Amphorae of Persia: Torpedo Jar as a marker of Sassanian imperialism, trade, and economy in the Persian Gulf and the Indian Ocean between the 3rd and 7th centuries.

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Cover image: Photo of a mural located in Cave No. 2, Ajanta Caves, Aurangabad District, Maharashtra state, India. The mural probably depicts an Indian ship transporting ceramic containers. (Wikimedia Commons, 2017, https://commons.wikimedia.org/wiki/File:Ajanta_Cave_2_three-mast_sailship.jpg**).**

Amphorae of Persia

Torpedo Jar as a marker of Sassanian imperialism, trade, and economy in the Persian Gulf and the Indian Ocean between the 3rd and 7th centuries.

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1. Introduction

1.1 Sassanian trade activity within the Indian Ocean as a relatively new topic

The Indian Ocean is one of the most commercially active regions in the modern era, this was also the case in the past. This Ocean offers practical waterway trade routes between East Africa, the Middle East, and the rest of the Asian continent. In Antiquity and Late Antiquity, it is commonly known that the Romans used it to trade with India (Tomber, 2007). However, due to the prevalent Eurocentrism of researchers in the 20th century, it has been assumed that Rome had a dominating role in the trade networks of this Ocean (Coningham et al., 2016, pp. 31). Such an assumption left the other aspects of Indian Ocean trade often ignored. This Eurocentrism has also caused setbacks in pottery research in India. Where ceramic containers of foreign origin were assumed to be Roman amphorae, only later to be confirmed to be Mesopotamian Torpedo Jars from the Persian Gulf (Tomber, 2007, p. 972). This discovery contributed to the discussion of the role that Sassanian Persia (2nd-7th century CE) played in the Indian Ocean. After all, it is quite peculiar that the main geopolitical rival of Rome, located between India and the Mediterranean, was previously pushed back by scholars to the second plan.

I chose the Torpedo Jar as an archaeological marker as they have a peculiar morphology (see Chapter 2.2) and they are widely distributed along the coasts of the Indian Ocean (Lischi et al., 2020, p. 2). They are known to have carried liquids but it is unknown which specific ones. The morphology, texture, and function of those jars will be described in a chapter dedicated to their description. Furthermore, numerous researchers tried to connect them to different topics surrounding the trade in the Indian Ocean. Among those, such researchers as R. Tomber (2007) linked the topics of imperial politics and economics to the distribution of those jars in the Indian Ocean. This thesis aims to expand on those ideas.

1.2 Research questions

To analyze Sassanian imperialism and economy through Mesopotamian Torpedo Jars, it is necessary to formulate research questions, which will support bringing up arguments further in the text. Firstly, it is necessary to funnel the broad concepts of Sassanian Imperialism and economy to more narrow concepts. It is perhaps possible to trace an imperial economic network (especially in the Persian Gulf) by the use of Torpedo Jars as markers. The same applies to Sassanian trade relations with other regions in the Indian Ocean, such as India. Secondly, the production of the Mesopotamian Torpedo Jars may also reveal the structure of the Sassanian economy. Based on those points, two main research questions can be formulated:

How does the research on Torpedo Jar containers as markers of Sassanian activity in the Persian Gulf and in the Indian Ocean between the 3rd and 7th centuries CE contribute to our understanding of Sassanian Imperialism and trade relations in those regions?

How does the study of Torpedo Jar containers in the Persian Gulf and the Indian Ocean contribute to our understanding of the structure of the Sassanian economy between the 3rd and 7th centuries CE?

Based on the two research questions formulated above, some sub-questions can be formulated to support answering the main research questions. For the first research question, it would be helpful to establish a comparison between the distribution of Torpedo Jars in the Indian Ocean and the Sassanian presence in this region:

Are there any similarities between the distribution of Torpedo Jars in the Persian Gulf and the Sassanian network of ports and forts in that region?

For the second research question, it is necessary to ask whether the existence of those Mesopotamian Torpedo Jars could represent some degree of centralization in the Persian economy, this also includes earlier developments in pottery making (ovoid jars) and the Torpedo Jars. Lastly, it would be helpful to compare the integration of the Persian economy when it comes to pottery making of transport containers to the Roman one.

1.3 Research limitations.

The research questions above depict the time frame and the geographical focus of this thesis, however, it is necessary to explain further limitations of the research that will be conducted.

Firstly, this thesis will mostly focus on the regions of the Persian Gulf and the West Indian coast due to the high Persian commercial activity in those regions. Other regions such as the East Coast of Africa, Egypt, or Roman-controlled territories in the Middle East will be briefly discussed because simply Sassanians did not have such a degree of influence over them as the Persian Gulf or West India.

Secondly, an important distinction has to be made to focus on analyzing Sassanian imperialism and economy by using the Torpedo Jar as a marker. Generally, although not always, the pottery class of Mesopotamian Torpedo Jars can be divided into two types TORP-S and TORP-C (Connan et al., 2020; Tomber et al., 2022). These mainly differ in texture and minimally in morphology but this will be described in a chapter dedicated to such a discussion (see Chapter 2.2). The significant distinction is that those two types generally correspond to different periods. TORP-S was mainly produced during the late Parthian and Sassanian control over the Persian Gulf (2nd-8th) whilst TORP-C corresponds to the Early Islamic period (8th-9th/10th). The transition between those two types is believed to happen in

the 8th century CE. So, in this thesis, the focus will be put on the TORP-S vessel. However, the topic of Torpedo Jars is relatively new in the archaeology of the Indian Ocean, consequently, in some pieces of literature no distinction is made, so the TORP-C Torpedo Jar will be often included (Kennet, 2002, 2004).

Finally, even though in this paper the Torpedo Jar is used as a marker, its predecessor, the chaff-tempered ovoid jar (see Chapter 3.2) and its production will also be a subject of discussion, as it can contribute to the discussion on production and trade dynamics in the Persian Gulf.

1.4 Methods & Guide

1.4.1 Introduction

This thesis classifies as a literature review. A literature review is necessary to connect the topic of the Torpedo Jar with various topics of Sassanian trade, economy, and imperialism. This demands a theoretical comparison of the topics. Hence, the option of a literature review has been chosen. A research paper collecting data on the distribution of the Torpedo Jars on the coasts of the Indian Ocean would be too demanding for this stage of the research in a Bachelor's thesis.

1.4.2 Order of the Thesis

In the introduction chapter of this thesis, the reader has been informed with basic information about the Mesopotamian Torpedo Jar. That is not enough. Hence, the first chapter of the body will be dedicated to that pottery type. The chapter will be divided into four sub-sections; morphology, production, texture, resources, and function. Each of them will present detailed information and description of Mesopotamian Torpedo Jars. The information from these chapters will be mainly based on research papers discussing the content of Torpedo Jars (fabric, additional resources, found materials, and museum descriptions). Such a chapter is necessary because topics that will be mentioned here could prove useful in connecting the ceramic to the topic of trade and consumption in the Indian Ocean between the 3rd – 7th centuries CE.

The third chapter of the thesis will present information about the predecessor of the West Asian Torpedo Jar. This is the chaff-tempered ovoid jar. This example must be brought up as it shares similar origins and distribution along the Persian Gulf as the Mesopotamian Torpedo Jar. Hopefully, a discussion about the origins of the chaff-tempered ovoid jar could also explain some of the production and trade dynamics on the northern littoral of the Persian Gulf.

In the fourth chapter, there will be an analysis of the network of forts and ports in the Persian Gulf. The description of such a network can visualize the shipping waterways that the Mesopotamian Torpedo Jar used. Such visualization can also highlight the importance of the control of the Persian Gulf. This will be supplemented with a sub-chapter on the Sassanian ideological justification behind the control of the Persian Gulf. The description of the Sassanian network of ports and forts will support the next chapter of the body about the distribution of Torpedo Jars, especially around the Persian Gulf.

The fifth chapter of the body will present information on the distribution of the Mesopotamian Torpedo Jars on the coasts of the Indian Ocean. This will be supplemented with arguments explaining higher and lower proportions of Torpedo Jar distribution in certain regions of the Indian Ocean. Due

to the character of this thesis, being a literature review, data will only be provided for additional information purposes.

Finally, the sixth chapter of the body of this thesis will include a discussion about the relations that the Sassanians had with foreign states in the area of the Indian Ocean. Furthermore, the abilities and the measure that the Sassanian Empire has undertaken to protect their interest in this trade network will also be widely discussed. The second subchapter of this chapter will include a discussion of the main incentives for participating in the trade network of the Indian Ocean. Lastly, it will highlight the role of the Persian merchant class in the decision-making process of the Sassanian Empire.

The objective of the discussion chapter is to connect the themes from all the previous chapters and make arguments supporting or negating the hypothesis that the Mesopotamian Torpedo Jar could be used as a marker for the topics of Sassanian trade, economy, and imperialism. Limitations to a conclusion will be specifically highlighted to not create unproven claims about the nature of this topic.

The final chapter is the conclusion. This chapter will summarize the conducted research in the previous chapters. The main arguments drawn in the discussion will be brought up and those that are the most probable will be highlighted. For future research on the research area, some recommendations will be given.

1.4.3 Other remarks

For the reader not to be confused while reading this thesis, I will use the terms Torpedo Jar, Mesopotamian Torpedo Jar, West Asian Torpedo Jar, or West Asian Torpedo Jar/Amphorae interchangeably. This also concerns referring to Sassanians as Persians.

2. What is a Torpedo Jar?

2.1 Introduction

I dedicate the first chapter of the body to a detailed description of the pottery in question in this thesis. What was the shape of the Torpedo Jar? What were its practicalities? Which resources were used to create this ceramic? How was it produced? What was the use of this vessel? These are the questions that I will be answering in this chapter. This chapter is divided into four parts with an additional summary. The first part will include a description of the morphology of the vessel. In the second part, I will reveal insights into the production process of the Torpedo Jar based on current scarce evidence. The following subchapter is dedicated to a discussion about the origins of the resources that have been utilized in the production of the Torpedo Jar. The last part before the summary includes a debate about the function of this West Asian container.

2.2 Morphology

The Mesopotamian Torpedo Jar gained its name due to its torpedo-like shape. Similarly to Roman amphorae, the shape of the Torpedo Jar starts with a pointy bottom, then the body widens. At the upper end of the vessel, the body becomes more narrow with a relatively wide opening as shown in Figure 2.1. The rim differentiates depending on the type of Torpedo Jar. TORP-S jars usually have an externally fattened rim whilst TORP-C jars are usually characterized by a plain internally fattened rim with a projecting lip (Tomber et al., 2022, p. 3).

