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**UNIVERSITY OF SOUTHAMPTON**

FACULTY OF HUMANITIES

Archaeology

**Sailing the Monsoon Winds in Miniature: Model boats as evidence  
for boat building technologies, cultures and collecting**

by

**Charlotte Dixon**

Thesis for the degree of Doctor of Philosophy

March 2018

UNIVERSITY OF SOUTHAMPTON

## **ABSTRACT**

FACULTY OF HUMANITIES

Archaeology

Thesis for the degree of Doctor of Philosophy

### **SAILING THE MONSOON WINDS IN MINIATURE: MODEL BOATS AS EVIDENCE FOR BOAT BUILDING TECHNOLOGIES, CULTURES AND COLLECTING**

Charlotte Lucy Dixon

Models of non-European boats are commonly found in museum collections in the UK and throughout the world. These objects are considerably understudied, rarely used in museum displays and at risk of disposal. In addition, there are several gaps in current understanding of traditional watercraft from the Indian Ocean, the region spanning from East Africa through to Western Australia. Using models of a range of boats from thirteen museum collections throughout the UK, this Collaborative Doctoral Award PhD research considers the value of these objects for both researchers and museums.

This thesis explores the potential of models to help us to understand traditional boats and boat building practices; some of which no longer exist. It achieves this through the production of a catalogue and analysis of a wide range of models. Then, through the presentation of two case studies it starts to explore a number of ideas about the physical attributes of these objects and how representative they are of full-size vessels. In addition, the wider cultural processes and contexts of the models are explored. It considers ideas about collecting, miniaturisation and the iconic symbolism of watercraft.

It is anticipated the outcome of this project will be the utilisation of models of boats from the Indian Ocean, and throughout the world, in future studies of traditional watercraft. It is also hoped that this research will help museums to re-evaluate the significance of these objects in their collections, and to use them in displays in the future to tell a range of narratives.



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## **List of Accompanying Materials**

Along with this main thesis document there are separate documents which contain Appendix A and Appendix E. There is also Appendix H which contains restricted images that cannot be displayed within the e-thesis due to copyright issues.

## Academic Thesis: Declaration Of Authorship

I, Charlotte Dixon, declare that this thesis and the work presented in it are my own and has been generated by **me as the result of my own original research.**

**Sailing the Monsoon Winds in Miniature: Model boats as evidence for boat building technologies, cultures and collecting**

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signed: .....

Date: .....

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## Chapter 1 – Introduction



**Figure 1** A drawer containing a model of a boat from India, in the British Museum stores. Approximate length is 630mm (inventory number As1849,0904.1; photograph taken by Charlotte Dixon, April 2014)

Models of boats from Asia, Africa, the Pacific and the Americas can be found in museum stores throughout the United Kingdom and other parts of Europe. These handcrafted, often highly detailed, objects are poorly understood, including how and why they were originally made or collected by museums, and are rarely put on public display. In addition, there is limited understanding about the value of models as evidence for the traditional boats they represent, and the maritime traditions they were part of; traditional boats and traditions that may have changed or disappeared since these models were made.

This thesis seeks to assess the value and potential of these models for museums and researchers by considering their contribution to boat studies, research on maritime cultures, collecting and understanding miniaturisation and models. It thus supports a small, but growing aspect of Maritime Archaeology and Ethnography: the study of boat building traditions in their cultural and historical context. Furthermore, it hopes to promote the importance of these objects for

research and display, to increase the study of these artefacts by future researchers and to help museum curators make more use of these model boats.

## 1.1 Research Questions

It is not possible, within the timeframe of this Collaborative Doctoral Award PhD, to research models of boats from all non-European countries. It has therefore been necessary to identify a particular study area so the value of models can be assessed. It is anticipated the methods used in this thesis will then influence future studies of watercraft from other regions.

As there is limited understanding about many types of full-size watercraft from the Indian Ocean, and models from this region have been considerably understudied (which will be verified later within this chapter and throughout the thesis), the research will primarily focus on models of boats from the Indian Ocean. It will consider the value of these miniature objects as a resource for understanding the full-size watercraft the models represent. The main objective is therefore to answer ***how useful are models as a tool for studying traditional boats from the Indian Ocean?*** This question will be approached throughout the thesis by answering a series of research questions specifically about the boats the models represent:

1. *What can models tell us about the different types and range of traditional boats?*
2. *Are model boats useful in understanding construction techniques and can they tell us how these vary over time and space?*
3. *To what extent can models tell us about the importance of boats in local cultures or in western cultures that might commission them?*

Then, to further understand the models and thus enable these questions to be answered comprehensively, questions are also asked regarding accuracy and context:

4. *Do the models accurately reflect full size vessels?*
5. *What is the purpose of the boat models? Why were they made and collected?*
6. *How have the models entered into Museum collections?*

As well as helping us to understand model boats specifically from the Indian Ocean region, this study also has wider implications for the maritime



archaeological interpretation of boat model evidence. These questions and the method used to answer them can thus be applied to models in the broader field of maritime archaeology in future studies.

## 1.2 Scope

This research is a collaborative doctoral project between the University of Southampton and the British Museum. It was developed to enhance studies of traditional boats around the Indian Ocean whilst using museum collections for which there is very little curatorial expertise. The original proposal was funded because boat models have been little researched, their specific stories are poorly known, and the broader information they might provide about maritime traditions or other aspects of the history of the Indian Ocean, has yet to be revealed. The thesis is part of the British Museum's focus on the Indian Ocean, which has included exhibitions in London (2015) and Western Australia (2016), seeking to pioneer the study of such model boats and explore what they can contribute to the understanding of the ocean's history. The research, therefore, focuses on models specifically from this region to address the question of how useful they could be as a tool for studying traditional boats. It thus supports the work of the British Museum not only in furthering the study of boats from the Indian Ocean in its own collections, but in its national role in supporting other museums in the UK with 'Ethnographic' collections. Whilst the definition of the term 'ethnography' altered throughout history, it refers, in general, to the study of people and cultures (Atkinson and Hammersley, 2007: 1). 'Ethnographic museums' are therefore institutions that "feature objects as the 'material culture' of peoples who have been considered...for anthropological research" (Lidchi, 1997:161). While early ethnographic collections presented "evidence of man in other cultures, the category now includes many whose ethnography is that of their own" (Isar et al., 1983: 135). Such collections have potential to contain objects from the Indian Ocean region.

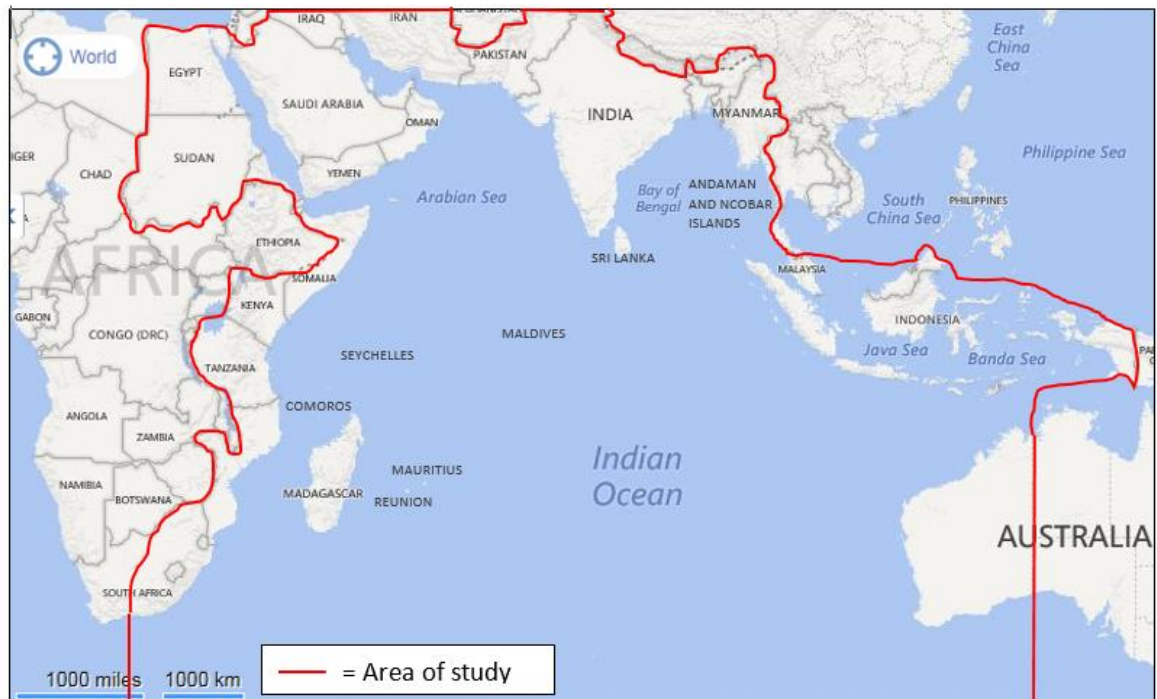
This section presents the scope of the project. It identifies the geographic boundaries of the research area, introduces the current situation of Indian Ocean studies and, importantly, justifies why traditional boats from the Indian Ocean, in particular, require further study.

### 1.1.1 Geographic boundaries

Although the exact boundaries of the Indian Ocean are debatable (Cordesman and Toukan, 2014: 1), it is considered to span the regions from South Africa through to Western Australia (see Figure 2). This includes the Red Sea and Persian Gulf and encompasses islands within, and regions bordering, this vast expanse of water. Whilst the western and northern borders of the Indian Ocean are relatively straightforward due to the surrounding land masses, the southern and eastern borders are questionable. In 2002 the International Hydrographic Organisation included the western coast of Sumatra, an island of Indonesia, in its defining limits of the Indian Ocean but not the eastern coast.

Many models in this research lack details about their specific origins due to limitations of some museum records. The country of origin is often recorded but specific locations within that country are generally omitted. For the purpose of this research, therefore, the Indian Ocean includes models from countries from South Africa through to Western Australia including Indonesia and Malaysia. Although some parts of Thailand border this ocean the majority of the coastal regions are connected to the Pacific Ocean. For this reason, the research excludes regions from Thailand, Cambodia and Vietnam onwards.

Westerdahl described the concept of ‘maritime cultural landscapes’ which essentially include whole networks of sailing routes including ‘transit points’ where the “river based cultural area meets the outer world” (1992: 6). Given Westerdahl’s definition of the maritime cultural landscape and the connectivity of rivers with the ocean, this study incorporates models of seagoing and riverine watercraft but excludes boats wholly designed for inland use, such as lakes.



**Figure 2** The geographic extent of the study area incorporating any countries that border the Indian Ocean from Eastern Africa through to Western Australia including the Red Sea, Persian Gulf, Malaysia and Indonesia [adapted from <http://www.bing.com/maps/> accessed 29.10.2015]

### 1.1.2 Indian Ocean studies

The Indian Ocean, the world's third largest ocean (The Columbia Encyclopaedia, 2015), has a long and complex history of seafaring spanning over 5,000 years (Pearson, 2003: 1). The exchange of commodities, technologies, cultures, religions and people, enabled by seafaring skills and technologies, made this region a fluid and diverse network of communities and trading links long before the Portuguese explorer, Vasco da Gama's, expedition to India in 1498 (Alpers, 2014: 69; Chaudhuri, 1985: 63; McPherson, 1998: 138; Pearson, 2003: 113). By the first millennium BC, at least, an understanding of the regular and predictable wind systems unique to the region, known as the monsoon winds <sup>1</sup> (referred to in the first century AD *Periplus of the Erythraean Sea* [Schoff, 1912: 38]) meant vessels were able to cross the vast expanse of the ocean. With the uneven distribution of raw materials in regions around the Indian Ocean, such as ivory on the Swahili coast, pearls around the Persian Gulf and spices in India, there was a desire to trade and exchange material goods long before European intervention

<sup>1</sup> This refers to annual wind systems and their associated seasons. The Northeast Monsoon occurs from November to January when "high pressure builds up over continental Asia and blows dry winds down from Arabia and western India toward eastern Africa and from China toward southeast Asia" (Alpers, 2014: 7). From April to August this process is reversed blowing strong winds and currents towards the north and bringing heavy rain. This is known as the Southwest Monsoon.

and colonisation (Sheriff, 2010: 11). The movement of people, in the form of migration as well as forced slavery, across the ocean and cross-cultural interactions when trading enabled the spread of ideas, technologies and religion (McPherson, 1998: 3).

The strong Portuguese presence in the Indian Ocean from the sixteenth century later followed by Spanish, Dutch and British powers, resulted in trade monopolies, conquest and colonisation (Chaudhuri, 1985; Pearson, 2003; Kearney, 2004; Alpers, 2014). This was a period that saw dramatic changes with new trade routes established, globalisation and the expansion of the British Empire (Figure 3 shows the extent of British rule in the Indian Ocean in 1915).



**Figure 3** Extent of the British Empire in the Indian Ocean by 1915 (depicted in red)

[<http://www.britishempire.co.uk/images4/britishempiremap1915.jpg> accessed 13.09.2017]

Despite the significance of this region in global history it was, for many years, the least studied of the world's oceans (Alpers, 2014: 1). This situation is now changing with increasing interest in trade, migration, cultural exchanges (Alpers, 2014: 1) and, in recent decades, the vessels that crossed the ocean enabling such interactions to occur (which will be mentioned later in this chapter). Studies that concentrate on the history and networks of the Indian Ocean region as a whole are still in the early stages (e.g. Chaudhuri, 1985; McPherson, 1998; Pearson, 2003; Kearney, 2004; Bose, 2006; Alpers, 2014) with support of Braudel's (1949) ideas of "an integrated oceanic system" (Mack, 2011: 61) often considered.

Whilst the development of studies of traditional boats from the Indian Ocean advanced understanding of regional histories (such as Chittick, 1980;

Rajamanickam, 2004; Agius, 2010), few studies have considered the ocean as a whole. There are still many gaps and limited knowledge about construction, use, meaning and different types of traditional vessels used around the ocean. With limited understanding of such vessels, declining numbers and, in many cases, their demise (as a result of the tsunami that devastated vast regions in and around the ocean in 2004, shortages of timbers and resources and the introduction of new materials and technologies), this research takes a holistic approach by focusing on models originating throughout the entire Indian Ocean region. This research therefore offers an important insight into vessels from multiple regions around the Indian Ocean and makes a significant contribution to studies of the ocean and its history.

### 1.1.3 Traditional boats of the Indian Ocean

*“From those white sands overshadowed by palms, we espied curious objects coming towards us over the blue rippling water. In the distance they looked like great sea-spiders with very long legs; but as they approached and turned sideways, we saw that they were long narrow canoes, most curiously constructed”*

An observation of outrigger canoes in Sri Lanka by a British traveller (Cumming, 1892: 18)

Such descriptions of watercraft in the Indian Ocean were not uncommon in nineteenth and early twentieth century European travel accounts, showcasing curiosity for vessels that appeared so fundamentally different to contemporary European boats. Despite such early curiosities, however, traditional boats from this region remain relatively little studied by scholars with considerable gaps in our understanding of many vessel types. Furthermore, published studies often focus on one particular vessel or region: a comprehensive study of traditional boats from the Indian Ocean is still yet to be collated.

Whilst late nineteenth and early twentieth century travel accounts can be useful in understanding general vessel types and their use they are limited in providing specific details that can significantly enhance understanding of traditional boats. British master shipwright John Edye (1834) and French naval officer Admiral François-Edmond Paris (1841), however, recorded vessels, such as the *masula* surf boat from India and outrigger canoes from Sri Lanka, through written descriptions and technical drawings. These records can help to decipher the design of particular vessels, but it was not until the mid-twentieth century onwards that studies of traditional boats from the Indian Ocean really developed.

Driven by curiosity and interest the early and mid-twentieth century saw publications by the ethnographer James Hornell, for example, recording and describing vessels from around the world including India and Sri Lanka (Hornell, 1920, 1941, 1943, 1946). Towards the end of the twentieth century, however, circumstances were changing. A shortage of suitable timbers, the introduction of new technologies, such as outboard motors, and materials, including man-made fibreglass, resulted in a decline and threats in the survival of many traditional wooden vessels around the Indian Ocean (Devendra, 2011: 13a; McGrail et al., 2003: 12). In addition, the establishment of Maritime Archaeology as a discipline in the 1970s (Bass, 2011: 7) and the move towards standardised methods of recording boats resulted in an increase in the volume of boat studies ranging from India (e.g. Kentley, 2003a; Rajamanickam, 2004), Sri Lanka (Kapitän, 1987, 1988, 1991, 2009; Vitharana, 1992), the Persian Gulf (Hawkins, 1977; Agius, 2010; Sheriff, 2010), Indonesia (Horridge, 1987), and of multiple regions around South Asia (such as McGrail et al., 2003) for example.

The situation changed in 2004 with the devastation of the tsunami. This impacted many regions around the Indian Ocean including Indonesia, India, Sri Lanka and the Maldives (Bose, 2006: 1). This natural disaster resulted in 230,000 casualties, displaced 1.5 million people (Tsunami 2004, 2015), destroyed homes and businesses and demolished vast quantities of boats, many of which were relied upon for people's livelihoods (Caldecott and Wickremasinghe, 2005: 60). With the quick and cheap production of glass-reinforced plastic (GRP) vessels compared to the traditional labour intensive wooden boats, relief efforts started replacing the lost craft with GRP alternatives. The demise of craft from this region revealed an urgent need to record any remaining traditional vessels and to produce studies on those recently lost (e.g. the study of Sri Lankan *oru* by Gerald Grainge, 2011).

Certain regions and vessels feature more frequently in traditional boat studies than others. For example, dhows from the Persian Gulf (e.g. Villiers, 1940; Hawkins, 1977; Sheriff, 2010) vessels from India such as the *masula* surf boat (e.g. Kentley, 2003a) outrigger canoes from Sri Lanka (e.g. Kapitän et al., 2009), and the (now vanished) *mtepe* from the Swahili coast of east Africa (including Adams, 1985; Gilbert, 1998) featured in multiple studies. It is quite apparent, however, that a comprehensive study of traditional boats from the Indian Ocean has not yet been conducted as other vessel types and regions, such as Malaysia and Myanmar, have, thus far, been virtually omitted. This chapter has only briefly introduced the subject and given a few examples of the relevant literature but

specific details of current boat studies including what has been researched, how and why and what has been omitted will be explored in greater detail throughout this thesis.

There are consequently gaps in our understanding of traditional boats from the Indian Ocean. Some of these vessels have been adapted; others have completely disappeared or are threatened with extinction. This research therefore focuses on models of boats from the Indian Ocean taking a holistic approach to assess if, and how much, they can tell us about the types, construction, use and meaning of vessels. It will identify if these objects are able to provide new evidence about traditional watercraft or if they can support or contradict the literatures. While it is acknowledged that this research cannot incorporate models of all non-European watercrafts within its scope, it is hoped it will be able to provide a framework for the use of models in future traditional boat studies.

## **1.2 Model boats as a resource**

Throughout the eighteenth and nineteenth centuries the production and use of models in Britain flourished (Baker, 2004: 29). Their mobile nature, aesthetic value and, significantly, their potential as educational resources made them particularly appealing at a time when exhibitions and the desire to display and educate were becoming increasingly popular (see Chapter 4). The three-dimensional representation of objects in miniature, however, did not start in the eighteenth century. The miniaturisation of objects, including boats, spans thousands of years<sup>2</sup>, but this research primarily focuses on models produced and collected in the nineteenth and twentieth centuries. The vast range and quantity of models produced during these periods raises questions about their cultural value, representation, purpose and their ability to inform us today.

Model boats vary greatly in their form and design, ranging from simple block models to technically constructed naval models (Lavery and Stephens, 1995: 1-16). Their functions and purposes range from aesthetic, votive and commemorative models to shipwright advertisement and models for test tank experimenting (Lavery and Stephens, 1995: 1-16). There is a comparatively large amount of literature on Western boat and ship models (which will be discussed in Chapter 2), including their roles in ship design, promotion of companies and

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<sup>2</sup> Archaeological excavations discovered funerary model boats in ancient Egyptian burial tombs dating from at least the Badarian period (c5500 – 4000 BCE) (Merriman, 2011: 56)

navies, as votives, as toys and hobby objects (e.g. Lavery and Stephens, 1995; Roach, 2008). In comparison, there has been relatively little research or published literature on models of non-European boats and ships. For example, few catalogues of non-western model boats have been published in the UK (e.g. The Royal Scottish Museum, 1956) and there was discussion of models in some nineteenth century studies of boats and ships (e.g. Pitt-Rivers, 1875). For the Indian Ocean, studies of models are very limited and are often only brief mentions in studies of traditional boats. However, models have been used as substantial evidence in studies of East African *mtepe* (Hornell, 1941; Adams, 1985; Prins, 1986; Da Silva, 2010) and Sri Lankan *yathra dhoni* (Vitharana, 1992; Green, 2001; Devendra, 2002; 2013); boats that no longer exist. Claire Wintle's publication (2015) is a rare example of an article about why ethnographic models were originally commissioned or collected. It stresses how such models are also themselves a product of, and evidence for, the history of European trade, rule and research in the Indian Ocean.

These once exhibited and valued objects are now generally in storage, out of public sight. They have been little studied with their purpose, representation and potential unknown. Despite dwindling interest in these artefacts, however, models of various boats and model making kits can still be purchased, magazines about these objects are in print (such as *Model Boats*) and there are websites and forums dedicated to communicating with model enthusiasts (e.g. <https://model-boats.com/>). It would seem then there is still an appeal of model boats for individuals around the world, whether it is for their aesthetic value, memorabilia or general interest. It is hoped this research will raise the profile of the vast range and quantity of model boats in ethnographic museum collections. The methods and extent they have been used in traditional Indian Ocean boat studies thus far will be discussed in Chapter 2, demonstrating just how little these objects have been utilised to date and why this research is essential. With consideration of the practicality of model making in terms of the process, tools, materials and how these can vary in the production of models and full-size vessels, the research examines in what way models can contribute to our understanding of traditional watercraft.



### 1.3 Thesis outline

This thesis is ultimately an introduction to the potential of models for the study of traditional boats by focusing on particular examples from the Indian Ocean. It does not aim to produce an in-depth review of all traditional watercraft from the region or to provide a comprehensive analysis of collecting or colonial histories. Instead, it provides overviews of different aspects of models to help us to understand why they were made and collected, what implications the process of miniaturisation can have on our interpretation of these objects, how they can be used to explore different aspects of full-size watercraft such as their construction and features, and to what extent they accurately depict full-size vessels.

To assess how useful models of boats are in the study of traditional watercraft from the Indian Ocean the thesis is divided into two main sections. The first introduces model boats by reviewing published studies of these miniature objects followed by an introduction of the models forming the dataset in this research. Contexts of the models will then be discussed in terms of their purpose and collecting histories. The second half of the thesis considers the models as representations of full-size watercraft. It will introduce published studies of watercraft in the Indian Ocean and, based on this information, present detailed analysis of a sample of models through the presentation of two case studies.

**Chapter 2 - Boats in Miniature: a review** introduces models of boats and concepts of miniaturisation. It discusses theories about why boats are reproduced in miniature and reviews how these objects have been studied in different contexts, taking into account current studies of boats from the Indian Ocean. This chapter demonstrates how models of boats from the Indian Ocean are an understudied resource. By doing so it emphasises the importance of this research.

**Chapter 3 - Model Boats in UK Museums: an overview** takes a holistic approach incorporating all models from the Indian Ocean housed in the thirteen museum collections identified. The purpose of this chapter is to introduce the dataset demonstrating the broad range, intricate details and sheer quantity of models available. Through simple analysis, including the dates the models were made and collected, where they originated from and what they represent, this chapter helps to identify the different types and range of traditional vessels represented through the models.

**Chapter 4 - Collecting: individuals, exhibitions and institutions** then addresses questions about the purpose of model boats and their collection using museum documentation and collector biographies to delve into their histories. This traces the models back to their origins telling the stories of why they were produced and collected, when, from where and by whom, and explores how these contexts could impact interpretations and current understanding. This chapter then also considers how and why museums acquired model boats with an emphasis on the long and complex nature of museum objects and their biographies.

**Chapter 5 - What can Models Contribute to our Understanding of Traditional Boats around the Indian Ocean?** This chapter aims to achieve two things. Firstly, it provides an overview of the current state of traditional boat studies including what has been researched and published to date. It also identifies regions and vessel types little studied or entirely omitted from the literature. The second part of the chapter draws on this literature review to select two case studies. It introduces the case studies, why they were chosen and how they are approached in the subsequent chapters.

**Chapter 6 - Outriggers of Sri Lanka** presents the first case study exploring outriggered watercraft from Sri Lanka. Some of these vessels no longer exist and others are no longer made in their traditional wooden form. This case study firstly explores what information is available in published studies of these boats before introducing the models. The chapter then goes on to analyse and compare the models with drawings and information in the literature to assess the accuracy of the models as miniature representations of full-size vessels. It also analyses technical details, such as construction techniques and broader ideas about their use and cultural value. This chapter, through comparative analysis of available literature, will highlight to what extent models can support or contradict current literature and if they are able to provide any new evidence for Sri Lankan outriggers.

**Chapter 7 - Traditional Boats of Myanmar** presents a collection of models reflecting a range of vessel types. With virtually no information published about traditional boats of Myanmar and multiple models housed in museum collections, this case study takes a slightly different approach. It will firstly explore potential literature that refers to boats from this region before analysing what information

can be interpreted from the models. It will consider aspects such as vessel type, features and construction of the vessels. The notion of cultural value and meanings of boats will also be considered. The purpose of this chapter is to demonstrate how models can be used to start to understand watercraft that we currently know very little about.

**Chapter 8 – Conclusions: the value of model boats** presents the concluding comments to this research assessing the significance of models in ethnographic museum collections. The individual research questions about the context of the models and their physical traits will have been addressed throughout the thesis. This chapter therefore evaluates and summarises to what extent and in what ways, models are useful as evidence for traditional watercraft from the Indian Ocean region with specific reference to the case studies and data presented throughout the thesis. It will also reflect on any other uses and values of model boats that may emerge throughout this study. Finally, it will consider how this research can be developed in the future to support scholars in the study of traditional watercraft and how models can be utilised by museums in future displays.



## Chapter 2 – Boats in Miniature: a review

Objects have commonly been crafted at a reduced scale throughout human history (Hiscock, 2015). Watercraft, which played a vital role in the movement of people, cultures and technologies (Mcgrail, 1981: 5), are by no means an exception to this. Models of boats have been produced for at least 5,000 years (Woolley, 1934) and are still very much prevalent around the world today appearing in shops, magazines (e.g. *Model Boats*), churches (Harley, 1995) and personal spaces, not to mention their great online presence in the form of model boat enthusiasts' websites (e.g. The Nautical Research Guild, 2016). These objects can appear in a range of forms and sizes serving different functions such as toys, ornaments, memorabilia, technical learning aids, experimentation devices, funerary and spiritual models.

Models of boats from the Indian Ocean commonly appear in museum collections. This chapter introduces the reader to the concept of miniaturisation, why such objects are frequently crafted at a reduced scale and how studies of miniaturisation could impact this research. It also aims to briefly introduce some of the published studies about model boats, not only from the Indian Ocean but worldwide. By briefly reviewing literature on archaeological, European and non-European models with a focus on those from the research area, this chapter aims to identify gaps in the subject and exemplify the need to study models of boats from the Indian Ocean. By conducting such reviews this chapter will also identify and consider the methods and techniques adopted to explore these objects. This will subsequently help to inform the methods and approaches used in this research.

### 2.1 Tales of tiny objects: conceptualising miniaturisation

Humans have been experimenting with scale for thousands of years (Foxhall, 2015: 1). This is evident, for example, in the production of miniature lithic cores in the Palaeolithic (Hiscock, 2015: 166). Although the concept of scale, which is often measured by the human body, where the body is taken as full-size (Pearce, 1992: 57), can refer to the gigantic, this research is concerned with the miniature – a reduction in scale.

Miniatures and models are not necessarily produced using the same processes. Whilst a miniature is a physically smaller representation of a human made object or natural entity (Foxhall, 2015: 1) it can be argued that a model is similarly a “mimetic object” (Mack, 2007: 72), often, but not always, made at a reduced scale. A model can also be a full-size replica of an object and Allen has differentiated how models, in the context of Egyptian tombs, are not functional whereas miniatures can be (Allen, 2006: 20-21). However, for the purpose of this research the term model refers to a reproduction, of reduced size, of a three-dimensional object that has often changed in terms of its intended function.

Whilst this research is primarily concerned with models of boats it is essential to question the whole idea of miniaturisation to understand why these objects might be made. In addition, it is important to consider theoretical ideas about the implications this process of miniaturisation might have for our understanding of traditional boats. With this in mind the longevity and variation in model making, the purpose of producing tiny objects, the practical issues of their construction and what implications this might have on our interpretation of such objects will be considered.

### **2.1.1 Why miniaturise?**

The process of miniaturisation is complex, occurring in a wide range of forms throughout cultures, time and space. It is not, therefore, possible to simply answer the question of why this process has, and still does, occur. Scholars have, however, speculated and theorised about the appeal of the miniature in general. Mack, for example, described how humans are instinctively drawn to small things, how small animals are considered to be more endearing than larger ones (Mack, 2007: 5-6). Levi-Strauss similarly claimed “all miniatures seem to have intrinsic aesthetic quality” (Lévi-Strauss, 1966: 23). Is it perhaps this aesthetic desire that draws us to small objects such as miniature books (Mack, 2007) and animal figurines (Meskell, 2015)?

Mack also discussed the ability to erase physical defects and imperfections of an object through a reduction in scale (2007: 12). A miniature object can thus be idealised and conceal and reveal different physical attributes (Fenner, 2014: 33). The act of miniaturisation gives the craftsman the power to relay the desired information and emotion and the option to exaggerate or diminish aspects. For example, the heads and tails of animal figurines in the Neolithic site of Çatalhöyük in Turkey are considerably enlarged compared to their bodies

(Meskell, 2015: 12-13). By the creation of unlikely scenes and by changing the context and scale of an object, miniatures have the ability to visually portray the impossible and to capture and stretch the imagination of the onlooker.

Ultimately, the representation of an object in miniature can serve a variety of functions such as ornamentation where miniatures are created for their aesthetic qualities. Another common use of the miniature can be for entertainment and to assist learning. Toys are a prime example of this such as the doll's house in Figure 4 from the Victoria and Albert Museum of Childhood. Doll's houses encapsulate and create a microcosmic scenario altering the context of everyday life into something of fantasy and play. Furthermore, Stewart noted how miniatures can be connected to a narrative, a personal story that enables them to imbue emotion and association of a particular memory (Stewart, 1993: 60). Miniature portable objects are often created as souvenirs but this entanglement of emotion is also true of miniature objects used for cultural and religious beliefs. For example, models in various forms have been identified in Egyptian burial tombs, such as pottery vessels functioning as offerings for the deceased in the afterlife (Allen, 2006: 19). Similarly models made from joss paper of everyday objects, such as the car in Figure 5, are burnt in Taoist funerals to accompany an ancestor in the afterlife (Scott, 2007: 21).



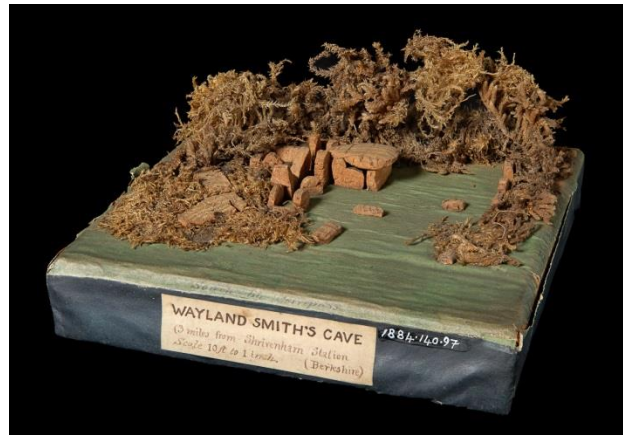
**Figure 4** A miniature dolls' house custom-made for Mrs Ann Jago Bryant in about 1865. It is said to be modelled on her own house, Oakenshaw in Surbiton. In the V & A Museum of Childhood collections (inventory number MISC.9-1955; © Victoria and Albert Museum, London)



**Figure 5** Funerary model of a car made from paper, from Singapore. In the British Museum collections (inventory number As2002,07.53; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

Miniature objects can further function as a way of relaying information in a three-dimensional format. This can be in the collecting of minute artefacts that represent a community or technology to inform and educate those who had not experienced this first hand. These objects can therefore be used as technical models to portray accurate details of the larger object they represent. They can also be made for exhibitions and museums to demonstrate miniature versions of full scale objects that visitors may not have otherwise seen (an example of this is the production of miniatures and models for the Great Exhibition of 1851 which is discussed in Chapter 4). Pitt Rivers Museum is an interesting example of this where ethnographic models of objects such as houses, farming equipment and boats are displayed. Pitt Rivers also collected models of archaeological sites such as the Neolithic tomb at Wayland's Smithy shown in Figure 6. Evans described how such models were a "vehicle for technical demonstration and, for popular amusement, edification, and professional display" (Evans, 2004: 109). Models thus had the ability to capture and record information of a given place and time prior to the widespread use of photography and digital recording methods.





**Figure 6** A scale model of Wayland's Smithy Neolithic Chambered Tomb, made in the 1860s by Alfred Lewis, and acquired by General Pitt-Rivers shortly thereafter. In the Pitt Rivers Museum collection (inventory Number 1884.140.97; © Pitt Rivers Museum, University of Oxford)

Lastly, it should be noted that models are not always produced with a specific function or connection in mind. They can be made from scratch or from kits as a hobby, for the thrill of the craft or the challenge of reproducing something at a minute scale, an idea which will be discussed in the subsequent section (2.1.2 Production and impact). Doll's house furniture, Airfix kits and model boats (see Figure 7) are all examples of this.



**Figure 7** David Mumford, an avid model boat maker, sits surrounded by models he has made (Photograph taken by James Topping, September 2016)

### 2.1.2 Production and impact

The production of an object at a reduced scale requires skills, tools and patience that can differ to those required in the production of a full-size item. For example, to create a full-size wooden boat today may require large timbers, saws, hammers and physical strength from the boat builder. By reducing the size of the boat that is to be crafted the materials may need to be adjusted in order to work at a smaller scale. In addition, a close eye for detail, steady hand and patience may be required. The challenge of creating a model is thus different to the challenge of creating a full-size boat. Indeed Foxhall observed how “in many

cases...reducing an object to a miniature scale increases the technical difficulty of making it” (Foxhall, 2015: 1).

Miniatures have the ability to portray precision and technical abilities used by the craftsman in their construction (Mack, 2007: 19; Foxhall, 2015: 1). When using models as evidence for full-size objects, however, it is important to acknowledge there could be some fundamental differences as a result of working at a reduced scale. Foxhall, in particular, noted how “frequently those who craft miniatures are selective in the features they choose to emphasize or to represent clearly” (2015: 3). This is linked to the idea Mack and Fenner discussed about the ability to conceal imperfections through the creation of miniatures (Mack, 2007; Fenner, 2014) supporting the idea that, when studying models, it must be acknowledged that certain features may indeed be exaggerated and not necessarily of true proportion. Regardless of any distortions, however, models are still representative. They are still recognisable as being smaller versions of a larger entity (Foxhall, 2015: 2) and thus have the potential to reveal information about the original object or scenario it portrays. In addition, they have potential to reveal aspects of everyday life that may not otherwise be available in the archaeological record (Kiernan, 2015: 45-46). As Stewart acknowledged “a reduction in dimensions does not produce a corresponding reduction in significance” (1993: 43).

### **2.1.3 Summary**

Reducing the original size of an object alters its initial intended function and purpose. For example, whilst a boat is a watertight mode of transportation the process of miniaturisation transforms it. Even if it can still be used on water, it has lost the ability to transport, and to be propelled by humans. Models have the potential instead to go beyond function with the ability to imbue emotion, beliefs and narratives. They have been used in religious practices, memorabilia, as toys and entertainment, aids to help us understand the world, experimental devices and as transportable evidence to inform us about societies and the objects that help to define them. The act of miniaturisation is not constricted: anything can be scaled down and made into a model from boats, trains, buildings, people, animals, weapons, tools and books for example.

Kiernan made a very interesting point that miniatures are often representative of full-size objects that were used in everyday life (2015: 45). Models could therefore be highly valuable resources in conveying information not only about

ritual and belief but about everyday material culture. There are some pitfalls that Kiernan discusses in using all miniatures as direct evidence for objects from the past but an important idea he highlights is that “these can be avoided if we pay attention to the different modes of representation that they employ” (2015: 56). This concept, which has currently been little studied, will be explored throughout the research by asking if models of boats are truly representative of actual boats and what they can tell us about the significance, use and design of watercraft in different communities around the Indian Ocean. It will consider Kiernan’s idea by assessing the mode of representation, why the models were made and collected before it can assess the information they can convey. In doing so this research will reflect how models are intrinsically entangled with the larger objects they represent and if the process of miniaturisation impinges on the information we are able to extrapolate.

## **2.2 Studies of archaeological model boats**

Modern literature devoted to the study of ancient model boats is limited and often focuses on models from burial sites, particularly in Egypt (Roach, 2008: 315). Reisner (1913) was the first to produce a specialised study on this topic by researching models of Egyptian boats in the Cairo Museum (Johnston, 1985: 3; Roach, 2008: 315). Reisner classified different types of boats by considering their structural composition and function and produced a catalogue with sketches of each model. Egyptian boat models, which are often highly detailed and well preserved, have featured in several publications since with a focus on their significance and connection with the afterlife. Jones (1990) and Merriman (2011), for example, studied models from Egyptian tombs classifying the models and producing catalogues. Jones observed two types of models were present in Tutankhamun’s tomb – those that represented real boats and those that were intended for use in the afterlife (1990: 3). Merriman looked at structural attributes of the models to build up a system of classification for the model boats (2011).

Although the majority of published studies about archaeological model boats focus on those from Egyptian tombs, models from other archaeological contexts have received some attention, though it should be noted here that models of boats were not made across all cultures at all times. Woolley, for example, in his archaeological report of the Mesopotamian site of Ur, discussed how models of boats, dating from around 5,000 years ago, made from bitumen (see Figure 8),

clay, copper and gold were found in the royal tombs (Woolley, 1934: 71 and 145). Of particular interest are the works by R. Rudolph (1974), Johnston (1985), Rick et al. (2004) and Wachsmann et al. (2013) about Chinese, Greek and North American models of watercraft. Most of the models discussed in these publications were discovered in burial contexts but Johnston (1985) also included models from domestic sites in Greece focusing not only on votive and funerary objects but also those used in everyday life. What is particularly interesting about these studies is how the models are used as evidence for ancient boats, of which there is little or no evidence available. Wachsmann et al. devoted an entire book to this idea by studying one boat model – the Helladic Gurob ship-cart model that was discovered in an Egyptian tomb (Wachsmann et al., 2013). To study the model in terms of its representation of a full-size object, Wachsmann et al. considered contemporary iconographic depictions of vessels, a method that was also used by Johnston (1985). By researching and cataloguing over 131 Greek boat models and classifying them by date and type Johnston was able to explore patterns in changes to different vessels over time and what this was able to tell us about the culture and significance of those who used them and represented them in miniature (Johnston, 1985).

Whilst studies of archaeological models from the Indian Ocean are rare, the concepts and methods used in available studies can help to influence how this research is approached. For example, using models to study full-size boats, the development of catalogues and classification systems based on their structural attributes, and the use of other iconographic sources to help draw comparisons with the models will help to shape this research.



**Figure 8** Model boat made from bitumen dating to around 2400BC-2200BC. Excavated from Royal Cemetery in Ur, Mesopotamia. In the British Museum collections, 750mm in length (inventory number 133043; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

## 2.3 European boat and ship model studies

Published studies about model boats, such as *The World of Model Ships and Boats* (Williams, 1971), often mention ancient models from Egyptian tombs but then jump straight to European examples ranging from the sixteenth century onwards (Roach, 2008: 315). Such miniature objects from the western world tend to dominate modern literature on the topic.

Roach attempted to bridge this gap by studying boat models from North-West Europe dating from the ninth century onwards (Roach, 2008). To do this Roach used mainly archaeological evidence to explore models from regions such as Germany, the UK and Scandinavia. Although this study is preliminary in that it does not provide extensive analysis of the models, it does highlight their existence and potential as sources of information for interpreting full-size remains of boats and for their hypothetical reconstruction (Roach, 2008: 329).

Despite the existence of some model boats from Medieval Europe, the majority of European boat models date from the sixteenth century onwards. These models range in their overall appearance, materials and purpose. For example, models hand crafted out of animal bone by prisoners captured during the Napoleonic War (see Figure 9) have been mentioned in several publications and also discussed in their own right in books devoted to the topic (e.g. Freeston, 1973). These objects vary from scale models of particular vessels to “freelance models based on the

type they represent” (Freeston, 1973: 150) and others bear little resemblance to full-size vessels but are considered to be exquisite works of art (Freeston, 1973: 151).



**Figure 9** Rigged model of a French two-decker ship of the line. Made from bone by a prisoner of war (c. 1800). In the National Maritime Museum collections, 448mm in length (inventory number SLR0620; © National Maritime Museum, Greenwich, London)

Votive models and those found in European churches are likewise discussed (Harley, 1995), as well as models of British small craft (Bathe, 1969; Fenner, 2014). Harley (1995) described how model boats found in churches around the UK can represent a variety of types of watercraft and carry with them different meanings. Harley argued that these models, which are often overlooked, can have real value as “witnesses of their time...[as] examples of true folk craft, made by devoted amateurs as expressions of their affection and deep feelings for the vessels they have re-created in miniature” (1995: vi). Other types of model boats include technical models used as part of the ship building process (Lavery, 2014: 9). These ranged from block models, half models, and detailed framed and planked models, all built to scale. In addition, these objects have been, and still are, made as souvenirs, toys, and as hobbies from kits. Ultimately though, models built and used by the navy or to represent warships dominate modern literature. Such publications range from edited catalogues (e.g. Clowes and Science Museum, 1948; Bathe, 1964; Stevens, 1995) to practical aspects of ship modelling (Davis, 2012) to histories of the models (Boyd, 1971; Lavery et al., 1995; Lavery, 2014).

There is an abundance of literature available about models of western warships often focusing on their aesthetic value or ability to help tell narratives of the ships they represent (i.e. Williams, 1971; Hobbs, 2014). Yet Lavery and Stephens made some interesting points that “as a cultural resource they [model boats] are much undervalued....[as]...a contemporary model of a ship, perhaps made alongside it [a full-size vessel] and at the same time, in many ways provides the best and most lasting record of it” (1995: 7). This research project extends this idea by helping to promote and understand the use of models as tools for studying boats.

## **2.4 Studies of non-European boat models**

Studies of boat models from Europe and the west might dominate modern literature on miniature vessels but models of non-European boats are not entirely omitted. Bathe (1966), for example, devoted a booklet to models of ‘foreign small craft’ found in the Science Museum’s collections. By selecting a few examples Bathe produced a brief history of different types of vessels using the models to demonstrate the “diversity of design, rig and decoration” (1966: 1). This includes European vessels as well as those from China, Fiji, Egypt, India, East Africa, Malaysia and Indonesia.

Ethnographic models, sometimes including those from the Indian Ocean, also appear in museum catalogues (e.g. South Kensington Museum., 1889; The Royal Scottish Museum, 1956) acknowledging their presence in collections but providing only limited descriptions. There are, however, more detailed studies devoted to particular groups of ethnographic models including those from China (Spencer et al., 1976; Brunero, 2015) and North America (Phillips, 1998; Rick et al., 2004; Daley, 2016). Brunero, for example, explored a collection of Chinese junk models collected by Frederick Maze in the early twentieth century (2015). By studying the origins of the models Brunero demonstrated how this collection can provide insights into local Chinese shipping as Maze only collected scale models built by boat builders. Daley, in the study of a model Alaskan canoe called a *baidarka*, similarly referred to the accuracy of representation portrayed by the model observing how the model “captures an image of Alaska’s past in miniature” (2016). The use of models to study full-size vessels and their level of representation are particularly interesting notions that are explored throughout this research.

Wintle's (2015) work is a rare study of the collection and commission of models of non-European boat models. This article explores the aesthetic, cultural and political significance of the ethnographic boat model collections housed at the National Maritime Museum, including models from China, the Maldives, Pakistan and Kenya. It is not an extensive study of all the models in this collection, but highlights that these objects have recently been at risk of disposal due to assumptions about their inaccuracy as true representations of full-size vessels (2015: 9). Wintle presents an argument for the potential of these objects to inform us about human interactions and cross-cultural engagement. By studying the purpose and significance of the models, their collection histories and museum biographies, both by individuals and institutions, Wintle has demonstrated how ethnographic models in museum collections can reveal insights into "maritime, imperial and other cross-cultural encounters" (2015: 14) and should thus not be overlooked or disposed of. This is a particularly valuable notion to consider when studying models of boats and has greatly impacted the way this research has been conducted.

There are no publications to date that address models of boats from the Indian Ocean region in its entirety. This is the first study to take this approach. There are, however, some studies that explore models of boats from regions within the Indian Ocean. Loewenstein (1958) and Gibson-Hill (1950), for example, addressed aspects of model boats from Malaysia. Loewenstein focused on a particular category of models – those of "magical significance" made in Malaysia to carry away the "demons of sickness and misfortune" (1958: 203). This publication discussed how these 'evil spirit boats' were not limited to Malaysia but similar concepts were apparent in regions such as Vietnam, Cambodia and Burma (now known as Myanmar) where they were used to expel "demons of sickness" (Loewenstein, 1958: 206) by placing offerings in the models and setting them adrift on rivers or the sea. Gibson-Hill also addressed Malaysian boat models through the discussion of a racing *jong* – a lightweight outrigger model made for racing on the coast of Singapore by the Malays (1950: 144-145). Both types of models, be it for their spiritual or entertainment value, were designed to be used on the water and are able to inform us about their significance and cultural use yet they are not necessarily reflective of contemporary full-size boats. This notion of value, which is echoed by Wintle (2015), is given due consideration within this research.



A few select models do appear in general studies of traditional boats as additional supporting, rather than principal, evidence. For example, McGrail (2001: 272) and Kentley (2003a) used models as supporting evidence for an Indian boat used on the surf known as a *masula*. According to Kentley, “of all sewn plank boats, the *masula* is possibly the one best represented by models in museum collections” (2003a: 120) yet they have still been little studied.

In addition, boat models have been incorporated as supporting evidence in the study of a *khulna* from Bangladesh (Blue et al., 1999; McGrail and Blue, 2003) and in works on Indonesian vessels (Haddon, 1920; Horridge and Snoek, 1981; Horridge, 1987). Haddon’s work, for example, dates from the early twentieth century and includes drawings and descriptions of models to provide evidence for a variety of Indonesian vessels with outriggers. In the discussion of source material Haddon stated photographs are only a reliable source for studying boats if numerous photographs are available and that models are “good evidence” (1920: 70) when their limitations are taken into consideration. Such limitations include that they may be “carelessly made and certain details may be slurred over or even wrongly constructed to save trouble” (Haddon, 1920: 70) however, this statement is followed with the notion that models, “in many cases, are made by those who actually build boats” (Haddon, 1920: 70).

Horridge and Snoek also expressed caution in the use of models from Indonesia stating they are “often inaccurate, sometimes even fanciful and usually incorrectly constructed with nails or plywood” (Horridge and Snoek, 1981: 75). An interesting point was raised regarding models’ rigging which can be repaired or altered incorrectly before reaching a museum or prior to installation in an exhibition. Models are not, however, dismissed from being accepted as evidence for rigging but rather require “cross-reference to illustrations of full sized boats under sail” (Horridge, 1987: 90).

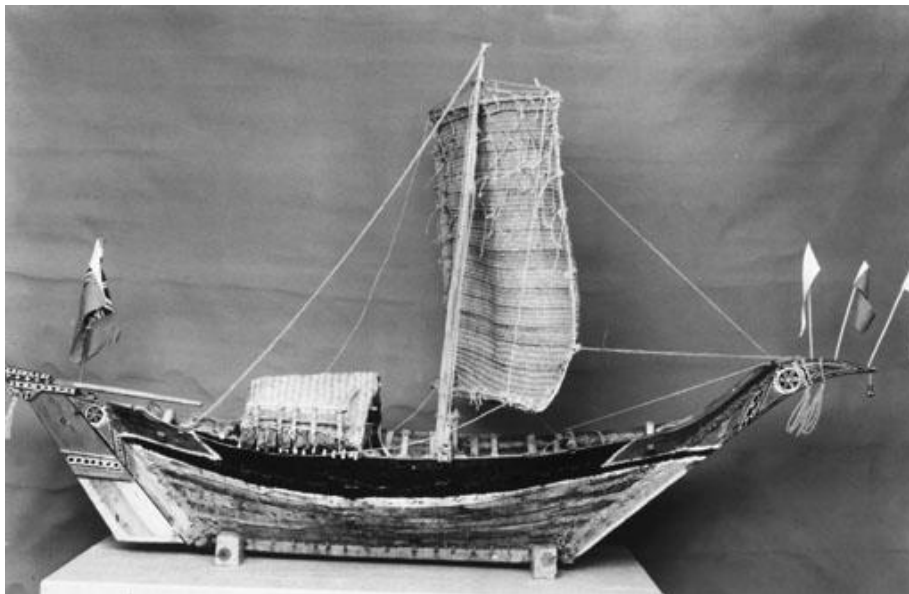
Whilst it is apparent that models of boats from the Indian Ocean are a considerably understudied resource they have been used as key evidence to study two types of vessels that no longer exist - the former East African *mtepe* (Hornell, 1941; Adams, 1985; Prins, 1986; Da Silva, 2010) and Sri Lankan *yathra dhoni* (Vitharana, 1992; Green, 2001; Devendra, 2002; Devendra, 2013).

#### **2.4.1 Models in *mtepe* studies**

*Mtepe* is a name used to describe the sewn plank-built boats made along the Swahili coast of East Africa. The last of these vessels was recorded as being built

in the 1930s<sup>3</sup> (Chittick, 1980: 298; Adams, 1985: 15) and no full-size vessels were recorded in detail while they were still in use. With the disappearance of the *mtepe* and with limited archaeological and ethnographic evidences available for this vessel (Gilbert, 1998), models have been utilised by scholars as evidence for the full-size boat.

Hornell (1941), Adams (1985), Prins (1986) and Da Silva (2010), for example, all used models of *mtepe* in their studies. They all referred to a model in the Science Museum (see Figure 10) whilst Da Silva, Adams and Prins also referenced a model in the National Maritime Museum collections (Figure 11). The *mtepe* was not a universal design however; scholars such as Hornell (1941) and Adams (1985) identified two different types – the original *mtepe* and the later developed *dau la mtepe*. Both types were identified in model form, with fifteen models of the true *mtepe*, distinguished by its beak-like stempiece and oculus, and five *dau la mtepe*, with their long bowsprits, acknowledged in international collections in 1986 (Prins, 1986: 70 and 81).



**Figure 10** Model of a *mtepe* from the Swahili coast of East Africa, collected by James Hornell in 1936. In the Science Museum collections (inventory number 1936-29; © Science Museum / Science & Society Picture Library -- All rights reserved. <http://www.scienceandsociety.co.uk/> accessed on 11<sup>th</sup> June 2014)

The use of models in these publications seems to take two forms. The first includes only very brief mentions of models as supporting evidence (e.g. Green,

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<sup>3</sup> The last *mtepe* to be built was recorded in 1933 in Faza (Chittick, 1980: 298)

2001) whereas other publications focus on models as the principle source for *mtepe* and *dau la mtepe* appearances and construction techniques (e.g. Adams, 1985). In addition to models, archaeological evidence in the form of *mtepe* planks in Fort Jesus, Mombasa (Green, 2001), photographs including the one held by the Peabody Essex Museum and documents were used as a method of comparative analysis to compare all the evidence, including models, and to help assess their accuracy.

Moreover, models were not only used by scholars to identify possible features of these former vessels (e.g. Hornell, 1941; Adams, 1985), but Prins claimed variations in *mtepe* construction could only be traced through the models (1986: 64). Such models have not, however, been used to study features and constructions without their critiques. Gilbert (1998), for example, compared the models with a photograph of a *mtepe* from the Peabody Essex Museum. Whilst the general appearance seemed similar to the models it differed in form where “the models all show a stout, awkward looking craft, whereas the vessel in the photograph has a swan-like grace” (Gilbert, 1998: 46). In addition, although Adams used models as evidence for *mtepe* throughout his thesis, he did suggest the abundance of dowels present in the Science Museum model (Figure 10) could be attributed to the practicality of model making and working at a reduced scale (1985: 32). The accuracy of models seems to have been considered, to an extent, within studies of these vanished sewn vessels, but limited evidence (in the form of archaeology, literature and iconography, such as photographs) has resulted in their frequent and fundamental use in studies of *mtepe* ranging from the mid-twentieth to the early twenty-first centuries.



**Figure 11** Model *mtepe*, from the Swahili coast of East Africa. In the National Maritime Museum collections, 1510mm in length (inventory number AAE0157; © National Maritime Museum, Greenwich, London)

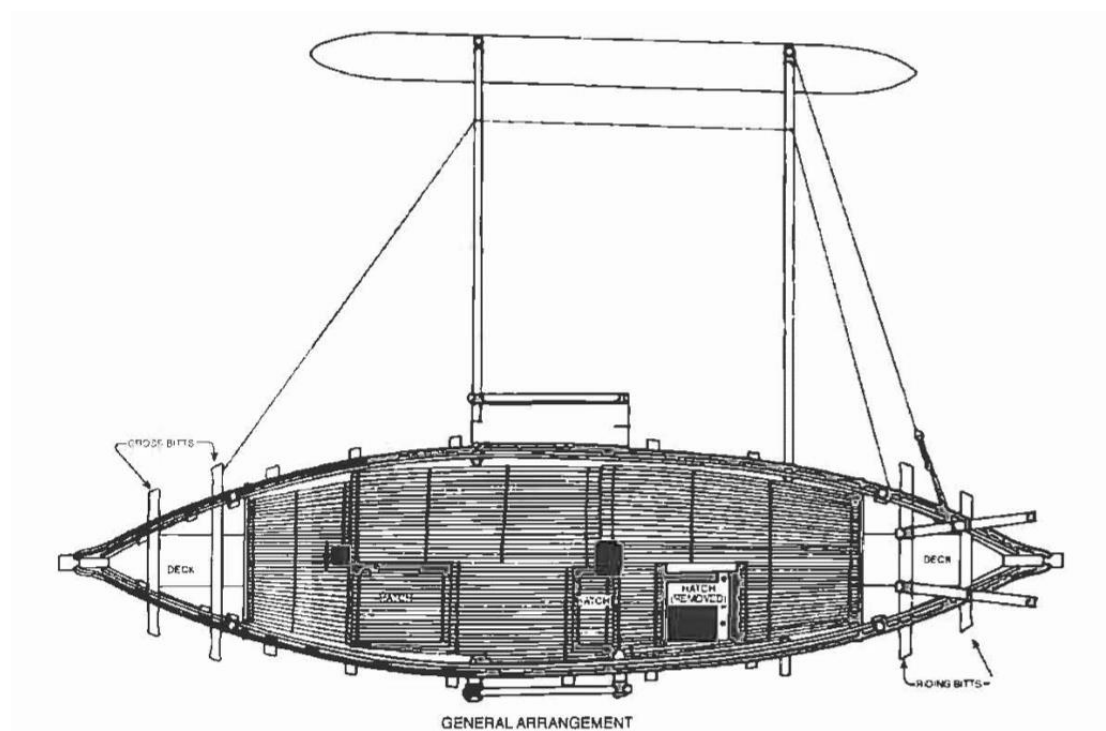
Although the use of models as key evidence is rare within studies of traditional Indian Ocean boats, it can be speculated the reason these objects were used to study this particular type of vessel was due to its disappearance and the limited range and availability of other sources. It should be acknowledged, however, that even though evidence is limited, no publication attempted to study *mtepe* purely using models; other evidence, where possible, were compared and contrasted.

#### **2.4.2 Models in *yathra dhoni* studies**

The *yathra* or *yatra dhoni*, a Sri Lankan outrigger, is a vessel that is no longer made or used with the last of its kind recorded as being wrecked in the Maldives in 1930 (Vitharana, 1992: 44; Green, 2001: 76; Devendra, 2002: 158). Similarly to studies of the *mtepe*, two approaches for using models can be identified in publications about the *yathra dhoni*. The first, uses models briefly as supporting evidence (such as Vitharana, 1992 where ethnographic interviews were favoured as a form of evidence). Then there are studies that used models as principle evidence for these former craft (e.g. Green, 2001; Devendra, 2002; Devendra, 2013).

Green (2001) and Devendra (2002; 2013) both studied a model of a *yathra dhoni* from Dodanduwa in Sri Lanka. This model was recorded, in detail, by Devendra and Vosmer using measurements and specialised software to produce technical

drawings (Vosmer, 1993; Devendra, 2002: 160). Green and Devendra both mentioned the historical origins and production of the model, which was said to have been built by a boat builder (Green, 2001: 76; Devendra, 2002). With this context and “in view of this attention to detail, it was thought that the accuracy of the model, both in scale and detail would make a fairly reliable source for documentation” (Green, 2001: 76). The accuracy of the model, in terms of its form and construction, was considered in both of these publications, but the use of technical drawings (see Figure 12 for example), hydrostatic analyses and comparisons with other sources led to conclusions that this particular model is a relatively accurate representation of the full-size *yathra dhoni* (Devendra, 2002).



**Figure 12** Technical drawing of a Sri Lankan *yathra dhoni* model, plan view (Vosmer, 1993: 40)

In addition, Devendra (2013) included images of other *yathra dhoni*'s including the model featured in Figure 13. With few sources, such as archaeological, ethnographic and photographic evidence, available about these vessels models seem to have become an integral resource for the study of the full-size *yathra dhoni*.



**Figure 13** Model of a *yathra dhoni* from Sri Lanka, collected in 1854. In the British Museum collections, 407mm in length (inventory number As1933,1110.1; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

Whilst some reference has been made by scholars to the use of models as evidence for traditional boats and, in certain cases, are one of the few remaining sources available, boat models are still a considerably understudied resource. This highlights the necessity and scope of this research to assess the extent models can be used to research traditional boats. Despite the limited publications using model boats, these studies have been insightful and could be influential in the adoption of a methodology. The comparative analysis of models with other sources, such as photographs, where available, is a useful technique in exploring the value of models. In addition, Vosmer (1993) and Devendra's (2002) use of technical drawings are useful in highlighting features, constructions and depicting the size and scale of a vessel whilst the concept of context, as explored by Wintle (2015), is also an essential step in understanding the purpose of a model, their biographies, agency and cultural value in a holistic manner.

## 2.5 Conclusions

Models of boats have been made for a variety of reasons to fulfil different requirements throughout history. These range from bone prisoner of war models to funerary models, toys, scaled down experimenting and testing devices, spiritual sickness models and as aesthetic, decorative objects. Such items, particularly those relating to funerary and burial practices, have been found in

archaeological sites dating from at least 5,000 years ago like those found in the site of Ur (Woolley, 1934), although model boat making has not been a constant feature of all societies. Today, miniature boats are still frequently made and used across different cultures around the world, not only for their aesthetic qualities but also, for example, as toys, memorabilia and in some religions, such as Taoism, for their spiritual connotations. Such objects are clearly a significant aspect of human history and require attention, yet there are evidently several gaps in the study of these miniature boats to date. The quantity and range of studies on this topic are thus not reflective of the widespread use and cultural connections with model boats.

This chapter has demonstrated how the majority of published studies on this topic tend to favour Western model boats, often with a focus on naval models. Ancient Egyptian models have also been a popular topic for discussion but other archaeological and non-European models remain considerably understudied. This is particularly the case with those from the Indian Ocean which are largely omitted from publications to date. The exception is found, however, in studies of traditional boats that no longer exist where evidence is limited. In such cases models have been called upon as a source of evidence to tell us about the overall design of these boats, their composition and technical details about construction. Despite their use in these particular cases the potential of models of other boats from the Indian Ocean are still unknown. This review thus highlights the need to study model boats from the Indian Ocean, to ascertain how useful models could be and what their potential is for future studies as well as to develop methods for the application of these miniature objects in broader studies of model boats and miniatures.

By examining the techniques and ideas that have so far been used to study models of boats this chapter has identified some key methods that have influenced the research. Of particular interest are Wintle's ideas about identifying wider social significance and cross-cultural contact by examining the biography of objects (2015). Other ideas that have been particularly influential are concepts about using models to understand full-size boats; the production of catalogues specific to a collection of models and the use of other iconographic depictions of vessels, when available, as supporting evidence for the models. In addition, it is hoped this research will further contribute to our understanding of the reasons, motivations and significance of reproducing boats in miniature.

Models are not, however, without their limitations. Foxhall, for example made the point that small objects, in general, by the process of miniaturisation could be selective in the features chosen to be included, that some features may be omitted or emphasised (2015: 3). Furthermore, Horridge and Snoek commented how models are often inaccurate yet this could be overcome by cross-referencing illustrations of boats, particularly in terms of thinking about rigging (Horridge and Snoek, 1981: 75; Horridge, 1987: 90). Although, by the process of miniaturisation, model boats are at risk of not being exact scaled down replicas of full-size boats Haddon acknowledged how they provide “good evidence” (1920: 70) so long as their limitations are taken into consideration. Throughout this research the limitations of models will be considered and resolved by comparing the models with other evidences where possible and by examining the purpose and collection history of the models to ascertain how representative of a full-size boat they are likely to be. In doing so it is hoped this research will identify the potential of a collection of miniature museum objects for future use by maritime archaeologists, museum professionals and historians of empire. After all, as Stewart stated, “a reduction in dimensions does not produce a corresponding reduction in significance” (1993: 43).



## Chapter 3 - Model boats in UK museums: an overview

Each model boat identified in this research is unique. They reflect a high level of craftsmanship (see Figure 14 for example) and depict a range of vessels from different locations around the Indian Ocean. This chapter introduces the wide range of models available in museum collections, demonstrating how they have potential to reveal information not only about the models themselves but also about the vessels they represent.



**Figure 14** Model of a *guffa* from Baghdad, Iraq. Collected by Colonel Lane in 1921. It has been woven together and coated in bitumen, a method of waterproofing. In the British Museum collections, 340mm in diameter (inventory number As1921,1208.1; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

The original proposal for this Collaborative Doctoral Award PhD predicted there would be some 200 models of boats from the Indian Ocean region in the British Museum and other museums throughout the UK. This research, however, has identified 667 models of a range of boats from the study area in just thirteen museums around the UK. This is over three times the number initially anticipated and reflects only a sample of museum collections rather than all museums in the UK. The reason all museum collections in the UK have not been explored will be justified in the methodology (section 3.2.1). This means the exhaustive number of boat models in all museums across the UK is likely to be even greater. With

such a presence in museum collections, and the extent of detail and craftsmanship involved in their production, queries can be raised about why these model boats are in UK museum collections, their significance and potential as tools for studying full-size watercraft.

This chapter is an overview of all the 667 models in the dataset. The aim is not to provide a comprehensive analysis of each model, but to highlight their potential overall and start to identify key groups to be explored in greater depth through case studies later in this thesis. Firstly, the methodology used to collect the data is outlined explaining which museum collections were consulted, why and how the information about the models will be extracted. Then, using core data in the catalogue in Appendix A, the models will be deconstructed and briefly analysed to identify the levels of information that can be learnt from these objects. This in turn will recognise if it is possible to answer the questions set out in Chapter 1 and identify which information is required to do so.

The analysis of the data is divided into two parts. The first is concerned with the context of the boat models in order to explore where they were from, who collected them and when. These details are necessary to explore the question of the purpose and collection of the models. The next section will then explore the extent of detail we can learn from the models and about the boats they might represent. This section is a crucial step in answering the questions about the types of vessels represented by the models and their construction.

### **3.1 Introducing the Boat Models: a physical description**

The dataset includes a wide variety of boats represented by the models – from small rafts to logboats with outriggers to large plank built sailing vessels (see Figures 15-17), from different regions around the Indian Ocean. The majority are made from wood but they are also made from a range of other materials such as paper, bark or bitumen. The dataset includes models that are highly decorative and painted, as well as models that are varnished or in their natural state. They range in size from under 300 mm in overall length to over 2000 mm and the scale likewise varies. Whilst some of the models contain figures, flags, sails, highly detailed rigging, anchors, or accessories such as cooking pots, fishing nets or baskets, others represent purely the hull of a boat. In addition, there are models that appear to be structurally highly detailed showing various

construction techniques and others are block models and carved from a single piece of wood.

Despite the variations in these objects they are detailed to some extent and would have required skill and time to produce in their miniature forms. Although some models appear to be very similar in style and size each model has clearly been handmade and is unique. The range of models in this dataset and their statistical analysis are presented throughout this chapter. A full catalogue of all the models in the research is also presented in Appendix A. This catalogue is one of the outcomes of the study making the data accessible in a way that can help to inform future researchers of traditional watercraft and museums about which vessels are available in model form and where they are located.



