LIFE AT SEA DURING THE ROMAN EMPIRE

A deep dive into the crew's assemblage found at three Mediterranean wreck sites

Christina von Schiervick

Master of Archaeology

60 credits

Department of Archaeology, Conservation and History

Faculty of Humanities

Spring 2021

Table of contents

Abstract

This master's thesis is an analysis of galley and table wear based on a comprehensive overview of the materials belonging to the crew's assemblage of three shipwrecks from the Roman era, the Port-Vendres II, the Plemmirio B and the Valle Ponti. From gathering the information necessary to understand the complex assemblages a wreck site constitutes, to the method of selecting the relevant objects used for the analysis. Known uses of the galley and table wear are considered to build a foundation on which the finds pertaining to the cooking and eating habits of the sailors are based. With this information the objects from the ships are first analysed separately before a comparative analysis is conducted. Finally, these finds are considered in a consumption study focused on colonisation and the romanisation of eating and cooking habits.

Acknowledgements

I would like to thank my adviser Søren Handberg for steadily guiding me through this process. I would also like to show my gratitude to my fellow students who followed me on this journey during a very strange and demanding time.

1. The beginning of a new era in archaeology

The accidental find of the Antikythera wreck in 1900 by sponge divers was the beginning of maritime archaeology as we know it (Delgado, 2000, p. 9). To this day the discipline is almost completely focused on shipwrecks but the definition is; "*the study of material remains after human activities on the seas and in interconnected waterways*" (Gibbins & Adams, 2001, p. 279). The field started expanding in the 1950s and 60s after Jacques-Yves Cousteau invented the aqua-lung, what we know today as SCUBA gear, but due to the special requirements for deep water dives it did not become efficient until the 70s with new technological developments to overcome previous obstacles. Along with the limitations on depth and dive time small things like depth and oxygen gauges were missing in the beginning and were very helpful when it came to excavating wrecks even in relatively shallow waters. The first shipwreck that was excavated in its entirety was in 1960, but deep-sea wrecks still constitute a major challenge. Even with the new developments in technology the difficult conditions have prevented this. New advances are made to make this possible as the best-preserved ships are often found in deep waters. The tools that are available today are different types of sonar, magnetometers and submersible vehicles, but new methods and technologies are developed at the same time as old ones are improved. As of now decompression dives and special mapping techniques are needed to utilize the limited time the divers have as efficiently as possible. As the standard of underwater excavations increased in the 70s, maritime archaeology also became an academic discipline (Bass, 2011, pp. 2-5). It has grown to a large field due to the many archaeological finds that lie basically untouched on the ocean floor, some have estimated the number of undiscovered shipwrecks to be around three million with less than 1% of them having been examined (Juvelier, 2017, p. 1024; Torpy, 2015, p. 83). One huge advantage of underwater sites is that in many cases the preservation of objects is far greater than the once found in terrestrial sites. There is also a greater number of artefacts and they can be dated more precisely (Bass, 1980, p. 140). But there are differences around the world in the use of maritime archaeology. In the Mediterranean, where the discipline was born, there are more registered wrecks than in any other ocean so the potential for growth is huge worldwide. As time goes by these numbers will hopefully even out as more of the ocean is explored.

Seafaring was an important part of the economic structure in the Roman empire. When excavating shipwrecks, archaeologists have focused on amphoras and other cargo items that

contributed to the understanding of economics and trade along with the structure of the ship itself. Objects used by the crew onboard have for a long time been singled out by the fact that they were found in very low quantities. Sometimes a single object has received a lot of attention, like the Antikythera mechanism. This is believed to be an astronomical calendar, a very intricate geared mechanism unique to this wreck. Since nothing like this has been found elsewhere many has written about it again and again trying to decipher its secrets, because even though it was degraded when it was found it is an exemplary artefact unlike than anything else of its' time (Freeth et al., 2006; Hannah, 2018; Safronov, 2016; Seiradakis, 2012; Wright, 2001, 2007). Less attention has been paid to the items used on the ship by the crew that can provide insight into the life onboard. The ship as a whole with their crew and material culture provide insights into the society from which they came (Gibbins & Adams, 2001, p. 280), they are also unique as an archaeological site. In the words of Gibbins and Addams (2001, p. 280):

As archaeological assemblages' shipwrecks offer a number of inferential advantages over other types of site where the same types of artefact are found. A wreck preserves a largely contemporaneous group of material which was not intended for discard; the nature of a ship as a self-regulating system would have counted against the retention of significant quantities of redundant materials.

Shipwrecks can be considered a closed find because they represent a single functional, cultural and social unit. Unlike a terrestrial site that has been affected by a number of adverse factors, the ship can be understood as the entire system (Adams & Rönnby, 2013, p. 11). This makes shipwrecks a snapshot of relatively undisturbed history. Where most terrestrial sites are prone to have materials from different time periods, that and the fact that a lot of the material were discarded by the people that used it makes this a limited source of information. The other most common type of terrestrial find are graves. Although providing a wealth of artefacts and information they are a specially curated group of objects chosen by the deceased's relatives. There are terrestrial sites like Pompeii where an entire city has been frozen in time, but they are quite rare. Of all the terrestrial site these are the ones that contain the most extensive archaeological evidence of people's daily lives. Shipwrecks also contain artefacts that reflect on the lives of people, more specifically ancient seafarers. This is significant because it is part of a culture we have little knowledge about as ancient texts, like archaeologists, in large part focused on the economic and technical aspects of seafaring.

For a long time, the attention has been paid to the cargo and the ships structure, recently more attention has however been paid to the domestic assemblage, a term used by Gibbins to characterize the material found on a wreck site that is not part of the ship and its nautical equipment or cargo. 'The term is loosely synonymous with 'ship stores', of anthropological significance as reflection of shipboard behaviour and for 'developing insights into seafaring norms in a particular culture' (Gibbins, 1989, p. 5). Here the term crew's assemblage will be used but it has the same definition. There has been some work done with the cooking and kitchen implements on ships but few that have compared the objects found at different sites. Further exploration of this can give a greater understanding of how life was for sailors during this time.

As most wrecks are submerged materials have gone missing either from the wreck itself or degradation from exposure to the water and other environmental processes. Due to these factors interpreting wreck sites requires an understanding of the processes affecting them. Work has also been done with refining and clarifying the criteria that is being used to separate the shipboard items, building towards a methodology that can be used during excavations to better record the findings. While working with this master's thesis the descriptions material that have been available have lacked specifics, in a lot of cases, on locations of finds. The older the reports are the more sporadic they have been with this information. The recording might have been done on site but it is not available for further study. Many sites are also not completely excavated, for the most part the sites that have been are very well-preserved ships, and these represent the minority of wrecks located around the world.

Ever since the development of this discipline the main focus has been on the economic significance of maritime trade and the technical aspects of ship construction. Therefore, especially amphoras but also other bulk cargo items have been the basis for most studies. Far less studied but no less important is the artefacts used by a ship's crew, the ones' that are not associated with the ship itself. These can help us understand what it was like living and working on a ship 2000 years ago.

1.2 Research topic

By examining the crew's assemblage, with the main focus on galley and table wear, what information is it possible to ascertain about life onboard based on the cooking and eating

habits? Are there some notable differences in the crew's assemblage depending on the types of ships and their areas of use? With this as a starting point an analysis of the artefacts used to prepare, cook, serve and store food items will be conducted. By examining the galley ware, is it possible to find out what the different shapes have been used for. What types of food can be found in the ships' stores and if there are any signs that there were livestock kept on the ship or meat used as a source of food, can this information provide further insights into the eating habits? What evidence is there of fishing as a source of acquiring food. Can the table wear give an estimate of how many people on board by linking the number of like types to a specific number of users? This will be the main focus as food consumption is a primary aspect of any person's life. Other artefacts from the crew's assemblage will provide further information as these would have been used when the sailors did not work on the ship.

Requirements for the shipwrecks selected here was that they contained archaeological evidence that food was prepared on the ship. This can be burnt pottery or cooking utensils with signs of use along with tiles and bricks and other remnants from the hearth itself. The ships are also selected from the European coast of the Mediterranean in the time period 25 BC to AD 200.

There are few studies that focused on the crew's assemblage found on shipwrecks. The ones that do discusses the categories of objects separately, sometimes even a specific artefact, without interpreting the crew's assemblage as a whole. One of the few other studied conducted on the topic of discussing the entire crew's assemblage is Tregos' (2004) master's thesis, but this is focused on the Hellenistic period. With an additional study from the Roman period we can begin to build a foundation on which we try to understand the material culture of seafarers and maritime social systems. However, as this field of study is still in its infancy, we have to start small by acquiring information from single ships. This master's thesis is a thorough examination of the crew's assemblage found at three Mediterranean wreck sites and a comparative analysis that will start this process by identifying certain aspects of material culture related to the preparation and consumption of food and hopefully from there social systems. With this light can be shed on the importance of the social aspects pertaining to life onboard during the Roman empire and hopefully contribute to an increased interest on further studies in this field.

2. Sailing in the ancient Mediterranean

Because of the complex nature of wreck sites, it is necessary to have an overview of the different factors that not only contribute to its formation but those that lead the ship on its voyage in the first place. A ships' sailing and trading patterns can aid when interpreting the different objects that will be found.

2.1 Seafaring and trade in the Roman world

Some ancient trade routes have been established with archaeological evidence found around known ancient ports like Alexandria, Rome, Marseille, Ostia, Antioch and Carthage. Most of the trade routes that are known have the ships sailing close to the coast but there must also have been some that crossed the open seas. Amphorae in all the shapes and sizes we know today are the result of specialization to carry various types goods, and to be able to stack it as efficiently as possible in the ships' cargo hold (Opdebeeck, 2005, pp. 25-40). As the cost of transporting goods on the sea was much lower than carrying them over land, about 30 to 50 times lower and it was about five times cheaper than on inland water ways, this aspect of trade was an important part of the economy in Roman empire (Peacock, 1978, pp. 49-51). Transport by ship was also much faster and the possibility of breaking fragile items much less likely than on a bumpy carriage ride. But this reacquired knowledge about when it was safe to travel, something it is clear that ancient sailors had. In the winter months the sea was too rough for cargo transport so shipping was restricted to the months between March and November (Opdebeeck, 2005, pp. 5-7). Since there were no instruments used by the sailors they relied on their knowledge of the areas they went to and familiarity with wind and current patterns, both well established in this period (Pomey, 1997, pp. 89-92). The ancient literature also contains information about when it is safe to travel across the sea. It describes the beginning of the sailing season as when flowers are blooming and marks the arrival of spring, after the seas are calmer and no longer rough and deadly. The harbours are coming to life and seamen are preparing to carry merchandise across the sea (Paton & Tueller, 1918, pp. 2-7).

There is evidence that trade in the Mediterranean had a certain structure. Stone, wine and tiles had a pattern of long-distance transport while the amphora trade patterns are more regional. One good example of this is the city of Rome. During the height of the roman empire the city

had grown so large that they could not get all the necessary goods from local sources and therefore relied highly om imports brought to the city by ships. Grain from north Africa, wine from the areas around the Aegean and the western Mediterranean along with oil from Africa and Spain was among the most important imports and it came from all over the empire. Other goods such as metals, marble, wood, ceramics, fish products, fruits and spices were also traded in bulk, and small quantities of luxurious exotic goods like ivory and precious metals is recognisable since they were found outside of their usual trading places (Horden & Purcell, 2000, p. 144; Meijer, 1986, pp. 169, 295; Opdebeeck, 2005, p. 6). During the Roman period tramping, sailing along the coast buying and selling goods at one port after another, was less important than the directed trade that largely characterised maritime commerce (Robinson et al., 2011, p. 5). This meant that the ships had to carry more supplies for the journey as there would be fewer stops.

2.2 Ancient ships and their structure

There are several different types of merchant ships used in this period, most described in little detail because the literature on the subject of ships mostly details the different types of warships. There are different classifications of the ships stemming from this era, one of these are the merchant ships. The first one relevant for the time period studied in this thesis is the *actuaria*. The name is Latin for merchant galley, and it was in use from around the 5th century BC to 8th century AD, both to travel in open water and on rivers. This was a specialised oared galley with 30 to 50 rowers depending on the size. The even smaller versions were referred to as the *akation*, this type had one single square sail in addition to the oars. This is the smallest version of the merchant galley as it carried less than 75 tons of cargo, or 1500 amphorae. this type is also the most common and it can be found throughout both the Hellenistic and Roman periods. Another version of this ship called the *epaktrokles* is believed to have been designed with a greater carrying capacity. It could carry 75 to 200 tons cargo or 2000 to 3000 amphorae and was in use from the 1st century BC to the 3rd century AD. The third type of galley can be found from the 3rd century BC but was mostly found in the late Republican period is called the *lembos*, the largest of the mentioned ships. Known to have as many as 50 rowers and sometimes two superimposed banks it carried its cargo both in open water and on rivers. This type of vessel could carry over 250 tons of cargo. When comparing this to the weight of amphorae it means that they could carry over 6000 of them. This type of ship are also known to have carried

heavy marble cargos during the latter part of the empire (Casson, 1986, pp. 150-160; Parker, 1992b, p. 93). According to (Parker, 1992b, p. 89):

The typical ancient merchant ship was a sailing ship between 8 and 40m long; though merchant galleys certainly existed, no proven example has been excavated. Many ships will have had two masts, though the foremast step is not often found, and would normally have been decked fore and aft of the hold. The cargo hatch has rarely been preserved, and there is no evidence that any ships had more than one; small ships and those which carried stone columns (or timber, though only small logs have been found archaeologically, at Valle Ponti) may have remained open throughout.

Most merchant ships that were used for more commercial purposes were also used by the navy in wartimes as auxiliary, the size of the ships did not matter as they served different functions close to their original objective (Casson, 1986, pp. 150-160). However, linking archaeological finds to a specific type of ship is very difficult, because for many shipwrecks most of the structure is gone, either due to the wreck itself or because of material degradation.

It was customary for a ships' crew to be all male but as passengers were normal on a ship, objects belonging to women can also be recovered at a wreck site. Ships also had a hierarchy with someone to give orders and those who followed them, evidence of this can also be found as the items they had onboard will vary in quality and quantity. When it comes to using material objects to illustrate life onboard it important to note that these are likely concentrated at the upper part of the ship where good preservation is least likely. This is where the ships galley would have been, located at the bow or the stern (Muckelroy, 1978, pp. 221-224). There is no written evidence for the location of a ships' galley so we are reliant on archaeological material to draw conclusions about the placement.

2.3 Ancient literature

There are many references to travel by ship in ancient literature, some are well known voyages like Homers epic *The Odyssey* that tells the story of a hero's journey home. There is however no mentions of how the crew and passengers lived while on the ships. On the other hand, there are quite a few mentions of sailors or oarsmen and their abilities. In the first book of Longus' adventure novel *Daphinis and Chloe* pirates are mentioned. The way they dress and what kind of weapons they used, the type of ship they sailed and how they raided. The story also mentions

that when the ship capsized the pirates quickly drowns due to the fact that they were being weighed down by their armour (Longus, 2009, pp. 49-51). Later in book two it is said that a group of young rich men set sail on a yacht using their household as oarsmen and travelled along the coast of Mytilene. This was a good place to sail as there were many harbours and residences where they could stay. While on their travels they hunted hares by using dogs but also wildfowl, geese, duck and bustards. While they hunted for fun, they also ate their catch. It also mentions that the men would not stay on the ship in autumn ad they would even beach the ship during this time if they feared a stormy night (Longus, 2009, pp. 73-75). If this is something that was done by the rich it could be that regular sailors and oarsmen hunted along the shores to replenish the ships' stores. Depending on the size of the crew and if there were any passengers onboard it would be logical to assume that they not only found food, but they would also require fresh water to survive their journey. Water would not only be found in ports along the way but also in rivers and lakes, so one could assume that the captain would be familiar with the territories they sailed along so there were specific stops made along the way. It is also expected that the captain would know how long it would take to sail from one of these stops to another so they could replenish their stores sufficiently to reach the next one without running out of food and water. Since it is also written that they would not stay on the ship during autumn when the weather would change and the seas would get rougher it is also logical to assume that sailors would, at least to a degree and especially if they had passengers, go ashore at night to cook and sleep when the sea got to rough. This hesitation to sail during curtain times of the year is also mentioned by Longus (2009, pp. 81-83) when he writes that to seek justice ten ship is sent out with infantry as oarsmen, but they would not send out more as winter was approaching and it was considered too risky. The literature also contains information about when it is safe to travel across the sea. The beginning of the sailing season, when flowers are blooming and marks the arrival of spring, after the seas are calmer and no longer rough and deadly. The harbours are coming to life and seamen are preparing to carry merchandise across the sea (Paton & Tueller, 1918, pp. 2-7). There is also a passage in one of Horace's works that says as the season changes into spring the river subsides and again flows within its banks (Horace, 2004, p. 239). If this is correct it would seem that not only ocean travel was limited to a specific time frame but that also sailing on the rivers were. Depending on the areas and the rate of ice melting in the mountains and as it is said that this lessens at the beginning of spring the sailing season on both river and sea was for the most part in spring and summer. 'Now the Thracian breezes, spring's companions that calm the sea, drive forward the sails; now the fields are no longer frozen and the rivers no longer roar, swollen with winter snow' (Horace, 2004, p. 251).

But it was not only the weather they feared. Horace (2004, pp. 29-31) also says that the ocean is dividing lands, the tossing waves, hazardous winds, rain storms and dangerous rocks but despite that ships still cross. This division is clearly seen as an obstacle especially with the dangers of the sea looming over every ship that attempts to cross but the advantages of traveling this way must be numerable since it was such a vital part of the trading economy. But this does not mean that the dangers are not of concern to those who man the ships. 'The Punic sailor trembles at the Bosporus, and, beyond that, does not expect an unseen death from any other quarter' (Horace, 2004, p. 121). It is clear that curtain dangers of the journey would have seemed more threatening than others and the sailors from different parts of the empire would have had different areas to fear depending on their usual routes. It would have been advantageous that the crew were familiar with the route they were taking as there are different obstacles at each of them. Not only would the Roman sailors need to have knowledge pertaining to the safe times of the year to sail but they also knew which areas so avoid or be especially careful when crossing. Though the captain would likely have had most of the knowledge it would be advantageous if the crew shared in the information as they are vital for a safe completion of the journey.

Traders are said to sail on the Atlantic Ocean three to four times a year to bring back products from Syria to produce wine (Horace, 2004, p. 81). This can be an indication of how many trips merchants set their ships out on the seas but the distance they sail must be considered. Traders that operated more locally could have had the time to do more round trips while those who sailed to areas outside the Mediterranean would embark on longer journeys so they might only have been able to complete one trip. This is however only speculative as there is no evidence that supports this, but it is a logical assumption based on the distance they would have to cover.

One section of Horace's (2004, pp. 51-53) work *Odes and Epodes* there is a chapter called The ship of state:

"*O ship! New waves are about to carry you out to sea. O, what are you doing? One final effort now, and make port before it is too late! Don't you notice how your side is stripped of oars, your mast is split by the violence of the Southwester, the yardarms groan, and the hull, without the support of ropes, can scarcely withstand the overbearing sea? Your sails are no longer in one piece, you have no gods left to call upon, now that for a second time you are beset by danger. Although you are made of a Pontic pine, the daughter of an illustrious forest, and you boast of your lineage and name, such things are of no avail; the terrified sailor puts no trust in painted sterns. Unless you are to become a plaything of the winds, take care! Until lately you caused me*

worry and disgust; now you inspire my devotion and fond concern. Make sure to avoid the waters that flow between the shining Cyclades!"

This is a good representation of how the ship itself is often covered in greater detail than the people that were on board. An ancient text mentions building fleets of ships for commerce or warfare and how this would affect the empire both within its borders and how it is viewed from the outside, but it does not contain any information about the people building them or the ones who man them (Cassiodorus, 2019, p. 218). A ships' structure, even the origin of its timber and materials used in the process of ship building is of great interest to both ancient and recent scholars and have therefore been studied and recorded at length. As the ship, or at least parts of it, can be found in the archaeological record it is an interesting subject that warrants in depth studies but with much of the focus on these subjects along with the ships' cargo many nuances of this important part of both commerce and warfare is largely overlooked. The most obvious being the human element. Without the crew these ships would not have been able to provide any of its services to the empire or their owners. There are mentions of the crew or oarsmen in ancient texts, but it is focused on the requirements they need to fulfil to be suitable for the work or legal issues concerning the size of the crew or wrongdoing on their part. Regarding the constitution of the oarsmen they were said to be steadfast, and that their talents are wasted when the sea is calm, not fulfilling their potential (Cassiodorus, 2019, pp. 218, 472).
One legal example concerns grain that was used as payment for taxes and were shipped on small boats to public distribution (Cassiodorus, 2019, p. 96). For the ships that transported the grain there were a number of oarsmen that was supposed to be on each ship. In the case it is mentioned that some of the ships had, due to untimely deaths less, than the required number of oarsmen, something the officials overseeing the ships were receiving payment for so it is written that this should be rectified quickly (Cassiodorus, 2019, p. 175). The qualifications for the new oarsmen to help with this task is described as the following (Cassiodorus, 2019, p. 176):

"*For the work of the oars demands the most active vigour of mind and body, since confidence of the mind is able to make way through stormy waves. For what is more daring than to enter so wide and faithless a sea with a small ship, which only the presumption of desperation causes to be surmounted? On that account, by our order, let it happen that you take this precaution, so that you will not provoke a complaint from an enfeebled assemblage of oarsmen, when you know that we had demanded the most robust of men for the task.* "

Though the sailors were said to encompass all these qualities they are not necessarily the only people onboard a ship, merchants also took on passengers for additional income. In addition, the ships' owner, family members or acquittances could use them for travel and would most likely get better accommodations than regular people seeking passage. This might also result in some preferential treatment while onboard. Wine is known to be a common drink both on land and apparently on the seas too. It is an important part of roman tradition but one aspect that might be surprising is that it was dunk as a way to help battle seasickness. 'Bring larger cups, boy, and pour us Chian or Lesbian wine, or rather Caecuban so that it may check our seasickness. It's a joy to get rid of our worry and fear for Caesar's cause with the sweet Loosener's help' (Horace, 2004, p. 295). Here it is even given a nickname, not only for health purposes but also to provide the travellers with greater fortitude, so the idea of liquid courage is actually an ancient notion. The preference of one type of wine over another could have to do with that it was superior to the others in regard to helping to lessen the effects of seasickness as it seems here, but it might also be a taste preference. Among the crews' rations there will likely be a specific amount of wine that is allotted them every day, the same ration could also have been given to passengers but there is no information on the practicalities of their travel.

In regard to the legal cases that mentions a ship's crew there is a case in one of the letters from Cassiodorus' work where there is a section that relates to sailors knowingly delaying a shipments of grain (Cassiodorus, 2019, p. 67):

"*But let us mention another kind of fish: perhaps the sailors of the aforementioned ships languish on account of the paralyzing touch of the eel, by which skilled hands are weighed down by such fixedness, that it thus corrupts the hand as though stricken through by a spear (to which it would be vulnerable), to the extent that a portion of the living body is stunned and immobile without any feeling. We believe that these sailors who are unable to move themselves have acquired such an affliction. But for them the impediment of the remora is venality, the bite of the conch is insatiable greed, the eel is the pretence of fraud. Indeed, these very men have fabricated delays with a perverse eagerness, so that opportunities for embarking should seem adverse. Let your greatness, you for whom it is especially important to be concerned about such things, cause this to be corrected by the most expedient emendation, lest the poverty native to this region seem not to be so much from the bareness of the season as from negligence."*

This could mean that the sailors saw a chance to earn more money by having the journey last longer, but this is dependent on that they received payment after the total time they stayed on the ship and not for completing a particular job. However, no references to how the crew were payed could be found so this is purely speculative but for what other reason would they have to delay their journey. No specific legal action is mentioned in regard to this delay, but it is clear that the writer wants this problem to be solved with expediency.

Another group of people that would be a common occurrence on merchant ships are the passengers, but little are said of the journey and the accommodations of the regular passenger in ancient literature. Cicero (1923, p. 531) mentions being a passenger on a ship as an analogy in one of his works, but he also writes about travel on a ship on more than one occasion in his letters and it appears as if this is a regular mode of transportation (Cicero, 1999a, p. 15, 1999b, pp. 169, 295, 2001, p. 289). Although he is not one of the common people and his talk about having a ship ready will certainly distinguish him from the regular passengers that does not have a ship at their command and is dependent on finding one that is already doing to their destination. Travel on ships must have been a regular occurrence as there were laws set to protect the passenger's rights. Cicero starts with the simple statement that passengers have rights on the ships they have bought passage on. A ship should be considered as belonging to the passengers for as long as they are on it, and only when they reach their predetermined destination this right is no longer valid (Cicero, 1913, p. 365). Cicero is not the only writer from this period that mentions this mode of travel. During the trail of a man prosecuted for fraud where he tried to sink his ship to defraud creditors and pocketing the money, there is a mention of passengers on the cargo ship along with the seamen (Demosthenes, 1936, pp. 178-181). The fact that people travelled on cargo ships is also mentioned by Cassiodorus (2019, p. 287), as these ships were sailing to various ports in the Roman provinces it was a good way to travel. The passengers are said to be on deck but during an incident and they have to move below deck, so they had to have some freedom to move around the ship. There were also ships especially made for passenger transport, they would be swift and were propelled by both sails and ores, these were mentioned in relation to Antiochus' defeat and the rules set by the Romans for his retreat (Livy, 2018, p. 123). The common people would likely not have travelled on this type of ship as it is mentioned in relation to military manoeuvres. No records of how many people travelled from one port to another could be found and the likelihood that a sufficient amount would travel the same route at a specific moment without special circumstances could be deemed too low to expect that these ships were used for transport of regular passengers in

everyday life. The probability that they booked passage on merchant ships is likely higher as it is mentioned and there were laws that gave the passengers rights.