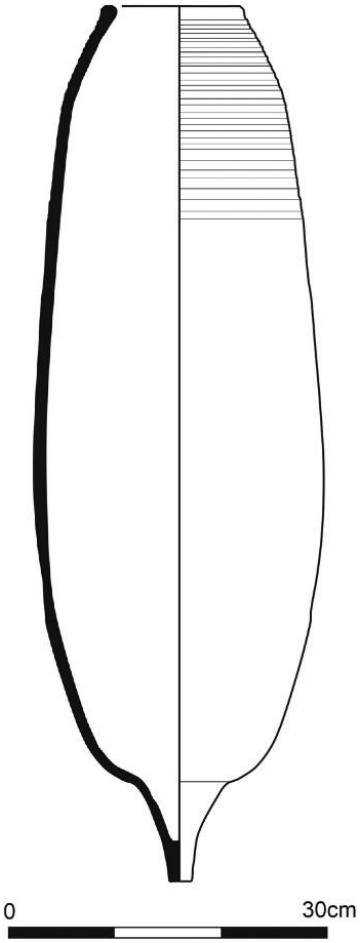

Figure 2.1 "Schematic drawing of complete TORP-S vessel (P. Copeland)". This is a schematic drawing of a TORP-S Torpedo Jar, supporting the description in sub-chapter 2.2. (Tomber et al., 2020, p. 3).

What makes the Torpedo Jar unique is the fact that it lacks handles that are quite practical for transporting containers. The same could be said about the non-existence of a neck at the top. The spike at the base of the West Asian Torpedo Jar allows stacking containers as tight as possible within the storage of a ship (Lambourn, 2022, p. 164). The thickness of the walls has been measured to 12 mm, making the vessel relatively thick, which is typical for transport containers of the time (Kennet, 2002, p. 159, 2004, p. 85). It was calculated that Early Islamic Torpedo Jars from the Phanom Surin shipwreck in Thailand (8th century CE) had a capacity of approximately 193 liters which exceeds the capacity of Roman Amphorae (Lambourn, 2022, p. 169). Considering that some space at the top of the jar had to be left empty, it could be estimated that the

Figure 2.2 Photo of a Torpedo Jar. This photo depicting a Torpedo Jar shows the applied pottery-making processes. (British Museum, museum number: 91951, https://www.britishmuseum.org/collection/object/W_-91951). © The Trustees of the British Museum.

West Asian Torpedo Jars from the Phanom Surin shipwreck stored around 180 liters of liquid (Lambourn, 2022, p. 167-169).

2.3 Production

Due to a lack of archaeological evidence of pottery kilns producing this type of vessel, the specific methods of production are unknown. To determine the pottery-making process, I will refer to an example. The British Museum has an almost complete (except the pointy base) Torpedo Jar in its collection, as shown in Figure 2.2. Based on the image available on the British Museum website of the complete vessel (Figure 2.2), it is possible to observe the different production processes utilized in pottery making. The top section of the Torpedo Jar from the British Museum includes throwing marks indicating that the jar was wheel thrown, while the bottom section of the jar seems to have been coiled with soft paddling marks on the exterior (British Museum, n.d.). Moreover, some clay slip was applied on the exterior of the base of the jar. On the interior of a Torpedo Jar, a thin layer of bitumen is usually applied.

Past research on Torpedo Jars fabric has shown that the fabric has been fired to 800-850°C based on the petrology and SEM Backscattered Electron (BSE) EDX analysis (Tomber et al., 2022, p. 10, 18). Any further information on the firing process is unknown due to the lack of any found kilns which could have produced this type of pottery.

2.4 Texture and Resources

Despite the abundance of the Mesopotamian Torpedo Jars that have been found throughout the Indian Ocean, the source of production of the torpedo jars is unknown due to the absence of production kilns for this pottery type. It would be useful to determine the geographical origin of the resources used in the production of the Torpedo Jar. Therefore, in this section of the text, two resources included in the Torpedo Jar will be described and discussed. The first paragraph will be dedicated to a description of the clay utilized in the production of this type of pottery along with a discussion about its origin. The second paragraph will be dedicated to the bitumen that is usually coating the interior of the jar.

A distinction has to be made between the TORP-S Torpedo Jar and the TORP-C Torpedo Jar. Both of them are morphologically similar however, they differ in the color of the fabric. The TORP-S is often described as being “sandy” and having an orange-brownish color of the fabric, while the TORP-C is often described as being “cream-colored” (Connan et al., 2020, p. 6). The TORP-S is also known to have rich sandy inclusion in its fabric, while the TORP-C fabric has considerably fewer inclusions. Previous chemical studies conducted on the pottery from Siraf determined that the possible geographical source of the clay is either in southcentral Iraq or southwestern Iran due to the high ophiolite content in the clay, typical for the pottery produced in both regions (Tomber et al., 2022, p. 8, p. 17-20). So, pottery alone cannot exactly determine in which specific region the Torpedo Jars were produced.

As previously mentioned, Mesopotamian Torpedo Jars are usually coated with bitumen on the interior of the vessel. The function of such a practice will be discussed in Chapter 2.5. Several chemical analyses compared bitumen from oil seeps in Iran and Iraq to the bitumen lined in TORP-S and TORP-C Torpedo Jars. The source for the bitumen in the TORP-S jars could originate from Dehluran in the northeast of the region of Khuzestan, in southwest Iran, as shown in Figure 2.3, although, other locations cannot be excluded (Connan et al., 2020, p. 16). The exact source for the bitumen in the TORP-C jars cannot be precisely determined, as it either could come from Khuzestan or the province of Fars (Connan et al., 2020, p. 16).

Based on those two materials one could say that the area of production for the Torpedo Jar is located in southwestern Iran and south-central Iraq due to the association between the proximity of resources to the area of production but that cannot be determined to a certainty.

2.5 Function

The bitumen coating on the inside of the jar is crucial for the determination of the jar’s function. Based on that, one could state that the jar itself was used to transport bitumen (Stern et al., 2008, p. 424). But, that hypothesis has been dismissed because the thinness and homogeneity of the bitumen layer, uncoated patches on the interior, and splash marks on the exterior surface of the pottery suggest that the bitumen lining on the interior of the vessel has been applied intentionally and in liquid form (Connan et al., 2020, p. 3; Stern et al., 2008, p. 424; Tomber et al., 2022, p. 19). Therefore, the bitumen coating was used to seal the container to prevent the leakage of liquids. Quite similarly, the Romans were using different sealants to seal their wine amphorae (Tomber, 2007, p. 976).

Transportation of wine has been suggested as the main function of the Torpedo Jar by many researchers due to the evidence contained in the ancient texts, notably in the Periplus (Lischi et al., 2020, p. 2; Tomber, 2018, pp. 400). For explanation, the Periplus is a Greco-Roman document containing information on navigation and trading opportunities in the Indian Ocean and neighboring

seas. Apparently, in India, there was a large demand for wine coming from the Persian Gulf (Periplus as cited in Durand, 2021, p. 27). However, this main function cannot be confirmed until chemical analyses prove that resin coming from the wine can be found on the interior of the jar, these have not been conducted as of yet. The Mesopotamian Torpedo Jars are also present in Eastern Christian monasteries in the Gulf such as the Al-Qusur monastery in Kuwait. According to R. Perrognon and J. Bonnéric (2021), it is doubtful that those were used for wine consumption as there were harsh monastic rules regarding the consumption of alcohol (p. 76). Furthermore, the quantity of the Torpedo Jar sherds present at the monastery is also not parallel with the possible use of wine for the sick (Perrogon & Bonnéric, 2021, p. 76). Other wares, such as bitumen-coated basins were used in fish sauce processing which could have been produced at the monastery (Perrogon & Bonnéric, 2021, p. 76). So possibly, the Torpedo Jar was also used to store fish sauce but there is no hard evidence for this hypothesis.

It has also been suggested that the torpedo jars performed the function of storing sweet water for the crew on merchant ships of the Indian Ocean. This suggestion is based on the relatively small number of Torpedo Jars on the Phanom Surin shipwreck (Early Islamic) (Lambourn, 2022, p. 166).

Despite, the main function of the Mesopotamian Torpedo Jar being transporting liquids, it is also known to have carried foodstuff in it. This can be proved by the fact that rice chaff has been detected in several Torpedo Jar sherds (Connan et al., 2020, p. 3).

There are also doubts about whether the jars were actual transport containers instead of domestic containers. This comes from the fact that the weight of the vessels found in the Belitung (Indonesia, 9th century CE) and Phanom Surin shipwrecks are unusual, as it exceeds those of typical Roman amphorae. If a jar were to be filled with rice it would have weighed around 170 kilograms whilst if it were to be filled with water it would have weighed around 220 kilograms making it difficult to move onto the ship two people, especially with the lack of handles (Lambourn, 2022, p. 169). Vessels with such capacity were typical for Early Medieval domestic jars despite the presence of the lined bitumen in the interior of the vessel. Lastly, rim sherds from the Phanom Surin shipwreck contain drilled holes with one of them including a piece of rope remaining in them, suggesting that the rope had the role of fastening a cover or a hard stopper (Lambourn, 2022, p. 173). I believe that such a hypothesis could be doubted by the fact that the distribution of Torpedo Jar sherds is generally greater in port cities, indicating that the Torpedo Jar sherds are more often found in a commercial context rather than a domestic one, this will be later discussed in a chapter dedicated to distribution (see Chapter 5).

Based on the section above one could assume that the Mesopotamian Torpedo Jars were mainly used as transport containers in the Indian Ocean trade for the transportation of whatever liquid was stored

in them. When it comes to regional proximity, these West Asian containers probably stored wine or rice as both were produced beyond the river of Shat al-Arab (shown in Figure 2.3). However, it seems that those vessels were also used in a burial context, as some complete vessels have been found in numerous graves at Susa from the Parthian period and in Bushehr (as shown on the map in Figure 2.3) (Tofighian et al., 2011, p. 3-4). It was prevalent among some communities along the Euphrates to place Torpedo Jars horizontally on top of the body (Simpson, 2015, pp. 30). The repurpose of Torpedo Jars in burials could likely contribute to the previous argument that Torpedo Jars could have been domestic containers.

Figure 2.3 A map showing the geographical locations mentioned in this chapter. Sites mentioned in sub-chapter 2.4 and 2.5 can be found on this map. (Tomber et al., 2020, p. 2).

2.6 Summary

Based on this chapter the reader can observe that information about the Mesopotamian Torpedo Jar is incomplete, especially the specific function that it could have served. Thanks to retrieved sherds and complete vessels that have been found, the morphology of the vessel reveals almost no mysteries. Yet, the lack of handles questions the way that the vessel could have been carried. Based on previous

studies, the only information that can be retrieved about the production process is the firing temperatures and some pottery-making processes based on the analysis of the surface. However, the absence of evidence of production kilns used for the firing leaves many questions unanswered. Previous chemical analyses of the clay and bitumen utilized in the production process do leave many insights into a possible area of production due to an association between the area of production and the geographical origin of these resources. The origin of the clay and the bitumen could most probably be pointed to the region of Khuzestan in southwestern Iran and if not to south-central Iraq. Both regions are located in the heartland of the Sassanian Empire perhaps indicating the focus put onto developing the core of the empire instead of its peripheries.