**Figure 15** Model of a *kattumaram*, a raft from Madras, India. Collected in 1849. In the British Museum collections, 330mm in length (inventory number As1849,0904.3; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)



**Figure 16** Model of a double outrigger canoe from Zanzibar, acquired in 1930. In the British Museum collections, 640mm in length (inventory number Af1930,0128.98; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)



**Figure 17** Model of a sambuk, a dhow from the Persian Gulf, acquired in 1954. In the National Maritime Museum collections, 1240mm in length (inventory number AAE0175; © National Maritime Museum, Greenwich, London)

## 3.2 Methodology: models, museums and databases

To collate data for this research museums containing models of boats from the Indian Ocean firstly had to be identified. Once these collections had been ascertained a systematic methodology involving three stages was developed. These consisted of: 1) searching museum databases; 2) researching museum documentation; and 3) recording physical boat models. This section will explore each of these phases in more detail starting with the identification of museum collections.

### 3.2.1 Museums

According to the Museums Association there are about 2,500 museums in the UK (Museums Association, no date). With this high volume of institutions, and the given time restraints to conduct the research, it was clear that it would not be feasible to examine every single museum collection in the UK, let alone those outside the UK. It was therefore necessary to identify a selection of museum collections. The following discussion reveals the museums identified and the rationale for their selection.

The accumulation of overseas objects was popular during the nineteenth century, with museums assembling complete sets of artefacts (Harrison, 2013: 93). With the process of colonisation and imperialism that was occurring throughout this century, affecting indigenous communities and their material cultures, the act of collecting could be seen as a way of “salvaging the authentic in the wake of the modernization of the tribal world” (Harrison, 2013: 93). Thus museums became inundated with collections of objects from around the world which generally became classified as ‘ethnographic’ or ‘world cultures’ collections, many of which still remain in museums today. Taking this into consideration it was necessary to investigate museums with large ethnographic or world cultures collections that contained models of boats from the Indian Ocean.

The first group of museums to be considered were prominent national museums, many of which were founded in the eighteenth and nineteenth centuries. This was a time when ethnographic collecting was prevalent, as well as the development of anthropology as a professional field (Harrison, 2013: 8). This was followed by the investigation of museums known for their ethnographic collections. The last group of museums were considered by their location – targeting museums situated in historically prominent port towns, particularly ports that were highly active during the nineteenth and twentieth centuries. The logic behind this relates to two hypotheses, firstly that museums located in port cities are more likely to contain objects of a maritime nature than those positioned inland and thus have potential to house model boats. The second idea is somewhat speculative linking to how collectors and models were transported back to the UK. Returning from the Indian Ocean on ships it is likely that collectors with their models would have landed in various port towns around the UK and it is possible some of these objects were deposited in local museums, or were collected and commissioned specifically for a museum.

The following lists show which institutions were approached under each of the abovementioned categories. However, while the majority of these museums do indeed contain relevant boat models in their collections, some do not. The museums in bold all contain such models and as a result became a part of this research. The museums that are not in bold either did not contain boat models relevant to this study or were unable to participate in the research.

National Museums:

- **The British Museum, London**
- **Science Museum, London**
- **National Maritime Museum, Greenwich**
- **National Maritime Museum, Cornwall**
- **National Museums Scotland**
- National Museums Liverpool
- National Museums Wales

Museums with large ethnographic collections:

- **Pitt Rivers Museum, Oxford**
- **Museum of Archaeology and Anthropology, Cambridge**
- **Horniman Museum and Gardens, London**
- **Eyemouth International Sailing Craft Association World of Boats, Eyemouth Maritime Centre (EISCA)**
- **Kew Gardens, Economic Botany Collection, London**

Museums in historically prominent port towns:

- **Plymouth City Museum and Art Gallery**
- **Bristol City Museum and Art Gallery**
- **Glasgow Museums**
- **Southampton City Museum Collections**
- Royal Engineers Museum, Kent
- National Museum of the Royal Navy, Portsmouth
- Tyne and Wear Archives and Museums, Newcastle upon Tyne

### 3.2.2 Step One: databases

Following the identification of relevant museum collections, the first step was to search museum databases to identify individual boat models. This step involved running searches on museums' online databases where possible and, where the collections were not available online, requesting lists of boat models from museums or access to their databases.

At the beginning of the research the vast quantity and range of models that would go on to form the dataset was not anticipated. For this reason, and

because of the fluidity and questionability of ocean boundaries (in this instance the division between the Indian and Pacific Oceans) when there is not a land mass marking the border, the very initial search included the South China Sea region around the eastern border of the Indian Ocean. As a result, initial searches included China, Taiwan, Thailand, Vietnam, Cambodia and Hong Kong. However, as the research developed it became clear there was a significant amount and range of data from the Indian Ocean excluding the South China Sea and to include these countries, particularly China, increased the number of models dramatically. It is therefore suggested boat models from the Indian Ocean and South China Sea should be two separate studies. Hence the geographical remit of this thesis on the eastern region of the Indian Ocean includes Indonesia, Malaysia and Western Australia but excludes Thailand, Cambodia, Vietnam, Hong Kong, Taiwan and China.

Once information was gathered from museum databases it was collated in Excel spreadsheets. This included details such as object description, date, field collection, location and acquisition details. Simple measurements were also recorded, such as overall length and width, when this information was available. A basic catalogue of this data is presented in Appendix A.

This step identified the data sample and highlighted variations in museum database records, where some models were recorded extensively, yet other records are comparatively limited. It is anticipated that an outcome of this research will be to update and add to museum records where possible.

At this initial phase of data collection all ethnographic models of boats were included but models from archaeological sites, such as ancient Egyptian burial chambers, were not as this would be a separate study in itself. This research strives to explore ethnographic, not archaeological, examples.

### **3.2.3 Step Two: documentation**

The next step involved researching museum documentation to collate as much information about each model boat as possible. This differed for each museum. While information in some museums was recorded digitally, considerable amounts of information and correspondence were only available in hard documents in others.

Exploration of these documents was therefore essential across the majority of the museum collections. It helped to reveal information about the objects' contexts

such as field collection, production and how and why the museum acquired them. Although additional documentation was not available for all museums or individual models, it was a valuable process to enhance understanding of the models where possible. The files included documentation such as correspondence letters, wills, exhibition labels, photographs and conservation records and these were recorded on Excel spreadsheet and Word documents.

### **3.2.4 Step Three: models**

The final, but essential, step involved observing and documenting the physical model boats in the different museum collections. This included taking photographs and notes of the overall models and particular traits such as features, i.e. if the model contained a mast, outrigger, thwarts or thole pins (for oars), and how it was constructed, i.e. if it was carved, or formed of individual planks and how they were fastened together. Basic measurements, such as the overall length of the vessel, width and height in mm, were also recorded when possible.

The substantial quantity of models forming this dataset meant, given the time constraints of the thesis, it was not possible to view all of the 667 models. Whole collections of models were observed where possible, but where this was not feasible a sample were viewed and photographs, if available, were observed. Challenge three in Appendix B 'Challenges: working with museum collections' discusses the quantity of models, time constraints and how it affected the methodology in further detail.

This step was an important part of the process to gain a better understanding of the models and their features. Prior to, and during, this phase published studies of traditional watercraft from the Indian Ocean were read to help further understand the boats the models represent. This helped in the identification of models and to acknowledge any that may have been incorrectly identified in the museum records. Where this did occur, the museums were notified.

Observations revealed most of the models are highly detailed reflecting different types of boats, features and construction techniques. This suggested some of the questions posed in Chapter 1 about the physical traits of the models could indeed be answered in this research.



### **3.2.5 Processing the data**

The final stage of the methodology involved processing and analysing the data before identifying the models for the case studies. The models in the dataset are examined on two levels in this chapter – their context and physical traits. The former can help us further understand the purpose and history of the models. Within this section the following data will be analysed: models on display; location; date and collectors. Technical details will then be briefly analysed under the following sub-headings: boat type; construction and material. Under each sub-heading there will be a brief overview and analysis of all the 667 boat models in an attempt to ascertain if it is possible to answer the questions presented in Chapter 1. This will be made possible through the production and discussion of tables, graphs and proportional symbol maps.

It became apparent, during the initial data collection phase, that the boat models at the National Maritime Museum, Cornwall are, in fact, loans from the National Maritime Museum, Greenwich. The models are included in the dataset but, as the records and information are held at the Greenwich site, the National Maritime Museum Cornwall has not been included as a separate museum collection for the purpose of data analysis to avoid repetition. The total number of museum collections in this research, therefore, is thirteen.

There were some challenges met during the data collection phase of this research which resulted in adapting the methodology accordingly. These challenges and how they were dealt with have been noted in Appendix B.

## **3.3 Placing the model boats in context**

This section reveals information about the context of the model boats in this research. It includes aspects such as why the models were collected, when they were collected, and where they originated from. It will help to start answering questions about the potential of the models and is an essential step before the physical traits of the models are subsequently analysed.

### **3.3.1 Models of boats on display**

To help contextualise the boat models in terms of their presence in UK museum collections it is useful to raise awareness about the number on display and, comparatively, in storage. Of the total 667 models from the Indian Ocean being questioned 85 were on display at the time of writing - a total of 12%. This leaves the remaining 582 boat models in museum storage where they are rarely visited

for research and often physically inaccessible to the public (although those with comprehensive online collections, such as the British Museum and the Museum of Archaeology and Anthropology in Cambridge, can be accessed, to an extent, digitally). This, along with the reviews of literature in Chapters 2 and 5, supports the notion that these model boats are both understudied and rarely displayed. Moreover, since carrying out this research, the models from the EISCA collection, which accounted for 14 of the models on display, were disposed of in a public auction in the summer of 2017. This will be referred to later in Chapter 8 but essentially highlights the threat to these collections and how few models are now accessible in museum displays.



**Figure 18** Ethnographic models of on display at the Pitt Rivers Museum, Oxford. This includes models from regions around the Indian Ocean (Photograph taken by Charlotte Dixon, April 2014)



**Figure 19** Model boats from the EISCA collections on display at Eyemouth Maritime Centre in 2014 including models from the Indian Ocean region. This collection has since been disposed of and the models are no longer displayed (Photograph taken by Charlotte Dixon, June 2014)

The Pitt Rivers Museum, “one of the world’s most celebrated museums of ethnography and world archaeology” (Pitt Rivers Museum, 2009: 3), has the greatest percentage of boat models on display – 51 amounting to 75% of their total collection of boat models from the Indian Ocean. One of the display cases of model boats can be seen in Figure 18. The reason for this large number of models on display relates to the early aims of the museum, following its establishment in 1884, to allow students “to see as many objects as possible” (Pitt Rivers Museum, 2009: 7). Models from the Indian Ocean from the ESICA collections were also on display at Eyemouth Maritime Centre until 2017 (Figure 19). These museum displays are not, however, typical examples.

The National Maritime Museum, Greenwich loaned ten of their Indian Ocean boat models to the National Maritime Museum Cornwall for permanent display. There are also two models on display at the Greenwich site in the ‘Traders’ gallery at the time of writing this thesis. The National Museum of Scotland has four models on display; the Horniman Museum and Gardens one; Kew Gardens two and the British Museum temporarily displayed one boat model from Indonesia in the ‘Connecting Continents’ exhibition between November 2014 and May 2015.

Since closing the ‘Shipping Gallery’ at the Science Museum in 2012, all of the boat models have been put into storage. Likewise, Plymouth City Museum and Art

Gallery, Glasgow Museums, the Museum of Archaeology and Anthropology in Cambridge and Bristol City Museum all have their boat models from the Indian Ocean in storage, out of public view.

With the vast majority of these models in storage, not visible to visitors and rarely being accessed for research, it is hoped this study will identify just how useful these models can be and promote their potential for future museum displays and exhibitions.

### **3.3.2 Distribution**

It has been noted the total sum of boat models identified for this research is 667; of these the location of 659 models is known. This leaves only eight models where their origins have not been identified. To understand what the models represent it is important to ascertain and analyse the origins and initial distribution of the museum objects. This will also help to establish if there are any biases in the collection of models from particular regions – are some regions represented more than others?

Table 1 shows the distribution of the models around the Indian Ocean region. In cases where the countries name has changed, the former name given to a region has been acknowledged in a separate column. This is due to the changing political nature of countries in and around the Indian Ocean during European presence and dominance in the region followed by a process of decolonisation and, in some cases, independence. This resulted in some changes in country name as well as alterations in some political boundaries and governance, so the region recorded in a museum record may refer to the former name rather than the current name of a country. For this reason, it is important to acknowledge variations on the names. This links to the discussion of empire in Chapter 4.

The locations highlighted in pink in Table 1 refer to regions that were formerly part of the British Empire. It can be noted almost all of the model boats came from regions that were once part of the British Empire. This is particularly interesting as it could suggest why some individuals and collectors from Britain were in these regions around the Indian Ocean (this is a notion that is explored further in Chapter 4).

### Chapter 3 - Model boats in UK museums: an overview

**Table 1.** The regions the model boats were acquired from. The locations highlighted in pink were once part of the British Empire, which included colonies, protectorates and dominions and both the current and former names for a region are included.

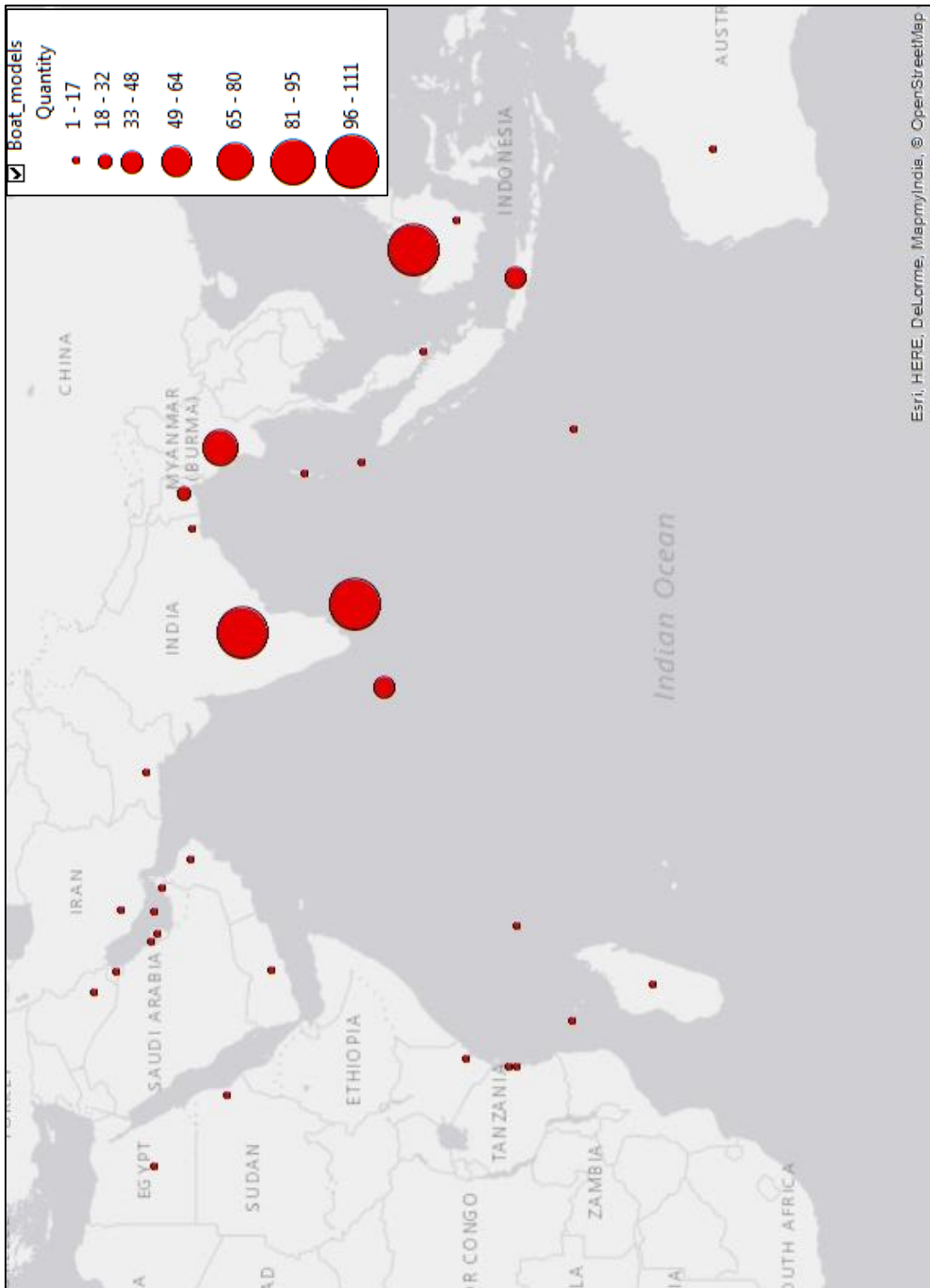
Location	Former name	Quantity of boat models
<b>East Africa</b>		
Africa (where specific country is not specified)		5
Comoros		1
Egypt		2
Kenya	British East Africa	12
Madagascar		13
Seychelles		1
Sudan		4
Tanzania	Formed in 1964 from:	2
	Tanganyika	
	Zanzibar	7
<b>Middle East</b>		
	Arabia (comprising Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE and Yemen)	10
Bahrain		5
Iran		1
Iraq		6
Kuwait		7
Oman		4
Persian Gulf, also known as Arabian Gulf		13
Qatar		2
Saudi Arabia		1
United Arab Emirates	Trucial States	2
Yemen	Aden (south Yemen)	3
<b>South Asia</b>		
Bangladesh	East Pakistan until separation	23
India		110
India and Bangladesh (West Bengal is now part of India, East Bengal Bangladesh)	Bengal	10

### Chapter 3 - Model boats in UK museums: an overview

Location	Former name	Quantity of boat models
Pakistan	West Pakistan, separated from India	7
Sri Lanka	Ceylon	106
Maldives		34
<b>South East Asia</b>		
Andaman Islands		11
Borneo (if the specific country is not identified) - consisting of parts of Malaysia, Brunei and Indonesia <sup>4</sup>		16
Burma-Malay border		1
Cocos (Keeling) Islands		4
Indonesia		34
Malaysia	Formed in 1963 from:	107
	Malaya	
	Sabah	
	Sarawak	3
	Straits Settlements (formed from Malacca, Dinding, Penang (now parts of Malaysia) and Singapore)	1
Myanmar	Burma	71
Nicobar Islands		13
Singapore	Part of Straits Settlements	7
<b>Australia</b>		
Western Australia		1
Unknown or unsure		7
		<b>Total = 667</b>

<sup>4</sup> Models of boats from Borneo have been included in this dataset as it is often not clear which part of Borneo they originated from. Therefore, to keep the study area simple the whole of Borneo has been included.

Figure 20 is a proportional symbol map based on the data presented in Table 1. This depicts where the models originated from. The circles plotted are proportional to the number of boat models from that particular region – the larger the circle, the greater the quantity of models. Specific locations within a given country are known for a few models but generally the models are only associated with, or recorded as being collected from, a country without regional data. While this will be addressed in greater detail in the case studies, it would seem that most of the models cannot be used to understand regional differences in watercraft within a given country. For the purpose of this overview the models have thus been grouped by country.



**Figure 20** Proportional symbol map showing the original distribution of boat models from all museum collections in this study

Table 1 and Figure 20 show clear patterns in the original distribution of boat models around the Indian Ocean region across thirteen museums. The most noticeable observation is the high quantity of models originating from Malaysia (111 models), India (110 models), Sri Lanka (106) and Myanmar (71). The regions where the next highest quantity of models were made / collected are the



Maldives, Indonesia and Bangladesh. It would appear, looking at this data, the central and eastern areas of the Indian Ocean more commonly produced model boats, or at least models were more commonly collected from these regions, than the western Indian Ocean.

This data raises question about why models of boats were produced and collected from some regions more than others. The majority, though not exclusively, of the models were made and collected from regions that once formed part of the British Empire. It would be interesting to further investigate this question to see if the models can help us to understand models in their global contexts such as the wider picture of the British Empire, East India Company, trade and resulting cross-cultural connections. To start to understand this and place the models in their contexts further it is important to establish when the models were made and collected and by whom. It must be understood, when exploring the data that these models are only representative of those that ended up in museums in the UK. This raises the question, if 667 models ended up in thirteen UK museums how many were initially collected and bought back to the UK that were not acquired by museums? How many were acquired by other nationalities such as Portuguese and Dutch collectors and how many of these models ended up in museums outside of the UK? How many were initially produced? Were they specifically commissioned to be collected / transferred to the UK or could this have been part of some mass market or souvenir trade? Why were boat models specifically deemed important enough to be miniaturised and transported to the UK? Were models of other items also made and collected from the same regions?

At this stage it is not possible to answer these questions. Distribution statistics do, however, reveal that boat models were produced in several regions around the Indian Ocean: they did not only originate from one area suggesting the production of boats in miniature was a widespread practice at the time of their acquisition. It has also demonstrated that there were patterns in the collecting areas. Regions around the Indian Ocean are not evenly represented in these museum objects but show a particular concentration in regions including Malaysia, India, Sri Lanka and Myanmar.

Whilst collating the distribution data it was also possible to make observations about patterns across different museum collections. Firstly, all the museums, with the exception of Bristol City Museum, contain models from Sri Lanka in their collections. These models were amassed by multiple collectors (an idea that will

be referred to later in this chapter and in Chapter 4). This suggests two levels of information. Firstly, Sri Lanka was a colony of the British Empire (see Appendix C) so the models can help us to understand how travel to this region was common compared to other regions around the Indian Ocean and what it can imply about interactions between locals and British for an exchange / collection of material culture to occur. It can also infer that Sri Lankan boats were significant, to some degree, both for local communities in Sri Lanka and for the western collector in order for them to be replicated and crafted in miniature.

There are other trends in the distribution of these objects across a number of museums. Models from India feature in eleven museums (except Kew Gardens and Glasgow Museums), there are models from Myanmar in ten museum collections (with the exception of Kew Gardens, Southampton City Museums and Bristol City Museum) and Malaysian models feature in all but Plymouth City Museum and Art Gallery, Kew Gardens, Southampton City Museums and Glasgow Museums.

Looking at the data for individual institutions further observations can be made. Over 50% of the boat models (59 of the total 110) from Malaysia are in the Museum of Archaeology and Anthropology, Cambridge. Over 60% of the models from Bangladesh are housed in Bristol City Museum's collections (14 out of a total 22) and over 31% of the models from India are in the Science Museum (35 of the total 110). This raises questions about why high volumes of models from these regions were acquired by these museums – why were they collected and what was the purpose of their acquisition into the museum? Who collected them and were they commissioned specifically for the institution? Moreover, the museums containing the highest volumes of models tend to have the most diverse range of boat models in terms of their location.

Data regarding original object location can not only inform us about where boat models were made and collected from, but we can also start to ask questions of the data about the popularity of certain regions for the production, collection and acquisition of boat models. In addition, this data raises further queries about the context of the models – who collected them and why? This will be explored in more depth in Chapter 4.

### **3.3.3 When were the models made and collected?**

Of the total 667 boat models in the dataset, 553 have been associated with a date. These dates refer to the production of the objects when known, the date of field collection or the date of acquisition into a museum. On the rare occasion when all three dates are known, the earliest date was taken to be represented in this data to indicate the earliest possible evidence for the boat model. Although the year of acquisition and field collection do not necessarily directly relate to the time of production, it can be acknowledged the models were made by the date presented in this research at the very latest.

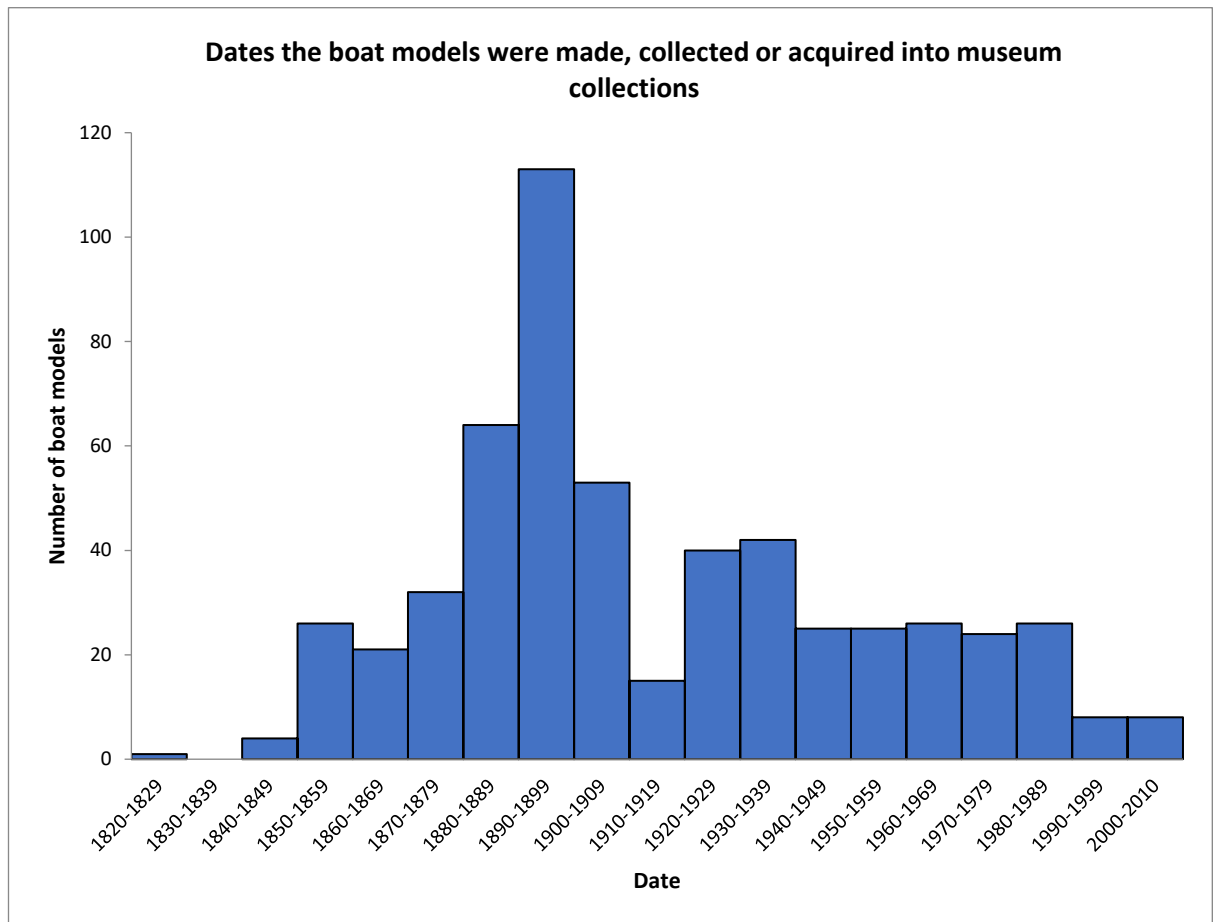
To answer questions about when the objects were made and collected, their associated dates have been analysed. The dates have been approached by decades rather than individual years to make the data processing simpler as the models span nearly 200 years. In addition, many of the museum records do not provide specific dates, but refer to a decade so this method enables these models to be included within the analysed data. As well as basic trends in collecting dates this information has potential to inform us about wider collecting practices and how they tie into the contemporary activities and political positioning of Britain at the time.

Table 2 and Figure 21 show clear patterns in the time span the models were produced, collected and acquired. They range in date from 1827 to 2003. There are no models that knowingly predate 1827 in this research.

### Chapter 3 - Model boats in UK museums: an overview

**Table 2** Dates the model boats were produced, collected or acquired into a museum

Date by decade	Total number of boat models
1820-1829	1
1830-1839	0
1840-1849	4
1850-1859	26
1860-1869	21
1870-1879	32
1880-1889	64
1890-1899	113
1900-1909	53
1910-1919	15
1920-1929	40
1930-1939	42
1940-1949	25
1950-1959	25
1960-1969	26
1970-1979	24
1980-1989	26
1990-1999	8
2000-2010	8
Unknown	114
	<b>Total = 667</b>



**Figure 21** Dates the boat models were made, collected or acquired by museums, shown by decade

Figure 21 shows a significant peak in the decade 1890-1899. Although models from different museum collections were acquired in this decade, 19% can be traced back to 1898 in the Horniman Museum and Gardens. This was the year Frederick Horniman started cataloguing his collection so we see a peak in the quantity of objects associated with this date (Horniman Museum and Gardens database). This means that the dates these models were actually collected likely predates 1898. In addition, 57 of the models collected in this decade, that is 50% of all the models collected between 1890 and 1899, can be attributed to a single collector. These were collected from Malaysia by the colonial administrator and ethnographer Walter William Skeat (Gullick, 2008). This will be further discussed in Chapter 4.

The other trends, shown in Figure 21, are peaks in the years 1880-1889 and 1900-1909 showing the production and acquisition of model boats was particularly prevalent in the late nineteenth and early twentieth centuries. These periods coincide with a British colonial presence around the Indian Ocean when several regions were run or administered by the British Empire (see Appendix C).

With a British presence in the region it makes sense that objects representative of regions around the Indian Ocean would be bought back to the UK. This demonstrates where the collectors travelled to, could symbolise British rule over indigenous lands, and signify the importance of boats in the local communities and the curiosity of the western collector. In addition, the peaks in dates also coincide with various international exhibitions hosted in the UK. For example, the decade 1880-1889 coincides with the Colonial and Indian Exhibition of 1886 and the International Exhibition of Industry, Science and Art in Glasgow, 1888 (these exhibitions are explored in greater depth in Chapter 4).

The war years, represented by the decades 1910-1919 and 1940-1949, show a decline in the number of model boats collected. This is not surprising considering travel around the Indian Ocean and back to Britain would have been limited and the focus would have been on warfare rather than collecting. While the quantity of models acquired increased following the end of the First World War, marked by the decades 1920-1939 in Figure 21, they declined again during the Second World War. The number of models collected and acquired by museums then did not increase following the end of the Second World War but remained constant and finally declined considerably from the 1990s on. This could relate to a number of reasons. Firstly, the mid to late twentieth century saw a period of decolonisation and independence of several regions from the British Empire, such as Myanmar in 1948 (see Appendix C). This, for example, resulted in a diminishing British presence in Myanmar from the 1960s onwards (Green, 2015: 461). Another explanation for this could be due to museum policies and the intake of objects in to collections. It may now not be in a museums' remit to collect objects relating to the Indian Ocean due to the focus of the museum or pressures on resources, such as storage space. Finally, there is the possibility that the numbers of model boats actually produced around the Indian Ocean diminished towards the latter end of the twentieth century.

**Table 3** Original distribution of models for the three most commonly represented decades

Location	Date		
	1880-1899	1890-1899	1900-1909
Andaman Islands	4	2	
Bangladesh	2		
Borneo		1	10
India	14	9	
Indonesia	2	5	1
Madagascar			2
Malaysia	1	63	16
Maldives	5	5	9
Myanmar (Burma)	19	10	4
Nicobar Islands	3	4	3
Oman		1	
Singapore	1		
Sri Lanka	10	9	7
Unknown	3	4	1

By cross-referencing frequently represented decades with location data (Table 3), it is possible to identify patterns. The majority of the models originated from central and eastern regions of the Indian Ocean with the west, particularly Africa, less represented. This raises questions about what was going on in these regions at the time, about colonialism and western relations with regions in the Indian Ocean. Who collected these models and why were the collectors in these countries interested in models of boats?

#### 2.3.4 Who collected the models?

It is common practice for museums to record how an object entered their collections (Ambrose and Paine, 2012: 220). This includes information such as who made the item, who collected it and who the museum acquired it from. This documentation is important so museums can leave a traceable context and narrative of the object for future generations. As mentioned in the challenges in Appendix B, not every record contains such data. However, 507 models of the total 667 have some form of information regarding the models journey into the museum. This can include names of producers and collectors but also the name of an institution it may have been transferred from.

This data is valuable in furthering our understanding about the context of the boat models and allowing us to consider who collected the object, how and why. Whilst many individual collectors appear to have only donated one or two models, certain people stand out as avid producers / collectors / donators. Skeat, Temple, Hornell, Pitt Rivers and Hose, to name a few, all appear to have donated significant quantities of boat models. This raises questions such as who were they and why did they collect boat models from the Indian Ocean? What was the initial purpose of the object?

In addition, the donation of models by particular individuals to multiple museums should be acknowledged. Analysis and further investigation into the variety of collectors and the reasons for the production and collection of models is discussed in Chapter 4.

### **3.4 Model boats and their representation: an analysis**

This next section explores the physical traits of the models. It briefly analyses aspects of the whole dataset such as boat types, construction, propulsion and the materials they are made from. It introduces different potential avenues about the models that can be explored in the case studies later in this thesis.

#### **3.4.1 What types of boats are represented in model form?**

The classification of boats is a complicated phenomenon. There can be several different names given to the same boat (Chaudhuri, 1985: 141, Prados, 1997: 190; McGrail and Blue, 2003: 32; Agius, 2010: 31). This can make the discussion of a particular boat type rather complex and confusing. For example, an Indian surf boat was given various names in early European accounts such as *massola* or *massoolah* which became standardised in the twentieth century as *masula*. However, other names have also been given to this particular type of surf boat where, for example, the name *padagu* has been used by Tamil speakers (Kentley, 2003a: 120-121).

In addition, there is the added complication where “vastly different boats can be given one and the same denomination” (Falck, 2014: 162). Taking these points into consideration the discussion of boat types represented by the models is highly complex. Furthermore, as McGrail highlighted in the discussion of early water transport, vessels were not mass produced so “each individual raft or boat is different from all others” (McGrail, 2001: 7). This is also true of the traditional Indian Ocean vessels of the nineteenth and early twentieth centuries. In addition,



there is the possibility of vessels adapting to meet specific needs and functions that may change over time, vary by region or on an individual basis. As well as these considerations, the nature of the model boats and their museum records can also affect the terminology used for a given model and boat type adding a further dimension to the challenging nature of boat nomenclature. This not only needs to acknowledge the variation in terminologies but the knowledge of the recorder who created the museum documentation for each model – how much did they know about the boats and was their terminology accurate (more about this is discussed in the challenges in Appendix B)? It is therefore imperative to recognise in this study that the terminologies given to classify a boat represented by a model are not static; there is an element of fluidity and an acknowledgement of the variations and questionability of terms.

Despite the complications, it is useful to classify the models to some extent to try to further understand the range of data and identify particular patterns the models may be able to reveal. While McGrail's system of classification, incorporating attributes of planked craft – shell or skeleton and principal techniques used to make them (McGrail, 1985), is acknowledged, the exact techniques are not always identifiable in the models. The system of classification used in this analysis therefore uses basic hull type – the generalised representation of rafts, basket boats, bundle boats, logboats and plank-built boats. Figure 22 shows the percentage of hull types represented by the boat models where this data is available. Models that have been produced by carving the hull yet do not appear to represent a logboat and have no indications of planking have been classed, for this section, as unknown and not included in Figure 22. However, models that have been carved and contain grooves imitating planking have been included.

Figure 22 shows the boat models across the museum collections researched reflect a range of hull types. The most common being a logboat, a dugout log with 263 models (nearly 40% of all the models in the dataset), followed by 112 models (17%) representing plank-built boats. There are also 27 rafts, four basket boats and one bundle boat.

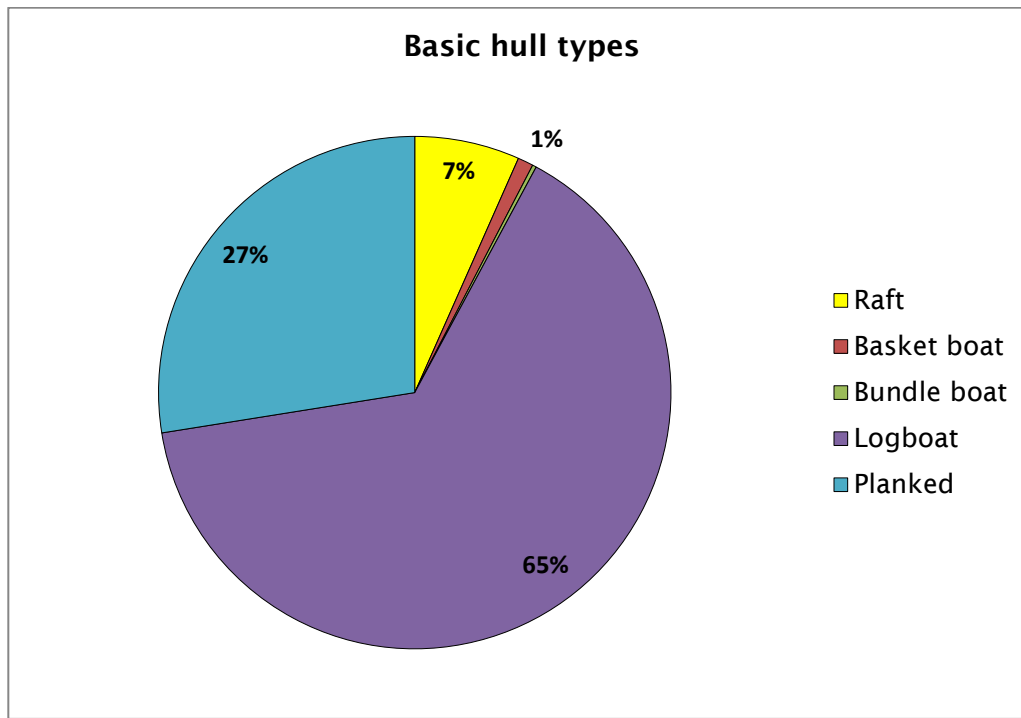


Figure 22 Basic hull types represented by the boat models

To make sense of this data it is useful to consider the distribution of the different hull types. The table in Appendix D reveals most of the rafts originated in India – the majority of which have been identified as being variations of the *kattumaram*. Most of the basket boat models originated in Iraq, namely from the Tigris River region and have been identified as *quffa's*, or *guffa's*. The only bundle boat has been identified in the museum records as being an *ambatch* bundle canoe from Sudan. These three hull types, although evidently present in the Indian Ocean region, seem to be in the minority when compared to the models representing logboats and plank-built boats.

Logboats, the dominant type represented by the models, have been sub-divided as logboats in the basic form, double logboats where two logboats are secured together side by side, logboats with a single outrigger and logboats with a double outrigger. Logboats are, of course, much more complex than this and can also be extended or expanded. However, for the purpose of this overview of data very basic typologies have been used.

The region with the highest number of single logboats represented by the models is Myanmar (comprising of 38 models), followed by Malaysia (27 models) and India (26 models). This type of hull model appears to be dominant in South and Southeast Asia. Double logboats do not appear to be quite so common with a small sample originating from India (only 4 models) and Sri Lanka (6 models). The

vast majority of models representing logboats with single outriggers originated from Sri Lanka. These models have been classified as types of *oru* and are notably the most common type of boat model featuring in twelve out of the thirteen museum collections researched and accounting for 10% of all the models. This raises questions about the significance of this type of boat and why they were represented in model form, collected by different people and bought back to the UK. The distribution of single outrigger boat models is not just in South Asia but also Southeast Asia and parts of East Africa. This is quite a contrast to logboats with double outriggers where there are 8 in total, 4 from Zanzibar and 4 from Indonesia – both the eastern and western borders of the Indian Ocean.

Models representing carvel planking originated mainly in South and Southeast Asia (India, Sri Lanka, Malaysia and Myanmar) and make up 12% of all the models. There are significantly fewer models with clinker and reverse clinker planking – in fact there is only one model representing reverse clinker planking which originated in Bangladesh. Planked vessels with single outriggers are in the minority with 2 from Sri Lanka, these have both been identified as *yathra dhoni*, a boat type that is now extinct (Devendra, 2013).

This distribution data (in Appendix D) is not necessarily indicative of the types of hull in use around the Indian Ocean in the nineteenth and twentieth centuries. For example, there is photographic evidence in the British Museum of rafts in use in Western Australia in the early twentieth century but this is not represented in model form in this particular data set. Although this data cannot speak for the types and regions not represented by the models, these models could be evidence for basic boat types that were in use in the nineteenth and twentieth centuries. The fact particular types have been collected seemingly more than others can also hint about the significance of the vessels in the community as well as the significance of the boats for the collectors and museums. In addition, the intricate details of the models reveal features which can be used to further explore the boats.

### 3.4.2 Propulsion

It is possible to identify features on the models, such as thwarts (seats), steering oars and outriggers, which might be indicative of features found on the full-size vessel the models portray. This, in turn, can help us to understand variations among vessels and potentially assist studies of full-size traditional watercraft. The

method of propulsion, i.e. sail, oars, paddles, can similarly often be identified from the models.

Of the total 667 model boats in the data set 343, that is just over 51%, contain a sail, mast or evidence to suggest a mast was once present, such as a mast step. The rigging of the models is an area that could be further explored to see if they accurately reflect what was used on full-size boats for particular vessels which could help to assess if the models are accurate portrayals of watercraft. However, the discussion of rigging can be a rather complex one and would require close study and analysis, and due to the delicate nature of the rigging in the miniature form, this is often a feature of the models that has been damaged over time.

Other forms of propulsion, such as oars or paddles, can also be investigated to learn about the boats the models represent. However, caution must be taken with this method as just because a model does not, in its current state, contain evidence to say it would have contained oars or paddles does not mean these objects did not once exist. The oars and paddles belonging to the boat models are often loose and it is possible some of these may have been lost before the model was acquired by a museum.

However, while we cannot gauge information about the propulsion of models where this data is missing this avenue can be explored for those models where this is still present. As propulsion needs to be considered in terms of types of boats and regional information it is not possible to analyse this information within this overview. However, aspects of propulsion will be explored in the case studies.

### **3.4.3 Construction**

With dwindling numbers of traditional boats currently being built around the Indian Ocean, there is concern for the need to record vessels and their technologies before this information is lost (McGrail, 2003: 16). As the majority of the models are highly detailed in their construction, they could potentially provide crucial information about boat building traditions in the nineteenth and twentieth centuries: traditions that may no longer exist.

Table 4 shows how the models were constructed. This combines information from the previous section on hull types with the fastening method used to affix components of the models together. This refers to the actual way the models

have been assembled; it does not take into account methods that are thought to be represented by the models.

**Table 4** Construction and fastening techniques used to assemble the boat models

Construction	Method of fastening												
	Logboat (fastening N/A)	Woven	Sewn	Tied	Dowelled	Dowelled and sewn	Dowelled and nailed	Nailed	Nailed and sewn	Stapled	Threaded	Glued	Unknown
Whole logs (rafts)			2	11	1								11
Whole pots (rafts)					1								3
Bundled													
Basket		4											
Dugout (logboat)	53		86		8	1		4	1			1	98
Planked			43		13	1		15	1	7			23
Carved	15		1		6		4	7		3		1	25
Unknown								3			2	2	210
<b>Total</b>	<b>68</b>	<b>4</b>	<b>132</b>	<b>11</b>	<b>29</b>	<b>2</b>	<b>4</b>	<b>29</b>	<b>2</b>	<b>10</b>	<b>2</b>	<b>4</b>	<b>370</b>

The highest numbers of models (96 in total equating to 13% of all the models) were made from a hollowed-out piece of wood, or dugout hull, with additional planks affixed to the hull using a sewn technique. Sewn boats were common in the Indian Ocean for thousands of years, with the first documentary evidence recorded in the *Periplus of the Erythraen Sea* dated roughly to the 1st century AD (Schoff, 1912: 28). This technique has, in recent years, declined dramatically due to the introduction of new materials and technologies (this will be further discussed in Chapter 5). Model boats could thus provide evidence for this type of boat building tradition.

Most of the models with a dugout hull, extended with planks affixed with stitches, have been identified as outrigger vessels, known as *oru*, from Sri Lanka. Models made from planks sewn together are also well represented in the data sample (43 have been identified). An example of one of these models, and to demonstrate the high level of detail in its construction, is shown in Figures 23 and 24 from the EISCA collection. This depicts a *masula* boat from India.



**Figure 23** Model of an Indian *masula* surf boat. It has been made from a series of wooden planks sewn together and depicts different patterns in the stitching inboard and outboard. In the EISCA collections, 630mm in length (no inventory number; photograph taken by Charlotte Dixon, June 2014)



**Figure 24** Close up of *masula* boat model from Figure 23 showing the stitching. It shows the inboard of the model with the stitches forming a criss-cross pattern used to join the wooden planks together. In the EISCA collections (No inventory number; photograph taken by Charlotte Dixon, June 2014)

Kentley described how *masula*'s from southern India were sewn using a cross-stitch pattern with vertical bars inboard and unconnected vertical bars outboard (2003a: 157). In addition, the inboard seams were wadded (waterproofed) with coconut coir and dried grass, as well as the outboard seams along the stem and stern posts (Kentley, 2003a: 156). This method of construction, according to

kentley (2003a), differs to *masula* boats of the northern and central regions in India. The model in Figures 23 and 24 reflect this pattern of construction as described by Kentley for *masula's* from southern India. This suggests not only that this model is an accurate portrayal of this traditional boat building technique and that the model maker had an understanding about precise traits of these boats, but also that it depicts vessels of this class from the southern region. The fieldwork for Kentley's study was conducted in the 1980s. With the impact of the tsunami in 2004 and the use of synthetic materials in boat building since this fieldwork was undertaken, it is uncertain how many of these traditional vessels are still in use. Models could thus provide crucial evidence for these vessels and their construction methods.

The *masula* model discussed here has briefly demonstrated how these miniature objects can reflect true traits of construction techniques found on full-size watercraft from the Indian Ocean. It would seem many of the models do reflect building techniques fairly accurately, although there does seem to be some discrepancy with scale. This is evident in the stitches used on most of the models where there are often fewer and larger stitches on the models than were actually used on full-size watercraft (this will be investigated further in the case studies).

Other construction techniques used to assemble the models (identified in Table 4) include hollowed out pieces of wood – or the logboat in its basic form. The woven models refer to the *quffas* or *guffas*, basket boats, discussed in the earlier section on type. The construction method 'carved' describes models that do not accurately portray a particular hull type and have been carved instead from a block of wood. Sometimes these have lines incised into the wood to indicate planks but for the purpose of constructional analysis they are not technical models in terms of their construction. However, some of these carved models do contain a sheer strake or washstrake (additional planking atop the hull of the vessel) so it has been possible, in some cases, to identify the material used to fasten this to the carved hull.

Models, such as those described in Table 4 as 'glued' or 'threaded' together, may be able to tell us something about the features of a boat but cannot reveal technical information regarding a boats construction. However, a brief overview of the data as a whole does reveal that different techniques in construction are clearly apparent as metal nails, wooden dowels or pegs and cotton thread have all been used to construct numerous models.

Within the scope of this particular section it is not possible to produce an in-depth analysis of each model and construction technique. This will, however, most certainly be explored in greater depth in the case studies that follow. It can be deduced, from this data, that the majority of the models have been produced in such a way that reflects how full-size boats were constructed. The models in the dataset represent not only a wide variety of types of boats but also a range of construction techniques which can, depending on further analysis of the accuracy of the models, be used as evidence for boats and the way they were constructed during the nineteenth and twentieth centuries.

#### 3.4.4 Material

**Table 5** Different types of materials the model boats are primarily made from

<b>Material</b>	<b>Number of boat models that primarily consist of this material</b>
Wood	442
Bark	2
Bamboo	6
Paper	3
Ceramic	1
Metal	1
Clove	2
Bitumen	1
Leaf	2
Ivory / bone	1
Reed	2
Animal skin	1
Plaster	1
Unknown	202



Analysis of the main materials used to produce boat models can provide some useful insights into these objects. Table 5 shows the majority, 66%, of the boat models are made from wood. Other materials have also been used, although the quantity is marginal by comparison. It is interesting to observe that two boat models have been constructed from the spice cloves (one of which can be seen in Figure 25). These models, from the 'Spice Islands' in Indonesia, are very intricate objects produced by threading dried cloves on to a fine wooden frame. Although these models are not particularly useful in studying the construction of full-size vessels as it would be impossible for a boat to be made from such a material, they can still be valuable sources of information when certain questions are asked. What is the purpose of these models, why were they produced? Were cloves used to make other goods? Other models made from cloves do exist in other museum collections such as the Tropen Museum in the Netherlands. The majority of these models represent boats but this is not exclusive – other models such as a horse and carriage exist. This clearly indicates the significance of the spice, as cloves were native to Indonesia yet were highly sought after and costly in Europe. Models made from this material were likely made as souvenirs and could be used to help us understand the souvenir trade between Indonesia and European regions. They can therefore help to inform us about cross-cultural interactions as well as the significance of the vessels that were chosen to be depicted in miniature. The models are also valuable for their aesthetic nature.



**Figure 25** Model of a *kora kora* boat made from threaded dried cloves, probably from Indonesia. In the British Museum collections, 580mm in length (inventory number As1972,Q.1944; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

This identification of the materials used to make the boat models in the research has been somewhat simplistic. For example, it has not been possible to analyse each of the different types of woods used to make the models due to time constraints of the research. However, it would be interesting to analyse and compare the woods used in the model making with those used to create full-size boats – would the same materials have been used or have the materials been adapted due to the ease of working with certain woods in miniature? It could also be interesting to consider the accessibility of the material in its raw state; was the wood used to create the models sourced locally or was it imported? This could help to hint about the significance of the boat models and the boats in local communities – to what extent did model makers go to replicate the boats and how easy was it to source the material in order to make the models? Unfortunately, the majority of the museum records simply state the material as ‘wood’ and do not provide further information so in order to explore this further the wood used in the models would need to be physically identified which is simply not feasible in this data overview. This is an avenue that could be explored in future research.

### 3.5 Conclusions

By starting to analyse data about both the contextual and physical attributes of model boats from the study area this chapter has demonstrated possible avenues to explore in further detail in the case studies. Through the presentation of statistical data, as well as descriptions of the models, it is clear that models are indeed valuable objects for both researchers and museums. They have potential to provide information about traditional watercraft, as well as wider historical aspects such as empire and colonial collecting.

The aim of this thesis, as discussed in Chapter 1, is to answer the question *how useful are models as a tool for studying traditional boats from the Indian Ocean?* To do this, questions are asked about the purpose and collection of the models as well as about their accuracy and ability to inform us about boat types, construction and their significance on a local and international level. Although these questions will be approached throughout the thesis some answers have started to emerge through the analysis of the data.

This chapter has identified how the models range in date from the early nineteenth to early twenty-first century with a concentration of models made and

collected in the late nineteenth and early twentieth centuries. This period was the height of the British Empire that saw trade links with many regions around the Indian Ocean that were ruled or administered by Britain. It is interesting to note the link between the regions the models originated from and former British colonies. For example, the highest numbers of models were from Malaysia, India, Sri Lanka (formerly Ceylon) and Myanmar (formerly Burma). All of these regions formed part of the British Empire from at least the late nineteenth to mid-twentieth century (see Chapter 4 and Appendix C for a full list of the former British colonies and protectorates).

The identification of boat types can be problematic, as discussed earlier in this chapter. However, it is possible to answer the question about types to some extent. The vessels represent a variety of types of boats, from logboats to frame first plank-built vessels. The important point to note here is the level of detail and the complexity of the models that enable answers to even be considered. The models often show highly detailed features of the vessels they represent and it is possible to not only explore the types of vessels but also, for some models, construction. For example, some of the models are sewn together with continuous stitches in a highly detailed fashion, other are assembled with dowels and others nailed. The assessment of how accurate these depictions are will be analysed through a sample of the models in case studies.

The significance of the boats in local cultures and for the western cultures who collected the models is apparent by the sheer volume of models produced and collected and the level of craftsmanship that went in to produce them. The number of boat models produced is likely to have been greater than the number bought back to the UK, and again by the number that were acquired by museum collections. There was clearly a demand for these models. This suggests, to an extent, the vessels identified in this research were considered to be important by the local communities who made them. It also implies these vessels were intriguing for the westerners who collected them and transported them back to the UK.

In addition to the questions raised at the beginning of this study, this chapter has identified several other avenues that require further attention yet cannot be explored within the timescale and remit of this thesis. This includes conducting comparative analysis with the types of woods used to create the model boats with those used in full-size watercraft. This would involve the identification and

analysis of the woods used in the models. It would allow us to understand to what extent these museum objects are accurate miniaturisations of watercraft in terms of their material. Broader ideas about global empire and colonial interactions have also emerged as possible avenues given the dates the models represent. Although the potential of these different concepts has been acknowledged, it is not possible to explore all aspects of model boats within this thesis. It is therefore hoped these avenues will be explored in future studies.

To comprehensively answer the research questions asked in Chapter 1, the contexts of the models are explored further in the following chapter. This will be followed by a review of studies of traditional watercraft and the identification of case studies to explore groups of models further.

## **Chapter 4 – Collecting: individuals, exhibitions and institutions**

Museum objects often have long and complex histories. Their story does not start in a display case or in a store; they have travelled both in time and space taking on different meanings and purposes along the way (Gosden and Knowles, 2001: 4). Through the use of museum records and collector biographies, this chapter focuses on the diverse and unique histories of model boats. From production to collection, and later their acquisition into UK museum collections, this chapter aims to contextualise the models in an attempt to understand their biases and assess how this might affect their application in research today.

Throughout this chapter the following questions, posed at the beginning of the thesis, will be addressed:

1. *What is the purpose of the boat models? Why were they made and collected?*
2. *Who collected the models, from where and when?*

To answer these questions and help contextualise the models the chapter is divided into three sections. It starts by introducing the notion of collecting in general and considers theories and approaches that may be able to be applied specifically to the study of model boat collecting. The next section applies a typological approach to identify collectors and their potential motivations for collecting models of boats from regions around the Indian Ocean. Finally, the third section considers the model boats in their museum contexts and how they came to be acquired by museums in the UK.

In addition to answering questions about the purpose and collection of these objects, this chapter will illustrate how boat models, placed in their wider biographical contexts, can provide evidence for wider histories about global empire, colonial relations and cross-cultural attitudes and encounters.

### **4.1 Why Collect: an introduction and theoretical approaches**

Collecting, which can be defined as “the gathering together of chosen objects” (Pearce, 1995: vii) is not a recent phenomenon. To explore this concept the

history of collecting is discussed in a brief historical overview. This is followed by theories about why people collect, who collects and how collections can be used. The objective is to both provide an introduction to collecting and to assess if current approaches and theories can be applied to the accumulation of boat models.

#### **4.1.1 Historical overview**

The act of amassing material culture is not a notion of the twenty-first century; it can be traced back to prehistoric (Pearce, 1995: 58), ancient Roman and Greek civilisations (Belk, 1995: 22; MacGregor, 2007: 1; Rutledge, 2012: 8), for example. However, the way objects have been collected, as well as the motivations for collecting, have changed and adapted over time. Susan Pearce, in her work *On Collecting*, identified five broad phases and themes of collecting practices. These are ‘archaic’, ‘Mediterranean’, ‘early modernist’, ‘classic modernist’ and ‘post-modernist’ collecting (Pearce, 1995). These different phases will be described as a way to briefly summarise the history of collecting.

‘Archaic’ collecting essentially refers to prehistoric object accumulation. Archaeological excavations have revealed objects amassed as hoards, graves and shrines (Pearce, 1995: 58), such as the deposition of Neolithic stone axes around major monuments (Bradley, 1995 as cited by Pearce, 1995: 59). Pearce then defined ‘Mediterranean’ collecting as encompassing pre-classical, classical Greek and Roman collecting through public temples and private collectors (Pearce, 1995: 93). This longevity of object accumulation suggests the culture of collecting is something deeply embedded within our social norms.

‘Early modernist’ collecting, defined by Pearce as encompassing the years 1500-1700 in Europe (1995: 109), can also be referred to as the age of curiosity (Pomian, 1990). This period can be seen as the forerunner of modern collecting practices and museums with the emergence of cabinets of curiosities and, to an extent, systems of classification. Such cabinets were used at a time of exploration and international trade to display collections of rare and exotic items including both natural and artificial specimens, such as shells and musical instruments (Shelton in Elsner and Cardinal, 1994: 177-203). Swann speculated the reason for the collection and display of such curios was because “during this era of burgeoning international trade, collecting was an important way of making sense – and cultural capital – of foreign lands” (2001: 23). Cabinets of curiosity became fashionable household items and not only displayed objects from around the

world but represented wealth, travel and an interest in exoticism in an age of enlightenment. This type of collecting was associated with a high social status and often formed the founding collections of museums. An example of this can be seen in the establishment of the British Museum collections amassed by Sir Hans Sloane (Caygill, 1981; MacGregor, 1994).

The model boats in this research were primarily collected throughout the nineteenth and twentieth centuries. This corresponds with ‘classic’ and ‘post-modernist’ collecting identified by Pearce (1995). The former of these phases refers to the broad period from 1700-1950. This era saw industrial revolution, imperialism and a time of “scientific revolution” (Pearce et al., 2002: xiii) which were to impact collecting practices. Exhibitions were held on a national and international scale showcasing a range of collections (such as raw materials, including diamonds, and technologies, such as carts and boats [The Art Journal, 1851]) and often aimed to demonstrate progress. Jasanoff observed how Britain, during this time of colonial expansion, “used collecting to reinvent itself, to define its sense of imperial purpose” (2005: 10). Collecting histories can therefore be indicative of empire and colonial interactions (Jasanoff, 2005: 6). In addition, this period saw the establishment of several museums and systematic scientific collecting took hold. These types of collecting, which will be elaborated on later in this chapter, altered the way material culture was collected, classified and interpreted, leading to modern and systematic ideas of collecting and display.

The final, and current, phase of collecting has been identified by Pearce as ‘post-modernist’ (1995). It is clear that in the present-day collecting is rife. Pearce stated that “nearly one in three people in North America collects something, and this figure is unlikely to be very different for most of northern and large parts of southern Europe” (1995: vii). Most people will have collected something at some point in their life, be it toys as a child, shells on the beach or model boats. It does not take long to find evidence of current model boat collecting - a simple search on the internet shows multiple websites dedicated to this pastime (e.g. [www.modelshipworld.com/](http://www.modelshipworld.com/)) and magazines such as *Model Boats*, dedicated entirely to the collection of these objects. The desire to collect these objects is ongoing and clearly as relevant today as it was in the nineteenth century, although the motivations for collecting are likely to have adapted and changed over time.

#### 4.1.2 Who collects and why?

The notion of, and theories behind, collecting have sparked academic and institutional interest in recent decades. It has been acknowledged that “we must start to understand the history and nature of our [museum] collections and the reasons behind their formation, so that we can appreciate better the assumptions about knowledge and value which they embody” (Pearce, 1994: 194). The desire to further understand collections has resulted in an increase in general collecting literatures incorporating theories about who collects and why (i.e. Pearce, 1992, 1995; MacGregor, 2007). With little published specifically on model boat collecting, this section will consider some of these general theories in an attempt to later identify approaches that can be applied to this study.

Everyone has the capacity to collect, but the reasons for collecting can vary and change over time (Pearce, 1994: 158). Formanek, in *Interpreting Objects and Collections*, identified five different motivations for collecting. These are: in relation to the self; in relation to other people; as preservation, restoration, history and a sense of continuity; as financial investment and as an addiction (Formanek in Pearce, 1994: 334). In addition, Wintle later acknowledged theorists identified competition as another common motivation for the collection of objects (2013: 67).

As well as considering motivations for collecting, Stewart (1993) and Pearce (1994) identified collecting typologies. Stewart distinguished between two different types of acquisition – souvenirs, which relate to personal experience, and a collection which prioritises classification over origin (Stewart, 1993; Shelton, 2001: 13). Pearce theorised collecting typologies further by discussing three modes of collecting – ‘souvenir’, ‘fetishistic’ and ‘systematic’ (1994: 194). Souvenirs are defined as personal memorabilia and are an “intrinsic part of a past experience” (Pearce, 1994: 195). Fetish collecting relates to serious, “obsessive collecting, in which the intention is to acquire more and more of the same kind of pieces” (Pearce, 1994: 197). Lastly, systematic collecting is defined as the purposeful selection of objects for a specific reason with an emphasis on classification - it “works not by the accumulation of samples, as fetishistic collecting does, but by the selection of examples” (Pearce, 1994: 201).

The second section of this chapter, *Boat Model Collecting: a typological approach*, will assess to what extent these approaches can be used to study boat model



collecting. The different motivations underpinning these modes of collection will also be considered.

#### **4.1.3 The value of collections**

Objects in museums, or in private collections, do not have static histories. They have the capacity to change meaning over time and the ability to reveal information beyond the physical artefact. With several publications available on material culture theories (i.e. Thomas, 1991; Gosden and Marshall, 1999; Harrison et al., 2013; Wintle, 2013), this section will explore a few key ideas that may be able to influence the way model boats are studied and interpreted. It will allow us to consider inextricable links between objects and the people who made, used and collected them, how their meanings and use may have altered over time and to place them in their wider cultural contexts.

Every object is, and has been, inherently intertwined with people. It was made, often used, traded or collected; each object has a history that goes beyond its current state. This notion of object biography has evoked interest in recent years. Gosden and Marshall traced this notion back to 1986 when Kopytoff “felt that things could not be fully understood at just one point in their existence and processes and cycles of production, exchange and consumption had to be looked at as a whole” (Marshall and Gosden, 1999: 170). The entanglement of objects and people, object histories and changing circumstances and meanings of objects has been supported by scholars such as Thomas (1991), Hoskins (1998) and Gosden and Knowles (2001). These theories can help the research by considering the models, not only as representations of boats, but as objects that were once made, possibly belonged to someone or used, traded and collected and what the objects meant to each individual who may have been connected to it. What can they tell us about what it meant for the individual who made it, used it, traded it, collected it and did it then come directly to the museum or did it have another ‘life’ before then becoming part of a museum collection? Finally, what meaning do the objects have now as museum pieces?

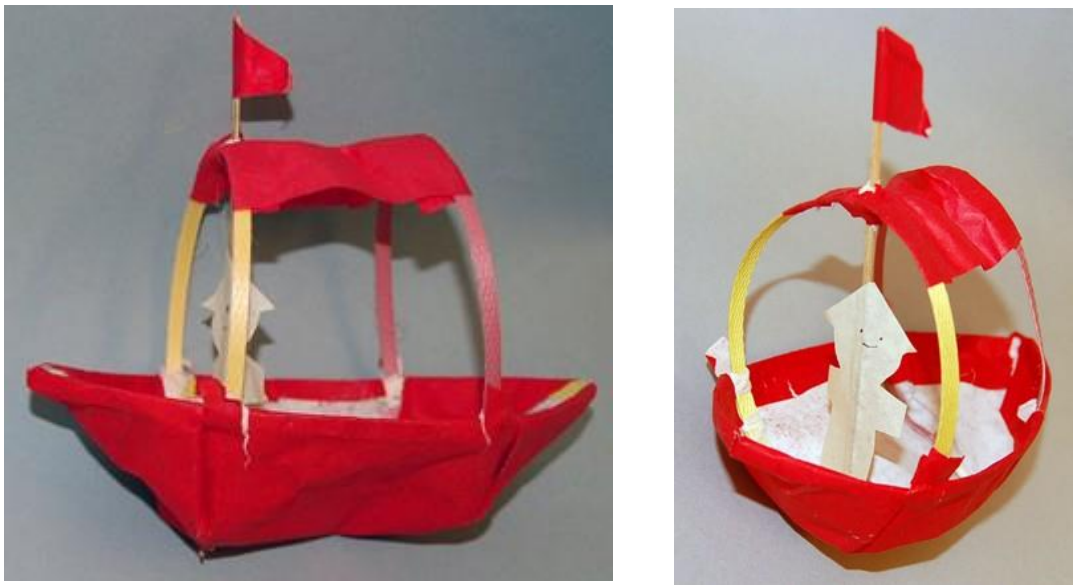
In addition to considering the connectivity of objects to an individual, there has been literature linking objects to the wider theme of social interaction and subsequent impacts. Gosden and Knowles noted “in producing artefacts, as well as in exchanging them, a whole series of social relations is set up” (2001: 17-18). Pearce commented how collecting is a “social phenomenon of considerable significance” (1995: 159) and Wintle discussed how the production of objects

uses skills “socially learnt and culturally embedded” (2013: 28). With these statements in mind it can be suggested that boat models could help to inform us about the social interactions that would have taken place in the production and exchange of these objects. This would not only hint at indigenous interactions but also of interactions between indigenous and western cultures in order for the models to have been traded and exchanged from producer to collector. The wider concept of colonial and post-colonial relations and the contribution of boat models can also be considered.

Wintle, in reference to the Andaman and Nicobar Islands, expressed a view of the importance of objects in the study of colonial relations and how they “have the potential to produce insights into the lives of those excluded from the written colonial archive” (2013: 1). It is on this note that the biographies of boat models will be explored with the aim to further understand the models, their biases and any wider themes of relations and interactions that may be able to be extracted. However, before delving into this it must be noted that the interpretations of objects and “any story of indigenous activity, agency and perspective can only be a partial one” (Wintle, 2013: 25).

## **4.2 Boat Model Collecting: a typological approach**

Two of the most recent model boats to be collected within the dataset were collected in c. 2000 and acquired into the British Museum collections in 2002 (“As2002,07.46; As2002,07.47” British Museum Collection Database, accessed 09 April 2015). The two models (Figure 26) from Singapore are funerary objects made from paper and bamboo depicting watercraft. They were collected by Dr Nigel Barley, a social anthropologist and former curator in the Department of Ethnology at the British Museum. It is instantly apparent that these models do not accurately represent vessels in use in Singapore; they are made from bright red Joss paper and secured with an adhesive. However, information about why these models were made and collected can inform us about the significance of boats in the community in Singapore.



