ceramic corpus from Bethany, in which he classified the pottery according to period as well as form.\textsuperscript{21} At Pella, R.H. Smith's classificatory system, like that of Stevenson's, was based on chronological divisions.\textsuperscript{22} As a result of the gradual shift in focus from surface treatment to context and form, the undecorated coarse wares had become a staple of Byzantine pottery publications.

In 1989, two publications appeared that dealt at length with coarse wares. Caroline Williams published the Roman and Early Byzantine pottery from Anemurium with an entire chapter dedicated to the common wares.\textsuperscript{23} Charlampos Bakirtzes took pottery research a step further in his study of all Byzantine cooking, transport, and storage vessels published to date.\textsuperscript{24} By consulting contemporary written sources and representations contained in illuminations, icons, frescoes, and mosaics, he correlated the ancient Greek names for these vessels with their archaeological counterparts. Bakirtzes also placed common wares, as much as is possible at such a remove of time, in the context of daily life.

The excavations of Harvard University at Sardis, specifically the Byzantine shops, have yielded coarse wares that were used by and exchanged among Jews, Christians, Greeks, and Romans. The finds from the Byzantine shops are presented not according to form or function, but, rather, by shop, thereby allowing for better contextual analysis.\textsuperscript{25}
The most recent refinement of Byzantine pottery analysis occurred in 1992 with John Hayes' publication of the Late Roman, Byzantine, and Turkish pottery from Sarachane. Although Hayes incorporated the categories developed by Stevenson and Rice, he reclassified each category according to fabric. Hayes also charted the development of each category at Sarachane within the larger regional context of Byzantine ceramic study. With Hayes, the fullest potential of Byzantine coarse ware analysis for historical and archaeological inquiry was realized.

METHODOLOGY

Over time, the scholars mentioned above established a certain paradigm for utilitarian pottery analysis, which came to include the following three features: 1) a detailed analysis of fabric, surface treatment, and method of manufacture; 2) a standard morphological description; and 3) a standard system of nomenclature based on vessel function and certain diagnostic features. In the following description of the Bozburun galley ware, I employ a methodology that incorporates these three features, with modifications to accommodate the copper artifacts.

In the object descriptions that follow, there are two sequences of numbers and letters. The first sequence (see below) refers to the context or the location on the ship where the object was recovered. "E11" indicates the two-meter grid letter and number. The four one-meter subgrids are abbreviated as follows: UL (upper left), UR (upper right), LL (lower left), and LR (lower right). The one-meter subgrids are further subdivided into four one-half-meter sub-subgrids and labeled 1 through 4. When the
object is on the border of two subgrids, both are listed and separated by a slash (/) (e.g., E11 UL4/LL). The registration system used (see below), both here and in the field, is based on a lot number,\textsuperscript{28} with complete or nearly complete objects also assigned individual inventory numbers beginning with the prefix BK (Bozburen-Küçüven Burnu).

For example:

*Field Registration:* Lot 2683, BK 218

The first object attribute described is fabric, which includes a description of the following: clay and core color, inclusions, decoration, and manufacturing techniques. Clay and core color, both dry and wet, were determined according to the *Munsell Soil Color Charts*. Inclusions are described according to type, size, and quantity. The inclusion types are "organic matter (evidenced by burn-outs)," "mica," and "sand/grit."\textsuperscript{29} Size descriptions used are "fine" (appears as a sparkle), "small (0.25 mm and less)," "medium (0.50 to 0.25 mm)," and "large (1.00 to 0.50 mm)." Quantity is based on amount of inclusions visible to the human eye per centimeter. The types of surface treatment include the following: slipped, glazed, and incised (both decorative and graffiti). In the description of
manufacturing techniques are observations about method of production (i.e., wheel-made, mold-made) and anomalies in vessel formation.

Accurate capacity and linear measurements were made possible by the complete removal of all marine concretion deposits by the conservation staff. Capacity and weight measurements were taken only of those vessels that were complete or nearly complete. This process began by weighing the dried vessel. After this measurement was recorded, the vessel was filled with measuring beads to the neck/shoulder junction. The measuring beads were removed and then measured in liters. In order to provide at least a minimum value with those objects missing the rim and neck, capacity was recorded with beads filled to the shoulder region.

The linear measurements taken (in cm) were the following: diameter (rim, maximum body diameter, and base), thickness (vessel wall), and height. In those instances when the vessel was not fully intact, the preserved height is indicated as such in parentheses. The morphology category is comprised of a full vessel description from rim to base, including all measurements and degree of preservation. Included in the form description of the vessels are the lip, rim, wall and neck profiles, handle style and placement, and base type. In the case of the copper pitcher, seam locations and type are given. The vessel analysis concludes with comparanda derived from within the INA collection at the Bodrum Museum and land sites. Treatment of comparanda are presented according to region, and then chronology. This regional approach coincides with the degree of similarity of the parallels.
THE GALLEY WARE

COOKING POTS

There are a combined total of eight partial and complete one- and two-handled cooking pots, ranging in capacity from 1.83–2.62 liters. Six of the cooking pots were found in grid E11 and two others in grids D10 and F11. All of the cooking pots are of the same fabric and manufacture. The one-handled cooking pot, because of its unique form, will be treated separately.

Cooking Pot #1 (CP 1), Figure 3

Context: E11 UL4/LL Field Registration: Lot 2683, BK 218

Preservation: complete, but bottom with circumferential crack and across center; one side, inside and out, is partly covered with calcareous growth; no obvious signs of use.

Fabric and Treatment:

Clay color: 5YR 3/2, dark reddish brown (wet); 7.5YR 4/4, brown (dry)

Inclusions: small to fine mica flakes, approximately 15/cm; few voids from burnt out organic matter.

Fabric: coarse; dark, gritty body susceptible to spalling mica flakes. Core: grayish-black.

Surface treatment: unslipped and unglazed; no incised decoration.
Technical/manufacturing remarks: rounder bottom than the other cooking pots and a distinct carination at bottom/side join; asymmetrical; handle attachments flare considerably at ends; turned on slow wheel.

Measurements:

Weight: 0.994 kg  Volume: 2.35 l  Height: 15.2

Diameters: 14.2 (rim), 17.2 (max.)  Thickness: 0.06 (vessel wall)

Form Description:

Globular body with a slightly everted, thickened rim and a rounded lip; a short neck with handle attachments located at neck and body above maximum diameter; two wide, flat, vertical, strap handles with slight groove at center which rise to level of rim before turning down towards body; handle ends flared; at shoulder, body tapers outward substantially; handles attach just above join of body and base; distinct carination at this join to very round bottom.

Discussion: Discussion of vessels #1–7 to follow.
Cooking Pot #1 (CP 2), Figure 4

Context: E11 UL4/LL2  Field Registration: Lot 2684, BK 219

Preservation: complete, but bottom broken into five sherds (breaks are old); breaks occur along body/bottom carination; one side of exterior is lightly covered in thin calcareous growth; same side of interior covered in worm tubes; signs of scraping on interior and exterior blackening.

Fabric and Treatment:

Clay color: 7.5YR 2.5/2, very dark brown (wet); 5YR 4/4, reddish brown (dry)
Inclusions: small to fine mica flakes, approximately 15/cm; few voids from burnt out organic matter.

Fabric: coarse; dark, gritty body susceptible to spalling mica flakes. Core: grayish-black.

Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: turned on a slow wheel.

Measurements:

Weight: 1.192 kg   Volume: 2.46 l   Height: 15.2

Diameters: 15.4 (rim), 17.8 (max.)   Thickness: 0.06 (vessel wall)

Form Description:

Globular body with flared rim and rounded lip; short neck that tapers inward substantially below rim; handle attachments located at neck and body above maximum diameter; two wide, flat, vertical, strap handles with slight groove at center which rise to level of rim and flare out beyond maximum diameter before turning down towards body and attaching at maximum diameter; handle ends flared; round bottom without base joins convex side at rounded carination (most rounded in collection); maximum diameter well above carination.
Cooking Pot #3 (CP 3), Figure 5

Context: E11 LL2    Field Registration: Lot 3323, BK 369

Preservation: complete; exterior substantially covered with calcareous growth, especially over bottom; interior has some worm casings on one side but otherwise unencrusted; some exfoliation of rim surface; dark staining on exterior bottom.

Fabric and Treatment:

Clay color: 5YR 2.5/2, very dark brown (wet); 5YR 4/3, reddish gray (dry)

Inclusions: small to fine mica flakes, approximately 15/cm.; few voids from burnt out organic matter.

Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: body slightly elliptical; turned on slow wheel.

Measurements:

Weight: 1.156 kg Volume: 3.00 l Height: 15.1

Diameters: 15.1 (rim), 18.8 (max.) Thickness: 0.06 (vessel wall)

Form Description:

Larger version of CP 1 with less carination at bottom; slightly flared rim with out-turned flattened lip; short neck that tapers inward below rim; handle attachments located at neck and body above maximum diameter; two wide, flat, vertical, strap handles with raised edges and slightly raised medial ridge; handles rise to level of rim and then turn downward towards body and attach just above maximum diameter; handle ends flared; bottom is spherical, joining body at hard turn.
Cooking Pot #4 (CP 4), Figure 6

Context: E11 LL2  
Field Registration: Lot 3324, BK 370

Preservation: complete, with bottom broken into small sherds; body cracked, some bottom surface exfoliated; minimal calcareous growth; some worm tubes inside; no obvious signs of use.
Fabric and Treatment:

_Clay color:_ 7.5YR 2.5/2, very dark brown (wet); 10YR 4/2, dark grayish brown (dry)

_Inclusions:_ medium to small mica flakes, approximately 15/cm.; voids from burnt out organic matter.

_Fabric:_ coarse.  
/Core:_ thick gray.

_Surface treatment:_ unslipped and unglazed; no incised decoration.

_Technical/manufacturing remarks_  turned on a slow wheel.

Measurements:

_Weight:_ 1.220 kg  
_Volume:_ 2.51  
_Height:_ 15.0

_Diameters:_ 14.5 (rim), 19.7 (max.)  
_Thickness:_ 0.06 (vessel wall)

Form Description:

_Similar to CP 1 in its distinct carination, but similar to CP 2 in its low carination and maximum diameter; slightly flared rim with out-turned flattened lip; short neck that tapers inward below rim; handle attachments located at neck and body above maximum diameter; two wide, flat, vertical, strap handles with slightly raised edges and medial ridge; handles flare at ends; shoulder rounds to sides which are more vertical over lower half; maximum diameter 3 cm below body handle attachment; spherical bottom joins sides at rounded carination._
**Cooking Pot #5 (CP 5), Figure 7**

*Context:* E11 LR3    *Field Registration:* Lot 3707, BK 471

*Preservation:* complete; sides nearly completely covered with calcareous growth; some exfoliation of surface on bottom and one side.

*Fabric and Treatment:*

*Clay color:* 7.5YR 2.5/2, very dark brown (wet); 7.5YR 4/2, brown (dry)
Inclusions: very fine mica flakes, approximately 25/cm; few voids from burnt out organic matter.

Fabric: coarse; dark, gritty body susceptible to spalling mica flakes. Core: grayish-black

Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: turned on slow wheel.

Measurements:

Weight: 0.908 kg  Volume: 1.83 l  Height: 16.5

Diameters: 14.7 (rim), 19.8 (max.)  Thickness: 0.05 (vessel wall)

Form Description:

Similar to CP 3; flared rim with everted, flattened lip; ledge-like internal thickening at neck/shoulder junction; two vertical, strap handles attached just below rim and at maximum diameter; handles have raised edges and slight medial ridge; ends flared at attachments; from neck, sides slope outward with maximum diameter just below handle attachment on body; round bottom (although slightly more pointed than others) joining sides at rounded carination.
Cooking Pot #6 (CP 6) (too fragmentary for drawing)

Context: D10 UL3    Field Registration: Lot 3696, BK 470

Preservation: fragmentary (in 29 pieces); three pieces missing in body area; some exfoliation of surface on bottom and one side.

Fabric and Treatment:

Clay color: 7.5YR 3/4, dark brown (wet); 7.5YR 5/4, brown (dry)
Inclusions: small to fine mica flakes, approximately 15/cm.; few voids from burnt out organic matter.