The specific function of the vessel remains partially unresolved. Due to the lack of data and archaeological evidence, it is not known what specific liquid was stored in the Torpedo Jar, it could probably have been wine. As highlighted before (see sub-chapter 2.5), there are doubts among some scholars that the Torpedo Jar (Lambourn, 2022, p. 171) functioned as a transport container. Instead, it could have been a domestic container but the evidence cannot attest that for certain. Lastly, the Torpedo Jars have been repurposed to store solids, such as rice that was harvested in southwestern Iran. Furthermore, the Torpedo Jars were also used in some Parthian and Sassanian burials.

3. The predecessor of Torpedo Jars in the Persian Gulf

3.1 Introduction

As observed in the last chapter, the West Asian Torpedo Jar had a long sequence of production and diffusion along the coastlines of the Indian Ocean, around seven or nine centuries. Of course, the vessel witnessed some changes which can be seen in the division between the TORP-S and TORP-C types of the Torpedo Jar. This type of transport container had a predecessor, the chaff-tempered ovoid jar which was starting to be replaced by the Torpedo Jar between the 1st and 3rd centuries CE. In this chapter, I will reveal whether the chaff-tempered ovoid jar could contribute to a discussion on regional economic dynamics in the region of the Persian Gulf. To do this, the reader will also get acquainted with the basic information about the Torpedo Jar predecessor.

3.2 General description

Firstly, similarly to the torpedo jar, the chaff-tempered ovoid jar does not include handles and it is also lined with bitumen on its internal surface. But, the chaff-tempered ovoid jar differs in morphology. Based on its name the body of the vessel reminds of an ovoid shape with two adjoined parts (Durand, 2021, p. 22). It also possesses a short neck at the top with a flattened rim (Figure 3.1). Contrary to the Torpedo Jar the base of this type of container is usually well-rounded instead of ending with a spike as shown in Figure 3.1. In terms of measurements, the chaff-tempered ovoid jar has a height of 60 cm with a maximum diameter in its body of 30 cm and a 15 cm diameter at the rim (Durand, 2021, p. 22). In contrast to the Torpedo Jar, it has a much smaller capacity of around 25 to 35 liters (Durand, 2021, p. 27).

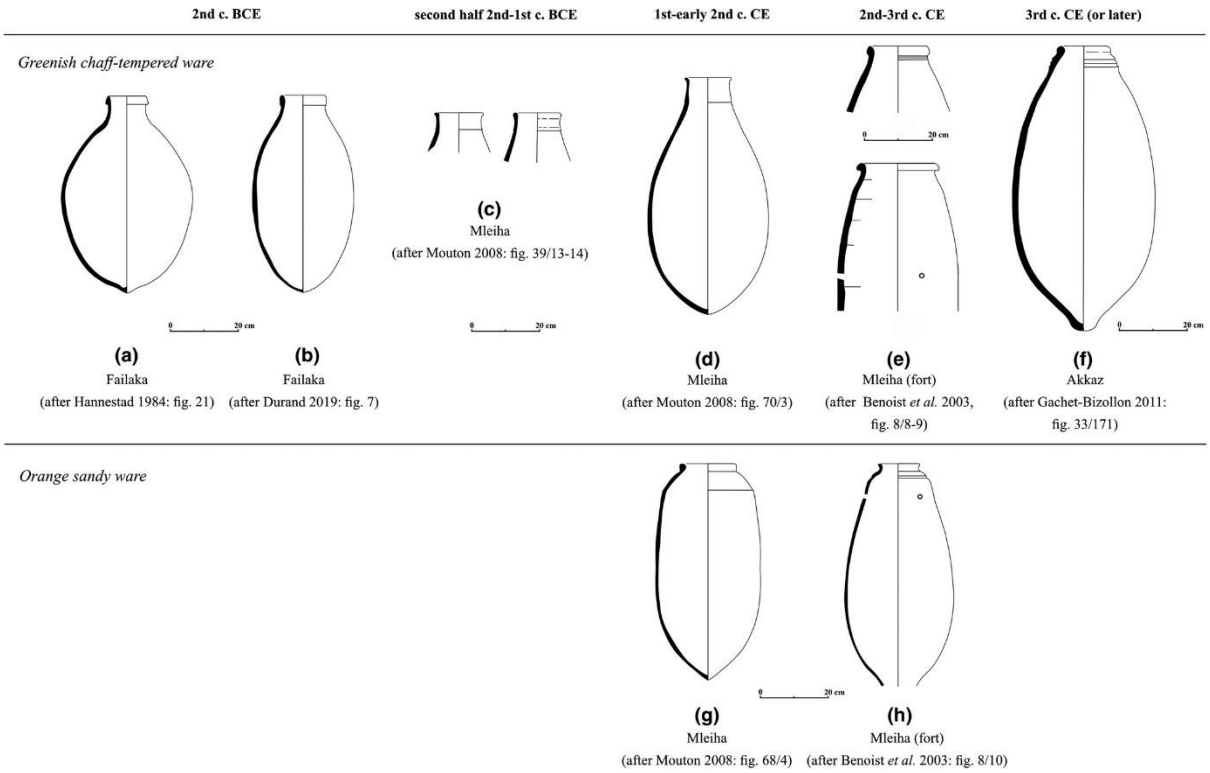

Figure 3.1 "Evolution of the bitumen-lined jars in the Gulf from the second century BCE to the third century CE". The schematic drawings show the chronological development of transport containers in the Persian Gulf. (Durand, 2021, p. 25).

Likewise to the Torpedo Jar, the chaff-tempered ovoid jar also could have served the function of storing and transporting wine due to the bitumen coating. But numerous examples of chaff-tempered ovoid jars and early "sandy wares" as described in Caroline Durand's article (2021), show the presence of a small drilled hole of 1 cm diameter in the upper part of the body (p. 28). These holes could have functioned as vent holes in avoiding further fermentation of the wine or were simply there for tasting (Durand, 2021, p. 29).

3.3 Origin

Bitumen analyses also support the determination of the regional origin of this pottery, similarly to the Mesopotamian Torpedo Jar the bitumen could either originate from South or Central Iraq or South-Western Iran. Likewise to the West Asian Torpedo Jar, this provenance can also be confirmed by the presence of rice chaff in the interior of the vessel that was cultivated in both regions (Durand, 2021, p. 27). Another indication for the origin of the chaff-tempered ovoid jar is that vessels sharing similar morphology and production technique have been found in Seleucid and Parthian levels (2nd century BCE – 1st century CE) in various sites in Mesopotamia (Durand, 2021, p. 27). The last determination factor is that several sherds of this type of transport container have had incised inscriptions on their surface, for example, the chaff-tempered ovoid jars from the Failaka island (Kuwait) from a 2nd century BCE context bear inscriptions in the Greek language. This suggests, that this pottery could have been

produced in Seleucid Mesopotamia or the Hellenized break-away states such as the Characene Kingdom in Southern Iraq (Durand, 2021, p. 27).

3.4 Rivalry with the Torpedo Jar

Similarly to the Mesopotamian Torpedo Jar, the chaff-tempered ovoid jar was distributed along the coastlines of the Persian Gulf and often in the same ports. However, based on Figure 3.2 their distribution outside of the Gulf does not seem as prevalent as compared to the Torpedo Jars. The main period of distribution of these jars aligns chronologically with the existence of the Hellenistic breakaway kingdom of Characene (Durand, 2021, p. 30). Early "sandy wares" that were the previous productions of the TORP-S Torpedo Jar, equalized the production of the chaff-tempered ovoid jars during the 1st century AD, indicating a possible rivalry in the Persian Gulf market between these two types of vessels, shown in Figure 3.3 (Durand, 2021, p. 30). This also suggests a regional rivalry between Southern Mesopotamia where the chaff-tempered ovoid jar was produced and Susiana in southwestern Iran where the early type of TORP-S was most likely produced (Durand, 2021, p. 30). Finally, during the 3rd century CE, the production of chaff-tempered ovoid jars fades away in favor of the TORP-S Mesopotamian Torpedo Jar. This could be reflected by the Sassanian conquest of the Parthian Empire (Durand, 2021, p. 30). Such a political change could have impacted regional production centers as the Sassanians favored the province of Fars instead of Southern Iraq.

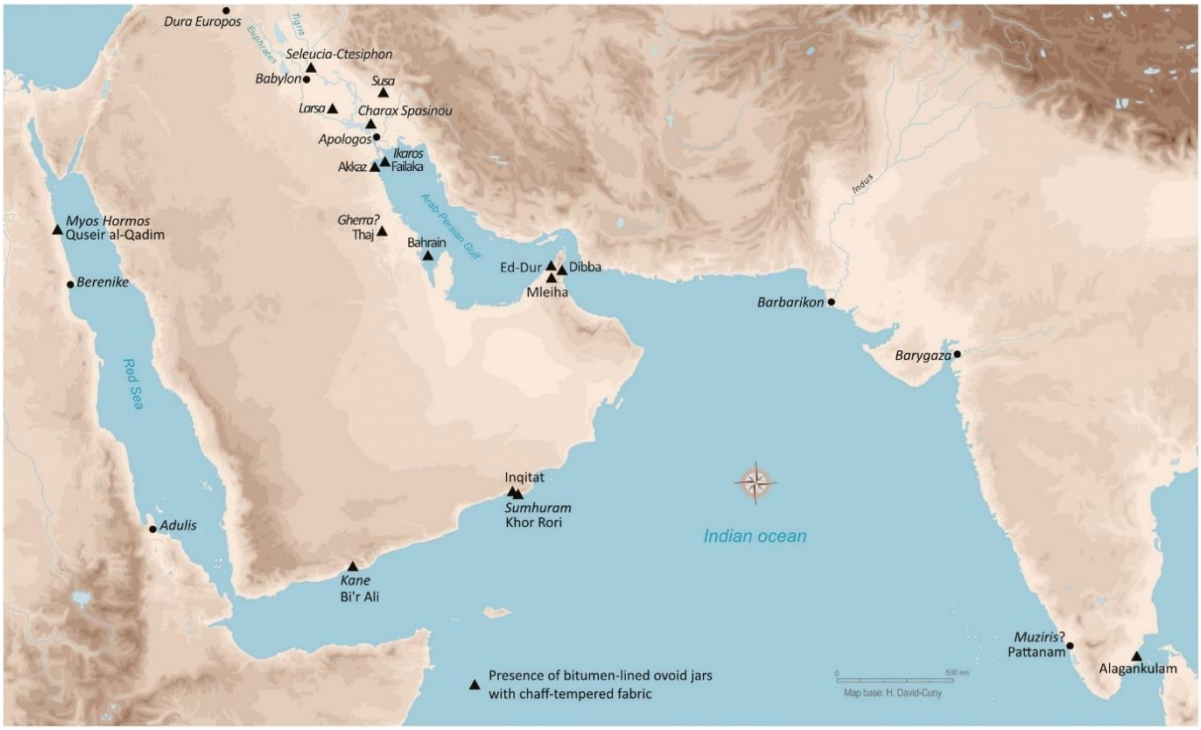

Figure 3.2 Distribution of chaff-tempered ovoid jars in the Indian Ocean. Map showing the sites with a presence of chaff-tempered ovoid jars (represented by triangles) in the Indian Ocean. (Durand, 2021, p. 29). © C. Durand (map base: H. David-Cuny).