Though it is not literature there is a collection of routes from all of the Roman empire called the Antonine itineraries. These routes are mainly on land, but they do indicate that river travel was an important part of travel in the Roman empire. The rivers were kept open to allow ships to sail to cities inland and is was illegal to obstruct their passage (Cassiodorus, 2019, pp. 219, 427). There were also maritime routes included in several separate itineraries (Graham, 2006, p. 46). These spanned all of the Roman empire and were mostly put together in the 3rd century AD, but some came even earlier with the route from Rome to Aries are from the very beginning of the 2nd century. This is however only when the routes were recorded in the itineraries and at least some of them would have been in use earlier but since there are no other such recordings of maritime routes a timeframe is difficult to discern without scouring ancient texts for mentions of such travels. Among the places that has routes in the itineraries are Gaul, Britain, Corsica, Sardinia and Carthage as they had relevance concerning the grain trade (Nicholas, 1978, pp. 229-246). This is a good indicator of how important the sea routes were at this time, not only were they in most instances faster but also safer in regard to merchandise not breaking as easily during transportation, but this is dependent on the journey happening within the timeframe that is deemed safest and knowledge of the area to avoid other dangers. Ships would also have been able to transport larger shipments with fewer men than were required with wagons on the roads, so it would have been much more cost efficient even with ships being lost at sea.

In ancient literature there are many mentions in regard to ships but unfortunately there are little information about what happens onboard. Most of the texts pertain to warships, shipbuilding and legal matters but none contain any specifics about the people onboard and how they lived. Other than a mention about wine being a remedy for seasickness or a mention about rich men hunting for food no other information about the crew or their diet can be found. The few pieces in the texts that are directly related to the crew other than this is the physical and mental attributes they would need to possess, but if Longus' story is correct some crews would consist of household staff and not trained sailors. Maybe this was more common for rich households when they wanted to travel on their own but probably not for merchants that would have required men with more experience that could safely bring the cargo from one port to another. Most of the sources are either from adventure stories, poetry or letters that for the most part

contains technical information and personal reflections about specific matters. These texts are written by the upper echelons of Roman society and not by the common people so the type of information that would be most relevant here is non-existent. Specifics about the way of life onboard including eating habits, hierarchy and other culturally significant information is unfortunately not found in texts so the archaeological material is all we have to go on when researching these matters.

3. Cooking implements and table wear

As there are no comprehensive overview of cooking and table ceramics used on ships, examples of possible implements used in a household will be the reference point. A moderately well of household in Italy in the beginning of the Roman empire would have a service of terra sigillata along with glass and metal vessels. The only plain earthenware used at the table would be jugs and flagons. The most common cooking pot was tall, had round shoulders with a narrower neck and a rim that turned outwards sometimes fitted with a lid. One jar more suitable for storage has a round body, turned out rim and two large loop handles on the shoulder. A second jar has a larger ovoid body with a wide thickened rim that has a horizontal upper surface. Also used for cooking was a large bowl with horizontal rims, vertical walls and a rounded base, sometimes with a lid, that could be put directly into the fire. Shallower bowls with a flat bottom was used for baking or frying. Mortarium had groves or a gravel on the inner surface to effectively ground up herbs and spices so it could be mixed with other ingredients and poured out through the spout. Flagons have a spherical body with a narrow cylindrical neck and a handle, often made from clay and coated with a white slip, used for storing and serving liquids. There are also more elaborately made ones that imitate bronze jugs. This imitation of metal vessels can also be found among other types of ceramics (Greene, 1992, pp. 10-13).

Among the functional categories of Roman pottery, the amphorae were mostly used during transport, but they were also used as post distribution storage of foodstuffs like wine, olive oil and fruit. Lamps were used for lighting, cookware used for the cooking or heating of both food and drink. Utilitarian wares are vessels used for storage or containment of food and drinks, also other non-edible substances. Table wears was used for serving or consumption of food and drink (Peña, 2007, p. 20).

Ceramic, glass, metal and stone vessels can fulfil a wide range of uses, to include storage, preparation and transportation of culinary or non-culinary products, cooking and serving, cosmetic, symbolic and decorative possibilities. Often, the function of ancient vessels is inferred from typological features (size, shape etc.), using ethnographic or experimental evidence to guide interpretation (Spataro & Villing, 2015, p. 134).

The finest types of vessels were smooth table wear with a glossy surface and sometimes with elaborate decorations. Terra sigillata produced in Italy was the most common table wear used for serving food. Bowls, lids, bottles, cups, dishes and plates were used to for this purpose along with small pots. Because of the many local cultures within the empire there were several parallel influences on the ceramic production and the way the vessels were used. The only standardized vessels were amphoras and dolia used for transport, along with the *mortaria* or mortar used for grinding and mixing ingredients used for cooking. Mortars were used for different purposes in different cultures, like daily cooking, they might also have been used to crush spices and aromatic herbs for preparation of wine (Spataro & Villing, 2015, p. 194). Trading patterns for different types of pottery varied greatly. Finer wares like terra sigillata was traded all throughout the Roman empire while unspecialized kitchen wares could be limited to a single town and the surrounding area (Greene, 1992, p. 7).

To analyse the tableware from the ships it is important to have a starting point. Berlin (2019, pp. 563-567) found that a single table setting for a crew member would be: one *olpe* (wine jug), one *kantharos* (drinking vessel), one large saucer, one small saucer, one wide bowl, one narrow bowl, one salter and one *guttus* (for oil). This will of cause not be exactly the same as this was found during the Hellenistic period, but it is a good indicator as to what to look for. The cultural changes from Greek to Roman cooking and eating habits will comprise most of the differences because of the development into more specialised implements. But this information with the vessels used in an Italian household will help interpret the finds. It is also important to keep in mind that ceramic shapes varied greatly over time and in different regions.

When it comes to the use of cooking vessels there are however some similarities. *Ollae* and large deep bowls were used for more liquid dishes while plates was used for drier ones. The *ollae* or jar had a rim whose diameter was smaller than the shoulder and about the same width as the wall height, a rounded body and a flat base often with no handles. It had several purposes and was good for preparing foods with a high liquid content as it evaporates more slowly, like

boiling porridges, meats and vegetables but sometimes also for storing or serving liquid and solid foodstuffs. When found in cookware settings in terrestrial sites this type can be found in higher quantities than others, even as the only vessel for preparing food as a tradition that avoids of specializes cookware. The cooking pots that have a rim width that is larger than the wall height is good for reducing liquids and therefore require a good amount of stirring. Round bases are good for heat distribution, narrow bases for immersing in embers, wider ones for hearths and grills. Pots were made to be multipurpose and could be used in untraditional ways (Spataro & Villing, 2015, pp. 6, 214-217). Pots with a flat base and an s shaped profile would have been put directly on the coals and then they were pushed up the wall to cook the food more rapidly. Pans were hung on a rack to cook the food slowly. With the introduction of Roman wheel-based ceramics fired in special kilns and using light coloured clay, often with a similar coloured slip, there was an increase in different types of vessels, like cooking dishes and jugs, used for cooking and more sophisticated techniques for preparing food. Another characteristic of Roman ceramics is the ring base. This cultural change arrived with the increasing Roman influence in the empire, introduced by the imperial soldiers (Spataro & Villing, 2015, pp. 223-229).

Cooking vessels would not have been used for a long time as the repeated heating would make them prone to fracturing. Also, table wear would have been short lived because of breakage, most likely form being dropped or damaged when it was stacked in between uses. Both have an estimated in-use period of about a year. Mortars was used for crushing or grinding various foodstuffs and are presumed to have a relatively short on-use period, maybe only a few uses. Storage jars can be used for long periods of time (Peña, 2007, pp. 57-58).

On the topic of how the different types of foods were prepared there are information available. Roman diet is known to be constituted of meat from pig, goat, sheep, cattle, while leafy plants, cereals, nuts, seeds were also widely used as were the use of spices, olive oil and wine. Meat would have been grilled or fried in a pan without a lid and served in shallow angular bowls. It was also common for sauces to be poured over the grilled meat from small vessels with a spout or sometimes dipped in them. The use of jars and cooking pots for animal products was also normal. Food with a more fluid consistency would have been prepared in a large flat based cooking pot and then shared. The *olla* is modern equivalent of a stew pot, but it was not used to make stew rather boil large meals. A *caccabus* would have had a large mouth as it was used for serving, marinating, make draughts but mainly to make sauces, it was however not made to

be used in an oven or other cooking structure. The *patina* used as a mixing bowl as well as a cooking pot, open with a flat shape among other things used to make egg dishes. *Pultarius* was a porridge pot but not exclusively used for this purpose. Many of the cooking wear overlapping in purpose but had different shapes (Spataro & Villing, 2015, pp. 108-144). There were also many different eating and cultural habits in Rome and the rural provinces. These variations also occur in the rest of the empire and leads to further variations in uses. This overlap in areas of use makes it difficult to draw conclusions about what the different types were used for without doing scientific analysis on the pots to look for remnants of their contents. The general shapes however provide an opportunity to make assumptions about their uses. This is a worth wile undertaking as communal eating and drinking was an important part of social interaction and integration, sometimes also differentiation, and has been for a long time (Spataro & Villing, 2015, p. 12). Therefor it is a logical assumption that dining together would have been done with some regularity.

There has however been done fewer studies of cooking vessels than amphorae and fine wear. The attention paid to the function of different types of cooking pots have increased in recent years but there is much less information about their uses. Most of this information is limited to finds at specific sites and not a comprehensive overview spanning several regions. There are however some common trends regarding shape and size and therefor their uses. One thing that is known is that sailors on merchant ships would reuse storage containers to store provisions and other materials but to do this they needed maintenance, like treating the inside with pitch (Peña, 2007, p. 71). Traces of pitch can also come from *Pinaceae* resins, from pine, cedar and fir, used on ceramic vessels to waterproof them. When this type of resin diterpenoids is exposed to intense heat it forms defunctionalized derivates that registers as pitch (Spataro & Villing, 2015, p. 132). Other alterations known to be performed on the domestic assemblage is graffiti and inscriptions that were scratched or painted on to the vessel after it was fired. This occurs with some frequency on Roman pottery. Likely to be a name or initials, sometimes a device but full sentences have also been found. All of these markings indicate who is allowed to use the vessel. Amphoras inscriptions also denote year of production, origin, weight and contents, particularly used for wine (Greene, 1992, p. 17; Peña, 2007, p. 29).

Regarding pottery terminology there are some problems. Coarse wear and fine wear can be close to each other in appearance due to differences in fabrics and preconceived notions about what is expected can steer interpretations. Cooking wear is not only used for cooking but also

food preparation, kitchen wear might be a better term, but this excludes storage (Spataro & Villing, 2015, p. 19). There are many more examples of this, so a clarification of the different terms used here are necessary. Cooking wear are vessels used to cook the food, this means they fall under the more general description of galley wear, which encompasses all the vessels used in the galley. Not only those utilized for cooking but also storage and food preparation vessels. Coarse wear will also be used but without the implication that these vessels are only used for cooking but also storage and as table wear. This will function more as a morphological description of the fabric. Table wear as it is used here means the vessels used to serve and consume food and drink.

4. Methods

A wreck site is a composite of several different factors all of which needs to be understood in order to draw conclusions from it. Therefore, an overview of the different factors that will have affected a wreck, both during the wrecking process and after, is outlined below. In addition to this understanding a set of criteria used for the selection of material is needed to be able to separate the crew's assemblage from the ships' cargo is necessary. Without this understanding it is not possible to single out the crew's assemblage without just selecting the material that is low in number at a particular site.

4.1 Wreck deposits

To understand a wreck deposit as it is found on the ocean floor it is important to have an understanding of the processes that leads up to this point. One also has to understand that no two wreck sites that are the same. A lot of the same factors contribute to each site, but these will never function in the same way or give the same result. About the wreck itself Muckelroy (1978, p. 157) put it very well: 'The shipwreck is the event by which a highly organised and dynamic assemblage of artefacts are transformed into a static and highly organised state with long-term stability'. This should be considered as the final state and has to be interpreted as such. Only a partial view of the ships original state can be discerned from this and the various processes that have intervened between its origin and the final state need to be identified and described so that a better understanding of the evidence can be obtained.

According to Muckelroy (1978, p. 158) evolution of a shipwreck can be explained in five stages.

First, we have the ship that then goes through the process of wrecking, there is no one way that this process happens and the most relevant consequences of this is the material that floats away. The rest will sink to the ocean floor.

Second, there are salvage operations where the material salvaged is removed from the site. These would in the first place have been conducted close to the time of the wreck.

Third, there is the disintegration of the perishables onboard where this material is lost.

Fourth, we have the movement of the seabed. In addition to disturbing the site this can also lead back to the second and third stage, and back in a circular process of salvage as the wreck can be rediscovered and disintegration as the conditions that preserve these materials is altered. Foreign material can be deposited at the site any time before the fifth stage.

Fifth, is the characteristics of excavation.

After all these factors have had effects on the site what remains is the observed seabed distribution. The wreck process constitutes a closed system since it has the ship as input and from this has different outputs, but they are all variations of the input as this is the systems effects on the environment. Unlike terrestrial sites where human interference is pronounced, the factors that disturb an underwater site is mostly environmental, the ones that are due to human activity are limited and in most cases can be tied to a few identifiable activities like salvage (Muckelroy, 1978, pp. 158-159).

The five stages that represents the evolution of a shipwreck can be divided into two groups: extracting filters and scrambling devices. Extracting filters are the mechanisms that took material away from the wreck, like the nature of the wreck process, salvaging and disintegration of perishables. The scrambling devices can again be divided into two groups. The first one is the wrecking process itself, while the second are those processes that moved artefacts around after deposition, resulting in the loss of contextual information. Among these are the movement of the seabed, currents, wave action and disturbance by marine animals. When it comes to seabed distribution it is divided into two categories: continuous and discontinuous sites. Continuous sites are those where the artefact distribution is concentrated in a self-contained area that is not interrupted by sterile areas that also has to be considered during interpretation. Discontinuous sites are those that are more scattered, where there have been a significant degree of reordering and the loss of any defining structure that can contribute to the interpretation of the remains (Muckelroy, 1978, pp. 165-214; Stewart, 1999, pp. 566-

570). Further development of Muckelroy's model have been done by Martin (2013), this version is more extensive considering other elements both before and after the ship as input. With the limitations of the material considered here Muckelroy's model will be used as there are few sources that can provide the information needed to fully utilize Martin's version.

A well-known and general idea is that the best-preserved shipwrecks it's mostly found in deep waters on a sandy bottom. The thought is that the closer you come to shore and the rockier the ocean floor is the worse are the conditions for preservation of a shipwreck (Muckelroy, 1978, p. 160). This is to a degree very logical as ships that went down on rocky shores would have severe effects from wave activity that would have spread the material so much that the context is difficult to discern. Since not only the materials but the context of which they are found are important to archaeologists very scattered wrecks are often of little interest. But it is important to remember that every site has its own unique geographical and topographical features that needs to be taken into consideration and despite the difficulties of interpreting these wrecks they can provide new information. This can increase the archaeological community's understanding of trade and seafaring in the Mediterranean.

4.2 The materials onboard

The objects found onboard a ship can provide insight to several aspects of life in ancient times. The goods they carried are an indicator of the type of merchandise people were willing to pay more for as local substitutes most likely existed. Or goods necessary to sustain people, like in Rome where the population was so large that local produce could not satisfy the demand. But a ship also provides insight into what the crew used to sustain life onboard. In recent years more attention has been paid to the cooking vessels onboard but there are other items that can provide more insight into the sailors' lives. A ship is in a way a self-containing system where what is needed for the journey is already onboard. Some necessities like fresh water and food might have needed to be replenished but as most ships did not stop frequently at ports, the stores they had would be sufficient for long stretches of time. Separating these two types of objects is not always an easy task. So Nieto (1986, p. 86) provided three categories of materials found on a ship:

1. The main cargo, the one whose economic exploitation started the ship on its journey.

2. Secondary cargo, one whose presence does not give rise to an additional cost of transport since it occupies the space not used by the main cargo. Its existence from the point of view of transport, reduces the general cost by increasing, with its sale, the total benefits.
3. The crew's assemblage, their presence on the ship does not have an economic function, but that of facilitating, spiritually and materially, the life of the sailors on the ship.

These three categories have been widely used in the past as it is a logical division of the objects, often sorted into them based on quantity. The last one is of greater interest here, but it is important to acknowledge the other two since being able to divide the objects into the categories is necessary.

4.2.1 Cargo

The cargo will be the most abundant materials in a wreck assemblage. However, there are some ancient wrecks found without a cargo, these could have been intended for passenger transport or simply sunk in the harbour before the new consignment could be loaded onboard, but these are few and far between as ships was mainly used as a method to transport goods from one place to another. Typical examples of cargo from this time period are amphoras containing wine, olive oil or fish products, fine ceramics like terra sigillata, grain and other food stuffs. Archaeological evidence of food transported in amphoras and other containers can be obtained when remnants of the contents are found in or on them. This can be fish bones, olive pits, shells, nuts, gape pips and fig seeds that were preserved in liquid for long distance transportation (Parker, 1992b, pp. 89-92). Chemical analysis can also provide answers from empty containers by taking samples from the inner wall (Foley et al., 2012; Hansson & Foley, 2008; Morgenstein & Redmount, 2005). This is helpful for identifying wine or olive oil as cargo. Pots other than amphoras and dolia was rarely used in the classical world for transporting goods, especially liquids. Evidence of food stuffs like grain that most likely was transported in sacks or baskets are very difficult to find as both disintegrates after it has been submerged. Household wares like pottery, glass and lamps are often found in wrecks but the quantities would suggest that they were most often for shipboard use and much less frequently as part of the cargo (Parker, 1992b, pp. 89-96).

Heavy goods like ingots were loaded in the foot of the hold. Amphoras was stored in layers, anything from one to nine has been documented but five seems to be the most common. The hold was filled up successively towards the centre, placed in sand or another other type of ballast for support. They were stacked to minimise shifting during the journey with some sort of packing material between them like brushwood or pine branches to prevent chafing. Light weight goods like pottery, grain and other foods were stowed on top of the main cargo or fore and aft. Pottery and glass was stored in packing cases, examples have been found where softer and lighter cargo like bags of nuts has been used as a barrier between the crates and the rest of the cargo (Parker, 1992b, pp. 89-92).

These stowage patterns can provide an advantage when attempting to understand a wreck assemblage. Even if this way of distributing cargo on ships was not always followed there are some general rules that has to be upheld for the ship to maintain its' stability. If the heavy items were dispersed unevenly, it would increase the likelihood that the ship would wreck as it would be difficult to manoeuvre. Therefore, they had to be followed to a certain degree. So, when analysing a wreck deposit, one would expect that the heaviest part of the cargo will remain largely in the same place they were deposited during the wreck and be grouped together, for the most part, as it would take a lot for these objects to be spread out over a large area.

4.2.2 Crew's assemblage

The bulk of the crew's assemblage from a Roman merchant ship will most likely come from the galley and living quarters. Most of these objects will have a daily use purpose like cooking and storage vessels, table ware and utensils used for the preparation and consumption of food. Other objects relating to this will be lamps for lighting along with fishing weights and hooks used to obtain food prior to preparing it. Foodstuffs the sailors would not be able to obtain during the voyage would have been brought onboard and stored on the ship, so it was available for use. Water, wine and other drinks would also be on the ship. Other objects that are part of the crew's assemblage are personal belongings. These do not have a function that makes it necessary to sustain life but can have religious, entertainment or other practical purposes (Gibbins, 1989, p. 5).

To be able to separate the crew's assemblage from the rest of the material a set of criteria is necessary for this selection process. Trego (2019, pp. 273-280) created a model based on the work done by Gibbins (1989, pp. 5-6) with more refined criteria than those that were previously used. 'In order for an object to be designated as galley ware and therefore part of the shipboard assemblage, each artifact should satisfy at least two out of three criteria: location on the seabed, quantity, and evidence of use' (Trego, 2019, p. 277). Even though these were used by Trego to separate out the galley wear they work just as well the whole of the crew's assemblage. This was also the purpose they had when first used by Gibbins but he used the term domestic assemblage and as mentioned earlier that will not be used here. A more detailed description of these criteria as they were set forth by Trego (2019, pp. 273-280) follows bellow.

The first criterion that contributes to functional designation are an object's location on the seabed and the spatial relationship between objects *in situ*. The materials relating to the galley, like cooking and table wear, are often located at the bow or the stern as this is the most common place to find the galley structure or living quarters but it is important to note that this is not always the case. It is therefore important to keep in mind that not all objects that constitute the crew's assemblage would have been kept in the same place. Stores of food and water would often have been separated from the galley and stowed elsewhere, the objects could also have moved during the wrecking process. Therefore, the wreck site environment and formation process must be analysed to understand the spatial relationships between objects.

The second criterion is quantity. If a category of objects appears in singular or limited numbers, it can indicate that they should not be counted as cargo. It is however important to compare the categories of all recovered objects identify the proportional relationships between them. Variety in fabrics, materials and sizes has also to be taken into account when determining functional designation not just the overall quantity of a given category.

The third criterion is visible evidence that an object has been used repeatedly. This includes fire blackening, repairs, graffiti and wear patterns.

It is also important to note that Nieto (1986, p. 86) used similar criteria in his work with the Culip wrecks but he also added two more; the manufacturing period of each object compared to that of the others and its type, nature and place of origin. An objects origin has been used to connect the ships last voyage to specific ports, but this can be quite unreliable since it is nearly impossible to ascertain how long it has been a part of the ships' assemblage so this type of inquire will not be pursued here. But these two criteria lead me to one of my own that will be used for the purposes of this master's thesis.

If a singular or a very small number of objects has an origin, typology or composition unlike anything else found in the wreck assemblage, this additional refinement of the quantity criteria will be used to single out materials uses by the crew, or even passengers that might have been onboard. This will however only be used on functional objects. Larger artifacts like statues for example can possibly be found in singular or small numbers but it would have no function for the people on the ship. A miniature temple on the other hand can be of religious significance so it is important to carefully consider each of these objects.

For the purposes of this master's thesis these four criteria are suitable for selecting material for the analysis as it is based less on the intuition of archaeologists during the excavations and makes it possible to draw new conclusions concerning the wrecks. In regard to Trego's criteria originally being used to single out galley wear, as they are based on those put forth by Gibbins to find what he terms the domestic assemblage. Not only that, an alteration to Nieto's final criteria makes them able to sort out objects that would be missed by the original three. The starting point of these criteria would in most cases the objects spatial relationship but since a shipwreck is often caused by a violent wrecking process it is very common to find the material as fragments, this is especially common for the smaller objects that constitute the crew's assemblage. The preservation conditions are also a factor as salt water and marine life can further deteriorate the objects of interest and remove traces of use. Therefore, an additional criterion that lets a single or low number object be selected without having to fulfil the spatial or use criteria makes it possible to include objects that with high probability belonged to the crew's assemblage even if they were displaced from the others at some point during the site formation. This also makes it possible to include items that were used by the crew for purposes not pertaining to food preparation. Even though this is the main focus of this master's thesis, additional information about the activities onboard can provide further insight into daily life on the ships during this time.

The most complete work pertaining to wrecks are Parkers' *Ancient shipwrecks of the Mediterranean and the Roman provinces*, therefore this book is the basis for the study. It was fist narrowed down to shipwrecks found on the European side of the Mediterranean and not the areas outside and then to the period 27 BC to AD 200, the beginning to the middle of the Roman empire. This is quite a big timeframe but it will be shown later that it is necessary for it to be this large to obtain a sufficient amount of material for analysis. The limitation in the

area used for the analysis is also kept to one continent to avoid cultural differences, at least as much as possible. There will be some as the European cost of the Mediterranean stretches over several countries, but this restriction aims to limit this as much as possible while still utilising a large enough area to get a sufficient amount of information. Since food preparation and consumption will be an important part of the analysis archaeological evidence that this occurred on the ship will be the main factor for selecting the wrecks.

5. Materials

From the aforementioned time period there are a total of four wrecks that contain archaeological evidence that a hearth had been used onboard, these are the Culip D, Pemmirio B, Port Vendres II and Valle Ponti. Among these are archaeological finds such as blackened pottery and tiles or other structures used to make a hearth. The only one of these ships not used for analysis here is the Culip D. This is a very interesting wreck and would have provided valuable information but unfortunately, other than summaries of the materials with no find contexts or detailed descriptions, the published works pertaining to this wreck is written in Catalan. These texts were also very difficult to obtain and translating them properly was regrettably impossible with the resources at hand. Therefor the material available comes from the other three shipwrecks. Two of these are closer to each other in time than the last, the Valle Ponti from 25-1 BC and Port Vendres II AD 42-48, the Plemmirio B is however from quite a bit later, AD 200. Even with this significant time discrepancy it is better to have another wreck to include in the analysis, just two would have made a comparison possible, but because the Valle Ponti wreck is much better preserved it is better to have another ship that have a more similar wreck site to the Port Vendres II. Therefor the Plemmirio B provides additional information making it possible to hopefully create a clearer picture. The Culip D could have provided additional information as it is from AD 70-80 and would therefore have helped bridging some of the time gap but due to the lack of information in English this is unfortunately not possible. There are other shipwrecks from this period that contains crew's assemblage or remnants of a galley but none of them with archaeological evidence that food was prepared onboard so these will not be included here.

One of the biggest problems encountered during the search for suitable shipwrecks to study was the fact that the information on most of them are not written in English. Not only does the

translations take a long time to complete but since, other than English, the languages they are written in is something I am not fluent in and only have a little prior knowledge of, so the possibility of translating errors are great. They are also not written in a single other language. The reports and other publications used here were written in English, French and Italian. This makes their availability to other than their native speakers limited. Another problem was the fact that much of the material is also difficult to get a hold of. The information from the Culip D wreck that was not used here due to the difficulties of translating the Catalan text could only be found in one library in Spain, so accessibility is limited. There is also no common way of delivering this information, so the contents of the texts vary quite a bit, this makes finding the necessary information difficult. The content also varies from only basic information to more specifics about the locations of the individual finds. These *in situ* locations provide valuable information and should be included in the reports as they are necessary to draw new conclusions about the materials and their uses. This brings us to another problem, the notes from the excavations is not available so a lot of assumptions have to be made based no limited information from the different sites. There was also no access to the actual materials, so all observations based on this is completely reliant on second hand information and interpretations made by others. With all this in mind the following information from the sites have been collected from the available sources and interpreted to the best of my ability.