**Figure 26** Funerary model boats from Singapore, acquired by the British Museum in 2002. In the British Museum collections, around 75mm in length (inventory numbers As2002,07.46 and As2002,07.47; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

The models were produced as funerary objects to be burnt and contain an effigy of an individual to be sent into the afterlife as a Taoist offering. This stems from Taoist culture where models of paper goods (such as boats, cars, houses, as discussed in Chapter 2), money and effigies are burnt at the grave during a burial to be sent into the afterlife with the deceased (Scott, 2007). This suggests the importance of boats for the recently deceased individual and for the relatives who would place the model at the grave. Models, such as these, are sold in shops with other paper objects as offerings to gods, ancestors and for funerary rituals and a total of 83 paper items, including a cooker, bed, clothing and even false teeth, were collected by Dr Nigel Barley from Singapore (“As2002,07.46; As2002,07.47” British Museum Collections Database, 2015). The production of these models suggests boats were deemed valuable or useful objects to accompany an individual into the afterlife and were associated with Singaporean beliefs.

In contrast, the earliest model boat known to be collected (Figure 27) originated in the Molucca Islands and was collected by a William Bennett, Esquire. The model was acquired by the Ashmolean Museum, Britain’s oldest public museum, in 1827 and was later transferred to the Pitt Rivers Museum in 1886 (“1886.1.409” in the Pitt Rivers Museum; MacGregor et al., 2000: 246).

## Chapter 4 – Collecting: individuals, exhibitions and institutions

William Bennett of Farringdon House, son of Daniel Bennett, was appointed the Lord High Sheriff of Berkshire in 1836, having previously assisted with his father's shipping company which traded mostly in the whaling, sealing and East Indian trade (Farringdon Community Website, no date). Exactly why the boat model was made and collected is unknown but the Pitt Rivers Museum online database does reveal that other boat models were collected and donated to the Ashmolean Museum by William Bennett, including a canoe from New Zealand.



**Figure 27** Model of Indonesian canoe collected in 1827 (outrigger missing). In the Pitt Rivers Museum collections, 1557mm in length (inventory number 1886.1.409; © Pitt Rivers Museum, University of Oxford)

A handwritten note found with the object describes how the model represents “an outrigger canoe, of light brown wood, used by natives of Moluccas Is. the outrigger is missing and one side has been smashed in...The straight sides have been lashed on to the rounded and much wider bottom part, and the ends slope sharply upwards from below” (“1886.1.409” Pitt Rivers Museum online database, 2012). It can be noted in Figure 27 the ‘straight sides’, interpreted as washstrakes, are no longer attached to the hull and the model is incomplete with the outrigger float still missing. Despite the partial state of the model there are still remnants of the thread used to attach the ‘rounded’ hull to the ‘straight sides’. From the visual and descriptive evidence, it would seem this model was once detailed and crafted to reflect a specific technique of boat construction: where washstrakes were sewn to a dugout hull.

The two examples of boat models, collected at least 173 years apart, vary greatly in terms of their physical appearances and contexts. The Singaporean models were made as funerary objects and the Indonesian model seems to reflect a type of full-size Indonesian boat and construction technique. These models demonstrate how varied and unique each model boat in this research is. No two models are identical; each one has been handcrafted and collected at different

times in different places to fulfil different purposes. This section endeavours to demonstrate how unique these objects are and to determine why context is essential to further understand the models and their purpose. In doing so it is anticipated questions about who made and collected the models, why, from where and when, will be answered. However, 134 individual collectors have been identified as well as three companies, seventeen institutions and societies, seven models made and collected for exhibitions and 53 where the collector is unknown. This data is vast so it is not possible to delve into detail about each collector and the models they collected within the remit of this thesis. It was therefore necessary to devise a method of classification to group the collectors and make the discussion manageable.

#### **4.2.1 Methodology**

The approach used to investigate model boat contexts, to understand the meaning and changing values of these objects, involved three main stages. The first stage explored museum documentation relating to each of the models. This involved searching museum records online, where available, as well as searching through the hard files in museum archives. This revealed documents that included letters of correspondence and legal papers relating to donors. Names of collectors and donors of boat models were recorded, where this information was available, along with when the models were collected and acquired into museum collections and where they were collected from. In addition, the numbers of objects, particularly boat models, donated by each individual were recorded to help understand the broader context of the collector.

The next stage involved researching each collector's biography. To do this the Oxford Dictionary of National Biography was consulted along with newspaper obituaries, biographical accounts in books and general internet name searches. Collector information was then arranged and recorded in tables including collector name, occupation, date of collection and donation, the quantity of boat models and objects in general donated, the collection location, type of boat model represented and level of detail.

It is not, however, possible, within this chapter, to discuss the biographies of all 667 model boats. A method, therefore, had to be established to group the models for ease of discussion. The identification and classification of the motivations and types of collectors have already been mentioned in this chapter. Pearce, for example, identified three modes of collecting: 'systematic', 'souvenir'

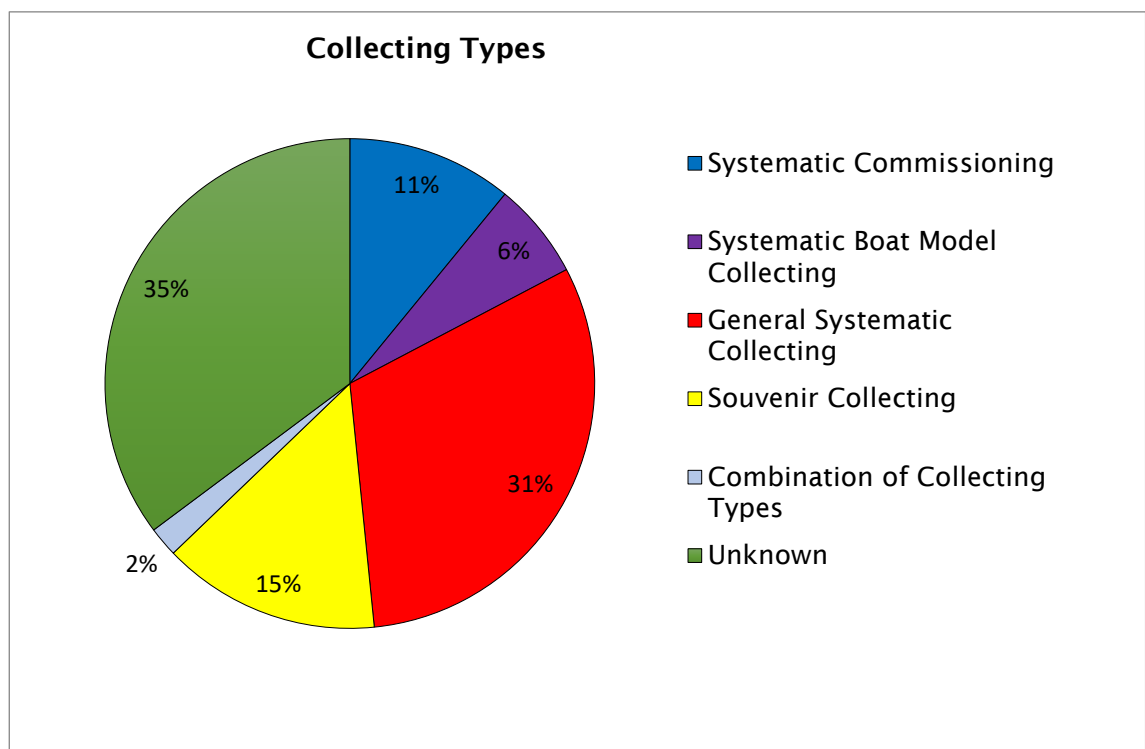
and ‘fetishistic’ (Pearce, 1994). While these collecting typologies make sense in principal, they are not entirely suitable for the classification of this dataset. After researching the biographies of the objects and their collectors the type ‘fetishistic’, defined by Pearce as obsessive collecting, (Pearce, 1994: 197), did not seem to apply. Some of the models also could not be easily defined as ‘souvenir’ or ‘systematic’. It was therefore necessary to build on Pearce’s typologies to create a model boat specific classification of collectors. This is not an attempt to definitively group collectors but this method will enable a collective discussion of the boat models in this dataset.

The research identified models that were commissioned to fulfil a specific purpose, such as their presentation in exhibitions. In addition, the idea of systematic collecting seemed to incorporate a range of boat model collecting types. This research has therefore identified four boat model collecting types: *systematic commissioning*; *systematic boat model collecting*; *general systematic collecting* and *souvenir collecting*.

*Systematic commissioning* incorporates any models known to have been made specifically for display at an exhibition or requested to be made to fulfil a specific function. *Systematic boat model collecting* refers to collectors with specialised knowledge about boats who actively sought to amass boat models using a scientific method of recording. *General systematic collecting* links to this collecting type but refers to the systematic collection of various objects, not just specifically boat models. The quantity of objects donated to a museum by one collector, along with collector biographies, can help to decipher this type of collecting – the donation of numerous objects by one collector can indicate object collecting was not a one-off activity but may have been intentionally systematically amassed. The identification of *souvenir collecting*, however, is slightly more problematic. The occupation and biography of a person can help to indicate if an individual had an invested interest in collecting objects and the number of objects collected / donated can be a signifier. If a boat model was collected as a one-off it is possible the model was gathered as a reminder of a place or experience or was given as a gift which can all be interpreted as souvenir collecting. It is acknowledged that this type is not definitive but can start to help us to understand how some models were acquired during activities such as leisure travel.

Figure 28 shows 35 % of the boat models have not been able to be put into a collecting type and are therefore described as unknown. This is partly due to limited museum records where collector and donor information is unidentified. It is also sometimes the case that the name of a donor is known but biographical information indicating collector type is limited. It is possible that many of these unknown collectors could fall into the category of souvenir collecting but with limited sources this is too unreliable to decipher.

The largest collecting type identified is general systematic collecting, and shown in the tables presented in Appendix E, followed by souvenirs, systematic commissioning, systematic boat model collecting and, finally, those who seem to reflect a combination of collecting types. This is an important point to consider – not all collectors can be neatly categorised, they can be typical of their time but there is no average collector (Wintle, 2013: 60). Collectors can accumulate objects for a variety of reasons and in a number of different ways and this individuality must be acknowledged. However, to enable a general overview of boat model collectors the four different collecting types will be discussed focusing on specific collectors as examples.



**Figure 28** Different ways the boat models were collected, according to collecting typology

### 4.2.2 Systematic Commissioning

This type of collecting addresses models of boats that were commissioned. They were specially ordered and made to fulfil a particular requirement, such as displays in exhibitions (rather than mass produced as souvenirs for example). Out of the total 667 models 72 have been identified as being systematically commissioned. The majority (93% of this collecting type) are associated with exhibition commissioning (see Table 6). With the overall objective to understand why boat models were made and collected, from where and when, this section will explore why exhibitions account for the collection of 67 models focusing on the phenomenon of exhibition mania.

**Table 6** Types of systematic commissioners and collectors and quantity of models collected

Type of collector / commissioning	Number of collectors	Number of boat models collected
Exhibition	7	67
Model maker	1	2
Armed forces	1	1
Company	1	1
Railway worker	1	1
<b>Total</b>	<b>11</b>	<b>72</b>

Figure 29 shows model boats on display in the India section of the Great Exhibition of the Works of Industry of All Nations in 1851. This image is highly significant. In the mid-nineteenth century model boats were included in displays on an international scale indicating their importance as technological innovations and value to local communities who built and used them. The fact this image depicts some of the model boats on display at the Great Exhibition suggests they were important enough within the exhibition to be recorded and published (Nash et al., 1852). Whilst this exhibition has been discussed extensively by scholars (e.g. Greenhalgh, 1988), model boats have been omitted from recent publications and their presence in the exhibition rarely acknowledged. The following discussion, in line with the overall aim of the research, will attempt to focus on, and raise the profile of, the use of models in international exhibitions.





**Figure 29** Image of model boats at the India section of the Great Exhibition, 1851(Nash et al., 1852, Available from: <https://archive.org/details/Dickinsonscompr> [accessed 9th April 2015])

### ***International exhibitions***

Large scale exhibitions showcasing national cultural and industrial objects began to emerge towards the end of the eighteenth century. Driven by political and economic motives, to enhance trade, showcase the latest technologies and assert political authority, exhibitions on a grand scale transpired in France, Britain, and later, in other European nations, such as Germany and Spain (Greenhalgh, 2011:15-22).

However, it was not until the mid-nineteenth century when exhibitions took on an *international* role and a strong system of classification took hold. It was at this time that an “international exhibition movement” (Hoffenberg, 2001: 1) emerged following the success of Britain’s largest exhibition, The Great Exhibition in 1851. This was the first exhibition to “invite all nations of the world to participate” (Greenhalgh, 2011:22) and motivations shifted from the desire to sell to the desire to display objects (May, 2010: 4).

In the years to follow, exhibitions encompassing items from multiple nations emerged around the world, from the Exposition Universelle, 1855 in Paris to the Golden Gate International Exposition, 1939 in San Francisco (Greenhalgh, 2011). Such exhibitions displayed a vast array of objects as well as, in some cases, living

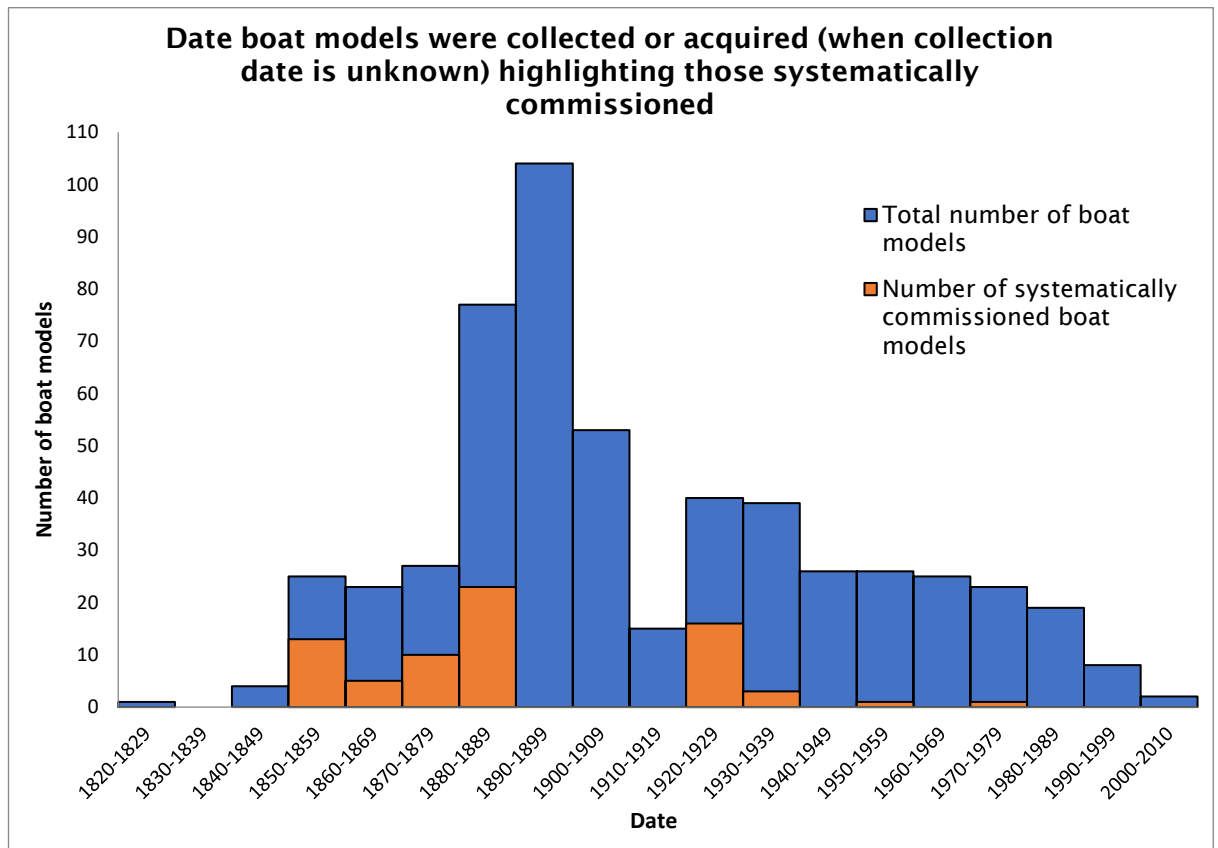
exhibits where ‘natives’ were showcased making and using traditional crafts (May, 2010:4). Such a display would, today, be highly controversial.

Models frequently appeared alongside full-size objects representing items that were too big or costly to be transported or where there was limited space for their display. These, for example, included model houses, factories, carriages and watercraft (Official Catalogue of the Great Exhibition, 1851) as a way of relaying information before the development of lantern slides.

Table 7 shows a breakdown of the different exhibitions the model boats were commissioned for. These exhibitions were held on a large scale and included multiple nations with the exception of the Native Boats exhibition held at the Science Museum in 1933 (Nature, 1933). It can be observed, using Table 7 and Figure 30, that the models were mainly commissioned for exhibitions held in the mid to late nineteenth century and again in 1924-5 and 1933. The use of model boats in exhibitions was clearly not unique.

**Table 7** Quantity of boat models originating from particular exhibitions

<b>Exhibition</b>	<b>Number of boat models</b>
The Great Exhibition of the Works of Industry of All Nations, 1851	13
Exposition Universelle, Paris, 1867	5
London International Exhibition, 1873	10
Colonial and Indian Exhibition, 1886	10
International Exhibition of Industry, Science and Art, Glasgow 1888	13
British Empire Exhibition, 1924-5	14
Native Boats Exhibition, 1933	1
	<b>Total = 66</b>



**Figure 30** Dates the systematically commissioned boat models were collected or acquired by museums, compared with the total number of boat models in the dataset

The question of where systematically commissioned boat models originated from can be answered by using the proportional symbol map in Figure 31. This demonstrates the majority were collected from India, Malaysia, Sri Lanka and Myanmar: regions that were formerly British colonies, and thus involved in numerous international exhibitions.

The locations plotted on the map in Figure 31 correlate with the production and collection location of the models. However, there is evidence to suggest models produced in India did not necessarily only represent Indian boat designs. A brief insight into the Great Exhibition and the commissioning of models will now ensue to contextualise and help further understand these objects.



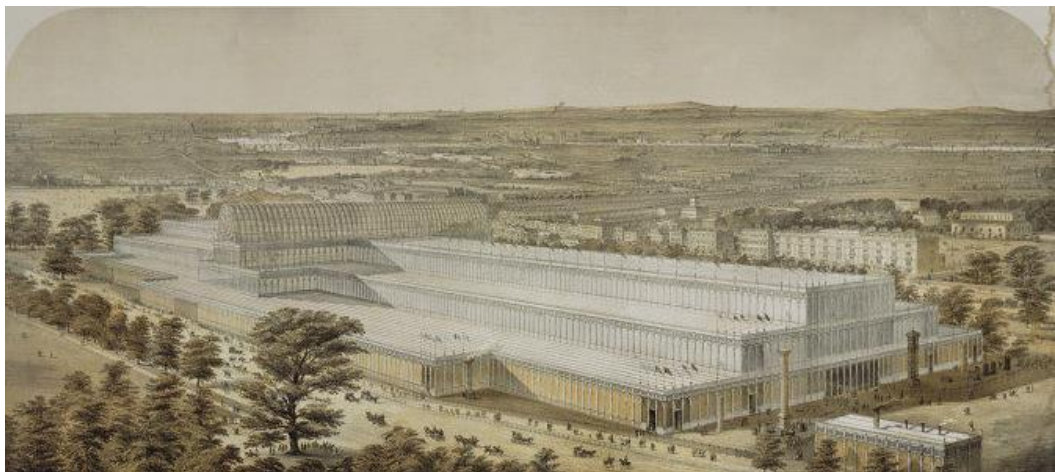
**Figure 31** Proportional symbol map showing the origins of boat models systematically commissioned

## The Great Exhibition of the Works of Industry of All Nations, 1851

*“Gentlemen, - THE EXHIBITION of 1851 is to give us a true test and a living picture of the point of development at which the whole of mankind has arrived in this great task, and a new starting point from which all nations will be able to direct their further exertions”* (HRH Albert as quoted in the Official Catalogue of the Great Exhibition of the works of Industry of all nations, 1851: 4).

It was Henry Cole who, inspired by an exhibition in France in 1849, put the idea of internationalism in exhibitions forward to Prince Albert, the President of the Royal Society of Arts (Greenhalgh, 1988:11). It was, as Prince Albert referred to in the above quote, designed to show the state of development around the world. This idea soon became a reality and The Great Exhibition of the Works of Industry of All Nations opened its doors for six months on the 1<sup>st</sup> May 1851 (The Official Catalogue of the Great Exhibition, 1851).

Attracting over six million visitors, the purpose-built glass building (Figure 32) in London’s Hyde Park, which came to be known as ‘The Crystal Palace’ (Greenhalgh, 2011:26), housed over 100,000 objects (May, 2010:17). Half the floor space was allocated to Britain and her empire and the other half to thirty-four ‘foreign’ nations. Britain’s exhibits were divided into four sections – raw materials; machinery and mechanical inventions; manufactures and fine art (Official Catalogue of the Great Exhibition, 1851). This became the first of many exhibitions to display objects using this system of classification.



**Figure 32** An image of an aeronautic view of The Palace of Industry For All Nations, from Kensington Palace by Charles Burton, 1851 - 1852. In the Victoria and Albert Museum collections (inventory number 19614; © Victoria and Albert Museum, London.)

## Chapter 4 – Collecting: individuals, exhibitions and institutions

A wide range of items were exhibited including various forms of water transport. It is not known exactly how many boats and boat models were displayed from Britain, the Empire and foreign nations as some models in the official catalogue, it was noted, were unable to be produced (perhaps as a result of time). Evidence such as the Official Catalogue, paintings and museum documentation do however suggest a significant amount of model boats from the Indian Ocean region were indeed present.

At least thirteen of these models are currently preserved in the Science Museum and National Maritime Museum collections. In reference to the map showing collection locations (Figure 31), Table 8 demonstrates that this does not always correlate with the region represented by the model. Three were recorded as being constructed in Bombay Dockyard in India but represent Arab boats (see Figures 33 and 34 of an Omani dhow). Exactly why this occurred is unknown but it can be postulated that it could be because such vessels would have been seen around the shores of India and Indian boat builders may have had knowledge about the construction of Arab vessels.

**Table 8** Quantity and location of boat models originating from The Great Exhibition, 1851

<b>Region represented</b>	<b>Construction / collection location</b>	<b>Number of boat models</b>
Oman	Bombay Dockyard	2
Strait of Hormuz	Bombay Dockyard	1
Bombay, India	Bombay Dockyard	2
Bombay, India / Arab	Cutch (Kutch), India	1
Cochin (Kochi), India	Cochin (Kochi), India	2
Bengal (now India and Bangladesh)	Bengal (now India and Bangladesh)	1
Lahore, Punjab (Pakistan)	Lahore, Punjab (Pakistan)	1
Ceylon (Sri Lanka)	Ceylon (Sri Lanka)	2
Sourabaya, Java, Indonesia	Sourabaya, Java, Indonesia	1

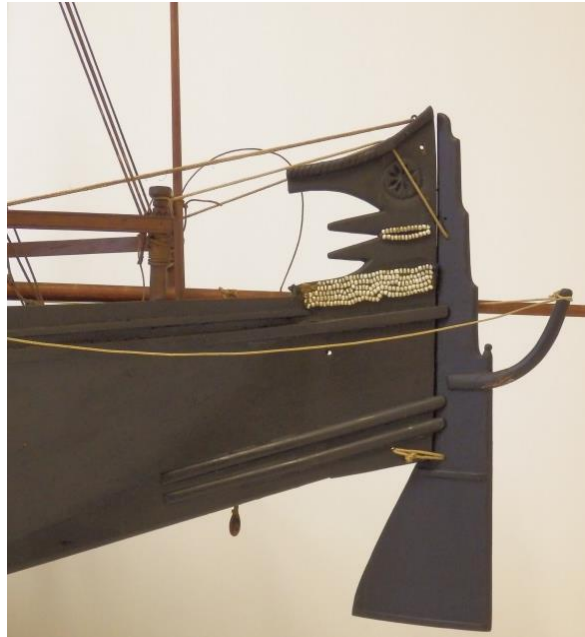
The Bombay Dockyard, located in Mumbai in southern India, was established in 1735 by the British East India Company. Here large ships were built by Indian boat builders overseen by British officials and, as stated in the Official Catalogue for the 1851 exhibition, in the mid-nineteenth century “models of native craft frequenting Bombay, and the Malabar Coast... were made in the dockyard at Bombay, under the superintendence of Commodore S. Lushington, Commander-in-Chief of the Indian Navy and Captain Hawkins” (1851:909). Models of particular



boats were commissioned and built in Bombay for the specific purpose of presentation at the exhibition. This is a very interesting insight into the Arab and Indian boat models made and collected for this purpose. As the models, it would seem to suggest, were built by boat builders alongside the construction of full-size vessels, it could be inferred that the model makers had knowledge about the construction and overall appearance of vessels and were familiar with Arab and Indian boats plying the shores of the Malabar Coast and Bombay. With this information in mind, these models could potentially be explored further to see if they can reveal information about the boats and technologies they portray.



**Figure 33** Model of a Joaseme pirate dhow identified as a *batello*, made in the Bombay Dockyard for the Great Exhibition. In the Science Museum collections, approximately 1230mm in length (inventory number 1880-75; © Science Museum / Science & Society Picture Library -- All rights reserved. <http://www.scienceandsociety.co.uk/> accessed on 16<sup>th</sup> April 2015)



**Figure 34** Photograph showing detail of the *batello* stern with a rope-actuated rudder and shell decoration. In the Science Museum collections (inventory number 1880-75; photograph taken by Charlotte Dixon, December 2014)

### **Colonial and Indian Exhibition, 1886**

The later nineteenth century saw a shift in the motivation of international exhibitions from “complacent pride” to “progandistic defence” (Greenhalgh 1988:58 as cited in Levell, 2000:65). The aim of the Colonial and Indian Exhibition of 1886 was to unite all regions of the Empire and demonstrate the “wealth and industrial development of the outlying portions of the British Empire” (Cundall, 1886:2). The idea of development was still emphasised as with previous exhibitions but, as Levell argued, “the propagandistic and chauvinistic motivations underscoring the event or rather the display of Empire were made explicit” (2000:66). This statement refers to an opening address given by the Prince of Wales in the forerunning of the exhibition in 1885:

*“This project is essentially one of a National and Imperial character, differing in this respect from former exhibitions in which the elements of trade rivalry and profit largely predominated”* (The Times 31 March 1885:9 cited in Levell, 2000:66).

Examining the official catalogue of the 1886 Colonial and Indian Exhibition it becomes apparent just how many objects were represented in model form. Included were models of street scenes, houses, temples, furniture and boats (Official Catalogue of the Colonial and Indian Exhibition, 1886) of which ten are now preserved in the British Museum and Horniman Museum and Gardens collections (Table 9). Eight of these have been identified as originating from



Malaysia, one from the Straits Settlements (a region that was once part of the British Empire but now makes up parts of Singapore, Penang (formerly Prince of Wales Island), Province Wellesley (now Seberang Perai), the Dindings and Malacca [Official Catalogue, 1886: 355]), and one from Sri Lanka.

**Table 9** Quantity and location of boat models originating from the Colonial and Indian Exhibition, 1886

Region	Number of boat models
Straits Settlements (a region that was once a British colony comprised of modern day Singapore, Penang, Dindings (now in the state of Perak) and Malacca)	1
Malaysia	8
Ceylon (Sri Lanka)	1

Figures 35 and 36 show two of the models from the Colonial and Indian Exhibition. One of them (Figure 35) is a model of a raft made from bamboo. Although this raft does not appear overly complex, the model maker has clearly crafted this piece precisely paying close attention to detail in the configuration of the bamboo poles and securing the poles / logs together using transverse poles entwined with plant fibre. According to the catalogue, this model appears to be the “Model Bamboo Raft” commissioned and donated by the “Government of Perak” (Official Catalogue, 1886:361).



**Figure 35** Model of a Malaysian raft. In the British Museum collections, 205mm in length (inventory number As1886,1213.8; © Trustees of the British Museum)

The other model, shown in Figure 36, is of a double-ended, carvel planked vessel with a mast, sail and oars. The planking is secured to a series of frames using wooden dowels and there are floorboards, thwarts, a mast thwart and thole pins. The intricate details in this model in the overall appearance, as well as the construction, along with the aim to show development and regional differences of the empire, suggest these models could aid the study of traditional Malaysian boats. Very little has been written about Malaysian watercraft so models from this exhibition could potentially provide some much needed evidence for traditional vessels of Malaysia.



**Figure 36** Model of a wooden passenger boat from the former Straits Settlements. In the British Museum collections, 721 mm in length (Inventory number As1886,1213.23; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

### **British Empire Exhibition, 1924-1925**

Finally, the British Empire Exhibition, held at Wembley in the summers of 1924 and 1925, was the latest exhibition to showcase model boats which are now present in museum collections discussed here. This was a large scale international event held to encourage peace following the events of the First World War. The official guide stated the exhibition gathered “riches... from all races of mankind” (1924:9) aiming to display items relating to industry, arts and engineering in order to bring unity to the empire following war, strengthen trade links and, yet again, to showcase progress. The official guide actually stated that, through the British Empire Exhibition, “the United Kingdom will show that she is still the supreme manufacturing country” (1924:9) suggesting an aim to show superiority.

As seemed to be a common theme in international exhibitions since the mid-nineteenth century, models had a strong presence in the 1924 and 1925

exhibitions and were highly detailed. The catalogue of 1924 referred to various forms of models – from houses, temples, and huts to elephants, boats and harbours, for example. Fourteen of the boat models presented in the India and Malaya Pavilions can currently be found in the Science Museum and Horniman Museum and Gardens collections (Table 10). The majority of these models (examples can be seen in Figures 37 and 38) were donated to the exhibition by the Fisheries Department of the Government of Madras, with the exception of one model donated by the Bengal Commissioner for the British Empire Exhibition and two by the government of Malaya.

**Table 10** Quantity and location of boat models originating from the British Empire Exhibitions, 1924-1925

Region	Number of boat models
Bengal	1
India	11
Malaysia	2



**Figure 37** Negapatam *kattumaram* model from India. In the Science Museum collections, 316mm in length (inventory number 1924-578; photograph taken by Charlotte Dixon, December 2014)



**Figure 38** *Masula* surf boat model from India. In the Horniman Museum and Gardens collections, 698.5mm in length (inventory number 24.298; ©Horniman Museum and Gardens)

Systematic commissioning of model boats was a common occurrence during an era of exhibition mania and, as Wintle noted, “throughout the entire period of colonization, anthropological endeavours were officially sanctioned by the Government of India: formal requests were made for the collection of objects for display at international exhibitions” (2013: 22). Such official requests and commissioning of models by British officials does raise the question why were particular models requested to be made and what was not represented through these displays?

Despite the British biases in the models chosen to be commissioned, the models still in existence today are highly detailed, represent a range of vessels and are often highly detailed in terms of their construction. Given the aims of the exhibitions to showcase technologies and developments these models could be further assessed to explore to what extent they can reveal information about traditional boats. However, the changing aims and motivations for the exhibitions must be considered, from manufacturers showcasing technologies to educating and improving colonial and post war international relations.

#### **4.2.3 General Systematic Collecting**

*“In systematic collection, an ostensibly intellectual rationale is followed, and the intention is to collect complete sets which will demonstrate understanding achieved”* (Pearce, 1995: 32)

This form of collecting, identified by Pearce, relates to a purposeful “selection of examples” (Pearce, 1994: 201) recorded in a scientific manner and often incorporates some form of classification. General systematic collecting, therefore, can be described as the intentional methodical selection of a range of objects to fulfil a particular function and understanding. Although boat models are

incorporated in this type of collecting, they form only a part of a complete collection.

Out of a total 667 boat models, 206 have been identified as generally systematically collected by 35 collectors, comprising the largest collecting group. In addition, nine boat models seem to have been collected using a combination of general systematic and souvenir collecting methods.

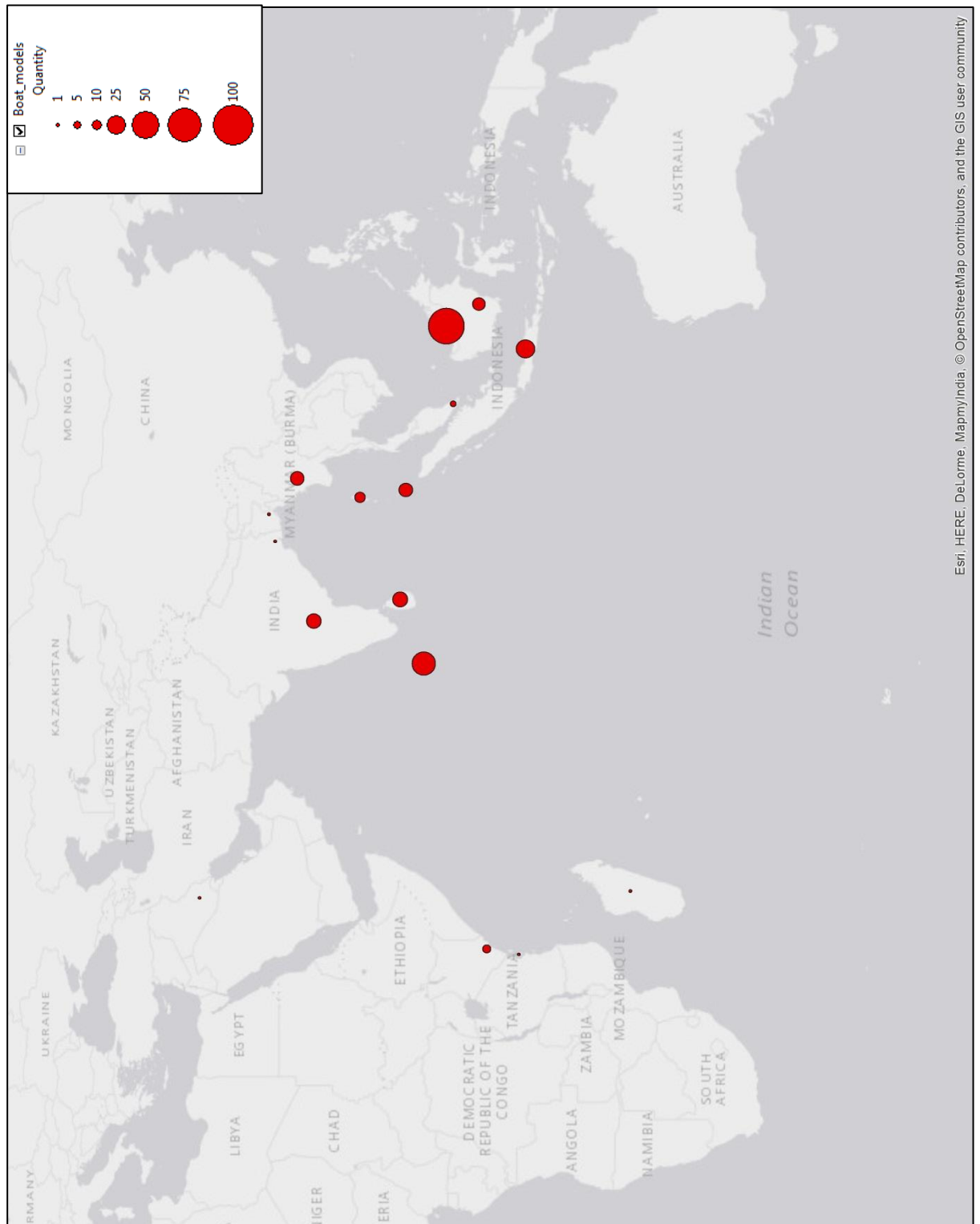
The identification of these collectors was enabled by researching museum documentation, biographies and ascertaining how many objects were donated by each individual. For example, the collection of multiple objects, but not just specifically boat models, suggests some form of purposeful collection; comprehensively documented objects including scientific and indigenous names suggests a level of scientific recording and, finally, biographies can indicate why an individual was in a region and their motivation for collecting, for example anthropologists are likely to have collected as evidence of indigenous cultures.

By analysing the data about the models' contexts it is possible to start to answer questions about who collected the models, from where, when and why. Using the collection location for each boat model collected generally systematically the locations were plotted on a map and proportional symbol representation used to show where the majority originated from (see Figure 39). Distinct patterns emerged showing the majority originated from south and south East Asia with only one from the Middle East and seven from East Africa / Madagascar. The most commonly represented area is Malaysia, which can be attributed to the colonial administrator and ethnographer, Walter William Skeat.

Skeat donated 57 model boats, collected from Selangor in Malaysia in 1896-7, to the Museum of Archaeology and Anthropology in Cambridge along with over 600 items including photographs, baskets and jewellery (Museum of Archaeology and Anthropology Online Catalogue, 2015). This donation accounts for a significant 86% of the model boats collected from Malaysia and 27% of the total models collected generally systematically. Walter William Skeat, born in Cambridge in 1866, worked as an administrator in Selangor, Malaysia between the years 1891-7 (Gullick, 2008). During his time in Malaysia, Skeat, influenced by Alfred Haddon's approach to what is now referred to as social anthropology, carried out ethnographic fieldwork with the "systematic collection of artefacts and data" (Gullick, 1989: 197). Later he went on to write books and articles on Malay culture and returned to Malaysia in 1899-1900 on an anthropological expedition

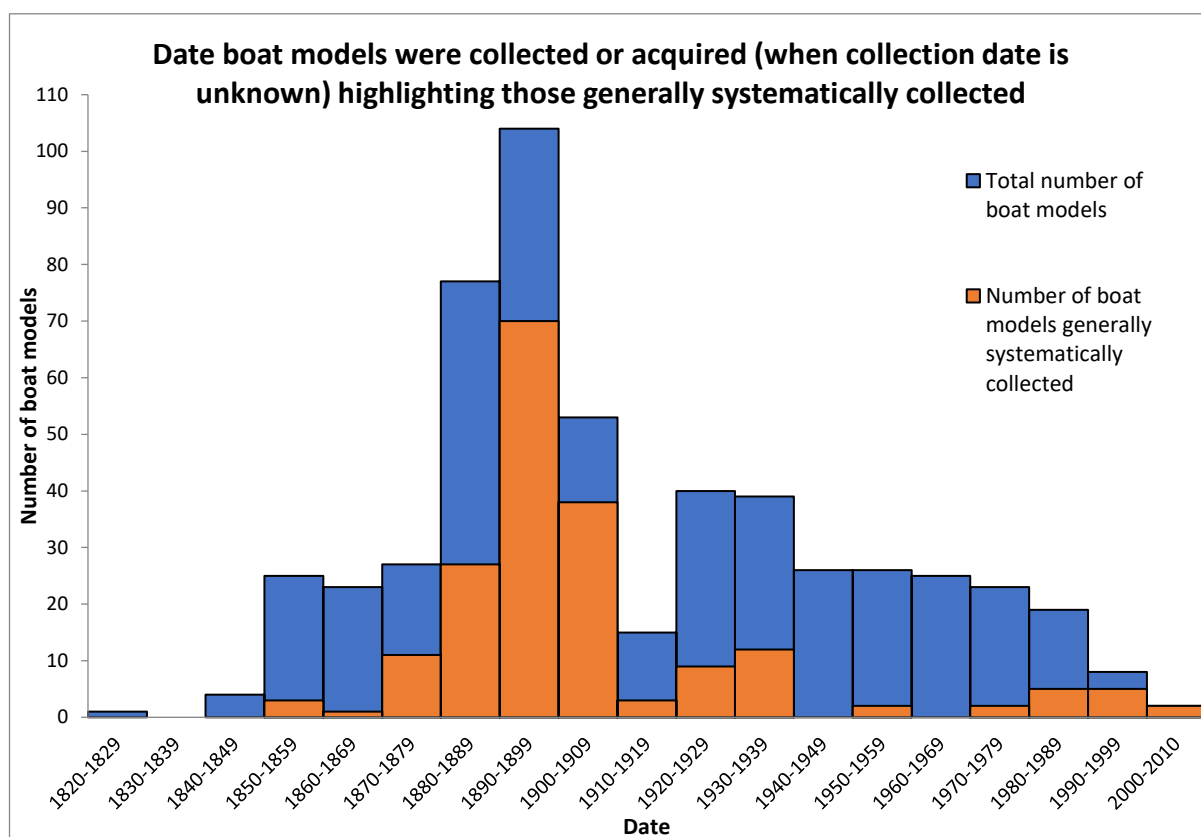
#### Chapter 4 – Collecting: individuals, exhibitions and institutions

(Gullick, 1989: 197). From this brief insight, it is clear Skeat collected the boat models as part of his anthropological fieldwork in an attempt to “record in a systematic fashion the elements of primitive and traditional societies, which were already beginning to change or disappear under the pressure of the ‘civilized’ world” (Gullick, 2008).



**Figure 39** Proportional symbol map showing the origins of boat models collected generally systematically

In response to the question of when the boat models were collected Figure 40 shows the dates all the boat models in this research were collected or acquired by a museum (as the collection date is often not recorded) highlighting those collected generally systematically. This shows the majority of the models were generally systematically collected in the late nineteenth and early twentieth centuries. The years 1890-1899 saw a particularly high peak in the collection of boat models, however 57 out of 70 can be accounted for by Skeat's Malaysian models. The other peaks and troughs in this graph can be attributed to types of collectors and what was happening globally in terms of empire, war and the development of disciplines.



**Figure 40** Dates the generally systematically collected boat models were collected or acquired by museums, compared with the total number of boat models in the dataset

Out of the 35 collectors who used a general systematic approach, twelve different types have been identified (Table 11). These types relate to careers and motivations for collecting and include anthropologists, zoologists, colonial officials working in overseas colonies and protectorates, curators and members of the armed forces. Table 11 shows the majority of boat models were collected by colonial officials with anthropological expertise followed by zoologists, anthropologists and combined anthropologists and archaeologists.



**Table 11** Types of general systematic collectors and the quantity of models collected

Type of collector	Number of collectors	Number of boat models collected
Anthropologist	7	26
Zoologist	2	34
Curator / expert	6	7
Colonial official	5	10
Armed forces	1	3
Anthropologist and zoologist	1	2
Colonial officials with anthropological expertise	5	93
Anthropologist and archaeologist	1	19
Natural scientist	1	2
Botanist	1	1
Gardener	1	2
Society	1	1
Unknown	3	6
<b>Total</b>	<b>35</b>	<b>206</b>

The nineteenth century saw a period of both industrial and colonial expansion and, by 1850, the British Empire “encompassed a quarter of the globe” (Jasanoff, 2005: 5-6). It follows then that objects were collected by colonial officials and anthropologists in the late nineteenth century - the heyday of colonial administration. In addition, anthropology as a scientific discipline seemed to emerge in the eighteenth century during a period of enlightenment, this was further developed following Charles Darwin’s publication of *On the Origin of Species* in 1859 (Eriksen and Nielson, 2001). With the acceptance and development of evolutionary thought, along with colonial expansion, many

anthropologists were concerned with collecting objects from traditional societies before they started to adapt or disappear as a result of colonial contact (Gullick, 2008). Thus, the collection of boat models in the late nineteenth and early twentieth centuries by anthropologists and colonial officials is not unexpected.

An influential collector in the late nineteenth century was the anthropologist, archaeologist and lieutenant-general Augustus Henry Lane Fox Pitt Rivers. Born in 1827, Pitt Rivers was educated at Sandhurst Military College and later became instructor at Hythe School of Musketry (Bowden, 2004). It was then that Pitt Rivers' passion for collecting emerged by amassing rifles which, after Charles Darwin's publication (1859), adapted to incorporate other ethnographic objects. These were collected and arranged typologically to "illustrate his theory of the evolution of culture" (Bowden, 2004). This typological arrangement and classification was a significant development in the collection of objects.

In 1884 Pitt Rivers donated his collection of around 30,000 objects to the University of Oxford forming the founding collections of the Pitt Rivers Museum (Petch, 2010). The typological approach was maintained through the displays (see Figure 41), a method still used at the museum today. Of these 30,000 objects twenty-five are model boats from the Indian Ocean, generally from India, Sri Lanka and the Andaman and Nicobar Islands (Pitt Rivers Museum Object Collections Online Database, 2012). Six of these are recorded as having been collected by Edward Horace Man but it is unclear how Pitt Rivers acquired the other nineteen. Petch described how Pitt Rivers acquired the majority of his objects through "field collectors and fellow members of the Anthropological Institute" (Petch in Shelton, 2001: 240) as well as dealers and auction houses and did very little field collecting himself, so it is likely these models were collected by another source. Whilst "public education was Pitt-Rivers's ultimate goal" (Bowden, 2004) inferring he would have wanted to relay information accurately, it is interesting that he may not have actually seen the full-size boats which were represented in model form.



**Figure 41** View of the Pitt Rivers Museum, circa 1890-1895. In the Pitt Rivers Museum collections (inventory number 1998.267.94.1, © Pitt Rivers Museum, University of Oxford)

This collecting technique varies quite considerably with other anthropologists of the time such as Edward Horace Man and Dr Charles Hose. Both Man and Hose were colonial officials in the late nineteenth century, Man was administrator of the Andaman and Nicobar Islands from 1869 to 1901 (Wintle, 2013: 5) and Hose was administrator of Sarawak, Borneo from 1884 to 1905 (Durrans in Shelton, 2001: 189). These collectors lived in the respective regions they acquired objects from, so would have been familiar with the material culture they encountered and sent back to the UK. Wintle made the interesting point that “material culture clearly has a particular position at the heart of empire in that much of the colonial project was about material exploitation” (2013: 2). With the development of anthropology as a discipline, the colonial focus on materiality and the spread of evolutionary thought, it is clear why most of the boat models collected in a general systematic manner were collected by anthropologists and colonial officials.

In addition to education and improving colonial relations, some of these collectors were also motivated by improving their status and career. For example, Durrans commented that Charles Hose was a “calculating careerist, bent on improving his status” (in Shelton 2001: 194) and sold over a thousand objects to

the British Museum and National Museums Scotland including thirteen model boats (see Figure 42 as an example). Man often collected in response to institutional requests and correspondence and even “commissioned miniature versions of Nicobarese material culture, such as small canoes, houses and ritual items for transport to Europe” (Wintle, 2013: 41). This resulted in the donation of material to various institutions including one model boat to the Museum of Archaeology and Anthropology in Cambridge, one to the British Museum (see Figure 43) and six to the Pitt Rivers Museum.



**Figure 42** Model boat from Borneo, collected by Dr Charles Hose. In the British Museum collections, 617mm in length (inventory number As1908,0625.41; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)



**Figure 43** Model of an outrigger canoe from the Nicobar Islands, collected by Edward Horace Man. In the British Museum collections, 1330mm in length (inventory number As1887,1015.2; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

The individuals who collected various objects in a systematic manner were driven by different objectives, recorded and classified to varying degrees and donated to different institutions. Each collector was very much an individual; however, by discussing those who collected using a systematic method as a single group it has been possible to identify certain trends. For example, these collectors generally collected numerous objects, recorded them in a scientific manner to a degree and were driven by the desire to either educate, enhance relations, capture traditional material cultures before they were lost or adapted, or to self-promote. Although this section has concentrated particularly on the late nineteenth and early twentieth centuries it must be acknowledged this form of collecting continued throughout the twentieth and into the twenty-first centuries by anthropologists, curators and other academics. The practice of anthropological collecting, however, naturally adapted as the discipline developed. Additionally, the quantity of boat models acquired by museums declined over time due to ever increasing pressures on museum storage space, as well as changing collecting policies.

Although it is not possible to discuss each collector separately, it is possible to observe that some models were collected as spiritual objects and a few as toys but the majority are highly detailed and, broadly speaking, seem to be representative of types of boats. A range of models were collected but it is interesting to note many of the models represent outrigger canoes (see Appendix E), perhaps because they appeared to be so vastly different to European boats and they matched a mental template of westerners' ideas of local watercraft. Through this discussion, it has been possible to start to answer who collected boat models and why, as well as where and when they were collected from. Through this we can start to understand how there came to be so many model boats from the Indian Ocean in museums throughout the UK.

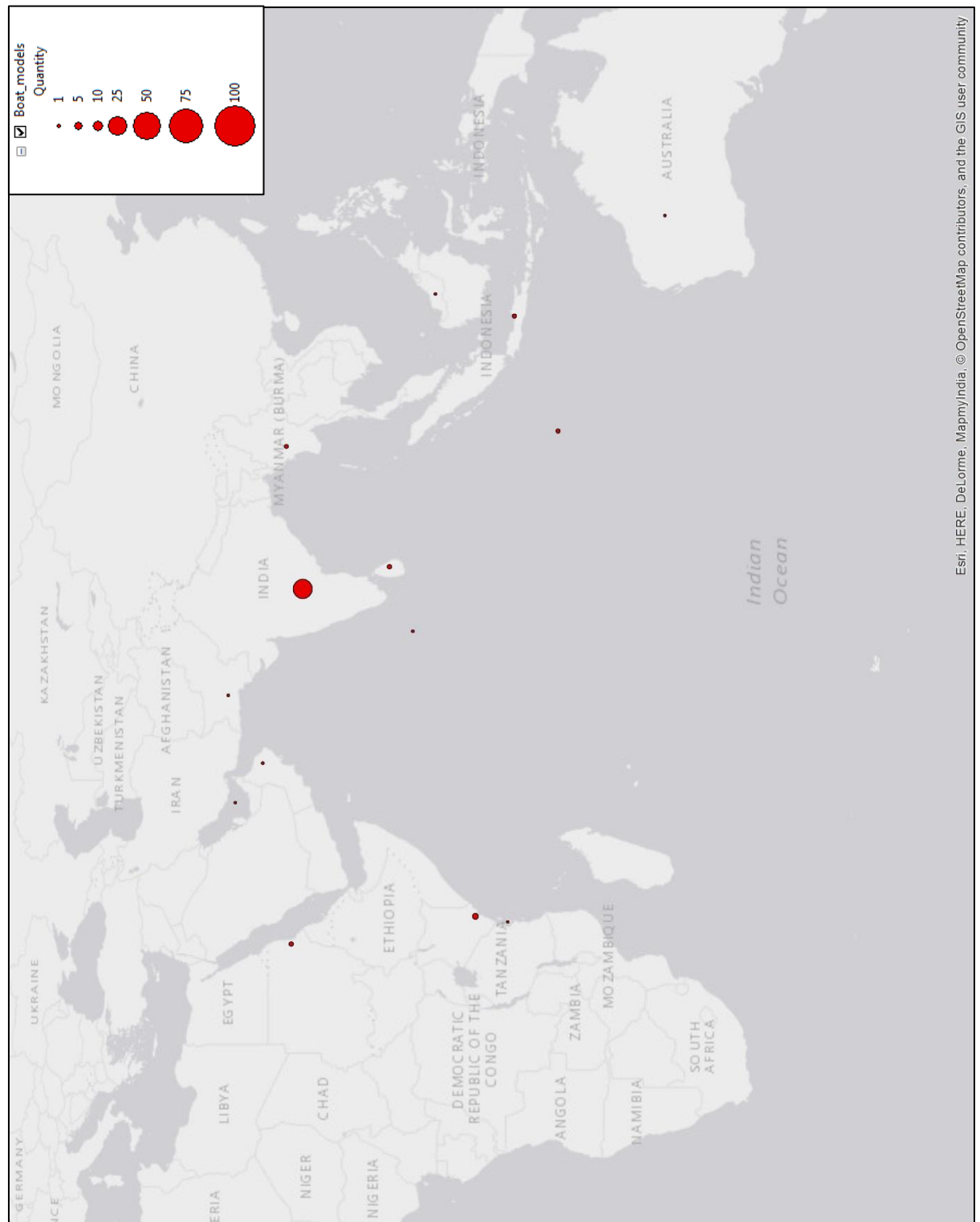
### **4.2.4 Systematic Boat Model Collecting**

Three branches of systematic collecting have been identified throughout this chapter building on Pearce's typologies (1992; 1994; 1995). These are: systematic commissioning; general systematic collecting; and systematic boat model collecting. This section is concerned with the latter, a type which can be defined as the methodical and intentional collection and recording specifically targeting model boats.

Six percent of the total models collected from the Indian Ocean region were classified as being systematically collected specifically targeting boat models. This equates to 42 models collected by twelve individuals and would seem, comparatively, to be the least common mode of collecting.

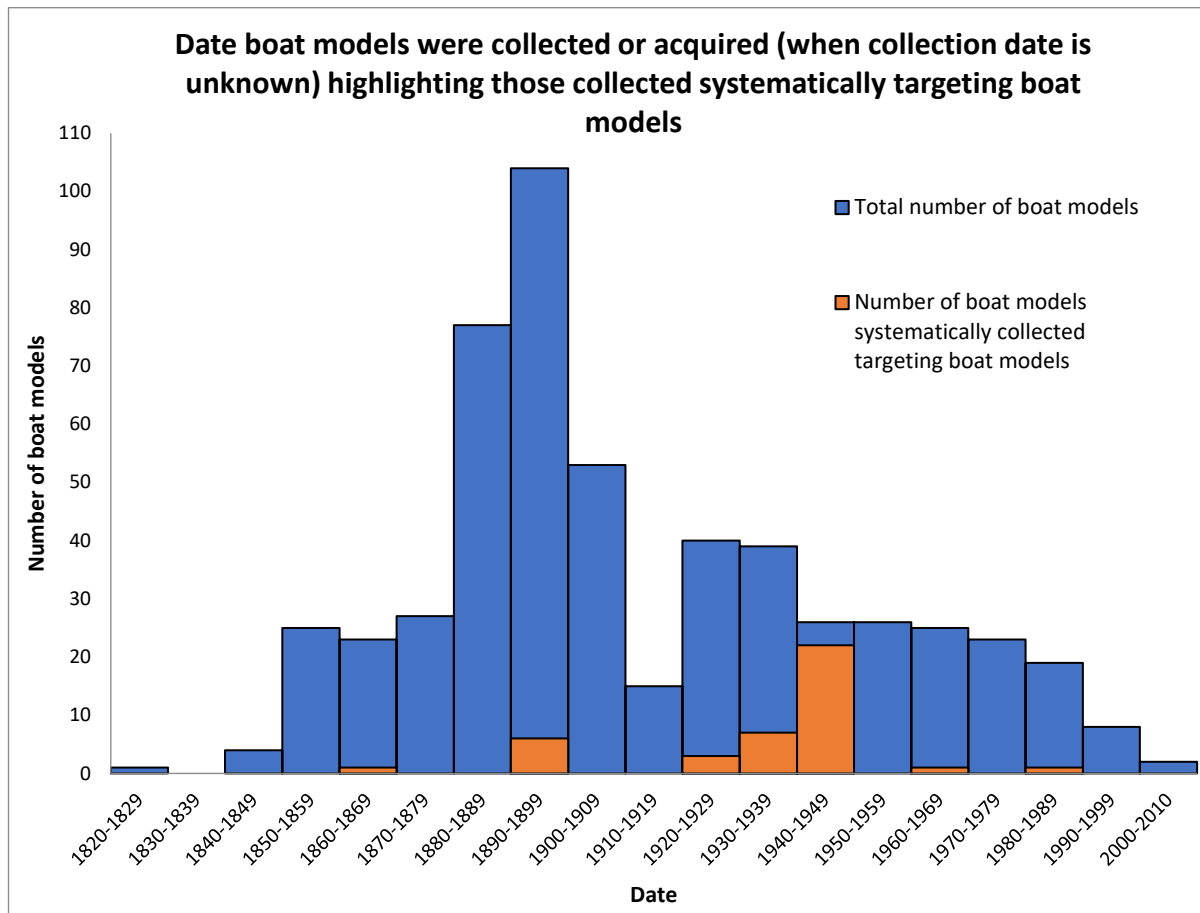
To identify these collectors, museum documentation and biographies were used to establish how many model boats were collected, if other objects were also acquired and if the individual had a particular motivation and use for boat models. For example, if an individual's career was associated with the study of boats, such as maritime curators and seafaring ethnographers, and numerous boat models had been collected and recorded in a scientific manner, it can be suggested boat models were intentionally collected to fulfil a particular research requirement or interest and would hence fit into this category.

Using Figure 44 where the collection locations have been plotted on a map using proportional symbol representation, it can be observed that the majority of the models (22) in this category originated from India. The rest of the models seem to have been fairly evenly dispersed, in low quantities, around the Indian Ocean incorporating regions in East Africa, the Middle East, South and Southeast Asia and Western Australia.



**Figure 44** Proportional symbol map showing the origins of systematically collected boat models

Distinct patterns emerged regarding when the models were collected or donated. Figure 45 shows the majority were collected between the years 1940-1949 with a few collected in the late nineteenth and early twentieth centuries. There are also three boat models individually collected in the mid to late nineteenth century and the mid to late twentieth century.



**Figure 45** Dates the boat models were collected or acquired by museums highlighting those collected systematically targeting boat models

Twenty-two of the boat models collected between the years 1940-1949 can be attributed to James Hornell. He collected eighteen models from various regions in India, one from Sudan, Sri Lanka, Malaysia and one from Indonesia which were donated to the Museum of archaeology and Anthropology in Cambridge in 1949 (Museum of Archaeology and Anthropology online catalogue, 2015). In addition, one model was collected from Kenya and donated to the Science Museum in 1936 (“1936.29” Science Museum files) and the coracle from India, pictured in Figure 46 was donated to the Pitt Rivers Museum in 1923 (“1923.56.9” Pitt Rivers Museum object collections online database, 2012).

These models are unique and represent a range of boats from various locations but they share in common a high level of detail. James Hornell was a marine biologist and anthropologist and worked as the Director of Fisheries in Madras in the early twentieth century (Hornell, 1946). He published several works about fishing and boats, including influential works on the subject of traditional boats such as *The Origins and Ethnological Significance of Indian Boat Designs* (1921) and *Water Transport: Origins & Early Evolution* (1946). With little published about



boats from the Indian Ocean, particularly in the early twentieth century, James Hornell was an influential figure in traditional boat studies and systematically recorded boats including details about their construction and use and used drawings and photographs as evidence. Numerous model boats were collected and donated as well as associated objects and photographs. These models could be used as supporting evidence for the boats they represented and as a tool for informing and teaching people about the full-size boats.



**Figure 46** Model of a hide covered coracle, collected by James Hornell by 1923. In the Pitt Rivers Museum collections, 435mm in diameter (inventory number 1923.56.9; © Pitt Rivers Museum, University of Oxford)

In addition to anthropologists, five other types of collectors have been identified within this collecting category (see Table 12). This comprises a range of collectors including naval architects, members of the armed forces and curators / boat experts. An example of a collector within the curator / expert type is Geoffrey Laird Clowes who was Assistant Keeper at the Science Museum. Clowes, who published work such as *Sailing ships: their history and development* (1948), collected a double outrigger canoe model from Zanzibar in 1932 (Figure 47). This model is detailed and portrays a dugout with attached outrigger. It can be speculated Clowes was motivated by the desire to enhance the collection of model boats housed at the Science Museum with the aim to learn and educate.

## Chapter 4 – Collecting: individuals, exhibitions and institutions

**Table 12** Types of systematic boat model collectors and the quantity of models collected

Type of collector	Number of collectors	Number of boat models collected
Curator / expert	3	7
Anthropologist	2	25
Colonial officials with anthropological expertise	1	1
Armed forces	3	5
Naval architect	2	3
Charity	1	1
<b>Total</b>	<b>12</b>	<b>42</b>



**Figure 47** Model of a double outrigger canoe and figure from Zanzibar, collected by G.S. Laird Clowes in 1932. In the Science Museum collections, 446mm in length (inventory number 1932-36; Charlotte Dixon / December 2014)

The models amassed within this category of systematic boat model collecting are highly detailed and showcase a range of boat types from various locations around the Indian Ocean. With motivations generally being to learn and educate, these models could have potential use in the study of traditional boats in terms of the types represented, overall appearance and features and, in some cases, technical details about construction. These would, of course, need to be assessed on an individual basis and the question of why they were made and collected considered.

### 4.2.5 Souvenir Collecting

*“Souvenirs are moving and significant to each of us as individuals; otherwise we would not keep them” (Pearce, 1994: 195).*

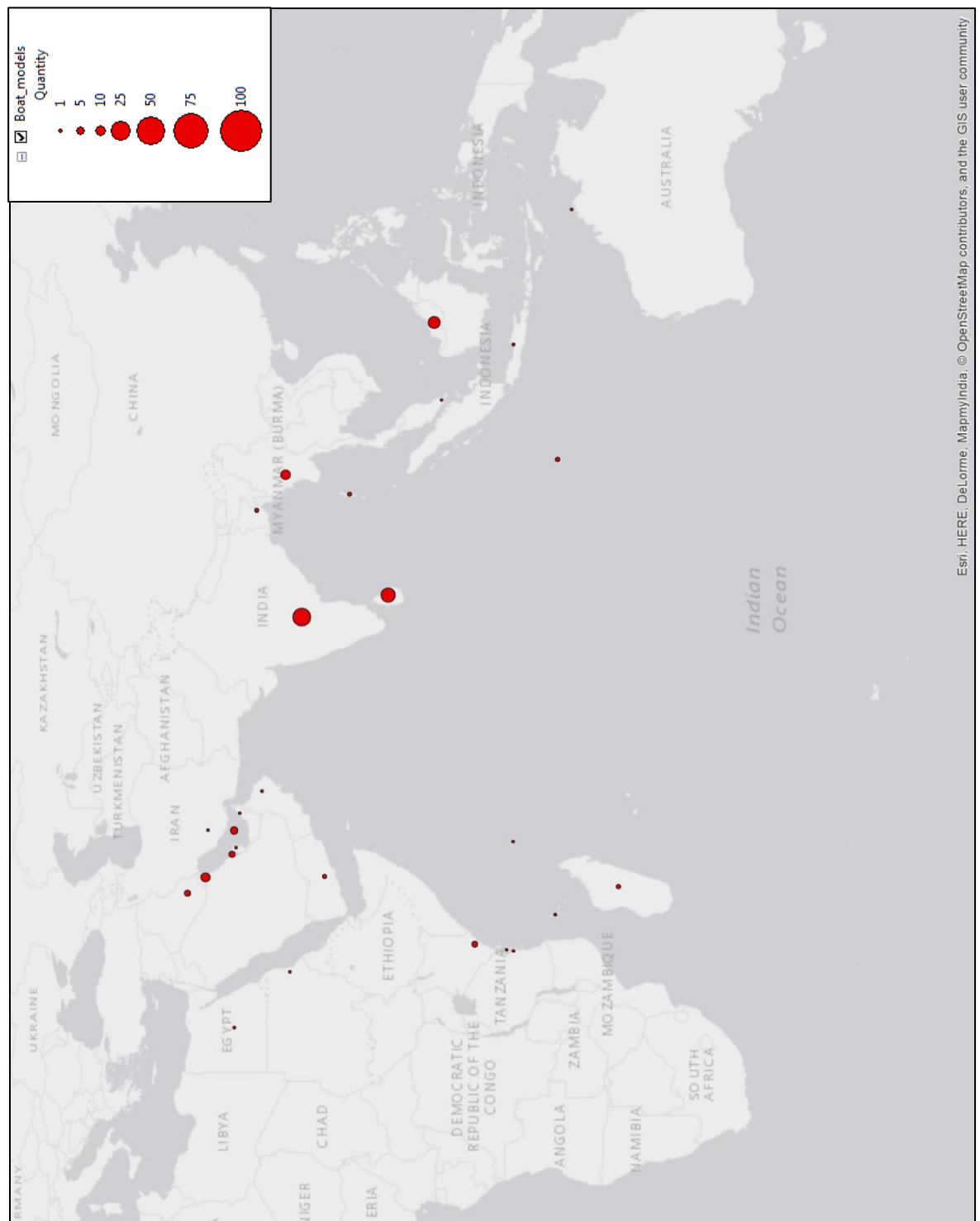
Pearce and Stewart both discussed the concept of souvenir collecting as memorabilia of a personal experience (Pearce, 1992; 1994; 1995; Stewart, 1993). This chapter has explored how certain boat models were intentionally collected to fulfil a particular purpose or function. However, 95 models were identified as souvenirs, a more sporadic form of collecting likely to evoke some sort of emotional connection to the object linking to memories of events, places or people. Some of these models were actively collected whilst others were given as gifts.

In addition to the 95 souvenir model boats, thirteen have been identified as using a combination of collecting modes (see Appendix E) and the rest are unidentified. The unidentified models could possibly have been collected as souvenirs but this is difficult to ascertain where museum records and collector biographies are limited.

To establish this collecting type museum records and collector biographies were used to identify how many objects were collected in general by each individual and acquired by museums. Taking the opposite approach to general systematic collecting, souvenirs can be indicated by small collections or one-off donations. In addition, the biographies of collectors and their careers can be indicative of why and how objects may have been collected. For example, if someone was a member of the armed forces, collected a model whilst working on an overseas mission, and only donated one model boat to a museum, it can be suggested the model was collected or gifted as a souvenir of a place, moment, event, person or culture rather than collected to fulfil a particular requirement, such as research

objectives. It is important to note, however, that defining a model as a souvenir is somewhat speculative.