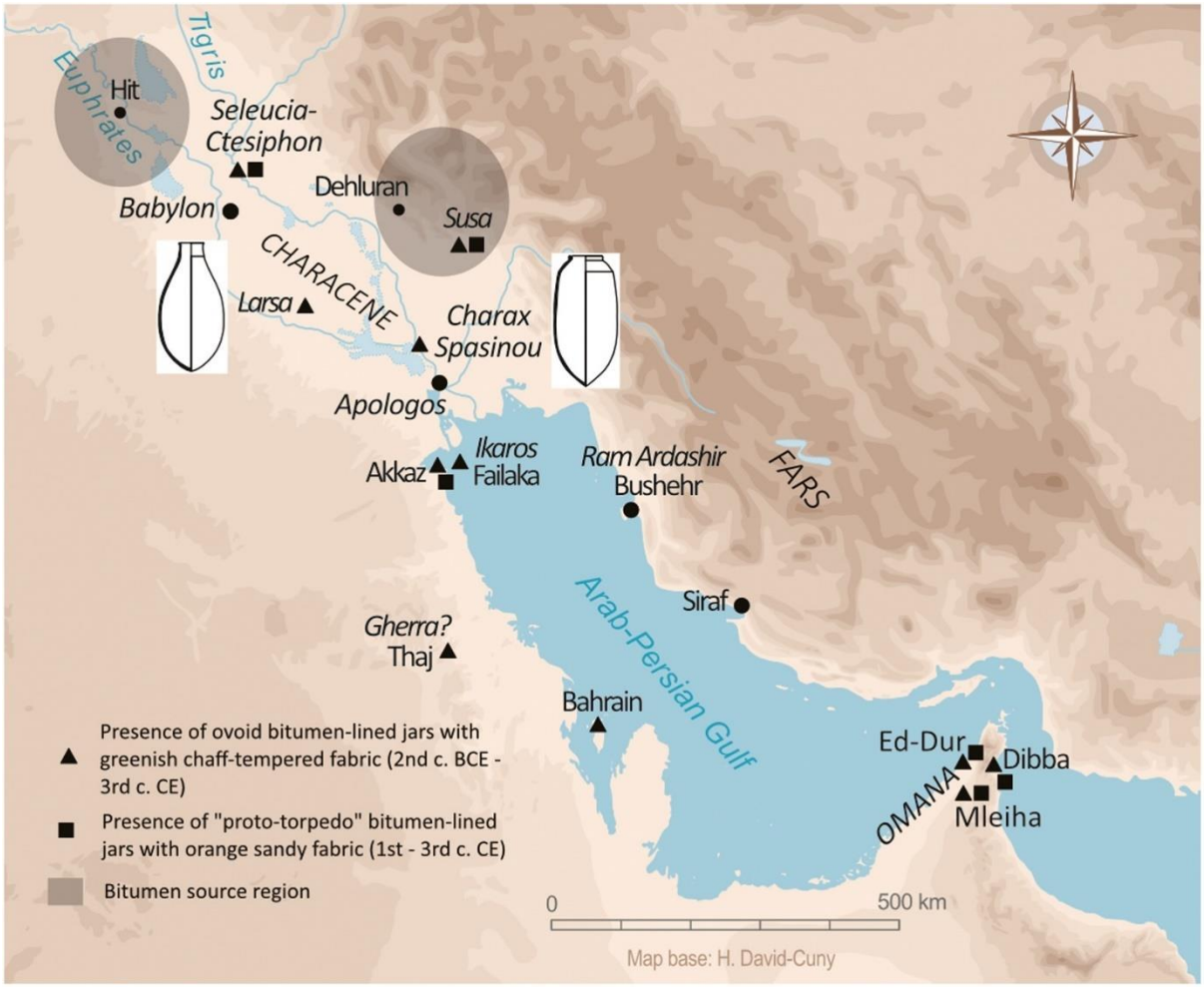

Figure 3.3 Distribution map of bitumen-lined jars between 2nd c. BCE and 3rd c. CE. The map depicts the rivalry between the chaff-tempered ovoid jar and the proto-torpedo jar. Triangles represent the chaff-tempered ovoid jar and squares represent early sandy wares. (Durand, 2021, p. 29). © C. Durand (map base: H. David-Cuny).

3.5 Summary

The information on the chaff-tempered ovoid jar brought up by Durand (2021) proves useful in the discussion for this thesis. I believe that the rivalry in production and the distribution between the chaff-tempered ovoid jar and the "Early Sandy Ware" and the following shift towards the production of the Mesopotamian Torpedo Jar accurately depict the impact of political processes on the production of ceramic containers. Specifically, during the period when the Persian Gulf was under Parthian rule, characterized by decentralized and regionalized management, both types of ceramic transport containers could coexist. However, after the drastic take-over of the Sassanian dynasty, the early sandy wares and the Mesopotamian Torpedo Jars drive the production of the chaff-tempered ovoid jar into extinction, thus reflecting a more centralized method of rule favored by the Sassanians. Such a metamorphosis of production can also be explained by the fact that the Sassanians compared to the Parthians also introduced economic regulations and commercial infrastructure allowing such centralization (Daryaee, 2010, p. 409).

4. “Sassanian Mare Nostrum”: a network of forts and ports in the Persian Gulf

4.1 Introduction

It is necessary to introduce and map out the network that the Sassanians created in the Persian Gulf for security and economic and commercial reasons. To protect shipments departing from the ports on the Iranian littoral it is practical to control the entirety of the Persian Gulf coastline, this is what the Sassanians aimed for. Firstly, the focus will be put on the Persian littoral with its natural ports, while in the second section, other Sassanian ports in the Persian Gulf will be mentioned. This will be provided with a historical context on how the Persians managed to create such a network and also their worldview of their own ideological “Mare Nostrum”. Describing such a network with the inclusion of maps will also support the chapter on the distribution of Mesopotamian Torpedo Jars throughout the Persian Gulf.

4.2 Iranian littoral

Although the capital city of the Sassanian Empire, Ctesiphon, was located on the Iraqi plains beyond Iran, the Iranian Plateau still functioned as the heartland of the empire similarily to previous and future empires that originated in that specific region. This is because the Iranian plateau is geographically protected from almost all orientations: in the northwest, there is the Caucasus mountain range and in the southwest, there are the Zagros mountains. Towards Central Asia, the north is protected by the Alborz mountains while to the south-east the Iranian Plateau is protected by the Lut Dessert. Such geography allowed Persia to develop economically, especially in the historical region of Fars. This created an incentive to trade with other regions in the Persian Gulf but also beyond it.

For that, port cities had to be created. During the Sassanian reign (2nd – 7th centuries CE), there were 2-4 ports on the Iranian side of the Persian Gulf. These were: Siraf, Bushehr, and Hormuz. Siraf and Bushehr are located in the proper Persian Gulf, as shown in Figure 4.1, while the port of Hormuz protects the mouth of the Persian Gulf. Due to its topography, Siraf was a small Sassanian coastal town with limited territorial expansion potential however, it had a natural harbor allowing the shipment of resources and products. Its connection to the city of Shiraz in Fars was also beneficial for commercial activity (Boucharlat & Salles, 1981, p. 68). The Sassanian fort, coins, and the presence of torpedo jar sherds confirm the Sassanian presence in this coastal city (Daryaee, 2010, p. 406; Tomber et al., 2022, p. 1). The city later gained more significance during the Islamic period. Bushehr is located 130 miles northwest of Siraf. It was a port located on a peninsula with a natural harbor, in the Sassanian era it was known as Rev-Ardashir. The city saw a decline in the 4th century AD with the rise of the port city

of Siraf (Whitehouse & Williamson, 1973, p. 42). When it comes to Hormuz, the island itself does not seem to have been occupied in pre-Islamic times. Instead, the port was located nearby, approximately 70 miles, to the east of the modern city of Bandar-Abbas in what is known today as Minab, shown in Figure 4.1. In that location, pottery from the 3rd – 5th century AD has been found confirming human occupation of that site (Boucharlat & Salles, 1981, p. 67). Khuzestan, the region in southwestern Iran, characterized by a vast plain, was commercially important as it gave access to the Persians to the rest of Mesopotamia. Along with Iraq, it was the most agriculturally productive region, notably the mentioned rice was cultivated there on a larger scale (Daryaee, 2010, p. 402). Historically, the ancient city of Susa was crucial in the region, especially during the Achaemenid period (6th – 5th centuries BCE), in the Sassanian period it remained important but it was on its decline. In Khuzestan there is no evidence of major Sassanian ports, this is perhaps due to the lack of natural harbors in the region (Boucharlat & Salles, 1981, p. 71).