5.1 The Port-Vendres II

Found in 1972 at the southern entrance of the harbour of Port-Vendres in southern France, very close to the Spanish border, 35 meters from shore, the location can be seen in figure 1 (from (Martínez ferreras et al., 2015, p. 278)). The ship was dated to AD 42-48 by the stamps on the tin ingots and typology of the Dressel 20 amphorae. As to its origin the pottery points to a Spanish, Baetician, origin for most of the cargo (Colls et al., 1975, pp. 61-62; Parker, 1992a, pp. 330-331). The ship was a large merchant vessel approximately 30-35 meters in length (Davey, 2016, pp. 37-39), and was buried 6-7 meters deep under seagrass and modern debris. Since the wreck lies so close to the entrance of the port it is probable that it wrecked during a storm that made the ship run into the reefs at the foot of the cliff due to strong winds and sank almost on the spot. This steep cliff is beneath Redoubt Béar, where the bottom slopes gently for about 30 meters until it forms a sort of basin, bordered to the north by a small ridge that is parallel to the shore and about one meter high. The wreck with most of its content slipped into

this basin where it stabilized, since the material was stopped by the small ridge. Since it is located so close to the port salvage near the time it sank is a possibility.

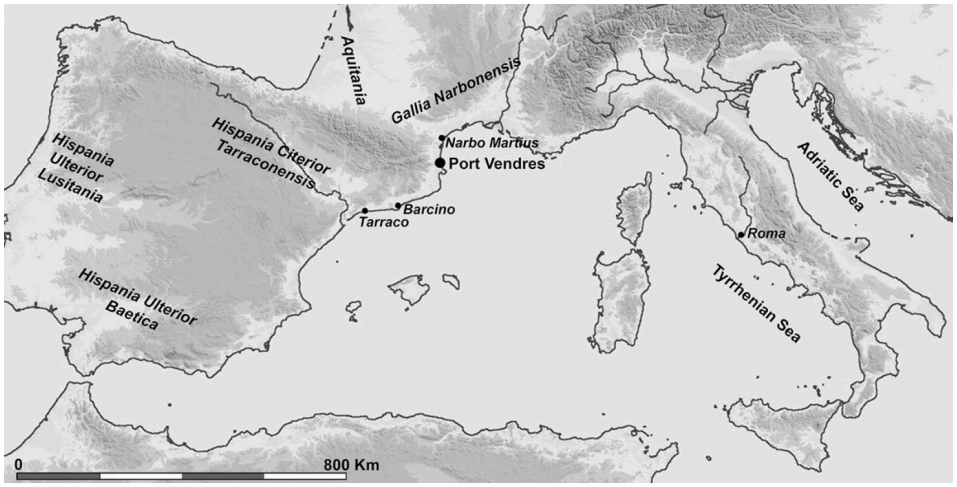


Figure 1 Map showing the location of the Port-Vendres II wreck site.

Along with the aquatic plant life large stone blocks covered the deposit, because of these and the violent wrecking process most of the ceramic material on board was fragmented. Excavation started in 1974 by removing the debris and plants. A total area of approximately 45 m^2 was excavated, this led to the find of hull remains lying parallel to each other, this along with nails, lead sheathing and what probably is remains of anchors provides a north-west south-east direction of the wreck with the bow of the ship in the south-east direction (Colls et al., 1975, pp. 61-62; Colls et al., 1977, pp. 7-10; Parker, 1992a, pp. 330-331). The site plan illustrates where the different types of finds were located can be found in the appendix, map 1. However, the numbers given to the different groups of objects does not correspond to the catalogue. This makes it problematic to use this to interpret the finds.

5.1.1 The selection process

There were no available records of where the finds were located so the descriptions of the individual finds along with the site plan that can be found in the appendix (Map 1) was used to separate the crew's assemblage from the rest of the ship's materials. This plan has a key to separate the different group of materials; A for ingots, B for amphorae, C for wood, D for bronze pieces, E for ceramics, F for iron pieces and G for lead (Colls et al., 1977, p. 10). This site plan is however not particularly detailed and the different types of amphorae are not marked with the abundance that were present at the site, but since most of the amphorae is drawn as whole or at least large fragments it is a logical assumption that these are the locations where the most complete items were found. This assumption is extended to the rest of the materials so that the ones that are depicted on the drawing are the items that are most complete or have some other significance. The items that are found in low numbers are also drawn on the site

plan, especially the smaller made of different types of metal. With these assumptions in mind another logical conclusion is that the most fragmented materials are not depicted so therefore their location in relation to the rest is unknown. Because of this the fragmented objects will not be taken into account here as there are no way to tie them to the others presented on the site plan.

The site is approximately ten by eight meters, so it is not a particularly large. It is divided into a grid where each square is 1 m^2 and is given a letter horizontally and a number vertically. Most of the materials drawn in on the site plan is located diagonally from A'4 to C1 and its adjacent squares on each side. This is also where the crew's assemblage is found, for the most part. By implementing the four criteria it was possible to separate the crew's assemblage from the rest of the archaeological materials using the item descriptions and the site plan. This was done for every object in the catalogue and at the same time finding the corresponding drawing on the site plan after the different categories of materials. Not every object could be tied to the site plan so the remainder of the material would have fallen into two of the other criteria. This is by no means a perfect system, but it makes it possible to select the relevant items. All the objects selected can be found in the appendix.

There are however some problems with this particular wreck site. Because of the condition of the site and it stabilizing into a basin it is a possibility that the information from the objects' placement in situ is distorted because of this. Since it is not possible to discern how much of an effect this would have on the location of the material a deliberate choice to take it for what it is was necessary as there are no model that can help unscramble the site. The very fragmented nature of the wreck is also a problem, and it is likely that more objects could be attributed to the crew's assemblage if the preservation of the site had been better. But since this is one of only three shipwrecks from the required area and timeframe that has archaeological evidence that food was prepared on board these limitations do not exclude the site from being used here but they should be taken into account.

5.1.2 Cargo

Because most of the materials found at this site is very fragmented, traces of use and other indicators secondary use of containers such as amphoras and pots are difficult to find.

Therefore, most of the ceramic material found at this site will be put in the cargo category. Some of these items, due to their limited number, can possibly have been used by the crew but this cannot be done without tying them to more than one of the criteria set fourth for separating this material from the rest.

The amphoras, particularly the Dressel 20, was for the most part limited to different sections in the excavated area with some overlap in the middle. The other types were mainly found together in another area further south-west. The main part of the cargo was Dressel 20 amphorae used to transport olive oil from the Baetica. At least 120 of these amphorae were part of the cargo, a number stemming from a few complete forms and rim fragments (Parker & Price, 1981, p. 222). There were also other types of amphora in the main cargo. About fifteen Haltern 70 amphorae was found, three of them complete or almost complete forms and ten fragments bearing painted inscriptions (Colls et al., 1977, pp. 33-40). These inscriptions made it possible to determine their content as *defrutum*. This is a sweel non-alcoholic liqueur made from boiling grape juice until it was reduced and used to sweeten bitter wine, preserve fruit along with various other purposes (Parker & Price, 1981, p. 223). Another amphora type from the cargo is Dressel 28. No complete amphoras have been found but there are diagnostic fragments that suggests that there were about ten of them. What they may have contained is unknown as no remnants have been found on the fragments (Colls et al., 1977, pp. 43-50). The last type of amphora is the Pompeii VII, less than ten of these have been found and while one is almost complete the rest are just fragments. It is clear that they transported fish products as one sherd has a large fishbone stuck in the pitch, another had several smaller bones that adhered to the inside. Three fragments were found to have painted inscriptions (Colls et al., 1977, pp. 40-50).

Ingots made of three different types of metal was also part of the primary cargo. They are put in this category as they would have been stowed in the foot of the hold, so it was not added later for additional income. Fourteen ingots of pure white tin in various sizes all weighing less than 9 kg, two copper ingots with one weighing almost 90 kg and three made of lead that weighed a bit above or below 50 kg (Colls et al., 1977, pp. 11-22). There were also a significant number of ceramics. This would have been the secondary cargo as both the amphorae and the ingots would have been stowed first to evenly distribute the weight and the ceramics would have been placed where there was room. Mostly South Gallic but also some Arretine sigillata were abundant at the site but the condition makes a count impossible. Two different types of

thin-walled ceramics were also found. About sixty different edge fragments from eggshell thin bowls varying enough to ascertain that the came from different vessels, so this is an approximate number of the quantity. The second is sandblasted vases with a slip, about thirteen or fourteen vessels in total. Both types are likely of Baetician origin. The last is a few pieces of late red glaze ceramics known to be produced in the Iberian Peninsula (Colls et al., 1977, pp. 107-114). Some of these ceramics might have been part of the crew's assemblage but it was not possible to place them there because no description of the actual locations of the fragments were available so they could not be proved to belong to any of the criteria.

5.1.3 Crew's assemblage

A collection of pots, saucepans, lids, mortars, bowls and lamps along with a casserole, an amphora, a plate, a drinking vessel and other small objects were found to belong to the crew's assemblage. These are all listed in the appendix with detailed descriptions. Most of the objects were found as fragments but some are complete, or almost.

5.2 The Plemmirio B

This wreck from 200 AD was located at the bottom of the southern cliff on Capo Murro di Porco at the eastern point of Penisola della Maddalena, a flat-top limestone mastiff on the south-eastern side of Sicily. The location is shown in figure 2. This steep cliff descends to 22-31 meters underwater, and the cliff base consists of large boulders, rocky ridges that are interspersed with caves, gullies and some horizontal areas that extends about 15-20 meters out from the primary cliff base. The secondary cliff base then goes down to a sandy bottom after dropping through a series of stepped shelves where it terminates at 41-43 meters. Due to the position of the artefacts and the lack of hull preservation it is believed that the ship went down because of rough weather conditions that made the ship crash into the cliff. The Plemmirio B

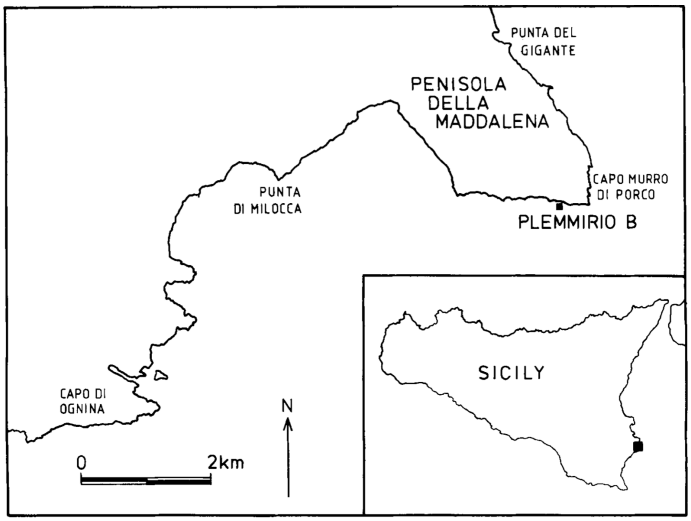


Figure 2 Map that shows the location of the Plemmirio B wreck site.

wreck was first discovered in 1953 but it was not until 1974, when an expedition from the University of Bristol came across it during a random search, that it was investigated. They spent 12 dive hours exploring, recording and raising a small quantity of material. The following year the wreck site's location was fixed, and they continued the examination. From 1979 to 1983 the site was further explored, the cliff where the wreck is located was surveyed and sediment samples taken along with establishing a general extent of the wreck deposit on the bottom of the cliff (Gibbins & Parker, 1986, pp. 267-275).

During the 1983 survey they found that the largest concentration of wreck material was located right below the primary cliff base at a depth of 22-31 meters, the upper wreck deposit. This material mainly consisted of amphora shards and concretions left by iron bars, this is also the two obvious archaeological features found on the site. The upper wreck deposit is spread out over 300 m^2 of the seabed, but the archaeological material is mainly deposited in around 50% of this area, mostly in sandy gullies and depressions. The lower wreck deposit was found bellow the second cliff base at 41-47 meters and consisted of large amphora fragments (Gibbins & Parker, 1986, pp. 272-275). The upper and lower wreck deposits were divided into five survey areas, this layout along with the locations of the gullies is shown in map 2 in the appendix.

5.2.1 The selection process

There are some notes on find locations available from the Plemmirio B excavations, these can be found in the reports from the site. The majority of the crew's assemblage was found in gulley M during the 1985 expedition, there is also a small concentration of this material in gulley A, including surgical tools, so this might have come from the ships living quarters. Pieces of three or four bricks, two small stones and 25 pieces of rooftile fragments including intact tegulae and imbrices was found in area 3. Since they were found in close proximity to the crew's assemblage in gulley M it is assumed that they were part of the cooking hearth and a tiled cabin roof (Gibbins, 1989, p. 3). This provides the spatial relationship criteria, based in two specific locations, one of the saucepans from gulley M also have soot on the base and indicates use onboard. The coarse pottery is also found in low enough numbers that they fulfil the quantity criteria. Because the crew's assemblage is found in two locations that are about 30 meters apart this is interpreted as two different areas on the ship, the galley and the living

quarters. A group of objects found in gulley A, scalpels and a couple of other objects that likely were part of a surgeons' kit, probably the property of a passenger, and this lends credence to the assumption. If such a passenger were on the ship, or even if it belonged to someone in the crew it is not the sort of objects one would have laying around, they would likely be stored in one of the cabins so the person who owned them could use them when necessary. A saucepan and a fishing weight were also found in this area provides further evidence that this concentration of materials came from the living quarters. Because of the information provided by the reports the selection process was relatively straight forward with spatial relationships being quite clear. This was a huge advantage as it was not necessary to try mapping out the locations only based on the site map.

5.2.2 Cargo

One of the consignments that constitute the ships' primary cargo was about one tonne of iron bars, they were found as concretions because the bars themselves has eroded away after years on the ocean floor. Each void was considered as one bar since this was the least subjective way of interpretation. All of the concretions were found in the upper part of the wreck deposit, in area 1-3, within the amphora sherd distribution and most at a depth of 22.5 to 29 meters. Since the concretions also contained amphora sherds and with the distribution study it is certain that the iron bars was a part of the ship's cargo (Gibbins & Parker, 1986, pp. 290-292). Africana 2A amphoras was the container type that dominated the wreck site. Gibbins & Parker (1986, p. 290) suggest that since resin was found on diagnostic sherds it is more likely that the Africana 2A amphoras were used to transport a fish product, because olive oil can dissolve the resin and it would have seriously diminished the quality. Another type of amphora found as a part of the cargo is Africana 1. Olive pits was found adhered to one of the amphora sherds so they probably contained olive oil (Gibbins, 1989, p. 5). There are only about 200 amphorae found at the site, about 80% was Africana 2A and the rest Africana 1, although this is a relatively small amphora consignment this was probably part of the ships' primary cargo along with the iron bars. No secondary cargo has been identified at the wreck site. The location of the site would also have made it impossible for ancient salvage, there are also no evidence of modern interference with the site so the difference to the original number of containers found on the ship is negligible (Gibbins & Parker, 1986, p. 278). The amphorae suggests that the ship

was sailing from Africa Proconsularis to central Tyrrhenian Italy since this is consistent with the export pattern of these types (Gibbins, 1991, p. 238).

Trying to ascertain the original placement of the cargo in the hold along with the general structure of the ship is difficult due to the violent nature of the wreck since this is usually done by looking at the distribution of the artefacts. Because of the geomorphology of the seabed the spread of amphora sherds is varied in density throughout the site, the concentration of amphora sherds is the defining factor of its spatial limit. In areas 4 and 5 that have sandy gullies the concentration of shards was much larger, and they had concreted together with other artefacts or ferrous concretions along with vegetation or bedrock. The highest density of exposed shards was found in areas 1, 3 and 2, gulley A and C, gulley B, and gulley C respectively (Gibbins & Parker, 1986, pp. 275-279). The most likely distribution of cargo on the ship would be the iron bars in the foot of the hold to balance the ship with the amphorae stacked on top.

5.2.3 Crew's assemblage

An amphora, a container, one pan, several saucepans along with lids, jugs, mortars, bowls and lamps are the artefacts that qualify for one or more of the selection criteria. There were also a fishing weight and scalpels that was found to belong to the crew's assemblage. All these items are catalogued in the appendix. Most of them were found as fragments but there are some whole artefacts.

5.3 The Valle Ponti

The Valle Ponti or Comacchio ship, dated to 25-1 BC, is a very well preserved wreck as it was found partially intact. The wreck was located in 1980 during the dredging of the main drainage channel in the Valle Ponti area, northern Italy, the map in figure 3 shows the location marked as the Comacchio (from (Berti & Palazzo, 1990, p. 15)). A thorough excavation was carried out the following year. It was found approximately 3.5 meters below ground level in an upright position. At the time of the wreckage the area where it was found was a beach environment near the mouth of a river. Due to its construction, it is clear that the ship was suitable for both river and sea navigation. The ship was approximately 25 meters long and 5.4 meters at its widest point. It was probably moved close to the shoreline and on to a sandbank, or between

two, during a storm. Since the materials, for the most part, stayed on the ship and there was no incrustation of various bivalves it is very unlikely that the ship was submerged. It must also have been exposed to the waves for some time as some of the load was thrown overboard and the ships' side was damaged. Since there are valuable items still onboard the sediments most likely buried it quite quickly since they were not recovered, and no human remains were found so the crew was probably not there (Berti, 1985, p. 553; Berti & Palazzo, 1990, pp. 13-22; Parker, 1992a, p. 444).

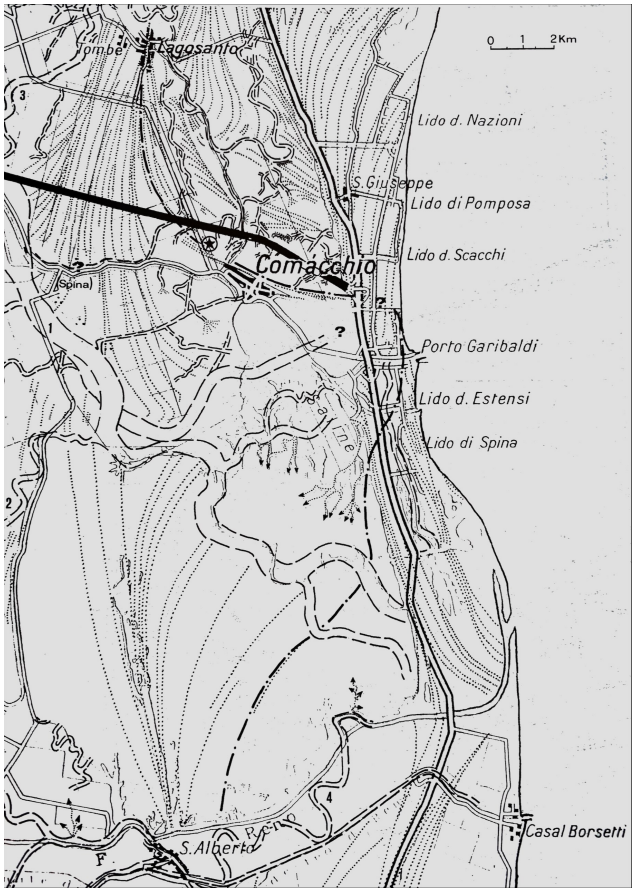


Figure 3 The location of the Valle Ponti, shown here as the Comacchio.

During the excavation the galley was found to be located towards the back, in a triangle between the stern and the first section of the floor. Fragments of a brick roof, both *tegulae* and *imbrices* was found along with pieces of bricks which is attributable to a plane for the hearth. Also, on the corresponding portion of the planking, lay a thick layer of ash. Numerous shells from molluscs were found nearby, interpreted as leftovers from meals. A jumble of more or less fragmented materials was also found and there was pottery with a clear sign of use. The living quarters was located behind the galley (Berti & Palazzo, 1990, pp. 59-61).

5.3.1 The selection process

Because the ship was so well preserved, with many objects still in its original locations, spatial relationships were much easier to interpret than in the wreck sites where it is clear that the ship sank due to a violent wrecking process. There was also extensive information about where on the ship the different material was found in situ. This is the case concerning the objects found in the galley and living quarters, all these are listed in Berti and Palazzo's book, so this was very valuable information that provided a starting point. These artefacts also had detailed

descriptions in the catalogue where it is clear that they vary greatly in composition and typology. These objects also have low quantities so most of them qualify for three of the criteria. In addition to the galley and living quarters there are also a collection of amphorae in the ships' cargo hold made up of different types. One of them has an inscription that most likely refers to the owner, that along with the small number and different places of origin for the amphorae suggest that they are not a cargo consignment but for use on the ship or at least belonging to someone onboard. This provides one of the four criteria and along with the origins they qualify for two of them. After looking at these two main spaces for the crew's assemblage the rest of the catalogue was examined and other objects that fulfil at least two criteria were selected. There is no site plan for the Valle Ponti but a reconstruction of the ships' structure can be found in the appendix, map 3.

5.3.2 Cargo

The Valle Ponti's primary cargo was lead ingots. More than one hundred was found in five different shapes with the counter stamps L.CAE.BAT and AGRIP, some also had the markings MAT, GEME, MAC, C.MATI or one of three monograms (Dušanić, 2009, pp. 107-111; Parker, 1992a, p. 444). On the basis of the ingots Parker (1992a, p. 444) suggests a Spanish origin for the ships' cargo. Most of the ingots were found scattered in the centre of the eastern flank and close to the transverse corridor or just beyond. There was no large secondary cargo on the ship only a few wooden logs (Berti & Palazzo, 1990, p. 53).

5.3.3 Crew's assemblage

Most of the crew's assemblage was found in the galley or the living quarters. There were however some objects found elsewhere on the ship that satisfied two or more of the criteria, all these are listed in the catalogue found in the appendix.

6. Consumption theory

Consumption studies were on the rise during the 1970s mostly pertaining to mass consumption in the US and Europe after World War II and it was not until after the 1980s that this type of

study were becoming an important discipline in the social sciences, particularly anthropology (Dietler, 2010, p. 207). Mass consumption has in recent years been seen as a way of resistance and building social identity, a significant form of agency that results in popular culture and a step away from capitalism (Dietler, 2010, p. 210). But consumption studies have also been important in other fields like economics where it has been seen as the result of supply and demand without much focus its social and cultural dimensions and the reasons for consumer preferences. Only recently has there been a shift directed towards increased analytical focus on these aspects (Dietler, 2010, p. 209). Dietler (2010, pp. 207-208) defines consumption as 'a material social practice involving the utilization of objects (or services), as opposed to their production or distribution', but this is not the only part that is highlighted, later there was a further addition to the definition; 'consumption is also the social process where the objects acts back on the consumer in complex ways'. With this new domain within these studies there was a change from the previous focus that they had from the beginning. In the words of Dietler (2010, p. 209):

"*What is novel in the recent turn to consumption is its recognition as an emphatically social and cultural practice that has significant consequences in other domains of social life and that must be explicitly studied and theorized as a distinct field of action"*.

These theoretical concepts were initially designed to analyse a phenomenon that had taken place in recent times and if they are to be converted so they could be used for case studies during an ancient period precautions needed to be taken. This is not only true for archaeologists but also historians and anthropologists, all scholars that wants to use these new concepts in their studies of more ancient periods. So, it is necessary that the concepts are transformed into new models and not taken for what they are, they would have to be converted into a consumption theory that is suited for the new uses. This was an opportunity to create this new version of consumption theory based on the examination of similarities and differences of historical cases and putting them into context with the modern ones. Considering the fact that mass consumption is not a new phenomenon but that during the Roman empire there was widespread circulation and consumption of these mass produced items, such as different types of ceramics, and they played an important role when the Roman provinces formed their new identities (Dietler, 2010, p. 213).

One of the newer ways to approach archaeological evidence is with consumption studies. Although archaeology have long been providing material evidence for a huge variety of

consumption patterns in both space and time, it is not until recently that this way of thinking has been given a place in the studies (Mullins, 2011, p. 134). In archaeological context consumption was for a long time only considered as an inferred process, a by-product that resulted from the end of production and distribution, and not the agentive social action it is (Dietler, 2010, p. 209).

"*Consumption has often loomed in archaeological thought as a logical and predictable end point for goods or for a straightforward relationship between supply and demand, rather than as the focus of analysis examining how agents shape the meaning of things and the social world*" (Mullins, 2011, p. 134).

Initially consumption was a vital part when studying colonization, often in more recent times, but there are precedence for these types of examinations of ancient periods and when archaeologists studies consumption during these times it can help explain material culture and provide a new way of looking at these societies (Dietler, 2010, p. 208). Another thing that it is also important to note is that colonial consumption gives special importance to the dynamic view of the historical process and therefore issues of transformation (Dietler, 2010, p. 214).

Consumption studies in the view colonialism are in large part based on cross-cultural consumption. This process is continual and based on selective appropriation and creative assimilation in accordance with the local logics that continually will keep constructing and reconstructing the areas culture, and this process has significant consequences because it alters the conditions of cultural reproduction (Dietler, 2010, p. 217). The process of colonisation is active and based on creative transformation and manipulation on the actions of individuals and social groups that have varying and competing interests and strategies of action embedded in local political relations, cultural perceptions and cosmologies. This agency that can be found within indigenous societies and structure are equally important when considering them as historical forces (Dietler, 1998, p. 299). In archaeological contexts, it has also provided a way of addressing the issue of agency in colonial situations by revealing patterns of choice and their consequences. These consumption studies are based on the agency of the people that are the consumers and the way they socialise goods (Mullins, 2011, p. 135).