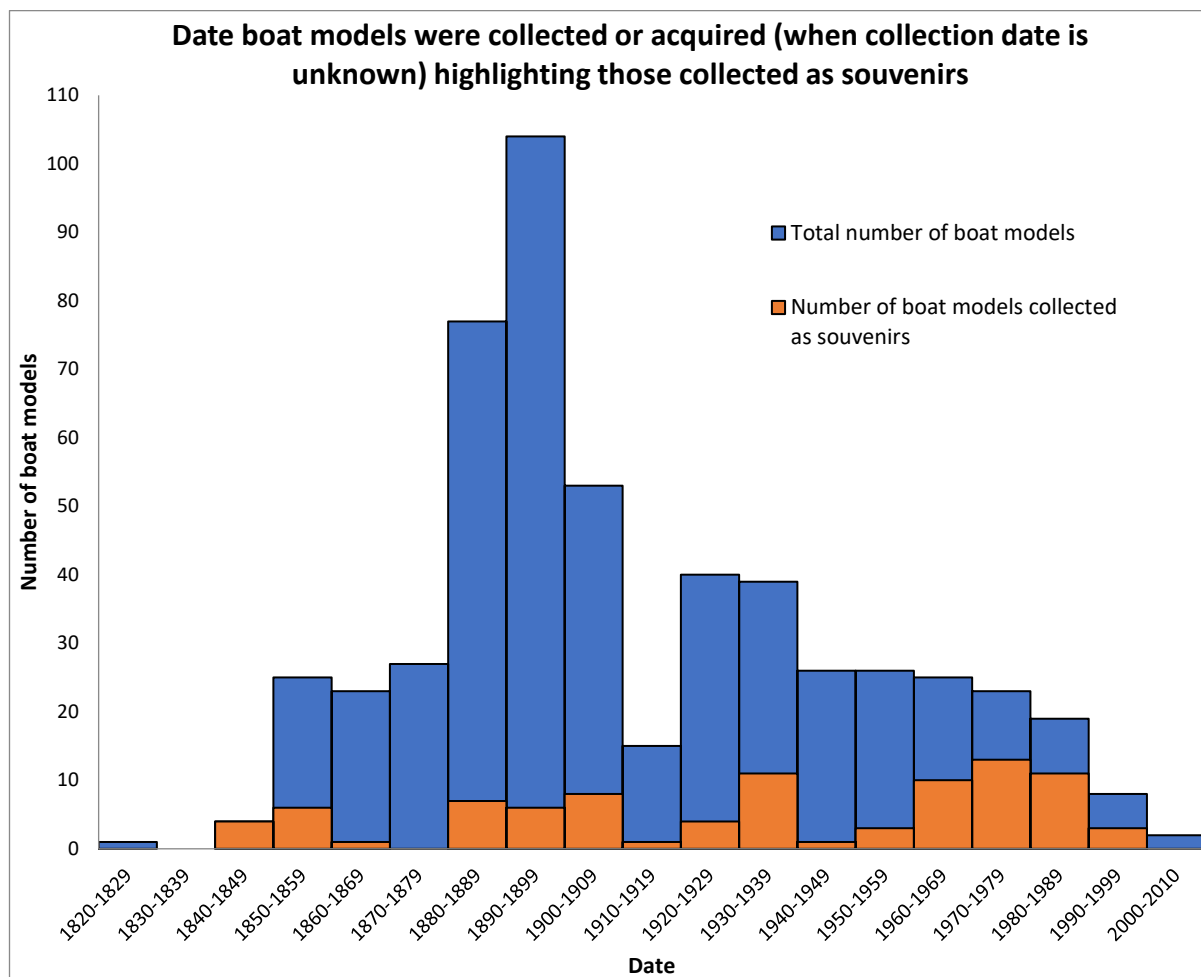
By analysing where the models originated from using a proportional symbol representation map (see Figure 48) it would seem the models collected as souvenirs were fairly evenly dispersed around the Indian Ocean. Some areas do seem to be more commonly represented than others, for example nineteen models originated from India whereas the Nicobar Islands and Maldives are not represented by souvenir models (where identified) at all. It is also interesting to observe the presence of models originating from the Middle East. This is a region that has been poorly represented through the other forms of collecting.



**Figure 48** Proportional symbol map showing the origins of model boats randomly collected as souvenirs

In response to the question of when these souvenir models were collected Figure 49 shows small quantities were collected from 1840 through to the late twentieth century. It is interesting to observe a high proportion of the models collected in the late twentieth century are associated with souvenir collecting. This can largely be attributed to the collector Ian Ogilvie who bequeathed twenty objects to the

National Museums Scotland which were accessioned into the collections in 2000 (National Museums Scotland museum records). Ogilvie was a civil engineer and keen mountaineer (National Library of Scotland, date unknown) and collected a range of Arab and Indian boat models throughout the late twentieth century. Thirteen of these represent Arab vessels and originated from regions around the Gulf. The majority seem to be highly detailed, both in terms of their general appearance and construction, whilst others mention “crude construction” (“T.2000.2-20” National Museums Scotland files) in the museum records. There is little information to say if these objects were collected to fulfil a particular function and with differing levels of detail in the models it can be speculated they were collected as souvenirs.



**Figure 49** Dates the boat models were collected as souvenirs, compared with the total number of boat models in the dataset

## Chapter 4 – Collecting: individuals, exhibitions and institutions

As demonstrated, this type of collecting is harder to quantify than the other types and involves a degree of speculation. Table 13 shows the wide range of collector types identified within this category and demonstrates there is no one particular collector. Anyone can collect souvenirs at any time and place. Colonial officials and members of the armed forces do, however, seem to be the more dominant types of souvenir collectors accruing objects whilst serving overseas. Additionally, members of the royal family were given model boats as souvenirs from overseas royal visits, religious workers including missionaries collected material cultures as “trophy of success.[which were] recontextualised as tangible evidence of their repudiation” (Thomas, 1991: 155), and merchants collected souvenirs on trade visits.

**Table 13** Types of souvenir collectors and the quantity of models collected

<b>Type of collector</b>	<b>Number of collectors</b>	<b>Number of boat models collected</b>
Colonial official	9	13
Judge	2	5
Political	1	2
Armed forces	15	20
Medic	3	5
Biologist	1	1
Gulf Air	1	1
Religious	2	2
Railway worker	1	1
Royalty	3	8
Engineer	1	19
Educationalist		1
Company	2	2
Merchant	3	3
Unknown	12	12
<b>Total</b>	<b>56</b>	<b>95</b>

Whilst this mode of collecting could be described as haphazard and includes a wide range of collectors, locations, dates, boat types and differing levels of detail, they can help us to understand cultural relations and the concept of a souvenir

trade. Thomas, in the discussion of pacific collecting stated “what was important about collecting, was not so much what could be said about or done with the specimens collected but the way that collected material attested to the fact of having visited remote places and observed novel phenomena” (1991: 141). With this in mind, souvenirs can be used as reminders and evidence of regions visited and suggests the production of model boats around the world to meet the needs of a tourist trade. Pearce made an important point that “the range of such pieces formally accessioned into museums is, of course, only a tiny fraction of the number which actually exists out in the world” (1994: 195) so the quantity of model boats made would have exceeded the amount traded, bought back to the UK and subsequently acquired by museums. The production of model boats specifically to be traded to tourists suggests boats were a significant part of a community in order to be represented in miniature and for tourists to see the models as representative of a place, particular memory, event, culture, or as a novelty item.

### **4.3 Museum Collecting**

It has been observed how models of boats were collected by various individuals at different times and from different places instigated by varying motivations and methods. It is important to acknowledge, however, that there are different dimensions to collecting. Not only can this activity take place on an individual basis but it also occurs on a large scale institutional level. It has already been discussed how boat models were collected for the purpose of exhibitions but this section will now consider these objects as museum acquisitions. By asking why the models were institutionally collected, their purpose and changing state - from initial production to field collection to museum exhibits - will be considered.

Within this study a total of 667 model boats have been identified as originating from the Indian Ocean across thirteen different museums in the UK. These museums range in their size, collections, aims, foundations and contain varying quantities of boat models. For example, the Museum of Archaeology and Anthropology in Cambridge houses 126 boat models, the British Museum 100 and the Science Museum 86. Comparatively, Kew Gardens only contain three and Plymouth City Museum and Art Gallery just nine. With these variances in mind this section will firstly consider when and why the museums were established and their aims, then why model boats were acquired, the movement of the models after their acquisition and, finally, their use as exhibits.



### 4.3.1 Establishing museums

The notion of museum collecting can be traced back to fifteenth century Italy with the emergence of museums as modern institutions (Pearce, 1992:1). They have since developed around the world with currently around 2,500 museums existing in the UK alone (Museums Association, 2015). This figure has not, however, always been so vast. Whilst this section will briefly explore why and when the museums in this study were established, it does not aim to produce an in-depth history of museums. Instead the objective is to answer questions about the purpose of the thirteen institutions, including when they were established, why and by whom, and the nature of their collections.

#### *Museums established as a result of individual collectors*

Three of the museums in this research were established based on individual collecting efforts. These are the British Museum, founded in 1753, the Pitt Rivers Museum, 1884 and the Horniman Museum and Gardens, 1898. Each institution shares in common their establishment following extensive general systematic collecting by three collectors: Sir Hans Sloane, Augustus Pitt Rivers and Frederick John Horniman.

Sir Hans Sloane was a physician, naturalist and collector and collected over 71,000 objects (The British Museum, date unknown). His “passion for collecting” (Caygill, 1981: 5) resulted in the accumulation of a range of objects from natural and anatomical items to books and artificial curiosities (Caygill, 1981: 5). Following his death in 1753 the collection was bequeathed to King George II “for the nation” (Caygill, 1981: 6) in return for £20,000 payable to his two daughters. Once the offer was accepted the British Museum was established through an Act of Parliament (The British Museum, no date) and opened its doors to the public in 1759.

The establishment of the Pitt Rivers Museum in 1884 (O’Hanlon, 2014: 39) differs slightly in the way that the objects collected by the archaeologist, anthropologist and evolutionist, Pitt Rivers, were donated to the University of Oxford during his lifetime. The collection included some 20,000 items (Gosden et al. 2007: 14) from archaeological and anthropological expeditions, although the majority were not directly field collected by Pitt Rivers himself. This included a wide array of objects from weapons to model boats arranged typologically “conveying an ethnocentric message of conservative evolutionary gradualism” (Stocking, 1985: 8).

Finally, the latest museum of this sort to be established was the result of the work of Frederick John Horniman. As a philanthropist and tea trader Horniman collected objects from around the world and, in 1890, opened the Surrey House Museum to make his collections publicly accessible (Horniman Museum and Gardens, no date). This was shortly followed by the opening of a public museum in 1901 and donating it “as a free gift to the people” (Horniman Museum and Gardens, no date).

These museums all had a common aim to showcase and share collections with the public, as well as educate and inform their audiences. Anthropological objects collected from various overseas locations formed part of these founding collections, and, in the case of the Horniman Museum and Gardens and Pitt Rivers Museum, included model boats.

***Museums established as a result of, and influenced by, international exhibitions***

Museums can be, and have been, established for a range of reasons and the process can be highly complex. Following the success of the Great Exhibition in 1851 a museum in South Kensington was established to permanently house the surplus objects (Robertson, 2004). Model boats were included in this move and, in 1880, were joined by the transfer of numerous model boats from the India Museum. Many of the model boats now in the Science Museum and National Maritime Museum stores originated in this former India Museum (South Kensington Museum, 1880).

Established by the East India Company and Asiatic Society for Bengal in the late eighteenth century, the India Museum (Figure 50) was an oriental repository in Leadenhall Street and became systematically organised as a museum in 1814 (Skelton, 1978). However, the Indian revolt in 1858 led to the demise of the East India Company and hence the museum. The collections became part of a new India office but following a lack of space the decision was taken to transfer several of the items to the South Kensington Museum (Skelton, 1978: 298). The museum subsequently opened a new Indian section and later changed name to become the Victoria and Albert Museum in 1899. As the museum and its collecting remit developed certain collections, including boat models, were dispersed to other institutions including the Science Museum and, later, several of these models were transferred from the Science Museum to the National Maritime Museum. The National Maritime Museum also received a large

proportion of its founding collections, following its establishment in 1937, from the Royal Naval Museum.



**Figure 50** A view of the East-India House, Leadenhall Street. (Bowles and Carter, 1802 © National Maritime Museum, London Available at <http://www.portcities.org.uk/london/server/show/conMediaFile.4023/A-view-of-the-EastIndia-House-Leadenhall-Street.html> [accessed 19 June 2015])

It is clear, from this brief insight, that the origins of objects following their initial acquisition into an institution can be long and complex. This helps to explain why some museum documentation is limited making it difficult to identify the initial field collector.

In addition, Glasgow Museums and Kew Gardens Economic Botany Museum were also influenced by international exhibitions. Glasgow Museum was founded following the international exhibition held in Kelvingrove in 1888 and Kew Gardens can trace many of the early collections back to the Great Exhibition of 1851.

### ***Museums established by societies, charities and councils***

The final set of museums consists of the Museum of Archaeology and Anthropology, Cambridge (founded in 1884), National Museums Scotland (1858), Plymouth City Museum and Art Gallery (1897), Bristol Museums, Galleries and Archives (1872), Southampton City Council Arts and Heritage (1912) and Eyemouth International Sailing Craft Association (1969). Although established at different times they were all either founded by societies, charities or government

with the aim to make collections publicly accessible and, again, to educate and inform their audiences.

#### **4.3.2 Acquiring model boats**

Model boats have been acquired by museums as gifts, purchases and bequests for over 150 years enhancing collections and making objects publicly accessible. The reason for the collection of each model is likely, however, to vary on a case by case basis and across institutions depending on their aims and visions. For example, the acquisition of many of the models in the Science Museum can be attributed to the museums aim to showcase technologies around the world. Similarly, the National Maritime Museum's collecting has been driven by the desire to collect and preserve the nation's maritime heritage.

There was a peak in the acquisition of model boats in museums in the late nineteenth century, a big drop in the years 1910-1919, which is likely to be a result of the First World War, and a steady decline from 1939 to the present day. The peaks in these acquisitions can be linked to the establishment of museums and founding collections, such as the Pitt Rivers Museum and Horniman Museum and Gardens, and a desire to showcase world cultures at a time when colonial powers, trade and travel were flourishing. The decline of model acquisition over the past century can be associated with post-colonialism and the independence of numerous nations that were formerly British colonies, dependencies and protectorates. This decline can also be attributed to a lack of space as museum stores are reaching capacity and concerns are raised for the care of collections. In addition, Gosden highlighted that "after the Second World War there was less academic emphasis on material culture, and interest in, and consequently funding for, collections largely dried up" (Gosden, 2001: 55).

#### **4.3.3 Complex histories**

Various scholars have commented on the complex histories of objects and their many lives (Thomas, 1991; Stocking, 1995; Hoskins, 1998; Gosden et al., 2007; Wintle, 2013). Model boats are a prime example of such complexities with changes in meaning and purpose accompanying changes in space and time. This refers to the purposes of the models during their initial production and what they meant to the producer, then to the individual collector, later to the museum as a collector and, finally, their meaning and purpose in the scenario of display or storage for curators and visitors.

Given the peak in collection and acquisition of the models in the late nineteenth century and gradual decline throughout the twentieth century, it is possible to suggest the significance and meaning of the model boats has altered. In the late nineteenth century collecting was a popular activity along with travel, anthropological studies and official work in the colonies and protectorates. There was a significant amount of intrigue about overseas communities and cultures so the collection and display of material culture was a way to inform and educate broad audiences. However, with stricter collecting policies in museums, limited funds and limited space, it has become somewhat less viable to collect such objects. Having once been at the forefront of large scale events, such as the Great Exhibition of 1851, their profile, significance and meaning has changed as they are now predominantly in storage, rarely displayed and rarely researched.

To add to the complex lives of these museum objects many have not only been made, collected and then acquired into museums but have been transferred numerous times from one museum collection to another. Brief insights have been given about the various transfers of collections between the India Museum, South Kensington Museum, Victoria and Albert Museum, Science Museum, Royal Naval Museum and National Maritime Museum. In addition, further complications have been met in the study of Bristol and EISCA's collections. Bristol Museums, Galleries and Archives received a large donation following the dispersal of the British Empire and Commonwealth Museum in 2012. The documentation for these models is significantly limited which is likewise the case with the models at Eyemouth where they were eventually transferred following the closure of Exeter Maritime Museum. Pearce highlighted this notion of complexity stating museum objects often arrive "incomplete, imperfect, and with associated documentation and information, itself immensely variable in quality and quantity" (1994: 194). Within the space of a museum context the objects rely on a level of interpretation, imagination and are often void of personal emotional connections.

### **4.4 Conclusions**

Collecting is a subjective activity driven by individualistic aims and motivations. Even institutional acquiring is subjective driven by the desirability of an object to meet specific needs and to expand collections. This is true for the accumulation of model boats but, through a typological arrangement of the collectors in this chapter, it has been possible to identify broad collecting patterns.

At least 134 different boat model collectors were identified with considerable variations in their motivations for collecting and the range of models amassed. By observing the collecting and collector types identified it can be deduced the most common form of amassing in this research was the intentional general systematic accumulation of objects which included, but did not wholly consist of, model boats. Delving further into the breakdown of collector types it is interesting to note that anthropologists and colonial officials, or colonial officials with anthropological expertise, seem to be the predominant groups whereas models collected by traders and missionaries are few and far between. This can be linked to when the models were collected and their location as well as wider global contexts.

The majority of the models were collected from India, Malaysia, Sri Lanka and Myanmar and these regions have been represented across all four collecting types. These regions were all former British colonies so it follows that colonial officials and other British collectors would have visited or resided in these areas and hence would have had access to objects in order to collect them. Linking to this notion there are clear patterns in the dates of collection where the late nineteenth century seems to account for the majority of the models acquired, with a decline in the later twentieth century which could link to the changing focus and situation of museums. It does not mean to say that fewer boat models were collected but that fewer were deposited in museums. This is certainly a point worth considering – the models in this research are just a sample of those that would have been initially produced and collected.

Moreover, these collecting histories are crucial in helping us to understand the perspectives and biases in the production and collection of the models: a notion that is essential to acknowledge before conducting any further analysis on the models. These objects are steeped in colonial hierarchies: they were collected by, and often commissioned by, British colonials. With this in mind it must be highlighted that, although the models depict local watercraft, they depict the local through the perspective of the non-local. Due to the very nature of the models and how they came to be acquired by museums in the UK this research is reliant on how ‘tradition’ was viewed by contemporary Europeans.

It is therefore important to stress here that the context in which the ideas and means of representation which were conceived on a local level cannot necessarily be fully appreciated or understood within the context of this research. To further

explore the research questions from a local perspective would require another body of evidence or interviews with model makers for example. The idea of colonial perspectives does not make the models any less convincing or reliable as evidence for full-size watercraft. What it does mean, however, is the choice of watercraft depicted in miniature can tell us about vessels from a British perspective at the time. This includes aspects such as why certain watercraft were miniaturised and made in model form when other vessels which were widely used at the time were not.

In addition to the statistical data able to be extrapolated from the collection of the models, it is also possible to identify more qualitative data regarding boat types and construction. This has been termed as qualitative as the discussion of boat types has various problems in itself, an issue that will be mentioned in Chapter 5. Whilst the types of boats represented range considerably there do seem to be some commonly occurring types. The *oru*, single outrigger logboats, from Sri Lanka seem to be the most commonly represented form of boat and Burmese rice boats also seem to feature regularly. In terms of the types collected by different collecting groups it can be observed that systematic boat model and souvenir collecting seem to have sourced a wide variety of models and there does not appear to be one type dominating the collections. However, dhows and Burmese rice boats, in particular, feature significantly in commissioned models. Outrigger canoes, including Sri Lankan and Nicobarese models, feature regularly among those generally systematically collected. It could be suggested that the high volume of outrigger canoes could be attributed to the fact that this type of boat is not present in Britain and so was collected out of curiosity and novelty.

As well as understanding when, where and why the models were made and collected and by whom, it is possible to start assessing how useful they are as evidence for traditional boats. The majority of the models appear to be highly detailed with only a few exceptions in the case of spiritual and toy models. In terms of construction there is, however, quite a variance with some seemingly representing true forms of boat construction whilst others have been carved out of a single piece of wood and sometimes include incisions imitating planks. As has been discussed in Chapter 3, there are patterns with the types of boats and location linking models that reflect detailed construction and those that do not. For example, Sri Lankan *oru*, whether collected systematically or as souvenirs, tend to be highly detailed both in terms of their appearance and construction. In addition, certain collecting groups are likely to have collected more precisely

crafted boat models than others. For example, it is difficult to determine exactly why boat models were collected as souvenirs and the collectors may not have actually seen the full-size vessels the models portray so it is difficult to make inferences about how particular the collectors would have been for the models to accurately depict boats. However, models collected and commissioned systematically to fulfil purposes, such as to educate and research, are more likely to reflect true representations of boats. With these points in mind the next chapter will review current understanding of full-size traditional boats and identify case studies to explore a selection of models in more detail.



## **Chapter 5 – What can models contribute to our understanding of traditional boats around the Indian Ocean?**

Many museums house models of boats from the Indian Ocean. How these collections came to exist has been reviewed in the previous chapter. The rest of this thesis now returns to the central question of what can models contribute to our understanding of the full-size boats they represent. This question is not, however, straightforward. The interpretation and use of these models has to acknowledge the limits of current understanding about traditional boats across the region.

The study of traditional boats from the Indian Ocean is a growing field (see Chapter 1.1.3). However, there have been relatively few researchers who have studied these boats, their use, construction and cultural importance, and these researchers came from different disciplinary backgrounds. In addition, although there have been attempts to study topics using the whole ocean (such as certain boat building techniques [McGrail and Kentley, 1985; Prins, 1986, for example]), there are still yet to be any comprehensive studies of vessels from the whole Indian Ocean region: most studies concentrate on one region or boat type. There are still clear gaps where several regions and vessel types have been little studied or entirely omitted from publications to date.

This chapter is divided into two main sections – a review of literature about traditional boats from the Indian Ocean and an introduction to the case studies. The literature review will firstly summarise a brief chronological overview of relevant publications followed by the identification of some of the key themes that have emerged across multiple studies. This review, along with the data presented throughout this research, will then help to inform which models to focus on for the case studies that will be presented in the subsequent chapters. These case studies will thus be introduced in the latter part of this chapter, along with a rationale for their selection.

By drawing on some key publications, this chapter will review the current state of knowledge about traditional boats from the Indian Ocean. It is not, however, an

extensive review of all studies on this subject; the chapter does not attempt to identify and discuss each publication relating to traditional boats across this large region. Instead it aims to broadly review the regions and vessels that have been studied and to identify what has been omitted. By doing so it will help to identify case studies to demonstrate how models can be used to help us to understand traditional watercraft.

## 5.1 The development of traditional Indian Ocean boat studies

There were mentions and illustrations of traditional vessels from the Indian Ocean in traveller's accounts from the first century AD (e.g. *The Periplus of the Erythraen Sea*, translated by Schoff, 1912) and particularly since the thirteenth century (e.g. Polo, c.1300; Haeckel, 1883: 74-75; Carpenter, 1892: 10-24; Ferrars and Ferrars, 1900) which can be highly valuable in the study of traditional watercraft. However, the scholarly study of vessels from this region only really started to develop in the nineteenth century with a particular concentration of studies in the late twentieth and early twenty-first centuries. There have been some significant contributions by shipwrights and naval officers, artists and scholars that have, to date, shaped our understanding of different vessels and the maritime cultures around the Indian Ocean that used them. This section will briefly discuss some of the key contributing authors and publications providing a chronological overview of the development of this subject.

Throughout the nineteenth century references to traditional vessels increased significantly with an influx in western visitors travelling, and having access, to numerous regions around the Indian Ocean. Given that this was a period of increasing colonial activity in several areas of this region, such as India and Sri Lanka (see Appendix C), it is perhaps not surprising that accounts written by western tourists, researchers (such as zoologists and anthropologists) and political figures (i.e. colonial officials) were published throughout this period. Travel literature, for example, increased throughout the nineteenth century (Speake, 2003: xii) with reference and descriptions of traditional vessels appearing in texts such as Hall (1833; Hall and Rawlinson, 1931: 126-129) and Cumming's (1892: 16-19) accounts of Sri Lanka. Driven by curiosity these early mentions of encounters with local crafts are useful in gaining a general understanding about the types of vessels in use at the time. Systematic studies,

with the exception of Edye (1834) and Paris (1841), did not, however, really flourish until the twentieth century.

An influential figure in the development of traditional boat studies was John Edye, a British master shipwright. In 1834 Edye produced a systematic study of Indian, Sri Lankan and Arab vessels through observations and technical drawings. This included physical descriptions of vessels, including their size, features and use, for example the *masula manché* from Madras in India was described as being “formed with a flat bottom, for the purpose of taking the beach in the surf” (Edye, 1834: 8). In addition, and equally significant in the study of traditional boats, the French naval officer Admiral François-Edmond Paris observed and systematically recorded vessels in a similar manner with the production of technical drawings (1841). These publications, along with the Flemish artist Balthazar Solvyns’ artistic impressions of boats in Bengal in the late eighteenth century (Solvyns, 1796, 1799; Hardgrave, 2001), form the earliest technical and descriptive accounts of traditional vessels of the Indian Ocean. These were, at the time, the only studies to be published making them valuable sources for traditional boats of the nineteenth and late eighteenth centuries. As ethnography did not emerge as a discipline until the twentieth century (Brewer, 2000) these early approaches can be considered a form of proto-ethnography (McGrail et al., 2003: 15).

In the early twentieth century, a few accounts and images of Malay vessels based on observations were published (e.g. Abbott, 1907 and Dalton, 1926). These studies, though useful in helping to understand the types of vessels used in Malaysia, lacked detail, physical descriptions and information about their construction. However, it was Radha Kumud Mookerji who, in 1912, introduced new themes and methods in the study of traditional boats with the publication of *Indian Shipping: a history of sea-borne trade and maritime activity of the Indians from the earliest times*. Encouraged by a lack of research in the subject and with a decline in traditional Indian shipbuilding, Mookerji attempted to conduct the first systematic study of Indian shipping using a range of evidence including literary sources, such as Sanskrit texts, and iconographic evidence including the Borobodur sculptures (1912: 19 and 46). This work offers an historical insight into the long tradition of trade and associated vessels incorporating a different approach to previous observational proto-ethnographic studies. Other influential works in the early twentieth century include Montgomerie’s somewhat colonial perspectives of Nicobarese canoes (1922), Moore’s work on lateen sails of the

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Red Sea (1925), Villiers' first-hand accounts of sailing dhows around the Indian Ocean (1940) and LeBaron Bowen's articles on Arab dhows (1949; 1952) reflecting an emphasis particularly on Indian and Arab vessels.

Following these early publications there was an increase in studies of traditional boats with a clear shift in approach. The emphasis across multiple publications, from the mid to late twentieth century, moved from general discussions and descriptions of vessels to focus on their distribution and origins with links to migratory patterns and cultural spread (e.g. Haddon, 1920; Gibson-Hill, 1946 and 1949 and Doran, 1974). Such approaches link to the idea of diffusion theory with the spread of cultural traits (Ellis, 2000: 193-194; Gould, 2000: 14; Hocker, 2004: 8) and the idea that cross-cultural interactions influenced technologies. Cultural diffusion theory has since been criticised and dismissed as being Eurocentric and racist assuming humans are un inventive (Gould, 2000: 14) and only capable of adapting vessels when influenced by other cultures. Nevertheless, these studies do provide some insights into traditional vessels, such as outrigger canoes from Indonesia (as discussed by Doran (1974) when theorising about the development and distribution of outriggers).

Evolutionary thought in archaeological studies, whereby material cultures and societies adapt as part of a "teleological process" (Hocker, 2004: 8) ever progressing to reach an end goal, originated in the nineteenth century following the publication of Charles Darwin's *On the Origin of Species* (1859). This theory was dismissed at the beginning of the twentieth century as it assumed complex technologies followed simpler ones (Gould, 2000: 14 and Shennan in Renfrew and Bahn, 2005: 38) and diffusionism was introduced to explain technological changes. However, various traditional boat studies throughout the twentieth century reflect a concept of evolutionary thought including works by the ethnographer James Hornell (1920 and 1946). Often considered a pioneer in traditional boat studies due to the international scope and detail of his work (South Indian Federation of Fishermen Societies, 2002), Hornell not only documented and recorded traditional watercraft around the world but theorised about the changing nature of technologies adapting to meet functional needs and available materials. In addition, the concept of extinction encouraged various scholars to study the now vanished Swahili dhow, the *mtepe*, from East Africa (e.g. Lydekker, 1919; Hornell, 1946; Adams, 1985; Prins, 1986; Gilbert, 1998). The decline and demise of this particular vessel raised a considerable amount of

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interest causing scholars to hypothesise about why the vessel ceased to be made. As previously discussed in Chapter 2, models were often referred to when studying the *mtepe* due to a lack of ethnographic, archaeological and historical evidence. This is a rare example where models were used as evidence for traditional boats from the Indian Ocean.

Whilst the works of early scholars made significant contributions to traditional boat studies they are somewhat few and far between. Most the available publications date from the late twentieth century and continue to the present day. The interdisciplinary nature of the authors from early to current studies can be noted ranging from artists, ethnographers and archaeologists with changing ideas and methods reflecting disciplinary developments and differences in the authors of traditional boat studies. For example, it was no longer only westerners producing publications about traditional boats as there was an increase in contributions from locals, such as Vitharana on the topic of Sri Lankan watercraft (1992; 2012), Al Hijji's book about Kuwaiti dhows (2001) and Shaikh et al. article about sewn boats from Goa (2012), to name a few. This development continued in the late twentieth century with the establishment of maritime archaeology as a discipline in the 1970s (Bass, 2011: 7) influencing the way boats were recorded and documented. This encouraged standardised scientific methods of recording and ideas of vessel classification became popular (for example W. Rudolph, 1974; McGrail, 1981).

Finally, the late twentieth and early twenty-first centuries saw a shift in the motivation for studying traditional boats moving away from general interest towards necessity. It is now acknowledged that certain factors such as new technologies and materials are influencing traditional wooden vessels around the Indian Ocean often resulting in their decline with the adoption of motorised and fibreglass vessels (Devendra, 2011). Changes have been occurring rapidly resulting in ethnographic recording and observations in an attempt to preserve and document these boats before they disappear. This can be seen in works such as *Sewn Plank Boats* (McGrail and Kentley, 1985), *Ships and the Development of Maritime Technology in the Indian Ocean* (Parkin and Barnes, 2002) and *Boats of South Asia* (McGrail et al., 2003).

Recent literatures not only explore the vessels as objects but often bring in the notion of human agency, linking to the cultural meaning and use of vessels as well as their design (e.g. Ransley, 2009). Agius also explored different types of

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dhow and their cultural significance by researching their histories and linguistic backgrounds (2008; 2010). Moreover, since the tsunami in 2004 destroyed a significant amount of vessels and maritime communities in the Indian Ocean, there has been an urgent need to record the remaining traditional boats before they disappear. This is apparent in recent literatures (e.g. Grainge, 2012).

A new approach to the study of boats was proposed by Daniel Vermonden in 2006. In this publication, which explores boat building in Indonesia, Vermonden introduced the ‘sequence of operations’ approach, or SOA (2006: 235). This considers all of the stages involved in building a boat including how skills and knowledge to build the vessel are acquired, the motivations and how wood is attained and shaped. Such an approach demonstrates how traditional boat studies have moved away from simply exploring technologies and typologies to considering boats in a holistic manner including social inputs and availability of resources.

The majority of the literature used ethnographic approaches to study and record traditional vessels contemporary to the time of publication. This ranged from observations and drawings in the eighteenth and nineteenth centuries (i.e. Solyns, 1796, 1799; Edye, 1834; Paris, 1841) to a more standardised and systematic approach used since the twentieth century (such as Hornell, 1920, 1943, 1946; McGrail and Kentley, 1985; Greenhill, 1971; Jansen and Bølstad, 1992; Prados, 1997; Vosmer, 1997; Peterson, 2000; McGrail et al, 2003; Dziamski and Weismann, 2010; Jansen van Rensburg, 2010). Although some historical and iconographic sources, i.e. accounts by explorers including Marco Polo and Ibn Battuta, and the Borobodur sculptures in Java, Mohenjo-Daro seals and Andhra coins, were used by scholars including Mookerji (1912), Agius (2010) and Rajamanickan (2004), they are somewhat scant. Likewise, there is a limited amount of archaeological data available with the exception of the Pontian boat excavated in the Malay Peninsula (Manguin, 1985), the Arab or Indian Belitung shipwreck found in Indonesia (Flecker, 2000), Thaikkal-Kadakkarappally boat from India (Tomalin et al., 2004) and the sewn timbers said to belong to a *mtepe* in Mombasa (Prins, 1986 and Green 2001), for example. It is perhaps, therefore, not surprising that ethnographic recordings of vessels are the focus of studies to date. However, given that numbers of traditional wooden watercraft around the Indian Ocean are dwindling ethnographic approaches are now being challenged (Green, 2001) and there is an urgent requirement to record any remaining vessels

in detail (McGrail et al., 2003: 16). This makes the assessment of the use of models in the study of traditional boats fundamental for future research, especially where vessels are under threat of vanishing or have already disappeared.

In sum, traditional boats from the Indian Ocean have drawn attention from westerners in particular with mentions in travel literature from the nineteenth century for example to recent systematic scholarly studies. While the study of these vessels has progressed significantly since at least the eighteenth century, and notably in the past few decades, it is still characterised by being carried out by a small number of researchers, many outside of academia and lacking a coherent approach. There is still yet to be an extensive synthesis or overview of watercraft from the Indian Ocean and comprehensive recent reviews for particular regions are rare. Furthermore, with the current situation of wooden watercraft adapting, declining or vanishing entirely, there is an ever pressing and urgent need to record the remaining traditional vessels from regions around the Indian Ocean.

### **5.1.1 Key themes identified in the literature**

Whilst this chapter does not aim to provide an extensive account of all the studies of traditional boats of the Indian Ocean, it is important to acknowledge and understand some of the key themes that have emerged across multiple publications. These themes relate to geographic scope, typologies, nomenclatures, construction, use of vessels, changes over time and the cultural significance of watercraft. This section will therefore briefly discuss some of the main points and issues that have arisen within the literature providing a thematic overview.

#### ***Geographic scope***

The published studies of traditional watercraft provide an uneven geographic scope of the Indian Ocean showing more bias towards some regions where others have still, to this day, been omitted. For example, traditional boats from India and Sri Lanka have appeared across multiple studies since the nineteenth century (i.e. Edye, 1834; Paris, 1841; Mookerji, 1912; Hornell, 1920; Blue et al., 1997; Rajamanickam, 2004; Pohl, 2007; Kapitän, 2009; Ransley, 2009; Grainge, 2012; Devendra, 2013). The early literature is likely explained by British colonial rule and thus increased access in these areas in the nineteenth and early twentieth centuries (see Appendix C). Watercraft from regions around the Gulf (e.g. Le

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Baron-Bowen, 1949; Hawkins, 1977; Prados 1997; Vosmer, 1997; Al-Hijji, 2001; Agius, 2008, 2010; Weismann et al., 2014), Indonesia (e.g. Haddon, 1920; Horridge and Snoek, 1981; Horridge, 1986; Horridge, 1987) and East Africa (Lydekker, 1919; Adams, 1985; Prins, 1986; Gilbert, 1998; Da Silva, 2010), for example, have also appeared across numerous publications. Yet boats from regions including Myanmar, Somalia, Sudan, Mauritius and Madagascar are considerably understudied. This could be due to factors such as the post-colonial political isolation that ensued in Myanmar (Green, 2015) which impacted access and, in turn, potential fieldwork. It can be observed, however, that publications are increasingly capturing a more holistic overview of vessels from the Indian Ocean region (such as Folkard, 1906; Hornell, 1946; W. Rudolph, 1974; McGrail, 1981; McGrail and Kentley, 1985; Greenhill and Morrison, 1995; McGrail, 2001; Barnes and Parkin, 2002; McGrail et al., 2003) but there is still yet to be a comprehensive study of the region in its entirety.

### ***Boat types and classification***

By reviewing the literature on traditional watercraft, it is quite apparent that some vessel types around the Indian Ocean have attracted more attention than others. For example, variations of the dhow have been studied by multiple scholars including Edye (1834), Paris (1845), Hawkins (1977), Severin (1985), Prados (1997), Vosmer (1997) and Agius (2005; 2008; 2010). Other vessels such as the East African *mtepe* (e.g. Lydekker, 1919; Hornell, 1941; Adams, 1985; Prins, 1986; Gilbert, 1998; Da Silva, 2009-10), Indian *masula* surf boat (e.g. Edye, 1834; Kentley, 1985 and 2003) and Sri Lankan *oru* (e.g. Kapitan, 1987; Gulbrandsen, 1990; Grainge, 2011; Vitharana, 1992) similarly appear across multiple publications. This is comparable to types such as Indian *kattumarans* (Pohl, 2007) and Malaysian *koleks* (Gibson-Hill, 1949) which are little referenced in publications to date. Furthermore, rice boats from the Irrawaddy River in Myanmar have seldom been mentioned in publications let alone studied in any depth. It is clear there have been biases towards which vessels have been studied to date, perhaps due to factors such as access to regions or vessels (Myanmar was, until recently, politically isolated since the 1960s for example [Green, 2015: 461]), awareness of certain vessel types, general interest towards some types over others or biases towards those that appear to be culturally symbolic (this notion will be discussed further under the heading 'Cultural importance of boats'). There are thus still many vessel types that require attention in future studies. As the models identified in this research represent a wide range of



watercraft from regions around the Indian Ocean they have clear potential here to help fill in gaps in our understanding of a range of watercraft.

Moreover, the classification of different types of vessels has been a recurrent theme throughout studies of traditional boats (e.g. Horridge, 1986; Jansen and Bølstad, 1992; Vosmer, 1997; Weismann et al. 2014). This need to classify is not unique to the Indian Ocean but occurs across a wide range of traditional boat studies around the world. This is particularly apparent in Hornell's publication which divided vessels (worldwide) into three groups - floats, rafts and kindred craft; skin boats, coracles, currachs, kayaks and their kin; bark canoes, dugouts and plank-built craft (1946), and McGrail's identification of nine basic vessel typologies (1981). While this approach is not always appropriate as many traditional watercraft around the Indian Ocean were not built to plans or to conform to distinct typologies (see Blue et al., 2017 regarding issues with the classification of watercraft through their construction for example), it does enable a collective discussion for a group of vessels.

### ***Issues with nomenclature***

Although categorisation has been a method adopted by several scholars as a way of discussing different types of watercraft one of the themes that has emerged through a review of the literature on traditional boats has been issues with nomenclature. Jansen and Bølstad, in their study of boats from Bangladesh, observed how nomenclatures of different types of boats is "most complex" (1992: 14) as there can be regional variations in the terminologies used to describe a single type of vessel. Several scholars such as Chaudhuri (1985), Prados (1997), Agius (2010), Kentley and Blue (2003), Hoogervorst (2013) and Falck (2014) made similar observations acknowledging that multiple terminologies can exist for one vessel. No particular solution to this challenge, however, seems to have been devised. With this in mind a range of nomenclatures for each boat type must be considered in the case studies in subsequent chapters to ensure thorough studies are conducted and models are not omitted due to discrepancies over their documented names.

### ***Construction***

The construction techniques used to assemble traditional watercraft around the Indian Ocean has been an integral component of several scholarly studies. For example, Peterson (2000) closely examined how *jukungs* from Borneo were dugout logs expanded over fire (9), McGrail et al. (2003) looked into reverse

clinker boats from Orissa and Severin (1985) went into detail about reconstructing an Omani *boom*, to name a few. The notion of construction has driven or been included in the majority of the available traditional boat publications but certain literatures, such as McGrail and Kentley's edited volume *Sewn Plank Boats* (1985), have explored vessels purely classified by their method of construction (as have Prins, 1986; McGrail et al., 1999; Peterson, 2000; McCarthy, 2005; Falck, 2014 for example). The fastening of wooden planks together using continuous stitches known as a sewn technique, a form of construction that was used in several areas around the Indian Ocean (Prins, 1986), has received particular attention by scholars. It will be interesting to assess to what extent models can contribute to our current understanding of the construction techniques employed to build full-size vessels and to use this literature to identify how representative models are of different boat building technologies, including sewn boats.

### ***Use of boats***

As well as the physical traits of vessels, studies of traditional boats from the Indian Ocean often refer to their use. This notion of use is apparent in varying forms. For example, Adams (1985) considered the design of the East African *mtepe* and the ability of the sewn hull to flex in waves and Kentley (2003b) looked at the Indian *masula* and its varying uses such as for fishing and ferrying and also themes such as how often these vessels required re-stitching. Other ideas of use are apparent in works such as Villiers (1940) and Grainge (2012) who provided accounts of sailing dhows and Sri Lankan *oru*. In addition, there has been a tendency to assume that one type of vessel has a particular function, or that different functional requirements determine aspects such as shape and construction (e.g. Dalton, 1926; Gilbert, 1998).

Vessel use has often been referred to in ethnographic works such as Peterson (2000), McGrail et al. (2003b) and Pohl (2007), to name a few. Studying this aspect of watercraft is possible when physically observing and documenting watercraft when they are still in use. However, it will be interesting to see, in the subsequent chapters, whether models have any potential at enhancing our understanding of the use of full-size vessels in terms of what they were used for, by whom and how they were used / propelled.

### ***Disappearing traditions***

The concept of traditional wooden watercraft adapting, changing and, in some cases, disappearing over time has been acknowledged by numerous scholars. Moreover, changes in watercraft have encouraged the recent ethnographic study of traditional vessels as a measure to record and, in doing so preserve, diminishing maritime traditions. Jansen and Bølstad, for example, observed how there had been a technological revolution among Bangladeshi vessels since the 1980s with the adoption of engines resulting in the adaptation of boats in terms of material and hull design (1992: 6-7). This encouraged Jansen and Bølstad to publish photographs of watercraft taken between 1988 and 1991 (1992).

In 2003 McGrail stated “there is an urgent requirement for today’s water transport to be recorded in detail” (16) as traditional wooden watercraft is being replaced with metals, plastics and engines (McGrail, 2003: 12). While this urgency was acknowledged in works by Greenhill and Morrison (1995), Prins (1986), Prados (1997), Green (2001), McGrail et al. (2003) and Vosmer (2005) for example the subject became ever more pressing following the tsunami of 2004. This natural disaster caused mass devastation around the shores of many regions around the Indian Ocean including Indonesia, India, Sri Lanka, Bangladesh and the Maldives (Iemura et al., 2006: 6). As well as 230,000 casualties (Tsunami 2004, 2015) there was a huge toll on boats, buildings, roads and railways to name a few (Iemura et al., 2006: 6). The destruction of watercraft resulted, in many cases, with the replacement of boats with fibreglass replicas (Grainge, 2012: 158). The construction of wooden watercraft has consequently diminished and an urgency to record any remaining traditional boats has been acknowledged by scholars such as Pohl (2007) and Grainge (2012).

The study of traditional boats has often focused on recording and preserving traditions in danger of disappearing. However, ethnographic approaches reflect contemporary vessels: they do not tell us about changes in vessels over time. As discussed in Chapter 2, models have been used in the past to discuss extinct or rare boats but this research considers if models of boats also have the potential to inform us about changes in watercraft over time.

### ***Cultural importance of boats***

Finally, a significant theme that emerged when reviewing literature on traditional vessels was the cultural value of watercraft. This refers to the meanings and roles played by boats in rituals, narratives and other aspects of a culture. It relates to

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how boats can become symbolic and be associated with wider meanings beyond the physical vessel and its function (such as the iconic notion of the Arab dhow as a symbol of trade and cross-cultural interactions [Sheriff, 2010]).

Hornell, for example, studied oculi or ‘eyes’ found on the bows of watercraft around the Indian Ocean with reference to cultural customs and beliefs associated with these features (Hornell, 1920: 42-43; 1938). Furthermore, several scholars discussed ceremonial activities that occurred in the construction and launching of vessels such as the *masula*. In the construction of this particular type of vessel Kentley described how a range of offerings including plantain were placed on the keel plank when it was laid and later a coconut would be broken over the bow before the boat was launched (2003a: 135-136). McGrail et al. (2003b) also included the notion of ceremonial activities associated with the construction of the Indian *vattai* where the foundation plank was blessed (217-218). These vessels had faces drawn on them in chalk to ward off evil and they received garlands of flowers over their stem and stern (McGrail et al., 2003b: 218). These are just a few examples of cultural and religious activities that are associated with the construction and launching of new vessels that have been discussed by several scholars studying traditional watercraft. It would be interesting to see if models can help us to further understand the cultural importance and symbolism of different types of boats around the Indian Ocean.

### 5.1.2 Summary

This review has demonstrated, through a brief overview of chronological developments and themes, what vessels and regions have been focused on so far and where there are considerable gaps that still need addressing. It is quite apparent, for example, that there has been a bias towards the study of particular regions, such as India, Sri Lanka, the Persian Gulf, and vessels, including the *mtepe* and different types of dhows. Yet other regions, such as Myanmar, and several vessels have been almost entirely omitted from studies to date.

Furthermore, the studies of traditional boats across this large region are, to a large extent, limited in number, patchy in their focus, variable in their quality and do not represent a coherent focus of academic study. There are few syntheses of studies in particular regions, and fewer that look at a larger geographical area of study. So far, the recent attention to focus on the whole Indian Ocean has not led to studies of traditional boats across this ocean.

With the disappearance or adaptation of traditional watercraft due to factors such as the introduction of materials such as fibreglass and technology including motorisation of vessels, and the impact of natural disasters such as the tsunami in 2004, there is an ever-pressing requirement to record remaining boats. However, with the decline and demise of traditional watercraft this is becoming increasingly problematic and with little archaeological and historical evidence available models of boats could prove to be crucial for our future understanding of this form of material culture and the communities that used them.

While it has been observed that some regions such as India, have been studied more than others, this is only comparative to regions that have not been studied at all. Our understanding of such regions is still limited and there is a need to continue to develop these studies in the future and to continue to record any remaining traditional watercraft. With this in mind, as well as the information about boat models and their biographies presented throughout this research, different case studies can now be explored to assess how models can contribute to the study of traditional watercraft from the Indian Ocean. These case studies, which will be identified in the subsequent section, will include more extensive overviews of any relevant literature in the next chapters.

## 5.2 Introducing the Case Studies

By reviewing current knowledge about traditional boats from around the Indian Ocean it is apparent that there is still much to learn. Models, therefore, clearly have potential to make a significant contribution to our understanding of traditional watercraft from the region. However, with 667 models representing a wide range of boats from several countries, it is not possible to conduct an in-depth study of each boat, or each region they come from, within this thesis or to address every issue highlighted in review of the current research. To answer questions about the potential of models as tools for studying traditional boats from the Indian Ocean this thesis will therefore use two case studies.

The wide range of models identified in this thesis and questions raised in recent research meant the choice of case studies was not straightforward. The way models were used in past studies of traditional boats was reviewed in Chapter 2. This demonstrated how models of extinct vessels have often been used to stand in for full-size vessels no longer available for study, such as the *mtepe* (e.g. Hornell, 1941; Adams, 1985; Prins, 1986) and *yathra dhoni* (e.g. Vitharana, 1992;

## Chapter 5 – What can models contribute to our understanding of traditional boats around the Indian Ocean?

Vosmer, 1993). The challenge of using models in this way requires further attention and other endangered boat types could benefit from this type of approach such as the Indian *masula*. For this research, however, it was decided to explore using models of boats in two different ways to demonstrate how they can be used in different circumstances.

This research has highlighted how boat models representative of a number of regions or vessel types could be studied in order to ascertain more about the boats themselves. For example, 111 models originated in Malaysia, a region where traditional watercrafts only feature in a few early twentieth century studies (i.e. Abbot, 1907; Dalton, 1926; Gibson-Hill, 1949, all in Barlow, 2009). There are also highly detailed models of the Indian *masula* surf boat and the East African *mtepe* which have not all been identified or studied in depth in research to date, and yet the full-size *mtepe* no longer exists (Chittick, 1980: 298) and the numbers of full-size *masula* that still exist and are in use are uncertain. In addition, there are models of traditional boats that have been little studied to date such as vessels from the Nicobar and Andaman Islands, Madagascar, Zanzibar and the Maldives, for example. Furthermore, there are models of different types of dhow, such as the *sambuk* or *sanbuq*, from several areas around the Gulf including Bahrain, Kuwait and Oman that could be used to further our understanding of full-size dhows complementing studies such as Hawkins (1977), Prados (1997) and Agius (2005; 2008; 2010). Other potential case studies could have addressed construction. For example, boat models could be used to tell us about regional and chronological variation in sewn boat construction. Considering the current gaps in our understanding of traditional vessels around the Indian Ocean, and the need to record and preserve elements of this heritage, models could prove a useful resource to start bridging these gaps and to provide evidence for vessels that no longer exist.

Whilst there are a range of case studies that could have been chosen, this thesis shall focus on two particular case studies: outrigger vessels from Sri Lanka and watercraft from Myanmar. The choice of these two case studies was influenced by the number of models available for each. Both have a large number of models found across different UK museums and they were acquired by different collectors. This means they are not biased by the choices of one collector. In contrast, of the 111 Malaysian models, over fifty percent were collected by Walter

William Skeat, a colonial administrator and ethnographer (Gullick, 2008), in the late nineteenth century.

Whilst this chapter has highlighted how traditional boats from Myanmar have been little studied it has also demonstrated how outriggers from Sri Lanka have been comparatively well studied. With this in mind, the case studies are intended to ask what can models contribute to a type of boat or region where there has been research and study (Sri Lankan outriggers) and to ask what can they contribute to an area where there has been very little research and study (Myanmar). The case studies have thus been selected because they are able to demonstrate how models of boats can be utilised in two different situations to help us to understand traditional watercraft.

### **5.2.1 Case Study One: Sri Lankan outriggers**

The first case study will investigate Sri Lankan outriggers, namely canoes, known as *oru* and planked craft known as *yathra dhoni*. These vessels feature in multiple publications, yet the models have been little studied. Furthermore, of the thirteen museums researched, twelve contain models of outriggers from Sri Lanka amounting to a total of seventy-five across the museum collections. Not only are these models plentiful, but they are also highly detailed - both in terms of their appearance and construction. While models of *yathra dhoni* only account for three of the models, there are seventy-two *oru* making these outrigger canoes the most commonly miniaturised vessel within this research. This raises questions about their significance and cultural value and why they were made and collected. The purpose and significance of these models will consequently be explored throughout this case study.

In addition, ethnographic studies of the outrigger canoe resulted in the comprehensive and detailed publication of photographs and technical drawings (e.g. Kapitän, 2009) which can be compared and contrasted with the models. With the demise of most traditional wooden *oru* in Sri Lanka which were replaced by fibreglass clones following their destruction in the 2004 tsunami (Grainge, 2012: 167) and complete demise of *yathra dhoni* (Vitharana, 1992: 44; Green, 2001: 76; Devendra, 2002: 158) this study aims to raise the profile of the significance of models as a form of evidence to complement and further current research and to identify the strength and importance of these miniature objects in studying watercraft that no longer exist.

Within the research questions presented in this thesis are queries about vessel type, construction technique, the importance of the boats and whether the models are likely to reflect full-size vessels. It is hoped that, through an examination of Sri Lankan outrigger models, these particular questions will be addressed. As Sri Lankan outrigger canoes, or *oru*, in particular, feature in multiple publications (e.g. Kapitän, 1987; 1988; 1989; 1991; 2009<sup>5</sup>), the models can be compared with details discussed about the boats, including their features and construction, as well as their use. In doing so, this case study aims to identify how accurate the models are likely to be, in terms of their physical appearance and construction, and to assess whether the models support or contradict the literature or if they can provide new information about this type of vessel.

### 5.2.3 Case Study Two: Traditional boats of Myanmar

The second case study will investigate models of boats from Myanmar. There are seventy-one models of these boats in UK museum collections. Yet there is very little literature referring to vessels from Myanmar let alone any in depth scholarly studies. One of the main sources of information about traditional craft in Myanmar is an unpublished report by Than (2006) but this focused mainly on royal barges and omitted detailed information about other vessel types. With very little information available about vessels from this region this next case study focuses on models from Myanmar asking to what extent they can start to inform us about a range of traditional boats.

The approach that will be used to study these vessels will differ to the previous case study on Sri Lankan outriggers as it will explore all models of boats from Myanmar, encompassing several types rather than focusing on one particular group. It is thus hoped that this case study will be able to answer the question about the use of models in understanding a range of types and variety of watercraft. In addition, with considerably less literature about traditional boats from Myanmar than Sri Lankan outriggers, comparisons of the models and literature will be limited. This case study, therefore, will focus on the models with reference to the literature rather than drawing extensive comparisons with the literature.

This chapter will focus on what the models could tell us about different types of vessels from Myanmar. In addition, it will explore features of these detailed

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<sup>5</sup> Gerhard Kapitän provided scale drawings and photographs in his ethnographic studies of the *oru* from the 1980s (1987, 1988, 1989, 1991 and 2009),



models and consider their cultural value for both locals and westerners. Through an examination of a range of model boats this case study aims to provide a new introductory insight into traditional boats from Myanmar.

### **5.3 Conclusions**

Whilst it would be interesting to produce in depth studies of all the model boats identified in the remit of this research it is not possible to achieve this given the timeframe and scope of the thesis. Even with two case studies the extent of the research will have to be restricted as each of these could, potentially, be whole research projects in themselves. With this in mind, the purpose of these case studies is to introduce the potential of model boats as evidence for traditional vessels through the demonstration and analysis of key areas such as features and construction. It is hoped that, through the presentation of these case studies, models will be included in future research and their potential realised and utilised.

Moreover, the choice of case studies demonstrates two different situations: one where we have some ethnographic evidence for the watercraft and the other where there is very little evidence and understanding of the construction and use of the full-sized vessels. By approaching these different collections of models, which are widely represented in UK museum collections, it is anticipated that this research will be able to answer the questions identified in Chapter 1. With the capacity to only research two case studies it is hoped that these approaches will be applied to future studies of traditional boats, not only throughout the Indian Ocean but worldwide, in an attempt to study vessels and the communities that support them that may be diminishing or no longer exist.

## Chapter 5 – What can models contribute to our understanding of traditional boats around the Indian Ocean?

## Chapter 6 - Outriggers of Sri Lanka

Models of watercraft from Sri Lanka are commonly found in museum collections throughout the UK ranging from small rafts to larger plank-built boats. Of these objects models containing outriggers, a device used to increase stability, are particularly prominent with seventy-five appearing in twelve of the thirteen museum collections consulted throughout the UK (see Figure 51, for example).

In addition, published studies of Sri Lankan outriggers are not uncommon providing a basis for comparison with these museum objects. With the aim of this research to assess to what extent models can be used to tell us about traditional boats of the Indian Ocean, this chapter compares available studies of outrigger vessels from Sri Lanka with models. It will assess how accurate these objects are likely to be as representations of full-size vessels and whether they can support or contradict current knowledge or reveal any new information about boat types, overall form, construction techniques and the general significance of these vessels. By focusing specifically on Sri Lankan outriggers, though acknowledging the wider range of vessels represented in miniature form, this chapter presents a case study to begin to understand the potential of this body of material deposited in museum collections.

To achieve this, published studies of these vessels will firstly be examined. This will identify the main aspects of Sri Lankan outriggers that have been discussed in the literature, such as boat types and construction. The models are then introduced before drawing comparisons between these sources. As well as analysing the usefulness of models as a source of evidence for full-size outriggers from Sri Lanka, this case study will also raise awareness of the potential and limitations of these museum objects.



**Figure 51** Model of an extended logboat with a single outrigger. The planks have been sewn to the hull and there is a mast and furling sail. In the National Maritime Museum collections, 13680mm in length (inventory number AAE0006; © National Maritime Museum, Greenwich, London)

## 6.1 Published studies of Sri Lankan outriggers – an overview

References to Sri Lankan outriggers, particularly extended logboats with single outriggers (McGrail, 2014: 56), were not uncommon in nineteenth and early twentieth travel literature (for example Bennett, 1843; Haeckel, 1883; Cumming, 1892). Whilst references in popular literature are indicative of the visual impact these vessels had on visitors to the island and travel writers at the time, they tend to omit detail or images beyond rough sketches. More detailed accounts and technical drawings do, however, exist in the form of systematic studies conducted since the nineteenth century making traditional Sri Lankan outriggers relatively well studied compared to boats from other Indian Ocean contexts, such as Myanmar and Malaysia (as discussed in Chapter 5).

Two of the earliest systematic studies date from the 1830s and 1840s whereby Edye, a master shipwright (Edye, 1834: 1), described and drew a plan, side and section view of a *Point de Galle canoe* showing a logboat with an additional strake, two booms with rigging to the hull and a float (Figure 52). The French naval officer Admiral Paris subsequently used a similar systematic method of

recording to draw a plank built outrigger described as a *dôni â balancier* and a *warkamoowe* (1841) (Figure 53). The latter shows similarities to the outrigger canoe described and drawn by Edye but contains a sail, mast step and rudders / leeboards. These early publications were exceptional and other systematic studies did not follow until the early twentieth century. This means Edye and Paris' work are highly valuable resources in helping us to understand Sri Lankan outriggers of the nineteenth century.

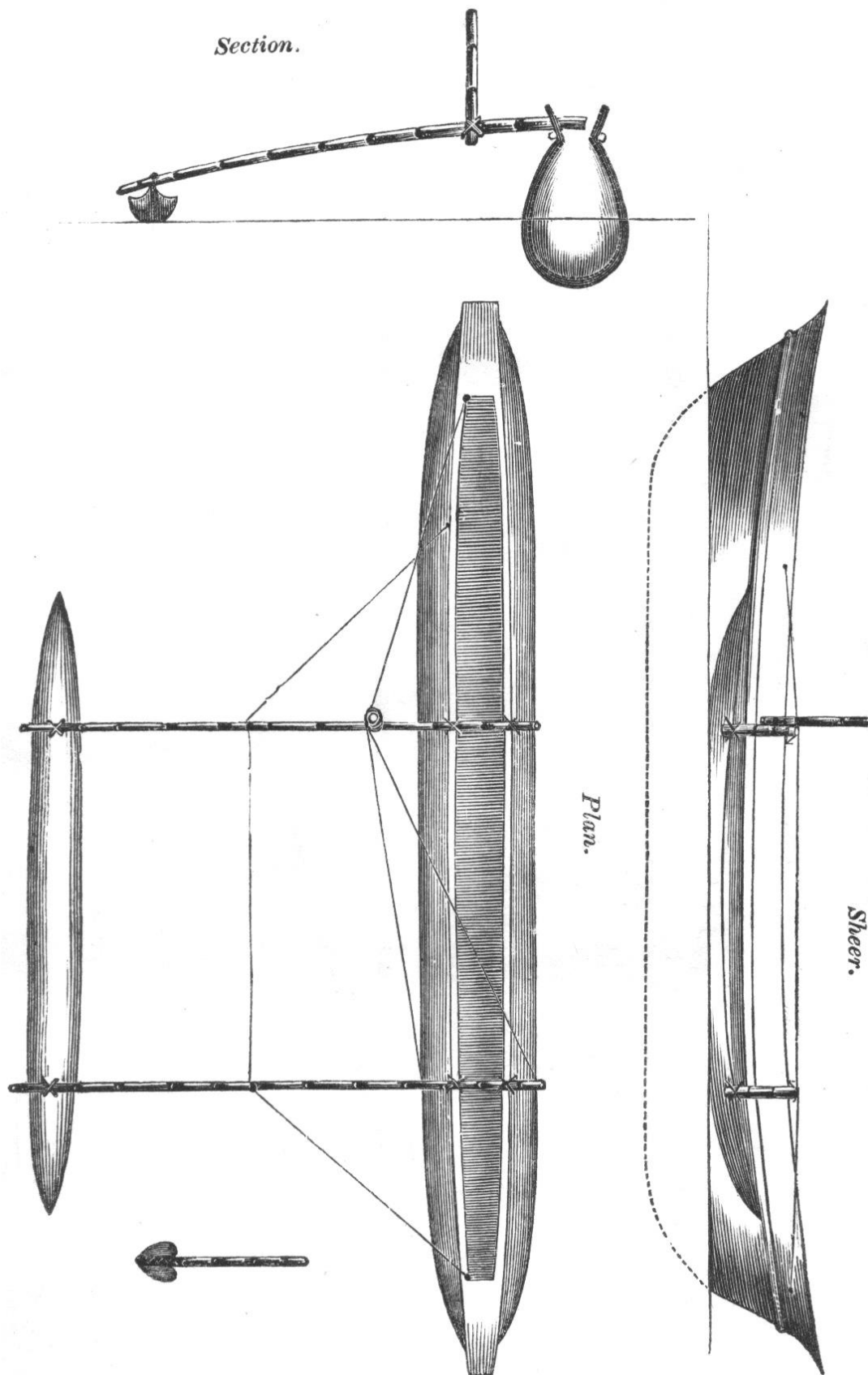
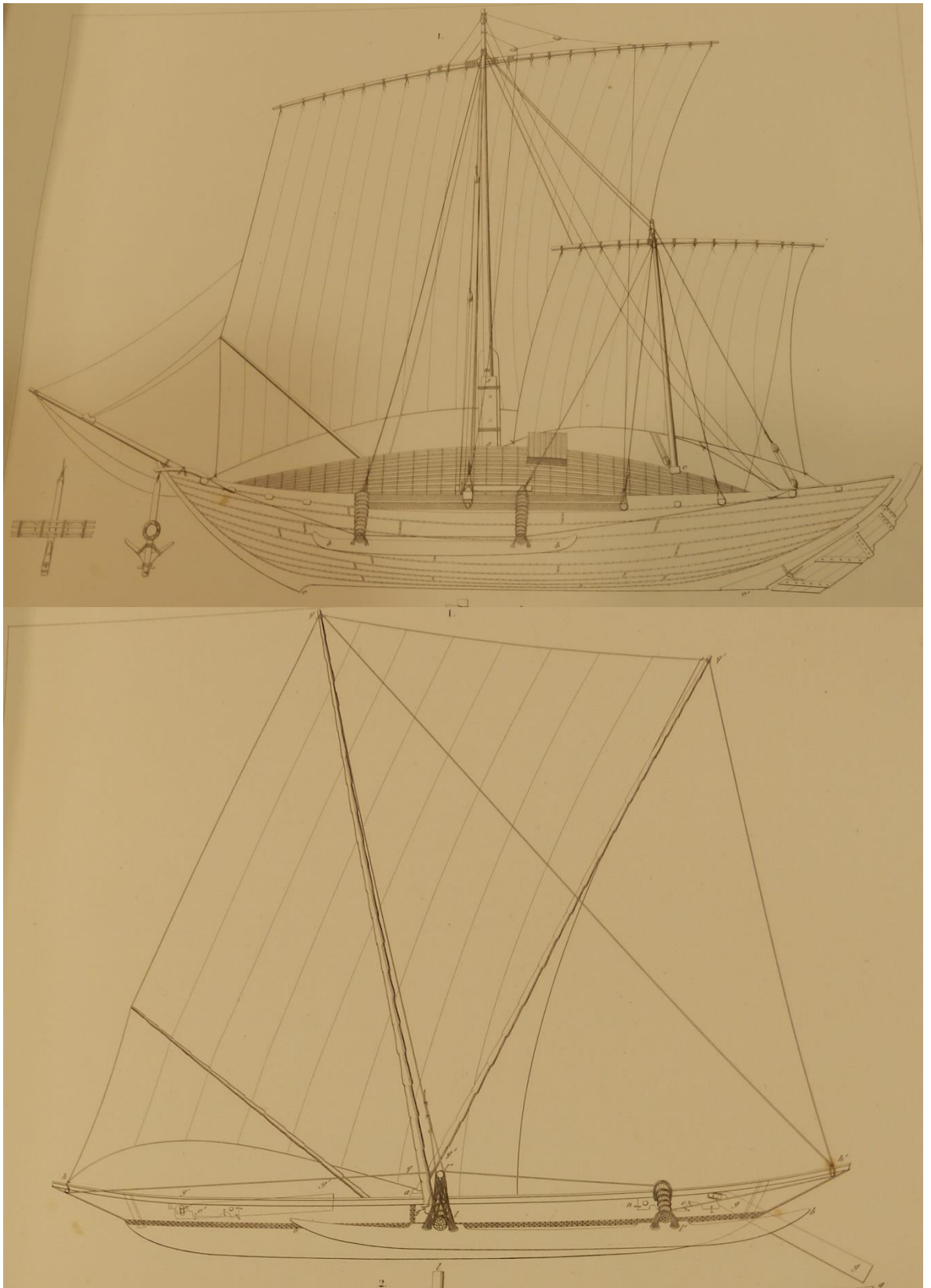


Figure 52 Point de Galle canoe (Edye, 1834: Plate II)



**Figure 53** Drawing of *A dōni â balancier* (top) and a *warkamoowe* (bottom) (Paris, 1841)

In the early twentieth century, Folkard and Hornell produced systematic ethnographic studies of boats on a global scale including descriptions and drawings of the plank built outrigger described as a *dhoney* or *yatrawe* by

Folkard in 1906 (2000) and *yathra oruwa* (Hornell, 1920: 32) or *yathra dhoni* (Hornell, 1943: 43) by Hornell in 1920 and 1943. Outrigger canoes were also studied by Folkard and Hornell described as the *Ceylonese* or *Point de Galle canoe* (Folkard, 2000) or *oruwa* in Sinhalese and *kulla* in Tamil (Hornell, 1920: 31; Hornell, 1943: 40). Whilst Folkard's contribution to the study of these vessels is significant Temple wrote a preface about the author's use of sketches claiming "they are from sketches made by the author from time to time when on voyage and tour in foreign parts: others he made from models in the United Service and other Museums; and some are from paintings, models and drawings in his own and other private collections" (Temple, 1906: vi). Caution must therefore be taken when comparing this literature with models to understand full-size outriggers. This is not, however the case with Hornell's descriptions and technical drawings, making them highly useful sources for understanding the overall design and use of these vessels during the early to mid-twentieth century.