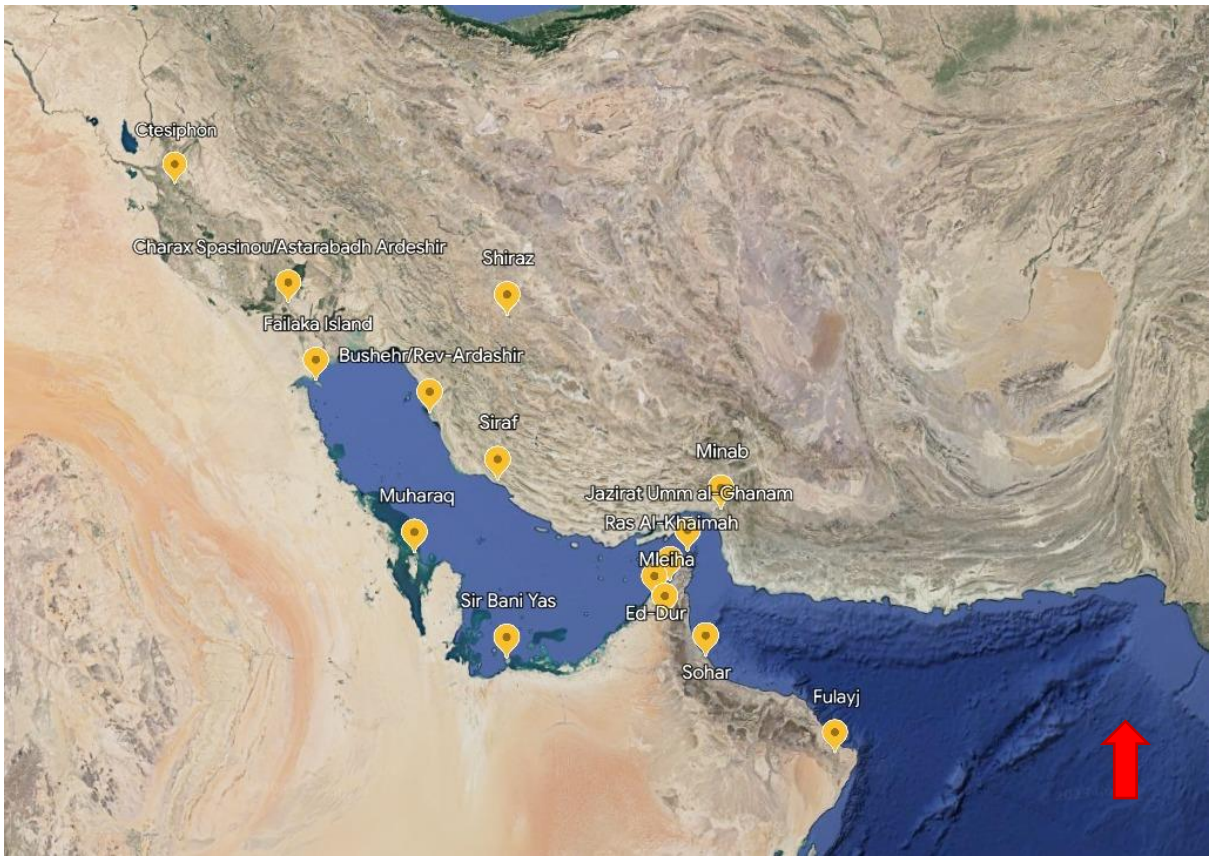

Figure 4.1 Map showing approximate locations for the sites in the Persian Gulf mentioned in Chapters 4 and 5. Yellow location markers represent the sites from Chapters 4 and 5. (Figure by Patryk Sztandar-Sztanderski, https://earth.google.com/web).

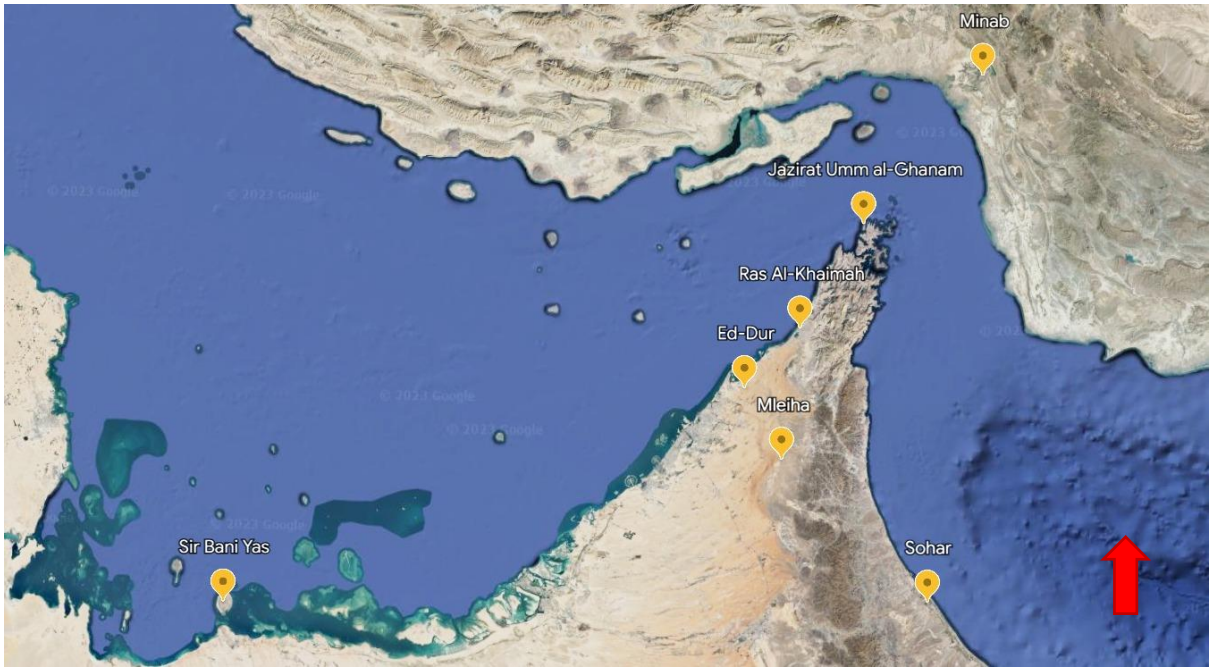

Figure 4.2 Zoomed-in map showing the approximate locations for the sites in the UAE and Oman mentioned in Chapters 4 and 5. Yellow location markers represent those sites. (Figure by Patryk Sztandar-Sztanderski, https://earth.google.com/web).

4.3 The rest of the Persian Gulf coastline

Next to Iran, the proper region of Mesopotamia opens, with the Sassanian capital of Ctesiphon (Figure 4.1) and its twin city Veh-Ardashir. For the coastline, there could have been three ports, two in Southern Iraq and one in modern-day Kuwait. In Southern Iraq, those were Apologos mentioned in the ancient texts (Periplus) and Spasinou Charax known as Astarabadh Ardeshir (Figure 4.1) in the Sassanian period later given up for Forat Meisan (Boucharlat & Salles, 1981, p. 72). Meanwhile, Failaka island, shown in Figure 4.1, shows signs of Sassanian occupation with the presence of Torpedo Jars on it as well (Durand, 2021, p. 22). These locations are well connected to the rest of Mesopotamia through three rivers: Shatt Al Arab, Tigris, and the Euphrates, which allow rapid transport of products.

Going further South, towards the Arabian peninsula, it is known that the Sassanians controlled the Arabian littoral on the Persian Gulf as shown in Figure 4.3. Traditionally, through historic sources, it was thought that the Arabian coastline on the Persian Gulf saw development under the Sassanian rule. However, based on archaeological evidence, this cannot be attested, and quite to the contrary, it seems that the focus on developing ports on the Persian side of the Gulf caused a decline in development in Sassanian-controlled Arabia (Kennet, 2007, p. 108). Despite this, Sassanian presence is quite well archaeologically attested. As previously mentioned Torpedo Jars have been found in Bahrain, United Arab Emirates, and Oman. The ancient source of Periplus mentions the port of Omana in modern-day Oman but due to the large Sassanian presence in Oman, this could necessarily not have been a single location site but several such as the locations of Mleiha and Ed-Dur, shown in Figure 4.2

(Overlaet et al., 2016, p. 139-140). On the Arabian side of the Strait of Hormuz, there was a Sassanian fortress located on the island of Jazirat Al Ghanam, shown in Figure 4.2, which could have overseen shipping according to some researchers (de Cardi, 1972, as cited in Daryaee, 2010, p. 43). Furthermore, the Arabian coast was nominally considered part of the Persian Empire. However, to what degree it was integrated into that network is often doubted by researchers (Munt, 2017). Other areas within the proximity of the Sassanian Empire in the Arabian peninsula were managed through a network of alliances with Arabian tribes allowing for a greater degree of decentralization of the empire on its peripheries (Morley, 2022, pp. 274).

4.4 The ideology behind the control of the Persian Gulf

This control of the Persian Gulf was intentional. As mentioned in the section above, there was an economic and security incentive in controlling the coastlines of the Persian Gulf. Not only it protected the core of the Sassanian Empire but it also allowed safe passage of commercial ships leaving and entering the Persian Gulf. It was the Sassanian gateway to the Indian Ocean trade allowing them to rival and prevent Rome from having a direct route to India through that Ocean. Typically for an imperial power, the Sassanian Empire exploited its peripheries, notably in Arabia in silver and copper mining (Daryaee, 2016, p. 44).

Aside from economic incentives, there was also an ideological justification behind the control of the Persian Gulf. This ideological justification is similar to the concept of “Mare Nostrum” that the Romans created around the Mediterranean Sea. The Sassanian vision of controlling the Persian Gulf was established within a Zoroastrian worldview. Their empire, Eranshahr, was entitled to control the shorelines of Puidig, Persian Gulf, which was considered the most important sea, as their people lived around it (Daryaee, 2016, p. 41). Consequently, control over the Arabian littoral was necessary, thus Arabia, and notably Oman, became a nominal part of the Sassanian Empire with the name of Arbayestan (Daryaee, 2016, p. 41-42; Munt, 2017, p. 277). One could say that the ideological justification had to be fabricated to justify the occupation of the littoral of the Arabian peninsula and the economic exploitation of that region.

Figure 4.3 "Sassanian Empire at the time of Shāpūr I". Map depicting the territorial extent of the Sasanian Empire (240-270 CE). (Encyclopædia Britannica, https://www.britannica.com/topic/Sasanian-dynasty#/media/1/524652/2031).

4.5 Summary

By outlining the network of forts and ports in the Persian Gulf I hoped to visualize the clear vision of the Sassanian Empire upon the future of that region. This network allowed the Sassanian rulers to address their security and economic issues. As it allowed them to protect their Mesopotamian and Persian heartland and the trading ships leaving the Persian Gulf. The desire to control the Persian Gulf proves that the region ought to be an integral part of the empire as without it the Empire would have not survived and also would have not had the opportunities to project its influence outside of it toward the greater Indian Ocean. To justify such an imperial vision the Sassanians created a whole ideology behind it, similar to the Romans. This chapter and its conclusion leave some questions unanswered, how does that relate to the distribution of Torpedo Jars? Or what was the Sassanian vision and power outside of the Persian Gulf?

5. Distribution of Torpedo Jars in the Indian Ocean and the Persian Gulf

5.1 Introduction

In this chapter, I will explore the distribution of Torpedo Jars in the Indian Ocean. This will be conducted on a region-by-region basis. The first section will be dedicated to the Indian subcontinent, the second section to the Persian Gulf, and finally the last section will be dedicated to other regions. This chapter will be closed with a summary including a discussion on the causes for higher and lower regional distributions of the Torpedo Jar. I chose such an approach due to the particularities of those regions regarding the distribution of that ceramic. It has to be reminded that this is not a quantitative study discussing data but a literature review discussing the distribution of Torpedo Jars based on chosen sources.