"*Foreign objects are of interest not for what they represent in the culture of origin but for their cultural specific meaning and perceived meaning and perceived utility in the context of consumption. Hence, the colonial encounter must be contextualised in the conjecture of the different social and cultural logics involved*" (Dietler, 1998, p. 299).

But it is not only the consumers that influence these the choices they make, there were also power on a larger scale, economic and political forces that were drawn into the agency of the indigenous societies and the understanding of colonialism, this has to be seen on various levels to understand the historical process. But it is not only the historical process that has to be understood, there are changes in history, but the different cultures must be seen as distinct because consumption is always a culturally specific phenomenon. Because of this the demand for different types of goods is always socially constructed and changing as history unfolds (Dietler, 1998, pp. 299-300).

The traditional studies of trade within a particular region have usually consisted of distribution maps along with typologies for a wide range of ceramics along with other objects, but most of this information has come from limited excavations, something that means that the materials gathered is incomplete at best. All these elements were however not meant to be used for studies in consumption, they would be used for cultural history and regional chronologies and are therefore often not well suited for this purpose. To be able to avoid these limitations one must put greater effort into the examination of the objects that were consumed and all the different ways they were consumed. This would entail examining the properties of each object, their contexts and the practices surrounding them to gain understanding of the social and cultural logic, and what effects their consumption would have on social, economic and politics. Along with these effects one would also have to examine the items that would be rejected in the same region. This would in turn provide an overview of goods and services that were not embraced even though they were available and what this pattern of selective consumption means for the people in contact with these foreign influences, 'one must seek to discern and explain the choices that were made and the consequences of those choices' (Dietler, 2010, p. 224).

With the emergence of archaeological studies into colonisation there has been more focus on the processes that happens in an area with several colonial contacts and what transformations that takes place within the community (Mullins, 2011, p. 137). The research strategy for examination of consumption is 'geared toward the simultaneous relational analysis, on regional, intra-site and household scales, of several features' and there are five fundamental elements that has been the main focus (Dietler, 2010, p. 224):

- Context of consumption, where objects are found, the contexts in which they are recovered
- Patterns of association among the goods consumed and how they were associated with each other
- Relative quantitative representation of different kinds of objects within sites and across regions
- Spatial distribution of specific goods, their distribution patterns examined across space
- The specific material and functional properties of different objects

To gain as much insight as possible from these analyses the patterns found in them will be explored further with a comparative analysis that takes both the temporal and spatial dimensions into account. This means that during this analysis there will be a focus on the historical process where successive phases has to be compared both at individual sites and within regions and that it would be preferable if it was possible to compare these to local patterns and look for both similarities and differences with those who can be found in adjacent sites and regions (Dietler, 2010, p. 224). This will require a lot of contextual information on the regional landscape and sites within that can only be gained from excavations on a large scale in the area as the contextual and procedural information of domestic situations must be collected from as much material as possible. This information can be used for a comparative analysis. It is however important that the classification of ceramics are based on functional criteria and not typological as have been the standard for earlier studies (Dietler, 2010, p. 225).

Archaeological studies have previously held on to a narrow definition consumption but by widening it beyond the limitation of the flow of goods from manufacture to discard new possibilities open up. The main direction for these new studies has been based on two directions. The first being the structural, material and ideological processes and all the mechanisms involved, this encompasses marketing networks, state trade mechanisms, dominant ideologies or underlying cultural and ethnic identities, all focused on how goods are delivered to consumers and what information can be gained from examining how specific items end up with the people and the ways this flow of goods can be defined. This focus on the structural trends often sees consumption as a part of broader systemic influences and the possibility to study how consumers acquire and define items in relatively consistent patterns within particular social, cultural, and historical contexts. But this is not the only archaeological definition of consumption, other scholars have focused on the conscious symbolic agency of

consumers that are based on how these people consciously ascribe meaning to the things outside of the dominant ideology, the state or economic interests. This view of opposition to economic determinism and how the consumers define the things they allow into their lives is common ground that can be found in most interdisciplinary consumer scholarship (Mullins, 2011, p. 134). Of all the things that have effects on consumption structural processes are one of the most profound and all the agency and symbolism of the consumers is heavily influenced by these dominant processes. Within the archaeological studies of consumption the differences between structural influences that are far reaching and consumer agency can possibly unite many of these studies and is called archaeologies of consumption (Mullins, 2011, p. 135). According to Mullins (2011, p. 135):

"*The process of socializing goods and defining them in a range of contextually specific ways is the heart of consumption scholarship and may well be a pertinent framing mechanism for archaeologists working in almost any context, but archaeology provides a critical mechanism to recognize the profound commonalities as well as the wide variation in how goods have been consumed across time."*

When it comes to food and cooking being studied as consumption it is usually in the form of feasts as they had social and political significance. When this is studied in small scale societies where there are no specialised and institutionalized political roles, it will often show that some individuals will manipulate the use of this ritual to acquire power (Dietler, 1998, p. 305). This has been a way to study the hierarchy within a society based on feasts and food. But this focus on feasts that would not be a daily occurrence leaves a vast area of study that is completely overlooked. Food processing, cooking and consumption are some of the most fundamental activities in creating and maintaining social life but unlike the feasts this subject has garnered little attention from the archaeological community. That is until it was introduced through gender archaeology. Since food preparation and cooking have long been seen as a female domain along with most domestic activities it has not received the same level of attention as other male dominated areas (Miracle et al., 2002, p. 4). But it is important to remember that 'cooking, cuisine, and, by extension, culinary equipment, constitute a basic medium of human social interaction' (Bray, 2003, p. 93). Food also is one of the most fundamental human needs and will always be a vital part of any society, large or small. 'The social discourses around food have been mainly developed in Sociology and Anthropology, but even here food processing and specifically cooking practices have drawn less attention than other aspects in the world of food' (Miracle et al., 2002, p. 8).

This is in large part because as mentioned before it falls within the realm of the domestic, and this is most often associated with women, and therefore the economic interest in this subject has been much smaller than the exchange of goods on a larger scale (Miracle et al., 2002, p. 9). Foodways have been the focus of many archaeological consumption studies because it is culturally distinctive performances of status and social relations. Food is also 'closely linked to consumers' agency over the symbolism of their own bodies' (Mullins, 2011, p. 138). This has been possible because the customs pertaining to food and drink can be reconstructed by archaeological evidence from excavations, where different types of vessels used in preparation and consumption have been found (Schucany, 2005, p. 39). But it is not only food that has cultural significance, drinking alcohol is also considered a social act and is usually done during personal interactions and like food this custom is governed by cultural rules. Not only does these rules indicate appropriate occasions but also which type of alcoholic drink, in most cases in Roman societies this would be wine, and the behaviour associated with its consumption which would be different for men and women (Dietler, 1998, p. 302). As a liquid form of material culture, drink has some distinctive properties. It cannot be stored for long and in distinction to other valuables it is meant to be consumed completely. The ingredients acquire value through culinary transformation and consumption in social rituals (Dietler, 1998, p. 303).

When looking at the effects of colonisation in the cooking and eating habits of an indigenous population there were a decrease in the use of native forms as time went by. This was true for all types of vessels, used for both drinking, cooking and eating, but with varying degrees. Some of the native forms also make a comeback after a time but never replaces the Roman forms that continue to be dominant in almost all groups of vessels, the only one that at one point is more common is the indigenous drinking vessels (Schucany, 2005, pp. 42-44). Though this is an example from a society in the Swiss Alpes it is expected to see a trend similar to this in other areas the Romans colonized. Not only did the Romans trade with these colonies but most had a strong military presence that would ensure influence over time. The mortarium is a sign of romanisation of food preparation, the same is closing vessels with lids as this was until the colonisations an Italian custom. Another increasingly common Italian custom was cooking in low wide vessels and because of this the most common serving vessel were flat wide platters (Schucany, 2005, p. 47). It was also Mediterranean to refine food with sauces (Schucany, 2005, p. 44). Inscriptions on vessels could mean that they were for the use of only one individual, Schucany (2005, p. 41) found evidence of this during her study of the romanisation of cooking

and eating habits in the Swiss Alps and believes this was done by the Romans as well. As seen earlier this was a common practice during the Roman empire.

The examination of a shipwreck with these consumption criteria one has to make refinements as many of the elements are not present. Dietler actually makes a note about shipwrecks where the cargo is a standstill of the exchange part of the consumer chain. Consumption usually determines where an object ends up and its condition, but in this specific category of archaeological sites there is a mix of the exchange part from the cargo and consumption in the other artefacts (Dietler, 2010, p. 209) The exchange part is rarely so evident in terrestrial finds and as discussed earlier a shipwreck is a closed system where the input and output is essentially the same, it is a snapshot of a single moment in time. During excavation on land there are usually layers of materials from different periods, these layers can also intersect due to natural or human influences, where as a shipwreck mostly has only the materials from a single event. It is not to say that there are no shipwrecks with mixed materials, at some point ships can have wrecked at the same place and their materials mixed but this is a much rarer occurrence than in terrestrial finds. They still also contain evidence from specific moments in time and not the gradually accumulated materials from most excavations on land.

Food preparation is usually seen as a part of the domestic domain, a role taken on by women, but on a ship where the crew would consist of only men, this automatically changes the social standing of the cook. It also raises a question, is there a member of the crew that only functions as the cook or would he have other chores as well? Unfortunately, there are no ancient texts or sources from the Roman period that can help us answer this, but it is logical that whatever the answer is it would likely be the same on most of the ships from this period. It would however also depend on the size of the ship, and one with a smaller crew would unlikely have a member that only had one job. As food preparation is unlikely a skill that all sailors had it is probable that one member of the crew had this job, at least some of the time, while the others fished, collected mussels or performed other chores. It is also not certain how many meals would be served each day, a guess can be ventured at two, some sort of breakfast in the morning and dinner at night. It is likely that the dinner would have been the most social of the two where the crew could sit and talk but there is unfortunately no actual evidence for this but within a Roman family this was considered the main meal of the day and would therefore have the most symbolic meaning (Bradley, 1998, p. 37). It is a possibility that it would be the same on a ship.

When conducting a consumption study on the objects found at a wreck site the five elements of interest must be examined to make sure they are appropriate as it is a very different type of society that is precent on a ship. When it comes to the context of consumption, where the objects were found and the context they were recovered, for many of the item the answer will be the same. Because one of the material selection criteria is the spatial relationship on the seabed, where a galley or some sort of cooking area was located, as much as it can in the remnants of an often violent wrecking process, most of the objects will have the same context. When it comes to the patterns of association among the objects and how they are associated it can be possible to find differences between the wrecks selected for analysis. The same is true for the relative quantitative representation of different objects within sites and across regions. Because the shipwrecks are all found in different places and are from different times it will not be possible to find specific trends related to a time and a place, but they are all from places with Roman influences. There is also no certainty that the ships came from the places they were found so they will have to be seen as very small independent societies under this colonial influence and they will therefore be seen as separate sites and all of them a region. This will be the only way to conduct an analysis on the shipwrecks. When it comes to the material and functional properties of the different objects the catalogue of the material found in the appendix will be the basis for these examinations. As there have been no consumption studies of the crew's assemblage found om wreck sites before there are no clear map of how to attack the problem so this preliminary approach will have to be enough.

7. Analysis

A separate analysis of the crew's assemblage found on each of the wreck sites, mainly focused on the galley and table wear but also taking into account remnants of food and other items that can provide insight into the cooking and eating habits onboard, along with objects that can shed light on the social aspects of the crew.

7.1 The Port-Vendres II

The Port-Vendres II wreck qualifies as a continuous wreck site as the basin and ridge held the materials in place and prevented further movement on the sea floor and the areas with little to no artefacts are very small, around one square meter and they are spread around the site.

Scrambling devices has had a huge effect of the site, especially the wreck itself, but also the large stone blocks that fell on the site during the second world war. This might be the reason why the material is in such a fragmentary condition. Both types of extracting filters have had an adverse effect. Little to none of the perishables that likely would have been onboard were found at the site other than almonds. If the wreck was as violent as the site would suggest large parts of the ship could have drifted away. Since the ship also sank so close to the port salvage operations is a possibility and if it is correct that the ship was about 30 meters in length this becomes even more likely as the ship most likely contained a larger cargo than what is registered here. The fact that a large portion of the ingots were found further west than the rest of the materials could be because they were located in the bottom of the ship and the fell out before the amphorae and pottery stacked on top. Since there are some remnants of the ships planking found around the ingots along with some of them in the middle of the two concentrations of material, the highest concentration with most of the pottery and other objects lies further east, it is reasonable to assume that after the initial wreck the ship stayed afloat for a while until it sank further away. The cliff the ship likely struck is about 30 meters away and the slope leading to the basin might not be steep enough for the materials to slide so far down it is a definite possibility, but still only educated guesswork as there are no way to say for certain.

Because the stern has been interpreted by Colls to have been located in an area where mostly ingots are found it is logical to assume that the galley was located at the bow, this is where most of the crew's assemblage was found along with most of the pottery consignments. If the assumption that this is a large ship is correct it is probable that the glass, late red glaze, thin walled and terra sigillata ceramics were part of the ship's crew's assemblage. Parker (1981, p. 226) also suggests that these might have been used onboard or been someone's personal property as it is a very diverse consignment. However, without further detail of their *in situ* locations they do not fulfil enough of the criteria set forth to be counted as such.

7.1.1 Galley wear

A large casserole (38 C) with the graffiti PSC had a very large diameter and clear signs of use, this is probably the largest cooking vessel in the assemblage, so it was probably used to prepare food for the crew. Colls et al. (1977, pp. 78-79) assumes that the graffiti is the mark of the

captain but no one person would be able to eat all the food that was prepared in this casserole. The idea that this vessel was used or owned by one person is also represented by Schucany (2005, p. 41). The single handled bronze pot (5 M) was also probably used for cooking. As bronze is a more durable material than ceramics it is practical to have on a ship since it would not have to be replaced as often. It has a S-shaped profile so it could have been placed directly into the embers, the rim is almost as wide as the body and could be used for a variety of liquid foods. Some of the ceramic pots (31 and 33 C) seams have a similar shape, these are mostly rim and wall fragments with the bottom missing, so this is assumed based on the characteristics of the sherds. The rim diameter is likely smaller than that of the bronze pot, but they could have been used for a similar purpose. Since fishing hooks were found at the wreck site, they night have been used to make fish soup. Among the pots with the largest diameter are the two (39 and 40 C) with graffiti PSC. The first has blackening so it was most likely used for cooking by placing it directly into the embers. There is also no trace of handles so this might be an *olla* and therefore used to cook liquid foods. Pot 32 C is made of a thinner fabric and is coated with a slip so this might not have been well suited for cooking but rather for storage. Storage might also be the main use for the rest of the pots (34, 36, 37 and 41 to 43 C), the last have two handles common for pots and jars used for this purpose but some could also have been used for sauces. All of these pots have traces of pitch on the inside so this makes it less likely that they were used to heat sauces as the pitch could spoil the food. As this was used to waterproof ceramics, they might have contained liquids, another possible content is fish sauce. Amphorae (41 A) with PSC graffiti is clearly marked by a crewmember or the captain. Therefore, this amphora appears to belong to the ship's stores and Colls et al. (1977, pp. 78-79) also suggests that it might have been kept in the galley. Two saucepans, one ceramic (44 C) with a fitting lid (49 C) and one bronze (2 and 3 M). The bronze saucepan has a rounded bottom and vertical walls and a wide rim so it could have been used for reducing liquids. As the ceramic saucepan has a convex bottom this might have been used to fry certain foods like meat and fish. The first there are no evidence for at the wreck site, but it is likely that they had at least a small quaintly in store. The only archaeological evidence that they had access to another protein source is the fishhooks. This means that they would have to catch the fish and there is no certainty that they would have been able to. The only other trace of food found was almonds but the likelihood that they had other supplies are very high. Fragments of three mortars (45-47 C) also suggest that they had herbs and spices to add flavour to their food, maybe even the wine. Other items that would have been used when preparing food are lamps. One almost complete (4L) and fragments of three other lamps (1-3L) are the only finds from this functional category.

7.1.1 Table wear

The finds associated with table wear are very limited. In relation to beverages only one small jug (30 C) and a goblet (28 T) satisfy enough of the criteria, but there must have been more. The goblet is thin-walled ceramic and would probably not have been used by members of the crew, but maybe the captain. The only other pieces of table wear are two small bowls, one made of tin (1 M) and one ceramic (35 C) along with two large bronze plates (4 M) that might have been used as trays rather than for eating. Especially if the cooking vessels are an indication as they were mostly for cooking liquid dishes. The only utensil found was a bone spoon but as this measure under then centimetres in length it was likely not used in the preparation of the food but rather for eating.

The assortment of cooking vessels is much larger than the table wear found at this site. This lends credence to the theory that at least some of the fine wears categorised as cargo most likely belonged to the crew's assemblage. As the site is still not completely excavated there might be more artefacts from the crew's assemblage that has not been found yet. However, due to this discrepancy it is very difficult to make an assumption about the number of people onboard the ship.

7.2 The Plemmirio B

This wreck constitutes a discontinuous site spread out over 300 square meters where there are large portions of the area that did not contain materials. The largest concentrations of the were found in sandy gullies 15-20 meters out from the top of the cliff. The ship probably struck the cliff hard causing it to break apart and depositing large portions of the cargo before the pieces started floating away losing materials as the went on before they finally sank. This is the most likely scenario as seabed movement probably would not be able to carry the cargo far away from the initial site. If this is close to the truth about what happened, it would also explain the fragmentary nature of much of the pottery. Because of the location where the ship went down it is unlikely that materials would have salvaged. Waves would have hit the cliff hard making it very dangerous even if they were able to free dive down to the depth where the materials were. There are also no perishables left at the site even though large portions of the material were found in the gullies. This means that they were covered over time and not fast enough to

aid in preservation. Another scrambling effect that can have rearranged the material is wave action, not in the literal sense that the waves disturbed the site but the force they generate might have moved the materials that ended up between the gullies and pushed them in.

The Plemmirio B had a tiled cabin roof and a galley with a hearth made from bricks. In close proximity to were these was located lies the main part of the crew's assemblage, mostly cooking wear but also three lamps used for lighting. One more lamp was found in gulley A along with some cooking vessels and a set of scalpels. This second concentration of non-cargo items probably comes from the ships living quarters, whose location on the ships is impossible to identify. As there were little to none of the ship's structure left at the site that could provide evidence for this interpretation other possibilities have to be explored. However, since there are natural rock formations between gulley A and M it is less likely that other scrambling effects than the wreck could have deposited them in these areas.

7.2.1 Galley wear

Found with the crew's assemblage in gulley M was several amphora fragments, one pear-shaped, one that had been part of a side handled amphora and two handles belonging to separate vessels. These along with a Mauretanian amphora that had its inside coated with pitch, unusual for this type and leads to the conclusion that they were part of the ship's stores. Because of the presence of the pitch the Mauretaninan amphora would most likely have been used to store some sort of liquid but not olive oil. The only other storage vessel from the assemblage was a jar (PL85/73). The type of cooking vessel found in overwhelmingly large number compared to the rest was the saucepan. Seven of them were found at the site varying in shape and size. Two were quite large, saucepan PL83/29 which comes from the central Tyrrhenian region in Italy and is a common Roman type, had an external rim diameter of 38 cm and walls much lower walls and a rounded base so it would most likely have been put directly into the embers. The second largest saucepan (PL83/26-28, PL85/36A-B) is of Tunisian origin with a rim diameter around 29 cm. The wall height was about half of the rim diameter so it would have the same use area as saucepan PL83/29 where their shape is congruent with cooking drier meals or for reductions. Two other saucepans that is probably of Tunisian origin is PL85/100 and PL85/85, but the condition of the fragments makes determining anything else about it impossible. The other saucepans from the assemblage with determinable size is smaller but have relatively

similar shapes with vertical, or nearly so, walls. As this type of cooking vessel has an intended use related to reducing due to its shape it is unlikely that they were used to prepare large liquid meals. The smallest one is PL87/12, probably from Tunisia. The only other cooking vessel is a flat-bottomed pan (PL85/81) that would have been used for frying, this vessel is also likely of Tunisian origin. Three lids were found one (PL85/56, 96) matches saucepan PL83/26-28, PL85/36A-B, but also the flat-bottomed pan. One of the other is a saucepan lid (PL85/82, 84) but there are no matches among the cooking vessels recovered but it was blackened towards the rim, so it was in use. The last (PL85/53, 136) is only a small fragment so unfortunately it is not possible to make assumptions about the type of vessel it would have been used for. For food preparation two mortars (PL87/6B and PL85/102), or at least fragments of, were found.

7.2.2 Table wear

When it comes to table wear five small ceramic jugs were found along with either a jug or bottle made of glass (PL85/55). The ceramic jugs could have contained enough wine for one serving per crew member. Two of the jugs (PL85/78A-C and PL85/123) are likely from Carthage. One of the other jus (PL85/80) are likely of Tunisian origin. As only the handle remains of the glass jug or bottle and there is no size recorded, it is impossible to say something about its function. The only other table wear found were bowls. Two were small (PL74/4, 5 and PL85/54, 134), the first is probably North African and made from a much finer fabric than the second that was rather coarse and likely Tunisian. There is also one bowl of undeterminable size (PL85/60), all of them ceramic. The last was a shallow and made of glass (PL85/116A-B). Gibbins (1991, p. 238) has a theory about the number of crew members based on all the vessels found for food preparation and consumption: ‘The quantity and range of vessels may accord with the kitchen equipment of a crew of perhaps 4 or 5**.** A larger crew would perhaps have required more saucepans and jugs, both for daily catering and in reserve.’

With seven saucepans and one flat bottomed pan as the only cooking vessels found on the site it is probable that the crew onboard this ship had a diet that consisted mostly of fried food and little to none of stews, porridges and other liquid based foods. This is of course only based on the cooking vessels found at the site. There might have been pots and other vessels better suited for these types of food that have gone missing with what is assumed to be the rest of the table

wear. But jugs and bowls are unlikely to have been the only table wear used as drinking vessels and plates are also expected.

7.3 The Valle Ponti

Continuous wreck site with very little distortion. This 25-metre-long ship was found in an upright position buried under a layer of sand with most of its materials still onboard, it had however been exposed to the waves as some of the materials had gone overboard and damaged the ship's structure. The waves can also have functioned as an extracting filter carrying materials away from the ship, but this most likely happened only in a very short time frame close to the time when the ship wrecked. Other than this here are very little rearranging of the materials compared to less well preserved wrecks and many of the objects found were still in the parts of the ship where they would be expected. As the preservation of the ship shows it was not exposed to the elements or submerged for a long period of time. It must have been buried quickly as there are no apparent traces of salvage. Another indicator of this is the fact that bones from a dog was found still onboard the ship, as the ship wrecked close to shore and a dog living on a ship would very likely be able to swim. This is a marvellously well-preserved ship, its contextual information and large number of objects belonging to the crew's assemblage can provide an indication of what could be expected from other wreck sites.

In relation to the types of foods eaten and prepared on a ship the Valle Ponti is a treasure trove of information. A group of bronze hooks (255) was found in a small wicker 'hook holder' basket. The hooks found are rather non-specific in their shape, but the size of the boat and the presence on board of malacological finds that are of marine origin would indicate that the fishing was done in the sea rather than in fresh water. Almost all of the shell species found on the ship are marine. More than 60% of the edible species were found in the stern area near the galley, which suggests that it was food for the crew. A basket filled with molluscs were also found onboard. It is likely that the molluscs were collected by the crew themselves by hand in shallow water. No tools were found on board the ship for collecting them, even the few fishing tools found suggest that fishing was not aimed at trade but only for self-sufficiency (Berti & Palazzo, 1990, pp. 114-117). During the excavation 326 bones, almost exclusively from domestic animals, was found. Because of the high level of conservation due to the humid and anaerobic environment even fragments of skin and meat was found. Most of this was located aft and it is clear that it had been butchered before it was taken onboard. Bones was for the

most part from ox, sheep and pig. The meat was found in the stern area and was part of the provisions for the crew. As for the meat that was in the bow, it is not possible to determine whether it was intended for trade or additional provisions for the crew. However, the findings onboard the Valle Ponti shows that the meat on board was mainly transported and consumed in salted pieces, probably kept in the galley or in an area very close to it (Berti & Palazzo, 1990, pp. 118-126).

7.3.1 Galley wear

The amphoras has by Parker (1992a, p. 444) been contributed as part of the cargo, but since there are only six of them found it is possible to presume that they were part of the ships stores. Especially since there are room for many more single handled containers similar to 104 along with other types as well (Berti & Palazzo, 1990, p. 70). Some of them also has painted and engraved inscriptions, especially the painted ones are commonly used for dating contents (Parker, 1992b, p. 92) but because of the low number in varied types along with no other location on the ship used to store liquids they qualify as stores for the crew. The amphoras found in the cargo hold were all, except two, of different types and no other vessels for storing liquids was found on the ship these fall within the two quantity criteria. There are also no other amphorae found on the ship so this would be an unusually small cargo consignment. That and the fact that three of the amphoras comes from Greek isles (105-107) and not near Sicily where the ship sank suggests secondary use or purchased somewhere along the way. One of these amphorae (105) also has graffiti indicating who it belongs to; of Sosicrates. There was only one amphora (103) that had a stopper, this was also the smallest, so it could have been brought on to the ship with the intention for the contents to be used by the crew since it was stored with the others. A container (104) was found in the hold along with the amphorae. It has an ovoid body shape and a round foot. Two other storage containers found falls a little outside of the parameters of a traditional jar used for storage. The first (125) had an ovoid body, the second (183) rounded and both have a flat base or foot. Both classified as *ollae* by Berti and Palazzo as they have no handles, which is typical for this type, shows the various uses of this type of vessel usually intended for cooking.