Fabric: coarse; dark, gritty body susceptible to spalling mica flakes. Core: grayish-black.

Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: turned on a slow wheel.

Measurements:

Weight: 1.130 kg    Volume: 2.62 l    Height: 16.0

Diameters: 15.0 (rim), 20.0 (max.)    Thickness: 0.05 (vessel wall)

Form Description:

Globular body with flared rim and rounded lip; short neck that tapers inward sharply below rim; handle attachments located at neck, lower handle attachments missing; two wide, flat, vertical, strap handles with slight raised ridge at center and shallow groove to either side (of ridge); handles rise to just below level of rim and flare out beyond maximum diameter before turning down towards body; they would have attached just above maximum diameter; handle ends flared; round bottom without base joins convex side at rounded carination.

Cooking Pot #7 (CP 7), Figure 8

Context: E11 LL2    Field Registration: Lot 9449

Preservation: partial; only part of rim, one handle and side of body remains.
Fabric and Treatment:

Clay color: 7.5YR 2.5/2, very dark brown (wet); 5YR 5/2, reddish gray (dry)

Inclusions: medium to small mica flakes, approximately 15/cm; few voids from burnt out organic matter.

Fabric: coarse; dark, gritty body susceptible to spalling mica flakes.  Core: thick gray.

Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: turned on a slow wheel.

Measurements:

Height: 15.2 (preserved rim to base)

Diameters: 14.0 (rim)  Thickness: 0.05 (vessel wall)

Form Description:

Large pot, based on height relative to other intact pots; similar in design to CP 4 with its distinct, but low carination; flared rim with rounded lip; ledge-like internal thickening at neck/shoulder junction; one vertical strap handle attached just below rim and on body above maximum diameter; handle has raised edges and slight medial ridge; ends flared at attachments; from neck, sides slope outward with maximum diameter 3 cm below handle attachment on body; spherical bottom joining sides at rounded carination.
Discussion (Figure 9):

The baggy shape of this group of two-handed cooking pots is typical of the seventh century and later. Cyprus has provided the greatest number of parallels for the Bozburun collection. The seventh- and eighth-century material from the Period IV storeroom in Area I and the kiln in Area III at Dhioros, Cyprus, included large quantities of domestic pottery. Two cooking pots in particular (P.92 [Area I] and P.111 [Area III]) serve as parallels for the Bozburun collection. Their basic design includes a globular
body with a low carination and round base. Vertical strap handles extend from just below the rim to the shoulder. The diameter of the mouth is significantly smaller than the maximum diameter. The first cooking pot (P. 92) has a similar handle attachment and base but a slightly wider mouth than CP 2. The second parallel (P. 111) shares the slightly pointed base of the Bozburun cooking pots, but has a wider mouth and is fitted with strictly vertical handles that attach to the lip.

At Soli, during the Canadian excavations, a complete cooking pot was found in the destruction level of the Great Christian Basilica, which is dated to approximately the ninth or tenth century. With the exception of the sharp body carination, all other features are similar to those of the Bozburun cooking pots. From the castle complex of Nea-Paphos, two cooking pot upper body fragments from the eighth-century strata are perfect parallels.

A close parallel was found in the Basilica at Kourion in the debris of the "late demolition" phase, which dates to the late seventh century or later. This cooking pot, with the exception of its wider mouth, is close in most of its features to CP 2 and CP 4. It is believed to be an import from the southwestern Asia Minor region, as it closely resembles pots found in eighth- and ninth-century contexts at Constantinople.

The last parallel from Cyprus, which is currently housed at the Cyprus Medieval Museum in Limassol, dates from the fourth to sixth century and was found at Kyperounda. Except for the high rim, which is a vestige of the Roman period, all other features closely resemble the cooking pots from the Bozburun shipwreck.
From the mainland of Asia Minor, the fifth- to seventh-century Byzantine shops at Sardis have provided close parallels for the Bozburun cooking pots. The closest parallel in terms of size and form was recovered from room BE-B of the Bath and Synagogue complex, which is adjacent to the Byzantine shops. Another upper body fragment from room W7 also shows a strong resemblance to the Bozburun cooking pot assemblage. Evidence for modified re-use is seen in yet another example of a cooking pot similar in all respects to those discussed above, but with neatly drilled holes in the
bottom, indicating probable use as a colander. This pot was recovered in what is held to be a fifth-century glass shop (room E17).

Farther north, the excavations of the church complex of Saint Polyeuktos at Sarachane in Constantinople have provided a number of parallels as well. One complete cooking pot of the "Ware 4" cooking pot series (seventh, eighth, and ninth centuries), is virtually the same as the pointed-base cooking pots from Bozburun (CP 1 and CP 5) in terms of both fabric and form. Cooking pots belonging to this group are made from micaceous brown clay and are believed to have been imported from the Aegean coast of Asia Minor. Two other parallels are cooking pot fragments of the same "Ware 4" series, which are made from gray clay with micaceous and lime inclusions, that have the same body type, handle type, and handle attachment. A later parallel from Sarachane belongs to the "Ware 6," Main Middle Byzantine series (tenth to twelfth century). This cooking pot has exactly the same body shape as those from Bozburun, but a lower handle attachment. Of the three parallels from an early seventh-century group recovered from this site, all have an internal lead glaze. Farther north in Romania, at Dinogetia, a rim/body/handle fragment of the loosely defined "Byzantine" period shows strong similarities in terms of handle type and attachment, body form, and rim.

To the west, similar profiles appear on two considerably later cooking pots from Corinth. The first parallel was found in a deposit closely dated to the last quarter of the twelfth century based on numismatic evidence. Despite the much wider mouth and lighter-colored clay, the cooking pot is very similar to those from Bozburun. The second parallel from this site, which was discovered in a bothros that dates to the later
thirteenth/early fourteenth century, is similar except for the high vertical rim.\textsuperscript{45} In the 
early thirteenth-century deposits of the Byzantine city located on the Acropolis at Sparta, 
a handmade cooking pot with similar dimensions to those at Bozburun, but with a darker 
clay, was found.\textsuperscript{46} The clay contains the same fine, micaceous inclusions although in 
greater quantity. From the late sixth-century private baths complex at Argos, a precursor 
to the Bozburun-type cooking pot possesses the same features and dimensions, but has a 
rounder bottom and slightly shorter handles.\textsuperscript{47} From the ninth-century reoccupation 
stratum at the Byzantine Emporio at Chios, two cooking pots of similar form and 
dimensions, but made with a micaceous red clay, have been excavated.\textsuperscript{48}

Still farther west, the exedra of the eighth-century Crypta Balbi in Rome has 
yielded a cooking pot believed to be an import, in that it shares many of the eastern 
Mediterranean characteristics discussed so far.\textsuperscript{49} Except for the upper handle attachment, 
which is closer to the lip/upper rim area, this cooking pot type has much in common with 
those from the Bozburun collection and its parallels mentioned thus far.

To the east, the excavations of a thirteenth-century Crusader fortress at Atlit, 
Israel, yielded a cooking pot, apparently a discard from an out-of-use kiln. It is similar to 
CP 2 in terms of its similar gritty drab ware and shape.\textsuperscript{50} It differs only in respect to the 
lower handle attachment, which is just above the maximum diameter. Based on the form, 
it is believed that Crusaders brought this pottery with them from Asia Minor;\textsuperscript{51} however, 
because there is no discussion of fabric or of its affinities with excavated Aegean pottery, 
it is difficult to evaluate the likelihood of this proposed provenience.
At Nessana, also in Israel, most of the cooking pots classified as Ware CXXI share many of the same attributes as the Bozburun cooking pots. One vessel in particular, found in the North Church deposits, is very similar to **CP 4** with its flattened and everted lip.\textsuperscript{52} It differs, however, in terms of handle attachment (the handles are small and extend from the neck/rim region to slightly above the point of maximum diameter) and in terms of clay color (described as orange-brown).\textsuperscript{53}

A more distant parallel (in form only) was found during the 1964–1966 British excavations at the Damascus Gate, Jerusalem.\textsuperscript{54} A rim/neck/handle fragment, which was found in a layer (ZII.29) dated to the early eighth century based on numismatic evidence, shows the now familiar, short, wide neck, offset from the shoulder by a shallow ridge with a thickened, rounded, and everted rim. Two parallels of similar early date (Area S4, third quarter of the sixth century[?]) derive from the 1952–1953 British excavations at Dibon in Jordan.\textsuperscript{55} A shortening of the neck and lengthening of the handles characterize these cooking pot fragments, features ultimately exhibited in cooking pots from later periods. Another evolution in form is apparent in a cooking pot fragment recovered from Stratum IIA (sixth to seventh centuries) in the Monastery of "Kathisma," during the 1961–1962 Italian excavations at Ramat Rahel.\textsuperscript{56} The odd placement and shape of the handles situate them between earlier, traditional, small handles and later, lengthier, more functional handles. These same handles are also found on a cooking pot from the transitional sixth/seventh-century shipwreck at Iskandil Burnu.\textsuperscript{57}

Along the North African coast, in a seventh-century deposit (XXIII) above the ecclesiastical complex at Carthage, a distant parallel to the Bozburun cooking pot was
found. It is made of a thin brown ware and, based on the appearance of its fabric and form, said to be a type from Constantinople.\textsuperscript{58} This cooking pot shares the same general body type as those from Bozburun, but has a taller neck and thicker handles. Another example from this site is similar in form, but has a slightly narrower neck and flared handles that attach to the upper rim/lip.\textsuperscript{59} The fifth- and seventh-century strata at the Coptic monastery at Kellia, Egypt have also produced cooking pots similar in form and size. A seventh-century vessel, the larger of the two parallels found at this site, has the same small mouth, sharp carination of the body, and pointed base of the Bozburun cooking pots; however, the ribbing is more closely spaced and the upper handle attachment is at the upper rim/lip, as previously seen with other examples.\textsuperscript{60} The closely spaced ribbing is apparent also on a smaller fifth-century example which has slightly smaller handles that attach above the maximum diameter; however, in terms of overall shape, the cooking pot is similar to CP 2.\textsuperscript{61}

Finally, another earlier example from North Africa comes from the church excavations at Sidi Khrebish Benghazi (Berenice), where a cooking pot of Late Roman Cooking Ware 2 was found in a questionable seventh-century context (Deposit 158). Based on its appearance and fabric, it may have an Aegean source, particularly in light of the close parallels from fourth-century Athens and sixth-century Knossos.\textsuperscript{62} The Benghazi cooking pot has a globular body, a sharp internal ledge at the rim, and vertical handles that extend from just below the rim to mid-body. The fabric is made of a hard, gritty, gray-brown clay (5YR 4/2) that contains shell, mica, and other sparkling inclusions.
Throughout antiquity, the form of the cooking pot underwent few significant changes, or, as well stated by C. Williams, "once a sensible, functional form was established, it tended to remain the same over a long period of time." The eastern Mediterranean cooking pot has very specific attributes: the handles are generally, although not exclusively, vertical; the height of the pot is approximately equal to or greater than the diameter; the maximum breadth is about halfway up the body; the pot has a low center of gravity; and the overall shape is globular. Indeed, this form is similar to the present-day güveç pots found throughout Turkey at road-side stands. Moreover, the consistent standard of craftsmanship evidenced in all of the cooking pots discussed above suggests large-scale production.

Slight variations in form and fabric do occur, such as the occasional presence of a ledge on the interior of the rim which is an indication of a covered pot; however, the associated lids have not been found, and the great variety of fabrics used, such as the gritty, gray-brown fabric at Benghazi to the red fabric at Chios. Despite these differences in form and fabric, the overall uniformity is striking: they all possess a short rim on a wide neck, two wide strap handles, and a globular body that is rarely glazed and never decorated.

It is interesting to note that many of the parallels cited above are greater in size than those from the Bozburun collection. In terms of function, is it possible that the Bozburun cooking pots were downsized specifically for shipboard use, or that smaller sizes were specifically chosen by the crew? At approximately 2–3 liters each, all seven cooking pots (plus the additional one-handed cooking pot to be discussed) were well
suited for a single serving. Therefore, the number of cooking pots may indicate the size of the ship's crew.\textsuperscript{66} If, indeed, there were only two collar stands on board, then it is possible that crew members ate in shifts. Also, because of the rounded base of the cooking pots, it is likely that the collar stands were used as support both during cooking and eating.