5.2 The Indian Subcontinent

Based on the ancient source of Periplus, it is quite likely that the Mesopotamian Torpedo Jars were meant to be transported to India as that region had a large demand for Persian and Arabic wine (Periplus, as cited in Durand, 2021, p. 27). Although the primary function of the transportation of wine cannot be chemically determined, the Torpedo Jar is indeed present on the Indian subcontinent: notably on the West Indian coast and Sri Lanka. The Mesopotamian Torpedo Jar is distributed in such Indian sites as Pattanam, Arikamedu, Mylapore, Alagankulam, Elephanta, Sanjan, and Chaul (shown in Figure 5.1), while in Sri Lanka important sites include Anuradhapura, Mantai, and Tissanaharama shown in Figure 5.1. The number of sherds in some of these sites is quite abundant. The distribution of Mesopotamian Torpedo Jars coincides regionally with the distribution of Late Roman Amphorae but not always on the same sites. For example, at Pattanam Roman Amphorae outnumber the West Asian Torpedo Jars by two (Cherian, 2011, p. 5). The findings in South Asia prove that the produce stored in the Torpedo Jars was highly popular among South Asians to the point where the distribution of Torpedo Jars competed with the distribution of late Roman Amphorae. The presence of Torpedo Jar sherds in Sri Lanka and the vis-à-vis coastline of India perhaps also shows the desire of Sassanians to influence the geopolitically significant Palk Strait (Stern et al., 2008, p. 411). Some researchers, such as R. Tomber (2007), wonder whether these two types of pottery containers of foreign origin arrived on the same ships or not (p. 983).

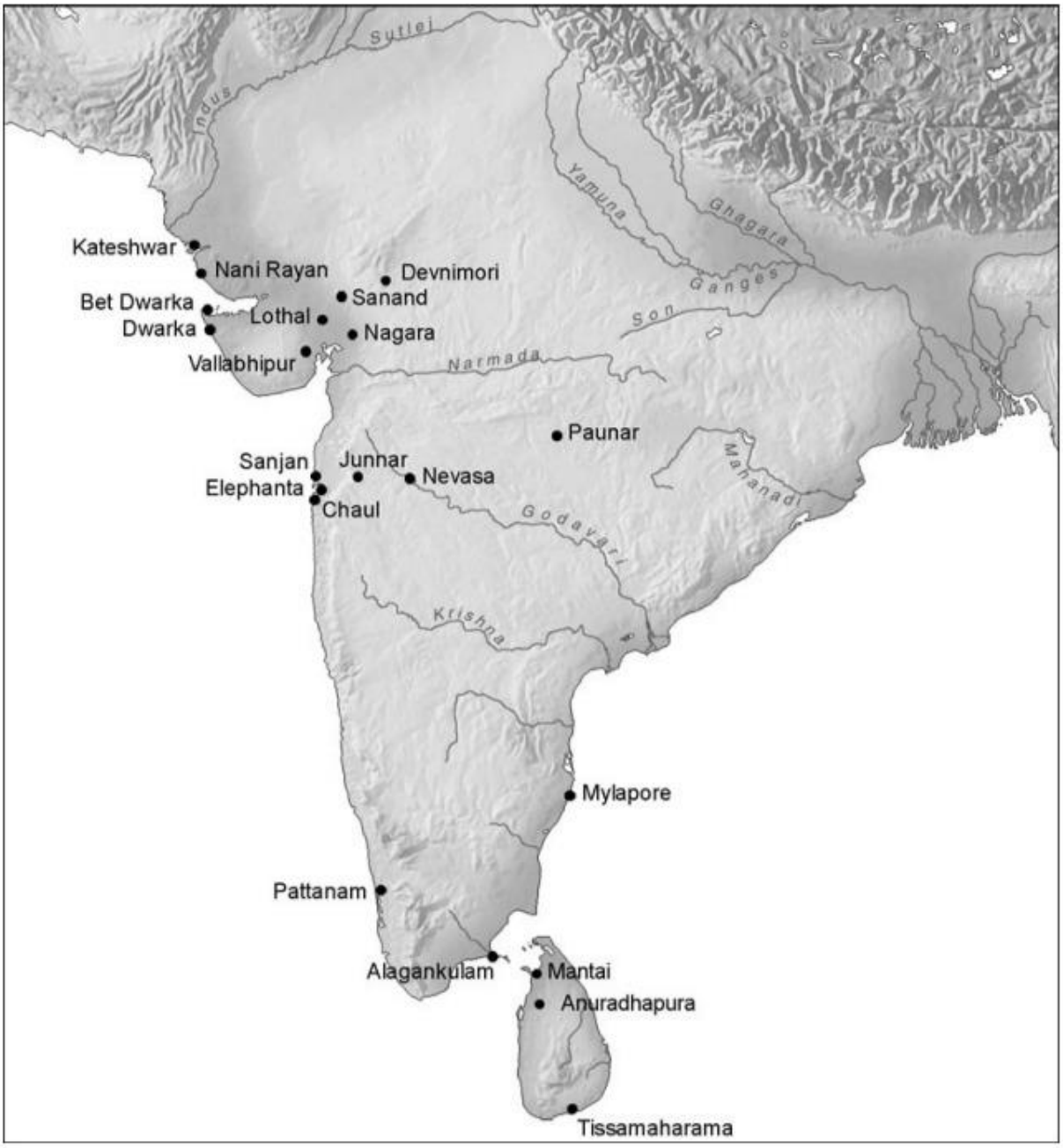

Figure 5.1 Distribution of Torpedo Jars in South Asia. Map made by A. Simpson showing the distribution of Torpedo Jar sherds on the littoral of the Indian Subcontinent. (Tomber, 2007, p. 977).

5.3 The Persian Gulf

Another region that sees a great concentration of Torpedo Jars is the Persian Gulf. This is quite unsurprising as the coastlines of the Persian Gulf are all within proximity to the possible center of production. The sherds of this type of pottery can be usually found in greater concentrations in port areas within the Persian Gulf. West Asian Amphorae sherds were found in the ports of Bushehr and Siraf in modern-day Iran, shown in Figure 4.1 (Durand, 2021; Tomber et al., 2022). In both places, the

sherds have been retrieved from a commercial context and a funerary one (Tofighian et al., 2011). The Torpedo Jars were also widely distributed in Southern Iraq, particularly near the capital of Tigris-Ctesiphon and also closer to the Iraqi coast within the Persian Gulf. These sherds have also been found on the territory of proper Kuwait and Failaka island, shown in Figure 4.1. It is quite likely that there used to be a major port within those areas of Kuwait and Southern Iraq due to beneficial geographical

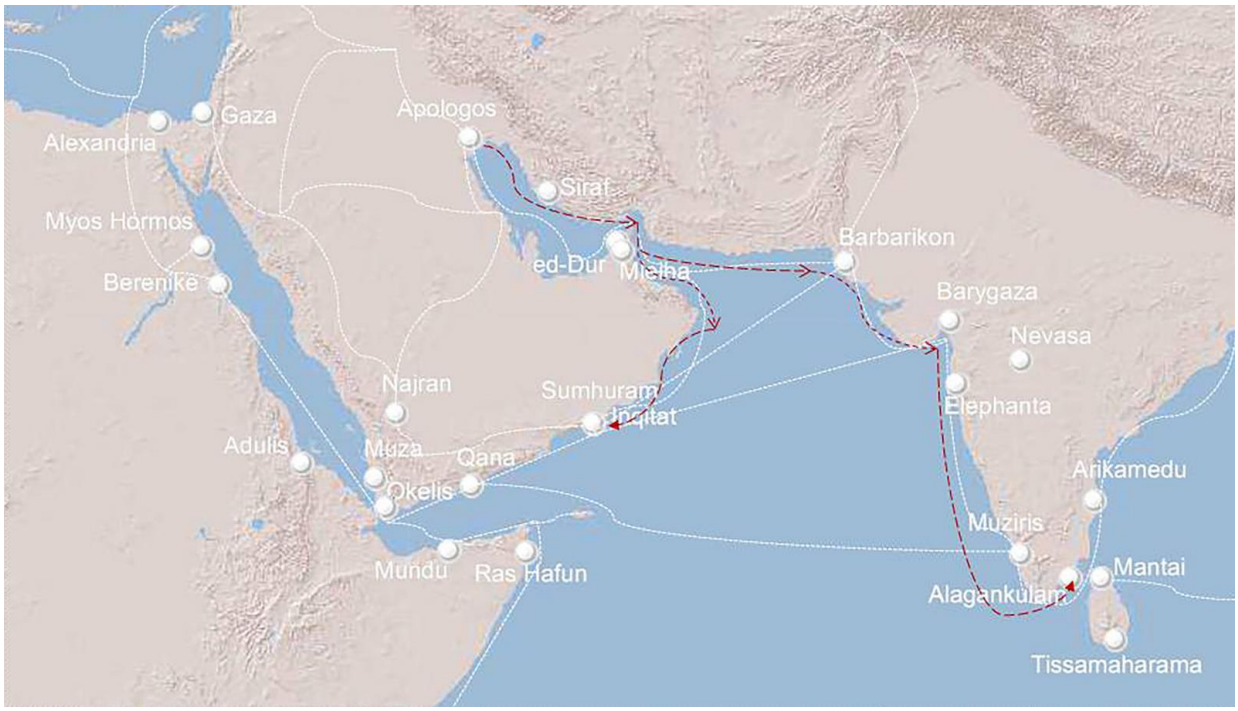

Figure 5.2 Journey of Torpedo Jars. Map depicting the sea route and destinations in which the Torpedo Jars would end up in. (Lischi, 2020, p. 12).

positioning. Ancient sources also mention the presence of a port in those areas, it being called Ubulla (Friedmann, 1992, pp. 15-16, as cited in Craddock et al., 1998, p. 11). The coastline of the Arabian Peninsula to the Persian Gulf also notes a presence of Torpedo Jar sherds, particularly in the United Arab Emirates at Ras al-Khaimah/Kush, Sir Bani Yas, Mleiha, Ed-Dur and in Bahrain at Muharaq, and Oman at the sites of Jazirat Al-Ghannam, Sohar and Fulayj, all shown in Figure 4.2 (Durand, 2021, p. 22, with further literature). The diffusion of Torpedo Jar sherds throughout the Persian Gulf shows the influence and control which Sassanian Persia had over that area for economic and security reasons.

5.4 Other regions

The two regions mentioned above show an exceptional presence of Torpedo Jar sherds. In this paragraph, other regions that cannot be characterized by such an abundant distribution of those sherds will be mentioned. Mesopotamian Torpedo Jar sherds are present on the Southern littoral of the Arabian peninsula in both Yemen and Oman. On one of the sites in Yemen, Qana, R. Tomber observed (2007) that both Torpedo Jar sherds and Late Roman Amphorae sherds are present at that site within the same archaeological context, coming to an assumption that Qana could have

functioned as an entrepot port for both Sassanian and Roman vessels (p. 983). West Asian amphorae can also be found on the coasts of Somalia at Ras Hafun and in East Africa in Kenya (Smith & Wright, 1988, as cited in Kennet, 2004, pp. 85; Tomber, 2007, p. 981). Finally, outside of the period of this research, there are Torpedo Jar sherds of the TORP-C type found in shipwrecks in Indonesia and Thailand (Belitung and Phanom Surin shipwrecks). Scarce quantities of Torpedo Jars found in Roman-controlled Egypt reveal the rivalry between Sassanian Persia and the Eastern Roman Empire and their respect for their territorial boundaries (Craddock et al., 1998, p. 11). Despite this rivalry, it seems that the Sassanians were able to influence Roman-controlled territories, as locally produced wares belonging to the Torpedo Amphora family were found in Early Islamic sites in Syria, clearly inspired by those produced further east in Mesopotamia (Vokaer, 2013, pp. 492).