When it comes to cooking wear a large bronze cauldron (178) was found in the galley. With a diameter of 40 cm this could contain a large portion of the food made for the crew. A bronze

olla (180) was also found and like the cauldron it was normally used to prepare more liquid dishes. There were some ceramic pots in the assemblage as well. One of these (126) was about the same height as the bronze *olla*, but there are some variations in the shape. It does however have a rim that is almost as wide as the wall height, so it was probably used to cook the same types of foods. The other two ceramic pots (127 and 128) were much smaller in size and would not have been able to hold more food than would be required for one person's meal so they were probably used to make sauces or other condiments used to enhance the foods flavour. Two bronze pans (216 and 217) and two ceramic (129 and 184) had signs of use, regardless of the fact that not all of them was found in the galley or the living quarters. The two made of ceramics were larger but not by much. Their shape and very low wall would indicate that they were used to fry dry foods like meat or fish. There were also two relatively small bronze saucepans with handles (209 and 218), very similar in size and shape. As both have walls that are lower than the rim diameter they would most likely have been used for reductions. One of them (209) was found in the living quarters with a food warmer (208) so it might have contained some sort of sauce. Only two lids were found, one made of bronze (179) and one made of wood (213). They do not fit exactly with any of the cooking vessels but are closest in size to the bronze pots and pans. Two mortars of different size and material, one large ceramic (185) and one smaller carved from wood (211). Due to their different compositions, it is logical to assume that they had their specialized uses. The ceramic mortar could have been used for more adhesive foods while the wooden might have been used for drier spices and herbs. Maybe even for preparation of wine. Among the other types of implements used for food preparation were two bronze colanders (181 and 210). Quite small and very similar in size, rim diameter of about 11 cm, would mean that they would not be very useful in relation to food but might have been used for wine preparation instead. Four bronze ladles (219-222), none of them with a rim diameter of more than 5.9 cm or less than 4.5 cm. Two of them (220 and 222) had a spoon shaped colander at the end so Berti and Palazzo suggests that they were used to prepare wine rather than food. One of the ladles (219) had a hook at the end of the handle which would have made it ideal for serving out of a large pot or cauldron as it could hang on the side in between uses.

7.3.2 Table wear

From the category of table wear there were three plates found at the site, two bronze (214 and 215) that were the exact same size and shape and one made of wood (212). All of the were approximately the same size, around 20 cm in diameter. This is a fitting size for one person. There are six bowls, four with small to medium rim diameter (119, 120, 115 and 132) and two that were larger (186 and 187). These two are made with a coarser fabric and has pebbles on the inside. While two of the small bowls (119 and 120) are covered with shiny red paint and decorated. There is also one (115) that is covered with a cream coloured englobe. The last (132) is made from transparent blue glass. Four jugs varying in size, two of them are covered in red paint (110 and 111) and one (112) in varnish that has a yellowish pink colour. The largest of the jugs (124) does not have any kind of varnish or paint. There were also two *olpe* or wine jugs. The smallest of the two (113) is covered in red and shiny paint and the largest (182) with a whiteish slip. When it comes to drinking vessels there are different types found in the assemblage among them a mug (114) with a shiny red varnish. The others were a *kantharos* or drinking vessel (117), a cup (118) and a glass (116) covered with red paint and intricate decorations. There were also three glasses with decoration in the 'kornmaregen' style. Similar in size and shape but two (122 and 123) are covered in a shiny red paint and one (121) has no slip or pain of any kind. When it comes to ascertaining the number of crew members on the ship in relation to the table wear there might be six or seven. As there were a total of seven jugs and drinking vessels, although not necessary intended for the same use but as there might have been limited availability for new ones during the voyage, they could have been used by one person each. There were also more objects likely belonging to the domestic assemblage at the site but as they were not located within the galley or living quarters, nor did they fulfil enough of the criteria to be counted as such.

7.3.3 Other objects form the crew’s assemblage

Among the most relevant items other than the galley wear and table ware is a grate (177) found in the galley. This and the remnants of ashes along with bricks in the same area are definitive evidence that cooking took place on the ship. Another very interesting object is the food warmer (208) found in the living quarters. Mostly made from wood but with bronze fittings, it has two compartments, one large and one small. This would probably not have been used by the crew but maybe by a passenger or the captain. Also found in the living quarters was a bronze steelyard that again could have belonged to the captain or a passenger. Two *aryballos*,

a type vase commonly used to contain oil used at a bath to clean of dirt after a long day. Some of the artefacts that provides insight into activities performed by the crew when they were not working are two game dice (249 and 250) and game pieces (251) made from pebbles and bone. As these are games most likely played in a group so there was a social component to living and working on a ship other than the consumption of food that would at least at times have been eaten together.

A total of 17 lamps was found on the ship, ten of them was blackened from use. The remaining seven was most likely used by the crew as well considering that this would be an abnormally small cargo consignment. Those that are listed in the catalogue were all found in the galley and living quarters (191-193, 196, 197, 201 and 202). Another interesting find was a bronze lantern cover (188). Because there was only one object like this it probably belonged to a person of higher status within the crew, like the captain, or a wealthy passenger.

Bones from a dog and even a tortoise, from the species *Testudo hermanni*, was found during the excavation. The tortoises' carapace was almost complete and parts of its bones and skin was also preserved. Since some of the scales was still attached the skin it most likely died and then slipped under the planking where it was found a short time before the ship was buried. It is believed that the dog and the tortoise was alive on the ship and not meant for consumption (Berti & Palazzo, 1990, pp. 118-126). This can mean that it was normal to have pets onboard. A tortoise might be a less traditional one than a dog but a pet none the less. As keeping animals is considered as social and great way to boost moral along with providing emotional support, they could have been a vital part of life on a ship. It is also another aspect that provides social interactions among the crew.

7.4 Comparative analysis

A comparative analysis can provide insights into patterns of the types of galley and table wear used on ships during the Roman period. An attempt will also be made to see the assemblages as a consumption study.

7.4.1 Galley wear

One of the main differences of the wrecks is that on the Valle Ponti there were found remnants of food that provides a much clearer picture of the sailors' diet. Salted meat from ox, sheep and pig were in the ship's stores, there were also clear evidence that both fishing and molluscs that were obtained during the voyage was an important source of food. As fishing implements have been found on all the sites in one form or another it is clear that fish was an important source of protein. If the food found on the Valle Ponti is representative for the diet onboard it was quite varied with large amounts of protein, something that would have been important as the days would have been filled with hard work. One of the vessels all the ships had was a mortar, used to grind up herbs, spices and sometimes food during perpetration. It is clearly a cooking staple as all three of the wrecks had more than one, maybe even intended for different uses.

The galley wear from the Port-Vendres II is largely pots and a casserole, both mainly used to cook liquid dishes like porridges. There are also variations in the sizes, so it is possible they were used for different purposes. The site had two saucepans that could have been used for drier foods or reducing liquids. Since there are no pans found at the site it is probable that these pans had a dual purpose even if frying foods are not their intended use. All of the cooking vessels were constructed in such a way that they could be put directly into embers. Since there are no remnants of a heart it is possible that the crew would go ashore to cook their food. The Plemmirio B ship definitively had a hearth onboard since bricks were found at the site, close to the tiles that belonged to a cabin or galley roof. The dominant type of cooking vessel on the site were saucepans with seven of them, one was large enough to have prepared a meal for a small crew. This shape is more indicative of cooking dry foods than liquid ones or reducing liquids. A flat bottomed pan that could only have been used to fry food was the only other type of cooking vessel found at the site. The saucepans rounded bottom shape are congruent with being placed directly into the embers like the cooking vessels found at the Port-Vendres II site. As there were lids fitting both types, in the case of the saucepans this could indicate that they could have been used to prevent all the moisture from escaping. The Valle Ponti wreck had a much larger assortments of cooking vessels than the other two. For preparation of liquid foods there were a large bronze cauldron along with other pots. As these were large enough to make food for the entire crew there were probably a social aspect associated with meal intake, maybe even a tradition of communal eating onboard. For frying and preparation of drier foods four pans and two saucepans was found but, as these were rather small so whey would not be able to hold food for several people. They could have been used for baking and preparation of other types of side dishes. This large range of different vessels suggest that they prepared an

assortment of foods, maybe not at the same time but they had the tools to do so. Small pots would have been well suited for sauces and condiments. Most have flat bases suited to be used on the grill found with the bricks belonging to the hearth, unlike the two other sites where most of the vessels were best suited to be placed in the embers. The cooking vessels at the Valle Ponti site are a mix of bronze and ceramic to a much higher degree than at the other sites where there are few bronze vessels. This might however be due to pour preservation. A characteristic that can be found at two of the sites are graffiti. Both of the large ceramic pots and the casserole along with one amphora at the Port-Vendres II site had inscription that was most likely attributed to the user. The same type of graffiti can be found on one of the amphorae at the Valle Ponti site. As stated earlier this was not an uncommon practice in this period so one could expect to discover traces of it at a wreck site. One of the things that separate the Valle Ponti from the other ships is that it could sail up rivers, though the other two might have had that ability they were not recovered at the mouth of a river and unfortunately there is not enough left of the structures of the ships to make any assumptions about them having this ability. Because of the large variety of vessels found at all three sites no conclusions can be drawn regarding different practices in food preparation since the Valle Ponti is the middle ground of the three.

7.4.2 Table wear

Regarding the table wear found at the three sites there are huge discrepancies among the quantity of materials. But this might not only be due to the lack of material located on site, it can also be because some of the table wear was made out of wood and have not been preserved. In reference to the Hellenistic Kyrenia wreck Gibbins (1991, p. 238) remarks: ‘Few Roman amphora ships of our period were as well accoutred; slipped table pottery would perhaps have been rather luxurious and not very durable at sea. Wooden bowls and platters would have made more sense, as would metal cauldrons, for cooking, although metal would presumably have been more expensive than pottery’. Since a wooden plate was found on the Valle Ponti this could have been common on other ships, but none of the other two had wooden table wear. This can be due to poor preservation but there is no way to say for certain.

The only table wear found at the Port-Vendres II site were a jug, a goblet, two bowls and two bronze plates that were so large that they might have been used as trays. There were however

other types of table wear at the site that could possibly have been used by the crew and some glass vessels. This site did provide the only artefact that was an eating utensil, a bone spoon. Very little table wear was also found at the Plemmirio B site. Five small ceramic jugs, one bottle or jug of undeterminable size made of glass and three ceramic bowls varying in size along with one made of glass. As with the cooking vessels the Valle Ponti have a much larger assortment of table wear than the other two ships. However, there were no category that had the same amount. This ship might originally have had a service for five or six people but the variations within the vessel types makes it impossible to draw a conclusion. This site did have not only a larger quantity of objects but a higher variety of vessel types. One common denominator for all three ships is that most of the table wear were painted or had some sort of varnish or slip. Glass vessels might also have been common as they were in a roman household, despite their fragile nature, since all three sites had fragments of glass.

7.4.3 Galley and table wear in view of consumption theory

Below is a table of the different types of vessels used in food preparation divided into their functional groups, this helps to provide a clearer picture of the variation found in the galley wear.

	The Port-Vendres II	The Plemmirio B	The Valle Ponti
Casserole/Cauldron	1		1
Large Pot	5		2
Saucepan	2	7	2
Pan	3	1	4
Sauce pot			2
Lid	3	3	2
Mortar	3	2	2
Storage vessel	7	6	9

If the cooking vessels found at the Port-Vendres II and Plemmirio B sites are representative for the assemblage that was onboard, the sailors' diets would have differed greatly as one would mostly have consumed foods with a high liquid content and the other based on dryer foods. Unfortunately, there are no records of where the different objects on the Port-Vendres II

originate but since the Italian custom is to cook in wide low vessels it appears as if the cooking vessels are not particularly influenced by the Romans. The shipwreck is from relatively early in the Roman period, AD 42-48, and was found in a harbour in southern France so it can have been influenced by the regional style of cooking. It was also located near the Spanish boarder so the culture there can also have influenced the style. The cargo came from southern Spain so they could have replaced some of their broken vessels there. But without any indication of the vessels' origin, it is impossible to say. There are however some romanisation of the cooking as mortars are used and that is an Italian custom. One thing that is certain is that there is a pattern for the use of large cooking pots. These were mostly made of clay but there is also one bronze pot, as for the saucepans there are one clay and one bronze. There are some variations within the clay types the pots are made of but without studying them in person it is very difficult to draw any specific conclusions about the materials. The wreck of the Plemmirio B was found on the north eastern side of Sicily and Gibbins assumes that it was sailing from Africa Proconsularis to central Tyrrhenian Italy based on export patterns. The ship sank in AD 200 and among the galley wear was a large number of saucepans, most of these have a likely Tunisian origin but there is also one from Italy. This suggests a pattern unlike the other two sites since there is no presence of any cooking vessel made to prepare liquid dishes, this can indicate strict adherence to the Roman style of food preparation. There are however no bronze cooking vessels found on this site and like the Port-Vendres II it is difficult to say anything with much conviction about the material properties of the different objects because the descriptions are mostly based on colour and texture, but without further study of the actual material it is not possible to draw any conclusions. This is however the only site where observations about possible origins for the different vessels have been noted. Mortars was found on this site as well. The Valle Ponti is the oldest of the wrecks from 25-1 BC and although it was found in northern Italy, the cargo was of Spanish origin. This is the ship with the largest variety among the galley wear, it had three large cooking vessels for more liquid foods along with two saucepans and four pans for drier foods. There was also greater variety in the materials used, meaning there were more bronze vessels than at any of the other sites, even one of the lids. But what cannot be found in the catalogue are indications of where the different vessels might have been made only descriptions of the clay, but this is mostly in terms of colour and texture. Along with mortars there are also small pots for sauces. The sauce vessels are unique for this site but there are mortars present at all three. The Valle Ponti site is also the only that still has utensils, probably used for preparation and serving of both food and wine.

When it comes to the table wear found at the three sites there is even more variation than in the galley wear, the functional groups are represented in the table below.

	The Port-Vendres II	The Plemmirio B	The Valle Ponti
Jug	1	6	6
Drinking vessel	1		7
Bowl	2	4	6
Plate	2		3

The quantitative representation is very different within the three sites. The drinking vessel and jug from the Port-Vendres II are both made of clay as is one of the bowls, the other is small with very thin walls and made of tin. The two plates are both made of bronze, they are also quite large. Table wear from the Plemmirio B has less variation but more objects, of the six jugs from the assemblage five of them are small and made of clay, mostly different types but two seem to be similar, while one is glass. Three of the bowls are made of clay and also here one is made of glass. This is however not what one would expect to find at a wreck site where most of the galley wear indicates the preparation of dryer foods. At the Vale Ponti site there were three plates, two made of bronze and one of wood. Two of the six bowl were quite a bit larger than the rest and can possibly have been used for serving, both of these were made from clay as was three of the smaller bowls. The last was made from blue glass and is between the others in regard to size. None of the clay bowls found at this site hade the same fabric. For most of the vessels there seem to be some overlap but within this particular functional group there is none. The same is true for the six jugs, they vary in both size and fabric, two of the are wine jugs. Most of the drinking vessels have some sort of red paint, three of them are decorated in the 'kommaregen' style. There is only one drinking vessel without some sort of decoration and the remaining three has different, and because the presence of these decorated vessels are more common no particular status can be attributed to any person on the ship based on these.

The tables provide a quantitative representation of the different objects both at the individual sites and within the region that is the three of them, but the wrecks are far apart both in space and time, so it is difficult to attribute these observations as variations within a region. Not even the specific material and functional properties of the different objects can be defined properly as the descriptions are often light on information. This lack of information is not only because

of the descriptions but the condition of the material, since a large portion is only interpreted from fragments the initial objects function is often not easy to determine and based on common forms leaving little room for local variations. The most difficult is the pattern of association among the goods and how they are associated. This would have provided a social context but other than the objects with graffiti or inscriptions there are few indicators of a particular hierarchy within the little society a ship constitutes. The only object that stands out is the food warmer found on the Valle Ponti, as this would indicate a person of status that did not eat with the rest since it was found in the living quarter of the ship. This could be the captain, but it could also be a passenger with a high status. The blue glass bowl and lantern cover found at the same site can also have similar significance.

There are clear problems when trying to conduct a consumption study based on the materials found on these wreck sites. Many of the objects are only found as fragments and are not described in detail in the source material and because the objects are not available for study in person one is completely dependent on the observations of others. This also entails which of the objects they considered important during the initial work at the site and during the cataloguing of the materials, and as mentioned before the cargo of a ship has been given a lot more attention. This has not only been a problem here but also during the interpretation of the sites because a lot of contextual information is left out, the same with object descriptions. I understand why Dietler made a point of requesting large scale excavations that provides as much information as possible, both contextual and functional both at the site and in the region, because this would provide a much better basis for this type of study. (Dietler, 2010, p. 225)

8. Conclusion

Since the beginning maritime archaeology has mainly focused on amphorae and the technical aspects of ship building as these fields of study contributed greatly to our understanding of the ancient economies. But when archaeologists focused on this topic a great source of material pertaining to the human element crucial to uphold this economy remained largely untapped. The crew's assemblages found on wreck sites can provide us with information regarding the material culture and social systems of seafarers. Since there is also little information about the common sailor or oarsman during this period found in ancient literature, we are dependent on the archaeological evidence as the source this knowledge can be obtained from. Although the

interest in these finds have increased recently it is still very underutilized and if new theories and analytical tools were used to re-examine this material at a later date the lack of crucial information is a problem.

There are a lot of elements to be considered when examining a wreck site. Insight into the site formation and the forces that effects a shipwreck during the wrecking process, right after and over time, are all important if any insight is to be gained from an area that on first glance can appear completely chaotic. This is why it is imperative to have as much information as possible about the excavation ant the various objects *in situ* locations on the seabed, because without it, relevant materials might fall through the cracks. But this is a question about publication and how much of the raw data can be used without being overwhelming and unnecessary for most people. This is why the raw data from previous excavations should be made available to the public so further exploration of these sites can continue. Even if this was possible there is the language barriers on archaeological studies in Europe. Because no common scientific language is used when publishing or during excavations this divide will not likely disappear anytime soon.

It is also important to have a way of selecting the materials needed for a study, in this case a set of criteria based on both Gibbins and Trego's work and fine-tuned with one that was created for this particular scenario. Although it is based on Nieto's the criteria was created for the purpose of singling out the few remaining objects that did not fall within two of the other three without getting every piece of single or low number objects because they had to be functional. This provided a solid base for the selection of objects but there is a good chance that some were still missed because on the sometimes lacking information on the different objects *in situ* locations.

The crew's assemblage found at the three wreck sites varied in both quantity and types of objects found. Where the Valle Ponti had a large assortment of galley wear suited for the preparation of both liquid based and drier foods, the other two wreck sites had vessels that were commonly used either one or the other. Whether this is a result of cultural differences in regard to food preparation and eating habits is impossible to know for certain without more information. It is also impossible to say how much if any of them are due to forces of colonisation. Where the Romans liked to prepare their food in low, wide cooking vessels and if some of the variation in the assemblages are due to this influence cannot be interpreted with

any conviction without further evidence. It appears that the Plemmirio B had the strictest adherence to the Roman style of cooking, with the Valle Ponti in the middle and the Port-Vendres II the least effected by romanisation. These differences should also be seen in the table wear but as both the Port-Vendres II and the Plemmirio B had very few of these objects no conclusions can be drawn. The Valle Ponti had a much larger portion of material falling into this category and an assumption can therefore be made that the other ships would have had enough table wear to constitute a service. Not necessarily a complete set for each crew member but more than was found at the sites.

The Valle Ponti is an unusually well persevered wreck, the richness and diversity found among its objects is not to be expected from most wrecks. However, it provides great insight into the crews' life onboard as not only the galley and table wear were preserved but also objects pertaining to activities preformed in their free time. But the fact that the analysis of the Valle Ponti was partially limited by the objects that did not qualify enough of the criteria raises a question about the model used here. Therefor further studies pertaining to the crew's assemblage should be conducted. Not only on new shipwreck finds but also more extensive studies of sites where work have already been done as few of them are completely excavated. With better techniques for recording find locations it will be easier for others to continue the work at a later date. This can be the start of a new understanding of the cooking and eating habits onboard ships during the Roman empire and its significance in regard to maritime culture. However, to be able to see patterns on a larger scale more studies of a similar nature have to be conducted on several wreck assemblages. If this is done after the standards set by Dietler consumption studies can be performed on a larger scale and on new types of sites. This opens a door to new possibilities within the field of archaeology since these studies explore different aspects of ancient societies and their culture.

8. Bibliography

Adams, J., & Rönnby, J. (2013). *Interpreting shipwrecks : maritime archaeological approaches* (Vol. 56). Highfield Press.

Bass, G. F. (1980). Marine Archaeology: A Misunderstood Science. *Ocean Yearbook Online*, *2,1980*(1), 137-152. https://doi.org/10.1163/221160080X00091

Bass, G. F. (2011). The development of maritime archaeology. *The Oxford Handbook of Maritime Archaeology*, 3-24.

Berlin, A. (2019). At home on board: the Kyrenia ship and the goods of its crew. Daily Life in a Cosmopolitan World: Pottery and Culture in the Hellenistic Period, Proceedings of the 2nd Conference of the International Association for Research on Pottery of the Hellenistic Period,

Berti, F. (1985). La nave romana di Valle Ponti (Comacchio). *Rivista di studi Liguri*, *51*, 553-570.

Berti, F., & Palazzo, B. (1990). *Fortuna maris : la nave romana di Comacchio : [Commacchio, Palazzo Bellini 28 aprile - 31 dicembre 1990]*. Nuova alfa editoriale.

Bradley, K. (1998). The Roman family at dinner. In I. Nielsen & H. Sigismund Nielsen (Eds.), *Meals in a social context : aspects of the communal meal in the Hellenistic and Roman world* (Vol. 1, pp. 36-55). Aarhus University Press.

Bray, T. L. (2003). To Dine Splendidly: Imperial Pottery, Commensal Politics, and the Inca State. In T. L. Bray (Ed.), *The Archaeology and politics of food and feasting in early states and empires* (pp. 93-142). Kluwer Academic/Plenum.

Cassiodorus. (2019). *The Variae : The Complete Translation*. University of California Press.

Casson, L. (1986). *Ships and seamanship in the Ancient World*. Princeton University Press.

Cicero. (1913). On Duties (W. Miler, Trans.). In. Cambridge, MA: Harvard University Press.

Cicero. (1923). Pro Archia. Post Reditum in Senatu. Post Reditum ad Quirites. De Domo Sua. De Haruspicum Responsis. Pro Plancio. (N. H. Watts, Trans.). In. Cambridge, MA: Harvard University Press.

Cicero. (1999a). Letters to Atticus (D. R. S. Bailey, Trans.). In D. R. S. Bailey (Ed.), (Vol. I). Cambridge, MA: Harvard University Press.

Cicero. (1999b). Letters to Atticus, Volume II (D. R. S. Bailey, Trans.). In (Vol. Loeb Classical Library 8). Cambridge, MA: Harvard University Press.

Cicero. (2001). Letters to Friends, Volume I: Letters 1-113 (D. R. S. Bailey, Trans.). In (Vol. Loeb Classical Library 205). Cambridge, MA: Harvard University Press.

Colls, D., Domergue, C., Laubenheimer, F., & Liou, B. (1975). Les lingots d'étain de l'épave Port-Vendres II. *Gallia*, *33*(1), 61-94.

Colls, D., Étienne, R., Lequément, R., Liou, B., & Mayet, F. (1977). L'épave Port-Vendres II et le commerce de la Bétique à l'époque de Claude. *Archaeonautica*, *1*(1), 3-145.

Davey, C. J. (2016). Large merchant ships in Roman times: the Spritsail legacy, Part II.

Delgado, J. P. (2000). Underwater archaeology at the dawn of the 21st century. *Hist. Archaeol.*, *34*(4), 9-13.

Demosthenes. (1936). Orations 27-40: Private Cases (A. T. Murray, Trans.). In *Orations* (Vol. IV). Cambridge, MA: Harvard University Press.

Dietler, M. (1998). Consumption, agency, and cultural entanglement: theoretical implications of a Mediterranean colonial encounter. *Studies in culture contact: interaction, culture change, and archaeology*, 288-315.

Dietler, M. (2010). Consumption. In *The Oxford Handbook of Material Culture Studies* (Vol. 1, pp. 207-226). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199218714.013.0008

Dušanić, S. (2009). *The Valle Ponti Lead Ingots: Notes On Roman Notables'commercial Activities In Free Illyricum At The Beginning Of The Principate*.

Foley, B. P., Hansson, M. C., Kourkoumelis, D. P., & Theodoulou, T. A. (2012). Aspects of ancient Greek trade re-evaluated with amphora DNA evidence. *Journal of archaeological science*, *39*(2), 389-398. https://doi.org/10.1016/j.jas.2011.09.025

Freeth, T., Bitsakis, Y., Moussas, X., Seiradakis, J. H., Tselikas, A., Mangou, H., Zafeiropoulou, M., Hadland, R., Bate, D., Ramsey, A., Allen, M., Crawley, A., Hockley, P., Malzbender, T., Gelb, D., Ambrisco, W., & Edmunds, M. G. (2006). Decoding the ancient Greek astronomical calculator known as the Antikythera Mechanism. *Nature*, *444*(7119), 587-591. https://doi.org/10.1038/nature05357

Gibbins, D., & Adams, J. (2001). Shipwrecks and maritime archaeology. *World Archaeology*, *32*(3), 279-291. https://doi.org/10.1080/00438240120048635

Gibbins, D. J. L. (1989). The Roman wreck of c. AD 200 at Plemmirio, near Siracusa (Sicily): second interim report: The domestic assemblage 1: medical equipment and pottery lamps. *International Journal of Nautical Archaeology*, *18*(1), 1-25. https://doi.org/10.1111/j.1095-9270.1989.tb00169.x

Gibbins, D. J. L. (1991). The Roman wreck of c. AD 200 at Plemmirio, near Siracusa (Sicily): third interim report: The domestic assemblage 2: kitchen and table pottery, glass, and fishing weights. *International Journal of Nautical Archaeology*, *20*(3), 227-246. https://doi.org/10.1111/j.1095-9270.1991.tb00316.x

Gibbins, D. J. L., & Parker, A. J. (1986). The Roman wreck of c. AD 200 at Plemmirio, near Siracusa (Sicily): Interim report. *International Journal of Nautical Archaeology*, *15*(4), 267-304. https://doi.org/10.1111/j.1095-9270.1986.tb01154.x

Graham, S. (2006). Networks, Agent-Based Models and the Antonine Itineraries: Implications for Roman Archaeology. *Journal of Mediterranean archaeology*, *19*(1), 45-64. https://doi.org/10.1558/jmea.2006.19.1.45

Greene, K. (1992). *Roman pottery*. University of California Press ; London : British Museum.