With more than 20 cooking pots, the galley finds of the seventh-century Yassı Ada shipwreck stand in stark contrast to Bozburun.\textsuperscript{67} Clearly, a larger crew, and perhaps a number of passengers, were aboard the former vessel at the time of its demise. On the other hand, the galley finds of the Kyrenia shipwreck, which dates to the early Hellenistic period, suggest a smaller crew: four each of salt cellars, oil jugs, pitchers, drinking cups, casserole bowls, and wooden spoon fragments were excavated.\textsuperscript{68}

Although the number of cooking pots may suggest the size of crew on board, it reveals nothing about the roles they performed. Fortunately, ancient texts pertaining to maritime matters reveal much about shipboard personnel, the types of supplies taken aboard, and methods of provisioning. The Rhodian Sea-Law, a compilation of maritime laws which range in date from the Late Roman/Early Byzantine to the Late Medieval Period, includes an Early Byzantine list which enumerates the parties involved in a maritime expedition and their due share in the profits upon completion of the voyage.\textsuperscript{69}

According to this list, seven roles/members are essential for success: the ναύκληρος (captain),\textsuperscript{70} the κυβερνήτης (helmsman), the πρωπεύς (firstmate in charge of the prow),\textsuperscript{71} the ναυτηγός (shipwright/carpenter), the καραβίτης (boatswain),\textsuperscript{72} the ναυται (seamen), and, lastly, the παρασχαρίτης (cook?). If one assumes that the lowly-paid ναυται ate after
their shipboard superiors (and the cook) and from the same vessels, then the number of Bozburun cooking pots would have been sufficient.

The daily diet of the crew remains unknown. The discovery of fish net weights suggests that the crew caught at least part of their meal. Remains of fish bones found within one of the cooking pots supports this notion, assuming that the ship was not provisioned with fish prior to departure. According to modern standards set by the Mediterranean Diet Food Guide Pyramid, which is a specialized version of the U.S. Department of Agriculture Food Guide Pyramid, a high caloric diet would have been required to sustain the sailors for prolonged periods under strenuous work conditions. Thus meals comprised of adequate portions of breads, vegetables, fruits, legumes, olive oil, wine, corn, fruit, nuts, honey, and fish, among many other food types, would have been essential. There is evidence for the seaborne movement of these foods in the accounts of ancient Roman authors, principally Strabo and Pliny, who record the export of numerous commodities throughout the western Mediterranean. Because most of these commodities do not preserve well, few have been found in the archaeological record. Amphoras marked with graffiti indicating content, however, indirectly attest to the transport of wine, olives, olive oil, grapes, and fish. The fact that these foodstuffs did not spoil as export items suggests that they could have survived just as well as provisions on lengthy sea voyages.

Once again, the Rhodian Sea-Law is a valuable source of information, for it details the types of food and drink consumed on board according to type of ship and length of journey. Ships of war were to be provisioned with biscuits, salt meat,
vegetables, cheese, garlic, onions, and vinegar. Under the *Barcelona Ordinance of 1258*, the shipowner was required to provide sufficient food to last for 15 days. Probably the lengthiest discussion in the Sea-Law relating to this subject concerns provisions on pilgrim voyages. According to the *Notules commerciales d'Amalric in Blancard*, the cargator was required to provision a pilgrim for 50 days on a one-way trip from Venice or Marseilles, and for 100 days on the return leg. No mention is made of crew provisions for this type of voyage (whether it was purchased along the route or purchased and stored before embarkment), although the Sea-Law does specify that the provision cost per crewman ultimately came out of his wages. In any case, space was allotted per pilgrim for adequate provisions that were assumed to last this extremely long voyage. Regardless of the type of ship or voyage, water for all was supplied by the captain. In fact, the skill of the captain was measured in part by his ability to find sources of fresh water along the chosen route.

As for merchantmen, because it is assumed that they frequently put into shore, such provisioning measures were not deemed necessary; therefore, victualling on board merchantmen was not a concern of the Sea-Law. On the Bozburun shipwreck, pantry items, such as grapes and olives, were found sealed in jars. Additional provisions may have been stored in bulk along with the main cargo. Furthermore, amphorae marked with undeciphered graffiti, as opposed to the readable graffiti that connote ownership, also may have stored some of the ship's provisions.

We return to the subject at hand, cooking pots, through Ch. Bakirtzes' research into Byzantine texts, although he uses the ancient record in another way. By combining
textually attested names for vessels with their excavated counterparts, he has created a useful typology of Byzantine ceramics. He refers to cooking pots in general as tsoukalia, a term derived from the demotic form of the Italian zucca, or pumpkin, because of its resemblance to this vegetable. He divides the tsoukalia into two general categories of one- and two-handed cooking pots. Those with two handles were grasped with both hands and moved vertically on and off the collar stand. Two handles are found most often on round-bottomed tsoukalia, as they can only rest on a collar stand and must be lifted off. The smallest tsoukalia, those with one handle, were most often fashioned with flat bottoms; therefore, they could rest directly on the hearth embers. In this way, the single handle was used chiefly to change the pot's position on the hearth.

Bakirtzes furthers his examination by reference to iconographic evidence. Two illustrations show the Bozburun cooking pot, or a slight variation, in use. In an interpretation of a thirteenth-century biblical scene taken from the book of Judges (6:11–18), an angel of the Lord stands over a two-handed cooking pot that is set upon a three-legged collar stand. In form the cooking pot is similar to those of the Bozburun assemblage. From a fourteenth-century collection of accounts of Alexander the Great is an illustration of Antipater, Alexander's viceroy, as he prepares a meal before setting out to war. The collar stand depicted here is of the same three-legged variety; however, the cooking pot to which he tends is without handles.

**Cooking Pot #8 (CP 8), Figure 10**

*Context:* F11 LL2  
*Field Registration:* Lot 9468, BK 741
Preservation: complete; some calcareous growth on exterior; worm tubes on one side of interior.

Fabric and Treatment:

Clay color: 5YR 3/3, dark reddish brown (wet); 7.5YR 6/6, reddish yellow (dry)

Inclusions: medium to small micaceous flakes, approximately 10/cm; few voids from burnt out organic matter.


Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: lopsided; base is uneven; unable to discern if vessel was supposed to have flat or rounded base; turned on slow wheel.

Measurements:

Weight: 0.742 kg   Volume: 1.921   Height: 14.4

Diameters: 12.0 (rim), 17.2 (max.)  Thickness: 0.07 (vessel wall)

Form Description:

Because of its distinctive form within the cooking pot group (i.e. one handle and lopsided base), the comparanda of CP 8 are discussed separately here.

One-handled cooking pot with globular body; everted rim with flattened lip; short neck that tapers inward below rim; although there is no distinct spout, note that height of rim on side of handle is 0.136 cm and on side without handle, 0.149 cm; on side of
Fig. 10. Cooking Pot #8, side and handle view (Scale 1:2).
handle, body is rounded and joins rounded base; on side without handle, straight-sided
shoulder moves outward to widest diameter at mid-body, then tapers inward to hard
carination as it joins malformed base, part flat and part convex; vertical strap handle
attaches just below rim and on body; handle has raised edge and slight medial ridge; end
flares at attachment.

Discussion (Figure 11):

To the north, excavations in Constantinople have yielded the most parallels for
this vessel. The ninth- and tenth-century strata at the Church of Saint Irene have
produced two cooking pots similar in form and size. The first parallel has the same small
shape, but is slightly taller and has a disk base. The handle of the second parallel flares
well below the point of maximum width, but the full, round, grooved body strongly
resembles the cooking pot from Bozburun. The tenth- to twelfth-century strata at
Saraçhane have produced cooking pots with the same slight sag in the body exhibited by
the Bozburun cooking pot. The last parallel from this region comes from a twelfth-
century well deposit on the southwest side of the Great Palace. Although similar in
shape, this cooking pot has a distinct, flat base and a flaring strap handle that extends
below the maximum breadth of the vessel for its attachment.

Farther north, the Black Sea region has also produced a number of parallels. The
ninth-century stratum of an ecclesiastical complex at Chersonnessos has yielded a closely
ribbed cooking pot similar in overall form to the Bozburun example. As with all of the
cooking pots mentioned thus far, in addition to the similar size and fabric, this cooking
pot has the same flat base and flaring strap handle that attaches well below the maximum diameter. From his study of late antique sites throughout the Crimea, Y. Iakobson believes that most pots created in the Chersonnessos region from this period were widely manufactured outside of Chersonnessos, but strictly within the confines of Crimea.\textsuperscript{88}

The western regions of the Black Sea have also produced parallels, although from a much earlier period. An example from the fifth- to sixth-century deposits at Sucidava

Fig. 11. Distribution of one-handed cooking pot comparanda.
has the same globular shape, distinct external ribbing, and shortened handle does the
Bozburun cooking pot.\textsuperscript{89}

This oddly shaped cooking pot was most likely intended to have a flat base, as did
most comparable single-handed vessels from this period. Unlike the many parallels listed
above, the strap handle of the Bozburun cooking pot is unusually short. As is seen with
the parallels listed above, the tendency for the majority of cooking pots is for a long strap
handle to attach at the rim and well below the mid-body. The fact that the one handle of
CP 8 is similar in all respects (\textit{i.e.}, width, length, and handle attachment) to those of the
previously mentioned two-handed cooking pots suggests that they were all made by the
same hand. It has also been suggested that the cooking pot handles were mass-produced
and attached to the pots by someone other than the potter. According to a proposed
scheme, a large sheet of clay was rolled out to a thickness of approximately 0.8 cm; long
strips of clay were cut with a sharp tool (hence the crisp corners) of varying widths
ranging from 3 to 5 cm; these strips were cut to smaller lengths of 10 to 12 cm; and,
finally, they were attached to the pot.\textsuperscript{90}

Whether the one- and two-handed cooking pots were used similarly is uncertain.
The mis-shaped bottom would not have permitted the pots to rest easily in their pot
stands. Bakirtzes has suggested that one-handed, flat-bottomed cooking pots were set
directly on the embers, whereas the two-handed, round-bottomed cooking pots rested on
pot stands.\textsuperscript{91} There is no information, archaeological, textual, or iconographic, indicating
the differences in food preparation between the two types of vessels.
PITCHERS

There is a combined total of seven partial and complete pitchers, ranging in capacity from 0.856–2.54 liters. Although most of the pitchers were found in the area of the stern, two had been recovered from amidship, specifically within the cargo, suggesting an alternative use. The first four pitchers catalogued (and the parts of two others) although varying in fabric, all share many common features and will thus be discussed together. The last pitcher has a distinct form and will be treated separately.

Pitcher #1 (P 1), Figure 12

Context: D9 UL4    Field Registration: Lot 454, BK 10

Preservation: handles and rim are missing, but remainder of pitcher is intact.

Fabric and Treatment:

Clay color: 5YR 5/6, yellowish red (wet); 7.5YR 6/4, light brown (dry)

Inclusions: small white and gray inclusions, approximately 10/cm; some voids from burnt out organic matter.

Fabric: coarse    Core: beige-pink

Surface treatment: traces of slip beneath base of shoulder handle.

Technical/manufacturing remarks: wheel marks on neck; post-fired scratch mark on shoulder; turned on slow wheel.
Measurements:

_Weight:_ 1.522 kg  
_Volume:_ 2.54 l  
_Height:_ 22.6 (from break to base)

_Diameters:_ 6.8 (rim), 18.0 (max.), 12.8 (base)  
_Thickness:_ 0.06 (vessel wall)

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Fig. 12. Pitcher #1 (Scale 1:2).
Form Description:

Everted simple rim; short neck tapers inward from rim to high neck/shoulder join; sloping shoulder from neck to bulbous maximum diameter; gentle turn of body inward to broad flat base; body-to-base join apparent by slight ridge; remains of handle attachment on neck and shoulder.

Discussion: Discussion of Pitchers #1-4 to follow.

Pitcher #2 (P 2), Figure 13

Context: F11 UL1/3  Field Registration: Lot 1321, BK 86

Preservation: partial; most of rim/spout missing; original surface flaked off over 30% of body; moderately covered with spots of marine encrustation and tiny worm tubes.