A considerable increase in the volume of studies published about Sri Lankan outriggers occurred from the late twentieth century onwards. This is associated with the demise of the plank-built outrigger, as the last of this type was said to have wrecked in the Maldives in the 1930s (Vosmer, 1993: 38; Vitharana, 2012: 42). This encouraged the use of oral histories by interviewing those who once used and saw these vessels to study and record them (Vitharana, 1992; Vitharana, 2012). Additionally, Vosmer, in 1993, conducted a study using a model of a *yatra* in the Maritime Museum in Galle (Figure 54) to understand the vessels construction, features, overall form, stability and displacement, for example. This is particularly interesting as Vosmer's work is one of the few cases where a model has been used in an Indian Ocean context to study traditional watercraft. It is thus important to ascertain if the models identified in this research, which were not analysed by Vosmer, can contribute further to understanding a vessel that is no longer built and used in Sri Lanka.





**Figure 54** *Yatra dhoni* model in the Maritime Museum in Galle, drawn and analysed by Vosmer (1993: 37)

In addition, multiple authors including, Alexandra (1982), Gulbrandsen (1990) and Devendra (2011b, 2014) commented on fundamental changes that were occurring throughout the twentieth century resulting in the adaptation and imminent threat to these traditional outrigger canoes. This includes dwindling local natural resources such as timber due to deforestation, the introduction of new materials including outboard motors, nylon cordage and fibreglass and the introduction of government subsidies to assist in the production and acquisition of fibreglass outrigger canoes (Alexander, 1982; Gulbrandsen, 1990; Devendra, 2011b, 2014). This encouraged urgent ethnographic studies of these traditional wooden vessels before their demise (resulting in studies such as Hollander et al., 1984; Kapitän, 1987b; 1987a; 1988, 1989; Gulbrandsen, 1990; Kapitän, 1991; Vitharana, 1992; Devendra, 2002; Kapitän et al., 2009; Vitharana, 2012). Subsequently, the tsunami that hit the shores of Sri Lanka and several regions around the Indian Ocean in 2004 caused great devastation with a huge toll on human life, destruction to homes, businesses and watercraft, greatly impacting maritime communities and livelihoods (Caldecott and Wickremasinghe, 2005). Several wooden outrigger canoes, lost as a result of this natural disaster, have since been replaced with fibreglass replicas (Grainge, 2012: 158) (see Figure 55 for example) resulting in a study of these new fibreglass outriggers by Grainge in 2012 and the amalgamation and publication of Kapitän's studies of Sri Lankan watercraft in their traditional wooden state in 2009.

So, in conclusion a considerable amount of studies about Sri Lankan outriggers, particularly logboats, were published from the nineteenth century onwards. Although some early studies do exist, the majority were published in the late twentieth century.



**Figure 55** Modern fibreglass *oru* beached near Negombo, Sri Lanka. Note the brightly decorated fibreglass hull used in conjunction with the traditional style wooden outrigger booms and float  
(Photograph taken by Dr JD Hill, September 2015)

### 6.1.1 Nomenclature

What is particularly striking about these publications is the variation in terminologies used to describe the same types of boats. Although the images and descriptions portray some discrepancies among the vessels they appear to represent two distinct types of boats which share similarities with the models: a plank-built outrigger and an outrigger canoe, yet they have been allocated a variety of terminologies. This is a notion that requires some deliberation linking to the wider scholarly debate about the issues of nomenclatures used in traditional boat studies. For example, the outrigger canoe was described as a *Point de Galle canoe*, *market boat*, *warkamoowe*, *oru*, *oruwa* and *kulla* yet they all describe the same type of boat – a dugout side and end extended logboat (McGrail, 2014: 56) with two booms connecting the hull to a single wooden outrigger float. In addition, it was not uncommon for these vessels to be

incorrectly called *catamarans*<sup>6</sup> within western nineteenth century travel literature (for example Carpenter, 1892: 10). It is particularly interesting to acknowledge that, since Hornell's use of the term *oruwa* in 1920 and 1943, scholars started to call these vessels *oru* or *oruwa*. It would thus seem these were fairly recent terms but Vitharana discussed how variations of this nomenclature can be traced back to a 12<sup>th</sup> or early 13<sup>th</sup> century exegetical work, *Jātaka Atuvā Gātapadaya* (Vitharana, 1992: 18-20). Therefore, for ease of discussion and due to the historical use of the term according to Vitharana, the word *oru*, which has been used in Sri Lanka, will be used throughout this chapter to refer to the outrigger canoe.

The plank built outrigger has likewise been given a range of terminologies including *yathra dhoni*, *yatrawe*, *maha oru* (meaning "big outrigger canoe" (Vosmer, 1993: 38)) and *yatra dhoni* reinforcing the idea of the complex nature of nomenclature. This issue has been raised previously by scholars studying traditional boats of the Indian Ocean as the name of a vessel often varies over time and space with region, dialect, cultures and time affecting terminologies (e.g. Prados, 1997; McGrail and Blue, 2003: 32; Agius, 2010; Hoogervorst, 2013). However, as *yathra dhoni* has been used in recent publications it will be used throughout this chapter whilst taking caution to consider a range of terminologies that might have been used in both literary and iconographic sources (models).

### 6.1.2 Themes

A range of themes emerged through the examination of published studies of Sri Lankan outriggers, from their distribution to construction and sailing abilities. Each of these themes will be briefly discussed highlighting some of the details of the vessels which will later provide a basis of comparison when analysing the models.

#### *Distribution*

Sri Lanka, an island situated off the southeast coast of India, has a vast expanse of coastland (about 1,100 miles long), rivers and lagoons with a tropical climate attributed to the monsoon winds (Department of Fisheries, 1958: 7-8). The environmental conditions of the north and south differ significantly with

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<sup>6</sup> Catamaran is a westernised adaptation of the Sinhalese term *kattumaran* which is a lashed raft but has been used by Europeans to describe multihull vessels (Devendra, 2011b: 14)

sheltered and shallow waters in the north whereas the south is far more exposed to winds, currents and “rough weather” (Department of Fisheries, 1958: 22). Using a map (Figure 56) that was compiled following a survey in 1958 by the Department of Fisheries of Ceylon, it is clear there were variations in the distributions of different watercraft, including *oru*. This is likely a result of differing environmental conditions, cultural traditions and fishing techniques. For example, the vulnerability of rafts to open water and rough weather makes them more suitable for the sheltered northern coasts of Sri Lanka, whereas *oru*, with their keelless hulls, built up sides and single outriggers were suitable for use in the exposed south and west coasts as they were deemed stable in high winds, could be launched in the surf and easily beached making them more suitable to use in the south than the less stable and generally outrigger free *vallams* (Department of Fisheries, 1958: 22). They were likewise used along the east coasts due to a large migratory fishing industry that took with it its fishing craft (Alexander, 1982: 94).

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**Figure 56** Distribution of fishing craft and fishing population (adapted from Department of Fisheries, 1958: 34)

Assessing the literary evidence (such as Kapitän et al., 2009) it would seem *oru* were present in the south and west of Sri Lanka from at least the early nineteenth century onwards, though evidence of their presence around the rest of the island appears to be somewhat intermittent and sparse. Devendra suggested this type of vessel may have originated from the south and west where, up until the nineteenth century, it was “under heavy rain forest cover which afforded builders a wide spectrum of timbers” (Devendra, 2011b: 21). He also speculated about the use of *oru* in the east and their demise as migrant fishermen moved, overland, from the south and west to the east with their vessels in response to the changing monsoons. This apparently came to an end in 1983 resulting in the demise of this craft in the east (Devendra, 2011a: 7). In addition, *oru* were not only found along the coasts but there are also references to their use in estuaries and lagoons (Vitharana, 1992).

Vitharana also discussed how *yathra dhoni* were distributed widely calling at all major and minor ports in Sri Lanka including Colombo, Negombo and Jaffna, as well as ports in southern India and the Maldiv Islands (Vitharana, 2012: 43-44). Hornell commented how “these old coasters” came from the coastal regions

between Colombo and Galle in the southwest of the island trading along the western coast (Hornell, 1943: 45). Whilst both vessel types seem to have been commonly found in the southwest of the island in the twentieth century *yathra dhoni* seem to have voyaged further afield.

### *Types*

Within studies of traditional boats there seems to be a strong need to classify vessels into a series of typologies and publications about Sri Lankan outriggers are no exception to this. This is particularly apparent in the discussion of *oru* where Kapitän (Kapitän et al., 2009) Vitharana (1992, 2012) and Devendra (2002) each devised systems of classifications. Vitharana noted a difference in size and features observing four main types existed at the time of writing in 1992. The first type being the *oru* in the simplest form comprising the dugout hull, booms and outrigger known, according to Vitharana, as *pila oru* which could vary with small gunwales attached to the hull (Vitharana, 2012: 30). Kapitän, however, described this type of vessel, for use on calm inland waters, as a *gañga-oru* (Kapitän et al., 2009: 56). The second type Vitharana identified were larger versions of the *pila oru* for use in lagoons for net fishing. He named these as *däl oru*, *katti däl oru* or *kullā* (Vitharana, 2012: 31), identified as *kattu-däl-oru* by Kapitän (Kapitän et al., 2009: 56).

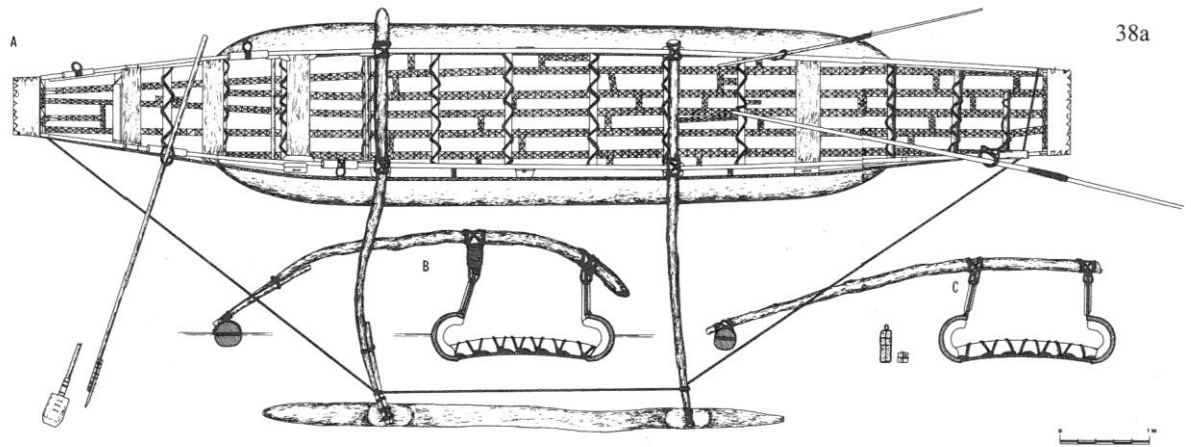
The most common type of *oru*, identified by Kapitän, Vitharana and Devendra, however are seagoing *oru* with washstrakes which, at the time of Vitharana's initial publication in 1992 could be seen around the west, south and eastern coasts (2012: 32). The last group identified by Vitharana were *vallam* or *vallam oru* with either no or shorter and lighter outriggers than those found on other *oru*. This group is again supported by Kapitän.

This group of outriggers, it would seem, varied according to their function, a concept Devendra strongly agreed with. For example, deep washstrakes were not required on calm inland waters but in rough seas were essential to prevent the canoe from filling with water (Devendra, 2011b). Whilst Vitharana (1992, 2012) and Devendra's (2002, 2011b) work on the different types of *oru* are useful in helping us to understand there was not one standard *oru* configuration and use, Kapitän's studies (1987b; 1987a; 1988, 1989, 1991; Kapitän et al., 2009) are the most comprehensive and thus most influential in understanding *oru* typologies. He devised two main steps in the classification of these vessels starting with an assessment of their use – whether they were for use on inland waters, for shore

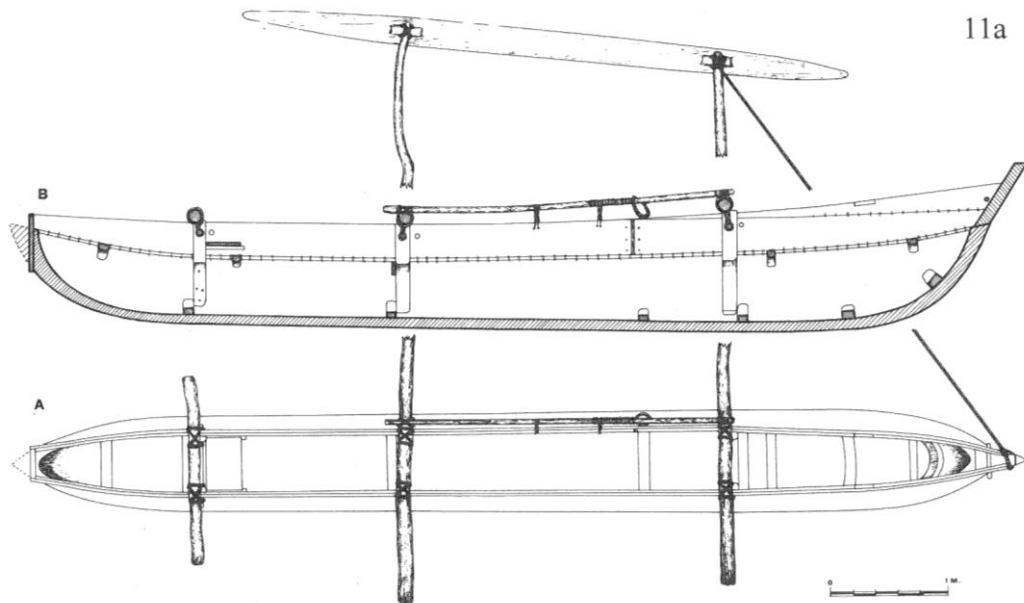
seining or sea-going. Within each of these categories a number of sub-types were then identified, for example in the sea-going category Kapitän noted a range of sub-types including *issañ-oru* (meaning prawn boat) and *thōra-oru* (for kingfish fishing), rigged with sails identified by Kapitän as double-sprit sails; *hādi-oru*, “*hādi* meaning ‘ornamentally shaped’” (Kapitän et al., 2009: 81) with two leeboards and a short rowing rail; and the *bala-oru*, meaning tunny boat, a rowed and sailed vessel with outboard rowing rails on either side (Kapitän et al., 2009: 80-81 and 95-101). These categories all seem to reflect the use and features of each *oru* and their ability to carry out fishing activities.

There have, thus far, been no attempts to classify *yathra dhoni* into sub-types but Devendra, using photographs and models, noted differences in their size and configuration concluding that some variation was likely (Devendra, 2014: 17). This comment, however, is based on a model from the British Museum which has only been briefly mentioned and thus requires further analysis to explore the accuracy of this object as a representation of a full-size vessel before such statements can be considered.

In addition to *oru* and *yathra dhoni*, Kapitän identified two other vessels in use in southwest Sri Lanka in the late twentieth century that contained an outrigger: a sub-type of the *mā-dāl-pāru* (Figure 57), a sewn-plank boat with chine strakes for shore seining; and a sub-type of the *vallam* (Figure 58), a logboat for fishing (Kapitän et al., 2009: 48-53 and 151-155). These vessels, however, in their standard form do not appear to contain outriggers and their outriggered versions have, thus far, been little studied. The adoption of the outrigger across various forms of craft designed for seafaring demonstrates the widespread use of this technology throughout Sri Lanka.



**Figure 57** Drawing of a *mā-dāl-pāru*, Lunawa, Moratuwa (Colombo District), 1990 (Kapitän et al., 2009: Drawing 38a)



**Figure 58** Drawing of a *vallam-oru*, Dodanduwa, Patuwata (Galle District), 1989 (Kapitän et al., 2009: Drawing 11a)

It would seem that *oru* have, thus far, been the most susceptible Sri Lankan watercraft to be classified by scholars. There are, however, limitations and problems with this method as, although it can help to make sense of variations that might occur across vessels, each traditional wooden *oru* was handcrafted without the aid of plans and measuring devices (Vitharana, 2012: 23-24). These vessels were therefore likely to vary to some extent and to be adapted by each individual owner according to trial, error and use – it is not necessarily the case that they conformed to a particular configuration just because they were used to

fish tuna or mackerel, for example. Caution must therefore be taken when studying these vessels to consider each vessel as a unique handcrafted object.

### **Features**

The basic components and specific features found on *oru* and *yathra dhoni* have been commonly discussed in published studies of these vessels. It has generally been agreed that the basic seagoing *oru* comprises a dugout hull with two washstrakes and end boards sewn on, two wooden booms lashed to the gunwale at one end with a solid wooden float lashed to the other ends through two holes bored in the upper part of the float (Kapitän et al., 2009: 80).

Several features, according to Kapitän, Devendra and Vitharana, vary according to classifications of type and function. Kapitän's work is particularly insightful due to his detailed drawings and photographs capturing different aspects of multiple *oru*. For example, some contain a mast, mast step, mast rest and sail<sup>7</sup>, others have rowing rails and outboard benches (Figure 59), thwarts, crossbeams, a platform on the outrigger used to hold fishing nets and baskets and others have booms reinforced with bamboo and a horizontal timber protruding from the outrigger end of a boom (Figure 60), known as a *kadise* in Sinhalese (Kapitän et al., 2009: 80). This feature is used with the outrigger windward so crew can stand or sit on the *kadise* acting as a counterbalance in strong winds (Kapitän et al., 2009: 80). The rigging likewise varies and several full-size *oru* have been depicted with leeboards / rudders.

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<sup>7</sup> The sail shapes and rigging do vary but this will be discussed under the subsequent heading





**Figure 59** *Oru* with outboard rowing rails on both sides, 1986 (Kapitän et al., 2009: Fig. 95)



**Figure 60** A large *palu-oru* for tunny fishing offshore. Note the masthead block, the horizontal timber on the after outrigger boom and the fish basket (all arrowed), Weligama Bay, 1986 (Kapitän et al., 2009: Fig. 137)

This differs considerably to the *yathra dhoni* which was said to essentially comprise of carvel planking with the joins caulked with coconut husk and coconut leaf (Vitharana, 2012: 46). The vessel contained a rudder, two masts, two curved

booms and an outrigger float (Hornell, 1943: 44; Vosmer, 1993: 37-42; Vitharana, 2012: 46-47). With few *yathra dhoni* recorded and studied it is difficult to ascertain variations that may have occurred with each vessel.

### ***Rigging and performance***

The sailing performance and technique of *oru* is a concept that appears within published studies of these vessels. Kapitän (Kapitän et al. 2009), Vitharana (1992, 2012) and Grainge (2012) particularly referred to the different rigs found on *oru*. Vitharana (2012), for example, classified *oru* into three different sailing rigs. These are distinguished by region. The first is described as a lateen rig (see Figure 61). This was supposedly a type that was used along the south coast (Vitharana, 2012: 34). Vitharana also identified the use of rectangular sails on a double mast used on the west coast of Sri Lanka (Figure 62) and of square sails used on the east coast (Figure 63).

Grainge (2012) reported his experience of sailing an *oru* with the rectangular sail Vitharana described. He noted how the hulls of these vessels were designed to be double ended but that the rigging had to be “turned inside-out” (Grainge, 2012: 158). Although it is not expected that the models will be able to help us to understand the sailing performance of these vessels (so this is not going to be discussed in depth here), it will be interesting to compare the models with the different sail types as described. Vitharana’s classification of rig seems very straightforward, but was this really the case?

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**Figure 61** South coast *oru* rigged with a settee sail (Dharmasiri Kāriyawasam in Vitharana, 2012: 24)

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**Figure 62** West coast *oru* rigged with a rectangular, double-sprit sail (Dharmasiri Kāriyawasam in Vitharana, 2012: 35)

[image removed and put in Appendix H due to copyright]

**Figure 63** East coast *oru* rigged with a square sail (Dharmasiri Kāriyawasam in Vitharana, 2012: 35)

### ***Construction***

One of the themes to appear in multiple publications within the discussion and study of traditional Sri Lankan outriggers is the notion of construction and fastening techniques. Several scholars referred to the dugout hull and use of stitches to secure washstrakes and end boards together on *oru* (Edye, 1834; Hornell, 1943; Hollander et al., 1984; Prins, 1986; Folkard, 2000; Devendra, 2011b, 2014). However, Vitharana produced the most in-depth account of the construction process using ethnographic evidence in 1992 (later republished in 2012 and as an appendix in Kapitän et al., 2009).

Vitharana observed how the construction process started with the selection and felling of a tree of adequate size which was hollowed out with an adze, hammer and chisel, as demonstrated in Figure 64 (Vitharana, 2012: 23-26). The outrigger float was reportedly then carved with two curved branches made ready for the booms. Holes were next bored out of the dugout hull with corresponding holes in planks which would form the washstrakes which were joined using a sewn method<sup>8</sup>. A lining of coconut leaf 5 cm wide was placed over the joins between the dugout hull and washstrakes and stitched together using coconut fibre rope, or coir, threaded between the bored holes forming vertical stitches with cross stitches in between (Figure 65). Whilst Vitharana described this formation as an “envelope flap design” (2012: 24). Prins referred to this process as a continuous linking cross stitch method (1986: 26).

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<sup>8</sup> Sewn, in this instance, refers to continuous stitching whereas lashed can be defined as isolated, or non-continuous, stitches. Both of these fastening methods form particular patterns through a series of co-ordinated acts (Prins, 1986: 14)



**Figure 64** Hollowing out a log with an adze (Kapitän et al., 2009: photo 39)

[image removed and put in Appendix H due to copyright]

**Figure 65** Close up image of the sewing technique used on *oru* (Vitharana, 2012: Fig. 8)

A thin strip of wood is later added to the top of the washstrakes forming gunwales (Vitharana, 2012: 24) and thwarts and crossbeams inserted into the hollowed out hull. Two curved booms are then lashed to the gunwales and the other ends of the booms lashed to the float through the “*kanhiya*” (2012: 24), or raised sections in the float with holes bored through for the purpose of lashing. Although Vitharana identifies the use of sticks bound to the booms with coir rope acting as reinforcements to strengthen the outrigger, Kapitän’s photographs published in 2009 show that whilst this was a feature on some *oru*, the booms on others were not reinforced.

Further descriptions specific to the double-sprit sail *oru* were given by Vitharana including the fastening of a mast step and *kadise* which is described as being “tied horizontally to the central boom” (2012: 25). In addition, the types of wood used to construct *oru* were referred to on several occasions where Vitharana described how the different components (hull, washstrakes, booms, outrigger

float, mast, rudder, oars) of the vessel were constructed from different timbers, all of which are hard woods to withstand use in the sea and lagoons (2012: 26-27). Edye likewise described how the hull, in 1834, was made from dūp-wood or pine varnish-tree (Edye, 1834: 5) and Hornell stated the washstrakes were generally made from jackwood (1943: 40). The stronger the wood used for the hull, the longer the vessel would last (Vitharana, 2012: 27).

[image removed and put in Appendix H due to copyright]

**Figure 66** The horizontal timber, or *kadise*, attached to the outrigger boom (Vitharana, 2012: Fig. 12)

Whilst the construction of *yathra dhoni*'s has not been described in quite as much detail as *oru*, it is still a common theme presented in studies of these vessels. Folkard, for example, described how no nails or pegs were used in its construction as the planks were stitched together using "coir yarn" (Folkard, 2000: 452). The seams were then made watertight by "soft matting...interwoven between the seams" (Folkard, 2000). Vosmer, using a model from the Maritime Museum in Galle said to be an accurate portrayal of a *yathra dhoni*, described how this vessel was assembled with wide carvel planking sewn together. Here Vosmer makes an interesting point observing that the bulk of the stitches were outboard the vessel which was a common feature found in Sri Lankan boats but "unusual in sewn craft of the Arabian Gulf and India" (1993: 39). Hornell added an interesting contribution to the discussion of caulking on these vessels stating leaf stalks of palm leaves were placed over the joins both in and outboard with dried plantain-leaf stalks inserted between the plank edges (Hornell, 1943: 43). Although constructed with flush-laid planking built up from a keel piece studies and drawings suggest these vessels were sewn together using the same technique employed in the construction and fastening of *oru*.

### **Use**

A range of fishing activities seem to be the most commonly discussed use of *oru* in published studies to date. Kapitän, Vitharana and Hornell in particular referred to different types of fishing including mackerel, prawn, tuna and kingfish using methods such as line fishing, sling nets, trawling and shore seining (Hornell, 1943; Vitharana, 1992; Kapitän et al., 2009; Vitharana, 2012). Kapitän described how these vessels were not only used during the day but also at night with vessels, such as the *rā-muhudu-oru* and the *palu-oru*, fitted with a stick to hang an oil lamp (2009: 119-141). In addition, Vitharana and Edye referred to the use

of *oru* as ferries transporting goods and passengers from ships to shore and vice versa (Edye, 1834: 5; Vitharana, 2012: 22) and discussion of the double-ended nature of some of these vessels and their ability to be sailed, rowed, poled or paddled also featured across publications (e.g. Kapitän et al., 2009; Devendra, 2011b: 20).

*Oru*, mainly employed by fishermen, were used regularly, often six days a week, to bring home fish to sell as well as feeding the crew and their families making these vessels indispensable among fishing communities (Hollander et al., 1984: 71-83; Devendra, 2011b: 21; Vitharana, 2012: 29). Along with their frequent use helping to support livelihoods, they often underwent particular ceremonial practices. This notion of symbolism and ceremony was discussed by Vitharana through an ethnographic study of these craft in the late twentieth century. These seem to vary across regions and religions but consist of particular practices following construction and prior to launching an *oru*. For example:

*"In the Catholic areas of the West coast and Batticaloa the priests bless the craft sprinkling holy water and lighting incense sticks before it is pulled down the beach. The fishermen offer prayers before setting off. Sometimes a special prayer is held within a church at which priests would say 'God bless these fishermen and this boat and protect them from calamity'. Eats and drinks are next served"* (Vitharana, 2012: 27).

This differs to the eastern coast of Sri Lanka in Trincomalee where:

*"There is a general belief that a divine or a demonish spirit resides in a tree, and that he has to be pleased before the tree is cut down. The ceremony at the launching is held specially in his honour"* (Vitharana, 2012: 27).

In addition to the overall use and associated ceremonial practices associated with *oru*, there has been mention within publications about the maintenance of these vessels. For example, Vitharana described how traditional wooden *oru* could last at least twenty-five years so long as they were maintained (2012: 27). To maximise the life of these vessels by reducing water absorption and surface cracking the dugout hulls were scrubbed on the exterior with sand, cleaned and then coconut oil applied once a month (Gulbrandsen, 1990: 3). Traditionally these vessels were not painted but now, in their new fibreglass form, it is common for the hulls to be painted in bright, vibrant colours (as demonstrated in Grainge, 2012).

### ***Evolution and history***

The final theme to emerge through studies of *oru* and *yathra dhoni* is the concept of evolution and attempts to trace their origins. Devendra's work, in particular, focuses on the adaption and evolution of these vessels over time arriving at the conclusion that two types of vessels in Sri Lanka stemmed from the basic dugout log – the *paru* and *oru*. From this *oru* branch came the extended *oru* which Devendra believed went through an adaptation process whereby multiple planks were sewn onto a dugout hull. This was later said to have developed into the *yathra dhoni* moving away from a dugout hull (Devendra, 2002; 2011b, 2014).

In addition, Vitharana and Devendra both discussed the long history of *oru* claiming they were in use at least 2,000 years ago (Vitharana, 2012: 22; Devendra, 2014: 12). The evidence for this, however, is limited<sup>9</sup> but Devendra speculated the reason for the long history of these vessels which, in their basic components, remained little changed until the twentieth century, was due to environmental factors, such as the availability of local materials, including timbers and coconut fibres, and the success of their overall form, with shallow draught and a keeless, sturdy hull which enabled the craft to withstand abrasion from the sand in the shallows and during beaching (Devendra, 2002: 132; Devendra, 2011b: 13).

#### **6.1.3 Summary**

A considerable amount of studies of Sri Lankan outrigger boats have been conducted by different researchers compared to studies of traditional boats in many other parts of the Indian Ocean, such as Myanmar. Whilst they can help us to understand different types of outrigger / *oru* vessels, their construction and use, they were predominantly published in the late twentieth and early twenty-first centuries. Information about, and evidence for, outriggers pre-dating the late twentieth century is thus limited but Edye (1834) and Paris' (1841) works do offer useful insights into the overall form and construction of *oru* and *yathra dhoni* in the nineteenth century. In addition, Hornell's (1920, 1943) publications in the early and mid-twentieth century are particularly informative with the inclusion of a diagram of a *yathra dhoni* and photographs of *oru*.

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<sup>9</sup> Evidence for the long standing use of *oru* can be seen in a logboat from the Kelani Ganga in Colombo, <sup>14</sup>C dated to 2300 BP ± 100 years, recorded by Kapitän who advocated it was likely used with an outrigger and could thus be an early form of the *oru* (Kapitän et al., 2009: 168-170)

The most influential work about *oru*, which can be used throughout this case study to help compare and inform how accurate models are as representations of full-size vessels, is Kāpitan's edited monograph published in 2009. This book includes technical drawings and photographs from a wide selection of *oru*. In addition, Vitharana's work (1992; 2012) offers useful information about the construction of *oru* and the overall form and use of *yathra dhoni*. Grainge (2012) can help us to understand the practical sailing abilities of *oru* and Vosmer (1993) provides a useful insight into *yathra dhoni* through the analysis of a model. As such, there is an existing body of literature on outriggers from Sri Lanka against which it is possible to compare the large number of models of these craft.

## 6.2 Outrigger models

With the aim of this chapter to compare and contrast models of Sri Lankan outriggers with published studies of these boats the purpose of this section is to briefly introduce the models and their contexts, when they were made, collected and their purpose. This will provide some background information about the body of material that will subsequently be compared with the literature discussed in section 6.1 enabling questions about accuracy, types and boat building techniques to be considered.

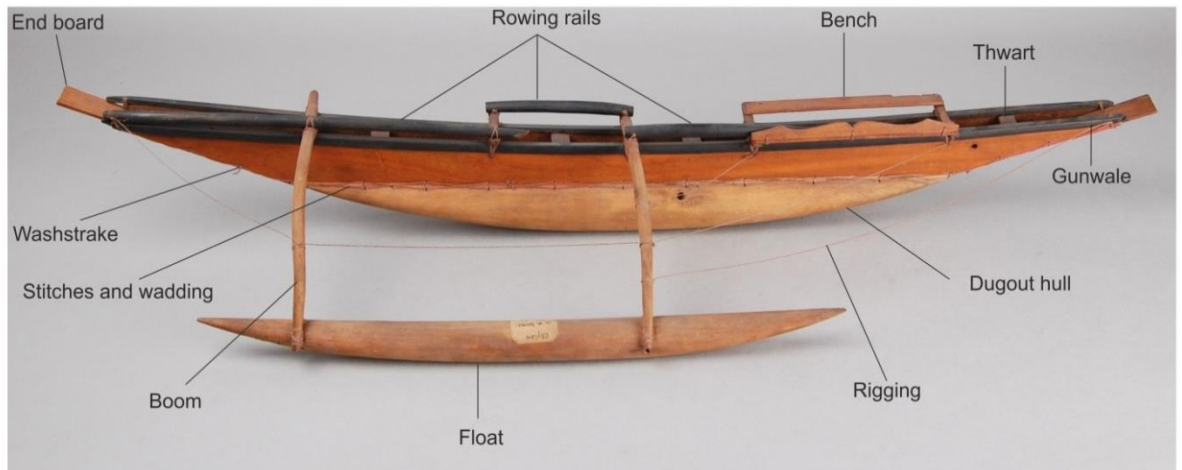
### 6.2.1 Models – an introduction

Models of outriggers, made and collected from Sri Lanka, are present in museum collections throughout the UK. Whilst only three have been identified as miniature representations of *yathra dhoni*<sup>10</sup> (Figure 68) models of *oru* (Figure 67) are surprisingly common with seventy-two appearing in twelve out of the thirteen museum collections consulted. These objects, intricately carved from wood and stitched together, are highly detailed, range in size and contain a variety of features such as masts and seats, or thwarts. A catalogue of these models is presented in Appendix F.

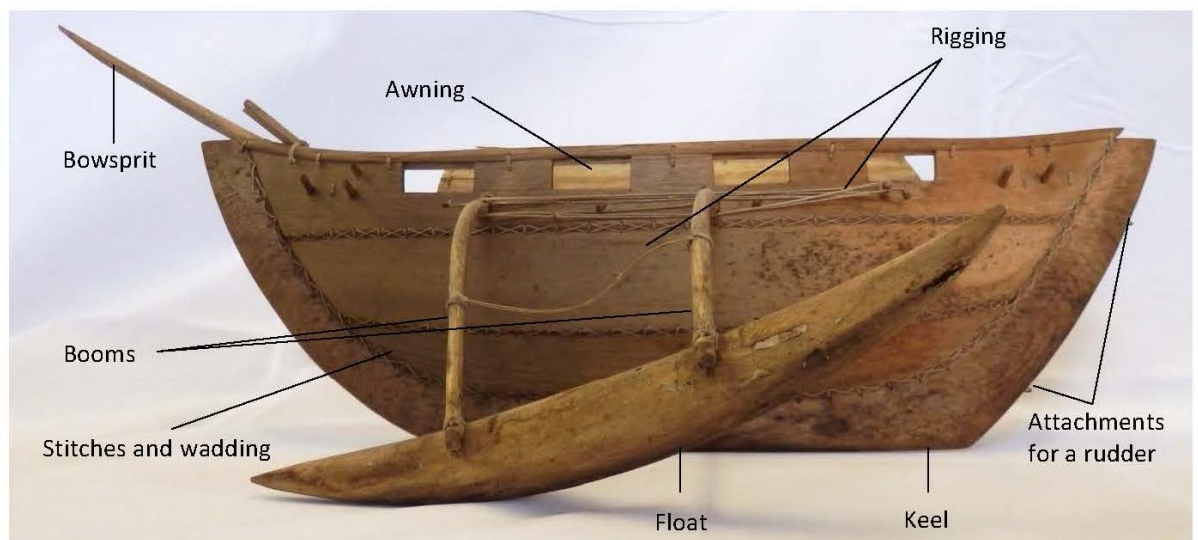
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<sup>10</sup> The models have been identified using a combination of museum documentation, historic records and published studies





**Figure 67** Labelled model of an *oru* showing its different components, 778mm in length (inventory As1907,-67; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence, adapted by author)






**Figure 68** Labelled model of a *yathra dhoni* showing its different components, 486mm in length (No inventory number; from the EISCA collections, adapted by author)

Outriggers are not, however, the only miniaturised vessels from Sri Lanka to be preserved in museum collections. Table 14 shows a variety of watercraft from rafts (*teppam* or *kattumaran*) to double logboats (*angula*) and sewn boats with chine strakes (whereby the models mimic sections of hollowed out logs incorporated into plank-built boats to enhance buoyancy, known as *madel paruwa*). Whilst this chapter is primarily concerned with vessels containing outriggers it is interesting to observe the range of vessels portrayed in miniature form, how models of *oru* considerably exceed others and the similar stylistic

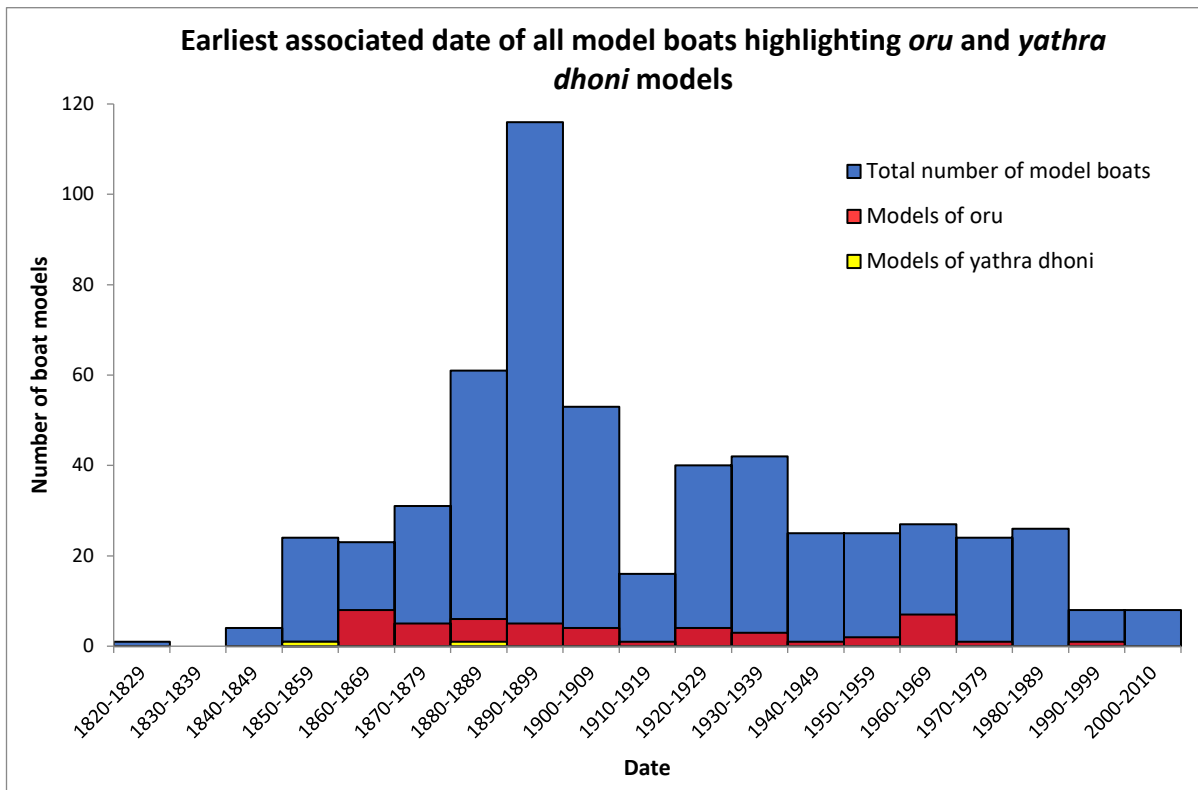
traits that are apparent in their construction. For example, they have all been fashioned from wood and assembled using particular sewn or lashed methods.

**Table 14** Models of Sri Lankan watercraft

Vessel type	Brief description	Image	Number of models
<i>Oru</i>	Logboat with sewn washstrakes and a single outrigger		72
<i>Yathra dhoni</i>	Sewn planked boat with outrigger		3
<i>Madel paruwa</i>	Sewn planked boat with two chine strakes		15
<i>Angula</i>	Two logboats connected with horizontal wooden planks		6
<i>Dhoni, unspecified</i>	Sewn planked boat		3

Vessel type	Brief description	Image	Number of models
Raft ( <i>teppam</i> or <i>kattumaran</i> )	Logs pegged or lashed together		2
<i>Warakan oruwa</i>	Sewn planked boat, similar in form to the <i>yathra dhoni</i> but with additional decking at the stern and no outrigger		3
Unidentified			2
Total Sri Lankan models in this dataset:			<b>106</b>

The *oru* and *yathra dhoni* models identified were made and collected from the mid-nineteenth century onwards. This broadly follows the overall patterns identified in Chapter 3 (see Figure 69), with a higher proportion of outrigger models collected in the mid to late nineteenth and early twentieth centuries.



**Figure 69** Earliest dates the *oru* and *yathra dhoni* models were made, collected or acquired by museums, compared to dates associated with all of the models in this dataset

The noticeable peak in the quantity of model *oru* entering museum collections during the period 1965-9 is not a true reflection on the dates these models were collected. These models entered the Pitt Rivers Museum in 1969 after being transferred from Oxfordshire County Museum. The dates of their initial production and collection are unknown resulting in unreliable information in terms of dates. This reflects the nature of working with museum objects and their often complex biographies which can sometimes result in a loss of information or limited records.

There appears to be a clear reduction in models being acquired by museums in recent years which could be due to pressures on museum collecting practices and storage issues (Macdonald, 2011: 88). This does not necessarily reflect a reduction in the amount of *oru* and *yathra dhoni* models being made in Sri Lanka and collected – indeed there is evidence to prove the collection of *oru* models is still an active practice (which will be discussed later within this chapter).

What is apparent, however, is that most of the models represent *oru* and *yathra dhoni* from the mid-nineteenth to early twentieth century with some representations of these vessels intermittently throughout the twentieth century.

### 6.2.2 Why were the models collected?

Models of Sri Lankan outriggers were each made and collected for a particular purpose to fulfil a specific role before they entered museum collections. Like other models in this study the history behind each of the *oru* and *yathra dhoni* models is not always traceable due to limited museum records. Nevertheless, the identification of collectors, when possible, can help us to understand their purpose and context.

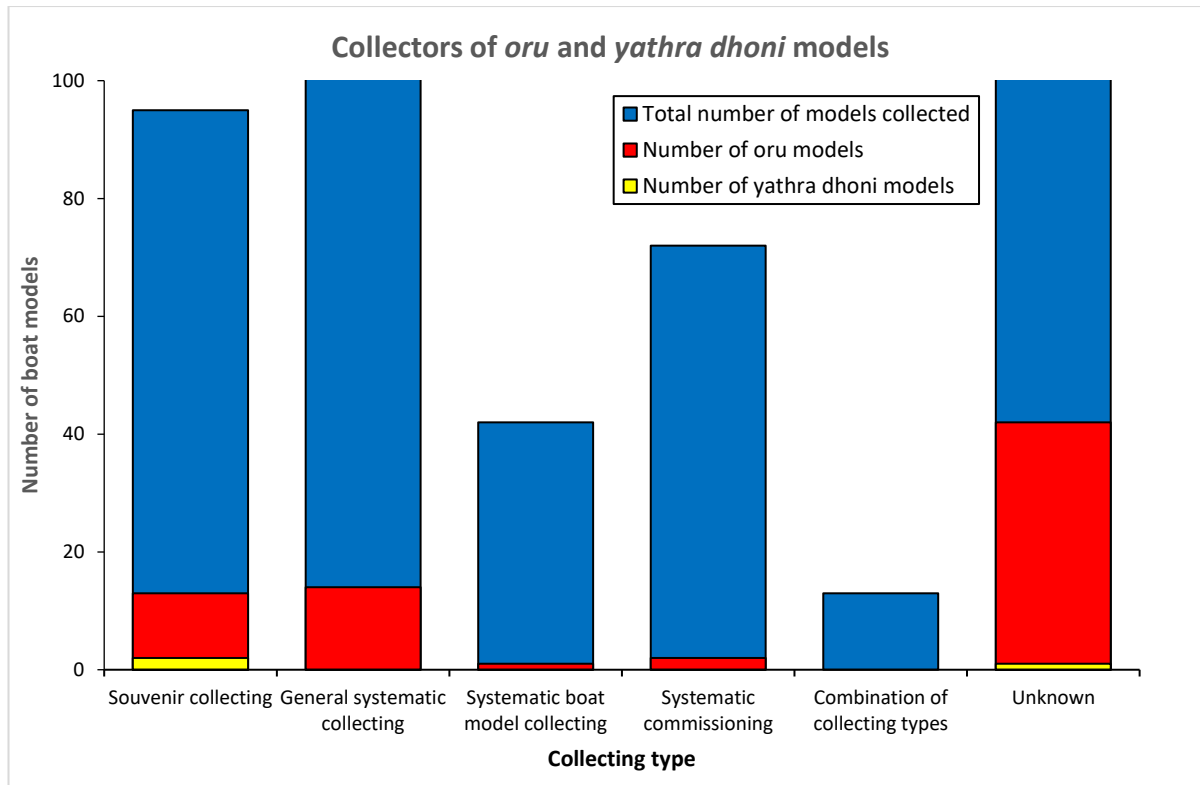
Figure 70 shows that, although the majority of the collectors are unknown, thirteen *oru* and two *yathra dhoni* models were collected randomly as souvenirs. This includes royalty, such as HRH the Duke of Cornwall who was presented with a model *oru* on a visit to Kurunegala in 1955 (National Maritime Museum, AAE0021); members of the armed forces collecting as memorabilia on expeditions, such as Lieutenant Sievwright who collected a model of a *yathra dhoni* in 1854 (British Museum, As1933,1110.1), and British chaplains working overseas, such as Frederick Lugard who collected a model *oru* before he left India in 1864 (Pitt Rivers Museum, 1949.8.40).

The graph also shows fourteen *oru* models were collected systematically, along with the collection of other objects. This includes colonial officials, such as the Governor of Ceylon Sir Arthur Gordon Hamilton in 1888 (Pitt Rivers Museum, 1888.11.1), who were either presented with models or collected objects to be brought to the UK to showcase different cultures. In addition, anthropologists, such as Augustus Pitt Rivers (Pitt Rivers Museum, 1884.81.26), botanists such as Thwaites (Kew Gardens Economic Botany Museum, 49495) and curators including Geoff Hancock (Glasgow Museums, A.1994.19) all collected models of Sri Lankan outriggers along with other objects reflecting cultures and environments in Sri Lanka.

Lastly, two model *oru* were commissioned for the International Exhibition of Science, Art and Industry, Glasgow held in 1888 and one model was collected by James Hornell as evidence for Sri Lankan watercraft. Whilst it would be expected that these models, as well as those collected systematically, would be more likely to be detailed than those produced as memorabilia, this is not the case. This concept will be explored throughout this section.

Figure 70 shows how the collectors of outrigger models closely follows the overall patterns of collecting types identified in Chapter 4. General systematic collecting and souvenir collecting accounted for the majority of the outrigger models

amassed, with few commissioned for exhibitions or collected specifically targeting boat models.



**Figure 70** The different types of collectors of *oru* and *yathra dhoni* models imposed over the overall collectors of all the models within this research. This has been zoomed in to see the first 100 models to make the graph clearer

Models of *oru* collected as specimens by anthropologists and ethnologists, such as Hornell and Pitt Rivers, or botanists, such as Thwaites, were collected as educational resources to demonstrate local cultures and associated material goods. It would thus seem *oru* were seen by these collectors as objects that were significant and representative of local communities within Sri Lanka which could be demonstrated through the collection of transportable models representing *oru* at a reduced scale. Alternatively, models were collected as memorabilia of overseas voyages acting both as reminders of memories and experiences and as trophies of voyages that could later be linked to a narrative of one's travels (Stewart, 1993: 134-147). The phenomenon of collecting multiple *oru* models as souvenirs suggests these particular types of vessels were seen by westerners as iconic to Sri Lanka thus creating a sense of symbolic status. Similar statements cannot be said about models of *yathra dhoni* as few models were collected and acquired by UK museums. It is important to note, however, that the quantity of models in museum collections is not necessarily reflective of the amount initially

produced or collected – it is highly likely the amount of *oru* and *yathra dhoni* models produced and collected was significantly higher.

### 6.2.3 Summary

Models of both *yathra dhoni* and *oru* vary in terms of their size, date of production and collection, purpose and their features yet there are consistencies in their overall form and method of construction showcasing particular stylistic traits. All of the models have been fashioned from wood and use a combination of continuous and isolated stitches with the addition of dried palm leaves over the joins. They all contain a single outrigger which is fastened to two wooden booms through holes bored into the float or through a raised section of the float. The *yathra dhoni* models all contain a mast or evidence of a mast and the *oru* models vary with some containing oars or paddles, and others containing sails of varying size, shape and rigging. In addition, some of the models have rigging running from the booms to the hull in various configurations whereas others completely omit any form of rigging. To assess how accurate these models are likely to be as representations of full-size vessels, if these consistencies and variations are accurate portrayals or if there are features that are particular to models, the next section will compare this data with published studies of *oru* and *yathra dhoni*.

## 6.3 Comparing models with studies of full-size boats

The heart of this study asks what value models might have for our understanding of traditional boats. Whilst there have been studies conducted and published about Sri Lankan outriggers, they do not provide extensive information about all aspects of these vessels. The majority refer to outriggers of the late twentieth century or were conducted retrospectively; leaving gaps in our knowledge and understanding of these boats and the communities they helped to support. The studies that have been conducted do, however, provide some crucial information about the configuration of such outriggers and their use. This can be compared with models to ascertain how likely they are to accurately depict full-size outriggers and if they can be used to help support or contradict our current understanding of these boats or if they are able to reveal any new information. The demise of traditional wooden *oru* and *yathra dhoni*'s makes this case study particularly significant in an attempt to further gauge information about the outrigger vessels that once plied the coasts and inland waterways of Sri Lanka. With evidence available for these vessels in the form of published studies, this

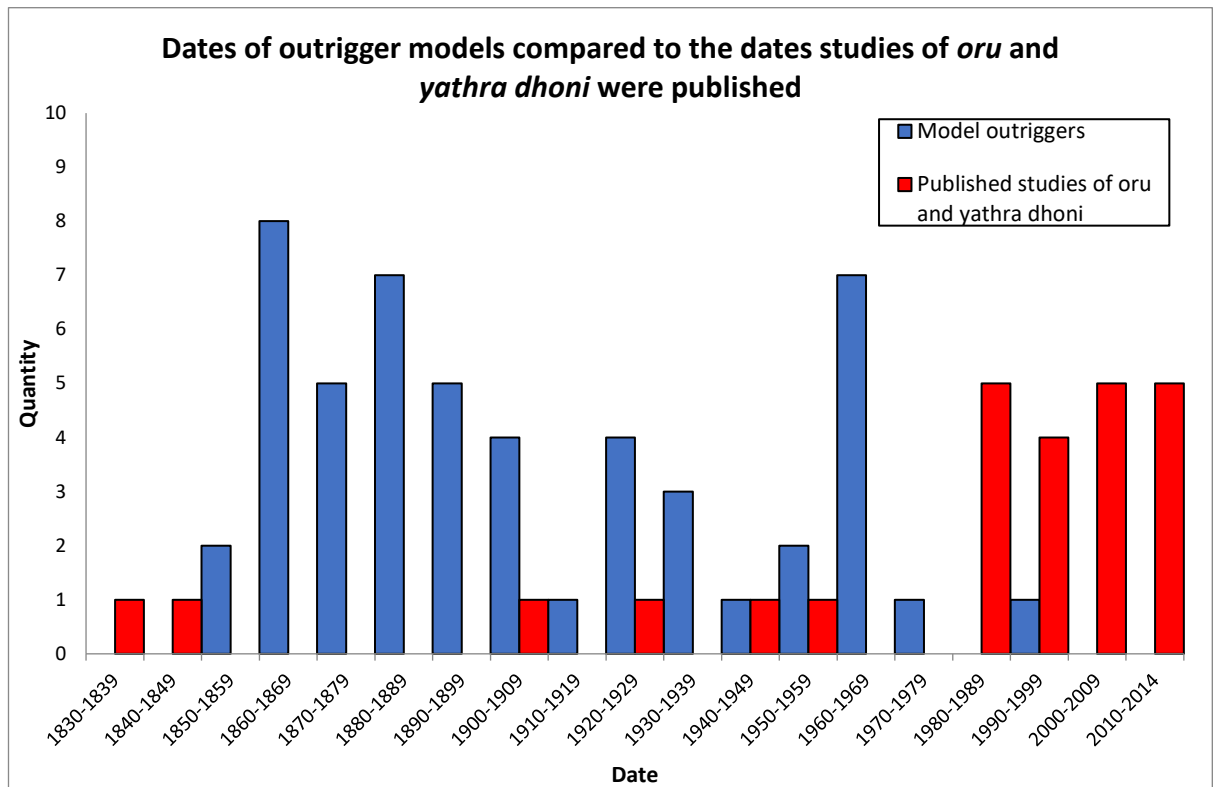
chapter uses examples of Sri Lankan vessels to explore how models can reflect realistic traits of full-size boats.

### **6.3.1 Can models provide information about outriggers over time?**

With the exception of Edye (1834) and Paris (1841), systematic studies of Sri Lankan outriggers have only been conducted since the early 1900s, and most date to the last forty years. A key finding of this study is to show that there are twenty-seven models that were made before 1900. As such, they may provide evidence for traditional boats before most systematic studies were conducted and potentially provide evidence for changes in these boats over time.

Figure 71 shows the extent that models pre-date the majority of published studies about *oru* and *yathra dhoni*. Most of the models date from the mid to late-nineteenth century yet the majority of studies were conducted and published in the late twentieth and early twenty-first centuries. The quantity of models made, collected and entering museum collections then declined in the late twentieth century which happened to coincide with an increase in the volume of systematic studies being conducted and published about these watercrafts. Models are therefore significant objects with potential to provide evidence for *oru* and *yathra dhoni* prior to the publication of most studies of these vessels which could in turn offer new insights and help us to understand these boats and their associated cultures at a time of British imperialism.





**Figure 71** Dates the models were made, collected or acquired by museums compared to the dates studies of *oru* or *yathra dhoni* were published. This shows how these two sources differ with models often pre-dating published studies

### 6.3.2 Distribution





There are certain restrictions with using models to understand the distribution and regional differences of outriggers in Sri Lanka due to limited museum documentation detailing their provenance. However, fifteen *oru* models where specific locations have been documented, the majority of which pre-date published studies of these vessels, support the notion that *oru* were mainly used along the south and west coasts of the island, particularly around Colombo, Galle and Negombo with some late twentieth century literary evidence also pointing to their use on the east coast around Batticaloa (such as Vitharana, 1992; Vitharana, 2012). Whilst some models do indeed support studies of these vessels in terms of their distribution, models of *yathra dhoni* lack details of specific provenances. Even a specific location would not necessarily imply the vessels were used in the area that a model was either produced or collected. Models are therefore limited in their specific application in studying outrigger distribution beyond helping to support published studies as, even if a specific location is known, the region a model was produced or collected does not necessarily reflect the region a full-size outrigger vessel was used.

### 6.3.3 Types




Studies of *oru* described how these boats were categorised according to function with Kapitän (2009) and Vitharana (1992, 2012), in particular, devising systems of classification to divide these vessels into sub-types. Museum records do not make distinctions between the different types of outrigger vessels the models represent. The models do, however, vary in their overall appearance, features and scale. In fact, a surprising result of this study has been that the models appear to show a greater variety of features than is apparent in the literature.

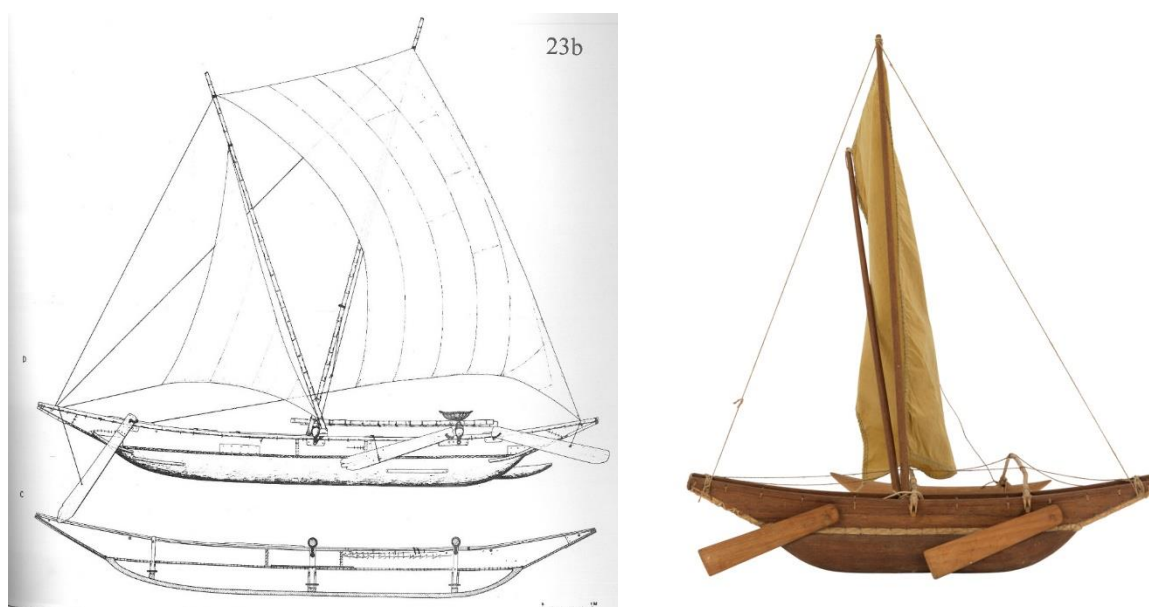
All of the models contain deep washtrakes. Kapitän hypothesised this feature means they represent seagoing *oru* as opposed to those used on calm inland waters where no or low washtrakes are required (Kapitän et al., 2009). According to both Kapitän (Kapitän et al., 2009) and Vitharana (1992, 2012), these seagoing *oru* were the most common type to be used in the late twentieth century. Taking this means of comparison further Table 15 incorporates sub-types identified by Kapitän and groups apparent among the models through an analysis of key features which are obvious on the models, including sails and rowing rails. This reveals that only ten models seem to conform to Kapitän's sub-types of seagoing *oru* leaving sixty-two uncategorised. By further analysing these models, patterns were identified revealing four groups of models showing similar stylistic features. Table 15, therefore, attempts to group the models of *oru* by sub-types using Kapitän's typologies (indicated by the numbers 4.1, 4.4 and 4.5), as well as the addition of categories identified by the author (indicated by the letters A-D). It should be noted though that Kapitän recorded a total of forty-two watercraft including log rafts, double canoes and shore seining boats, or *madel paru* (Kapitän et al., 2009: 9). The quantity of *oru* recorded therefore is considerably less than the seventy-two models identified making the models a larger body of material to analyse. It must also be highlighted that, due to the eruption of civil war during his fieldwork years, Kapitän only recorded *oru* from the south and west of Sri Lanka so it is possible that types used in other regions (although considerably fewer in number) have been omitted from this study.

**Table 15** Classifications of *oru* combining types identified by Kapitän which has been built on by the author

Type	Devised by	Name of <i>oru</i>	Image	Definition (by Kapitän and the author)	Quantity of models
4.1	Kapitän	<i>Issaṇ-oru</i> or <i>thōra-oru</i>		Seagoing <i>oru</i> rigged with <i>oru</i> sprit sail and with 2 or 3 leeboards	4
4.4	Kapitän	<i>Elena-däl-oru</i> , <i>pilā-oru</i> or <i>rā-muhudu-oru</i>		Seagoing <i>oru</i> with one short rowing rail on the outrigger side	2
4.5	Kapitän	<i>Podi-oru</i> , <i>rā-muhudu-oru</i> , <i>palu-oru</i> , <i>bala-oru</i> or <i>ām-oru</i>		Seagoing <i>oru</i> with one long outrigger-side rowing rail between the ends of the hull	4
A	Author	N/A		Seagoing <i>oru</i> with a settee sail, 1-3 benches on the gunwales, 1-4 rowing rails and stayed from the booms to both ends	29

## Chapter 6 - Outriggers of Sri Lanka

Type	Devised by	Name of <i>oru</i>	Image	Definition (by Kapitän and the author)	Quantity of models
B	Author	N/A		Seagoing <i>oru</i> with settee sail or no sail, 2 leeboards and a <i>kadise</i> , not stayed on the booms	4
C	Author	N/A		Seagoing <i>oru</i> with a settee sail, sometimes a <i>kadise</i> but no rails or leeboards	2
D	Author	N/A		Seagoing <i>oru</i> with no sail, 2 leeboards, a frame on the booms and no stays	2
Unclassified	Author	N/A		Incomplete and thus not possible to differentiate types	25



**Figure 72** Comparison of a drawing of an *Issaṇ-oru* or *thōra-oru*, described as Type 4.1 (Kapitän et al., 2009) with a model of a similar vessel in the National Maritime Museum collections, 570mm in length (inventory number AAE0158; © National Maritime Museum, London)

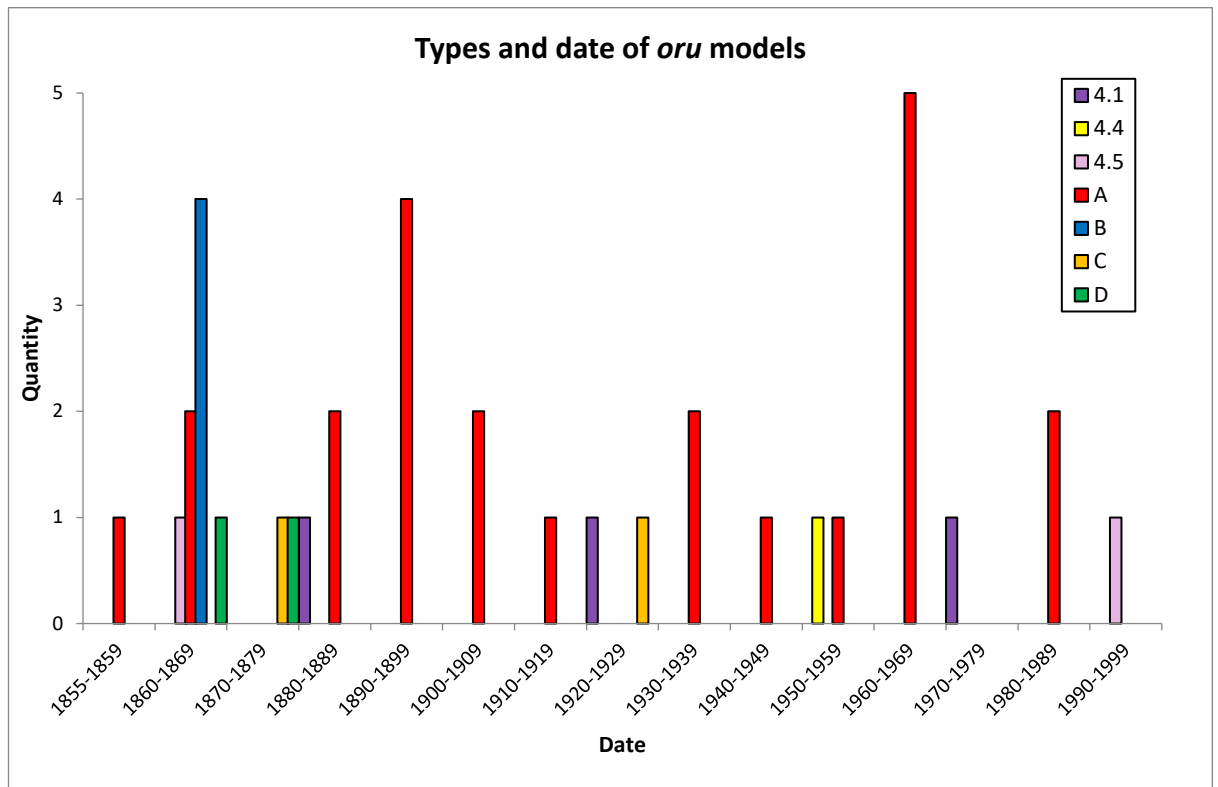
Over 40% of the models contain a settee sail, one to three benches atop the gunwales, one to four rowing rails and are stayed on the booms to each end suggesting they worked as double-ended watercraft<sup>11</sup> but do not conform to any of Kapitän's categories. This group of *oru* models have been identified as group A in Table 15, a new group previously unidentified. There are fewer models that comprise the other three groups but these are, nevertheless, new sub-types of *oru* that appear to be represented across more than one model that have previously been omitted from studies.

To ascertain if these groups were attributed to a specific period in time the various types identified have been plotted against their date of production, collection or acquisition (Figure 73). This is interesting because the graph does not show any particular patterns across potential types of *oru* that were produced in miniature form over time suggesting that an array of types were in use at any given time. Type A for example seems to have been present for over 100 years which could suggest this type of *oru* was real. There is, however, a pattern in the *oru* identified as category B with either a settee sail or no sail, two leeboards and a *kadise* which were all dated to 1864 at the latest. These four models, which are now all coated in a thick lacquer (see Figure 74 for example), were transferred from Somerset House in 1864 to the South Kensington Museum and were later

<sup>11</sup> Kapitän suggested *oru* that were stayed fore and aft were double-ended able to proceed from either end first (Kapitän et al., 2009: 66)

moved to the Royal Naval College Museum before finally entering the National Maritime Museum's collections when it became established as an institution in 1934 (National Maritime Museum records). With their long and complex history in museum collections, the initial acquisition details are unknown but we do know that these models all share similar stylistic traits and were produced in 1864 at the very latest making them some of the earliest *oru* models in UK museum collections. These models could thus provide evidence for an early type of *oru* that has otherwise not been recognised in publications to date. They each have comparatively long booms, appear to be double ended but the outrigger is off centre and there is no sign of rigging from the booms. The addition of the horizontal timber, or *kadise*, protruding from the booms indicates this type of vessel would have been used in rough seas enabling crew to step onto it to counterbalance the vessel. Whilst only one of these models now contains a sail it is possible the other models may once have had this feature which could have become detached and lost over time. This would make sense as the *kadise* is a feature that would have been used under sail in high winds. This, however, is only speculative.