Hannah, R. (2018). The Inscriptions of the Antikythera Mechanism. *Aestimatio : Critical Reviews in the History of Science*, *13*, 1-9.

Hansson, M. C., & Foley, B. P. (2008). Ancient DNA fragments inside Classical Greek amphoras reveal cargo of 2400-year-old shipwreck. *Journal of archaeological science*, *35*(5), 1169-1176. https://doi.org/10.1016/j.jas.2007.08.009

Horace. (2004). Odes and Epodes (N. Rudd, Trans.). In L. C. Library (Ed.), (Vol. 33). Cambridge, MA: Harvard University Press.

Horden, P., & Purcell, N. (2000). *The corrupting sea : a study of Mediterranean history*. Blackwell.

Juvelier, B. (2017). "Salvaging" history: underwater cultural heritage and commercial salvage. *American University International Law Review*, *32*(5), 1023-1045.

Livy. (2018). Books 38-40 (J. C. Yardley, Trans.). In *History of Rome* (Vol. XI). Cambridge, MA: Harvard University Press.

Longus. (2009). Daphnis and Chloe (J. Henderson, Trans.). In *Loeb Classical Library* (Vol. 69, pp. 3-199). Cambridge, MA: Harvard University Press.

Martin, C. (2013). Wreck-Site Formation Processes. In (1 ed.): Oxford University Press.

Martínez ferreras, V., Capelli, C., Jézégou, M.-p., Salvat, M., Castellvi, G., & Cabella, R. (2015). The Port-Vendres 4 Shipwreck Cargo: evidence of the Roman wine trade in the western Mediterranean. *The International journal of nautical archaeology*, *44*(2), 277-299. https://doi.org/10.1111/1095-9270.12109

Meijer, F. (1986). *A history of seafaring in the classical world*. Croom Helm.

Miracle, P., Milner, N., & Albarella, U. (2002). *Consuming passions and patterns of consumption*. McDonald Institute for Archaeological Research.

Morgenstein, M., & Redmount, C. A. (2005). Using portable energy dispersive X-ray fluorescence (EDXRF) analysis for on-site study of ceramic sherds at El Hibeh, Egypt. *Journal of archaeological science*, *32*(11), 1613-1623. https://doi.org/10.1016/j.jas.2005.05.004

Muckelroy, K. (1978). *Maritime archaeology*. Cambridge University Press.

Mullins, P. R. (2011). The Archaeology of Consumption. *Annual review of anthropology*, *40*(1), 133-144. https://doi.org/10.1146/annurev-anthro-081309-145746

Nicholas, R. (1978). Pattern and Purpose in the Antonine Itinerary. *American journal of philology*, *99*(2), 228-254. https://doi.org/10.2307/293648

Nieto, J. (1986). El pecio Culip IV : observaciones sobre la organización de los talleres de Terra sigillata de La Graufesenque. *Archaeonautica*, *6*, 81-115.

Opdebeeck, J. (2005). *Shipwrecks and amphorae: Their relationship with trading routes and the Roman economy in the Mediterranean* University of Southampton].

Parker, A. J. (1992a). *Ancient shipwrecks of the Mediterranean & the Roman provinces* (Vol. 580). B. A. R.

Parker, A. J. (1992b). Cargoes, containers and stowage: the ancient Mediterranean. *International Journal of Nautical Archaeology*, *21*(2), 89-100. https://doi.org/10.1111/j.1095-9270.1992.tb00351.x

Parker, A. J., & Price, J. (1981). Spanish exports of the Claudian Period: the significance of the Port Vendres II wreck reconsidered. *The International journal of nautical archaeology*, *10*(3), 221-228. https://doi.org/10.1111/j.1095-9270.1981.tb00032.x

Paton, W. R., & Tueller, M. A. (1918). Book 10: The Hortatory and Admonitory Epigrams (W. R. Paton, Trans.). In *The Greek Anthology* (Vol. IV). Cambridge, MA: Harvard University Press.

Peacock, D. (1978). The Rhine and the problem of Gaulish wine in Roman Britain. In J. d. P. Taylor & H. Cleere (Eds.), *Roman shipping and trade: Britain and the Rhine provinces* (pp. 49-51).

Peña, J. T. (2007). *Roman pottery in the archaeological record*. Cambridge University Press.

Pomey, P. (1997). L'art de la navigation dans l'Antiquité. *Publications de l'Académie des Inscriptions et Belles-Lettres*, *7*(1), 89-101.

Robinson, D., Wilson, A., & Oxford Centre for Maritime, A. (2011). *Maritime archaeology and ancient trade in the Mediterranean*. Oxford Centre for Maritime Archaeology.

Safronov, A. N. (2016). Antikythera Mechanism and the Ancient World. *Journal of Archaeology*, *2016*, 1-19. https://doi.org/10.1155/2016/8760513

Schucany, C. (2005). Cooking like a native, dining like a Roman: food preparation and consumption in Roman Switzerland. In D. M. H. Maureen Carroll, Hugh Willmott (Ed.), *Consuming passions: dining from antiquity to the eighteenth century* (pp. 39-48). Tempus.

Seiradakis, J. H. (2012). The Antikythera Mechanism: From the bottom of the sea to the scrutiny of modern technology. From Antikythera to the Square Kilometre Array: Lessons from the Ancients,

Spataro, M., & Villing, A. (2015). *Ceramics, cuisine and culture : the archaeology and science of kitchen pottery in the ancient Mediterranean world*. Oxbow Books.

Stewart, D. J. (1999). Formation processes affecting submerged archaeological sites:An overview. *Geoarchaeology*, *14*(6), 565-587. https://doi.org/10.1002/(SICI)1520-6548(199908)14:6<565::AID-GEA5>3.0.CO
2-F

Torpy, R. E. (2015). Grave robbers or archaeologists? Salvaging shipwrecks. *Journal of Maritime Law and Commerce*, *46*(1), 83-103.

Trego, K. M. (2004). *Life on Board: A comparative study of the shipboard items from four classical to early hellenistic merchantmen* University of Cincinnati].

Trego, K. M. (2019). For Sale or Sailors? Towards a Galley Ware Functional Designation Methodology. *Journal of Maritime Archaeology*, *14*(2), 273-289.

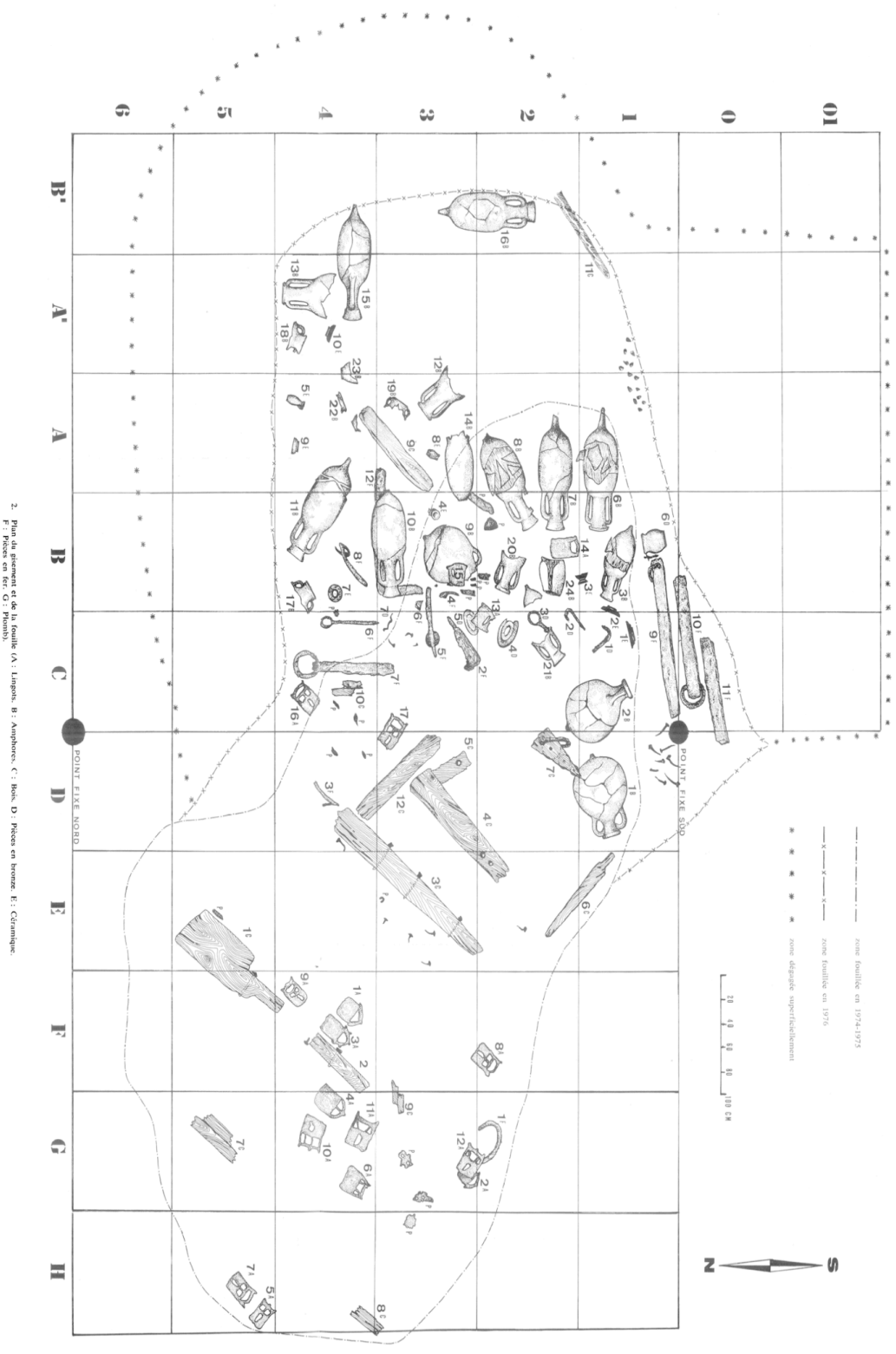
Wright, M. T. (2001). The Antikythera mechanism. *Astronomy & Geophysics*, *42*(9).

Wright, M. T. (2007). The Antikythera mechanism reconsidered. *Interdisciplinary science reviews*, *32*(1), 27-43.

9. Appendix

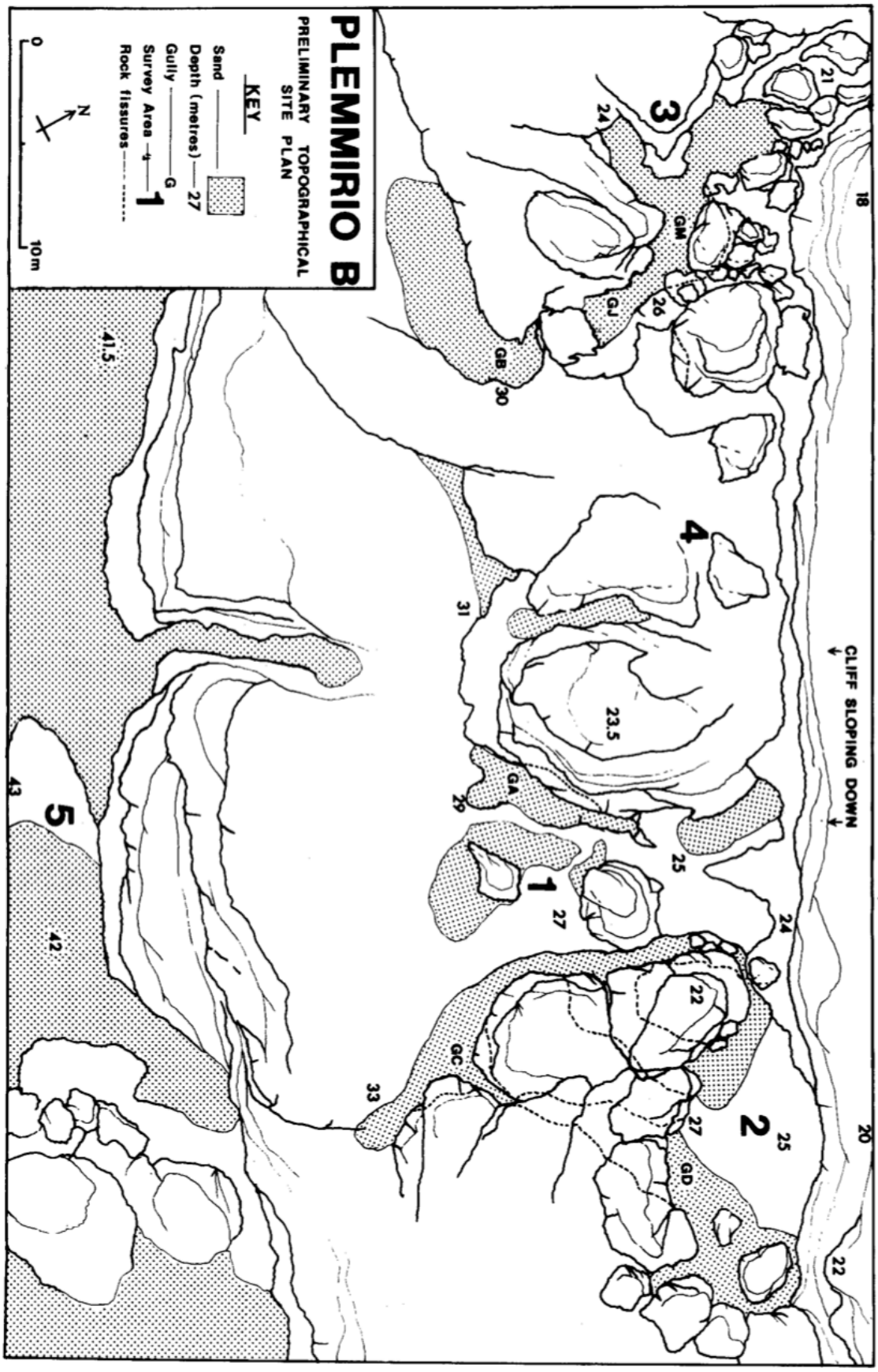
9.1 Maps

Map 1. Port-Vendres II site plan (Colls et al., 1977, p. 10)

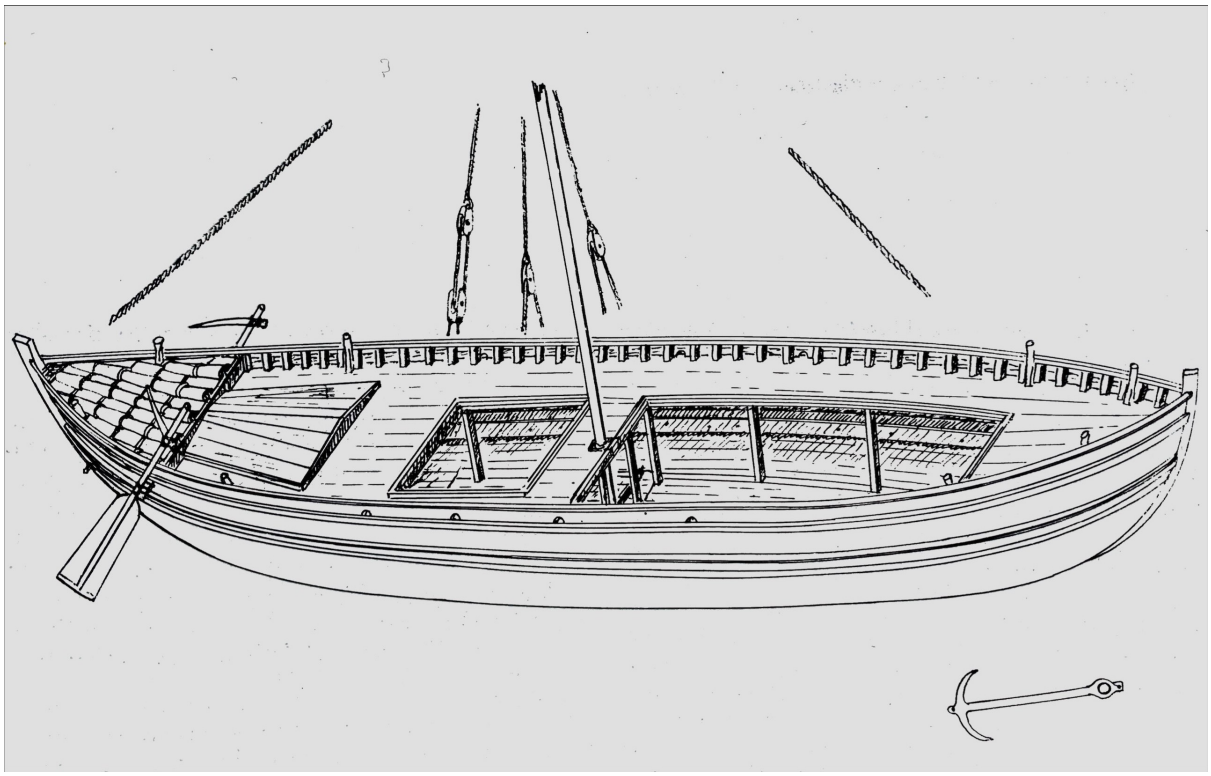


2. Plan du gisement et de la fouille (A : Lingots. B : Amphores. C : Bois. D : Pièces en bronze. E : Céramique. F : Pièces en fer. G : Plomb).

Map 2. Site plan Plemmirio B (Gibbins & Parker, 1986, p. 271)



Map 3. Reconstruction of the Valle Ponti ship (Berti & Palazzo, 1990, p. 38).



9.2 Catalogue

9.2.1 The Port Vendres II

Because Colls and his co-authors have divided up their catalogue after the materials the objects are made of there are some overlapping numbers. In this thesis they are divided by form, so a letter is added to each group to avoid any confusion. A for amphorae, C for coarse wear (what Colls calls common ceramics), L for lamps, M for miscellaneous objects and T for thin walled ceramics. Listed below in a catalogue is the materials that fulfils two or more of the selective criteria set fourth earlier. It is translated and re-written from Colls et al. (1977, pp. 78-127).

Amphorae

41 A. This Pompeii VII amphora was reconstituted but the point is missing. Height 80.5 cm and the maximum diameter of the body 37.5 cm. It has the same cylindrical body and long neck as the others found on the ship. The handles are attached under the rim and on the shoulder. At the height of the lower attachment of the handles, almost in the middle there is an

inscription in two lines that reads; C IVLI / APOLLON. This suggests that the amphora was bought from a *C. Iulius Apollonius*. It is adorned with graffiti that was incised after firing. An arrow goes up to the name of Apollonius, on the other side of the neck is a cross, a large ridge-shaped design, and above all of this are the letters PSC. The same engraving can also be found on shards belonging to cooking vessels (Colls et al., 1977, pp. 78-79).

Casseroles

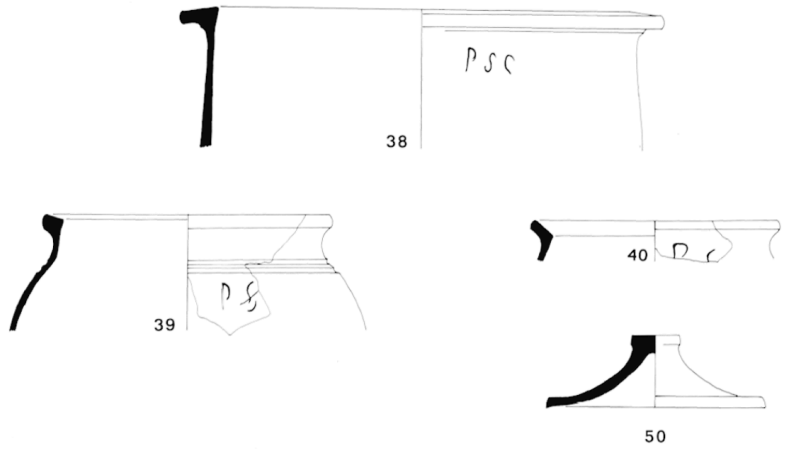


Figure 4 The three fragments of pottery that are engraved with the letters PSC, 38 C, 39 C, 40 C and a complete lid 50 C.

38 C. Three fragments of a large and deep casserole. It is wide with an almost horizontal rim and almost vertical wall. Made from a red ochre coloured clay that is not very homogeneous. the internal diameter is 28 cm. The outer wall is blackened by fire or smoke and has been smoothed. Graffiti on the outside wall, engraved under the edge after firing are the letters PSC.

Pots

5 M. Bronze pot with a tapered body, flared neck and a rim that is folded over in a rounded shape. Found in square B 1 and the metal is very corroded. Height 22.5 cm, maximum diameter of the body 20.7 cm and diameter of the foot 14.3 cm. These measurements are approximate due to the corrosion. The handle is surmounted by a thumbpiece in the shape of a leaf, directly underneath it has two arms decorated with volutes. At the curvature on point furthest from the body of the vessel a median groove begins and as it moves towards the lower end it widens and curves in volutes. This handle is 14 cm long, the width from one end of its arms to the other is 9.2 cm and at its thickest point it is 1.3 cm. These measurements are exact as it was possible to restore the handle.

31 C. Fragment of a pot with what probably was two thick handles with a fine groove. One is missing. The rim is vertical and is curved on itself and has a diameter of 9 cm. Made from light grey clay and has a yellowish ochre coloured outer surface.

33 C. Small fragment of a pot with two handles. The rim is curved and moulded outwards, measuring 10 cm in diameter. Made from a yellowish ochre coloured clay that is rather coarse.

39 C. Fragment of a large pot made from red ochre coloured clay that contains a few grains of mica. The rim is 20 cm in diameter. The outer surface is blackened, especially towards the edge. Graffiti engraved on the shoulder reading P S [.], likely missing the C.

40 C. Small fragment of a pot made from brown ochre clay, unrelated to that of the two previous vessels. The rim would have been 17 cm in rim diameter. Same graffiti, P S [.].

32 C. Fragment of a small pot with two handles. The rim is oblique and 7 cm in diameter. The wall is relatively thin. Made from a pinkish ochre coloured clay that is fine and well fired. It has a yellowish ochre slip on the outside.

34 C. Rim fragment of a pot, 10 cm in diameter, no trace of handles. Made from a pink ochre coloured clay, well fired. The outer surface is yellow ochre coloured and there is traces of light brown pitch on the inner wall.

36 C. Bottom fragment of a pot made from yellowish ochre coloured clay, diameter of the foot is 8.2 cm. The inside has abundant traces of brown pitch.

37 C. Fragment of the bottom of the pot made from yellowish ochre coloured clay, diameter of the foot is 10.2 cm. The inside has abundant traces of brown pitch.

41 C. Two fragments of a pot with a thick rim that curves outwards. Rim diameter 13.2 cm. It has a very wide handle that is fastened right under the edge, with a single groove. Made from yellowish ochre clay and has a rough surface along with some traces of pitch inside.

42 C. Several small rim and body fragments of a pot with two thick handles that is hollowed out with a wide groove. The wall is thin, and the rim has an oblique shape for receiving a lid. Rim diameter is 15.2 cm. Made from light ochre coloured clay that is slightly pinkish or greyish depending on the sector. It also has a fine black degreaser in the fabric and traces of pitch on the internal wall.

43 C. Fragments of the upper part of a pot with two handles that are thin flat hollowed out with a fine groove. The wall is relatively thin, and the rim has a characteristic internal hook and a diameter of 11.2 cm. Made from a pinkish ochre coloured clay with the wall being yellow ochre. The inside is completely covered with a brown pitch.

Saucepans

44 C. Fragmentary saucepan with a slightly oblique wall, the rim is hollowed out with a small groove to be able to accommodate a lid (number 49 C for example adapts very well to it). The rim has a diameter of 26 cm and the dish has a convex bottom. Made from red ochre coloured clay, rather fine, with traces of a brownish slip on the outside, blackened by fire.

2 M. The upper part of a bronze saucepan, found in square C2, the handle has a suspension hole at the end. Rim diameter 9.7 cm, thickness of the edge 0.8 cm, handle length 14 cm and thickness 0.9 cm. Fig. 44.

3 M. Bronze container bottom found near 2 M. It is probable that this belongs to this saucepan.

Lids

48 C. Fragment of a lid made from red ochre coloured clay. Rim diameter is 29 cm. The inside of the rim is slight traces of soot. Would probably have been used to cover a saucepan.

49 C. Fragment of a lid made from a brown clay that is rather coarse. Rim diameter is 28 cm. would probably have been used to cover a saucepan.

50 C. Complete lid that is totally different from the previous two. It has a gripping button that is placed off-centre. Rim diameter is 15 cm. Made from an iron grey coloured clay that has a rough surface. Made to cover a pot.

Mortars

45 C. Fragment of the upper part of a mortar with a hooked edge. not possible to determine the rim diameter. Made from pinkish ochre coloured clay.

46 C. Possibly a fragment of mortar made with red ochre coloured clay with the outer wall being yellow ochre. Diameter indeterminable.

47 C. Fragment of mortar made from pinkish ochre coloured clay. The outer wall yellow ochre, as in the previous fragment. Diameter indeterminable.

Jugs

30 C. Small jug, almost complete with a single handle that has an internal groove, which is unusual. Rim diameter 3 cm, height 16.3 cm. The bottom is slightly domed, so it is a little unstable. Made from light ochre clay, the surface is not smooth.

Drinking vessels

28 T. Two fragments belonging to the body of a goblet. Made from ochre clay with a polished outer wall and decorated with a comb pattern, group of three incisions. The profile suggests that it is of italic origin.