Fabric and Treatment:

Clay color: 5YR 6/4, light reddish brown (wet); 7.5YR 5/6, strong brown (dry)

Inclusions: small to fine micaceous flakes, approximately 10–15/cm.


Surface treatment: single, post-fired incised line on shoulder, approximately 80° counterclockwise from handle.

Technical/manufacturing remarks: body and neck exterior slightly ridged; neck interior, sharply ridged (first ridge resembles stopper seat); turned on slow wheel.
Measurements:

*Weight:* 1.60 kg  
*Volume:* 2.25 l  
*Height:* 24.0

*Diameters:* 6.8 (rim), 17.2 (max.), 12.9 (base)  
*Thickness:* 0.05 (vessel wall)

Fig. 13. Pitcher #2 (Scale 1:2).
Form Description:

Thickened flat lip on flared rim; traces in mouth/spout suggest that it was pinched into slightly rising spout; rim tapers inward to tall, narrow neck; moderately sloped shoulder with easy inward turn to broad, flat base; slight pinch at base-to-body join; handle attaches slightly below rim and at outer limit of top of shoulder; handle similar to sloped amphora handle, elliptical in section with slight ridge outside and well defined edge on one side.

Pitcher #3 (P 3), Figure 14

Context: G12 UR1   Field Registration: Lot 10084, BK 843

Preservation: approximately 1/3 of rim, associated upper neck and handle missing; old break; some white marine encrustation and worm tubes on shoulder; found with stopper in place; handful of grape pips found inside.

Fabric and Treatment:

Clay color: 7.5YR 3/2, dark brown (wet); 10YR 6/2, light brownish gray (dry)

Inclusions: fine micaceous flakes, approximately 10–15/cm.


Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: prominent external wheel ridges on body; turned on slow wheel.
Measurements:

*Weight*: 1.184 kg  
*Volume*: 1.84 l  
*Height*: 20.2

*Diameters*: 16.5 (max.), 12.8 (base)  
*Thickness*: 0.08 (vessel wall)

Fig. 14. Pitcher #3 (Scale 1:2).
Form Description:

Rim missing; tall neck tapers inward to narrow neck/shoulder junction; shoulder slopes outward to maximum breadth; convex body to wide, flat base; ridge at body-to-base join; handle attachment base on shoulder.

Pitcher #4 (P 4), Figure 15

Context: G12 UR2  Field Registration: Lot 10085, BK 844

Preservation: nearly complete (missing one half of rim and small part of associated neck); some white marine encrustation and worm tubes on body near base; stopper sealed in place by pitch; pitch residue all around neck; handful of recognizable grapes among thousands of grape pips found inside.

Fabric and Treatment:

Clay color: 5YR 5/4, reddish brown (wet); 10YR 6/3, pale brown (dry)

Inclusions: fine micaceous flakes.


Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: external wheel ridges on body; turned on slow wheel.

Measurements:

Weight: 1.332 kg  Volume: 1.906 l  Height: 22.9

Diameters: 16.5 (max.), 10.9 (base)  Thickness: 0.09 (vessel wall)
Form Description:

Wide, flared rim similar to P 2; tapers inward to tall, wide neck; gently convex shoulder slopes downward to maximum diameter and convex body ending in flat base; slight ridge at body-to-base join; handle attached below rim and to top of shoulder, flaring

Fig. 15. Pitcher #4 (Scale 1:2).
in width and blending into maximum diameter; handle elliptical in section with slight ridge outside and well defined edge on one side.

**Pitcher #5 (P 5), Figure 16**

*Context:* F12 LR4  
*Field Registration:* Lot 9094 joins with Lot 10442 to form complete base

*Preservation:* partial; base and part of body; marine encrustation and worm tubes on exterior.

**Fabric and Treatment:**

*Clay color:* 10YR 4/2, dark grayish brown (wet); 10YR 5/3, yellowish brown (dry)

*Inclusions:* fine micaceous flakes, approximately 10–15/cm.

*Fabric:* coarse.  
*Core:* dark grayish brown.

*Surface treatment:* unslipped and unglazed; no incised decoration.

*Technical/manufacturing remarks:* internal wheel ridges apparent; turned on slow wheel.

**Measurements:**

*Weight:* 0.364 kg  
*Height:* 10.2 (from break to base)

*Diameters:* 11.2 (base)  
*Thickness:* 0.08 (vessel wall)
Form Description:

Quasi-ring base that meets side at hard angle; defined ring on one side of base, other side less clear; remains of vessel wall show concave body; internal ridging very clear.

Discussion:

Based on the measurements available for this pitcher and Pitcher 6, parallels are included in the discussion for Pitchers #1–4. The base diameter, vessel-wall thickness, and base thickness are similar to those same measurements of this group.

Fig. 16. Pitcher #5 (Scale 1:2).

Pitcher #6 (P 6), Figure 17

Context: H10 UR3    Field Registration: Lot 164, BK 11
Preservation: partial; base of pitcher.

Fabric and Treatment:

Clay: 5YR 6/6, reddish yellow (wet); 5YR 7/4, reddish yellow (dry)

Inclusions: small micaceous flakes, approximately 10/cm; few voids from burnt out organic matter.

Fabric: coarse. Surface treatment: unslipped and unglazed.

Technical/manufacturing remarks: wheel ridges and unintentional potter’s mark on internal base; turned on slow wheel.

Measurements:

Weight: 0.198 kg  Diameters: 10.0 (base)

Form Description:

Base only; prevalent internal ridges; inner-most ridge is raised.

Discussion (Figure 18):

The pitchers documented so far, although varying in fabric, all share many features in common: a wide, flat base; handle attachments at maximum breadth and rim; a globular body; and a trefoil, or pinched mouth. In light of these similarities, the pitchers will be treated together in the following discussion.
This style of pitcher appears frequently throughout the eastern Mediterranean. The Yassi Ada shipwreck provides some of the closest parallels in terms of form and fabric. The recovered galley ware includes two oinochoe (P16–P17), both of which are approximately 19 cm high and share the basic features of the Bozburun pitchers discussed above. In addition, the clay color and fabric closely resemble two of the four Bozburun pitchers; (Bozburun) P 3 has the dark clay color of P16, and (Bozburun) P 1 has the lighter, redder clay of P17.
On Cyprus, two seventh-century sites, the Kornos Cave and the Basilica at Kourion, have produced pitchers similar to those found at Bozburun. The pitcher from Kornos, however, has a concave base, and the pitcher from Kourion is made of a darker clay. To the east, the sixth- to seventh-century well deposit at Tell Fara (South), Israel, has produced a pitcher similar in all aspects except for a pronounced step at the base of the neck.

Along the North African coast at Sidi Khrebish Benghazi (ancient Berenice), this

Fig. 18. Distribution of pitcher comparanda.
type of pitcher comprised more than 25% of all the pottery from mid-sixth-century deposits. Three parallels from this site all have the familiar, wide, flat bases ranging from 7.8 cm to 13.0 cm in diameter, but possess a smaller average volume (one liter) than the pitchers of the Bozburun collection. Of the three Benghazi parallels, the pitcher with the smallest base diameter is also the tallest, not only of the parallels listed here, but of the entire mid-sixth-century collection. A similar phenomenon is apparent also at Bozburun: the base diameter of P 4 is only 10.9 cm, yet this pitcher is the second tallest of all pitchers, jugs, and juglets. It cannot be determined from the available data if this inverse correlation between base diameter and height was related to vessel function or simply a matter of individual taste.

To the west, a number of parallels have been found at Early and Middle Byzantine sites in Greece. The late sixth- and seventh-century well deposits of the Athenian Agora have yielded a pitcher similar to P 1 in terms of height (ca. 23 cm) and fabric (i.e., light-colored, micaceous). From a seventh-century burial at the Agora come two more parallels, similar in form and fabric but smaller in size. The first pitcher stands at 17 cm., and has a flat base, narrow neck, and slightly everted lip. The second pitcher is a miniature version of P 4 in that it shares all of the basic features, but stands only 12.5 cm. A twelfth-century well used in connection with a Byzantine house built over the north part of the Odeion has yielded another flat-bottomed pitcher approximately 22 cm in preserved height.
The mid-seventh-century deposits from the Acropolis Hill at Emporio, Chios have produced numerous parallels, which, despite their fabrics, share the familiar wide, flat base, single, thick strap handle, and trefoil mouth of the Bozburun pitchers. Grooves on the shoulder and occasional combing are the only surface treatments visible on the Chian pitchers. Two pitchers from the Chian assemblage bear a striking resemblance to P 1, despite a great disparity in size—namely, one is 24 cm in height, whereas the second is only 15 cm.\textsuperscript{101}

The tenth- to twelfth-century deposits from the Byzantine settlements of the agora at Corinth have produced three parallels ranging in height from 14.5 to 24.5 cm. The fabric of all three is comprised of clay that varies from pink to red and contains small white grits. All of the pitchers have a wide, flat base with a thick, single handle at the usual points of attachment. Although the rim has not been preserved on any of these pitchers, it is likely that they bore a trefoil mouth.\textsuperscript{102} Lastly, there is a wide-bottomed pitcher from the sixth-century destruction level at Argos, close in terms of form and clay color (7.5 YR 5/4, reddish-yellow to strong brown), but smaller in height (13 cm).\textsuperscript{103}

Farther north, a number of parallels are known from the Black Sea region. Deposits from an eighth-century small village at Tavrika, Crimea, have yielded a pitcher similar in terms of form and size, but with a slightly thicker neck and handle.\textsuperscript{104} A pitcher from the ninth-century deposits at Chersonessos shares all of the basic features discussed above except for two parallel grooves running around the shoulder.\textsuperscript{105} Similar pitchers also come from the later tenth- to thirteenth-century deposits at this site: in particular,
two pitchers, which stand at 16 and 24 cm respectively, have a short, globular body, thin
neck, wide, flat bottom, and a long, thin, strap handle.\textsuperscript{106}

The sixth- and seventh-century deposits at Sucidava on the western coast of the
Black Sea have produced a pitcher 16 cm in height and with the same wide, flat base,
globular belly, and handle attachments.\textsuperscript{107} Similar pitchers were found in a transitional
ninth/tenth-century grave at the same site; however, these pitchers possess a high ring
base.\textsuperscript{108} Lastly, a pitcher from an eighth-century necropolis in Bulgaria has a slightly
narrower base than the parallels mentioned thus far, but with the same narrow neck,
trefoil mouth, and handle attachments.\textsuperscript{109}

All the measurements of these four pitchers, with the exception of the base
diameter, are within a 1.5-cm range. The volume and base measurements of \textbf{P 3–4} are
slightly smaller than the other two pitchers of this group, but the height and maximum
diameters of all four are comparable. Insofar as the base diameters are smaller, which
renders them more susceptible to tipping over, perhaps they were better suited as
pantry/storage vessels and, therefore, not to be used in the galley. Indeed, \textbf{P 3–4}
originally might have been used in the galley and, once they had tipped over, were broken
and deemed no longer suitable for galley use. The wider bottoms of \textbf{P 1–2}, however,
would have rendered them more suitable as galley ware items in that they could withstand
the pitch and roll of the ship.

In total, \textbf{P 1–2} could have held approximately 4.75 liters. Water would have been
stored in skins and transferred to the pitchers at mealtime. Another pitcher, \textbf{P 5}, which
was recovered from the same area as \textbf{P 1–2}, could have held an additional liter of liquid.
It is a safe assumption that the two additional vessels P 6 and P 7 (discussed below), based on their reconstructions, also could have held a liter each. Based on the aforementioned hypothesis that a crew of seven manned this ship, or that seven could be seated at once (see p. 27), 7.75 liters would have sufficed for a single meal.

In this instance where the rim is preserved, there is a trefoil mouth, a feature typical to this type of pitcher. Of note is the use of former trefoil-mouthed pitchers as storage vessels — namely, P 3–4 which were found together, each containing grapes, stored near an amphora also containing grapes. The rims of these pitchers had been broken before they were sealed, as evidenced by the presence of pitch on the broken edge, which clearly indicates that they were in secondary use.