5.5 Summary

Based on the information above, it can be summarized that Torpedo Jars were diffused in greater numbers in the Persian Gulf due to sheer proximity to the area of production and on the western littoral of the Indian subcontinent due to the high commercial activity with the Indians who desired Persian products. Meanwhile, the diffusion of Torpedo Jars to the West of Iran is less frequent due to the existence of the bordering imperial power, Eastern Rome. Whether Torpedo Jars and Late Roman amphorae traversed the Indian Ocean on the same ships is unknown with the information provided above, to make such an assumption more context about trade in the Indian Ocean needs to be presented. Overall, the distribution of Torpedo Jars outside the territorial boundaries of the Sassanian Empire indicates the significant activity of Persian merchants in the Indian Ocean. Based on the information provided in this chapter, it could be concluded that once the Torpedo Jars were shipped, they either traveled along the coasts of Persia or in a direct sea route to India as shown in Figure 5.2.

6. Sassanian sphere of influence and their relations with trade partners

6.1 Introduction

Lastly, it is necessary to provide some context about Sassanian relations with their trade partners in the Indian Ocean to understand their commercial relations in that region., this section will also dive into the decision process of the Sassanian Empire highlighting the merchant class's role in it helping to understand the character of that Empire.

6.2 Sassanian Relations with trade partners

Full control over the Persian Gulf allowed the Sassanian Empire to be directly involved within the Indian Ocean trade network and most significantly have direct sea access to the rich Indian subcontinent. This strategic location of the empire allowed it to be a middleman with a force to intervene and embargo rivals (Howard-Johnston, 2022, pp. 294; Whitehouse & Williamson, 1973, p. 45). These options undermined the Roman and then later Byzantine position in the Indian Ocean trade network. This can be witnessed by the decline of the port of Berenike on the Red Sea littoral, which forced Romans to act through proxies having freer access to the Indian Ocean such as the Kingdom of Aksum (Howard-Johnston, 2022, pp. 295; Morley, 2022, pp. 276). Despite that, such attempts were rather unsuccessful as Persian merchants remained a dominant force in the Indian Ocean trade network. Despite, those abilities being available to the Persian rulers, they were not exercised as often as one might think, as it was simply not necessary given the Persian merchant's class power (Daryaee, 2010, p. 406). Nevertheless, military action through the usage of the navy was used in some cases, for example in the 6th century CE the Sassanian navy closed the Red Sea access to the Indian Ocean. Meanwhile, Sassanian presence in the Indian subcontinent was quite significant, as they held fortification at the mouth of the river of Indus (Kervran, 1994, as cited in Howard-Johnston, 2022, pp. 292). However, this area was located within the Sassanian sphere of influence. Elsewhere on the Indian subcontinent, as previously mentioned, the Indians demanded Persian/Arab wine from the Gulf. To the east, in Mesopotamia and Arabia, the Sassanian Empire was bordering the Roman Empire and then later the Byzantine Empire. The two imperial powers had often fixed borders along Mesopotamia and Caucasus formed in treaties (Howard-Johnston, 2022, pp. 291). These were not permanent as they were interrupted by periods of peace and war.

6.3 Merchant class and drivers of the Sassanian economy

The territorial diversity of the lands that the Sassanian Empire controlled incentivized commercial exchange outwards. While the economic demand coming from the Persian aristocratic houses, the court, twin capital cities, and the army, incentivized imports from the east, notably the Indian subcontinent (Howard-Johnston, 2022, pp. 289). Consequently, this made the merchant class crucial

for the survival and development of the imperial economic network. The authorities were aware of that input, consequently, they promoted craft production in the beginning phases of state-building. The next process was to create a network of ports in the Persian Gulf (see Chapter 4), where the ports on the Persian side of the Gulf were promoted instead of the Arabian ones (Howard-Johnston, 2022, pp. 289). This exemplifies the core-periphery theory, to which imperial powers tend to adhere to. These accommodations for the merchant class left them with a great degree of influence over the decision-making process within the empire.

This can be exemplified by the dealings of the Sassanian ruler Khusro I with the Turks and Sogdians in Central Asia, where they had a common threat to the Hephtalites. Khusro I backed the Turks and the Sogdians into invading the Hephtalites but in a second round of negotiations they demanded access to the Sassanian market. This was done to sell their silk. At first, Khusro I refused the demand but later the silk was bought and burned (Howard-Johnston, 2022, pp. 297-298). In consequence, the Turks and Sogdians led a coordinated attack with the Romans on the Sassanian Empire. The possible assumption is that the Persian merchants lobbied the ruler to conduct such a peculiar decision as they held a monopoly on Silk Trade in the Indian Ocean (Howard-Johnston, 2022, pp. 297-298).

6.4 Summary

Based on the two subchapters above, one could say that the Sassanian Empire found itself in a significantly positive geographical position to influence and manipulate the trade networks of the Indian Ocean for its own geopolitical and commercial benefit. This positioning not only gave the empire state abilities to embargo its geopolitical rivals but also an opportunity for its merchant class to trade within the Indian Ocean with almost no limitations and without the necessity for state intervention in that sea. The diversity of the lands over which the Sassanians ruled promoted both export and import, the ruling class was aware of that and eased any boundaries for the merchant class to trade by creating a vast network of forts and ports in the Persian Gulf as described in the previous chapter. In consequence, the merchant class found itself in a favorable position within the Persian Gulf with the ability to lobby decisions for its benefit.

7. Discussion

7.1 Introduction

In this part of the thesis, all of the information from the chapters above will be summed up. Important points will be brought up and connected and discussed. Moreover, it will be crucial to highlight some limitations in concluding as not everything can be assumed just based on the information from the body of this thesis. Notably, I will discuss why the distribution of the West Asian Torpedo Jars is relevant to the topic of Sassanian imperialism. For discussion, I believe that is also necessary to produce a comparison of the Sassanian mode of production of transport containers to the Roman one in the Mediterranean Sea. I chose to make such a comparison because for one the Romans were arguably the most significant rival of the Sassanian Empire. Secondly, similarly to the Sassanians, Rome's survival depended on the control of the sea. This comparison, along with arguments from Chapter 3, could bring valuable points about the impact of political change on transport container production.

7.2 Comparison to the Roman model of ceramic production of transport containers

In this sub-chapter, I will discuss Woolf's (1992) article on the political economy of the Roman Empire and compare it to my observations on the Sassanian mode of production of transport containers. This will be done with the hope of simplifying and establishing concluding points on the centralization or the decentralization of the Sassanian economy. I will also explain why making assumptions based on the regionalization of the production of Roman amphoras cannot necessarily explain the regionalization or rather the lack thereof in Sassanian transport containers.

Pre-industrial empires are often considered to be systems in which the core of the empire extracts surplus resources from its tributaries and subjects to spend them on improving an infrastructure that allows the elite of the empire to maintain power (Woolf, 1992, p. 283). In the case of Rome this systematic definition of what makes an empire seems to be true as Rome maintained a tax regime on all of its provinces to spend that capital on the army and the infrastructure to keep the empire integrated and stable. The statements above regard the political economy of Rome and other empires but not the overall economy of Rome, which is often mistakenly considered to be an integrated system. Where the tributaries or the provinces are disallowed to trade with the other provinces unless it's the core province of Italy.

However, such exchanges did happen making it necessary to change the model of how the Roman Empire functioned as an economic system (Woolf, 1992, p. 284). Woolf (1992) exemplified such a model using amphoras due to their prevalence as a transport container for various goods such as olive

oil, wine, or fish sauce in exchanges around the Mediterranean (p. 284-287). Based on his findings, there used to be a period when one type of Amphora containers, used to dominate exchanges in the Mediterranean, which would be the period of Republican conquests (Woolf, 1992, p. 288-289). However, starting from the 1st century CE the production of amphoras around the Mediterranean Sea became more regionalized as the regions of the Roman Empire started exporting their products (Woolf, 1992, p. 286). Coincidentally, this would fit the period when the Empire consolidated its gains a stopped conducting major expansions (Woolf, 1992, p. 290).

How does this compare to the situation with the Sassanian Empire and the production of Mesopotamian Torpedo Jars? As I have highlighted before based on C. Durand's (2021) study of chaff-tempered ovoid jars and their decay of production, that example demonstrates the impact of political change and territorial expansion on the production of transport containers. Yet, the production of Roman Amphoras can be differentiated from the production of Mesopotamian Torpedo Jars. In contrast to the Mediterranean, in times of stability and regulation during the Sassanian reign (3rd- 7th centuries CE), the Torpedo Jars caused the decline of production of the chaff-tempered ovoid jar and became the only transport container of Persian production to be distributed around the Persian Gulf. This of course raises some possible assumptions, such as the fact that the Sassanian Empire could have been keener on centralization than the Roman Empire. Hence, the lack of regionalization of the production of transport containers in the Persian Gulf.

However, it must be pointed out that such an assumption comes with several limitations. I believe that the Persian Gulf bears less potential for the regionalization of the production of transport containers as it is simply much smaller in surface area compared to the Mediterranean Sea. Where some of the Roman provinces were distanced from each other at much greater distances than those in the Persian Gulf. Secondly, the lack of archaeological evidence for pottery kilns associated with the production of the Mesopotamian Torpedo Jars in the Persian Gulf poses an issue in making such a conclusion as it is simply not known with certainty where the Torpedo jars were produced. Although, based on plausibility, their area of production could be associated with the area of the exploited resources. Nevertheless, this assumption will be kept in mind since in contrast to the Parthian Empire, the Sassanians encouraged centralization.

7.3 Discussion

What is the worth of the chapters above on the discussion about the significance of Mesopotamian Torpedo Jars in the topic of Sassanian imperialism? This must be discussed thematically as the topic itself is multifaceted. To commence such a discussion, the themes from the previous chapters will be repeated.

This discussion can be started with the theme of the production of the West Asian Torpedo Jars. Based on several studies conducted on the clay fabric of the Torpedo Jar and the bitumen layer that covers the vessel from the inside, the source of the production of that ceramic could most likely be pinpointed to the northwestern side of the region of Khuzestan in the southwestern part of Iran at the end of the Zagros mountains (Connan et al., 2020, p. 16; Tomber et al., 2022, p. 19). Although it is not located on the direct routes between the Persian ports of Siraf and Bushehr to the cities in Fars, it is still proximal to these mentioned ports allowing for rapid transport and then export. That location is also well protected geographically, being on the northern coast of the Persian Gulf disallows any foreign incursion. The Sassanian foundation of a "Mare Nostrum" of their own makes the region protected from the sea.