Bowls

1 M. A small white tin bowl was found in square A'4. It had to be straightened out by hand as it was completely crushed. Rim diameter is 11.5 cm, bottom diameter is 5.6 cm, 4.2 cm in height and the wall thickness is not the same along the wall but varies from 0.2 to 0.3 cm.

35 C. Several fragments of a bowl that has been partially reconstructed. It is low, wide and has a protruding body. Diameter at the widest point is 13.2 cm and height 7.3 cm. At the widest point there are two moulded studs that are 2.5 cm wide which could help to grip the bowl. Made from dark grey clay that is well fired, hard with some fine particles of mica. It is lighter in colour on the inside and has a smooth and polished outer surface.

Plates

4 M. Two large bronze plates found in squares C2 and C3, badly damaged. The first plate is round and has a diameter of 25-26 cm with a retained height of 4 cm and thickness of 0.4 cm. Has traces of tinning. The second plate was crushed and crumbled as it is encrusted with marine concretions. It has an oval shape with an approximate length of 40 cm and width 26.3 cm. The thickness is 0.9 to 1.5 cm, but it is difficult to determine since the encrusted layer has not been removed.

Other

Among the small miscellaneous finds is a spoon made of bone. Broken and in three pieces; two belong to the handle while the last is the bowl. When put together it measures 8.4 cm in length. It is however important to note that the three pieces do not conform perfectly to each other. Three other bone pieces was also found, one in the shape of an arrowhead, bit it is not possible to determine what these objects might have been (Colls et al., 1977, pp. 123-127).

A small cylindrical box with fishing hooks was found in square B2. It is made of boxwood, 9.5 cm high, with a diameter of 3.1 cm. the lid is gone but it still contained five hooks; three smaller and two that is of a larger size (Colls et al., 1977, p. 123). There are also a good quantity of almonds found scattered at the site, mostly in the south-eastern part (Colls et al., 1977, p. 7).

Two bronze strigils were located in squares Cl and C2. The metal on the first is quite damaged. The measurements are 25.8 cm in length, the handle is 2.1 cm wide and 0.7 cm thick while the curved spoon is 1.4 cm wide. The second has on the other hand been exceptionally well preserved. 28.4 cm in length, handle width 1.8 cm with an average thickness 0.6 cm while the spoon is 1.4 cm wide. It also has a rectangular recess through the side on the upper part of the handle which made it possible to put it on a belt or a ring. Both have two similar stamps with raised letters reading IANVARI, with ligature of YV and VA, on the internal face and at the base of the handle (Colls et al., 1977, pp. 123-126).

Lamps

All catalogue information from Colls et al. (1977, p. 105).

1 L. Small wall fragment made from a greenish clay, it has a brown slip that is light and partly disappeared.

2 L. Fragment of a nozzle with the start of a volute made from a light ochre coloured clay that is fine, hard and well fired. Orange-brown slip that is shimmery and shiny.

3 L. Two small fragments of a disc decorated with a figure that is probably female, which carries the handle of some tool on her left shoulder. Light ochre coloured clay, fine, hard and well fired. It has a slip that is brown and shiny.

4 L. Complete lamp without the handle, type Dressel 11. Light ochre coloured clay with a light brown slip that is a little lustrous and shiny in some places. Diameter 7.4 cm, length 10.8 cm and height 2.9 cm. It has a rounded nozzle that is connected to the disc by two somewhat flat volutes. Concave disc surrounded by four circular mouldings of different sizes. The feed hole for the oil is to the side due to the décor. Vent hole in the mouldings surrounding

the disc. Disc decorated with a relief depicting Ocean's head. Slightly convex bottom with a makers' mark.

9.2.2 The Plemmirio B

Listed below in a catalogue is the materials that fulfils two or more of the selective criteria set fourth earlier. Re-written, as much as possible without losing context and information, from the three field reports (Gibbins, 1989, pp. 7-19, 1991, pp. 229-299; Gibbins & Parker, 1986, pp. 279-299). Since they were listed in categories with overlapping numbers the find ID numbers will be used here to avoid confusion.

Amphoras

One pear shaped Mauretanian Dressel 30 amphora was probably made in or around Tubusuptu, modern Tiklat, in what is now Algeria. Tubusuptu was important in regard to olive growing and it has therefore been suggested that the Mauretanian amphoras was used to transport olive oil. But since there were pitch found lining the inside of the sherds from the wreck it was postulated that the amphora did not contain olive oil at the time of the shipwreck and therefore likely may have been in secondary use. An intact pear-shaped amphora made with a Tunisian fabric and manufacture identical to the Africana 2A and 3B amphoras from the ship's cargo. Part of a side-handled amphora, very similar to Tripolitana 2 form, was also found along with two other amphora handles in association with the domestic material in gully M (Gibbins, 1989, p. 7).

Jars

PL85/73. A base from what might have been a jar. Orange fabric with cream surface, dense and with inclusion of quarts and limestone.

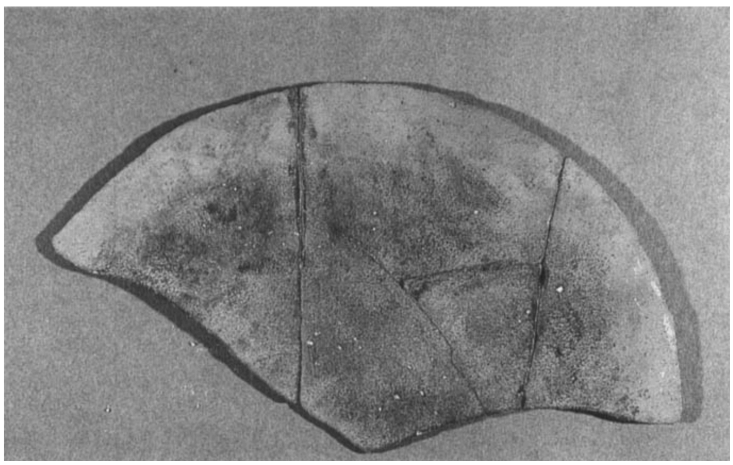


Figure 5 Saucepan PL83/26-28

Saucepans

PL83/26-28, PL85/36A-B. Saucepan with a maximum rim diameter of 29 cm and a height of 12.5 cm. Reconstruction of a complete profile was possible since the fragments was very well preserved and included much of the rim, sides and the base. The fabric was a hard, coarse orange-red clay with tiny micaceous and white inclusions, characteristic for North Africa. As is its morphology known as Van der Warff 12, which is Tunisian. Date estimated to mid 2nd to mid 3rd century AD. Wheel-rigged and there was an ash-grey wash that covered the outer surface from the edge of the base to the top of the rim. The base and lower parts had soot and oxidation discolouration which indicates that the vessel was used by the ship´s crew. Found almost completely buried under an encrustation layer in gully A.

PL85/100. Saucepan with fabric and patina similar to PL83/26-28, PL85/36A-B. Possibly Tunisian as similar has been found in Raqqada from around mid 2nd to mid 3rd century AD.

PL85/120. Saucepan with its base missing, made from a dark, micaceous fabric. Origin unknown.

PL85/85. Saucepan with its base missing. Fabric similar to PL83/26-28, PL85/36A-B and therefore probably Tunisian.

PL85/36, 79. Saucepan with a worn base and a light-orange slip. An African red-slip of the type Hayes 23B from the late Antonine-Severan period.

PL83/29. Large flat-rim saucepan with its base missing. Found in area 3 with the remnants of the hearth, north-west of gully M. The fabric was fairly hard and varied in colour from light yellow brown to purple brown with many large inclusions that were angular and dark. It is a common Roman type saucepan from central Tyrrhenian region in Italy. This type is very common in the Imperial period. Morphology, especially the riled top and toothed rim suggest that it can be dated closer to 2nd to 3rd century AD. The saucepan has an approximate external diameter of 38 cm with the thin, flat ledge rim protruding about 4.5-5.3 cm from the vertical line of the neck, terminating on the underside with a chamfered ledge.

PL87/12. Small flat-rimed saucepan with a purple-brown, hard and gritty fabric. Probably from Raqqada, Tunisia.

Lids

PL85/82, 84. Saucepan lid. Fabric and patina as PL83/26-28, PL85/36A-B but it has a blackened outer surface towards the rim.

PL85/56, 96. Saucepan lid with similar shape as PL85/82, 84 but smaller in size. The lid matches saucepan PL83/26-28, PL85/36A-B and flat-bottomed pan PL85/81 perfectly. This type lid was very common during the Imperial period so it cannot be dated more precisely.

PL85/53, 136. Small rim fragment, possibly from a lid-plate, with a light orange slip. The piece is worn, and it is not possible to determine the original objects' form.

Pans

PL85/81. Wide-mouthed flat-bottomed pan with the same fabric and finish saucepan PL83/26-28, PL85/36A-B. Probably Tunisian due to these similarities and there are parallels from Raqqada from the mid 2nd to 3rd century AD.

Mortars

PL87/6B. Small, lugged, stone mortar, probably sandstone but very degraded.

PL85/102. Probably a large mortar made from a hard, fine fabric with some inclusions. The base is thick and heavy so it would have been suitable for grinding, but it could also have been a storage vessel, since no parallels have been found it is difficult to discern its function.

Jugs

PL85/78A-C. Small single-handed jug with a sandy yellowy-beige fabric containing limestone inclusions typical of Carthage. Might have had a cream surface but it is worn. It is an Early Roman type 4 jug possibly dating to the mid 2nd to 3rd century AD.

PL85/123. Small jug, possibly without a handle and with a concave outer rim. Made with a fabric similar to PL85/78A-C.

PL85/88. Small, single-handled jug. The fabric is hard and coarse with few inclusions, a light orange colour and cream patina.

PL85/80. Small, handle less made from a fabric similar to saucepan PL83/26-28, PL85/36A-B. It also has the same patina.

PL85/59. Small, handle less jug made from a brittle, sandy fabric with a buff-orange colour.

PL85/55. Strap-handle from a glass bottle or a jug, thick and angular, flat on the outer surface with folds against the outer side of the rim. Broken off at the neck and shoulder joints.

Colourless but with some small blue streeks, iridescent and many air bubbles. Very worn. No measurements recorded. Found in gully M.

Bowls

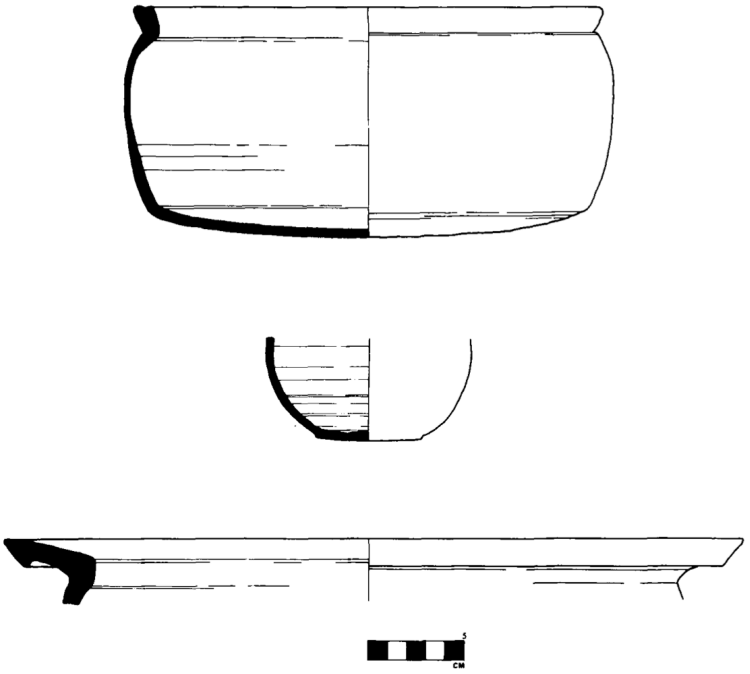


Figure 6 Casserole (PL83/26-8), bowl (PL74/4,5) and saucepan (PL83/29).

PL74/4, 5. Small bowl with a missing base, found in area 1, right beside gulley A. Measuring no more than 6.2 cm in height and 10.6 cm in diameter. The fabric of the sherds was fine, hard and light orange coloured with inclusions so small that they are insignificant. The bowl is probably North African and there were no indications that it once had an external slip or wash. There were no diagnostic sherds, so the shape is uncertain, and the fragments was very worn.

PL85/54, 134. Small bowl with fabric similar to saucepan PL83/26-28, PL85/36A-B. Surface very worn so there are no remnants of any patina.

PL85/60. Flat base with concave profile that might have been from a bowl. Fabric similar to PL85/59 but worn.

PL85/116A-B. Base of a shallow glass bowl, worn and slightly misshapen. The low base-ring was added separately and has tool marks on the outside. Colourless with some striations and less air bubbles than what was found in PL85/55. A little over 7 cm wide but no exact measurements recorded. Found in gully M.

Lamps

PL85/96. Top part of the oil chamber of an African lamp with a piece of the sallow sloping shoulder and rim, but was missing its handle, nozzle and lower part of the oil camber. The fabric was cream-buff clay that possibly had an orange wash. It has a concave discus

decorated with a reclining antelope that is flanking the filling hole and the shoulder adorned with an olive-wreath. The piece measures 6.6 cm I width and 1 cm in hight, it is also worn down. The determination that this lamp is African comes from a parallel lamp found in Raqqada, Tunisia.

PL85/46. Base of the lamps oil camber, lower part of the nozzle along with some of the shallow, sloping rim with a small part of the concave discus was found. The lamp was very worn and the handle, most of the shoulder and the upper central part of the nozzle were missing. Due to its condition the decoration on the shoulder is hard to see, but it was found to be an olive-wreath and ivy pattern between regularly spaced pair relief dots. Measurements for the lamp was 7.3 cm in width and 2.6 cm in height. The fabric was cream-buff clay with a brown wash on the base. It has been suggested that the lamp is of African origin but with such a small piece of decoration and limited number of surviving features it is impossible to give a definitive answer.

PL85/95. What remained of a third lamp was the concave discus on the top of the oil chamber along with parts of the rounded shoulder and sloping side wall, with the handle still attached. Its handle has a hole and the outer face has two grooves running along each edge. Faint grooves also mark off the shoulder. The nozzle was completely gone and only a very small fragment still remained of the base. Made of light cream-buff clay. The lamp is 7.3 cm wide and the body is 2.2 cm high, the handle 3.7 cm. Shoulder is decorated with a ring and dot pattern, the discus has five lines radiating out from the filling hole that terminates before they reach the two deep groves that defines it from the shoulder. This impressed ring and dot pattern is most often found on lamps made in central Italy so that is the most likely origin.

PL85/138. This lamp is almost complete with only the top part of the handle missing, it is however quite abraded. It is still possible to discern that the lamps decoration is a pair of palm branches flanking the filling hole on the concave discus. The shoulder is shallow, and sloping marked of by two groves, the sides slope down to a shallow base-ring. Base has a stap, IVNDRA. The nozzle is flat-topped and almost heart-shaped, marked of from the shoulder by semi-circular groves. Lamp is 7.6 cm wide, 10.6 cm in length and 2.7 cm high, made of light cream-buff clay. Morphological features point to an Italian origin, more precisely central Tyrrhenian. An identical stamp can also be found on an Italian Loeschcke 8 lamp from Rome and a few others with varying decorations. It is probably of the same type made by a lamp maker that was active around AD 175-225.

Other

PL85/115. Pottery tube that is closed at one end. The fabric is sandy with many inclusions, light orange with a cream-green surface. It also has faint spiralling corrugations on the surface. Since there are no parallels for this item it is difficult to know its function but some of the possibilities are a part of the hearth structure, for stabilizing cargo, a goblet or a vaulting tube.

PL87/10. Small conical, lead fishing weight, poorly formed and partially flattened. 2.2 cm high with two open tangs for making a hole. Badly preserved as it is highly corroded. Found in the base layer of gully A.

Three bronze scalpel handles and a piece of wood, possibly a bandaging stick, was found at the bottom of gully A. The bronze handles were well preserved but only traces remain from the scalpels' iron blades. This is probably a small part of larger tool kit and are the first clear evidence of surgical instruments onboard a ship. The scalpels found might have been used for the very specialised discipline of ocular surgery and their specialised nature suggest that they probably belonged to a traveling surgeon and not used by the crew (Gibbins, 1989, pp. 7-8).

9.2.3 The Valle Ponti

Translated and re-written from the work of Berti and Palazzo (1990, pp. 192-285). As the numbers for the whole assemblage are sequential and not divided into groups based on the types of finds all the items listed have the numbers they were assigned originally.

Storage containers

104. (inv. 53367) *Contenitore*, container of micaceous clay, fine, reddish in colour with a slip. Height 46.3 cm, rim diameter 5 cm, diameter at the widest point 24.5 cm and foot diameter 9.3 cm. Collar rim with edge marked on the outside by a rounded band. Cylindrical neck. The shoulders are very swollen, the body is ovoid, the foot is circular and the bottom convex. The handle has raised edges, is arched and joins the neck to the median part of the shoulder. Turning grooves on the body.

125. (inv. 52937) *Olla*, container for food storage made from clay with a rough surface, yellowish hazelnut colour covered with grey slip. Slightly flared rim with rounded edge, very

short neck with a slight edge that separates it from the bulging shoulder. Ovoid body on a flat base.

183. (inv. 52938) *Olla*, container. Height 19.2 cm, rim diameter 12.3 cm and foot diameter 11.5 cm. Porous and micaceous clay, on the surface it has a pink chamois colour. Circular mouth with flared rim, short and wide cylindrical neck marked at the narrowest part by a groove. Round body and a broad flat foot. The two handles join the lip to the shoulder.

Amphorae

103. (inv. 52946) Amphora with painted inscription. Height 50 cm, rim diameter 12 cm and foot diameter 13.5 cm. Fine, micaceous and porous clay, covered by a thick cream-colored slip and irregularly mottled due to its position. Rim with shaped strip both outside and inside to support the lid. Short cylindrical neck, very swollen shoulder, ovoid body, ring-shaped foot. The handles are flattened, they join the neck to the shoulder at a sharp angle. The inscription denotes weight in litres. Stopper (inv. 52947), height 1.7 cm and diameter 10.5 cm. Made from fine and purified clay with a slip. Discoidal shape with a cylindrical grip.

105. (inv. 52964) Chian amphora, from Chios, with engraved inscription. Height 92.5 cm, rim diameter 10.5 diameter at the widest point 30 cm. Porous clay with mica, pinkish slip gradating to hazelnut with patches. Rounded rim, slender and cylindrical neck, short sloping shoulder that is clearly distinct from the body, tapered and ending with a tip. The graffiti reads CWCIKPATOY which translates to [amphora] of Sosicrates. The name is attested to the Rhodian area.

106. (inv. 53370) Amphora, from Kos, with painted inscription. Height 90 cm, rim diameter 12.5 cm and diameter at the widest point 32 cm. made from porous fine clay, micaceous, reddish yellow in colour with a hazelnut slip. Rounded rim, short and cylindrical neck marked at the base by a groove, short and hanging shoulder and an ovoid body ending with a tip. The handles are raised and bent at an angle, set below the rim and at the end of the shoulder. The inscription painted in dark ink by brush, on the shoulder, in two lines. As there is only a fragment what it reads is not conclusive but most likely it is; wine, old. The old referring to aging of the wine.

107. (inv. 53426) Amphora, from Kos, with painted inscription. Height 82, rim diameter 11 cm and diameter at the widest point 32.5 cm. Made from micaceous and porous clay, pale brown with a pale pinkish slip. Inscription painted in dark ink, by brush, on the shoulder in two

lines. Though the inscription is faded a date notation is recognized in the first line, the rest is very uncertain, but a possible interpretation is that the content was meant to be drunk.

108. (inv. 52961) Amphora made from fine and compact micaceous clay, very pale brown in colour with a pinkish slip. Height 90 cm, rim diameter 12.5 cm and diameter at the widest point 39 cm. Rounded rim, neck flared towards the shoulder which is wide and sloping. The ovoid body ends with a short round tip. The handles are almost folded at an angle, join the top of the neck to the middle of the shoulder.

109. (inv. 57103) Amphora, Italic of the type Dressel 6 A, made from pale white clay in a fracture and a greyish white slip. Height 100 cm, rim diameter 17 and diameter at the widest point 39.5 cm. Banded rim with a shaped neck, short shoulder, oblique and marked where it connects with the body. The body is ovoid and progressively expands towards the tip, which is long. The handles are close to the wall and join the neck to the shoulder.

Cauldron

178. (inv. 59659) *Calderone*, cauldron with an estimated diameter of 40 cm as it is quite deteriorated. Made from bronze, a wall-mounted vessel that is very thin, presumably rounded in shape, with an everted and folded edge. Also belonging to the cauldron is two bronze handles (inv. 59660 and inv. 59661). Ring handles, with the ring hanging from a moulded eyelet and joined to the walls by means of a crescent shaped attachment, secured by small pins. Both are 11 cm in length and the diameter of the is ring 6.8 cm. the second handle is more deteriorated.

Pots

180. *Olla*, bronze pot. Height 24 cm, diameter of 16 cm at the foot. Rounded and slightly prominent rim, distinct neck with an oblique profile, body with convex walls, flat bottom.

126. (inv. 52943) *Pentola*, pot made from porous and compact clay with inclusions whose surface colour is a more and less dark grey. Height 23 cm and rim diameter 20 cm. the rim has an arched profile with a thickened and rounded edge. Globular body and a concave bottom. Thickened handles, small and curved, which are set on the rim and on the shoulder, indistinct from the body.

127. (inv. 52924) *Pentola*, pot made from porous clay with inclusions, dull colour, covered with a dark grey patina. Height 9.8 cm, rim diameter 10.2 and foot diameter 10 cm.

Convex rim with rounded edge, swollen body with a concave base. The flattened handles are small, arched and join the rim to the shoulder.

128. (inv. 52899) *Pentola*, pot made from a porous clay with inclusions, reddish surface colour with a slip. Height 13 cm and rim diameter 12.5 cm. Flared rim that is shaped on the inside, globular body indistinct from the shoulder. The handles are flattened and almost circular. Two engraved lines between shoulder and body.

Pans

216. (inv. 55071) *Teglia*, pan made from cast and turned bronze. Height 3.5 cm and rim diameter 22.2 cm. Protruding flat rim, basin with oblique walls and a flat bottom. Ring handle welded to the body by a tab and a round pin.

217. (inv. 55072) *Teglia*, pan made from cast and turned bronze. Height 2 cm and rim diameter 19.5 cm. Low rim with an externally convex profile. Flat bottom marked by slight prominence at the junction. No handle but there is a tab for attachment.

129. (inv. 52953) *Tegame*, pan made from porous and compact clay, reddish on the surface and a dark patina on the outside. Height 8.5 cm and rim diameter 28.4 cm. Shaped rim with internal step, bowl with curved wall and a concave bottom. Cylindrical handles, which adhere to the wall slightly surmounting it. Pair of outside engravings, about halfway up the wall.

184. (inv. 55977) *Tegame*, pan with a height of 4.7 cm, rim diameter 23 cm and foot diameter 17.7 cm. Made from clay with small inclusions and holes, grey-brown in colour. Convex wall with oblique edge, only partially grooved, flat bottom that is engraved on the outside.

Saucepans

218. (inv. 55066) *Casseroula*, saucepan of cast and turned bronze. Height 8 cm, rim diameter 15 cm, bottom diameter 8.5 cm and handle length 17 cm. Flat, slightly protruding rim. Basin with a concave profile ending in a convexity underlined by a slight rounded fairing. Flat bottom externally decorated by a motif of concentric raised circles. Rectangular handle with slightly arched edges that is also slightly raised. It has two semi-circular eyelets at the end, acting as suspension holes, flanked by small protuberances. At the attachment to the bowl

there are two half-moon holes, placed vertically, flanked by stylized swan heads. Very similar to 209 with only a slight variation in size.

209. (inv. 55063) *Casseroula*, saucepan of cast and turned bronze. Height 8.5 cm, rim diameter 16.3 cm, bottom diameter 8 cm and handle length 17 cm. Flat, slightly prominent rim. Basin with concave walls ending in a rounded convexity, underlined by a slight fairing. Flat bottom externally decorated with a motif of concentric circles in the centre. Rectangular handle with slightly arched edges that is also slightly raised. It has two semi-circular eyelets at the end, acting as suspension holes, flanked by small protuberances. At the attachment to the bowl there are two half-moon holes, placed vertically, flanked by stylized swan heads. Very similar to 218. Found with the food warmer 208.

Lids

179. (inv. 59641) *Coperchio*, bronze lid with a diameter of 26.5 cm. Circular shape with thick walls, vertical rim highlighted from above by being raised, circular ribbing on the upper face around the handle attachments.

213. (inv. 56092) *Coperchio*, lid made from oak wood. Height 1.4 cm and rim diameter 18 cm. Discoid shape with a slightly irregular edge.

Mortars

185. (inv. 52954) *Mortaio*, mortar. Height 4.6 cm, diameter rim. 24 cm and foot diameter 15 cm. Compact clay included, very pale brown with a more yellowish surface because it has an englobe. Curved, wide rim bordered internally by an incline, which opens into hole for pouring out its contents. Large basin with minute grains and a ring-shaped foot.

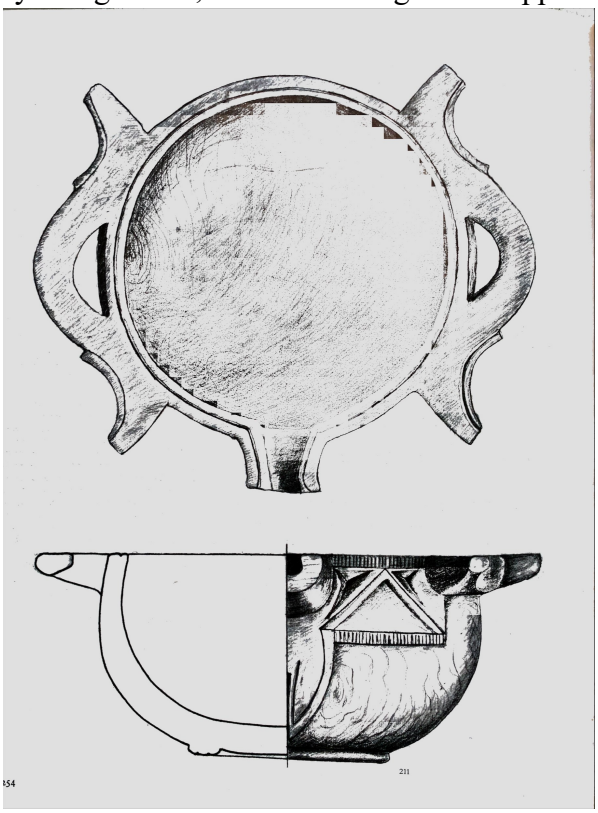


Figure 7 Mortar (211).