**Pitcher #7 (P 7), Figure 19**

*Context:* F11 UL4  
*Field Registration:* Lot 2146, BK 163

*Preservation:* nearly complete (approximately 1/3 of rim and associated upper neck missing; old break); moderately covered in thin layer of white marine encrustation and worm tubes.

*Fabric and Treatment:*

*Clay color:* 7.5YR 4/2-4/4, dark brown (wet); 7.5YR 5/4, brown (dry)

*Inclusions:* fine micaceous flakes, no more than 10/cm.

*Fabric:* medium coarse.  
*Core:* reddish brown.
Surface treatment: incised wavy line on upper shoulder; five peaks and valleys with beginning and end overlapping opposite the handle; incision continues on shoulder under handle.

Technical/manufacturing remarks: wheel ridges apparent on interior and exterior of neck; prominent ridge/contour change 2 cm above base; possible finger indent on maximum diameter; turned on slow wheel.

Measurements:

Weight: 0.628 kg  Volume: .856 l  Height: 18.2

Diameters: 7.8 (rim), 13.3 (max.), 9.1 (base)  Thickness: 0.05 (vessel wall)

Form Description:

Rim is round expansion (not pinched or spouted) of thin neck wall; wide mouth and wide, tall neck tapers inward slightly to gentle turn of neck into sloping shoulder; below maximum breadth, body is convex and meets wide, flat base at hard angle; base appears to be separate piece; single handle is elliptical in section with slight ridging on outside; handle attached below rim and to top of shoulder, flaring in width and blending into maximum diameter.

Discussion (Figure 18):

On the Anatolian mainland, the storeroom of a hardware shop (E11) located in the Byzantine shop complex at Sardis provides the closest examples in terms of form and
geography. The first example is missing the incised wavy line, but bears a striking resemblance in terms of shape.\textsuperscript{110} It stands 2 cm shorter than the Bozburun example, but has the same conical neck and slight body ribbing. Another parallel from this site shares many of the same aforementioned features of P 5, but has a wider maximum breadth with three incised wavy lines on the neck/shoulder region.\textsuperscript{111}

This style in form and decoration is also seen on a ninth-century parallel from as far east as the site of Sirjan, Iran, in debris from a kiln.\textsuperscript{112} It stands approximately 19 cm
in height with a flat base, globular body, and a straight, wide neck. The round handle attaches at the top of the shoulder and just below the rim, as in ours from Bozburun. It does, however, also have a thumb stop at the upper point of attachment, unlike ours. The horizontal incised wavy line runs along the entire shoulder under the handle.

Along the western coast of the Black Sea, the sixth-century deposits at Sucidava have produced a pitcher similar in form to the more globular Bozburun examples, but with a single incised wavy line running around the shoulder. An example of early Byzantine date is on display in the Archaeological Museum of Nesebr (ancient Mesembria) on the southern Bulgarian coast. From the Crimean region, the ninth-century deposits of Chersonnesos have produced a jar with a single incised wavy line just below the rim running around the shoulder.

Lastly, near the Crimea on the Tamanskiy peninsula, fifth-century remains from the ancient city of Gorodische include a pitcher without the wavy line, but similar in form and fabric. This pitcher stands 17 cm in height with a wide neck, straight rim, broad shoulder, and wide bottom.

The incised wavy line is a common decorative motif throughout the ancient Near East. The seventh- to eighth-century Umayyad period, in particular, is well known for combing and thumb impressions. Some examples from Amman include two basins and a bowl in which the decoration includes either a single wavy line, combed wavy lines, or alternating band with wavy line. Another parallel with the undulating incision from Jordan can be found in the Byzantine deposit at Pella. In Israel, similar comparanda derive from the sixth- to seventh-century well deposit at Tell Fara, the late Byzantine
cave deposit at Bethany, the Byzantine-Arab deposits at Nessana, the sixth- to seventh-century deposits at Ramat Rahel, and the seventh-century deposits at the North Wall. This stylistic trend continues during the later periods as evidenced by discoveries at Mt. Nebo and Dhiban.

JUGLETS

A collection of four partial and nearly complete juglets were recovered form this wreck; two within the confines of the galley (F11), one from the other side of the stern (D9), and one from outside the confines of the wreck itself. Although it is not known for certain if this last juglet belongs to the wreck, it will be treated as part of the collection since late Antique parallels do exist. The following four vessels are treated as juglets and not pitchers because there is a 5 cm difference between the tallest of the juglets and the shortest of the pitchers. In addition, the capacity measurements of the juglets, when available, did not exceed 0.5 liters.

Juglet #1 (J 1), Figure 20

Context: F11 LL2  Field Registration: Lot 305, BK 48

Preservation: partial; base and part of body.

Fabric and Treatment:

Clay color: 5YR 6/6-6/4, reddish yellow to light reddish brown (wet); 2.5YR 6/6 to 6/8, light red (dry)
Inclusions: small to fine micaceous flakes, approximately 15/cm.


Surface treatment: unslipped and unglazed; no incised decoration.

Technical/manufacturing remarks: internal wheel ridges apparent; turned on slow wheel.

Measurements:

Weight: 0.172 kg Height: 5.2

Diameters: 7.2 (base) Thickness: 0.08 (vessel wall)

Form Description:

Flat base meets straight side at hard angle; tight internal wheel ridges.

Fig. 20. Juglet #1 (Scale 1:2).
Discussion:

Because so little of this vessel remains, it is difficult to describe with certainty its form; however, based on similarities in clay color and base dimensions with Juglet 2, it is discussed together with Juglet 2.

Juglet #2 (J 2), Figure 21

Context: F11 UR4   Field Registration: Lot 2279, BK 178

Preservation: Nearly complete (portion of spout missing); moderately covered in whitish marine encrustation, especially on handle side.

Fabric and Treatment:

Clay color: 5YR 6/6, reddish yellow (wet); 2.5YR 6/6, light red (dry)

Inclusions: small to medium sand and micaceous flakes, approximately 10/cm; some voids from burnt out organic matter.


Surface treatment: remnants of slip visible (7.5YR 7/4 pink); no incised decoration.

Technical/manufacturing remarks: flat base is probably separate piece; wheel ridges apparent on external body; turned on slow wheel.

Measurements:

Weight: 0.378 kg   Volume: 0.461 l   Height: 13.8

Diameters: 10.6 (max.), 6.0 (base)   Thickness: 0.06 (vessel wall)
Form Description:

Shape of body reminiscent of P 2 and P 4; wide, flaring rim with mouth pinched into simple spout; sharp taper inward to narrow neck; sloping shoulder meets convex body at hard turn; body meets relatively narrow base at moderate angle; strap-like handle with longitudinal depression on outside, attached at rim and widest diameter of shoulder where ends of handle flare in width.

Fig. 21. Juglet #2 (Scale 1:2).
Discussion (Figure 22):

A juglet from the seventh-century shipwreck at Yassî Ada, which is perhaps the closest parallel, stands 15.5 cm and, similar to J 2, has a long strap handle. Instead of a trefoil rim, however, the Yassî Ada juglet has a tall, conical neck that ends in a plain, rounded mouth. To the south, at Kourion on Cyprus, there is another parallel, similar in form, but with a slightly rounder handle and an overall bulkier form.
To the west, the seventh-century deposit of an *osteotope*, located on the northeast slope of the Areopagus of the Athenian Agora, produced a juglet similar in size and form but with a slightly taller neck and a more rounded body.\textsuperscript{128} The excavations at Corinth have produced another parallel that has a similar fabric color and composition to J 2, but is slightly taller and has a conical, rather than a flared, rim.\textsuperscript{129} Lastly, Argos has produced a pitcher that stands at approximately the same height as the juglets discussed so far, and which shares many of the same features as J 2, except for a rounder handle.\textsuperscript{130}

**Juglet #3 (J 3), Figure 23**

*Context:* D9 LL4  \hspace{1cm} *Field Registration:* Lot 2685.01 (body); Lot 10539 (handle fragment)

*Preservation:* Base and part of side intact; rest of vessel in numerous pieces; clay has exfoliated in layers.

*Fabric and Treatment:*

*Clay:* white buff, Gley 1 8/N

*Inclusions:* some small voids from burnt out organic matter.

*Fabric:* fine. \hspace{1cm} *Core:* white.

*Surface treatment:* yellow glaze.

*Technical/manufacturing remarks:* slight indent on body opposite handle; wheel ridges apparent on external body.
Measurements:

*Weight*: 0.152 kg  
*Volume*: 0.140 l  
*Height*: 10.2

*Diameters*: 8.2 (max.)  
*Thickness*: 0.06 (vessel wall)

Form Description:

Flat rim with cylindrical ridge; rim tapers inward to narrow neck; gentle transition to sloping shoulder; at maximum breadth, body takes hard turn and tapers inward strongly to ring base; strap handle attachment stub on widest diameter and rim sherd; prominent external wheel ridges on body of vessel.

Fig. 23. Juglet #3 (Scale 1:2).
Discussion (Figure 24):

The closest parallels for this unique juglet come from Constantinople. The ninth-century deposits from the excavations at Sarachane have produced substantial material belonging to the "Glazed White Ware II" category, which was first described by Stevenson in his report on the Great Palace. The fabric is a well-levigated white clay with a glaze that is either yellow, or, by the addition of copper oxides, an intense green. This type of white ware is a hallmark of the Byzantine period. A pale yellow glaze

Fig. 24. Distribution of comparanda for Juglet #3.
covers the upper exterior of the first parallel from Sarachane, which has the same disk base and body ridging as the Bozburun example. A second parallel, which is covered with the same yellow glaze and body ridging, is slightly taller and has the remains of a pinched rim and a handle stub on the maximum diameter, as seen on the Bozburun example. The last parallel possesses all the attributes described above except for the glaze, which is green rather than yellow.

To the north and northwest, a thirteenth-century example from the region of Skopje (Macedonia) is similar in shape, but has a more detailed surface treatment of cross hatching. In modern day eastern Bulgaria, two eighth-century parallels were found on a necropolis which closely resemble the Bozburun juglet in terms of both form and fabric. The surface treatment, however, varies in that one of the juglets is unglazed and the other is burnished. Another white ware juglet — this one with a dark glaze and twisted handle — was found in the twelfth-century strata of the Prilep region. Despite the more elaborate handle, it is similar to the Bozburun juglet in terms of overall form.

To the east, similar but smaller juglets have been found, for example, within the fifth- to sixth-century sanctuary at Mount Nebo. To the west, the Byzantine strata at Athens have produced additional parallels close in terms of size and form: a trefoil rim juglet, 10.5 cm in height, is similar in terms of overall form and clay color to the Bozburun juglet; however, its green glaze recalls the last of the three Sarachane parallels discussed above.
Juglet #4 (J 4), Figure 25

*Context:* found above wreck on slope  
*Field Registration:* Lot 996

*Preservation:* most of body and base; neck, rim, and handle are missing.

**Fabric and Treatment:**

*Clay color:* 5YR 6/4, light reddish brown (wet); 5YR 7/4, pink (dry)

*Inclusions:* fine micaceous flakes, approximately 5/cm.

*Fabric:* fine.  
*Core:* light reddish brown.

*Surface treatment:* unslipped and unglazed; no incised decoration.

*Technical/Manufacturing remarks:* wheel ridges apparent on external body; turned on fast wheel.

**Measurements:**

*Weight:* 0.182 kg  
*Volume:* 0.460 l  
*Height:* 12.0

*Diameters:* 10.5 (max.), 3.9 (base)  
*Thickness:* 0.04 (vessel wall)

**Form Description:**

Ovoid-shaped body (unlike any other Bozburun vessel with thin vessel wall throughout; concave shoulder rounds out to maximum diameter and rounds into very narrow disk base; on one side, ridge at body-to-base join is apparent; on exterior of body, closely spaced, faint, wheel ridging; ridges on interior more prominent.
Discussion (Figure 26):

Because it is not possible to ascertain whether or not this vessel possessed a handle, parallels are based on the shape of the lower body, which, fortunately, is distinctive. The Yassi Ada wreck produced a vessel with a similar base and ovoid lower body, although the rim clearly indicates that this vessel was a cup.\textsuperscript{141} To the west, the sixth-century destruction level at Argos has produced a number of jugs, all with a flaring rim, tall neck, bulbous lower body, and ring or disk base.\textsuperscript{142} An additional sixth-century example with the same bulbous lower body comes from Dinogetia in Romania.\textsuperscript{143} This pitcher sits on a ring base with a high conical neck and flared rim. It also possesses a small handle that extends from mid-neck to mid-shoulder.
Of the juglets discovered at Bozburun, only two (i.e., J 1 and J 2) were found in the area of the galley. J 4 was found on the slope nearest to the galley, and J 3 was found outside the "confines" of the galley on the port side in square D9 along with a pitcher. Based on the discovery of numerous valuable items (i.e., glass decanter, two goblets, ivory horn, remains of orpiment) in this area, it is supposed that the location
corresponds of the captain's quarters; however, it is also possible that pitcher P 1 and J 3 slid to this section of the galley when the ship sank.