The use of bitumen indicates the main function of the vessel, which is the storage and transportation of liquid products. The lack of scientific research analysis however provides no answers on which specific product it could have been despite historical sources and correlations pointing it towards wine. Such a piece of information would in my opinion be crucial for this discussion as it would provide a certain degree of knowledge on the Sassanian choice of projecting commercial influence in the Indian Ocean. In a case where the liquid that was stored in those vessels was to be wine, that would suggest deep commercial ties with the Indian subcontinent rivaling those of the Roman and then later Eastern Roman Empire.

The distribution of the Mesopotamian Torpedo Jars is one of the most crucial components in this analysis. The visualization of the distribution of Torpedo Jars improves the understanding of the influence that the Sassanian Empire possessed in the region. Chapters 4 and 5 had the exact aim of doing that. As expected, the large presence of Torpedo Jars in the Persian Gulf has been reflected accurately due to the sea being controlled by the Persians. Moreover, the Torpedo Jars are usually present within port areas either on land or in the sea in such places as Siraf or Bushehr in Persia proper or even in Arabia, thus suggesting their function in the export of produce. Yet, the sherds of these vessels have also been found in burial funerary contexts in numerous locations. Additionally, they are present within the compounds of Christian monasteries at Ras Al Khaimah and Al-Qusur on the Arabian peninsula indicating also use in domestic contexts. Next, the prevalence of Torpedo Jars on the western littoral of India and Sri Lanka shows that the Indian subcontinent was one of the largest trading partners of the Sassanian Empire. Furthermore, Sassanian interest in that specific part of India highlights the desire to control trade ways further east.

When it comes to the Arabian peninsula, it could be treated as a middle-ground between Sassanian Persia and the Romans, this could be highlighted by R. Tomber's (2007) observation based on the site

in Qana where Late Roman Amphora sherds intermingle with Torpedo Jar sherds in a similar archaeological context. However, the hypothesis of these vessels leaving that port towards the east on the same ships cannot be verified but is probable if there were middlemen.

The scarcity of sherds in north-east Africa reflects accurately the degree of rivalry that both of the empires shared as Egypt was controlled by the Romans and the Kingdom of Aksum often acted for the benefit of the Romans. Some sherds have been found in the Horn of Africa and then further South but in that case, the scarcity of those materials cannot be explained. Outside the question of proper Sassanian imperialism, as mentioned earlier some Early Islamic Torpedo Jars were found on the shores of Indonesia and Thailand. This could prove that the Persian and Arab merchants used the Sassanian-developed infrastructure to accomplish further commercial exchanges, this argument is supported by the fact that the port of Siraf was developing and being in use for shipping during the Early Islamic period. The spread of the Torpedo Jar throughout the Indian Ocean not only can be accredited to the infrastructure that the Sassanians developed in the Persian Gulf but also to the influence that the Persian merchants possessed as mentioned previously (see Chapter 6.3).

Lastly, I believe that the preliminary evidence such as the shift from the production of chaff-tempered ovoid jars to the production of the Torpedo Jar reflects accurately the takeover of an economically centralized empire (Sassanian Empire) over a decentralized empire (Parthian Empire). This is also supported by the fact that the Sassanians compared to the Parthians introduced many rules and regulations regarding economic activity. Meanwhile, the takeover of the TORP-C over the TORP-C believed to happen during the 8th century CE could reflect the rapid conquest of Persia by the Arab Caliphates. Although this does reflect a change, TORP-C is still a type of the same vessel that the TORP-S represents. This indicates, that the impact of political change on regional production centers should not be overrated. Further trade in Torpedo Jars, beyond the 8th century CE, reflects an enormous economic legacy that the Sassanians left in the Persian Gulf. Bringing the Roman example from Chapter 7.2 to the discussion, one can observe that the Sassanias stand in contrast to the Romans. As, under their reign, the regionalization of ceramic containers does not occur. Nevertheless, based on these examples, one could state that regional production centers certainly change under political pressure, especially when it comes to territorial expansion.

8. Conclusion

8.1 Main Conclusion

After discussing the findings in Chapter 7 it is necessary to produce concluding statements for this thesis. For the reader, I will refer to the research questions that were formulated in Chapter 1:

How does the research on Torpedo Jar containers as markers of Sassanian activity in the Persian Gulf and in the Indian Ocean between the 3rd and 7th centuries CE contribute to our understanding of Sassanian Imperialism and trade relations in those regions?

How does the study of Torpedo Jar containers in the Persian Gulf and the Indian Ocean contribute to our understanding of the structure of the Sassanian economy between the 3rd and 7th centuries CE?

For the first question, the answer has to be divided into several segments. This will go hand in hand with the previous chapters of this thesis. The use of Torpedo Jars as markers can divide Sassanian imperialism into stages. Concentrating on the development of the core of the empire, the Sassanians exploit the resources in the provinces in modern-day Iraq and Iran to produce a widely distributed ceramic container. Further, the container was shipped from significant ports on the northern coastlines of the Persian Gulf. The safety of the ships exporting the Torpedo Jar was guaranteed by a system of ports and forts existing on the southern coastline of the Persian Gulf. From that stage, the Torpedo Jar could have been exported either domestically to other areas controlled by the Sassanian Empire. Or, it could have been exported to main trade partners, notably on the Indian subcontinent. As a third option, the product was acquired by third parties, possibly in Yemen and Oman, and then exported, although rarely, to areas under Roman/Byzantine influence. Generally, Torpedo Jar sherds can be rarely found in Roman-controlled territories, this is a consequence of rivalry and economic war between the two imperial powers. Nevertheless, the wide distribution of the Torpedo Jar signifies the Sassanian willingness to participate in the global trade network of the Indian Ocean. And such participation could have not occurred without the “emancipation” of the merchant class.

The transport container function of the Torpedo Jars is often questioned. A substantial amount of evidence points to that function however, as shown in this thesis, some doubts can be raised. Meanwhile, the domestic distribution of Torpedo Jars and embedded rice grains on one of the sherds confirm a wide repurpose of the Torpedo Jars in burials, monasteries, and in storing/transporting food.

For the second research question, the answer is shorter. The imperial realm around the Persian Gulf allowed the Sassanians in contrast to the Romans to integrate the territories into a considerably more centralized economic system. I strongly believe that this is due to the proximity that those territories

shared allowing the Sassanians to exert more control. This cannot be confused with security issues as previously mentioned the peripheries of the empire were decentralized. The centralization of the Sassanian economy is exemplified by the archaeological record, notably the Torpedo Jars in question. Especially this can be seen by observing the transition of distribution in the Persian Gulf from chaff-tempered ovoid jars to Torpedo Jars in the times of the Sassanian takeover. The rare presence (in contrast to the Torpedo Jar) of the chaff-tempered ovoid jar at the sites outside of the Persian Gulf also confirms Sassanian commitment towards the development of commercial infrastructure in contrast to the Parthians. Consequently, that infrastructure was further used and developed in the Early Islamic period explaining the continued Torpedo Jar distribution in areas beyond India to the east. Therefore, it can be concluded that the Torpedo Jars are a satisfying material representation of Sassanian centralization and trade infrastructure.

8.2 Recommendations for future research

I believe that with the current knowledge about Torpedo Jars, there are still many questions that remain to be unanswered. One of the most significant causes for that is the material record associated with the Torpedo Jars. Through, this entire study, one conclusion that can be made is that the Torpedo Jars have a prevalent record in the distribution along the coasts of the Indian Ocean. However, as mentioned previously, the production process is still largely unknown as no production kilns have been recovered. Therefore, I would encourage conducting more archaeological surveys and excavations in the Persian Gulf to discover the material culture associated with the production of Torpedo Jars. Of course, this is easier said than done as there are many restrictions on entering Iraq and Iran. Secondly, one of the most crucial pieces of information that is missing is the content of the Torpedo Jars. What specific liquids were they transporting? Wine? Perhaps as the historical sources suggest. Nevertheless, scientific evidence is necessary to prove that claim. Consequently, more chemical studies are needed to be done on the internal fabric of Torpedo Jars. This would finally reveal the insights into Perso-Indian trade in Late Antiquity and Early Middle Ages.

I believe that the function of transport containers is more probable than them (Torpedo Jars) being domestic containers. Despite that, the plausibility of domestic containers must be explored. Hence, in my opinion, the need for the contextualization of Torpedo Jars in a funerary context. The repurposing of the Torpedo Jars regarding the transportation of solid foodstuff also must be studied.

Lastly, I will leave criticism for the methods I used. The application of a literature review instead of a research paper was due to the intensity of research required for the latter method regarding the topic of Torpedo Jars. A research paper would require a quantitative analysis of all the Torpedo Jar sherds on the shores of the Indian Ocean and the Persian Gulf. In contrast to a literature review, this method

of research would produce more refined and concise conclusions, as specific data would have been provided for that method of research.

Abstract

The topic of ancient trade in the Indian Ocean has been popular for a while already. But, most of the attention was directed toward the commercial connections that the Roman Empire established with India and China under the framework of the Silk Roads. This resulted in the research of Roman ceramic containers, the amphorae. Consequently, other aspects of the Indian Ocean trade were often ignored. However, after the discovery of Sassanian ceramic containers known as Torpedo Jars, the role of this imperial player in the Indian Oceans started being questioned by many researchers such as R. Tomber. My thesis aims to evaluate Sasanian strategies in geopolitics, trade, and economy through the use of Torpedo Jars as an archaeological marker. Through the use of literature on the topics of Torpedo Jars, Sassanian imperialism, trade, and economy my thesis aims to compare information and expand possible conclusions. The thesis introduces a thematic chapter each contributing to the discussion on the relevance of Torpedo Jars in the Sassanian activity in the Persian Gulf and the Indian Ocean. Based on the findings from the chapters, a wide network created by Sassanians was revealed. The primary objective of the Sassanian Empire was to secure the Persian Gulf for security and economic reasons. This allowed them to possess an influential stake in the Indian Ocean trade causing a wide distribution of Torpedo Jars in the region, especially in the main trading region of India. Moreover, Sassanians in contrast to the Parthians made an effort to centralize their economy of transport container production, also supporting the further distribution of Torpedo Jars. This was exemplified by a study on the chaff-tempered ovoid jars (predecessor of Torpedo Jars in the Persian Gulf) and a comparative analysis of the production of transport containers in the Roman Mediterranean and the Sassanian Persian Gulf. Nevertheless, the topic of Torpedo Jars is still not studied enough. More excavations and archaeological surveys need to be conducted to find further evidence of the production and function of Torpedo Jars. Based on my thesis I would also encourage conducting a quantitative research method on the distribution of Torpedo Jars in the Indian Ocean producing a wide dataset with proportions.

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Figures