Furthermore, it is interesting to observe how there is evidence for the type of *oru* identified by Kapitän as type 4.1 as early as the 1880s. This suggests this type of vessel had not changed over time, or at least within 100 years.



**Figure 73** Different types of *oru* represented in model form and the dates of their production, collection or acquisition into museum collections



**Figure 74** Model identified as category B with two leeboards (which have been attached to the gunwales during its life in the museum) and a *kadise*, 467mm in length (inventory number AAE0011; © National Maritime Museum, Greenwich, London)

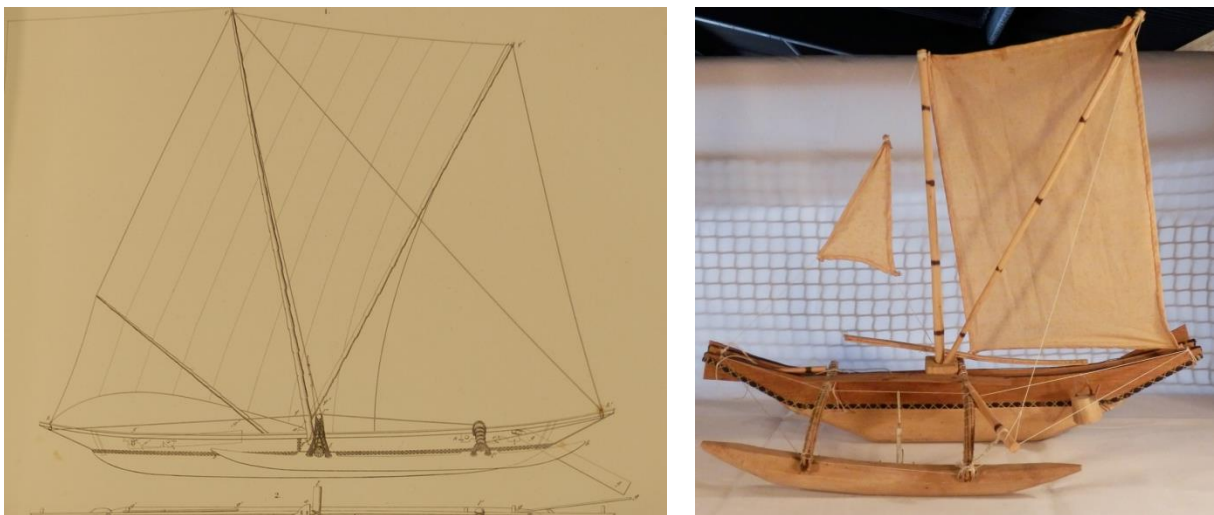
Although typologies for these models have been considered there is a danger in attempting to unnecessarily force them into categories. Models, similarly to the full-size vessels, were individually hand crafted without the use of plans and are thus likely to range in their configuration. However, whilst considering this there does seem to be strong evidence from the models to suggest there was more variety among *oru* and they contained a wider range of features than Kapitän (2009), Vitharana (1992; 2012) and Devendra indicated (2002, 2011b). The notion of classification according to use, however cannot be supported as the models are static museum objects and thus rely on visual analysis resulting in the exploration of features over function in the identification of sub-types. This idea of use will be discussed further in section 6.3.8.

With the small sample size of *yathra dhoni* models available and little published in studies about variations and types it is not possible to identify whether different types of these vessels existed before their demise in the 1930s.

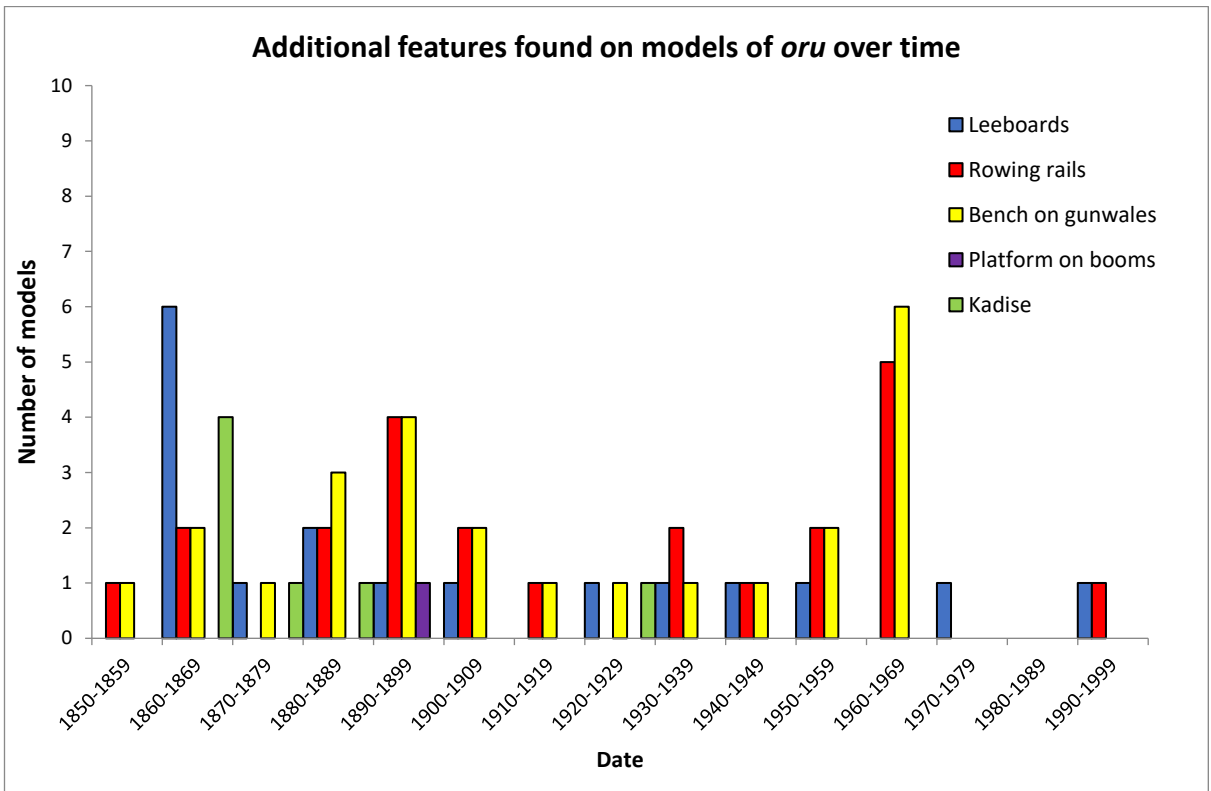
### 6.3.4 Features

Close examination of models and images and descriptions within current studies, particularly Kapitän's plans, reveal certain similarities and differences in terms of the features presented on *oru*. For example, thwarts, sails, mast rests and rowing rails are quite often present in depictions of *oru* in published studies as well as models (see Figure 75 for example). In this case the models help to confirm the presence and configuration of these features on full-size *oru*. However, there do also appear to be additional features present on the models that are not otherwise mentioned or depicted within published studies to date. Figure 76 shows a selection of the predominant features found on models including rowing rails, leeboards and benches atop the gunwales and how frequently they appeared over time. All of these features, with the exception of benches, are depicted in studies of *oru* and the graph shows there are few obvious changes over time, although no models from the mid-twentieth century onwards appear to contain a *kadise* and only one model, where a date has been identified, contains a platform on the outrigger booms.



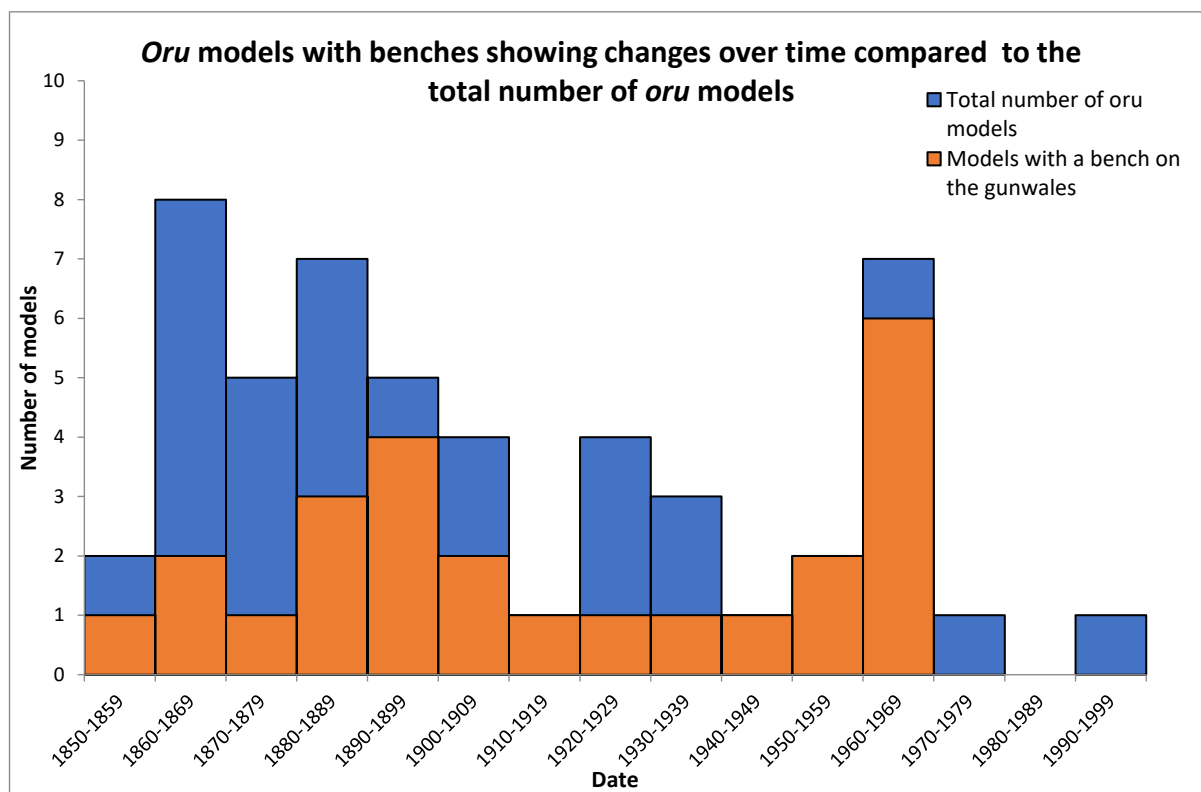


**Figure 75** An example of how drawings of *oru* can be compared with models to help identify features. This helps to confirm the presence of features such as sails, leeboard and mast steps for example (left: Paris, 1841; right: model *oru* from EISCA collections, 480mm in length, inventory number unknown, photograph taken by Charlotte Dixon, 2014)



**Figure 76** Some of the main features found on models of *oru* over time

This research has revealed thirty-five models and almost 50% of all the *oru* models researched contain what can be described as a bench. This feature (as shown in Figure 78 and 79) comprises a wooden structure resembling a bench, often with elaborately carved sides, lashed to the gunwales. Interestingly several of these models contain two of these benches (as demonstrated in Figure 79) and one even contains three. Looking at Figure 77 it is apparent that a significant proportion of the total *oru* models contain such a feature and there is not a clear differentiation in their presence over time – models with this feature range from the mid-nineteenth to the late twentieth century. As these features were not only present on models within a given time frame or collected by one particular individual, it is indicative that such benches were once present on traditional full-size *oru*. Yet this feature is not evident within recent published studies of these vessels.



**Figure 77** Benches found on models of *oru* over time. This shows how a significant proportion of the models contain this feature



**Figure 78** Bench on an *oru* model with elaborately carved sides. In Southampton City Council Art and Heritage collections (temporary number 1, photograph taken by Charlotte Dixon, 2015)



**Figure 79** Model *oru* with two benches atop the black painted gunwales. Note these are relatively equally spaced along the hull. In the British Museum's collections, 950mm in length (inventory number As1895,0616.1, © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

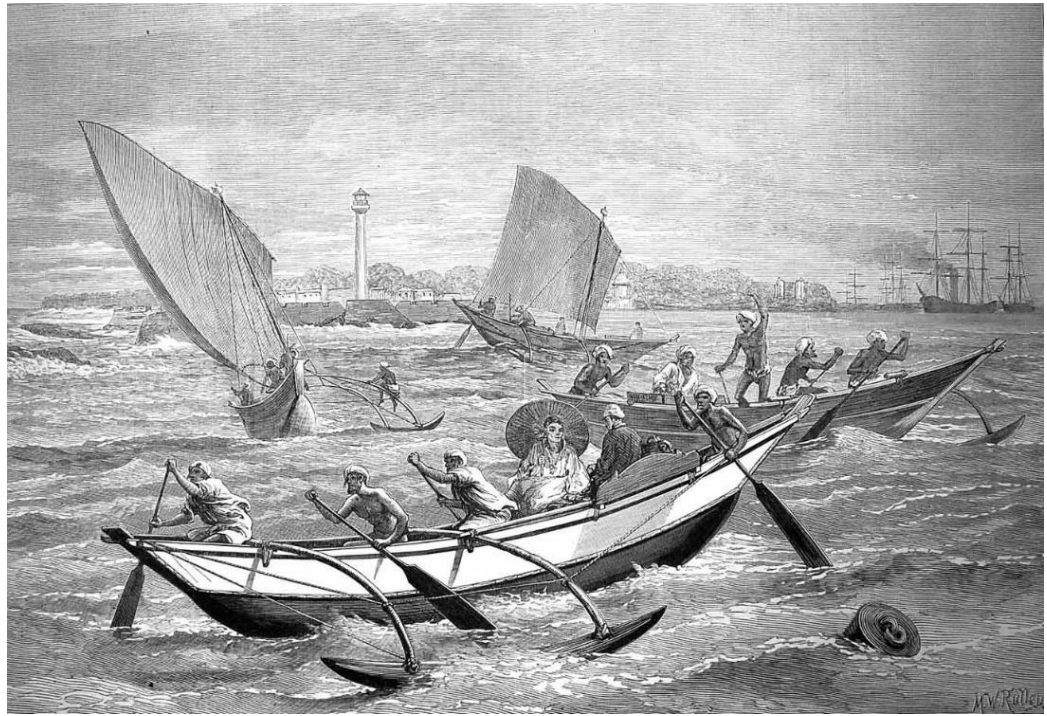
This leads us on to question what exactly these benches were, whether they were truly present on full-size *oru* and what their function was. Or were they just stylistic traits of the models? To further explore these questions research has been conducted exploring other sources that might be able to help provide some answers. Folkard included two sketches of the “Ceylonese... or Point de Galle canoe” (Folkard, 2000: 454) in his 1906 treatise of sailing boats around the world. Within these sketches, drawn by Folkard, one is rigged with a sprit sail and the other with a settee sail; there appear to be two of these bench features on the

gunwales towards the centre and at one end. They are described as “flanging thwarts, resting upon cross-pieces... fastened to the top-sides aft of the canoe, so that the crew can sit out beyond the gunwale, and facing each other, their legs hanging down in the trough, or interior, of the canoe” (Folkard, 2000: 456). Whilst the sketches and description heavily imply these benches were found on full-size *oru* in the early twentieth century, it must be acknowledged that, although Folkard made sketches of vessels overseas when on voyage and tour there, he also made some sketches from models in UK museums (Temple, 1906: v-vi). These depictions could thus be based on models rather than full-size boats.

However, two other sources do help to further support Folkard’s concept of the inclusion of these features and their use as benches. They are shown on images of *oru* in the London Illustrated News in 1872 (Figure 80) and on a postcard sent to Holland in the 1920s (Figure 81). Close observation of these images combined with the models, indicate wooden benches were often lashed to the gunwales of *oru*, tended to be elaborately worked to produce an aesthetic finish on the back rests, and were used as seating for passengers and crew as well as to hold cargo. Holman, a naval architect, suggested they could be some sort of seat or device to make fishing and handling cargo easier. He also suggested the frames were not likely to have added a big percentage of weight to the hull to affect their stability and crew could have balanced the weight distribution by their positioning on the vessel and outrigger (based on a conversation with Holman, 2016). It is thus likely that these featured on full-size vessels without affecting their overall performance and stability. Another theory is that these benches were removable which would explain why they appear in some depictions of *oru* but not in others.

The omission of these benches on *oru* in recent studies yet their significant presence among models raises questions about why. The London Illustrated News shows passengers aboard these vessels sitting on the benches and Edye commented how ships were boarded by *oru* (Edye, 1834: 5). Both of these sources pre-date the construction of a breakwater in Colombo which was built between 1874 and 1876 following increased shipping into Galle and Colombo (Mills, 2012: 245). Before the construction of the breakwater smaller boats, such as *oru*, were required to ferry passengers and goods from ship to shore and vice versa. However, the construction of harbours enabled large vessels to reach the shore. This meant *oru* were redundant as passenger ferries. This could explain why recent studies do not mention benches on the gunwales as this feature is likely no longer required.

Models, therefore, have the ability to inform us about one of the ways *oru* were used in the past, raising awareness of the significance of these vessels as they would have been one of the first things visitors to the island would have seen. In addition, the models can tell us how these benches were assembled and configured on a variety of *oru*.



**Figure 80** 'The Voyage to China: Ceylon Boats at Galle' (*London Illustrated News*, 30<sup>th</sup> November 1872). Note how passengers are sitting on one of the benches in the *oru* in the foreground.





**Figure 81** Postcard showing an *oru* under sail rigged with a settee sail. A bench can be seen although it is not in use and there is a Y shaped stick which would serve as a rest for the yard when the sail was furled

Models of *yathra dhoni* likewise show some similarities as they all contain a keel, wooden planks sewn together with thread, a roof made from bamboo, two curved booms perpendicular to the hull with a carved wooden float, much like those found on the *oru* models. With a small sample size of three it is difficult to decipher true patterns but there are some clear differences across the models as two contain a rudder or fixings for a rudder and a bowsprit but one does not. The sheer strakes and shape of the keel likewise vary with two models showing a more angled keel than the other. A comparison with published studies about these vessels support the idea that they contained masts, a roof structure, rudder and two of the models support the notion of the bowsprit shown in Hornell's drawing.

### 6.3.5 Rigging

Vitharana stated in 1992 that there were three different shapes of sail in use on *oru* depending on their location. This supposedly comprised the square sail from the east coast, lateen sail of the south and rectangular sail of the west coast (Vitharana, 2012: 34-35). Kapitän did not record any *oru* with square sails but referred to the rectangular sails as double sprit sails and lateen sails

inconsistently as either lateen or lug sails (Kapitän et al., 2009). However, as it is not appropriate to give these rigs western names, and the sails are not triangular like the lateen sail, the rectangular sails will be referred to as the *oru* sprit rig and the lateen or lug sails as settee sails.

None of the *oru* models appear to have square sails so this study is not able to support Vitharana's theory that they featured on vessels from the east coast of the island (2012: 34-35). In addition, only three models contain an *oru* sprit sail: the majority have a settee sail (see Figure 82).

Whitewright discussed how the traditional study of rigs using geometric sail shape can result in misidentification arguing for the need to consider their technical application (Whitewright, 2015: 576-577). Grainge explored the rig and technical sailing ability of the modern fibreglass *issan oru* (2012). He recognised how the rig of the double-sprit sail needed changing when shifting direction of sail (Grainge, 2012). Model boats in museums are, however, limited as substantial standalone evidence in terms of their rigging. Yet when used in conjunction with pre-existing studies they can be useful as supporting evidence, providing caution is taken to acknowledge their fragmentary nature.

Analysing the rigging on models can be both an insightful yet challenging task. For example, 57 models of *oru* contain a sail or evidence of a sail which can help us think of these boats in terms of their sail shape and rig. However, whilst many of the models are incomplete or damaged to an extent even models that seem to be in a relatively good condition may have damaged rigging. As the cordage represented in model form is made from fine thread or string it is particularly vulnerable to environmental or human damage. Changes in temperature and humidity can cause the thread to become brittle and susceptible to damage so it is not surprising that this is broken or missing from several models. The sail is likewise vulnerable to environmental conditions and is often missing or furled and unable, due to conservation purposes, to be unfurled leaving the shape of the sail questionable. Moreover, the rigging from the mast and sail is often detached and the mast down or missing. It is also important here to consider the biographies of these objects and their long histories from production to collection and museum display / storage. It is possible that damage to the rigging would have occurred prior to their entry into museum collections and it is possible some models would have undergone repairs. This raises concerns about

who might have carried out repairs and if they had detailed knowledge about the rigging found on full-size *oru*.



**Figure 82** Model of an *oru* with a settee sail. In the National Maritime Museum collections, 1021mm in length (inventory number AAE0001; © National Maritime Museum, Greenwich, London)

Models are able to support studies of *oru* in the way their features and sizes differ demonstrating variety with some rigged with sprit sails and others with settee sails for example. What is particularly interesting is that the majority of early travel literature as well as photographs, sketches, postcards, stamps and bank notes tend to depict *oru* rigged with sprit sails whereas the majority of the models depict *oru* with settee sails.

#### 6.3.6 Shape

Another approach that can be used to help determine the accuracy of the models in terms of their representation of full-size boats is by analysing their overall shape. *Oru*, both full-size and in model form, were individually handcrafted so some minor differences in shape are to be expected. In addition, the tools and skills required to produce a full-size *oru* compared to those used to create its miniature counterpart are likely to differ (a concept discussed in Chapter 2). As a result, this could lead to discrepancies, such as scale and shape, between the full-size and the miniature. As a preliminary methodology this study considers the basic shape of the models' hulls and outriggers and compares this information



with the shape of full-size *oru* by using scale drawings of these vessels by Edye (1834), Paris (1841) and Kapitän (Kapitän et al., 2009).

### **Method**

The use of morphometrics as a method for understanding and studying shapes has been used in disciplines such as biology (e.g. Bookstein, 1978) and recently in archaeology to analyse stone tools from the Middle Palaeolithic (Hoggard, 2017), for example. This technique has not, however, been applied to the study of model boats. This section thus presents a statistical and scientific approach to the study of boat models and relative comparisons with full-size watercraft through the application of geometric morphometrics.

Geometric morphometrics is the “statistical analysis of form based on Cartesian landmark coordinates” (Mitteroecker and Gunz, 2009: 235). It essentially means that by plotting particular points on an image of a model boat it is possible to create statistical results and to enable the models to be “visualized as actual shapes or shape deformations” (Mitteroecker and Gunz, 2009: 235). This can be visually and statistically compared with the shape of boats and other boat models and to thus determine if there are correlations or discrepancies among the shapes of the boat models and the full-size vessels. Using this method it is also possible to analyse if there are variances in the shapes of different types of *oru* or if there are changes over time.

To analyse the shape of *oru*, photographs of the models and drawings of full-size craft by Edye (1834), Paris (1841) and Kapitän (Kapitän et al., 2009) were used. For the purpose of this research and given the data available this case study concentrates on analysing the shape of two different angles of the *oru*: plan and profile views. However, there is potential in future research to extend the analysis to explore different views and cross-sections of these vessels, and to similarly apply this technique to the wider study of other types of model boats. There is even potential to use this method as a tool for analysing other forms of iconographic depictions of watercraft in future studies.

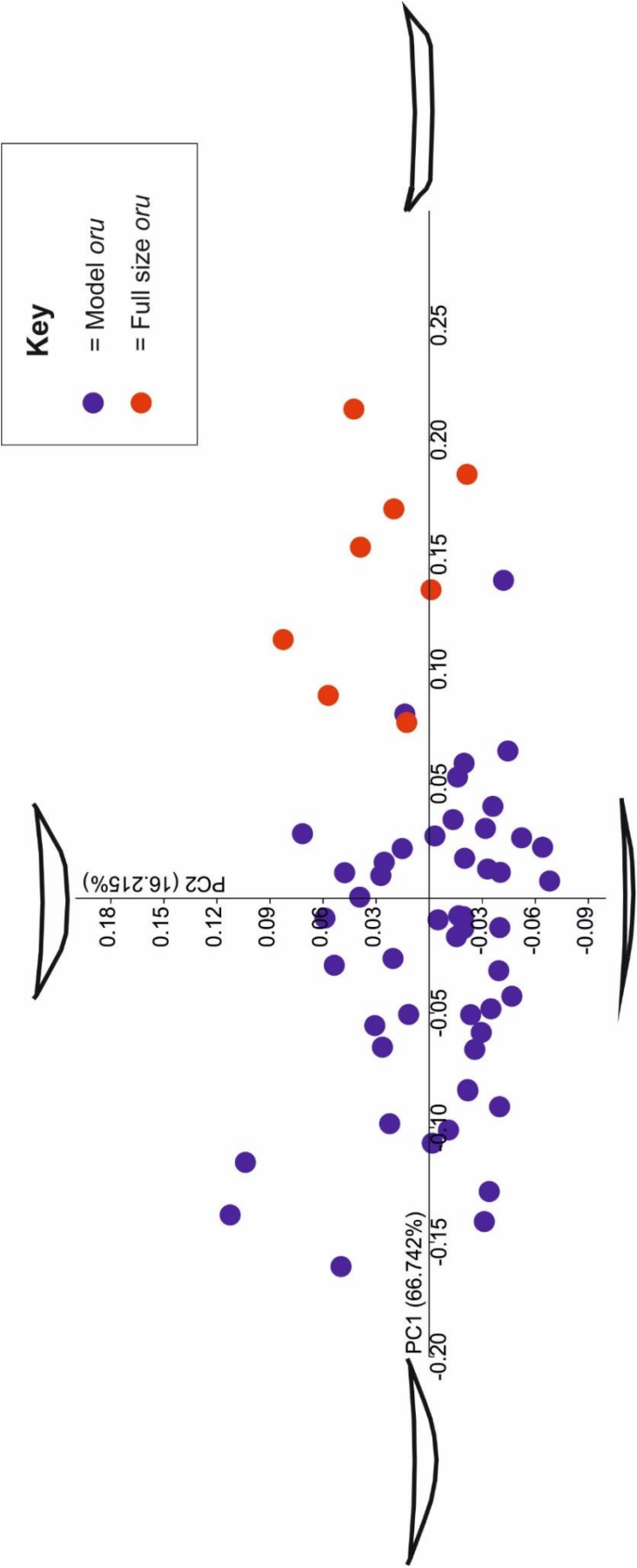
Using the photographs and drawings a particular set of points, or landmarks, were plotted on the images to give a basic outline of the boats using a morphometric analysis programme, TPSDig. This information was then uploaded onto a data analysis programme, Past3. This transformed the landmark points, or coordinates, recorded into standardised Procrustes. This meant that the landmark

points plotted on the *oru* images were uniformly scaled so that purely shape, rather than size, could be analysed. The shapes of different *oru* were then able to be plotted onto a scatter graph using Principal Component Analysis (PCA) to show variations. Using Past3 it was also possible to visualise any deformations from the mean shape of these vessels revealing areas of the boats that were relatively consistent or that significantly varied in terms of shape. To visually compare and understand the variances in shape of *oru* on the scatter graph the extremes at either end of each axis were drawn using the landmark points. These points were then joined up using the graphics and illustration software CorelDRAW to reveal the outline of the four *oru* with the most extreme shapes.

The axes of the graphs use two different principle components (labelled as PC1 and PC2 rather than X and Y). These represent the main sources of variation in terms of *oru* shape. Thus, by looking at these scatter graphs which use Principal Component Analysis, it is possible to identify similarities and differences in the shape of both model and full-size *oru*.

#### ***Geometric morphometrics – an analysis of oru models versus full-size craft***

Firstly, the profile shapes of *oru* hulls were plotted on a scatter graph (Figure 83). The model *oru* are shown in blue and the full-size *oru* shown in red. The four outline drawings depict the extremes in the profile shapes. The PC1 axis shows variation in the curvature of the hull and PC2 shows variation in the hull depth. On first glance it would appear that there are two distinct groups – that of the model *oru* and that of the full-size *oru*. However, on closer inspection it is apparent that the depth of the hulls (PC2) across all *oru* are fairly consistent. There are not distinct differences here between the models and full-size vessels. However, when we focus on the curvature of the hull (PC1) it is clear there are some distinct differences. The models are clustered to the left of the graph representing a curved hull whereas the full-size *oru* are clustered to the right showing a flatter base. There are a couple of exceptions to this pattern where two of the models have a similar hull shape to the full-size vessels. In fact, one of the models is almost a direct correlation to a full-size vessel in terms of its hull profile shape. A possible reason for the difference in hull curvature could be due to the process of miniaturisation. The small size of the models and working at a reduced scale may have meant it was harder to achieve a flatter hull that was directly comparable to full-size *oru*.

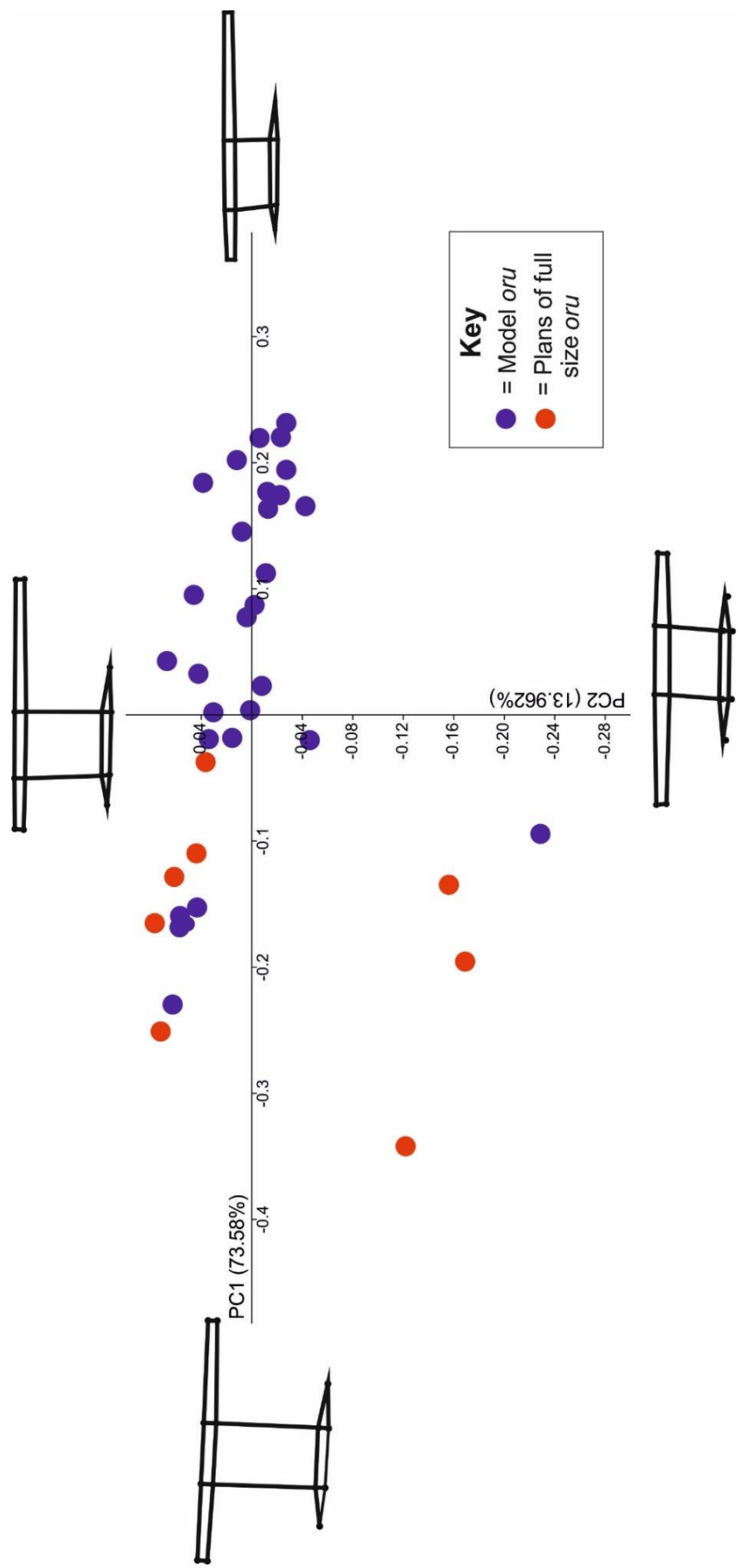


**Figure 83** The profile shape of full-size *oru* compared to models of *oru* where the drawings represent the four extremes

The plan view of the models and full-size *oru* were then analysed (Figure 84). This shows the shape of the hulls from above and the relative positioning of the outriggers and booms. The PC1 axis shows variation in the length of the booms and the PC2 axis shows the positioning of the booms and outrigger along the length of the hull, from left to right. Fewer models (shown in blue) have been plotted on this graph compared to those plotted on Figure 83. This is because some of the models are detached from their outrigger or incomplete. This meant that Principle Component Analysis could only be conducted on thirty models equating to forty-two percent of the dataset in this chapter.

Similarly to Figure 83, there appears to be distinct differences in the shape of *oru* models and full-size vessels from a plan view. This refers mainly to the length of the booms joining the outrigger to the hull, along the PC1 axis. The cluster of blue points towards the right of the graph shows that the majority of the models have relatively short booms. The full-size vessels, however, are positioned more towards the left of the graph showing they have comparatively longer booms. There are a few overlaps where the length of the booms on some of the models is consistent with that of the full-size vessels. The majority of the models, however, have shorter booms than the full-size *oru* plotted in Figure 84. This could be due to the practicality of model making and transporting these objects and their fragility as the longer the booms the less sturdy they were likely to be when handled.

The PC2 axis showing the positioning of the outrigger relative to the hull shows that the majority of both models and full-size *oru* have the outrigger towards the left of the hull. Three full-size *oru* and one model have their outriggers positioned more centrally and slightly towards the right. This will be further analysed in the next graph (Figure 85) to ascertain if this has anything to do with *oru* types. Despite the variations in boom length and some variation in outrigger positioning the overall shape of the hull from a plan view is fairly consistent, as are the outrigger floats.



**Figure 84** The shape of full-size *oru* compared to models of *oru* from a plan view where the drawings represent the extremes in terms of shape

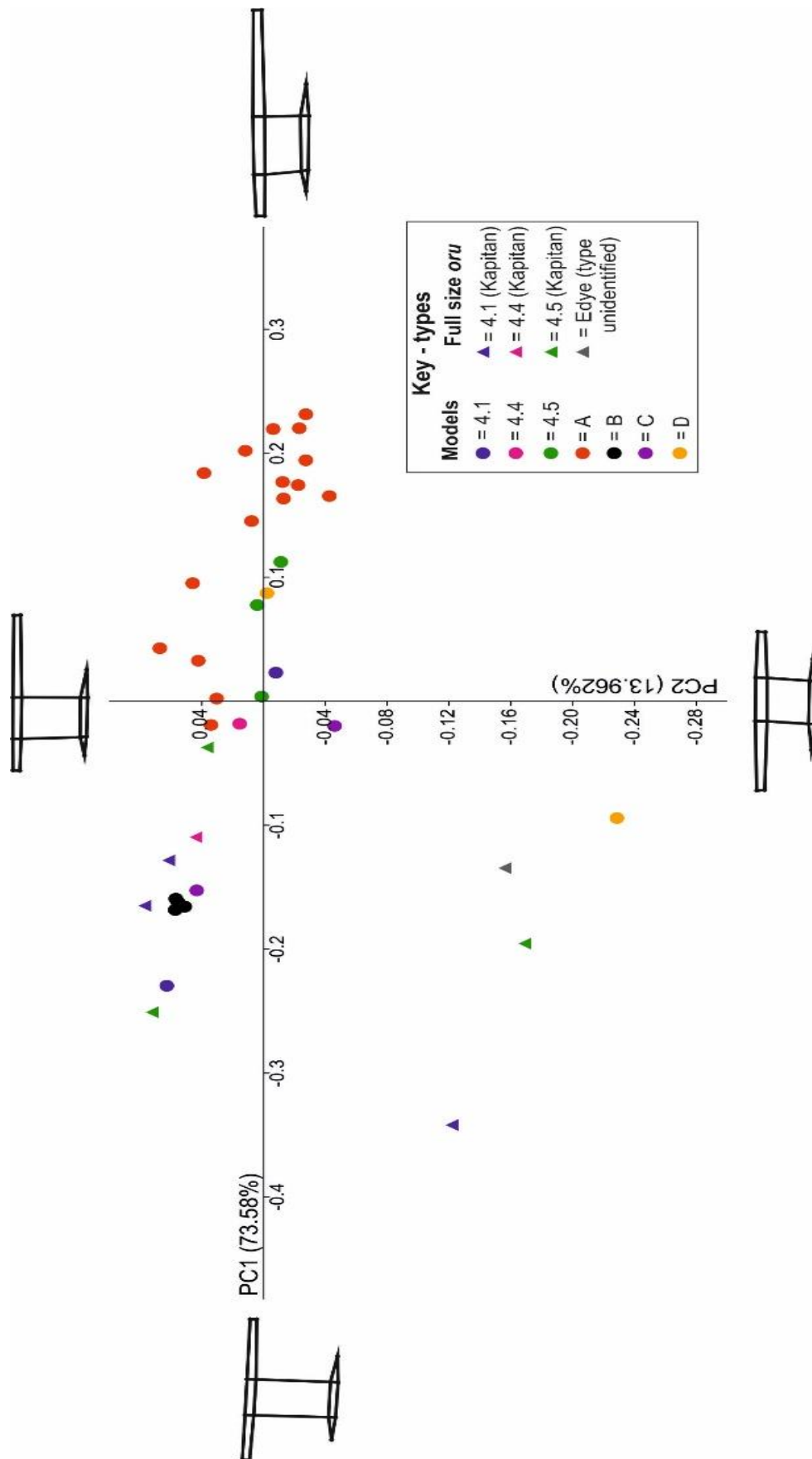
The shapes of these objects were also analysed according to date but there were not any clear patterns indicating a change over time. However, when plotted according to types, as discussed in section 6.3.3, some interesting correlations appeared. Figure 85 shows the different types of *oru* in both their miniature and full-size form illustrating some clear trends. The models identified as types A and B, in particular, are clustered towards particular shapes. Those identified as type B, dating from at least 1864, are very closely related in shape with relatively long extended booms and the float positioned off centre towards the left of the hull. This is highly significant as section 6.3.3 queried whether these models, a type previously unidentified, were accurate depictions of full-size *oru*. These models identified as type B are very similar in terms of shape with each other and they also share similar traits in terms of their shape with other full-size *oru*. Whilst it is acknowledged that Kapitän had not recorded this type of *oru* and the models depict vessels from at least the 1860s, it is interesting to note they share similar shape characteristics with some of the *oru* recorded by Kapitän in the 1980s. The length of the booms seem to correlate more with the full-size vessels recorded than with the majority of the models which have relatively short booms. This could suggest that this group of models, type B, were not produced to simply be stylistic but accurately depict the overall shape and form of these vessels.

Type A, of which there are a significant proportion of models, shows the opposite. These models, ranging considerably in date from the nineteenth through to the twentieth century, are clustered together on the graph with comparatively short booms and the float positioned more towards the aft, or left. Although it would seem the length of the booms may not accurately depict those found on full-size *oru* there are no full-size vessels that fall under this classification for comparison but it is interesting to acknowledge how vessels within this group, regardless of when they were made and collected, are closely related in their overall shape.

There do not, however, seem to be correlations evident with the models identified as groups C and D but comparison of the models and plans of full-size vessels identified by Kapitän as type 4.1 and 4.4 show similarities in terms of the positioning of the outrigger and length of booms. This suggests the model makers had knowledge of the full-size vessels they were reproducing in miniature and took the overall shape of these vessels into account. Type 4.5, however, shows differing results with shorter booms found on the models than on full-size *oru*. In fact type 4.5, both in terms of models and full-size *oru*, is generally rather

scattered across this graph suggesting this type, which was recorded by Kapitän in the 1980s, is not necessarily related to hull shape.

With few models accurately portraying the length of the booms found on full-size *oru* it would seem this aspect has been shortened during the process of miniaturisation making the models less fragile and less likely to get damaged. Whilst the proportion of the outrigger booms cannot thus be ascertained from models the analysis of shape has identified some variation in the shape of *oru* according to type and that some models seem to be more accurate depictions of *oru* than others in terms of overall plan shape. This notion of shape is something that could be investigated further in future studies where the cross-section of these vessels could be analysed to help us understand how accurate the depth of hull and washstrakes are, for example.



**Figure 85** Shape analysis of different types of *oru*. This includes types of full-size *oru* identified by Kapitan (2009) and Edye (1834), some of which are reflected in the models. It also shows new types suggested by the models and how the shape of their hulls and outriggers compare



### 6.3.7 Construction

The basic methods of construction described in studies of both *oru* and *yathra dhoni*, along with evidence available in technical drawings and photographs, is sufficient to enable comparisons to be made with the models. Studies (particularly Vitharana, 1992; 2012) have firstly identified how the hulls of traditional wooden *oru* were formed by hollowing out a log and sewing on an additional plank either side and end through holes bored in both components. All seventy-two models of *oru* reflect this construction technique with the hull carved and hollowed from a single piece of wood regardless of the size of the model. The end boards and washstrakes have been attached to this hull in a similar fashion to the full-size vessels according to published studies with continuous linking stitching forming a cross-stitch pattern with vertical stitches either end outboard (see Figures 88-90) and vertical stitches inboard. Underneath these stitches outboard are thin strips of dried palm leaf which is a feature present on traditional full-size outriggers from Sri Lanka as a method of waterproofing the joins. The linking cross-stitch method of sewing can be seen across all but one of the complete models. This model is of unknown provenance (National Maritime Museum, AAE0145) and has been configured using the same basic principle of construction but the hull and washstrakes have been secured using isolated stitches, or lashed, and omits the thin strips of palm leaf. Despite this anomaly, the model still depicts the use of stitches to fasten components of *oru* together.

The use of linking cross-stitches can also be seen among models of *yathra dhoni* (Figure 86) which is said to use the same method of fastening although there does seem to be an inconsistency with the width and quantity of planking. For example, Hornell's diagram (1943: 44) and the model studied by Vosmer (1993) show multiple planks were used either side of the hull yet all three models show three wide planks either side built up from the keel plank (see Figure 86). Whilst the use of planks and stitches seem to reflect the true method of assembly the scale on the models appears to be somewhat exaggerated.

A particular discrepancy can be seen within the stitching. Whilst all of the *yathra dhoni* models show the stitches packed fairly close together the stitching on models of *oru* vary considerably in terms of spacing. Figure 87, for example, shows an *oru* model with few elongated stitches which varies considerably to other models changing the overall appearance. By comparing *oru* models with drawings made by Kāpitan it is clear the models contain far fewer and considerably exaggerated stitches. This could be due to the process of

miniaturisation as the stitches were used on full-size *oru* (see Figures 89 and 90) and *yathra dhoni* to hold components together and secure palm leaves over the seams to make the vessel watertight. The representation of these vessels at a reduced scale resulted in a change in functionality as these objects have taken on a more aesthetic role. The stitches therefore reflect the method of fastening used on full-size vessels and the overall pattern of stitching but are not an accurate portrayal of the scale. This exaggeration could also be due to the practicality of physically working at a reduced scale where different tools and skills are required to bore holes and stitch components together compared to those required for the construction of full-size outriggers.

Another theory for the exaggeration and inclusion of stitches on all the models of *oru* and *yathra dhoni* could be to highlight that this was a key feature of these vessels and one that differs considerably to the method of construction used on contemporary western vessels. The fact they were sewn and contained an outrigger are two aspects that would have made these vessels intriguing for western visitors to the island and could be why so many models of outriggers, particularly *oru*, were represented in miniature form for a souvenir market, more than other vessels contemporaneously used around the shores of Sri Lanka.



**Figure 86** Sewn technique applied to a model of a *yathra dhoni*. In the British Museum collections (inventory number As1933,1110.1; photograph taken by Charlotte Dixon, 2014)



**Figure 87** Example of elongated stitches found on *oru* models. In the EISCA collections, 448mm in length (inventory number unknown; photograph taken by Charlotte Dixon, 2014)



**Figure 88** Example of stitches with dried plant leaf underneath covering the seams. In Southampton City Council Arts and Heritage collections (inventory number temporary 2, photograph taken by Charlotte Dixon, 2015)



**Figure 89** Full-size *oru* dating from 1964. In the National Maritime Museum Cornwall collections (National Small Boat Registration number 383, photograph taken by Charlotte Dixon, 2017)



**Figure 90** Stitches used on a full-size *oru*. In the National Maritime Museum Cornwall collections (National Small Boat Registration number 383, photograph taken by Charlotte Dixon, 2017)

In addition to the fastening technique used, reference has been made by scholars about the use of different woods for different components of *oru* (Vitharana, 2012: 26-27). Whilst the different woods used to produce the models have not undergone analysis in this research, it is clear that the model makers, in several cases, have attempted to replicate these differences. The hull and washstrakes often appear to be made from different woods of differing colours and the



gunwales, thwarts, rowing rails and oar handles were often painted black. This indicates the model makers may have been trying to portray the use of different woods which is apparent on 60% of the *oru* models. Different woods were perhaps used to serve different functions in the construction of *oru*.

Another aspect of construction that can be compared is the way the outrigger floats are attached to the booms. Vitharana discussed how coir was used to lash these components together through a raised section on the float with holes bored through it, known as *kanhiya* (2012: 24). Kāpitan's work, however, reveals that some *oru* floats omitted this feature with holes instead bored directly into the float. The latter is reflected through the models with only one, collected in 1975, portraying a *kanhiya*. The way the models generally portray the connection of the booms and float appear to be considerably accurate (see Figure 91 and 92) supporting current studies, though it is interesting that only one model depicts a *kanhiya*.



**Figure 91** Holes are bored into the outrigger float and lashed to the boom, as demonstrated in this image of a model from Southampton City Council Arts and Heritage collections (inventory number temporary number 2; photograph taken by Charlotte Dixon, 2015)



**Figure 92** Model *oru* with a raised section in the outrigger float for attachment to the outrigger boom (inventory number AAE0158; with kind permission from the National Maritime Museum, Greenwich, London)

Two of the *yathra dhoni* models similarly show how the booms are attached through holes bored directly into the float which correspond with Paris' drawings of this vessel. The booms on one *yathra dhoni* model, however, have been tied directly around the circumference of the float (Figure 93). There is no evidence to suggest this technique was applied on full-size vessels however and the thread used to secure the float and booms appears to be paler than other thread used on the model suggesting it may have been fastened in this manner as a repair and thus may not be an accurate portrayal. Caution must therefore be taken when using models to understand full-size vessels to consider and assess whether they may have undergone repairs during their life with a collector or in a museum.



**Figure 93** Attachment of the outrigger float with the boom on a *yathra dhoni*. In the British Museum collections (inventory number As1933,1110.1, photograph taken by Charlotte Dixon, 2014)

Overall, models of both *oru* and *yathra dhoni* incorporate a combination of continuous sewn and isolated lashed techniques similar to those found on full-size vessels according to published studies. *Oru* models portray an extended logboat and *yathra dhoni* models a plank-built vessel with a keel. Both types of models include two booms lashed to the hull and a float carved from one piece of wood lashed to the booms. These aspects of construction all support the techniques discussed within the literature showing knowledge of construction techniques by the model makers. The inclusion of stitches and the outrigger were clearly considered important features of these vessels to replicate, regardless of scale, in miniature.

#### 6.3.8 Use

Whilst the discussion of use is crucial in helping to further understand traditional *oru* and why they were made, models are somewhat limited as tools for comparison with ethnographic studies. Information about the practical element and application of different *oru* is often omitted from museum records leaving only the visual evidence for analysis. Some features found on models can, however, be indicative of use to an extent. For example, the models investigated in this research have been identified as representations of seagoing vessels due to their deep washstrakes, and the inclusion of fishing equipment such as baskets and nets included on particular models suggest they were intended for fishing. In addition, the inclusion of benches lashed to the top of the gunwales of

several models can be compared with contemporary postcards and drawings which suggest they were used to carry passengers, or crew, and the quantity of thwarts, rowing rails, oars or paddles (if any) are indicative of the size of the crew required to sail, row or paddle these outrigger canoes.

Aspects of the use of *oru* such as ceremonial activity (Vitharana, 2012: 27-28), sailing techniques (Grainge, 2012), wetting the sail to increase speed (Hornell, 1943: 42), repair and maintenance (Devendra, 2011b: 27; Vitharana, 2012: 27-28) and crew numbers ascertained through ethnographic observations and interviews have been mentioned in publications yet can be little elaborated on by studying models. This is not surprising considering they are static museum objects taken out of their original contexts and reduced in scale so as to become miniature representations of boats and, in doing so, became non-functioning objects, thus making the concept of use problematic. Although these objects are not particularly successful in furthering our understanding of the use of this particular type of watercraft, videos such as 'Negombo Coast' filmed in 1934 and 'The Last Sailors: the final days of working sail' filmed in 1984 show traditional wooden *oru* under sail demonstrating their active use. Such recordings and primary historical sources have the potential to be used in conjunction with the models to further understanding in this area enabling the concept of physical use and human interaction with the vessels to be explored. However, as this case study is concerned with comparisons between current studies and models this group of sources will have to be re-evaluated in future studies. It can thus be deduced that model boats are limited in what they can reveal about the use of *oru* in Sri Lanka but the information they do portray (their use as passenger transportation, for fishing, variations in the method of propulsion, and use as seagoing vessels) does seem to support studies of these vessels to date.

### 6.3.9 *Oru* as an iconic image of Sri Lanka?

*"From those white sands overshadowed by palms, we espied curious objects coming towards us over the blue rippling water. In the distance they looked like great sea-spiders with very long legs; but as they approached and turned sideways, we saw that they were long narrow canoes, most curiously constructed"* (Cumming, 1892: 18)

One of the key findings of this research has been increased awareness and understanding of the significance and value of Sri Lankan outriggers, particularly *oru*. This relates to the users of these vessels, model makers and the impression and impact they had on visitors. British travellers had been venturing to Asia in ever expanding numbers following the rise and success of the East India



Company and increased interest in travel literature since the eighteenth century encouraged visitors to record and publish their impressions (Bowen et al., 2011: 81). *Oru* would have featured in early views of Sri Lanka encountered by visitors (see Figure 94 for example), as these vessels plied the coasts in considerable numbers carrying out fishing activities. They were also likely to have experienced these vessels first hand as they were used to ferry passengers and cargo from ship to shore (Edye, 1834: 5) before the introduction of breakwaters around the coasts. It is not surprising then that descriptions of these “extraordinary boats” (Bennett, 1843: 161), such as the above quote by Cumming, featured in accounts by travel writers, colonial officials and naval officers, to name a few, throughout the nineteenth and early twentieth centuries.



**Figure 94** View of Colombo, with palm trees and the shore with *oru* under sail in the foreground.

Watercolour painted by Andrew Nicholl, 1850 (Item number: 1366 Available at:

<http://www.bl.uk/onlinegallery/onlineex/apac/other/019wdz000001366u00000000.html> [accessed 17.9.15])

*Oru* were not the only type of vessel in use in Sri Lanka yet it is more commonly represented in model form in the nineteenth and twentieth centuries than any other type of boat, including the *yathra dhoni*. In 1986, for example, 4,400 non-motorised outrigger canoes were recorded as being in use in Sri Lanka for fishing whilst non-motorised log rafts totalled 3,900 (Gulbrandsen, 1990: 12). Although log rafts, known as *kattumaran* or *teppam*, made up a significant proportion of the total fishing craft in use, *oru* were more commonly depicted in miniature and sold as souvenirs to visitors. This could be because they were seen upon arrival

via ship and were both sewn together and contained an outrigger; two fundamental differences to vessels contemporaneously constructed and used around the coasts of Britain and other European nations. This seems to have sparked interest in these particular vessels resulting in the production and collection of their miniaturised counterparts. These vessels, it would seem, were viewed by westerners visiting, or residing in, Sri Lanka as 'traditional' watercraft from the region.

This notion of appeal and the *oru* being an iconic image of Sri Lanka from a western viewpoint is further supported when other iconographic depictions of these vessels beyond models are considered. For example, in addition to their three-dimensional miniaturisation, *oru* featured on postcards from the nineteenth and twentieth centuries (Figure 95 and 96), stamps from the 1950s (Figure 97) and a Sri Lankan banknote printed in 1941 (Figure 98) suggesting their significance as an emblem of Sri Lanka. These representations, which predominantly depict sprit sail *oru* under sail, indicate they were significant and considered to be an iconic image of Sri Lanka when it was both part of the British Empire and after obtaining dominion status in 1948. It is interesting to note, however, a decline in the depiction of these vessels following full independence in 1972. Models were often built by local boat builders (Devendra, 2002: 130), although information about their collection suggests they were produced to fulfil a souvenir market and many postcards were produced by western firms such as Plâté and Co. and Skeen. With this information, it could be postulated that the seemingly symbolic status of *oru* was fuelled and influenced by British authorities and visitors to the island. Whether these vessels were deemed as iconic from the local perspective is uncertain and an area that requires further investigation.



Figure 95 Postcard of a 'fishing canoe' at Colombo, date unknown



Figure 96 Postcard, used as a Christmas card, showing 'fishing boats in harbour, Mutwai', posted from Sri Lanka to the UK in 1904





**Figure 97** Postal stamp used in Sri Lanka in the 1950s. It depicts a sprit sail *oru* under sail and shows a figure stood on the *kadise*. (In the Philatelic collections, British Library)



**Figure 98** 1000 rupee banknote picturing *oru* being beached. Printed in 1941. In the British Museum's collections (© The Trustees of the British Museum)

Despite the decline in visual depictions of *oru* since the late twentieth century models of these vessels are still being produced today. Figure 99 shows a model of a wooden sprit sail *oru* which reflects the traditional sewn and lashed technique of construction. This model was sold on a beach near Negombo in

2015 as a souvenir and it is particularly interesting that, although *oru* in their traditional wooden form can no longer be seen around the coasts of Sri Lanka (Devendra, 2011a: 36), it is this form that is depicted with exaggerated stitches. In addition, a documentary filmed in the 1980s captured local children playing with models of *oru* in the water alongside full-size vessels (see Figure 100). This demonstrates that not only were such models made to fulfil a souvenir market as aesthetic objects but they also functioned as toys. More research is required to fully gauge if, and to what extent, models were made for this purpose, but this does help to reinforce the significance of these particular vessels in local communities around the coasts of Sri Lanka.



**Figure 99** Model of an *oru* collected near Negombo in 2015. 225mm in length (Photograph taken by Charlotte Dixon, 2017)

[image removed and put in Appendix H due to copyright]

**Figure 100** A model *oru* being played with by a child, alongside full-size beached *oru*. Still image taken from 'The Last Sailors' filmed in 1984 (Adventure Film Productions, 2005)

Not only do models have the ability to help us understand the meaning of these vessels but the production and exchange of these objects between local and western communities can be indicative of interactions in colonial and post-colonial Sri Lanka and how locals adapted the production and sale / gifting of material culture for foreign trading and souvenir markets (Wintle, 2013: 8). Furthermore, simple searches for these models online show they were not only acquired into British museums in the nineteenth and twentieth centuries but all around the world including Australia and America indicating they had a widespread appeal.

Although historic travel accounts can provide general descriptions and information about early sightings of *oru* in the nineteenth and twentieth centuries and Edye (1834) and Paris (1841) produced plans, recent published studies of these vessels tend to focus on their use largely omitting discussions about their cultural value, and particularly about foreign perceptions and symbolism. Used in conjunction with other iconographic evidence, such as postcards, models of boats have potential to help us to understand wider socio-cultural practices of material culture exchange, the colonial endeavour and general insights into this age of colonial and post-colonial travel.

Whilst few models of *yathra dhoni* are in museum stores and they are little represented in iconography such as postcards, *oru* have been visually represented in multiple platforms. As these vessels were crucial in the fishing industry helping to support local families and the wider economy, it would seem they were culturally and socially embedded within local communities, as well as being used to transport passengers and goods from ship to shore. This, in turn, seemingly influenced by British authorities and visitors, led these vessels to be seen as a symbol of Sri Lanka and subsequently to be collected in various mediums, including models, predominantly as souvenirs.

Overall the distinctive shape and construction of *oru* and the significance of their ferrying abilities upon arrival by sea resulted in non-locals viewing them as iconic images of Sri Lanka. This means models of these vessels have been, and still are today, considerably popular souvenirs resulting in particularly high numbers of *oru* models in museum collections, not only in the UK but worldwide. This is particularly important in understanding models as this one type of vessel is represented far more frequently than other vessels such as the *yathra dhoni* because they are so iconic but this does not reflect the quantity or importance of



the full-size vessels actually in use in the region. This could mean some models over represent some types of boats more than others, a factor that must be considered in the subsequent case study.



**Figure 101** Construction of a model *oru* being made in the 1980s (Image courtesy of Tuanie Ismail)

## 6.4 Conclusions

The aim of this chapter was to ascertain how useful models are as tools for understanding Sri Lankan outriggers, particularly in terms of the range and types of vessels, their overall form, construction and significance. With a considerable body of published studies available about these boats this chapter has attempted to draw on this information as a way of comparing the models to assess their accuracy as representations of vessels and to identify if the objects are able to support or contradict current knowledge or if they can add new information. This analysis has produced some interesting results proving the models are able to support certain aspects of outrigger studies as well as revealing new information which can contribute to our understanding of these vessels and their significance.

The key results of this case study are listed below and divided into two headings to highlight both the benefits and limitations of using the models to study traditional Sri Lankan outriggers.

**How are models useful tools for understanding traditional Sri Lankan outriggers?**

- The majority of the models considerably pre-date ethnographic studies of full-size vessels offering evidence for and insights into these boats at a time when there were few scholarly records available
- The models provide evidence for traditional boats no longer in use or that have since been adapted
- There are more models available than numbers of vessels researched in ethnographic studies of full-size *oru*
- The way both *oru* and *yathra dhoni* models are constructed with a sewn and lashed technique supports the boat building techniques presented in published studies
- It can be hypothesised that the exaggeration of stitches on the models imply this was an important aspect of the vessels to relay, or perhaps was a result of the model maker working at a reduced scale
- New, previously unidentified, types of *oru* have been identified from the models
- The benches atop the gunwales of several of the *oru* models provides evidence for a feature otherwise omitted from studies and helps us to consider their use as passenger and cargo ferries before the construction of harbour breakwaters / docking facilities. This provides evidence for changes in *oru* over time according to their function and need
- The comparative analysis of models with published studies including overall form, features and construction confirms models are relatively accurate depictions of full-size vessels and can thus help us to understand the physical attributes of these vessels
- An analysis of *oru* shape revealed that the models share similar traits with full-size vessels recorded in terms of the depth of their hulls and the positioning of the outrigger. It also showed that some *oru* types are related to hull shape / outrigger positioning but one of Kapitän's types identified as 4.5 does not appear to be related to hull shape
- The models, along with other forms of popular iconographic depictions of *oru*, can help us to understand their significance as an iconic image of Sri Lanka, particularly from a colonial perspective



### What are the limitations of using models to understand traditional Sri Lankan outriggers?

- While the models can provide evidence for basic construction techniques and features found on outriggers they cannot be used to assess scale. The stitches, for example are considerably exaggerated
- The hulls of the models are more curved than the full-size vessels analysed with geometric morphometrics. The booms are generally shorter too. These could both be attributed to the process of miniaturisation and so the practical concept of producing something at a reduced scale and the limitations of the tools and materials must be taken into account when studying models as evidence for full-size vessels
- While new types of *oru* have been identified from the models, few models support the categories devised by Kapitän making it difficult to carry out many direct comparisons

With the models generally predating publications there is considerable potential for these objects to be used to explore outriggers from the nineteenth century onwards and assess any changes that might have occurred over time. This research has actually revealed considerably few changes in the overall form, features, construction, types and shape over time. However, one group of models identified as a new type recognised in this chapter as Type B with leeboards, sometimes a settee sail, a *kadise* and comparatively long outrigger booms date from 1864 at the latest. This group have not been identified among models of a later date or in ethnographic studies thus revealing new information about early *oru*. In addition, the models are in their initial wooden state, though some have had lacquer applied during their lifetime in a museum, which supports the traditional appearance of *oru*. These vessels, now made from fibreglass, are often brightly coloured and more ornate, an aspect which is not depicted in any of the models.

The question of accuracy has been raised throughout this chapter in order to understand how much models can actually tell us about *oru* and *yathra dhoni*. This has been assessed through the comparison of descriptions, photographs and drawings of vessels in terms of construction, types, features, rigging and shape. This has concluded models do indeed accurately depict full-size vessels, particularly *oru*, but certain features, such as stitching and the length of the booms, have been exaggerated, as have some aspects of hull shape. Despite the

discrepancies with scale however the models can tell us about the overall form and configuration of outrigger vessels.

Throughout this chapter, it has been demonstrated how models have the ability to provide some fundamental information about outriggers, particularly *oru*. For example, they provide evidence for a variety of outriggers that were built and used in Sri Lanka since the early nineteenth century. Analysis of the models alongside published studies of these vessels also revealed new types previously unidentified and discovered how benches were used on the top of gunwales to transport people and goods which in turn revealed a use of these vessels which is no longer necessary. In addition, this chapter has shown how models are able to support information about these vessels in published studies, such as boat building techniques and features such as thwarts and sails. Of particular note, as well as the physical attributes of outriggers, is that the volume and detail in the models indicate their significance. By exploring other iconographic depictions of these vessels such as postcards, stamps and banknotes, it is possible to ascertain that *oru*, with their dugout hulls, sewn components and outriggers, became an iconic image of Sri Lanka and thus more models of these particular vessels were collected than models of *yathra dhoni* for example. This leads us on to consider the over representation of certain models over others throughout this research. The quantity of a particular type of boat represented in model form in museum collections is therefore not necessarily an indication that the vessel was a dominant type used. This is a notion that has emerged through this case study that will be considered in the subsequent chapter on boat models from Myanmar.

## Chapter 7 - Traditional boats of Myanmar

Traditional watercrafts of Myanmar (formerly known as Burma) have been surprisingly little studied compared to vessels from other regions around the Indian Ocean. Despite the lack of scholarly attention, there are a relatively large number of model boats from Myanmar in UK museums (see Figure 102 for example). Seventy-one models were recorded in this study. While the previous case study asked what can models add to our understanding of a class of watercraft that have been comparatively well studied, this chapter asks the opposite. How can models be used to build an understanding of traditional boats in a region where there has been little published literature?

To approach this question the chapter is divided into three sections before drawing conclusions about the value of museum models. Firstly, the geo-political history of the country is briefly introduced to provide some background for the rest of the chapter. Understanding the regions' complex history, with periods of unrest, colonial rule and, later, political isolation, can help to provide some important context for the production and exchange of models and why traditional vessels from this region have been so little studied to date. Next, the existing literature available about traditional vessels from Myanmar will be discussed. This will establish what information is known about boats from this region, who recorded them and why. It will also highlight the vast gaps in our understanding of boats from Myanmar. This is followed by an introduction and discussion of the range of models available in UK museum collections. It will showcase variation and similarities in the models and begin to unfold their potential as tools for understanding traditional boats without much literature available for comparison.

Unlike the previous case study, which provided an in-depth discussion of particular vessels, this chapter does not set out to conduct an exhaustive survey of boats from Myanmar. Instead it aims to be an introductory study demonstrating the potential of museum models and, in doing so, it will introduce the reader to a variety of watercraft, some of which are no longer used.



**Figure 102** Model of a rowing boat from Myanmar, acquired by the British Museum in the 1860s. On close inspection it is possible to see the hull of this model was once decorated with gold paint. In the British Museum collections, 1990mm in length (inventory number As.3955; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

## 7.1 Setting the scene – Myanmar and its geographical, historical and political context

Myanmar is situated in mainland Southeast Asia sharing borders with Bangladesh, India, China, Laos and Thailand (see Figure 103). The region is surrounded by mountains to the north, east and west with a long coastline defining the south stretching along the Bay of Bengal and the Andaman Sea (Aung-Thwin and Aung-Thwin, 2013: 41). It is also characterised by a network of major rivers and lakes creating natural waterways running from north to south (Nyunt, 1996: 2-3). In addition, dense forests provide an abundance of hardwoods such as teak useful for boat building (Fraser-Lu, 1994: 82; Aung-Thwin and Aung-Thwin, 2013: 41). Myanmar is naturally rich in precious metals and gems, such as gold, silver, jade and rubies, as well as oil and gas (Aung-Thwin and Aung-Thwin, 2013: 41-43). With these physical attributes came an external desire to utilise Myanmar's gateways into other countries, such as India and China, and to establish trade links exploiting the regions natural resources (Aung-Thwin and Aung-Thwin, 2013: 176).