J 1, J 2, and J 4 could contain, at most, 1.5 liters, a volume insufficient to serve as an additional meal or drink for a crew member. The three juglets, then, could have been used as cruets for condiments such as olive oil and, perhaps, a grape or raisin sauce.\textsuperscript{144} J 3, on the other hand, might have had a non-culinary function. Because of its unusually diminutive size, purely decorative exterior glaze,\textsuperscript{145} and its possible association with the other luxury items found in the "captain's quarters," it has likely that this juglet held a precious oil.

COPPER PITCHERS

Two copper pitchers were recovered from the area of the galley – F11 and E11. One pitcher is partly intact, whereas the other was crushed at the time of the ship's sinking. A triangular boss was found near each of the pitchers.

Copper Pitcher #1 (Cp. P 1), Figure 27

\textit{Context:} F11 UR \hspace{1em} \textit{Field Registration:} Lot 1240 and 2340, BK83

\textit{Preservation:} badly corroded and incomplete; much of one side of body missing (side exposed; rim separate from neck (may join); metal thin, eroded away in places; triangular boss of sheet metal filled with lead found lying face up in center of corroded area (function unknown); corners rounded, one face flat and other with defined rim; covered by fragile crust of white corrosion.
Material and Treatment:

Material: Copper.

Surface treatment: ribbing on body and neck, herring-bone motif on shoulder.

Technical/manufacturing remarks: crenulated join in body below maximum breadth; possible second join at neck/shoulder junction; unable to ascertain evidence of solder.

Measurements:

Weight: too fragile  Volume: too many holes  Height: 19.8 (from base to break)

Diameters: 5.4 (rim), 15.3 (max.), 12.6 (base)  Thickness: 0.01 (vessel wall)

Triangular boss: 5.3 (width), 1.1 (thickness)

Form Description:

Short, cylindrical rim applied over crimp; tapers out to conical, ribbed neck; sharp turn to broad, slightly sloping shoulder; hard turn again to maximum diameter; slightly convex, moderately tapered body to wide, flat base with foot ring formed by crimping bottom up slightly; ribbing covering neck and body; herring-bone motif covering shoulder.
Fig. 27. Copper Pitcher #1 with front and side view of triangular boss (Scale 1:2).

Copper Pitcher #2 (Cp. P 2)

Context: E11 LR3    Field Registration: Lot 8498

Preservation: Less than 20% complete; fragment of body and shoulder.
Material and Treatment:

*Material:* Copper.

*Surface treatment:* ribbing on body and neck; unable to determine possible shoulder decoration.

Measurements:

*Height:* 10.5 (preserved)

*Diameters:* 14.0 (max.), 12.0 (base)  *Thickness:* 0.01 (vessel wall)

*Triangular boss:* 4.3 (width), 0.9 (thickness)

Form Description:

Same type of vessel as **Cp.P1**, but slightly smaller in size; marked change in profile as body bends under to form base and shoulder as vessel wall turns upward to form neck.

Discussion (Figure 28):

This type of vessel is common throughout the central and eastern Mediterranean region. A similar pitcher was found in the Yassı Ada shipwreck. Although the height (27 cm) and form of the lower body are similar to those of the Bozburun pitcher, the double-step shoulder and neck of the Yassı Ada pitcher are slightly different. Furthermore, as the neck narrows towards the rim, the lip becomes splayed. It is clear that the Yassı Ada pitcher was made from two pieces and, as noted by Bass, was cold-
hammered, as evidenced by the absence of soldering marks. An unattached triangular piece of lead was also found, similar to that at Bozburun in terms of size but slightly thicker.\textsuperscript{147}

On the Anatolian mainland, Sardis has provided a number of parallels as well. The first example, recovered from a possible residence (E16), is slightly shorter than the Bozburun pitcher, with a total preserved height of 20 cm.\textsuperscript{148} The overall shape is similar to the Yassi Ada example; however, the shoulder has a single horizontal step. Another

Fig. 28. Distribution of parallels to copper pitchers 1–2.
example from Sardis was recovered in a possible residence or wine shop (E4). This pitcher is similar in height (21 cm) and in overall shape (hard turns at shoulder and base to body with straight sides), but is missing the horizontal step(s) found on the aforementioned parallels. A much taller example (32.5 cm) was recovered from a dye shop (E6), possibly owned by a Jewish merchant (E6) also in the Byzantine shop complex. This pitcher (here called a jug) has a disk base and the familiar box-like shape. The concave neck has a ridge at mid-height and a twisted handle that attaches directly to the rim and shoulder. The last example from Sardis (room E4) stands at 24 cm and has an unusual trefoil mouth. It also has the concave neck with a ridge around the center as seen in the previous example. Unlike this former example, however, the handle is attached beneath the rim and just below the shoulder.

To the northwest, another parallel, but of a slightly later date, was found at Corinth. A bronze pitcher, 23.5 cm in height and with the same sunken disk base and box-like shape as the Bozburun example, was recovered from a thirteenth-century stratum. On the one hand, the shape of the shoulder is similar to that of the Yassı Ada pitcher (except for its single horizontal step). On the other hand, the incised geometric designs on the shoulder and top of the neck resemble those of the Bozburun pitcher.

The earliest parallel recovered thus far derives from a well in Sisak (in the former Yugoslavia) which dates to the second century AD. This pitcher has a splayed base and is sharply carinated. As with the many of the parallels already listed, there is a single step on the shoulder. At 26.5 cm in height, the Sisak pitcher is slightly larger than the Bozburun sample; it, too, is comprised of three sections of copper sheeting apparently
soldered together. Rivets and soldering on the neck indicate the previous existence of a pouring handle. A metal band would have secured the upper handle attachment at the neck, and the lower handle attachment would have been braced against the lower body. Examples of such a handle on copper vessels have been found at Pergamon and Olympia. The bronze tankard from Pergamon measures 30 cm in height, and the two pitchers from Olympia measure 26 and 23 cm respectively.

To the east, the Levant has also produced comparanda. In the fifth- to sixth-century monastery at Mount Nebo a pitcher was found, which is 21 cm in height and has the same thick ring base as the Bozburun pitcher. The shoulder bears an incised herring-bone motif whereas the neck simply has ribbing. The surface of the vessel was blackened by fire, which, according to the excavator Schneider, is due to its use as a kettle. This vessel bore a handle in the form of an encircling band around the neck and an attached bar, perhaps similar to what would have adorned the Sisak pitcher. A larger version of the Mount Nebo pitcher (*i.e.*, 28 cm), also with neck ribbing, was found in a mid-eighth-century context (Locus 50, North Dependency) within the Byzantine church complex at Pella.

There are two other parallels, currently housed in museums, that bear mentioning. On display at the Cyprus Medieval Museum in Limassol is a small copper jug, described in the accompanying text as a "bronze dipper," excavated at the Forum at Amathus, which is dated broadly to the sixth and seventh centuries. Rather than the herringbone motif of the Bozburun pitcher, it has transverse strokes inscribed on its shoulder. The other copper pitcher, at the American Colony Hotel in East Jerusalem, is displayed, along
with other antiquities from illicit excavations, in a case with no provenience and little chronological information (attributed loosely to the Byzantine period).

Capacity measurements were not included in any of the parallel descriptions; therefore, the following estimate is drawn from the capacity measurements of ceramic pitchers similar in size. Bozburun pitcher #1 is slightly larger than Cp. P 1 in terms of height, maximum diameter, and base diameter. Based on the fact that P 1 has a capacity of 2.5 liters and Cp. P 1 is slightly smaller in its dimensions, an approximation of two liters for the capacity of Cp. P 1 is feasible. An approximation of slightly less, one and one half liters, is suggested for Cp. P 2.

The two advantages to copper cookware are high heat transfer (the highest of any material used in cooking) and even heating (no hot spots). In addition, the heat loss with copper cookware is far less than its ceramic counterpart; therefore, the aforementioned suggestion of the pitcher's use as a kettle is feasible. The advantages of a closed copper vessel on board a ship would have been the following: 1) a more efficient way of heating water for cooking purposes (therefore less fuel on board required); and 2) less loss of liquid in a kettle on a rolling ship. These two points are highlighted by the apparent absence of lids for the cooking pots.

COLLAR STANDS

Two collar stands were found in grid E11. Based on their comparable size, form, and material, it is likely that these stands were thrown by the same hand. The incisions on
the stands may be connected to their respective uses, but at this time remain undeciphered.

Collar Stand #1 (CS 1), Figure 29

Context: E11 LL3  
Field Registration: Lot 9697, BK 780

Preservation: complete, with minor chips along edges.

Fabric and Treatment:

Clay color: 5YR 5/6, yellowish red (dry); 2.5YR 4/4, red (wet)

Inclusions: small sand and micaceous flakes, approximately 10/cm.

Fabric: very coarse.  
Core: light reddish brown.

Surface treatment: unslipped and unglazed; pre-fired incision in form of a "Δ" (delta) and an "I" (iota), on interior.

Technical/manufacturing remarks: turned on slow wheel

Measurements:

Weight: 0.574 kg  
Height: 6.2

Diameters: 13.8 (upper end), 14.1 (lower end)  
Thickness: 0.04 (vessel wall)

Form Description:

Wider end served as base; from base, vessel wall slopes inward and upward and gradually becomes vertical at mid-height; distinct ledge at mid-body, which flares out
again to support wide, thick "rim" upon which cooking pots would sit; a distinct "Δ"
(delta) and "Ι" (iota) incised into collar stand pre-firing.

Fig. 29. Collar Stand #1 (Scale 1:2).
Collar Stand #2 (CS 2), Figure 30

Context: E11  
Field Registration: Lot 3719, BK 473

Preservation: complete.

Fabric and Treatment:

Clay color: 5YR 5/4, yellowish red (dry), 5YR 4/4, reddish brown (wet)

Inclusions: numerous fine sand and micaceous flakes.

Fabric: very coarse.  
Core: light reddish brown.

Surface treatment: unslipped and unglazed; pre-firing incision, possibly in form of upside down "A" (lambda).

Technical/manufacturing remarks: turned on slow wheel.

Measurements:

Weight: 0.532 kg  
Height: 4.6

Diameters: 14.3 (upper end), 14.9 (lower end)  
Thickness: 1.2 (vessel wall)

Form Description:

CS 2 with same broad base as CS 1; however, 16 mm shorter; from base, side slopes inward to minimum diameter, then flares out quickly and rounds upward and inward to form upper end or "rim"; an incision made visible from horizontal viewpoint; unclear whether this symbol is Greek character or some other form of identification; incision was made pre-firing; not as deep as incision on CS 1.
Discussion (Figure 31):

From the Anatolian mainland, the seventh- to eighth-century deposits from a hypocaust fill at Anemurium have produced collar stands with the similar low ring as the
Bozburun example. The diameters of the rim and base, which are broader than the Bozburun sample, range from 20 to 23 cm. Farther south, contemporaneous deposits in the Period IV storeroom of the Byzantine factory at Dhioros, Cyprus, have produced much larger collar stands that range from 45 to 55 cm in height. Lastly, the longevity of the form is evidenced by discoveries from the transitional second-century/third-century Roman strata at Karanis, Egypt. Here, a collar stand was recovered 6.8 cm in height with a wide base diameter of 18 cm. The fabric is similar to the Bozburun collar stand insofar as it contains white, straw, and micaceous inclusions.