211. (inv. 54930) *Mortaio*, mortar carved from a single piece from maple wood. Height 7.7 cm, rim diameter 13.6 cm and foot diameter 7.6 cm. It has a hemispherical basin on a ring-

shaped foot and a slightly convex external base. On the flattened rim, two horizontal sockets with a curved profile are set diametrically opposite, ending in sinuous handles. In a central position with respect to these a small spout that can be used to pour out the contents from the inside of the container. A continuous engraving emphasizes, in the middle, the top of the rim and a similar engraving runs along the outer edges of the extension of the handles. The front, finely carved, has two triangles on the sides of the spout between horizontal bands with thick orthogonal outline, while below it is a lanceolate motif with a central carving in the lower part.

Colanders

181. (inv. 55067) *Colatoio*, fragment of colander, a perforated bowl used to strain off liquid from food, especially after cooking. The length of the handle is 21 cm and the diameter of the rim is 11.7 cm. Cast and turned bronze. Long handle with rounded end, modelled with a concave profile at the top, with a rectangular section below. The rim is rounded (this part is lost) and jutting of the bowl.

210. (inv. 55065) *Colatoio*, colander. Made from cast and turned bronze. Height 6.2 cm, rim diameter 11.4 cm, handle length 21.5 cm. Rounded jutting rim. Hemispherical cup with concave bottom. Long handle with rounded ends that has a concave profile in the upper part, rectangular in the lower. The holes on the cup walls are arranged in spirals, surmounted by a double row of denser holes.

Ladles

219. (inv. 55061) *Simpulum*, ladle made from cast and turned bronze. Height 2.3 cm, rim diameter 5.9 cm and handle length 15 cm. Enlarged and rounded rim, almost cylindrical bowl with flat bottom. Connected to the handle by two tabs, with small hooks for decoration. Composite handle with concave profile ends and central rod delimited by enlargements. Hooked end, for suspension, on the handle imitating the head of an animal (swan?), under which there are two small hooks.

220. (inv. 55059) *Simpulum*, ladle made from cast and turned bronze. Cup height 2.5 cm and rim diameter 4.5 cm, handle length 8.5 cm. Slightly prominent rounded rim on a cylindrical cup with oblique walls and flat bottom. Rectangular handle, ending in a spoon-shaped colander.

221. (inv. 59652) *Simpulum*, ladle made from cast and turned bronze. Height 2.5 cm, rim diameter 5.7 cm and handle length 6 cm. Slightly prominent rounded rim, cylindrical cup with oblique walls and a flat bottom. Rectangular handle. The inside of the bottom is decorated with four concentric circles. The external part of the handle, at the point of junction with the cup has an oblique hatch pattern between horizontal segments.

222. (inv. 55062) *Simpulum*, ladle made from cast and turned bronze. Cup height 2.2 cm and diameter 4.5 cm, handle length 16 cm. Flat rim that is highlighted externally and on top by two ribs, the cup is primarily cylindrical with a flat bottom. Handle with a rectangular section, straight, joined to the body by two welded tab appendages and ending in a slightly concave spoon shaped colander with a cracked surface.

Plates

212. (inv. 59684) *Piatto*, plate made from turned maple wood. Height 2.8 cm, rim diameter 19 cm and foot diameter 10.5 cm. It has a rim with a moulded edge and a ring foot.

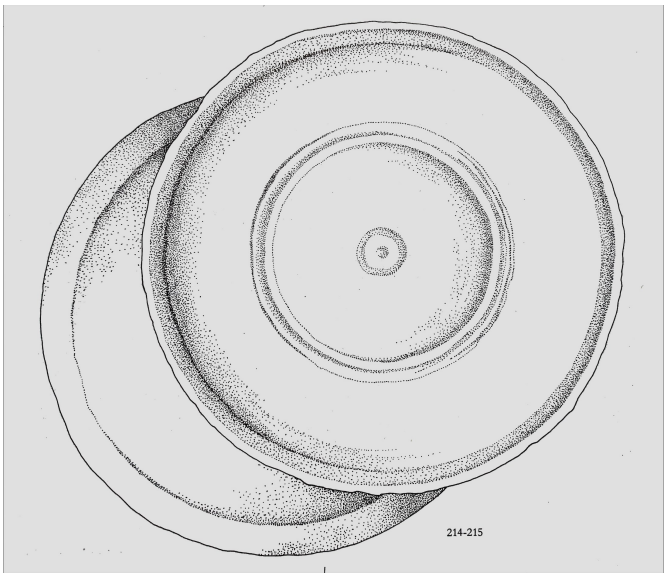


Figure 8 Bronze plates (214 and 215).

214 and 215. (inv. 59639 and inv. 59640) *Piatto*, plates made from cast and turned bronze. Height 2 cm, rim diameter 20.8 and foot diameter 10.5 cm. Rounded and everted rim. Shallow basin with an externally convex profile. Low ring foot marked by a step at the junction with the body. On the face there is a raised ring with a central dot.

Bowls

119. (inv. 52856) *Coppa*, bowl made from compact and micaceous clay, light brown in colour. Height 6 cm, rim diameter 10.3 cm and foot diameter 5 cm. The red and shiny paint also covered the foot and appears to have fallen almost completely on the outside. Rounded edge marked on the outside by an engraving, hemispherical basin, foot with an oblique ring. The handles, grooved, divide and rest on the edge forming a ring. The basin is decorated with dense and minute knurls that rise in a radial pattern from the foot.

120. (inv. 52851) *Coppa*, bowl fragment. Height 6.7 cm, rim diameter 13.5 and foot diameter 6 cm. Compact and micaceous clay, pink in colour. Dense shiny red paint. Rounded rim marked on the outside by a groove, hemispherical basin, foot with an oblique ring. A line cuts through the outside of the wall just above the foot, delimiting a band decorated with three rows that is rough and grainy that prop different patterns, one on the edge, the rest at the bottom.

186. (inv. 52939) *Ciotola*, Bowl. Height 9.2 cm, rim diameter 24 cm and foot diameter 6.7 cm. Porous and micaceous clay, friable and soft, grey in colour. Battened surface of a darker, shinier tone. High banded edge with tapered rim, truncated cone shaped basin, ring foot, apical bottom. Inside, grey and brown pebbles making the bottom rough.

187. (inv. 59663) *Ciotola*, fragment of a bowl. Height 8.4 cm and rim diameter 26 cm. Soft and crumbly clay, with sparse included, grey in colour, much darker on the surface than in the fracture. High banded edge with tapered rim, truncated cone shaped basin and a ring foot. Inside a circular incision delimited the bottom that is rough with sprinkled pebbles.

115. (inv. 55885) *Coppetta*, small bowl made from pale hazelnut clay, shiny englobe that has a light cream colour, with markings and patches. Height 4.1 cm, rim diameter 10.7 cm and foot diameter 5 cm. the bowl has a curvilinear profile with a bell-shaped rim and a ring foot. The interior is marked by three slight protrusions, the first emphasizes the edge, the rest run respectively to one and two thirds of the wall.

132. (inv. 52855) *Coppa*, fragment of a bowl made from blue glass, that is not completely transparent and has small porosities. Covered with a golden-yellow patina. Height 5.5 cm and rim diameter 16.5 cm. Flared rim with a rounded edge, hemispherical basin decorated with dense, slight ribs that has an elongated and inclined triangular shape. Inside, an incision marks the connection between the rim and the basin.

Jugs

110. (inv. 52891) *Brocca,* jug. Height 14.5 cm, rim diameter 10 cm and foot diameter 9.3 cm. Made from micaceous clay that is fine, soft and reddish yellow in colour. Red, compact and shiny paint that also covers the foot. Circular mouth with a cordoned band rim, short and wide neck, marked by a very small relief. Lowered globular belly, ring shaped foot. Handle with raised edges, on top it is stopped by a tablet from which three appendages lead out. Two of these follow the mouth for a short distance forming scallops. The third, median, is quadrangular, incised on the front, and curves upwards. The handle then ends on the belly with a mask: beard and flowing hair frame the marked features of a Silenic face.

111. (inv. 56009) *Brocca*, jug made from clay, the little that shines through has a reddish colour. Bright and thick red varnish which entirely covers the jug and is also found inside the mouth. Height 17 cm, rim diameter 4 cm and foot diameter 4.7 cm. Three-lobed and thickened rim, slender and shaped neck, swollen shoulder, truncated body and a ring-shaped foot furrowed by an incision. The handle connects the neck to the extremity of the shoulder.

124. (inv. 52941) *Brocca*, jug made from micaceous clay with inclusions, whose base colour is pink hazelnut. Height 27.5 cm, rim diameter 11 cm and foot diameter 8 cm.
Circular mouth with an everted, fluted, flat rim, irregular due to two protrusions obtained by impressing fresh clay. The neck is cylindrical, the body is globular with an indistinct shoulder and the bottom is convex. Overlapping handle which joins the mouth to the extremity of the shoulder.

112. (inv. 52889) *Brocchetta*, jug. Height 13 cm, rim diameter 8.5 cm and foot diameter 6.5 cm. Made from clay that is a little porous and micaceous. It has a yellowish pink colour, where the varnish has detached it is red, also present on the foot. Circular mouth with flared and fashioned edge. Wide shaped neck, marked at the base by a slight step, globular belly, ring-shaped foot. The handle joins the mouth to the outer part of the shoulder.

113. (inv. 52894) *Olpe*, wine jug. Height 18.8 cm, rim diameter 3.1 cm and foot diameter 6.5 cm. Micaceous and soft clay, reddish yellow, mottled due to the detachment of the paint, which is red, compact and shiny. Circular mouth with a distinct thinned edge, slender neck a little shaped, very wide shoulder, globular belly, ring foot. The thickened ribbon handle, bent at an angle, is set at the end of the shoulder and below the lip, where this is engraved by two grooves.

182. (inv. 57144) *Olpe*, wine jug. Height 28 cm, rim diameter 9.3 cm and the foot diameter 9.2 cm. Made from soft and crumbly clay covered with a thick pale and whitish slip. Circular mouth with enlarged and flared rim, slender neck that widens slightly as it approaches the shoulder. Globular body on ring-shaped foot. Angled, ribbed handle that is connected below the rim and at the end of the shoulder.

Drinking vessels

114. (inv. 55888) *Boccale*, mug made from soft, micaceous clay that is pink in colour. Red, shiny and thick varnish, which on half of the mug has assumed a creamy white tone and has detached. Height 12 cm, rim diameter 7.5 cm and foot diameter 6.5 cm. Circular mouth with rounded and thickened rim, highlighted on the outside by a slight groove. Wide and

cylindrical neck, globular and lowered body with a ring foot. The two short handles are arched and join the neck to the shoulder, on which they rest with an irregularly triangular end. Slight prominence at the junction between neck and shoulder; an engraving at the widest point on the body.

117. (inv. 52892) *Kantharos*, drinking vessel. Height 9.8 cm, rim diameter 9.6 cm and foot diameter 5.7 cm. Compact and purified reddish clay. Red paint that is stained, also present on the foot. The rim is vertically shaped, and the neck is wide and cylindrical, connected to the body by a band with prominent edges. The handles are grooved and fastened by a decorative stud, connect the rim and the bowl-shaped part of the vessel. It is decorated with phytomorphic motifs framed by ovules. Straight indented leaves with raised edges arise from a stud, accompanied by a pair of heart-shaped leaves and a pair of arched leaves. This element is alternated with chained hearts surmounted by a bud, arched leaves and corymbs (a flower cluster whose lower stalks are proportionally longer so that the flowers form a flat or slightly convex head).

118. (inv. 52929) *Tazza,* Cup. Height 13.6, rim diameter 16.3 cm and foot diameter 7.6 cm. Made from red clay that is reddish yellow in colour. Bright and thick red paint, with markings and stains, also present on the foot. High convex edge with small rounded edge, hemispherical bowl, ring shaped foot. The handles are grooved, arched, and join the rim to the tank. At the top there is an ivy leaf applied. The basin, divided by horizontal grooves, has the following decoration: hand-shaped leaves joined to each other by sinuous stems and daisies with twisted petals. Followed by ribbed bands suspended in an arch and superimposing, stopped at the top by rosettes and at the superimposed points by studs. They delimit irregularly triangular backgrounds. One sees a large flower with eight petals, two bees in flight and a running hare. And again, a four-petal flower, a left profile mask and a pair of small birds. A wreath of triple linked leaves and four-petal flowers close the composition at the bottom.

116. (inv. 52857) *Bicchiere*, glass made from compact and fine clay. Red paint, bright, with brown markings, also present on the foot. Height 12.8 cm, rim diameter 8 cm and foot diameter 3.5 cm. High rim on a slightly rounded band with a thinned edge, the shoulder is very short and goes outward in an almost 45º angle. The body is deep and rounded with a disc shaped foot. It is decorated with a band marked on both sides by a pair of engravings, inside a horizontal branch of ivy leaves and small flowers. A more complex floral ornament follows, it originates from hanging, creased bands and is held at the top by a five-petalled palmette and berries on sinuous stems surmounted by bow shaped element. To the side, at the bottom, a

small flower, then a three-petalled flower with a median calyx in fused form flanked and surmounted by helical tendrils.

121. (mv. 52897) *Bicchiere,* glass. Height 11.1 cm, rim diameter 7.5 cm and foot diameter 4.3 cm. Compact and micaceous clay, mottled, pinkish chamois colour. High, slightly convex banded edge with tapered and folded out rim. The body is deep and almost linear while the foot is disc shaped. The decoration shows a small crown of curled V's, lying down, spaced little hearts, alternating with elements similar to the previous ones; 'kornmaregen' which, next to the foot, has a free triangular shape.

122. (inv. 52896) *Bicchiere*, glass. Height 9.3 cm, rim diameter 6.4 cm, foot diameter 3.6 cm. Compact and dry clay, with porosity and mica, red colour. Shiny red paint also on the foot. High banded edge that tapers slightly at the rim and folds out. The body is deep and only slightly rounded while the foot is disc shaped. The decoration is a 'kommaregen' that displays single or joint rhombuses and triangles at the vertex, so as to form composite geometric figures. Smaller and paired triangles at the base.

123. (inv. 55907) *Bicchiere,* glass made from purified fine and soft clay, very pale brown in colour. Height 11.2 cm, rim diameter 7.4 cm and foot diameter 4 cm. Has thick and shiny red paint, which has fallen of here and there, covers the whole vase except for a small part of the foot. High banded edge that narrows slightly towards the rim which is folded outwards. The body is deep and only slightly rounded while the foot is disc shaped with a groove. The decoration is in 'kommaregen'. They make up triangles and rhombuses: each major triangle, drawn along a perimeter band, contains a smaller triangle. The triangles are more or less pointed depending on whether their base rests up or down. Between the triangles there are four rhombuses.

Other

177. (inv. 59664) Grate. Length 38 cm and width 29 cm. Made from iron and has four feet, composed of eight cross bars with a square section.

208. (inv. 59727) *Scaldavivande*, food warmer made from linden wood and bronze. Length 37 cm, the larger bowl has a of diameter 20 cm and height with lid 13.3 cm, diameter of the smaller bowl 8 cm and height 8.7 cm. Handle width 4.4 cm and height 5.7 cm. Consists of two bowls, one hemispherical with a flat bottom, the other cylindrical, connected by a hollow

handle with a quadrangular section and closed by a lid. A metal hinge placed between the handle and the larger diameter cap allows you to first open the lid of the handle, then that of the bowl. A pair of hinged, rotating goose-head hooks can secure the lid to the bowl since it has two tabs with hollow rectangular plates fixed to it. The rim of the bowls is decorated with a bronze band, fixed by regularly spaced nails. The larger bowl has a second hinge, which joins two plates, nailed respectively to the lid and to the wall. The lids' rim is slightly raised and covered with a bronze band of the same width as the underlying. The hinge is pushed over the rim of the lid and prevents it from opening. The handle features two circular studs on the side with suspension rings. The lock is nailed to the smaller bowl, on the opposite side of the hinge. On top, this consists of a plate fixed to a ring and a latch. On the bottom, there is a plate with a knob that the latch closes over. Found with the 209 saucepan.

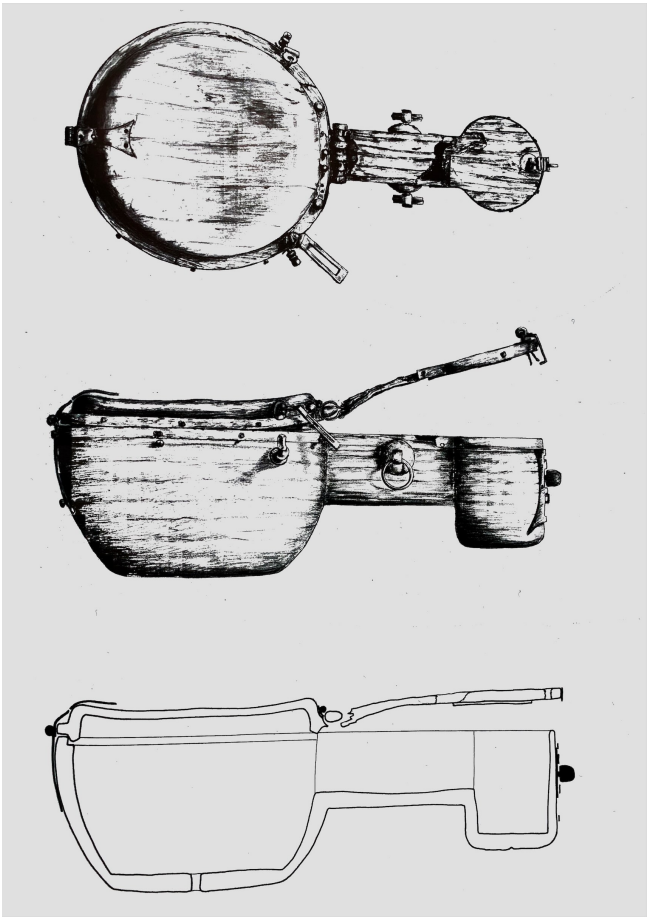


Figure 9 Food warmer (208).

206. (inv. 54925) Cast bronze steelyard, diameter of the plate is 12.3 cm. Steelyard with large *scapus*, this beam has a decreasing oval section with two graduations. The beam has three rings on one side, the last of which suspends the plate, the other two holds the hooks. Between the three rings and the beginning of the graduation is the following inscription: PON ... I. On the other side is a larger ring which is needed to stop the weight. The plate is decorated in concentric circles, with a raised central disk, rounded on the top and the bottom. It has four eyelets that is joined with the chains that have banded links alternating with simple links. The hooks are cast in the shape of a stylized swan's head, the one that supports the plate is double. The suspension hook is missing. A weight, cast bronze filled and with lead, weighing 455 grams. It has the shape of a sphere. On the surface is engraved the figure AXXV depicted with Roman numerals. On the top remains the suspension ring, fused together with the piece.

161. (inv. 55073) *Aryballos*, vase commonly used to contain oil used at a bath. Height 7.3 cm, diameter of the rim 4.7 cm, diameter of the foot 3.3 cm. Made from cast and turned

bronze, with burin decoration. Large bowl-mouth that is slightly rounded on the outside, under the rim are two thin raised bands ends at the start of the neck which marked by a step. Small central hole highlighted by a recess. Flared neck with raised edges at the end. Globular body. Disc foot with slightly oblique walls, slightly recessed bottom with central ring. Vertically set handle, welded just below the rim and on the body near the point of maximum expansion. The upper attachment is formed by two appendages with spiral scrolls that branch off from a stylized knot, marked by two ribs, and by an inverted V-shaped terminal element. The lower attachment, with a triangular tongue, is decorated at the edges with engraved lines.
Decoration on the body is divided by a raised band placed at the point of maximum expansion, on both sides of this is double-line engraved pods.

169. (inv. 52900) *Aryballos*. Height 13.5 cm, diameter of the rim is 7 cm and diameter of the foot 5.7 cm. Made from porous, micaceous clay with small inclusions that is grey in colour. Black paint. Mouth with hemispherical cap, short and cylindrical neck originating from a raised band. Globular belly that cannot be distinguished from the shoulder except two engravings. Ring shaped foot and a handle with raised edges. The belly has a strigulated decoration that is vertical and irregular

249. (inv. 52902, 52904) Game dice made from ivory. The sides measure 1.5 cm. Cubic in shape, have numerical values engraved and represented by circles with a central point. Adding the values of opposite faces always gives 7.

250. (inv. 52903, 52905) Game dice made from wood. The sides measure 1.7 cm. Similar to the previous ones and a little larger, the engravings indicating the values were damascened (of hammered iron or steel).

251. (inv. 52906) Pawns, game pieces made from pebbles and bone. Height 1 cm and diameter 1.5 cm. They are circular, have a flat base and hemispherical back. Twenty-four are made from pebbles, two are of bone.

255. (inv. 54926) Group of fishing hooks made of bronze. Corroded together the total measurements are; 9.5 x 6.7 x 3.6 cm. Round hooks of different sizes, with a straight tip or slightly curved towards the shank and equipped with a barb, the stem ends in an opening. Dimensions of measurable hooks in cm (length-opening): 3.6-2.1; 2.9-1.8; 3.3-2.2; 2.5-1.1; 3.8-2.3 cm.

Lamps

188. (inv. 59637) Bronze lantern cover. Height 8.5 cm, rim diameter 13 cm.

Hemispherical shell with rounded and thickened rim. Holes arranged individually and in pairs. At the top and laterally are three ring sockets, on one side a hook. Between the upper ring and one of the two side rings a grip that is inserted with a rectangular section, slightly curved, which continues in a chain, now welded to the cover. Inside, a rectangular and a curvilinear element are embedded, forming part of the support.

191. (inv. 55935) Lamp. 2.4 cm in height, length 6.4 and diameter of 5.3 cm. Light hazelnut coloured clay purified and compact. Orange-brown, matte varnish. Blackened area from use around the vent hole. Flattened biconvex profile tank. Shoulder delimited by concentric grooves and decorated with a relief motif of bars surmounted by rings, arranged in a radial pattern around the disc, slightly concave and very small in size. At the base of the nozzle, which is missing, there remains part of the vent hole and the first element of a decoration probably consisting of three daisies enclosed within impressed circles. The handle is missing but was on the shoulder. Almond shaped base bounded by a flattened edge.

192. (inv. 55898) Lamp. Height 2.6 cm, 7.5 cm in length and diameter 5.4 cm. Hazelnut-yellowish clay purified and slightly porous. Dark grey slip. Blackened area from use around the wick hole. Flattened biconvex tank profile. In the upper part, the decoration consists of the face of a bearded Silenus that occupies the entire space between the infundibulum, delimited by a flat edge, and the large hole for the wick. The elongated, rounded nozzle is formed by the extension of the beard. Side outlets barely visible, ribbed handle set on the shoulder. Flat circular base.

193. (inv. 55934) Lamp. Height 3 cm, length 6.5 cm and diameter 5.6 cm. Light hazel coloured clay, well purified and compact. Orange-brown varnish that is diluted and irregularly distributed. Convex, flattened tank profile. Wide shoulder, decorated with a row of triangles, single or double, made up of orbs. Small lateral appendage. Concave disc, very small in size, circumscribed by a slightly raised border and with a small infundibulum in the centre. The handle is missing but was set on the shoulder. Oval base, slightly raised, with the stamp embossed in the centre reading ANT.

196. (inv. 52908) Lamp. Height 2.4 cm, 8.2 cm in length and diameter 6.3 cm. Whitish clay, well purified and compact. Nozzle blackened from use. Flat tank with vertical walls. Shoulder reduced to a thin raised and rounded edge encircling concave disc, delineated by an engraving. The relief is a representation of an erotic *symplegma* under which is the small infundibulum, located very close to the rim which is an unusual position. Short nozzle with expanded tip, slightly rounded. Handle with subtle ribs set on the shoulder and bottom of the tank. Ring base that is slightly raised.

197. (inv. 52909) Lamp. Height 2.8 cm, length 7.9cm and diameter 6.1 cm. Clay coloured, well purified and compact. Blackish slip. Nozzle blackened from use. Tank with inverted truncated cone profile. Shoulder reduced to a thin raised and rounded edge around the disc that is large and concave. On the disc is the very schematic representation of an anchor, engraved after firing. Small central infundibulum and vent hole, inside the disc, near the nozzle attachment. Short nozzle, with 'anvil' termination. Flat circular base.

201. (inv. 59563) Lamp. Height 2.8 cm, length 8.6 cm and diameter 6.7 cm. Hazelnut-yellowish clay purified and compact. Dark grey slip. Nozzle blackened from use. Convex tank profile. Shoulder reduced to a thin edge separated from the disc by a groove. The disc is broad and concave. Small slightly eccentric infundibulum and small vent hole, inside the disc, near the nozzle attachment. Short nozzle, with 'anvil' termination. Flat circular base.

202. (inv. 59564) Lamp. height 2.5 cm, length 8.2 cm and diameter 6.4 cm. made from hazelnut-yellowish clay purified and compact. Blackish slip. Convex tank profile. Shoulder reduced to a thin edge separated from the disc by a groove. The disc is broad and concave. Small slightly eccentric infundibulum and small vent hole, inside the disc, near the nozzle attachment. Short nozzle, with 'anvil' termination. Flat circular base.