**Figure 103** Map of Myanmar showing the long coastline, bordering countries and major rivers and tributaries (Available at: <http://www.mapsofworld.com/myanmar/myanmar-river-map.html> [accessed 09.01.2017])

Myanmar has been of international interest, from the Chinese using it as a thoroughfare to access India and other parts of Central Asia from at least 2,000 years ago (Woodman, 1962: 12-13), to the establishment of Portuguese trading stations in the south in the sixteenth century (Topich and Leitich, 2013: 176). This chapter, however, focuses on a period of political instability, war, heightened international trade and annexation of a Burmese king – a time of British colonialism.

In 1824 the first Anglo-Burmese war erupted lasting until 1826 (Tarling, 1966: 145; Aung-Thwin and Aung-Thwin, 2013: 177; Topich and Leitich, 2013: XV). This was the result of a border dispute between British India (as India was known at the height of the British Empire) and the Kingdom of Ava (the main kingdom that ruled Myanmar) (Thant Myint, 2001: 18-20). The British were successful and

gained a significant portion of the country (see Figure 104). In 1852 a second Anglo-Burmese war erupted followed by a third in 1885 (Thant Myint, 2001: 2-3; Aung-Thwin and Aung-Thwin, 2013: 177; Topich and Leitich, 2013: XV). Figure 104 shows how much land was gained by the British following each of these wars, where they firstly captured parts of 'Lower Burma', as it was coined under the reign of the British Empire (Aung-Thwin and Aung-Thwin, 2013: 8), followed by the annexation of King Thebaw and control of 'Upper Burma' and its capital Mandalay in 1885 (Woodman, 1962: 222-246; Aung-Thwin and Aung-Thwin, 2013: 177). This was shortly followed, in 1890, by colonisation of the whole of the region, renamed British Burma in 1886.



**Figure 104** British territorial acquisitions in Burma. (Aung-Thwin, A., Steinberg, D. and Aung, M. (2016) *Myanmar*, Encyclopaedia Britannica, Inc. Available at: <https://www.britannica.com/place/Myanmar> [accessed 07.04.2017])

During British control Burma, as it shall be referred to when discussing the regions colonial history, was treated as a province of British India (Stockwell, 1999: 390). There was a significant increase in the cultivation of padi (rice) particularly along the drained Irrawaddy River Delta. Rice, along with teak and, later, oil, became the main exports and colonial economic drivers (Stockwell,

1999: 391). With the increase in trade came the need to transport goods along the Irrawaddy River, the “country’s artery” (McCrae, 1980: 87). This resulted in the founding of the Glasgow managed Irrawaddy Flotilla Company Limited in 1876 (McCrae, 1980: 88-90). This company employed a fleet of modern paddle steamers and barges to transport passengers and cargo, including rice, up and down the river (McCrae and Prentice, 1978). The Burmah Oil Company, established in 1886, also utilised the Irrawaddy Flotilla Company’s fleet to transport oil from central Burma to the refineries in Rangoon and resulted in the construction of new specialised steamers and barges (McCrae, 1980: 95-96). This was a time that saw the use of both modern paddle steamers as well as local watercraft along the major waterways. Colonial workers and residents in British Burma would thus have been familiar with the local watercraft in use at the time. With the natural waterways spanning the country the region has always relied heavily on boats for transportation, communication, the economy and culture as watercraft was an integral aspect of life. Moreover, the seasonal flooding of villages along the river deltas due to the monsoons meant communities were dependent on boats for transport and even children had their own “tubs” (Ferrars and Ferrars, 1900: 81) to get around (see Figure 105).



**Figure 105** Children playing with ‘tubs’ at the riverside (Ferrars and Ferrars, 1900: 74, Fig.159)

Whilst the economic growth in Burma resulted in an increase in certain jobs (Aung-Thwin and Aung-Thwin, 2013: 196), there were several disputes and periods of unrest between locals and British colonials. The Second World War marked some significant changes starting with the Japanese army taking over in 1942 (Aung-Thwin and Aung-Thwin, 2013: 225-226; Topich and Leitich, 2013: xvi). In 1948, after the war, Burma gained full independence (Topich and Leitich, 2013: xvi). The period following saw the rise of a number of political parties and military take over from the Burma Independence Army and over half a century of

civil war (Aung-Thwin and Aung-Thwin, 2013: 226). During this time, until the election of a new civilian government in 2011 (Aung-Thwin and Aung-Thwin, 2013: 282), Burma, which the military government renamed Myanmar in 1989 (Aung-Thwin and Aung-Thwin, 2013: 7), experienced not only a time of political instability and civil unrest but also a time of self-imposed isolation. This involved restrictions to access the country and thus little international engagement (Green, 2015: 461), particularly with the western world in an attempt to close a door on its colonial past (Aung-Thwin and Aung-Thwin, 2013: 250). Given these circumstances it is perhaps not surprising that the volume of scholarly works on the region, particularly relating to its traditional watercraft, are considerably few compared with that of Sri Lanka for example.

In addition to Myanmar's political history it is important to acknowledge the devastating impact of Cyclone Nargis in 2008. This natural disaster, which affected the Irrawaddy Delta and Yangon (formerly Rangoon [Topich: xviii]), reportedly "caused more destruction and human suffering than any natural disaster in Myanmar's history" (FAO, 2009). With 140,000 casualties, 2.4 million people affected, and the destruction of 44% of the small fishing boats employed in the area, Cyclone Nargis had a huge toll on human life, livelihoods and the economy, including rice production (FAO, 2009). With the destruction and decline of traditional watercraft in recent years this chapter will assess the value of models as evidence for such vessels.

The changing nomenclatures of the country under colonial and military rule were, and still are, somewhat contested. The term 'Burma' was an English word used during colonial rule and the renaming of the region to 'Myanmar' in 1989 by the military government links back to the regions earlier use of 'Mranma' (Aung-Thwin: 7). Whilst it is acknowledged that 'Myanmar' is currently the official name this chapter will, for ease of discussion, refer to the region as 'Burma' when discussing its colonial history and pre-1989 and 'Myanmar' thereafter using the term 'Burmese' to refer to its citizens.

### **7.2 Published studies of Burmese boats – an overview**

There do not appear to be any detailed published studies of watercraft from Myanmar. In the course of this research, however, a small number of publications were identified that include a discussion of traditional watercraft from this region (Ferrars and Ferrars, 1900; Nisbet, 1901; Nyunt, 1996; Fraser-Lu, 1994; Than,



2006 and Davy and Svensson, 2009). In addition, Burmese boats were considered alongside vessels from other regions in systematic studies such as Paris (1841), Folkard (1906) and Hornell (1946). However, none of these publications attempt to provide a scholarly account of boat types, technology or use. Thus, there are clear gaps in our understanding of traditional Burmese boats highlighting a fundamental need to produce a scholarly account of vessels from this region. It is therefore important to assess the limited literature that is available about Burmese watercraft. This can then be reviewed in conjunction with the models identified in section 8.3 so we can start to build an understanding of traditional Burmese vessels and their associated maritime cultures.

Ferrars and Ferrars' book *Burma* (1900), which is about the region, its people and culture in the late nineteenth century, is perhaps the most useful resource, particularly when considering the construction of traditional wooden vessels. Written by the director of public instruction in British Burma (Wright, 2013), this work is useful for providing a basic understanding of boats, their variation and construction as well as the impressions they gave the European visitor to the region in the late nineteenth and early twentieth centuries. Observing the region at a similar time Nisbet, a Scottish conservator of forests in British Burma in the late nineteenth century (1901a and 1901b), wrote two volumes on the region including a section on boat races in volume II (1901b, 268-271). Within this section Nisbet described the tradition of boat racing demonstrating the importance of watercraft in riverine communities with some basic descriptions of these vessels. These publications, along with Paris (1841), Folkard (1906) and Hornell's (1946) studies of boats from around the world, provide a basic insight into traditional Burmese watercraft used in the nineteenth and early twentieth centuries.

The publications that mention traditional boats then jump forward to the late twentieth and early twenty-first centuries leaving gaps in our knowledge about Burmese vessels in the first fifty years of independence. This is perhaps not surprising given the political instability and isolation from the western world as mentioned in section 8.1. In 1996 Nyunt published a booklet about the seventh annual regatta festival, an annual procession and boat races which were historically held by Burmese kings (Nyunt, 1996: 4). This booklet was produced under the guidance of the State Law and Order Restoration Council to revive and preserve this aspect of cultural heritage and for political incentives, for repatriation, to promote national unity and boost morale by putting on a regatta

(Nyunt, 1996: 54-55). Than's unpublished report, produced later in 2006, uses much of the information, often word for word, from the Regatta Festival booklet briefly adding sections on aspects such as boat building. Although these works had clear political incentives they include information and images of a variety of processional and racing boats that can help us to understand these particular vessels, their use and significance.

In addition, Fraser-Lu produced a book on Burmese crafts (1994) which discussed wood crafts and the different vessels that were made from hard woods. Whilst these descriptions lack detail, the use of local nomenclatures and descriptions of the variety of vessels are useful when attempting to build up a picture of traditional Burmese watercraft. Lastly, in 2009, Davy and Svensson published guidelines, under the Food and Agriculture Organisation of the United Nations (FAO), for the production of hand crafted wooden small boats. This was a response to the devastation caused by Cyclone Nargis which left many fishermen without boats. These guidelines are an attempt to help recover the economy and are interesting for the study of traditional vessels in the way that they incorporate aspects of traditional watercraft. Yet they were designed and adapted by Davy, a naval architect, specifically to rehabilitate subsistence fisheries (Davy and Svensson, 2009: iii) and are thus a modern adaptation limiting the information it can provide about traditional watercraft.

Whilst there are a lack of scholarly accounts of traditional Burmese vessels there are some clear themes that have emerged when reviewing the publications, namely boat types, use and construction methods. This section therefore summarises some of the key points discussed by the aforementioned authors to provide some background and a basis for comparison with the models later in this chapter. It will do so by firstly discussing boat types and their uses as mentioned by the authors followed by the construction techniques identified in the publications discussed. By making the reader aware of the watercraft that often emerge in these publications it will also highlight those that seem to be omitted and, in the summary, consider the reasons for this.

### **7.2.1 Boat types and their uses**

Different types of vessels and their uses are often discussed in publications that mention Burmese watercraft (e.g. Ferrars and Ferrars, 1900; Nyunt, 1996; Than, 2006). Yet a formal classification and exhaustive survey of different boat categories has not, thus far, been devised. Nevertheless, the main discussion

across multiple publications focuses on vessel type according to use. This refers to boats used for different purposes namely as ferries, for war, ceremonial activity, to transport cargo and for racing. They are then sometimes further differentiated by identifying where these vessels were used, be it rivers, lakes or as sea-going craft. By considering the range of boats discussed in multiple publications this section attempts to synthesise a classification of Burmese watercraft based primarily on use. This is formed from the authors' interpretation of the literature as a way of discussing different vessels which can later be compared with the models.

### ***Rafts used as ferries***

Ferrars and Ferrars' book about British Burma, which was published in 1900, includes a section about water transport where there is a brief mention about the use of rafts (1900: 118-119 and 141). These rafts, as can be seen in Figure 106, were used to ferry people and goods along the rivers. Ferrars and Ferrars did not provide detailed information about this form of water transport, but commented how "great as are the facilities for travel from the native point of view, to Europeans the discomfort of travel, once off the lines of rail and steamer, is so considerable that few who can avoid it wish to visit the interior" (1900: 141).



**Figure 106** Ferry station (Ferrars and Ferrars, 1900: 141, Fig. 317)

Over one hundred years later Than also included a photograph of a "bamboo raft in the wide shallow waters" (Than, 2006: 45). This raft, as shown in Figure 107, similarly appears to be ferrying passengers. Another photograph (see Figure 108) depicts a much larger floating structure described as a "woody raft in the river" (Than, 2006: 46). This appears to be considerably larger and less manoeuvrable than the previously mentioned rafts and contains multiple wooden structures or shelters. It is interesting to note the use of rafts in Myanmar but beyond three

photographs we are left with very little information about this form of water transport.

[image removed and put in Appendix H due to copyright]

**Figure 107** Bamboo raft in wide shallow waters (Than, 2006: 45)

[image removed and put in Appendix H due to copyright]

**Figure 108** Woody raft in a river (Than, 2006: 46)

### ***War and ceremonial boats***

The next group of watercraft identified in the literature is considerably different to the previous class. These are ornately carved and decorated keelless vessels, often built up from logboats, for use on the rivers and internal waterways. They are war or ceremonial vessels. Nyunt (1996) and Than (2006) observed how Burmese chronicles mentioned thirty-six different types of ceremonial boats and barges as well as thirty different war boats. There is, however, a lack of differentiation between these two key classes where naval vessels were often used for both defence and display showing considerable cross-over with ceremonial vessels. As war boats are not easily distinguishable from ceremonial boats this research has incorporated both uses under one category for ease of discussion.

The procession and display of watercraft can be traced back to at least the sixteenth century to King Bayint Naung. This display was held annually by kings as both a naval exercise and royal pageant (Nyunt, 1996: 21-22) until King Thebaw was exiled by the British in 1885 resulting in the dissolution of the Burmese monarchy (Stockwell, 1999: 390). During the British colonial period patriotic festivals were discouraged, though pony and boat races continued to be held on a local level (Nyunt, 1996: 24). It was not, however, until 1989 that the annual traditional regatta festivals were revived by the State Law and Order Restoration Council Government. The aim was principally to restore order, encourage patriotism and to boost morale on a national scale as well as preserving cultural heritage. This festival still takes place every September where procession of a royal flotilla, made up of ornately decorated boats based on those

used by kings in the past, are followed by heats of canoe racing (Nyunt, 1996: 59). It is not clear, however, if this includes traditional vessels that were used in regattas in the past or if these vessels are all modern reproductions.

Nyunt, under the State Law and Order Restoration Council, produced a booklet about the seventh of these traditional regatta festivals held in 1996 which included a re-enactment of King Thayawaddy's naval expedition to Dagon in 1841 (Nyunt, 1996: 46-49). This booklet is particularly useful as it contains images and descriptions of different types of war and ceremonial vessels and their origins, or rather the legends of different boats. For example:

***"The legend of Thone Lu Pu Zaw Boat***

*When three calamities fell upon the kingdom of Vesali, Sakka and devas created a celestial boat on which the Lord Buddha was carried on a water journey. Three sentient beings (Thone Lu) namely the humans, the devas, and the Brahmas paid homage to the Lord Buddha. So the boat came to be called Thone Lu Pu Zaw. Thone Lu means sentient beings, Pu Zaw means 'pujema' i.e., paying homage. This boat has the figures of the crowns of a human king, a deva king and a Brahma king affixed on the bow, and three umbrellas hoisted on the stern" (Nyunt, 1996: 7-8).*

[image removed and put in Appendix H due to copyright]

**Figure 109** *Thone Lu Pu Zaw boat* (Nyunt, 1996)

Nyunt and Than mention a range of different types of royal boats (see Figure 109 to 112) with variations in their features and origins. The names for the vessels can be broken down to understand the meaning and legend behind the boats. For example, *nawa rupa* means nine beauties so the *nawa rupa* boat (Figure 110), also known as *nawara*, has nine beauties. This includes "the beak and mane of karaweik bird...two tusks of elephant... two wings of parakeet...and the body of toe naya (unicorn)" (Nyunt, 1996: 9). A variation on the legend is that the boat was called *nawa raja* boat meaning nine kings (Nyunt, 1996: 9).

[image removed and put in Appendix H due to copyright]

**Figure 110** *Modern nawa rupa boat* (Than, 2006: 12)

These vessels vary in terms of their overall forms and features, from a simple logboat with raised stern in the shape of a fish tail and several thwarts (Figure 111), to large barges with elaborately carved figureheads and pagodas decorated with gold paint (see Figure 112).

[image removed and put in Appendix H due to copyright]

**Figure 111** Royal rowing boat (Than, 2006: 65)

[image removed and put in Appendix H due to copyright]

**Figure 112** Modern Karawait barge (Than, 2006: 71)

Paris (1841), in his ethnographic recording of watercraft in Burma, included drawings of what are described as a ceremonial vessel (Figure 113) and war boat (Figure 114) demonstrating how these vessels could be sighted in the nineteenth century. Both vessels depicted are ornately decorated and have raised sterns with steering oars. Figure 113 also has a figurehead and pagoda and Figure 114 is complete with a crew of oarsmen with a steersman stood on the raised stern which is decorated with what appears to be a large feather and hanging ornaments. Interestingly, Fraser-Lu described war craft as long and narrow with low, sharp bows and recurving sterns that would be manned by about 40-60 people (Fraser-Lu, 1994: 107-108). Furthermore, “arms were stowed in a rack extending down the middle. To signify their status as royal boats, the sterns were festooned with loops of tinsel, a royal umbrella, and a flag with a kon-baung peacock emblem” (Fraser-Lu, 1994: 108). Here Fraser-Lu describes war craft with a local name, *ye-hle* (1994: 107).



**Figure 113** Royal boat of the Burmese emperor (drawn by Paris, 1841)



**Figure 114** Burmese war boat (drawn by Paris, 1841)

There appears to have been a wide variety of ornate vessels used for war and ceremonial purposes in Burma since at least the mid-nineteenth century. They seem to range in size, decoration and overall style but are all keeless logboats or extended (built up) logboats, ornately decorated. The decoration varies from elaborately carved and painted figureheads to slightly less elaborate ornaments hanging from the stern. With a long and complex history of warfare on both a local and international level, such as the Anglo-Burmese wars of 1824-6, 1852 and 1885 (Topich and Leitich, 2013) for example, it is not surprising that the regions navy and showcasing this power at regattas was so important. As will be demonstrated in the subsequent section these vessels were, and are, considerably different to working vessels.

### ***Racing boats***

Nisbet observed and recorded boat races, or “*Hlé Pwé*” (1901b: 268) and regattas in the late nineteenth century. Here he noted how “each town and big village had its own racing canoe (*Laung*) and its crew well trained to the use of the short paddles with which they are propelled” (Nisbet, 1901b: 268-269). Ferrars and Ferrars likewise observed and commented on these races, but at the time of both of these publications the national annual regattas previously mentioned were discouraged under British rule (Nisbet, 1901b: 269). These descriptions, therefore, refer to the local small-scale races that continued to take place around Burma’s waterways.

Ferrars and Ferrars (1900) and Nisbet (1901b) described not only the races, where different villages often competed against each other (Ferrars and Ferrars, 1900: 178), but also the vessels themselves. Ferrars and Ferrars, for example, noted how racing canoes (as seen in Figure 115) were “forty to sixty feet long and only wide enough for one man: they are lacquered inside and out... [and] paddled by a crew of eight to twenty” (1900: 178). This notion of lacquer is interesting as Nisbet acknowledged how boats and canoes were not usually painted but sometimes smeared with “dark-brown crude earth oil to preserve and beautify them” (Nisbet, 1901b: 381). Racing skiffs, however, formed an exception to this where they were coated in a black ‘Thitsi’ varnish both inboard and outboard (Nisbet, 1901a: 381; Nisbet, 1901b: 269). The application of lacquer inboard and outboard would have helped to strengthen a vessel and to enhance its speed through the water – an important quality for a racing boat.



**Figure 115** Canoes racing (Ferrars and Ferrars, 1900: 191)



Racing boats were described by Nisbet as “keeless skiffs” (1901a: 269) ranging from thirty to fifty feet in length. They were logboats made from teak or yamané (a lighter tree) with the addition of washstrakes either side. They were generally only wide enough to seat one paddler across, but Nisbet also mentions that the larger of these canoes could accommodate two paddlers astride. These boats were steered with a large sweep by a steersman sitting at the stern of the vessel (Nisbet, 1901b: 269).

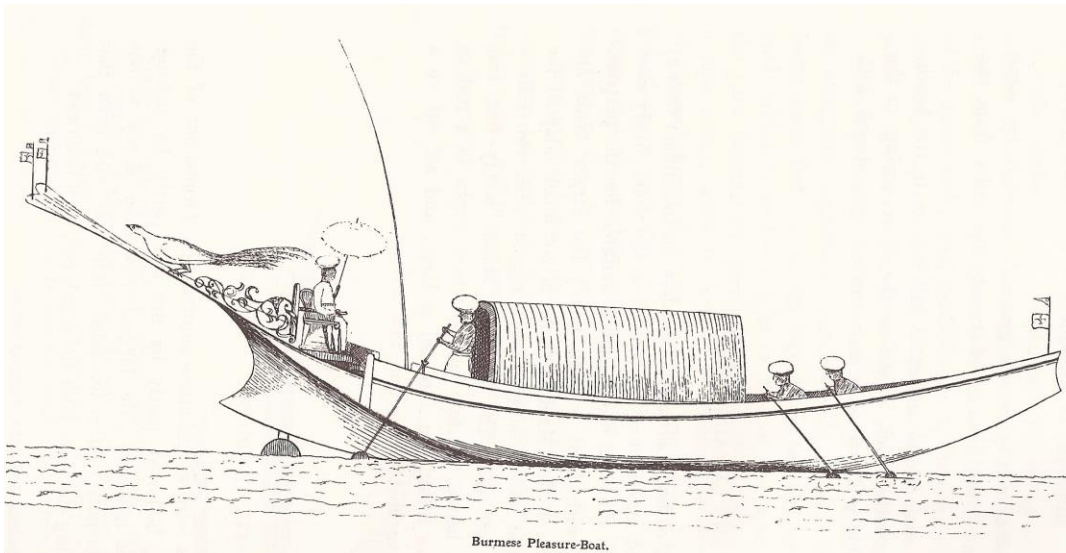
From the information provided by Ferrars and Ferrars (1900) and Nisbet (1901b), Burmese racing boats seem to have varied in size and width but were really quite long for seemingly narrow boats. The vessels, according to the descriptions, were keeless logboats built up with additional planking forming washstrakes. They were paddled by a large crew of men and had a black appearance from the application of Thitsi varnish to help enhance their performance.

### ***Working boats***

The last, and most commonly discussed, group of boats range considerably in terms of their size and form but all seem to be used for the transportation of goods or people. For simplicity, these vessels shall be classified as working boats. This includes all working watercraft as discussed in the available literature from cargo boats used to transport rice along rivers, to boats used to transport earth oil, to ferries used to transport passengers. These vessels differ considerably to those identified as war and ceremonial boats in the way that they are not painted and rarely decorated. Whilst it is acknowledged that the classification ‘working boats’ can incorporate a wide range of vessels this section attempts to sub-divide this category further by considering the boats in terms of their propulsion and function.

### **Working boats: River-going rowing / paddle boats**

In Folkard’s brief description of Burmese boats he refers to ‘pleasure boats’ with sterns high like fish tails and a Chair of State for the steersman (see Figure 116) (Folkard, 1906: 458-459). It is noted how these vessels were light and buoyant and could be carved and decorated with details such as birds and flowers (Folkard, 1906: 458-459). In Folkard’s drawing of such a vessel it can be observed that the crew are rowing, there is a canopy amidships and the profile shape of the vessel is considerably curved at both bow and stern.



**Figure 116** Burmese pleasure boat with the high stern like a fish tail, Chair of State, carvings and a side rudder at the stern and awning amidships (Folkard, 1906: 458)

Than included a drawing of what is simply described as a ‘rowing boat’ (see Figure 117). The shape of the stern in this drawing and use of oars for propulsion are similar characteristics of the vessel depicted by Folkard (Figure 116). A photograph of a boat that fits these descriptions has also been incorporated in Than’s report but is used to simply show people travelling by boat. However, this photograph (Figure 118) supports Folkard’s description by showing a vessel with a curved hull, Chair of State and a canopy and makeshift roof structure. It is unclear, however, in these descriptions as to the exact purpose of these vessels but they appear to be used for the general transportation of people, and possibly goods, on rivers.

[image removed and put in Appendix H due to copyright]

**Figure 117** Rowing boat (Than, 2006: 66)

[image removed and put in Appendix H due to copyright]

**Figure 118** Photograph of a Burmese boat containing a canopy and steersman’s chair (Than, 2006: 44)

Nisbet described these vessels as an “ordinary Burmese river boat” which has an “arched awning of bamboo mat so as to form the dwelling place of the crew...here the cooking is done on a shallow box filled with earth, and here the

men sleep at night” (Nisbet, 1901b: 382). Bamboo mats then form decking to protect the cargo on-board.

Little information is available about the rowed and paddled vessels that plied the rivers in Myanmar but it is possible to start to identify particular stylistic characteristics, especially in terms of the shape of the long narrow hull with its curvature and distinctive stern and the chair for the steersman which, it would seem, is sometimes ornately carved.

### **Working boats: River-going sailing boats**

This type of working vessel is one of the most commonly depicted and discussed within literature referring to traditional Burmese watercraft. These are cargo vessels that transported goods such as dried fish, salt, rice as well as imported goods, up and down the major river ways (Ferrars and Ferrars, 1900: 136-137). They reportedly carried large sails that could be used before the wind making use of prevailing winds (Ferrars and Ferrars, 1900: 134-136) and, according to Than (2006), the masts varied between single masts and double masts splayed and hinged at the base and joined together at the top to form a triangle, or bipod mast (see Figures 119 and 120 for example).

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**Figure 119** Up-country sailing boat with flying prow and stern (Than, 2006: 47)

[image removed and put in Appendix H due to copyright]

**Figure 120** Kind of riverine sailing craft with the downwind mast (Than, 2006: 56)

Fraser-Lu (1994: 107) and Ferrars and Ferrars (1900: 134-136) both referred to these vessels as *laung-zat* (see Figure 121). According to Ferrars and Ferrars the *laung-go*, a cargo boat with solid hull similarly used to transport rice, carried a square sail as well as being rowed and poled when needed (Ferrars and Ferrars, 1900: 134-136). These vessels, as discussed by Fraser-Lu, had high sterns with steersman’s platforms which were often “beautifully carved with relief decoration” (Fraser-Lu, 1994: 106-107). An example of such a stern is demonstrated in Figure 122 Interestingly, the name *laung-zat* was also used by Hornell (1946: pl.XLIII) but to describe a different vessel which will be referred to later. This clearly demonstrates the issues of taxonomy and their use by non-locals.



**Figure 121** *Laung-zat* sailing upstream (Ferrars and Ferrars, 1900: 132, Fig. 294)



**Figure 122** A steering chair of teak on a Burmese boat c.1900 (Fraser-Lu, 1994: 107)

### **Working boats: River-going sailing boats with outriggered gangways**

Ferrars and Ferrars (1900), Hornell (1946), and Fraser-Lu (1994) all refer to a sailing vessel outriggered with gangways. Often referred to as *pein-gaw* (Ferrars and Ferras, 1900; Fraser-Lu, 1994), Fraser-Lu identified that they were used to transport oil. Hornell, however, described them as rice boats and observed that, by the 1940s, they were “extinct” (1946: Pl. XLIII). These vessels are distinct from other Burmese craft as they are equipped with outboard gangways either side

running along the length of the vessel (see Figures 123 and 124). These are said to have been used as a platform for propulsion (Ferrars and Ferrars, 1900: 135; Hornell, 1946: 265-266; Fraser-Lu, 1994: 107) and would have enabled more passenger or cargo space within the deck house that extended along most of the length of the vessel (Ferrars and Ferrars, 1900: 135).



**Figure 123** Two Burmese rice boats (now extinct) furnished with broad outrigger gangways of 'parodos' (Hornell, 1946: plate XLIII)



**Figure 124** *Peingaw* sailing upstream (Ferrars and Ferrars, 1900: image 299)

### ***Sea-going boats***

With the vast internal waterways connecting a large expanse of Myanmar, particularly in terms of the major rivers and their tributaries, it is perhaps not surprising that riverine watercraft account for the majority of the vessels mentioned within Burmese boat literature. Ferrars and Ferrars did, however, acknowledge the presence and use of “the only sea-going craft... [known as]... *kattu*” (1900: 138). These vessels are described as small junks of “twenty to sixty tons” (Ferrars and Ferrars, 1900: 138) that sailed as far as the Nicobar Islands to ship coconuts during the north-east winds. These vessels are said to have only been used during these winds which are associated with dry fine weather (Alpers, 2014: 7). The *kattu*, according to Ferrars and Ferrars, were not used the rest of the year (1900: 138). These vessels remain significantly omitted from the majority of the literature available about Burmese watercraft but Ferrars and Ferrars’ description is highly significant to inform us about the ability of Burmese boats to venture into deep waters and exposed conditions.

#### **7.2.2 Construction**

The technologies and methods used to make traditional Burmese watercraft is another key theme apparent in the literature identified in this research. Ferrars and Ferrars (1900:133-138) and Nisbet (1901a: 379-381) both recorded aspects of boat construction in their accounts of Burma. These publications noted two particular methods of boat building: the first being the dugout method where a log is hollowed out and the second fastening wooden planks to a frame (Ferrars and Ferrars, 1900: 133-136; Nisbet, 1901a: 380).

Folkard (1906) and Fraser-Lu (1994) also discussed the former of these methods, which Folkard described as “primitive” (1906: 457), but also commented how boat-building was an important aspect of Burmese industry. The hollowed, or dugout, log method starts with the felling of a large straight tree. This was often *thingan* which was durable and could last twenty to thirty years (Ferrars and Ferrars, 1900: 133-135; Nisbet, 1901b: 380; Fraser-Lu, 1994: 82), although teak and *in*, which was not as durable but a tree that was abundant and thus an accessible resource in Myanmar, were also used (Nisbet, 1901b: 380). The log was then hollowed out using a chisel and smoothed off with an adze (see Figure 125) making sure the thickness of the log was even (Ferrars and Ferrars, 1900: 133; Fraser-Lu, 1994: 106-107). Ferrars and Ferrars then described how the log was filled with water and emptied when it became waterlogged, frames with

levers inserted and a small fire was built under the length of the log (1900: 133-134). This technique used the application of steam produced from the fire and waterlogged wood to widen the beam of the log assisted with the frames and leverage system so it doubled in width. Thwarts were then added into recesses in the log before the hull retracted securing them into position. Ribs were inserted and planks nailed onto the sides of the hollowed and expanded log to increase the freeboard, the edges of which were caulked with bee dammar (Ferrars and Ferrars, 1900: 134).



**Figure 125** Rough hewing the boat hull (Ferrars and Ferrars, 1900: 133)

The dugout expanded hull method was applied to a range of *laung* (canoe), from small to large, with variations in the extent they were built up. For example, Ferrars and Ferrars noted that large cargo boats had an additional tier of thwarts unlike the smaller *laung-go* (1900: 134). In the larger of these vessels the bow is kept low but the stern is significantly raised by the addition of planks to form a platform for the steersman. These were often elaborately carved (Nisbet, 1901a: 380; Fraser-Lu, 1994: 106-107). The low bow and raised stern resulted in a significantly curved hull.

Ferrars and Ferrars also describe the construction of the earth-oil carrier, the *peingaw*. This differed to the line of the *laung-go* as it was formed from two partially hollowed out teak logs. These were positioned at each side of the base with planks in-between creating a flat-bottomed vessel. Two planks were then added with nails either side and bamboo outriggers were fitted (Ferrars and Ferrars, 1900: 137).

The final type of construction, identified by Ferrars and Ferrars (1900: 136), Nisbet (1901a: 279-380) and Than (2006: 31), is that of the *hle*, or carvel planked boat. Than photographed plank-built boats under construction (Figure 126) and Nisbet explained how the only vessels not using the dugout hull technique were designed to be sea-going with heavy ironwood keels (1901a: 380). These differed significantly to the *laung* as they were built entirely of planks nailed to a wooden frame and were able to be built on a larger scale and with a greater capacity.

[image removed and put in Appendix H due to copyright]

**Figure 126** Traditional boat building showing flush-laid planking being attached to a wooden frame  
(Than, 2006: 31)

Ferrars and Ferrars similarly commented how the larger vessels, or *hle*, could be carvel planked using teak (1900: 137). However, they also went on to report the following:

*"In Burma proper, where timber does not attain such size as in the moist region, canoes only are made on the laung-go plan: the larger boats have always been built up. In these the laung-go type is also simulated...The narrow bottom is flat and is fixed to the side-planks of the lower hull by ribs. The planks are... held together by nails driven obliquely from recesses near the seams, which are luted with dammar, and are strengthened with ribs.... Poop and prow are strengthened by iron dee-nails along the seams"* (Ferrars and Ferrars, 1900: 137).

If 'built up' here refers to the construction of vessels entirely from planks and frames, it would seem it was not only sea-going vessels that used a flush-laid plank method. It would thus seem the construction technique employed was not only dependent on the intended use of the vessel but also on location and the availability of resources.

Burmese boat construction seems to have had a certain appeal, particularly for British authors in the early twentieth century. The majority of the vessels were formed or built up from a hollowed log expanded by fire with the exception of the flush-laid planked sea-going craft, earth-oil carriers and in regions where the timber was not large enough for this construction technique.



### **7.2.3 Summary**

Although the literature available about Burmese watercraft is limited in terms of scope and detail, it has been possible to start to build up an idea about the different types of watercraft that were in use since the mid to late nineteenth century and the techniques used to build them. This background can be used when observing the models to help draw out similarities and differences and to ultimately see if models can build on this understanding of traditional boats.

It is interesting to observe which vessels were discussed in the literature and which were omitted. For example, war, ceremonial and racing boats feature in more detail than the majority of working boats. This could be due to the significance of regattas and the importance of their revival by the state since 1989. It could also be due to the impressive aesthetic nature of the vessels for European visitors that enticed them to include such vessels in their publications. This can start to enable us to understand how important traditional watercraft was in Burmese society and their impact on foreign writers.

A number of vessels do, however, seem to have been omitted from the literature identified. For example, sea-going boats are rarely mentioned. The focus has been on river going vessels. There are also several gaps in the literature in terms of date, particularly in the nineteenth century and from the early to late twentieth century. This study is therefore important to see if models can contribute to our understanding of Burmese vessels and to see if it can start to fill in any of these gaps.

### **7.3 Model boats: what can they tell us about traditional Burmese watercraft?**

With little research conducted on traditional Burmese boats to date, the large number of detailed model boats in museum collections can provide crucial evidence about the range and construction of watercraft. The rest of this chapter thus showcases a range and variety of traditional watercraft, their particular features and cultural value through observations and analysis of the models. A catalogue of these models is presented in Appendix G. It begins to work towards a classification of these vessels and considers aspects of their technology that can provide a comparison for any future research on surviving traditional boats in Myanmar.

The models and their biographies are firstly introduced to provide an understanding of when and why they were made and collected. The chapter then goes on to explore the physical attributes of the models which are compared, where possible, with literature and other iconographic sources, whilst considering the key research question - *how useful are models as a tool for studying traditional boats from the Indian Ocean?*

### 7.3.1 An introduction to the models

Seventy-one, often highly detailed, models of watercraft from Myanmar are present in nine of the thirteen museum collections consulted in the UK. This equates to just 10% of all the models from the Indian Ocean identified in this study. They range considerably in terms of their style, form and ornamentation from bamboo rafts (e.g. Figure 127) to wooden canoes (e.g. Figure 128) to elaborately carved and painted vessels for example (e.g. Figure 129).



**Figure 127** Model of a Burmese raft made from bamboo, acquired in 1919. In the British Museum collections, 198mm in length (inventory number As1919,0717.41; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)



**Figure 128** Model of a Burmese canoe. In the National Maritime Museum collections, 520mm in length (inventory number AAE0063; © National Maritime Museum, Greenwich, London)

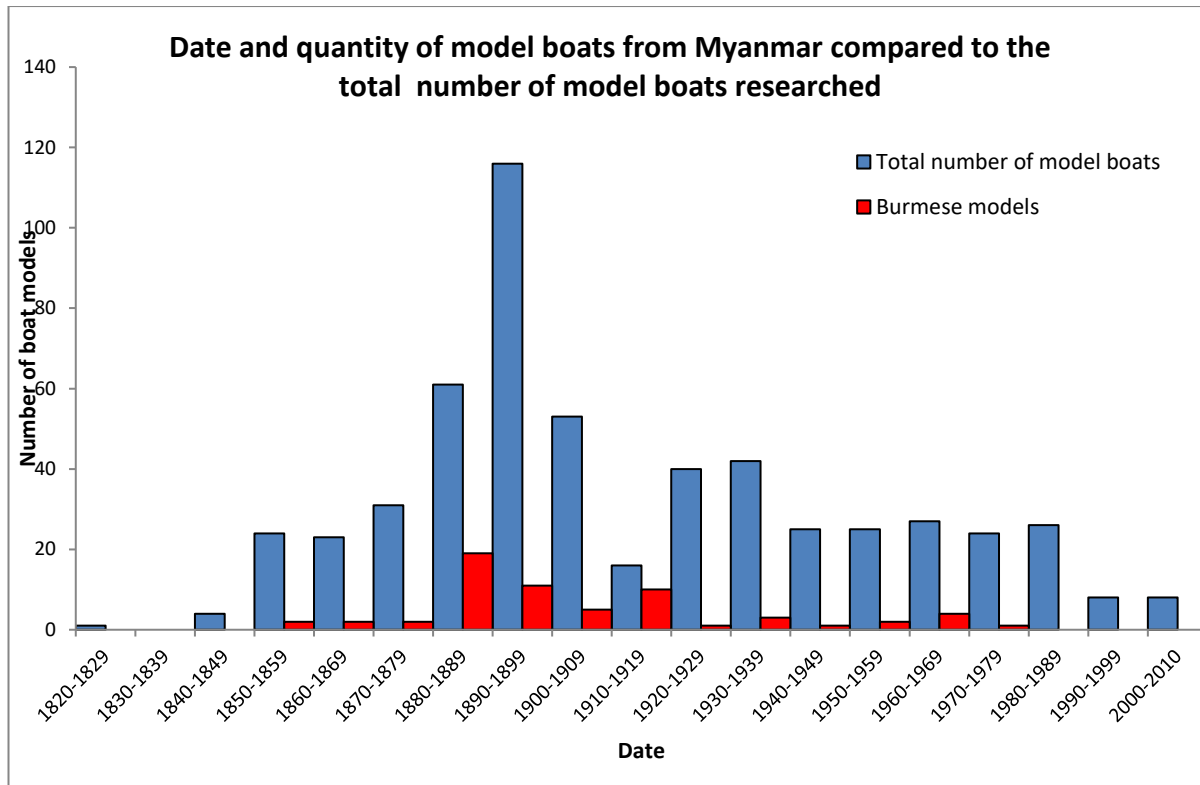


**Figure 129** Model of a ceremonial barge. In the Glasgow Museums collections, 850mm in length (inventory number 1907.43.b; Photograph taken by Charlotte Dixon, 2015)

The majority of the models date from the late nineteenth and early twentieth centuries, a time when the British annexed King Thebaw and took control of Burma (see section 7.1). Few model boats were made, collected or acquired prior to this (see the red columns in Figure 130). There are likewise few models dating from the end of the First World War through to the late twentieth century<sup>12</sup>. The

<sup>12</sup> Whilst the earliest model, a state barge now in the Science Museum (inventory number 1916-17), is recorded as having been made in 1850, the dates of some of the more recent models are less reliable. This refers, in particular, to the models dated to 1969 and 1977 in the Pitt Rivers Museum, the former of which were transferred to the museum in 1969

greatest volumes of models were thus acquired at a time when a British presence was at its peak in Burma in the late nineteenth and early twentieth centuries.



**Figure 130** Dates of the Burmese models compared to the dates of models from the Indian Ocean in the dataset

When comparing the dates of Burmese models with the overall dates of all models from the Indian Ocean in Figure 130 it is apparent that the collection of Burmese models does not simply fit with what was going on contemporaneously around the rest of the Indian Ocean. Although there were peaks in model collecting towards the end of the nineteenth century, during the height of the British Empire, few Burmese models were collected after 1919. Yet models from the rest of the Indian Ocean were still being collected throughout the rest of the twentieth and into the twenty-first century. Models of boats from the Indian Ocean, including Sri Lanka, date from the early and mid-nineteenth century but few Burmese models were collected until the British had full control over Burma after the third Anglo-Burmese war in 1885 (Aung-Thwin and Aung-Thwin, 2013: 177). The pattern of collecting model boats from this region thus seems to be Burma specific and it is perhaps not surprising how few were collected from the mid-twentieth century onwards when there were increasing tensions with Britain and

and the latter was found in the collections in 1977. Although the very latest possible dates of production and collection have been recorded it should be acknowledged that some of the models are likely to pre-date this.

the western world, as well as a period of political instability, civil unrest, independence in 1948 and political isolation (see section 7.1).

This ties in, broadly speaking, with the wider acquisition of Burmese objects into the British Museum's collections as discussed by Green (2015). The British Museum's Burmese collection, including model boats, saw an influx towards the end of the nineteenth century with the advance of colonial power in the region (Green, 2015: 449-450). Green observed that objects collected at this time therefore have the potential to inform us about the "colonial endeavour" (Green, 2015: 449-450). In addition, and similarly to the patterns of Burmese boat model collecting shown in Figure 130, there was a significant decrease in donations from the 1940s to 1980s as a result of the end of colonialism, the rise of a Socialist government and decline in international engagement (Green, 2015: 451). However, the main absence of boat models in this study is actually from the 1920s and 1930s. It would seem, then, that this case study has the potential to not only inform us about traditional Burmese boats and their miniature counterparts but also ties into the broader notion of museum collecting, colonial encounters and British-Burmese relations.

With specific regional information regarding the origins of the objects only documented for five of the seventy-one models researched<sup>13</sup>, it is not possible within this chapter to explore distribution and regional differences among Burmese watercraft. It is possible, however, to reflect on why the models might have been made and collected and how this could impact their use as tools for understanding traditional boats.

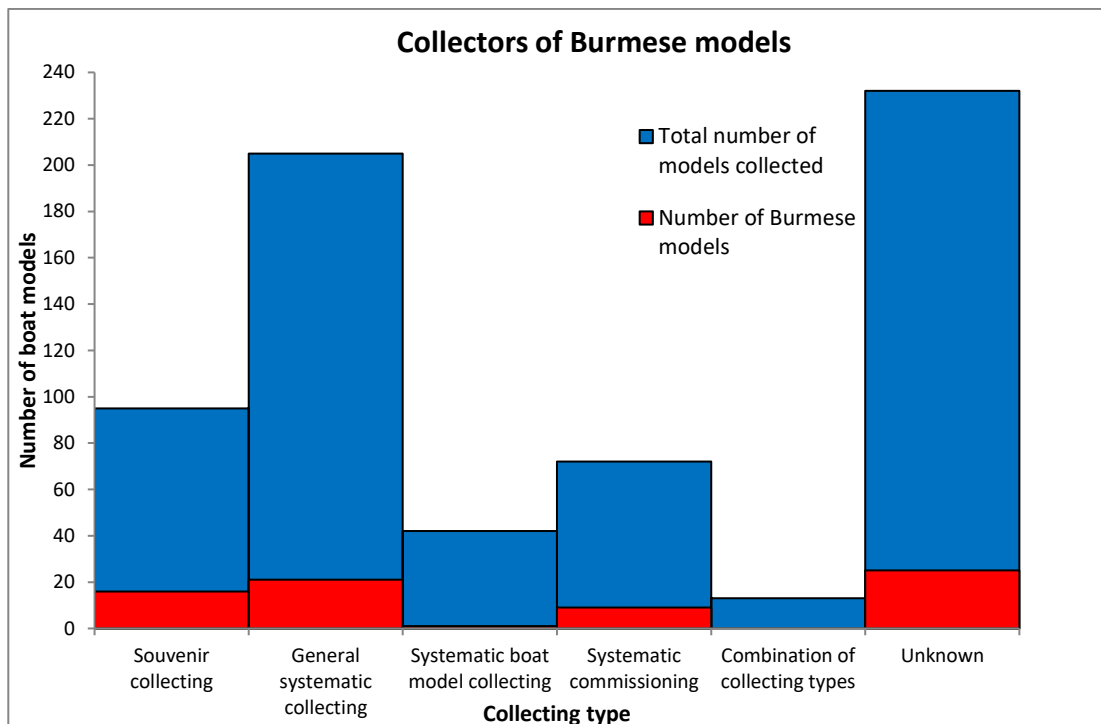
### **7.3.2 Why were the models collected?**

The reasons for acquiring models of Burmese boats is not uniform but varies from collector to collector. By analysing the different collectors and their associated collecting types identified in Chapter 4 it is apparent the majority of the models, where known, were generally amassed systematically (methodologically collected alongside a range of other objects). In addition, sixteen models were collected as souvenirs and nine were specifically commissioned. Figure 131 shows this fits the overall collecting trends of boat models from the Indian Ocean from the early nineteenth to early twenty-first

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<sup>13</sup> The few that do provide slightly more specific locations are recorded as originating from the Irrawaddy River, southern Shan State, the former capital of Myanmar, Rangoon or Yangon and 'lower Burma' which refers to the coastal region showing variation in their origins.

centuries reflecting the broader colonial presence in the region, the rise of anthropological collecting, museums and leisure travel. However, whilst some models from other parts of the Indian Ocean were collected in a systematic manner to specifically research and record watercraft (systematic boat model collecting), by Hornell for example, only one Burmese model was collected in this manner. This is a model of a Burmese war boat from Rangoon (NMM, AAE0013) collected by the naval architect Robert Seppings (Brown, 2004) prior to 1869. The lack of any other models being collected in this specific methodical way perhaps reflects the lack of systematic study of traditional Burmese boats to date.



**Figure 131** Different types of collectors who amassed models of Burmese boats compared to the types of collectors of all the models identified in this research

Nine models of different types of Burmese vessels, now in Glasgow Museums' collections, were commissioned specifically for display at The International Exhibition of Science, Art and Industry held in Glasgow in 1888. This exhibition followed in the footsteps of the Great Exhibition of 1851 and included objects showcasing aspects of science, art and industry from the colonies as well as Scotland and the rest of the UK<sup>14</sup> (Kinchin et al., 1988: 34). At this time Upper Burma was under British control and soon, in 1890, the whole of Burma was to become a province of British India (Fraser-Lu, 1994: 26). Furthermore, the

<sup>14</sup> Although Scotland's exhibits accounted for two thirds of the space and the rest of the UK amounted to a significant proportion of the rest leaving only a small portion of exhibits for the colonies (Kinchin et al., 1988: 34)

Irrawaddy Flotilla Company, founded in 1865 for the transport of passengers, cargo and mail by steam paddlers on the River Irrawaddy (see Figure 132 and section 7.1), was registered and managed in Glasgow (McCrae, 1980: 88). The majority of the engineers, captains and local managers employed by this company were Scottish (Killingray et al., 2004: 124) resulting in a strong Scottish-Burmese connection. It is thus not surprising that a section on Burma was included in the 1888 exhibition with the display of a variety of traditional wooden boat models (see Figure 133). The official catalogue remarked how “model representations of various industries, such as Pearl fishing, Arrack Distilling, Capturing Wild Elephants in a Kraol, and of native boats, wagons etc., are also displayed in different parts of the building” (*International Exhibition Glasgow 1888 – Official Catalogue* 1888: 249) implying these models were made to accurately depict these industries.



**Figure 132** A steamer of the Irrawaddy Flotilla Company with flats alongside, showing the way troops were conveyed up the river (Photograph by Willoughby Wallace Hooper, 1885, Available at: <http://www.bl.uk/onlinegallery/onlineex/apac/photocoll/a/019pho000000312u00008000.html>)





**Figure 133** Model of a *hlay pyong poay*, a Burmese outrigger boat made for The International Exhibition of Science, Art and Industry in Glasgow, 1888. In Glasgow Museums, 675mm in length (inventory number 1888.109.un; photograph taken by Charlotte Dixon, 2015)

As previously mentioned, the majority of Burmese models were intentionally amassed alongside other objects (general systematic collecting). These collectors were often anthropologists such as Frederick Horniman and Augustus Pitt Rivers and the majority of models were collected in the late nineteenth and early twentieth centuries, a time when anthropology was formally emerging as a discipline (Erickson and Murphy, 2016: 1). Other collectors, who amassed Burmese models in this manner, included colonial officials working in the region, such as Richard Carnac Temple (see the model in Figure 134 for example). In addition William Kidd, who was pastor of the Presbyterian Church in Rangoon (now known as Yangon) from 1886 to 1891, donated 260 objects he collected during his time in Burma to the British Museum (Green, 2015: 451). Among this collection of objects included three models of boats which will be shown later in this chapter.





**Figure 134** Model of a Burmese sailing boat, collected by Richard Carnac Temple by 1889. In the Pitt Rivers Museum collection, 1645mm in length (Inventory number 1889.29.40; © Pitt Rivers Museum, University of Oxford )

Furthermore, sixteen model boats were identified in Chapter 4 as being collected in a spontaneous one off way as souvenirs. Such collectors include members of the armed forces and individuals visiting and working in Myanmar. William Garland Soper, for example, who was a British merchant and politician ([http://freepages.genealogy.rootsweb.ancestry.com/~soperstuff/soperstuff/Surrey/wgs/wgs\\_pamphlet/index.htm](http://freepages.genealogy.rootsweb.ancestry.com/~soperstuff/soperstuff/Surrey/wgs/wgs_pamphlet/index.htm), the bourne society, 2008), was presented with a model of a gold painted ceremonial vessel (Figure 135) in 1895 by the manager of the Burma State Railway, G. Felton Matthew (National Maritime Museum records, inventory number AAE0196).

Whilst the models were made and collected for different reasons there do not appear to be significant patterns linking the collecting type with date. Moreover, the majority of the models appear to be highly detailed in their appearance but the models commissioned to depict traditional watercraft for the Glasgow exhibition of 1888 are particularly likely to reflect true details of vessels in miniature.

### 7.3.3 Types and use

One of the most important contributions models can make to our understanding of traditional Burmese watercraft is their depiction of a variety of vessels. These

range in terms of their overall form, features and ornamentation but it is possible to start to observe commonalities in particular stylistic traits that occur across multiple models. This section aims to demonstrate the range of watercraft represented in miniature and starts to introduce ideas about the different types of vessels that were used for different purposes in Myanmar. However, whilst potential types are considered, the classification of boats can be problematic with issues such as variation according to location (Bølstad and Jansen, 1992: 14), variation as a result of being hand crafted (McGrail, 2001: 7) and issues with nomenclature and transliteration (McGrail and Blue, 2003: 32). With this in mind, and given the lack of formal classifications of Burmese watercraft to cross reference, this section does not aim to devise or make assumptions about typologies. It introduces a range of watercraft to the reader that could potentially be compared, in future studies, with watercraft that is still in use in Myanmar today or to reflect on watercraft of the past that no longer exists.

Using descriptions recorded in museum documents along with physical observations of the models, these objects can generally be distinguished into two broad groups for ease of discussion – working watercraft and war and ceremonial watercraft. This also links to the different types of watercraft identified in the literature as discussed in section 7.2.1.

### ***War and ceremonial watercraft***

Sixteen of the models studied seem to represent watercraft used for war or ceremonial purposes. These have been identified by descriptions recorded in museum documentation and their physical appearance with reference to the naval and ceremonial craft identified in the literature. These models are highly ornamented often with elaborately carved figureheads and raised decorative sterns or are painted. Whilst a ceremonial boat may not have been intended to be used in warfare, Nyunt observed how naval watercraft was paraded at the royal regattas as these events were a “naval exercise of a sort as much as it was a royal pageant on water” (Nyunt, 1996: 21-22). This point was raised in section 7.2.1 when discussing the literature and is echoed again here. With naval and ceremonial vessels therefore difficult to differentiate this study will identify and discuss these types of vessels collectively.

The models researched in this thesis reflect a range of war and ceremonial craft from painted and elaborately carved boats such as Figure 135 to less ornate vessels. Two models are painted gold encrusted with glass jewels and have an

elaborate figurehead at the bow and tail at the stern. One of these models is depicted in Figure 135 and is particularly interesting when its context is taken into account. This model, which represents King Thebaw's barge used on the Irrawaddy River, was presented by G. Felton Mathew, manager of the Burma State Railways, to a Mr Garland Soper in 1895 (National Maritime Museum, AAE0196). This was only ten years after the annexation of King Thebaw to India and perhaps acts as a souvenir to reflect the dissolution of Burma's kingdom. The model shows the king seated amidships on a dias surrounded by oarsmen. The figurehead, according to the museum records, is carved in the shape of a hooded bird of prey with the raised stern depicting its tail. Aspects of this model such as the figurehead, pennants, and use of gold paint can be seen in recent examples of war and ceremonial vessels as discussed in section 7.2.1 where Nyunt (1996) and Than (2006) captured photographs and drew images of similar vessels in the late nineteenth and early twentieth century.



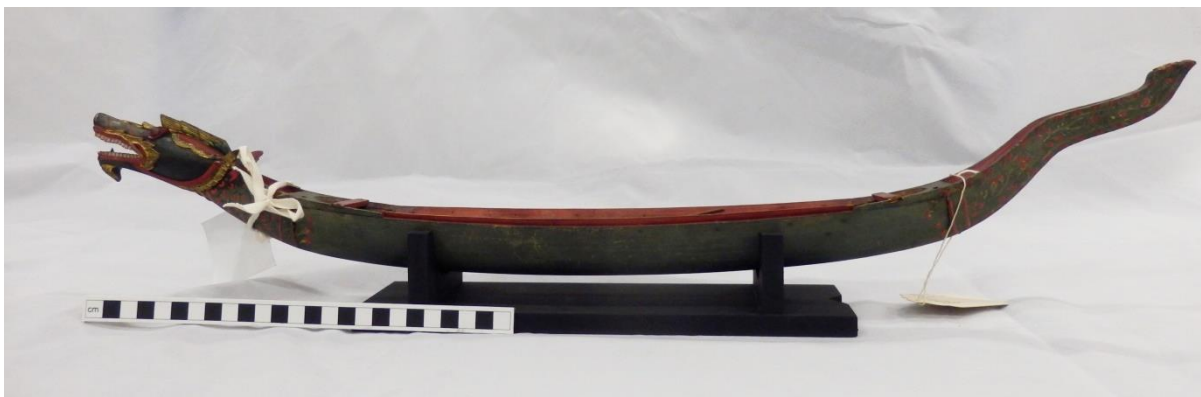
**Figure 135** Model of a Royal barge, acquired in 1895. It has an elaborately carved figurehead and stern and is painted gold. In the National Maritime Museum collections, approximately 900mm in length (inventory number AAE0196; © National Maritime Museum, Greenwich, London)

Other models of vessels described, primarily, as war boats, are not painted gold but are miniaturised logboats decorated in the style of a dragon like figure. Such a model is demonstrated in Figure 136. This example, of unknown provenance, shows a long and narrow logboat with raised bow carved and painted in the form of a dragon's head and raised stern in the form of a dragon's tail. There are a series of thwarts and a scale like pattern painted on the bow and stern of the vessel.

A similar model in Glasgow Museum collections was made for the International Exhibition of Science, Art and Industry, Glasgow in 1888 (see Figure 137). This model is described as a *dohn lay* or dragon boat (Glasgow Museum, 1888.109.ui) and shares similar features to the model in Figure 136 with its carved figurehead and stern forming a dragon like appearance, series of thwarts and dark green, red and gold painted hull. This exhibition just predated the height of Britain's colonial rule in Burma and, with the Glaswegian links to the Irrawaddy Flotilla Company, showcasing aspects of Burma's indigenous art, culture and technologies would have promoted the idea that Britain was integrating itself in to the area. The inclusion of this dragon boat demonstrates which vessels were deemed significant to miniaturise and display from a colonial British perspective.



**Figure 136** Model of a war boat with carved dragons head and tail at stem and stern. In the National Maritime Museums collections, 660mm in length (inventory number NMMAAE0057; ©National Maritime Museum, Greenwich, London)



**Figure 137** Model of a dragon boat, or *dohn lay*, made for the International Exhibition of Science, Art and Industry in Glasgow, 1888. In Glasgow Museums collection, 670mm in length (inventory number 1888.109.ui; photograph taken by Charlotte Dixon, 2015)

Whilst some models described as depicting war and ceremonial craft have elaborately carved figureheads, others reflect simpler designs. Such vessels account for the majority of the models ranging from long narrow logboats with painted hull exteriors to vessels such as those depicted in Figure 138 and 139. The latter two of these designs (Figure 138 and 139) have an interesting hull shape which is curved with a raised stem which is pointed in a ram like fashion. The stern is also raised and carved forming what appears to look like a fish tail. The inclusion of figures on both of these late nineteenth century models shows how a steersman is positioned at the stern. It is interesting to observe how the figures in Figure 138 are clearly positioned facing aft and their oars are held in place with thole pins indicating they are rowing. Figure 139 shows the opposite with the figures facing forwards, there are no thole pins and the paddles are smaller implying they are paddling not rowing.



**Figure 138** Model of a Burmese ceremonial boat dating from around 1890. In the National Maritime Museum collections, 845mm in length (inventory number NMMAAE0045; ©National Maritime Museum, Greenwich, London)





**Figure 139** Model of a ceremonial boat, acquired in 1898. In the Horniman Museum and Gardens collections (inventory Number 985; Horniman Museum and Gardens)

There are clear variations among the models identified as war or ceremonial craft but it is apparent they are all intricately worked with carvings, the application of paint or the inclusion of pennants or pagodas. It is easy to imagine how these vessels, on a larger scale, would have been aesthetically impressive for the British visitor to the region.

### ***Working watercraft***

The term working watercraft refers, in this case, to vessels with significantly different uses to the previous category: they are not used for their aesthetic qualities but rather to function as fishing boats, to transport cargo or to transport people. This group, therefore, covers a range of watercraft from rafts to logboats to large plank-built vessels and accounts for the remaining fifty-five models.

Three models depict bamboo rafts. Figure 140 shows a model of a raft presented by the Secretary of State for India circa 1884 (National Museums Scotland, T.1946.13). This raft is formed from five different sections of four logs / bamboo canes which are secured by cane lashings. The museum records note that this is to make the raft flexible so it is suitable for use on the turbulent upper reaches of the rivers. It also contains railings and a small deckhouse. There is little information available about Burmese rafts but it was noted in section 7.2.1 that Ferrars and Ferrars observed rafts being used to transport passengers and cargo along the rivers (1900: 141). With little known about Burmese rafts the models provide valuable clues about this mode of transport.

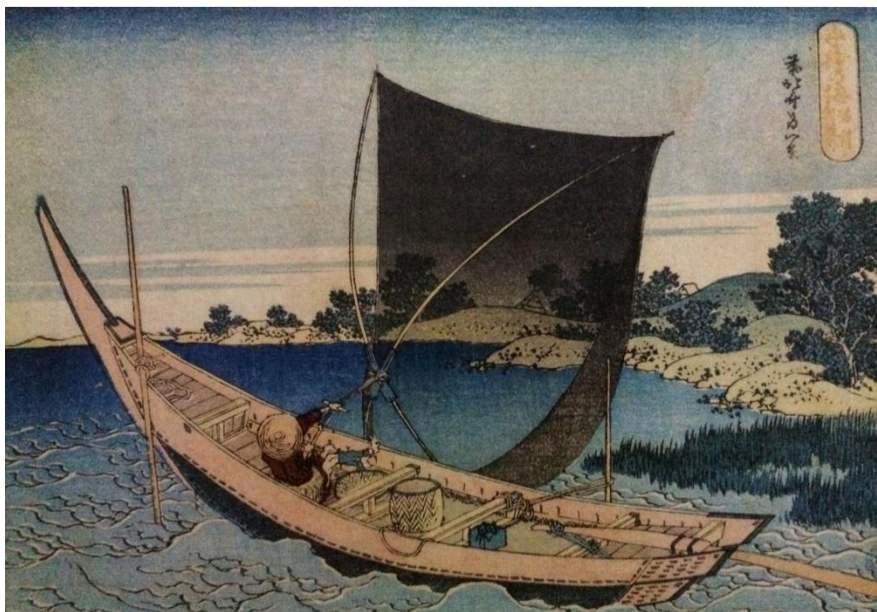


**Figure 140** Model of a Burmese river raft, acquired in 1884. In the National Museums Scotland collections, 762mm in length (inventory number T.1946.13; National Museums Scotland)

Another model of a working boat is pictured in Figure 141. This model is particularly interesting as it is a rare example of a fishing boat. It was collected by Richard Carnac Temple, an anthropologist and colonial official in Mandalay and, Later, Rangoon (Enthoven, 2004) and presented to the Pitt Rivers collection in 1889 (Pitt Rivers Museum, 1889.9.35). It is described in the museum record as a fishing boat, locally known as *yagwingye*. It depicts a logboat with a hinged fishing net which would have been lowered into the water and raised again when full of fish. This type of fishing was not uncommon in parts of South Asia, such as India and Japan (see Figure 142), but there is little information about this form of fishing boat in a Burmese context. Ferrars and Ferrars (1900) did not reference this type of vessel but did mention swing net fishing described as *yagwin* with a photograph showing this type of fishing from the shore (Figure 143). The model featured in Figure 141 thus provides important evidence about a type of fishing vessel that was in use in the late nineteenth century. It also can tell us about a fishing technique used in Burma at this time and will be discussed further in section 7.3.5.

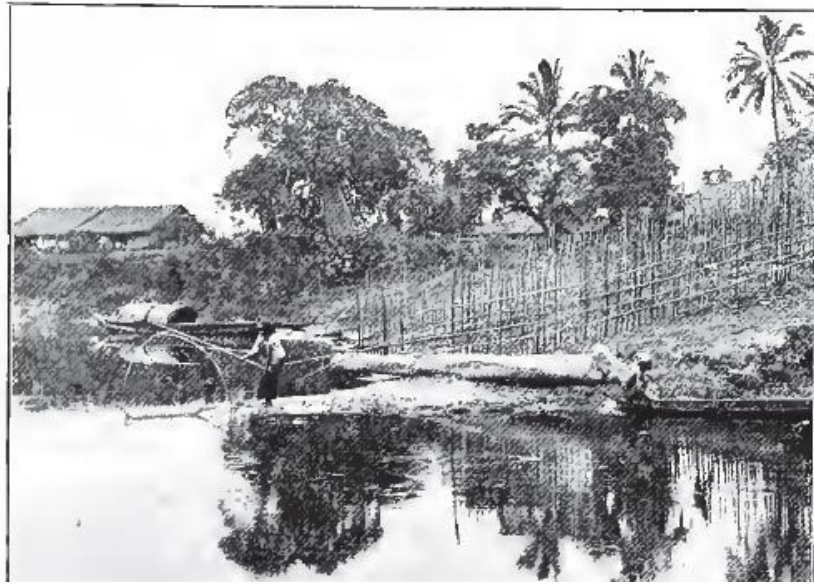


**Figure 141** Model of a fishing boat with a hinged fishing net, locally known as a *yagwingye*. Collected by Richard Carnac Temple in 1889. In the Pitt Rivers Museum collection, 443mm in length (inventory number 1889.9.35; photograph taken by Charlotte Dixon, 2015)



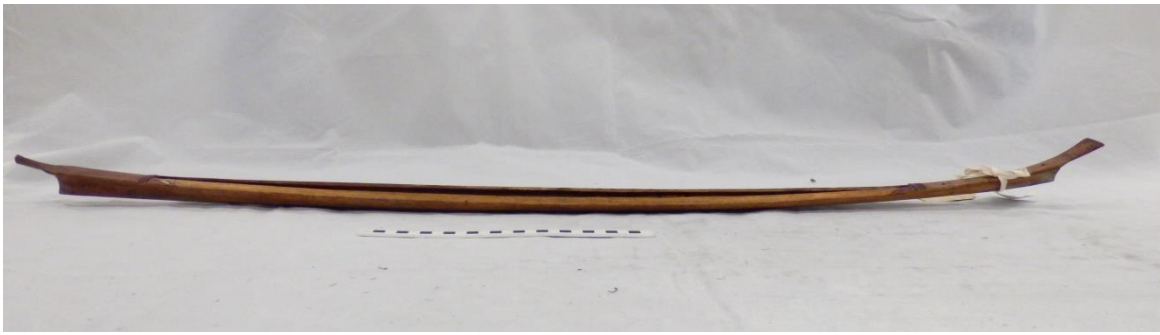
**Figure 142** *A Thousand Pictures of the Sea*, a colour woodblock print by Hokusai, c. 1833. This print depicts a swing net in use in Japan. In the British Museum (inventory number 1930,1112,0.5; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)





**Figure 143** Fishing with a swing net (*yagwin*) (Ferrars and Ferrars, 1900: 88, Fig. 191)

Of the working watercraft models identified thirteen depict long and narrow logboats. These models often have a slightly curved profile with raised pointed stem and raised stern splaying out in the shape of a fish tail. Two of these models, including the one featured in Figure 144, were made for the 1888 International Exhibition of Science, Art and Industry in Glasgow where they are described in Glasgow Museums' records as racing boats (Glasgow Museums, 1888.109.uh.1 and 1888.109.uh.2). These models tend to have little or no ornamentation; some are fitted with thwarts and thole pins whilst others omit these features. Racing boats were discussed as a class of vessel in section 7.2.1 where Nisbet (1901a) described them as long and narrow vessels with washstrakes and they were coated in a thick varnish inboard and outboard giving them a black appearance. The models fit this description with the exception that not all of these logboats are side extended with washstrakes. In addition, few are coated in varnish and as the majority of models made for exhibitions, such as the model in Figure 144, were coated in varnish and it was also standard practice to do this in some early museums, such as the South Kensington Museum (Wintle, 2015: 243), it is difficult to assess whether the varnish was a feature of the original model intended to reflect this feature of full-size vessels used for racing or whether it was added at a later stage.