There has been much speculation regarding the use of these stands. It has been suggested that they were primarily intended for the convenience of stacking round-based pots on shelving; however, the soot residue found on many of the examples from Anemurium suggests use in a kiln or hearth. Such stands were found in situ in a kiln in Russia, perhaps used as saggars for vessels being fired. The evidence provided by the Bozburun shipwreck, however, suggests that they were used as stands for the round-bottomed cooking vessels in a hearth. Upon experimentation, it was readily apparent that the cooking pots rested evenly upon the collar stands, and, moreover, the stands were found in the vicinity of the hearth tiles and charcoal deposits.
Fig. 31. Distribution of collar stand comparanda.
CONCLUSIONS

The combined analyses of the Bozburun hull, its botanical remains, cargo, and galley ware provide a view into the origin of the ill-fated ship, life on board, and the purpose of its voyage. As part of this endeavor, this thesis, through an examination of the galley ware, offers a view of shipboard life and, by a comparative analysis of kitchen wares from terrestrial sites, suggests a possible port of embarkation.

Based on the number of one- and two-handled cooking pots, it is reasonable to suppose that a crew of eight manned this ship. Furthermore, the Rhodian Sea-Law prescribes the same sized crew for a standard ship's company. Three other east Mediterranean shipwrecks with well preserved galley ware assemblages help put the size of the Bozburun crew in perspective. The sizeable galley ware assemblage at Yassi Ada, with over 20 cooking pots alone, suggests the presence of passengers in addition to crew. In sharp contrast, the Kyrenia shipwreck, with its comparatively spare assemblage of only four settings, probably carried a much smaller crew.\textsuperscript{164}

Despite the proposed neat correlation between cooking pots and personnel, other aspects of the galley ware assemblage point to an irregular shipboard schedule. The collar stands were needed to support the cooking pots both in the hearth and on a surface; therefore, only two meals could be prepared and consumed at once. This constraint suggests that meals were taken in shifts, perhaps two men at a time. Furthermore, the minimal number of galley ware items and the complete absence of food preparation vessels (\textit{e.g.}, casseroles, large vats, caldrons) not only supports the notion of a two-man galley, but also brings into question the presence of a cook. It stands to
reason that a cook should have adequate equipment to prepare meals for a group of several men. From the recovered material available, it appears that the galley of this ship was not fitted for a cook. If the Bozburun ship was, indeed, manned by a crew of eight then, perhaps, the seventh and eighth berths were occupied instead by additional sailors.

That the galley itself was small is further substantiated by its approximate dimensions: almost all of the cooking pots, both of the collar stands, and the stone tiles were recovered within the 2.00 x 2.00-m-square area of E11. Unlike the Yassi Ada shipwreck, the galley at Bozburun did not span the width of the stern. Large meals, then, were probably not prepared and eaten in the Bozburun galley.

Fish was likely the staple of the crew's diet: fish net weights were found in the stern area and fish bones were recovered from one of the cooking pots. This basic meal was supplemented by grapes, olives, and wine, all of which are archaeologically attested at Bozburun. It is likely that easily-stored provisions such as bread, nuts, and fruit (cf. Rhodian Sea Law) were also kept on board. Liquid provisions, such as sauces and olive oil, were probably stored in bulk in the cargo hold and dispensed in small amounts from juglets and cruets at mealtime. Because provisions were probably replenished whenever the ship put in for fresh water, not much storage space was taken up by daily food supplies. Water, which was used for drinking and meal preparation, was perhaps stored in animal skins. Whether the wine stored in the hold was available to the crew is unknown.

Despite the eclectic nature of the overall assemblage, it is likely that the eight one- and two-handled cooking pots and the two collar stands were part of the
shipowner's/captain's initial purchase made at a single workshop. This supposition is based on their overall similarity in fabric. As for the collar stands, in addition to sharing the same fabric, they were an essential accompaniment for the round-bottomed cooking pots. In general, the diameter of collar stands ranges widely, yet at Bozburun the collar stands perfectly accommodate the cooking pots.

The unique combination of decorative shoulder motif and triangular boss indicates that the copper pitchers were purchased together as well. Certain questions exist regarding their use on board: first, was there a functional relationship between the collar stands and pitchers, of which there were two of each? The lack of burn marks on the base of the copper pitchers (marks which appear on many of the parallels given) seems to indicate that they were not set directly on the embers, but rather, on the collar stands. Although the diameters of the collar stands were larger than the bases of the pitchers, the stands could still support the pitchers. Used in this way, signs of burning might not appear. Second, were the copper pitchers acquired because of their efficient heat transfer? Perhaps they were used for hot beverages? One might also deduce that meal components were prepared in the individual cooking pots and then cooked by adding boiling water. According to this method, fuel for the fire was utilized more efficiently; thus, more space on board could be devoted to provisions, equipment, and cargo and less to fuel.

The ceramic pitchers were probably acquired separately. Despite their stylistic uniformity, these pitchers were made from different fabrics, and, therefore, probably did not come from the same potter's workshop. The captain/shipowner selected pitchers
with a thick, sturdy handle, a trefoil mouth, and a wide body and base. This last feature was an important factor because it stabilized the pitchers on a rolling vessel. The storage pitchers, described here as "pantry items," were probably used as such once their rims were broken, thereby rendering them unsuitable for kitchen use. The "wavy-line" pitcher (P 5), with its plain conical rim and body decoration, is anomalous. Whether or not this pitcher was acquired for a specific purpose on board because of these stylistic differences is unknown.

In light of the varied collection of juglets, it may be that they were acquired on an *ad hoc* basis. The relationship between form and function is unknown. Perhaps the glazed juglet held a special commodity such as vinegar. The fact that all four juglets are disparate in size and shape suggests a differentiation in their usage and/or contents.

Now that we have discussed the personnel of this ship and the individual vessel types from which they ate and drank, let us turn to the assemblage as a whole and compare it to similar assemblages at terrestrial sites. There is no reason to believe that these vessels were produced specifically for galley use (or use at sea); rather, they were chosen for their size and durability. The galley of the Bozburun ship was half the size of the Yassi Ada galley; therefore, large vessels, such as vats or caldrons could not be easily accommodated on board at Bozburun. Compared to cooking pots from land sites, those from the Bozburun galley are much smaller. Furthermore, the collar stands that accompanied them are also smaller (diameter = ca. 15 cm) than their counterparts on land (diameter = 20–55 cm).
It is interesting to note that many common domestic items discovered at roughly contemporaneous land sites apparently were not taken on board the Bozburun ship. Their absence is likely due to the fact that space and budget restrictions dictated which equipment and supplies were chosen for the expedition and how they were to be used. The discovery of only one lamp on board indicates that other instruments of lighting were employed, such as torches, which did not survive. The galley might also have been constructed in such a way as to allow natural light to filter through apertures in the deck.

In point of contrast, meal preparation vessels such as cauldrons, vats, basins, mortars, and pestles were found at Sardis, and a ceramic frying pan was recovered at Sarachane. In terms of meal consumption, a wide collection of eating utensils made from bone, copper, or iron were excavated at Sardis, and cups were found at both Sardis and Sarachane. In addition, lids for the cooking pots and casseroles, as well as small bowls and plates, were recovered from Sarachane. Lastly, clear personal effects were missing altogether at Bozburun. It may be that most personal possessions were taken off the ship between the time it struck and the time it sank. The unusual deer and ivory horn, the functions and ownership of which are thus far unexplained, may or may not have belonged to an individual on board.

In light of all the items that were missing from this ship and the likely space constraints on board, it is possible that the captain/shipowner tried to economize by putting certain vessels to multiple uses. The cooking pots may have served doubly as meal preparation and consumption vessels, thus eliminating the need for a plate. Although the pitchers constitute evidence for liquid provisions, by what instrument these
liquids were consumed is unknown. Perhaps the pitchers, too, had a dual function—namely, as both storage and drinking vessels.

It is difficult to state with certainty if the parallels from land sites are truly representative of domestic pottery. Beyond the designation of "Byzantine settlement," no further information is given regarding the findspots of utilitarian pottery at Sparta and the Athenian Agora. Many comparanda derive from residential, if not élite, contexts, such as the castle complex at Nea-Paphos, the Great Palace in Constantinople, and the private bath at Argos. Such sites not only are likely to produce less utilitarian pottery, but also, because of their monumentality (and subsequent appeal to archaeologists) tend to skew the ceramic data. Thirty-six percent of the parallels came from religious centers, either a church complex, basilica, monastery, bothros, or sanctuary.

Here again lies a problem of interpretation: is it safe to deduce that the comparanda from these sites were acquired in the same manner as those aboard the Bozburun ship? Perhaps the former prestige of the centers was absent in the common living areas such as the kitchen, thus allowing for a more utilitarian element. It is also possible that these centers either had their own potter's workshop, or had their kitchen wares "commissioned" or custom-made. A great many of the comparanda come from secondary contexts such as well and tomb deposits, which, unfortunately, can do little more than to suggest a geographic distribution and a relative date.

The Byzantine shops at Sardis provide the best comparanda not only in terms of material culture, but also context and vessel use. Many of the comparanda were found in storerooms, shops (and not necessarily as goods for sale), and possible residences of
shopkeepers. Sardis is also one of a few sites at which the vessels were probably locally made. Perhaps it was this region of southwestern Asia Minor that John Hayes had in mind when suggesting a place of origin for utilitarian pottery from other Byzantine sites in the eastern Mediterranean.

A preliminary inspection of the amphorae made by visiting specialists to the excavation suggests an origin for the Bozburun cargo somewhere in the Black Sea region. Further analyses (i.e., timber) may confirm this provenance. Unfortunately, however, there is a dearth of well-published excavations in the Black Sea region that might otherwise have produced galley ware comparanda. Moreover, utilitarian vessels rarely appear in the final excavation reports. The bulk of the Bozburun galley ware, however, suggests a point of origin for the ship, or at least a port of call, in southwestern Asia Minor. Despite the many communication networks that existed at this time, it is likely that utilitarian pottery was acquired not far from the point of its production. Perhaps this ship was a mid-sized freighter practicing cabotage back and forth along the coast of Asia Minor, with stops as far north as the Black Sea. While my conclusions conflict with the aforementioned preliminary inspection of amphorae, a reconciliation of my data is better postponed until all the analyses are completed and synthesized in the final excavation report.

The convergence of different studies associated with the Bozburun shipwreck will hopefully answer many questions related to the source and ownership of the cargo and the route and homeport of the ship. This thesis seeks to illuminate one aspect of shipboard life, the preparation and consumption of meals, through an analysis of the
everyday pottery used in the heart of the ship, the galley, by the men who manned her sails and guided her across all too perilous waters.
ENDNOTES

1 A series of church excavations were carried out at Sarachane; for the pottery report, see Harrison, Fıratlı, and Hayes 1968, pp. 203–16 and Hayes 1992. The results of the land excavations that provided significant Byzantine material culture remains can be found in the following site reports: Rice 1958 (Constantinople), Rice 1928 (Hippodrome), C. Williams 1989 (Anemurium), and Lightfoot 1994 (Amorium). For an overview of these and other contributions of land archaeology, see pp. 93–4 below.

2 See Bass and van Doorninck, Jr. 1982.

3 See Bass et al. forthcoming.

4 For further details, see Bass 1974 and Parker 1992.

5 Hocker and Scafuri 1996, 8.


7 For the definitive treatment of the hull, see the forthcoming Texas A&M doctoral dissertation by Matthew Harpster, An Inspection of the Hull Remains of the Byzantine Shipwreck at Bozburun.

8 Christine Powell’s analysis of these amphoras will also appear as a doctoral dissertation at Texas A&M University.

9 Gorham 2000.

10 This information is based on the results of the dendrochronological analysis carried out by Peter Kuniholm on the ship timbers.

11 Hocker 1998b, 6.

12 Morgan 1942, 1.

13 Ebersolt 1910.

14 Dawkins and Droop 1910–1911.

15 Rice 1929.
Morgan 1942.

Stevenson 1947.

Ibid. 33.

Catling 1972.

Schneider 1950.

Saller 1957.


Williams 1989.

Bakirtzes 1989.

Crawford 1990.


This system of identification and registration was created by Dr. George Bass and is unique to the Institute of Nautical Archaeology.

Lot number refers to a group number assigned to a collection of sherds, shards, wood fragments, concretions, and complete or incomplete vessels that are recovered from a specific location within the grid on a single dive.

The inclusions described as "sand/grit" have a glass-like appearance; those referred to as "mica" are opaque and reflect light; when the inclusion cannot be identified, its color is merely noted.

Catling 1972, 13, fig. 7.P92; 57, fig. 33.P111.

Hayes 1980, 378, fig. 11.

Ibid. 378, with fig. 13.1–2. There is a problem with this reference in that the drawing for this cooking pot in Hayes 1980 does not appear in the original site reports (Megaw 1971, 1972).

34 Hayes 1982, 184.

35 Personal observation, 3 September, 2000.

36 Aker 1985, 14, fig. 16.

37 Crawford 1990, 33, uninv. object 59, fig. 102.


39 Hayes 1992, 55, fig. 79.109.

40 Ibid. 55, fig. 56.13–14.

41 Ibid. 57, fig. 80.113.

42 Harrison, Firatli, and Hayes 1968, 203, fig. C1–3.

43 Barnea 1967, 186, fig. 120.10, here listed as an “imitation” Byzantine form.

44 MacKay 1967, 295, fig. 4.119.

45 Ibid. 299, fig. 5.132.

46 Sandars 1993, 281, fig. 13.70.

47 Aupert 1980, 433, fig. 43.285b.

48 Ballance, Boardman, Corbett, and Hood 1989, 114, fig. 43.284; 114, fig. 35.285, pl. 25.

49 Sagui, Ricci, and Romei 1997, fig. 8.16.

50 Johns 1934, 144, pl. LVII.3.

51 Ibid. 142.

52 Baly 1962, 275, Ware CXXI, pl. LVI.134.9; see also p. 296 for additional information on Shape 134.9.
53 Ware CXXI, although dated by the excavators to the Hellenistic and Roman periods, is said to be "clearly related" to Cooking Pot Ware XV, which ranges in date from the first century BC to the Arab period (= eighth and ninth centuries), and has the following features in common with the Bozburun cooking pots: clay color of buff brown to purple or even black; no surface treatment; and a coarse ware with a high gritty content.


55 Tushingham 1972, 74–6, fig. 9.7–8.

56 Aharoni 1964, fig. 23.1.

57 Lloyd 1984, 44, cooking ware 1, illustration 15, pl. 17.

58 Hayes 1978, 50, fig. 11.4.

59 Ibid. 43, fig. 8.12.

60 Egloff 1977, 103, object no.141, pls. 18:5, 52:4.

61 Ibid. 104, object no. 142, pls. 18:6, 52:5.

62 Riley 1982, 270–1, fig. 107.551; the Athens parallel is based on a personal communication with J.W. Hayes. For further reading on the Knossos parallel, see Johnston and Frend 1962, 223, fig. 16.37.

63 Williams 1989, 61.

64 I refer to these cooking pots as "eastern Mediterranean" because, as it has been pointed out to me, contemporaneous sites from western Europe had an entirely different tradition in the development of the cooking pot. The shape identified with cooking-pots from the west is characterized by a taller form with a very small base and only slightly wider rim. (Jülide Aker, pers. comm., Boston, MA, May 2001.)

65 Hayes 1992, 4.

66 Dr. Fred Hocker, pers. comm., September 1997.

67 The galley ware items also included 17 storage jars (as opposed to amphorae), and a large quantity of plates, bowls, cups, and jars. For an overview of the galley ware assemblage, see Bass and van Doorninck, Jr. 1982, 315.
68 Katzev and Katzev 1989, 163.

69 Ashburner 1909, 58.

70 The treatment of ναύκληρος here is as a separate entity from the ναύται, or the sailors. For further reading on the several interpretations of this term, see Ashburner 1909, cxxxii-cxxxv.

71 These first three roles are mentioned in classical works, always in the order of their respective importance (for references, see Ashburner 1909, 58).

72 Bass and van Doorninck, Jr. 1982, 313.


74 For a complete list of food products exported from Spain, see West, 1929. Pliny and Strabo are the chief ancient authors who list food products.

75 For a description of the fish and fish product trade in Imperial Spain, see West 1929, pp. 36–9; for a discussion of pickled fish, see Athenaeus III.118; for those amphora fragments from throughout the Mediterranean world that contained strips of sea bream and tunny which were found at Corinth, see C.K. Williams 1979, p. 117; for a discussion of amphoras containing fish sauce, or garum, see Etienne 1970.

76 Ashburner 1909, cliii.

77 Ibid. cli.

78 Ibid. cli, here in reference to the Consulate of the Sea, a collection of laws contained within the Rhodian Sea-Law. The composition of the Consulate dates to the end of the fourteenth century but, notwithstanding, contains much earlier material.

79 While it is held that the bulk of trade tended to be closer to shore, the results of deep-sea exploration have confirmed what ancient authors occasionally reported, that is, open water travel could and did occur. Two eighth-century B.C. Phoenician wrecks, the Elissa and the Tanit, both cargo ships, were found 50 km off the coast of Ashkelon (see King and Stager, 2001 and Stager et. al. forthcoming); and a Hellenistic period wreck was found 350 km off the southwestern coast of Cyprus (Phaneuf, Dettweiler, and Bethge 2001).

80 Bakirtzes 1989, 130.
81 Ibid. 34, fig. a.

82 Ibid. 35, fig. b.

83 Peshlow 1977/78, 409–11, fig. 18.120.

84 Ibid. 399, fig. 8.86.

85 Hayes 1992, 57, deposit no. 39.4-5, fig. 63.

86 Rice 1958, 111, fig. 22b.

87 Jacobson 1959, 311, fig. 164.3.

88 Ibid. 300.

89 Scorpan 1977, 20–1, fig. 32.1–2: see also 1976. 172, pl. 25:2, 4; it is not mentioned in either of these references whether the ewers are from the Citadel, the Basilica, or the surrounding tombs. For more information on the site see Tudor 1965.

90 Aker 1985, 24.

91 Bakirtzes 1989, 130.

92 Bass and van Doorninck, Jr. 1982, 169, object no. P16, figs. 8.10, 8.11; 169, object no. P17, figs. 8.10, 8.11, Wreck plan Vd.

93 Catling and Dikigoropoulos 1970, 48, fig. 3.9, pl. 32A.

94 Megaw 1976, 364, pl. LII:CB 3887; see also Hayes 1982, 184.

95 Tubb 1986, 61, fig. 6.1.

96 Riley 1982, 395, fig. 142.D1196; 396, fig. 142.D1199; 396, fig. 143.D1201.

97 Robinson 1959, 118, object no. M365, pl. 33.

98 Ibid. 122, pl. 35:N6.

99 Ibid. 122, pl. 35:N8.
100 Frantz 1938, 464, fig. 28.D5.

101 Ballance, Boardman, Corbett, and Hood 1989, fig. 32.183, pl. 22:189; for other comparanda, see figs. 32.181; 32.185; Pl. 22.185; Pl. 22.186; Pl. 22.178; p. 103 description for all.

102 MacKay 1967, 274, pl. 64:36; 274, pl. 64:37; 277, pl. 65:51; for specific excavation information, see Robinson, 1960

103 Aupert 1980b, 430, fig. 41.232.

104 Jacobson 1970, 43, fig. 10.1.

105 Jacobson 1959, 314, fig. 168b.

106 Jacobson 1950, 109, fig. 67.7, 9.

107 Scorpian 1977, 288, fig. 29.7.

108 Tudor 1965, pl. 4.2, 11.

109 Doncheva-Petkova 1977, 176, Type V, pl. XVII:238.

110 Crawford 1990, 78, uninv. object 67, fig. 377.

111 Ibid. 59, object no. P68.175: 7886, fig. 261.

112 Morgan and Leatherby 1987, 96, fig. 53.7.

113 Supra n. 106.

114 Dr. Fred Hocker, pers. comm., 2000. I am indebted also to Kroum Batcharov and the Director of the Archaeological Museum of Nesebr.

115 Jacobson 1959, fig. 165.1.

116 Sokol'skii 1966, 134, fig. 7.2.

117 Zayadine 1977–1978, 44, fig. 25.505, 507–8

118 Smith 1973, 222, pl. 28:1233.
119 Tubb 1986, fig. 6.10.
120 Saller 1957, 266–7, figs. 51–2.
121 Baly 1962, pl. LII:72.
122 Aharoni 1964, pl. 7:13.
123 Hamilton 1940, figs. 7.5–6, 8.3–4, 9.1–2, 5.
124 Schneider 1950, fig.13.4, 7.
125 Tushingham 1972, fig. 10.78–9.
126 Bass and van Doorenck, Jr. 1982, 172, object no. P30, figs. 8.12, 8.14, Wreck plan Vd.
127 Megaw 1976, 364, pl. LII:C3887.
128 Robinson 1959, 122, pl. 35:N6.
129 MacKay 1967, 276, pl. 65:44.
130 Supra n. 102.
131 Stevenson 1947, 39.
133 Ibid. 18, 227, pl. 6:g.
134 Ibid. 18, pl. 6:h.
135 Ibid. 18, pl. 6:k.
138 Babić 1986, pl. 93:1.
Waage 1933, 327–8, fig. 21b.

Bass and van Doorninck, Jr. 1982, 173, object no. P34, fig. 8-14.

Aupert 1980, 431, fig. 41.252–4, 257.

Scorpan 1977, 287, fig. 30.2.

Compare these delicacies from the Roman period: *Caroenum* (boiled wine or grape sauce), *defritum* (a thick fig syrup), *liquamen* (a salty fish sauce), and *passum* (wine sauce sweetened with honey).

The absence of an interior glaze indicates a purely decorative, rather than functional, role for the glaze.

Bass and van Doorninck, Jr. 1982, 269, object no. MF 5, figs. 12-2, 12-3, Wreck Plan Vc.

Ibid. 284, object no. MF 31, figs. 12-11, 12-12, Wreck plan Vf.

Crawford 1990, 94, inv. no. M63.56:5871 (M8 531), fig. 522.

Ibid. 54, inv. no. M67.29:7475, figs. 212, 214.

Ibid. 62, inv. no. M67.16:7382, fig. 285.

Ibid. 54, inv. no. M67.15:7381, figs. 211, 213.

Waage 1935, 90, fig. 9; see also Davidson 1952, 74, pl. 52:559.

Hoffiller 1908, 133–4, fig. 9.

This observation was first made by Bass in regards to a similar pitcher found in the Yassi Ada wreck (1982, 272).

Conze *et al.* 1913, 326, fig. 117a.

Furtwängler 1890, 213, pl. LXXI:1372

Schneider 1950, 313, object no. 271, fig. 3 (left) on pl. 137.

159 C. Williams 1989, 103, fig. 63.598

160 Catling 1972, 13, fig. 7.P100–1, P103


162 Catling 1972, 65.

163 Kobylnia 1966, 176, pl. 6, kiln no. 3.

164 The soon-to-be published Serçe Limanı shipwreck was divided into three sections with ample space for crew and passengers.

165 According to the preliminary findings of Matthew Harpster, this ship was in service for an extended period before it sunk. It is indeed possible that the origin of the ship timber and the origin of the pottery assemblage may bear no relationship at all. One must bear in mind also the maxim of archaeological interpretation: "absence of evidence is not evidence for absence."
WORKS CITED


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Assistant to Principal Investigator of the Tel Mor Archaeological Publication Project, Jerusalem, Israel 2000–2001
• Analyzed and documented Tel Mor pottery (ca. 1500–1000 B.C.).

Nautical Archaeologist, Leon Levy Shipwreck Survey, Ashkelon, Israel 1997
• Team Member of underwater survey.

Staff Member, Bozburun Shipwreck Excavation, Bozburun, Turkey 1996–1998
• Analyzed and documented complete collection of shipwreck galley ware.

Volunteer, Combined Caesarea Excavations, Caesarea, Israel 1993
• Team Member of both underwater (Harbor Project) and land (Vault Project) excavations.

MUSEUM EXPERIENCE

• Digitally photographed and documented parts of 1300-piece Cesnola Collection from ancient Cyprus.

SELECTED PUBLICATIONS AND PRESENTATIONS