**Figure 144** Model of a racing canoe. Made for the International Exhibition of Science, Art and Industry in Glasgow, 1888. In Glasgow Museum's collections. (inventory number 1888.109.uh.1; photograph taken by Charlotte Dixon, 2015)

In addition, there are five models that depict long and narrow logboats, sometimes extended at the stem, stern and sides, with raised pointed stem and raised splayed stern. These vessels also have a canopy and often thwarts (see Figures 145 and 146). The model in Figure 145 was collected by Reverend William Kidd, a Pastor of the Presbyterian Church in Rangoon in the late nineteenth century (British Museum Collections Online), is carved from one piece of wood and contains a canopy made from dried leaves or bamboo. The model in Figure 146 differs slightly as it longer and has an additional stem piece and washtrakes as well as a steersman and steersman's seat at the stern. This is described in the museum record as a ferry (National Maritime Museum, AAE0067).



**Figure 145** Model of a Burmese boat collected by rev. William Kidd, 1919. Kidd systematically collected a range of objects from Burma and sold them to the British Museum in the early twentieth century. In the British Museum collections, 268mm in length (inventory number BM As1919,0717.40; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)



**Figure 146** Model of a Burmese boat with a canopy and steersman's chair, collected by, Kepple Taylor, before 1913. In the National Maritime Museum collections, 825mm in length (inventory number NMM AAE0067; © National Maritime Museum, Greenwich, London)

An alteration to the aforementioned vessels is the addition of a single mast which can be seen across four different Burmese models (see Figure 147 for example). These vessels are of a similar design to those previously discussed but have the ability to sail. One of these models was made for the Glasgow International Exhibition of Science, Art and Industry and is described, in the museum record, as being known locally as a *hnau* used for carrying ragpu, or fish paste (Glasgow Museums, 1888.109.um).



**Figure 147** Model of a Burmese boat with a single mast. In the Horniman Museum and Gardens collection (inventory number Nn5536; Horniman Museum and Gardens)

Of all the Burmese models that ended up in UK museums over 20% have a curved hull with raised stem and stern and a sail affixed to a bipod mast (discussed further in section 7.3.6) which could be raised or lowered. These vessels generally have a steering oar or side rudder, a steersman's platform or chair and a cabin. They are still long and narrow vessels and Glasgow Museums documentation recorded one of these models made for the International Exhibition of Science, Art and Industry as a *sat lay* used to transport rice (Glasgow Museums 1888.109.ul). Figure 148, donated to Glasgow Museum in 1952, is described in the museum record as an Irrawaddy rice boat (Glasgow Museums, A.1952.24). This model, along with a model of a similar vessel collected by Temple, has an oculus affixed to the stem, is fully rigged with rectangular sails and bipod mast and there is a carved steersman's chair and a large side rudder towards the stern. Fraser-Lu identified vessels with such features as *laung-gaw*, *laung-zat* and *hnaw* used to transport cargo up and down the Irrawaddy River (1994: 106-107).



**Figure 148** Model of an Irrawaddy rice boat with bipod mast and sail. In Glasgow Museums collections, 550mm in length (inventory number A.1952.24; photograph taken by Charlotte Dixon, 2015)

A variation of these vessels seems to be the addition of outboard platforms or gangways. Seven models, including one made for the International Exhibition of Science, Art and Industry in Glasgow and two collected by the anthropologist and systematic collector Richard Carnac Temple, have an external platform made from wood or bamboo running along the length of either side of the hull. These are often referred to as outriggers in museum documentation. Figure 149 shows an example of this. Collected by Temple circa 1889, it has a sail and includes four figures which can help us to understand how these vessels were used. One figure sits at the raised stern with a steering oar and two others are stood on the outrigger gangways using poles to propel the vessel. A model with this feature in the National Maritime Museum collections is referred to in the museum documentation as a *laung zat* or rice boat (National Maritime Museum, AAE0065). Hornell (1946) similarly referred to these vessels as such, but Ferrars and Ferrars (1900) and Fraser-Lu (1994) referred to outrigger vessels as *peingaw* for transporting earth oil. It is thus possible that the names and uses of these vessels varied.



**Figure 149** Model of a river boat with outboard gangways and crabclaw sail. In the Pitt Rivers Museum, 355mm in length (inventory number 1889.29.43; © Pitt Rivers Museum, University of Oxford)

Similarly to the literature where there is little mention of sea-going vessels there is only one model described as a Burmese “coasting vessel” (South Kensington Museum Inventory, 1880, no. 3,726). This model, as seen in Figure 150, has a complicated biography as it is currently in the National Maritime Museum collections after being transferred from the Science Museum in 1958. However, it can be further traced back to the South Kensington Museum’s catalogue of 1880 where it was described as a “model of a coasting vessel” received from “Burmah” and it is “Decked; with 3 masts and red Chinese lateen sails. Armed with a brass pivot gun” (India Museum slipbook, no. 4,890). This model, later described as a junk (National Maritime Museum, AAE0022) is remarkably similar to Chinese junks and differs considerably to other types of Burmese models. In addition to its three masts and junk rig, the hull is decorated with paint and mother of pearl and an oculus is positioned either side at the fore end.

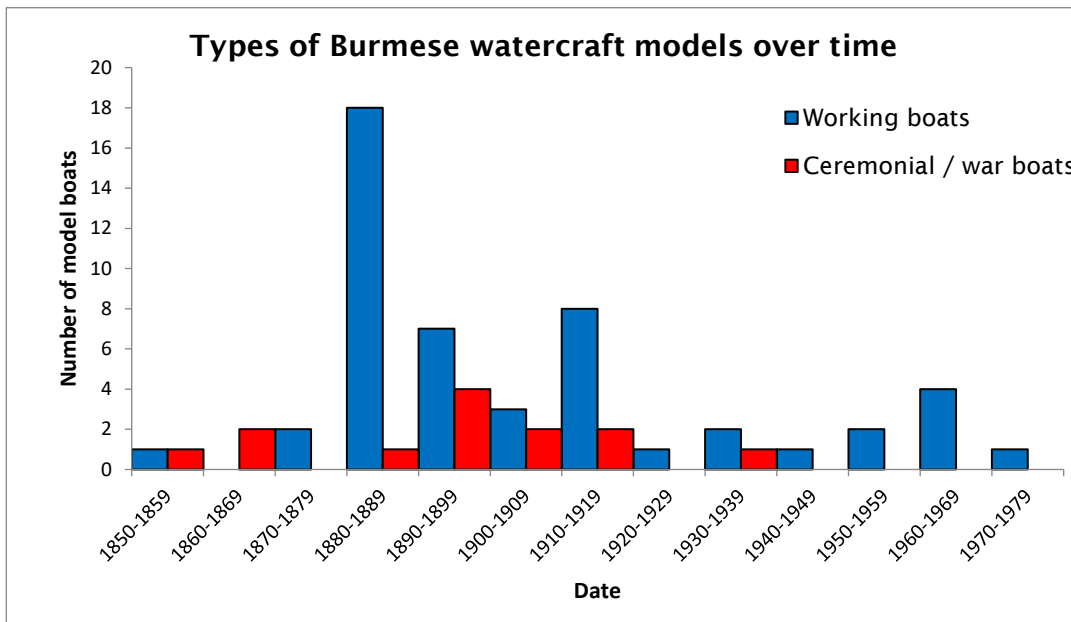




**Figure 150** Model of a Burmese junk. In the National Maritime Museum collections, 455mm in length (inventory number AAE022; © National Maritime Museum, Greenwich, London)

***Models of different Burmese watercraft: a discussion***

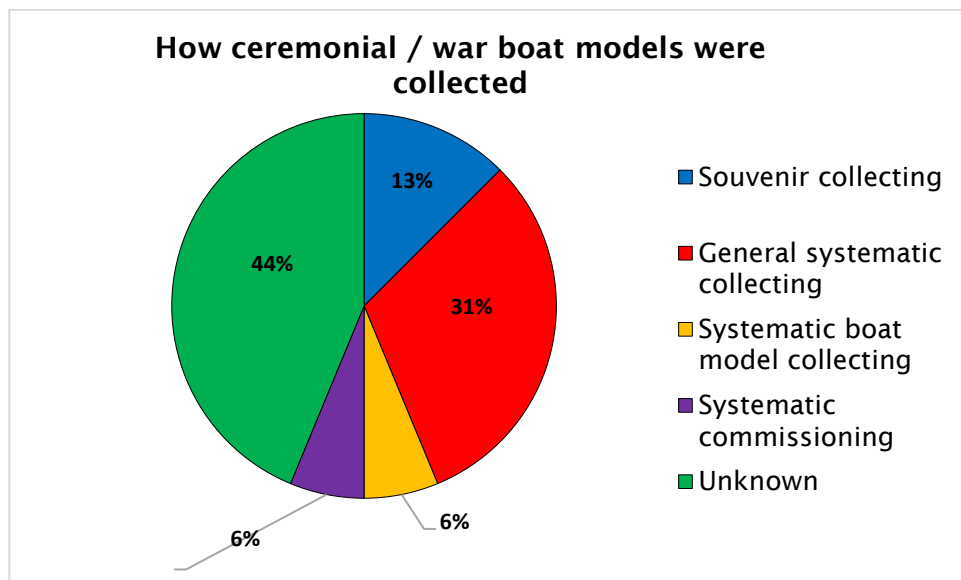
The models seem to reflect a wide range of watercraft used throughout Burma since the mid-nineteenth century. Figure 151 shows that there was not a clear distinction in the dates the different classes of vessels were made and collected in model form. However, the ceremonial / war models appear to have stopped being acquired in the early twentieth century, although few models in general were acquired since the mid-twentieth century.



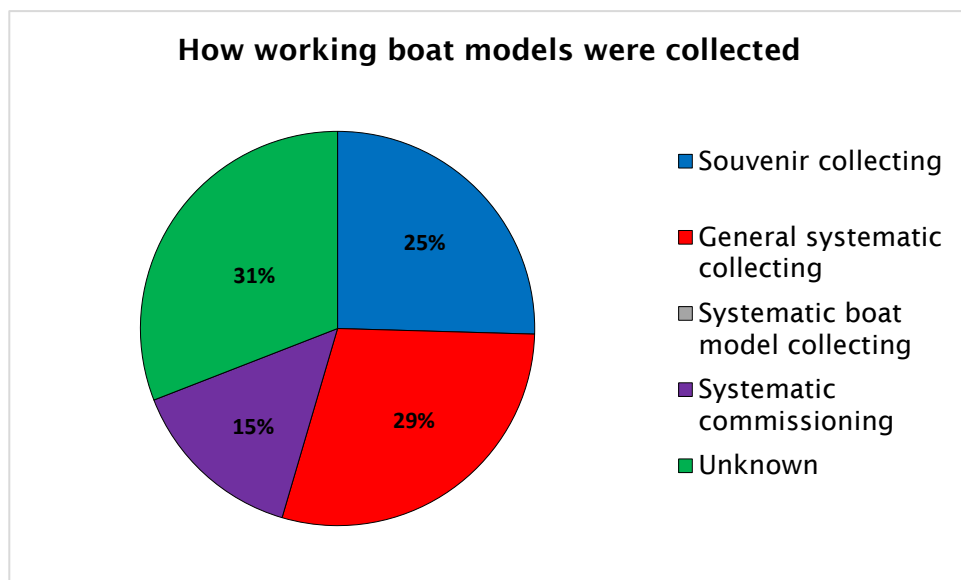
**Figure 151** The main types of watercraft and dates they were collected

In addition, Figures 152 and 153 show the different types of models were not limited to particular collectors but were instead acquired systematically as well as randomly as souvenirs. This is different to the *oru* models made in Sri Lanka at a similar time (as discussed in Chapter 6) where models were often made to replicate one particular form of vessel, often for the souvenir market. It is interesting here to observe that both ceremonial / war and working boat models were commissioned for the Glasgow International Exhibition of Science, Art and Industry in 1888. These vessels, made to demonstrate the different technologies and modes of transport in colonial Burma, do not only depict one type of vessel but showcase a range of riverine watercraft from ornate ceremonial and war vessels to a raft, logboats described as racing boats and cargo boats with large sails and bipod mast.





**Figure 152** The different ways models of ceremonial / war boats were collected



**Figure 153** The different ways models of working boats were collected

Whilst the models are useful tools for us to learn about a range of watercraft in use in Burma since the mid-nineteenth century, it is also useful to turn this idea around and consider what vessels have not been represented in model form or within the literature discussed in section 7.2.1. Fishing vessels, for example, seem to be considerably underrepresented with little mention in literature and only depicted once in model form. However, we know, from reports following the destruction of Cyclone Nargis (FAO, 2009), that fishing boats played an important role in the region's economy. So why, then, are they so little represented? Similarly, sea-going vessels account for only one of the seventy-one Burmese models. All the models seem to be for use on rivers but there is little reference to

coastal and sea-going watercraft in both model and literary form. These are important points to consider when using the models as evidence for different boat types – they do not reflect all types of vessels in use but depict the vessels that British collectors were interested in acquiring. This could be due to European activity at the time. For example, river boats used for the transportation of rice seem to be, relatively speaking, commonly represented in model form. As rice was one of Burma's main exports (Ferrars and Ferrars, 1900: 89) this is perhaps not surprising. Similarly, with the rise of the Irrawaddy Flotilla Company there was a strong interest in, and British presence around, the Irrawaddy. The models, therefore, have the ability to inform us about a range of vessels that were in use in Burma at the height of colonialism, some of which were replaced by steamers, as well as the potential to go beyond the material object and raise questions about British economic and cultural interests.

#### **7.3.4 Construction**

As previously discussed the models studied in this chapter are highly detailed with close attention to detail in terms of their features. The way the models were fashioned are no exception to this. This section examines the different techniques used to construct the models and whether these techniques could reflect those used to make contemporary full-size vessels.

The rafts identified are made from bamboo and fastened, or bundled, together using cane and wooden pins running transversely through the bamboo. The raft in the National Museums Scotland collections (Figure 140, page 249) uses a slightly alternative method by using wooden pins again running transversely across the logs but this time on top of, rather than through, the bamboo. The logs are then lashed to the pins with cane. As both techniques secure a bundle of bamboo logs with cane and wooden pins it shall be referred to, in the ensuing analysis, as bundled.

The majority of the models, however, are carved from a single piece of wood simulating logboats. Some of these have the addition of washstrakes and stem and stern pieces, sometimes fixed with an adhesive, nailed or dowelled and sometimes with the use of metal staples. The metal staples, as demonstrated in Figure 154, are present on eight models, three originating from the Glasgow International Exhibition of Science, Art and Industry in 1888. This is interesting as the only mention of such fastenings in the literature discussed in section 7.2.1 is by Ferrars and Ferrars who refer to “dee nails” (1900: 137) used on cargo boats. A

similar technique using clenched hook nails was found to be employed on Bangladeshi reverse clinker boats to secure the *goloi* (McGrail et al., 2003c: 81-85). This fastening technique will be further explored in the subsequent analysis.



**Figure 154** Model of a *sat lay* for rice transportation. It was commissioned for the Glasgow International Exhibition, 1888. There are metal staples at stem and stern joining the hull with stem and stern posts. In Glasgow Museum collections (inventory number 1888.109.ul; photograph by Charlotte Dixon, 2015)

Furthermore, some models have been constructed with planks nailed or dowelled together using a carvel technique whereby the planks are laid flush to each other (see Figure 155), or lines have been incised on a solid carved piece of wood to give the impression of carvel planking (as can be seen in Figure 156). Planked models often have a separate carved stem and stern piece and Figure 156 even imitates a scarf join used on the stem and stern.



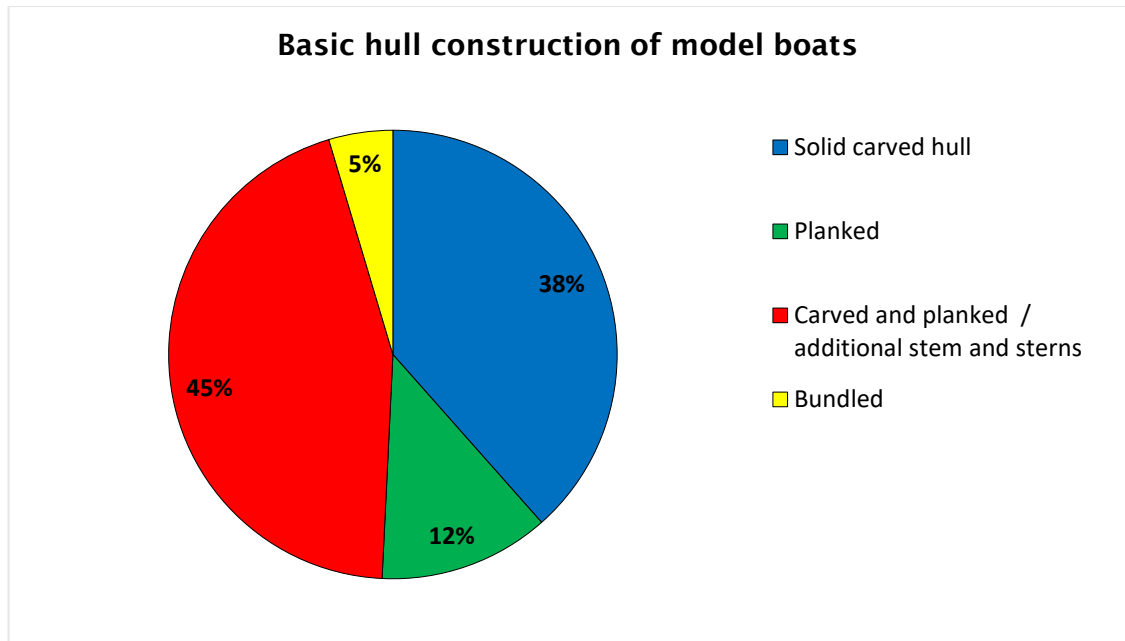
**Figure 155** Model of a *laung-zat* for transporting rice. It is made from flush-laid, planking with additional stem and stern posts. This model also has an oculus (eye) at the stem. In the Horniman Museum and Gardens, 1016mm in length (Inventory number 1975; Horniman Museum and Gardens)



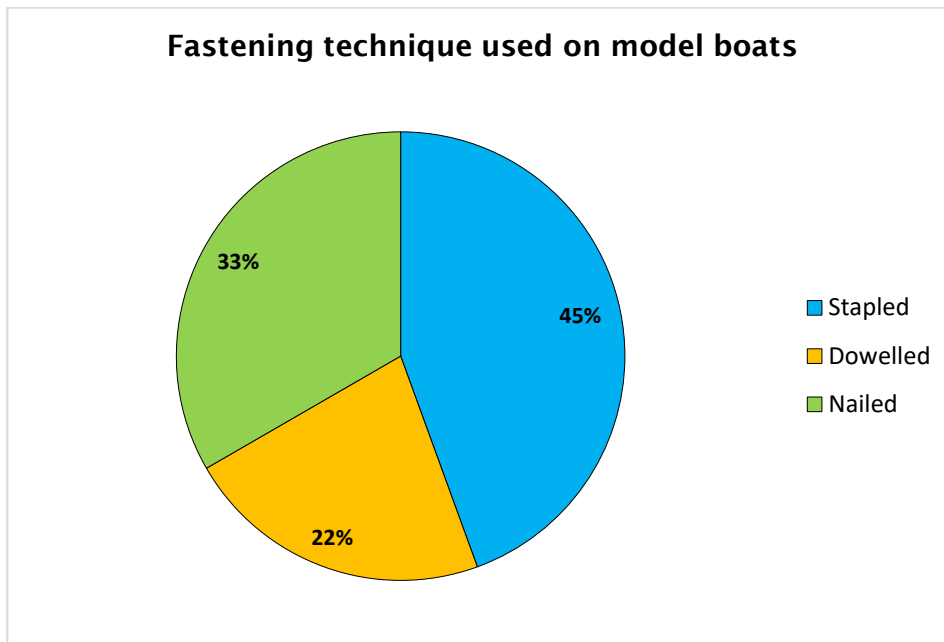
**Figure 156** Model of a Burmese boat with incised planking and scarf join at the stem. In the Pitt Rivers Museum collections (inventory number 1969.8.6; photograph by Charlotte Dixon, 2015)

Overall the models support Ferrars and Ferrars (1900), Nisbet (1901a) and Than's (2006) descriptions of vessel construction showing a range of model vessels constructed as basic logboats, extended logboats with side planks and stem and stern pieces and plank-built vessels. The use of staples and the construction of rafts have, however, been little mentioned in the literature thus highlighting the significance and importance of models as evidence for Burmese boat building techniques.

Figure 157 shows the majority of the models were carved with the addition of planking or stem and stern pieces. The next most common form of construction seems to be solid carved hulls imitating logboats but few are built entirely from planks, or incised to appear like they are, or bundled. To assess this further Figure 158 shows the fastening techniques employed on planked or planked and carved vessels where this is identifiable from the models. It shows that the majority used staples, a third used nails and 22% employed the use of wooden dowels. None of the models depict a sewn method of fastening.

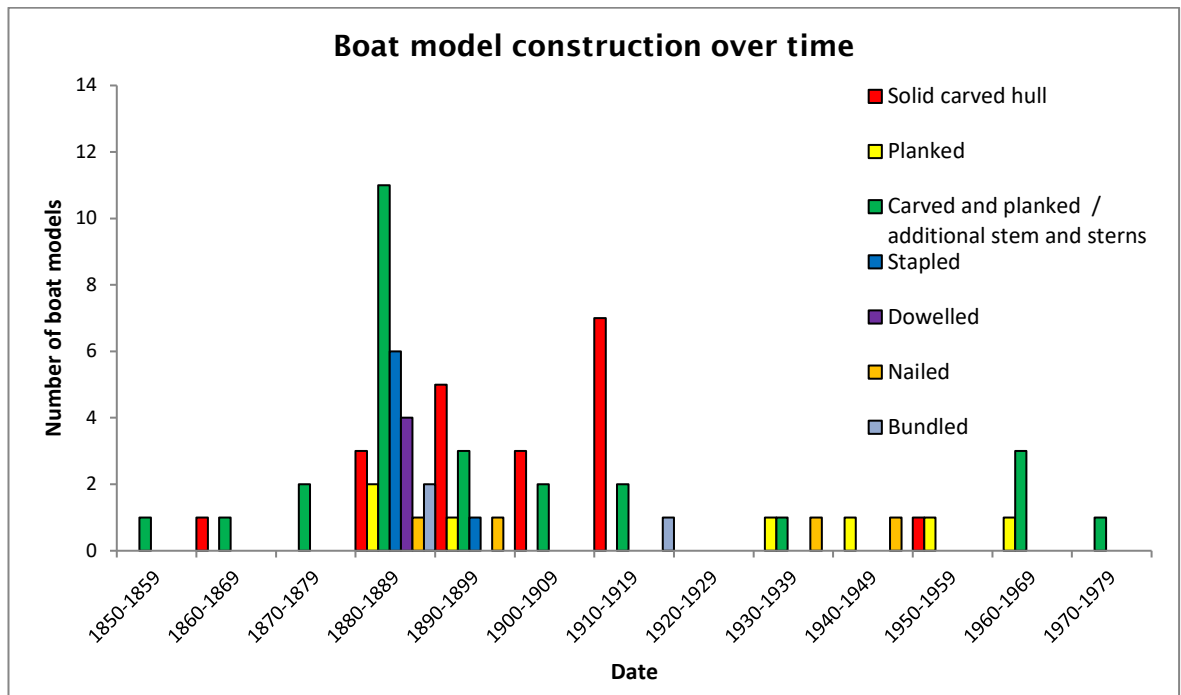


**Figure 157** The percentage of different type of basic hull construction techniques used on models of Burmese boats



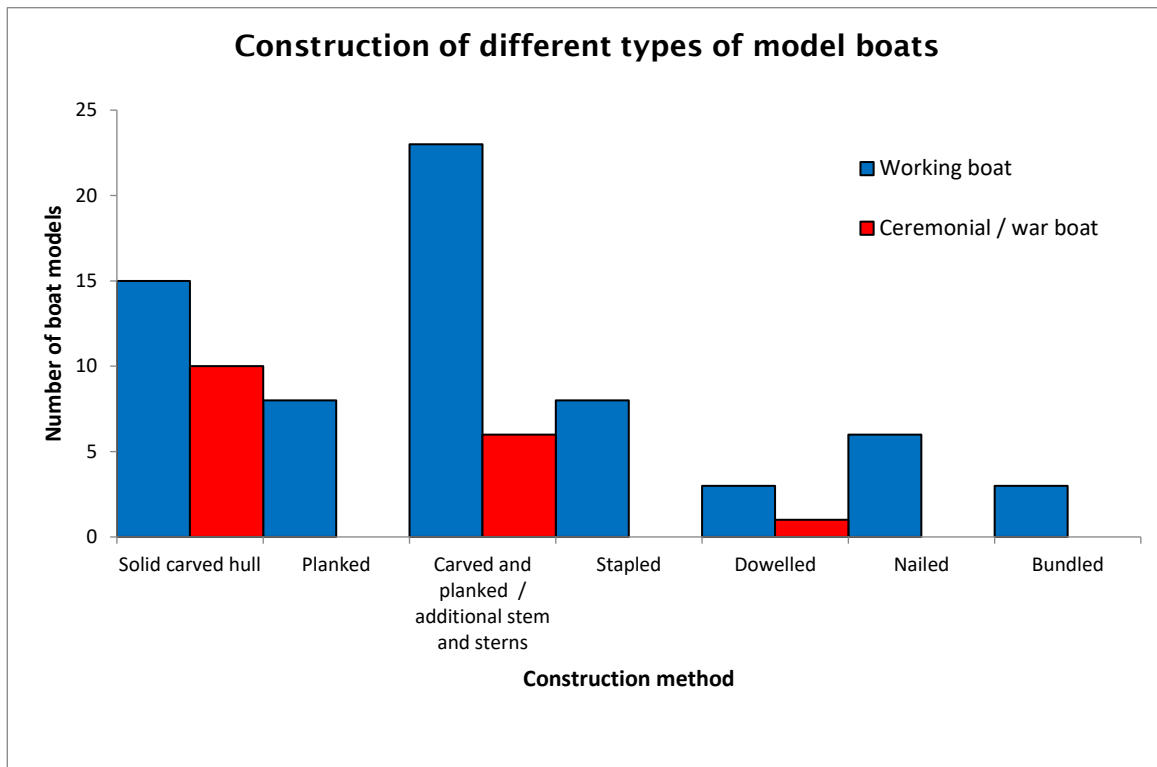
**Figure 158** The percentage of different types of fastening techniques used on models of Burmese boats, where this could be identified

To further assess the different methods of construction the main techniques have been analysed by date to observe any changes over time. Figure 159 shows some interesting results where, up until 1919, the majority of the models were carved hulls imitating logboats or had additional planks or stem and sterns. However, from 1920 onwards only one model depicted a basic logboat. All the others were either planked or combined a carved hull with planking or stem / stern pieces. The models also reflect some interesting changes over time in terms of their fastening techniques. The majority of the models associated with the late nineteenth century used staples or dowels to join together components of the hull. However, throughout the twentieth century only models using nails to secure components together were identified with staples and dowels no longer used. One interpretation of this data is that it shows changes in building techniques since the mid to late nineteenth century.



**Figure 159** Different construction and fastening techniques used on models of Burmese boats over time

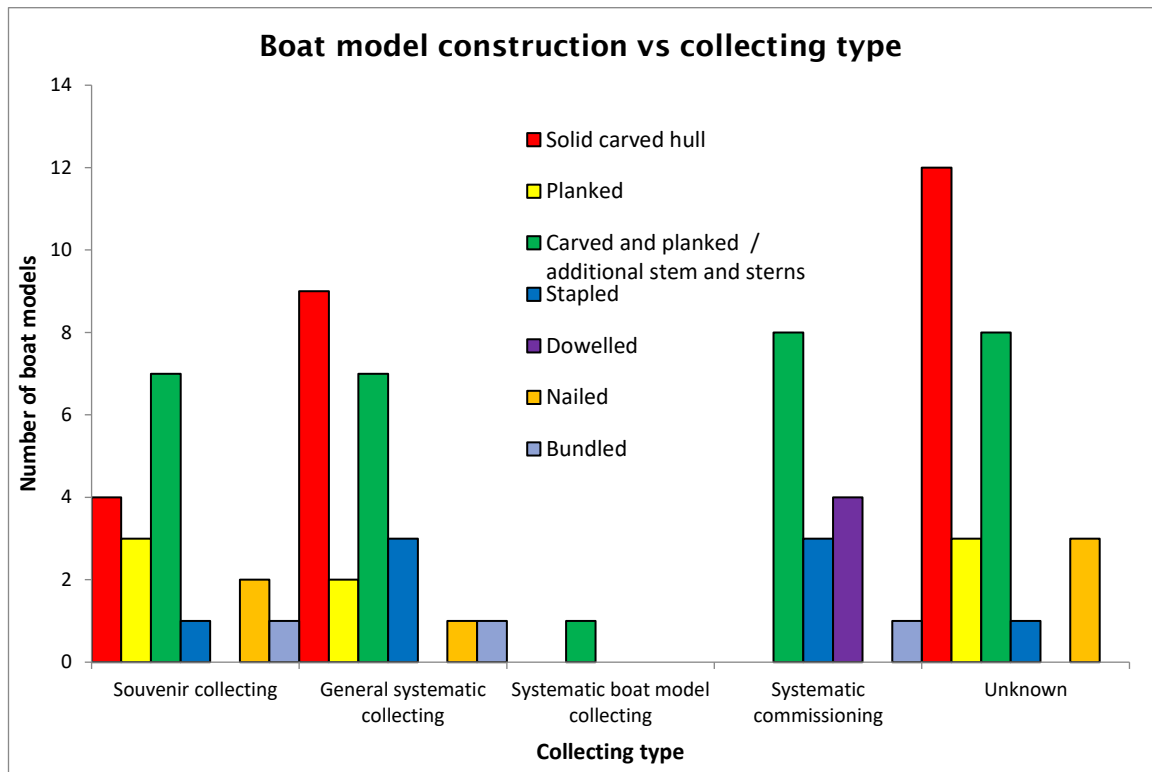
Another way to analyse the construction data can be seen in Figure 160 which considers the main construction techniques separately for working boat models and ceremonial / war vessels. This marks some interesting differences in the techniques employed to construct the models of different types of watercraft. For example, all the ceremonial / war boat models have either solid carved hulls or combine this with the addition of planks or stem and stern pieces. None of these models are constructed purely with planks, or give the impression of being constructed with planks, but eight models of working boats have been identified as being entirely plank built. It is also interesting to observe that only working models were fastened with metal staples or nails.



**Figure 160** An analysis of different construction and fastening techniques used on models of working boats compared with models of ceremonial / war boats

Finally, the construction of the models can be further considered by analysing construction technique with the types of collectors who acquired the models. Figure 161 shows that actually no major patterns emerged, although models commissioned for the Glasgow International Exhibition of Science, Art and Industry in 1888 were only carved with the addition of planks or stem and stern pieces and nails were not used. Variations in construction technique thus appear in models collected by a variety of individuals for different purposes and at different times. This could indicate these techniques potentially reflect those used on full-size vessels as it doesn't seem that the use of staples, for example, were only stylistic on souvenir models or those commissioned for exhibitions but on an array of models made for different purposes and at different times. With this in mind the models researched in this chapter are potentially good sources to help us understand the different construction techniques used on Burmese vessels since the mid-nineteenth century.





**Figure 161** An analysis of different construction and fastening techniques used on models amassed by different classes of collectors

### 7.3.5 Features

The Burmese models identified in this research have been hand crafted with close attention to detail which is clear when observing the intricate features found on many of the models. Such features, from figureheads to side rudders and steersman's platforms, vary from model to model although some parallels can be observed across models identified as being of a similar type / use.

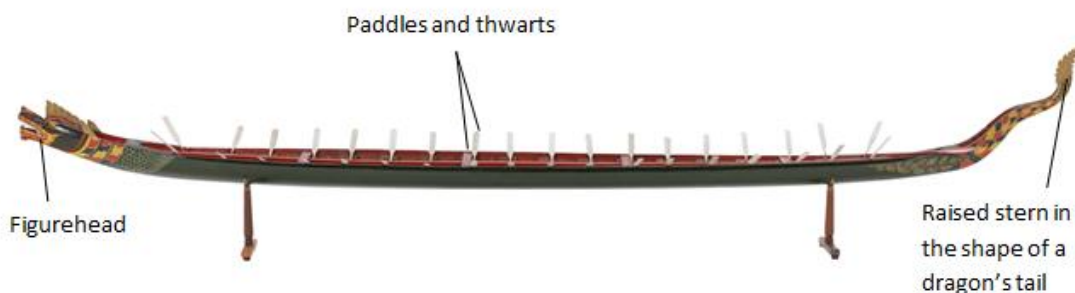
The first feature to note is on a model of a working vessel (as depicted previously in Figure 141, page 250) described as a fishing boat in the Pitt Rivers Museum records (Pitt Rivers Museum, 1889.9.35). This is a hinged fishing net and it is the only example of fishing equipment found on any of the models in this research. The net is supported by a curved wooden frame which is able to move up to rest on a wooden triangular structure when not in use. This is similar to the Chinese fishing nets, or *cheenavala*, still used today in southern India (Lim et al., 2016: 42). These fishing nets are fixed land installations as opposed to being used on boats and are operated by balance and counterweights to descend the net into the water (Southern Backwaters, 2017). This particular model could thus provide a vital insight into nineteenth century Burmese fishing techniques and their potential connection with Chinese fishing nets.

Looking at ceremonial / war boat models there are a number of features that recur on multiple models (see Figure 162) including highly ornate carved and painted figureheads and pagodas (a Buddhist temple / tiered tower).



**Figure 162** Labelled model of a ceremonial boat, 850mm in length (Adapted from a model in Glasgow Museum [inventory number 1907.43.b] and Charlotte Dixon)

Other ceremonial / war boat models, like the one in Figure 163, include a series of thwarts and paddles or oars. This model (Figure 163) is painted with a figurehead and raised stern, as in Figure 162, but it has been carved and painted to depict a dragon. Figure 164 shows a close-up image of the figurehead demonstrating how detailed such features are even when they are produced in miniature.

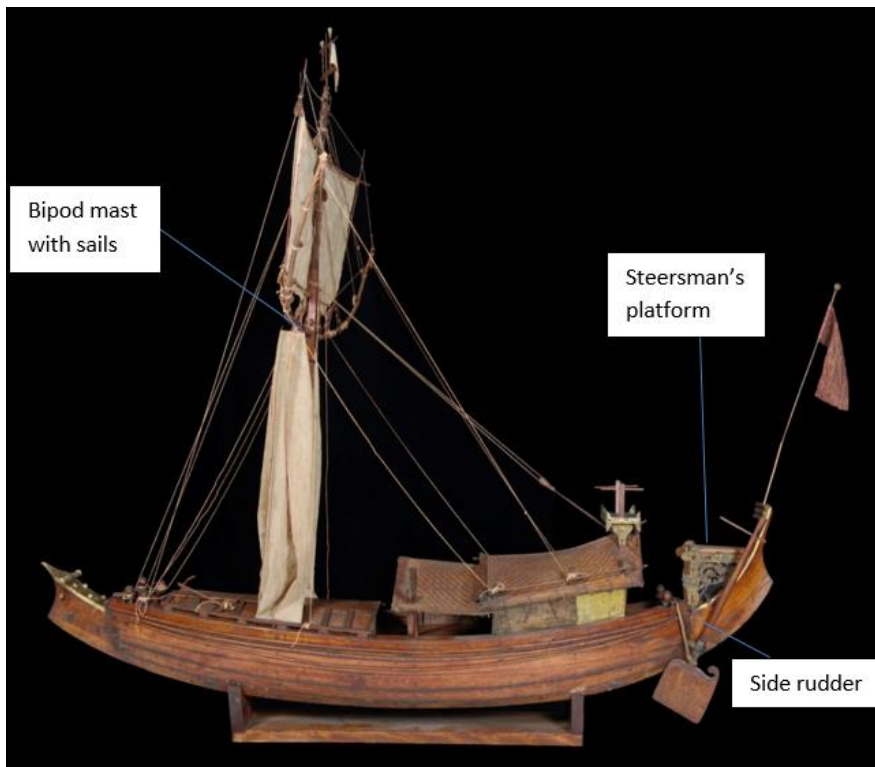


**Figure 163** Labelled model of a war boat, 2684mm in length (Adapted from a model in the National Maritime Museum [inventory number AAE0080; © National Maritime Museum, Greenwich, London] and Charlotte Dixon)



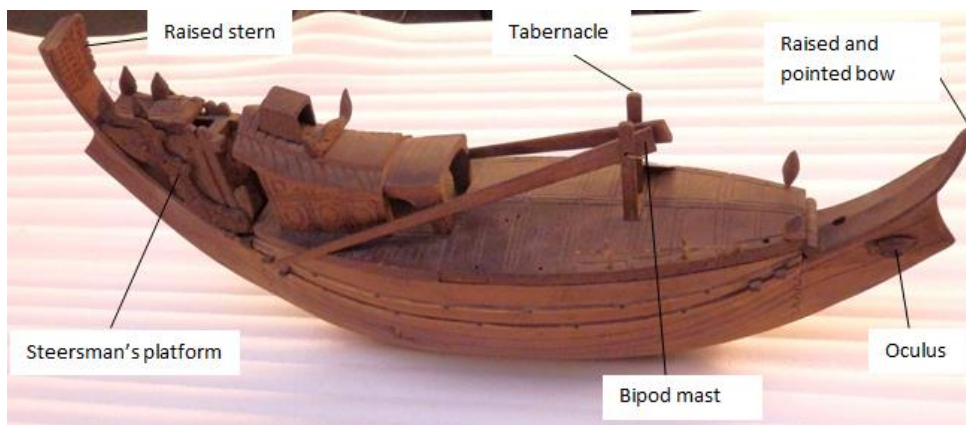
**Figure 164** Close-up of the dragon figurehead (inventory number AAE0080; ©National Maritime Museum, Greenwich, London)

There are a variety of features found on models of working boats but few are decorated and painted like the war / ceremonial boat models. Figure 165 shows a few of the main features that are commonly found on models of working boats including the bipod mast with sails (which will be discussed in section 7.3.6), steersman's platform, where the steersman would sit or stand to navigate the boat, and the side rudder next to the steersman's platform. These steersman's platforms, present on twenty-four models, are often elaborately carved and form the most decorative component of the vessel. Singer observed that before 1885 large sailing boats were rarely decorated due to sumptuary laws but vessels with elaborately decorated sterns emerged following the fall of the dynasty (1993: 26).



**Figure 165** Labelled model of a Burmese boat with bipod mast, 1645mm in length (Adapted from a model in the Pitt Rivers Museum [inventory number 1889.29.40; © Pitt Rivers Museum, University of Oxford] and Charlotte Dixon)

Other models of working boats incorporate similar features, such as the bipod mast and steersman's platform, as demonstrated in Figure 166. These models also have the curved raised stem and sterns that seem to be characteristic of Burmese vessels. Accompanying the bipod mast in Figure 166 is a tabernacle so the mast can be raised and lowered on a pivot system. In addition, the model in Figure 166 has a wooden oculus, or eye, located either side of the stem. The detail in this feature can be observed in Figure 167.

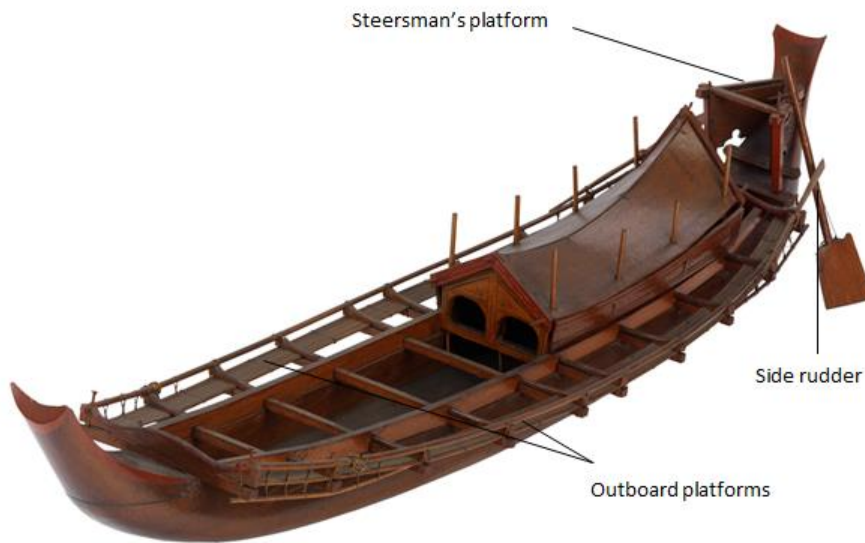


**Figure 166** Labelled model of a Burmese boat with bipod mast, 740mm in length (Adapted from a model in the Pitt Rivers Museum [inventory number 1969.8.6.1-2] and Charlotte Dixon)



**Figure 167** Oculus (eye) on the stem of a model boat. In the Pitt Rivers Museum collections (inventory number 1969.8.6.1-2; photograph taken by Charlotte Dixon, 2015)

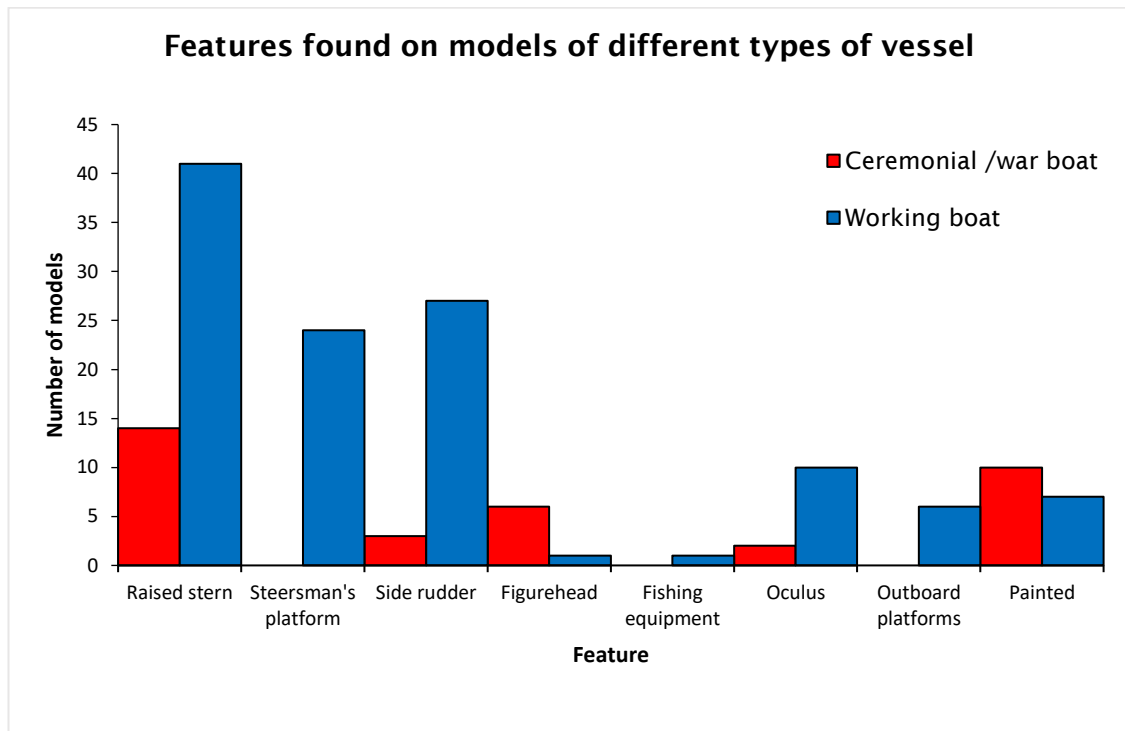
Lastly, Figure 168 shows a model of a working boat with outboard platforms. This model again has a steersman's platform, side rudder and raised stem and stern with the addition of outboard platforms, or gangways, either side running the full length of the vessel. These gangways, according to Hornell, would have enabled crew to walk from stem to stern without having to pass through the cargo / passenger hold (Hornell, 1945: 265-266).



**Figure 168** Labelled model of a *laung-zat*, or rice boat, 722mm in length (Adapted from a model in the National Maritime Museum [inventory number AAE0065; © National Maritime Museum, Greenwich, London] and Charlotte Dixon)

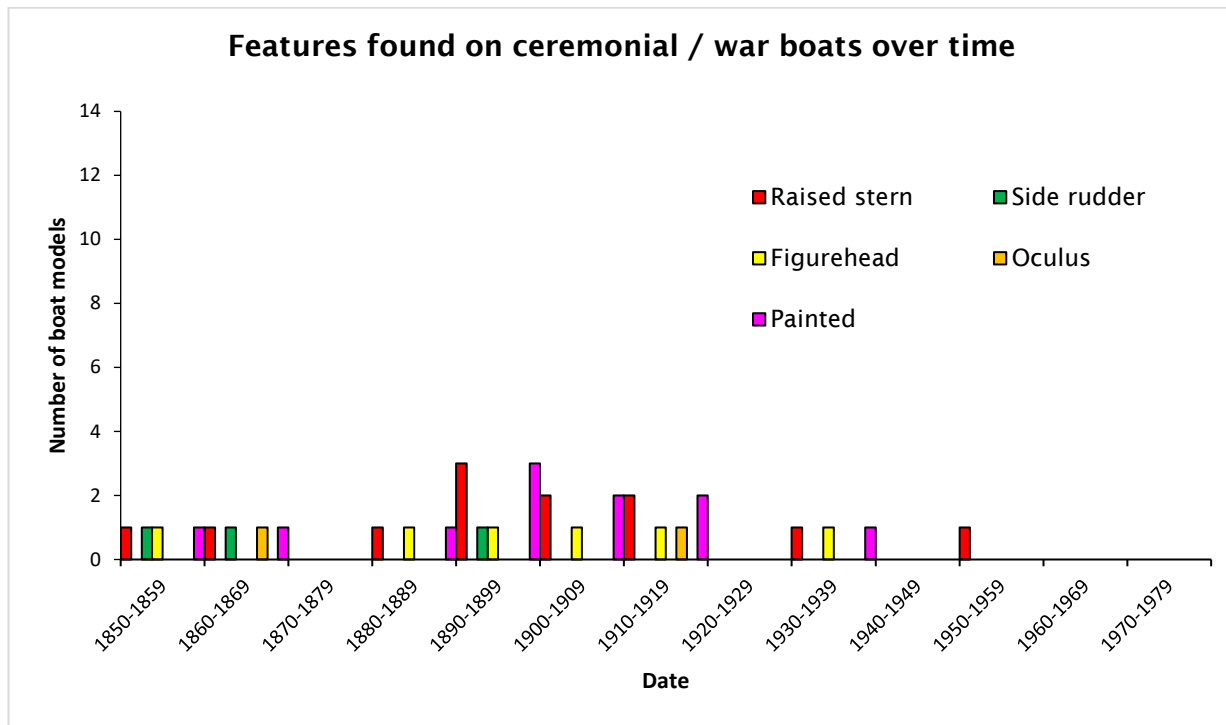
Burmese vessels varied regionally depending on where they were built (Than, 2006: 47-59) and how they were used, a notion that was similarly identified with Sri Lankan *oru*'s discussed in Chapter 6. It has, however, been possible to identify some common similarities. This discussion has focused on some of the main features found on models of Burmese watercraft such as figureheads, raised stems, outboard platforms and side rudders. To really analyse these features and identify patterns it was necessary to explore them in terms of the vessel type (working or ceremonial / war) and by date to see if there were any noticeable changes over time. Figure 169 compares eight key features by vessel type. This is interesting as it highlights that steersman's platforms, fishing equipment and outboard platforms are only present on models of working boats and not on ceremonial / war boats. It also reveals that a higher proportion of ceremonial / war boat models are painted and have a figurehead. Given the literature discussed in section 7.2.1 this does not come as a surprise as the ceremonial / war vessels discussed by Nyunt (1996) and Than (2006) have an ornate appearance.





**Figure 169** The main types of features found on models of Burmese boats

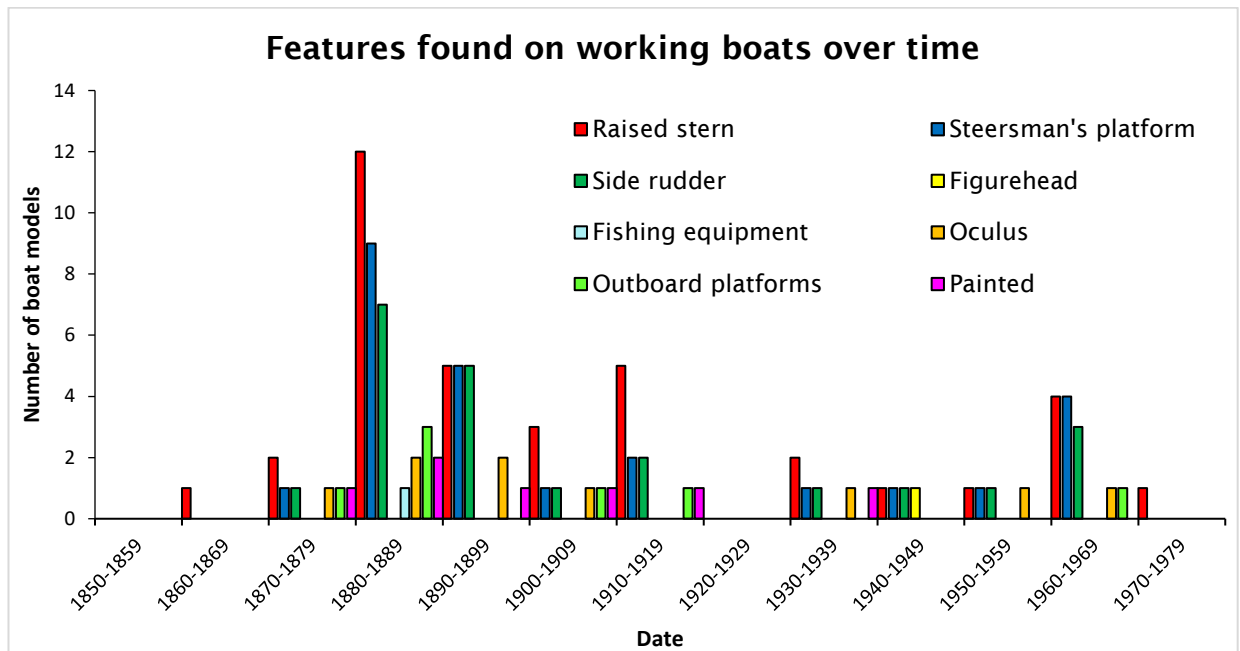
Taking this analysis one step further to consider whether these features changed over time, Figure 170 shows the presence of the key features found on ceremonial / war boat models by date. This shows that only two models dating from the late nineteenth century contain side rudders, although whether this accurately reflects the full-size vessels or if these delicate features may have become detached during its life in a museum is uncertain. However, several of these models, from the mid-nineteenth to mid-twentieth centuries, have raised sterns, often ornately carved giving them a tail like appearance. This feature seems to be fairly commonplace among ceremonial / war vessels and is also evident in Nyunt (1996) and Than's (2006) images as shown in section 7.2.1. Figureheads and overall paint and decoration are similarly present showing few changes over time but oculus only appear on two models in this class – one in the 1860s and the other in 1910-1919 suggesting this feature was less common in such vessels.



**Figure 170** The main types of features found on models of ceremonial / war boats

When analysing the same features over time for working boats (see Figure 171) it is immediately apparent that there are far fewer models that are painted and have figureheads. In fact, only one model, dating from the 1940s, contains a figurehead. Oculus, however, are present on models of working boats from the 1870s through to the 1960s. Raised sterns, steersman's platforms and side rudders are likewise common on models spanning the late nineteenth to late twentieth century. The presence of outboard platforms is, however, a different matter. They appear on models from the late nineteenth century through to the early twentieth but then do not appear again until the 1960s. Hornell observed, in 1946, that these vessels were no longer used which could explain the reduction in the production and distribution of models of these vessels.





**Figure 171** The main types of features found on models of working boats

Based on this analysis and the sample of models used in this research it would seem there are particular attributes that are commonly found on, and help to define, Burmese vessels. The raised sterns that splay out to depict a tail are present on the majority of models. Raised and pointed prows or figureheads, bipod masts and outboard platforms also seem to be common features that were perhaps stylistic traits of Burmese vessels.

### 7.3.6 Propulsion

Different methods of propulsion have been identified on the models where possible. This includes the presence of poles, paddles and oars. The latter two are differentiated by the presence or absence of thole pins or the attachment of an oar to the vessel in some manner. If it can be manoeuvred on a pivot it is likely to represent an oar. Paddles, however, are not attached or manoeuvred in this manner. Lastly, masts and sails have been identified, sometimes in conjunction with paddles or oars suggesting a combination of propulsion methods. This is to be expected as it was noted in the National Museums Scotland records that both paddles and sails were carried whereby “the usual practice is to sail up-stream with the wind, which is almost invariably favourable, and return down-stream with the current” (National Museums Scotland, ‘TY1938.78’). These can be further broken down as three different types of masts seem to be present on the models. The first is a single mast or pole. However, with few of these models accompanied by sails, which could be due to a number of reasons including detachment during its journey into and life in a museum, it is difficult to say

whether this pole served as a mast for a sail or as a flagpole. The only model with three single masts and sails attached is the model of a sea-going vessel as discussed in section 7.3.3 which has junk-like sails.

Bipod masts, as referred to by Hornell (1945: 227), appear on several of the models. These masts, as depicted in Figure 172, have been described as “a mainmast consisting of two spars, which converge to form a topmast” (National Museums Scotland, TY1938.78). The masts on several models have a triangular like appearance tapering in towards the top of the mast and separating into two poles towards the base. These bases tend to be set on a tabernacle enabling the mast to pivot and thus be lowered when not in use. The sails are usually rectangular in shape and there are generally both mainsails and topsails.

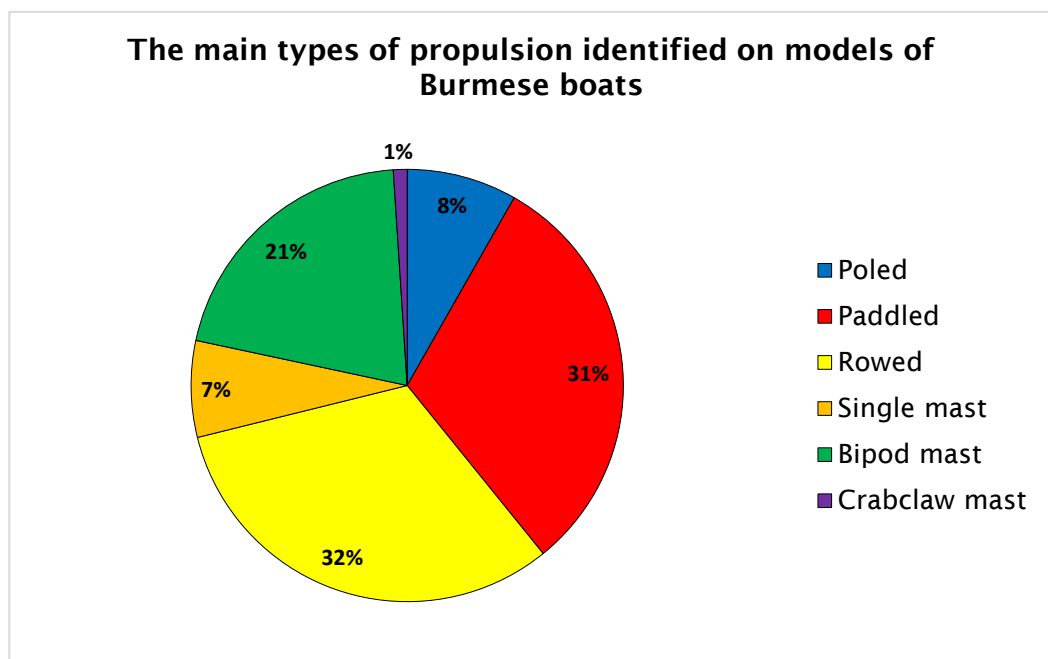


**Figure 172** Model of an Irrawaddy rice boat with a bipod mast. In the Science Museum's collections (inventory number 1894-184; © Science Museum / Science & Society Picture Library -- All rights reserved. <http://www.scienceandsociety.co.uk/> accessed on 11<sup>th</sup> June 2014)

The bipod mast is the most common type found on models of working boats. There is, however, an anomaly present on two models, one of which was shown previously in Figure 149, page 256. On these models two poles are used to form the mast but they taper towards the base and open out at the top in an opposite manner to the bipod mast. This is similar to the crab-claw sail used around the Pacific (Haddon and Hornell, 1975: 52). These models are interesting as they

were collected systematically by Temple in the late nineteenth century yet other models he contemporaneously collected depict the bipod mast. Questions are therefore raised about whether this type of sail was a true feature found on full-size Burmese vessels or if it was simply construed differently by the maker or as a result of the miniaturisation process.

Figure 173 shows that the majority of the models contain paddles or oars but a significant number, amounting to 21% of all the models contain a bipod mast. Whilst looking at these different methods of propulsion by date did not reveal any particular patterns or changes over time, a breakdown of propulsion methods by type of vessel has identified some interesting differences (Figure 174). The vast majority of the ceremonial / war boat models contain oars or paddles and few are equipped with masts and sails. However, nineteen models of working watercraft contain bipod masts whilst eight were seemingly also poled.



**Figure 173** Main types of propulsion methods identified on the models

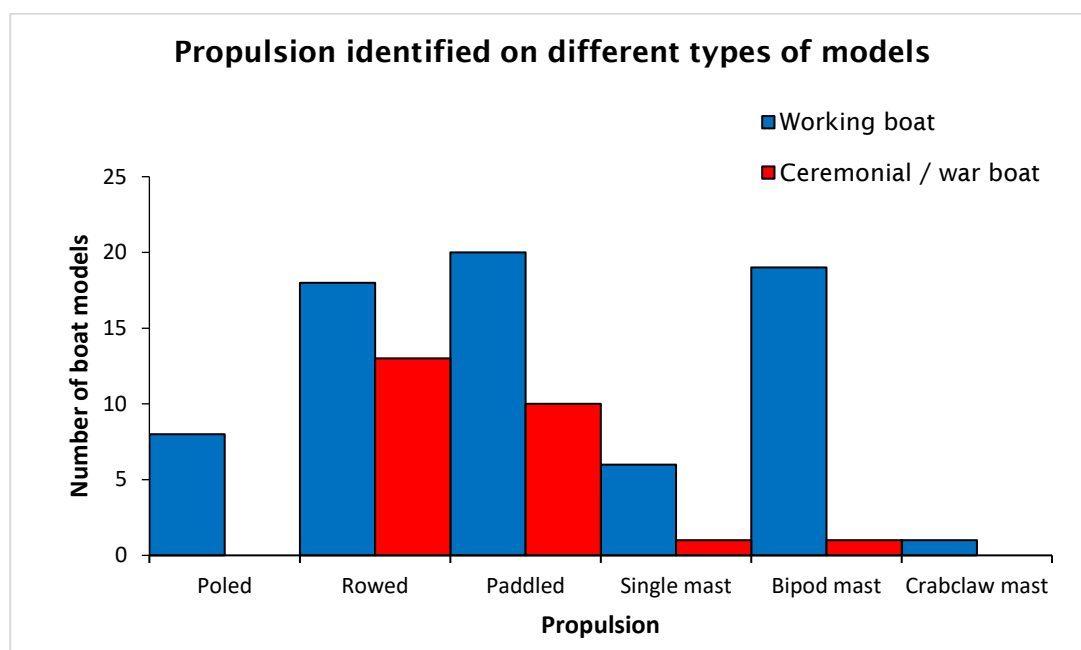


Figure 174 Propulsion identified on models of Burmese boats

### 7.3.7 Boats as iconic images of Burma?

In addition to models of Burmese watercraft there are a number of other iconographic sources depicting boats. This was similarly the case with Sri Lankan outriggers discussed in Chapter 6. Images of river boats depicted on a range of different materials, such as banknotes, postal stamps, postcards and photographs, show they were, and still are, seen as an emblem of Burma, or Myanmar, particularly from a British perspective.

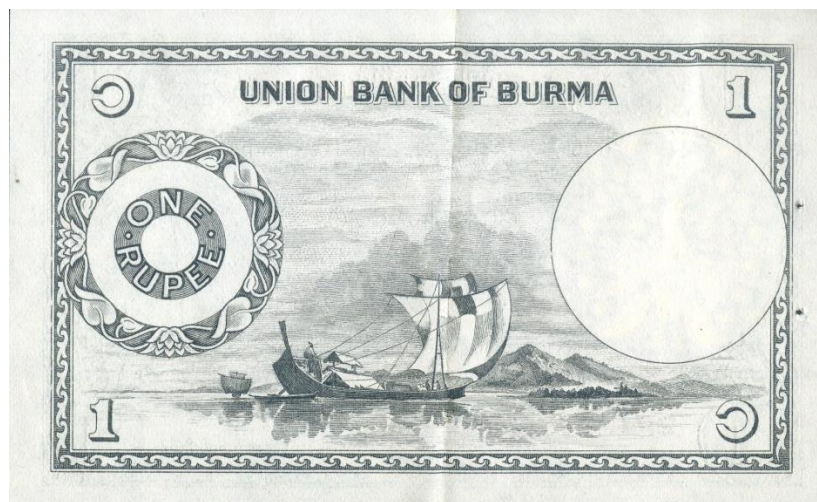
#### *Banknotes*

Burmese banknotes, from the 1930s to at least the 1990s (see Figures 175 to 179), have intermittently depicted watercraft on their reverse sides. The value of these artefacts is two-fold. Firstly, they depict a range of vessels from riverine working watercraft under sail (Figures 175 and 176) to royal barges (Figure 177), racing canoes (Figure 178) and fishing boats (Figure 179). Given the lack of information about the latter of these vessels the People's Bank of Burma one kyat banknote (Figure 179) is useful in providing an image of fishing with conical cages as described by Ferrars and Ferrars (1900: 90). Here the fisherman is depicted standing on a flat stern or bow, similar to the low flat pointed bows seen on some of the working models as demonstrated in Figure 180. He has a paddle or steering oar in hand ready to drop the fishing cage in the water. This could help to explain why some of the models have similar bows – perhaps they were functional for standing on for fishing or propulsion. Furthermore, the sailing

boats in Figures 175 and 176 depict the long narrow boats with raised sterns, steersman's platforms, side rudders and bipod masts that have been depicted on many of the models as discussed in this chapter. This helps to support the notion that features found on many of the models were present on full-size watercraft of the time.



**Figure 175** Ten rupees banknote, Reserve Bank of India, 1938, with small image of boat under sail. In the British Museum's collections (inventory number CBA10187 (reverse); © The Trustees of the British Museum)



**Figure 176** One rupee banknote, Union Bank of Burma, 1953, with boats under sail. In the British Museum's collections (inventory number 2\_r949 (reverse); © The Trustees of the British Museum)





**Figure 177** Ten kyats banknote, Central Bank of Myanmar, 1996, depicting a royal barge. In the British Museum's collections (inventory number CBA213844 (reverse); © The Trustees of the British Museum)



**Figure 178** One kyat banknote, Central Bank of Myanmar, 1996, depicting two racing canoes in the foreground and a royal barge in the background. In the British Museum's collections (inventory number CBA214596 (reverse); © The Trustees of the British Museum)



**Figure 179** One kyat banknote, Peoples Bank of Burma, 1965, depicting a fishing scene with a man using a fishing net off a logboat. In the British Museum's collections (inventory number CBA10210 (reverse); © The Trustees of the British Museum)



**Figure 180** Model of a working boat with a low, almost flat pointed bow. Could this be used to stand on as is portrayed in the banknote in Figure 179. In the British Museum's collections, 225mm in length (inventory number As1919,0717.39; © The Trustees of the British Museum. Shared under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence)

The second aspect of the banknotes, which can be applied to all iconographic material depicting Burmese watercraft, is that of their significance and value on a cultural level. The majority of these banknotes were issued post-independence so reflect aspects of Burmese culture deemed to be significant enough to print and distribute around Burma, or Myanmar as it became known. This can help to give us an insight in to the value of the regattas and royal barge processions as discussed by Nyunt (1996) and Than (2006) as well as the fishing economy and localised practises and the importance of rivers and riverine craft.

### ***Postal stamps***

In addition, some stamps, issued both by the postal system set up under British occupancy (Stamps of Burma, 2012) and post-independent Union of Burma, depict traditional watercraft. Whilst one stamp issued in the 1930s (Figure 181) portrays a working boat under sail on the Irrawaddy river, the other three shown here (Figure 182 to 184), ranging in date from the 1930s through to the 1970s, depict royal barges with the double karawait figureheads, as represented in model form and on banknotes. This again reflects the significance of these vessels, both from a British imperial and local perspective.



**Figure 181** Eight annas postal stamp, Burma Postage ‘The Irrawaddy’ depicting a boat under sail on the river, 1930s (In the Philatelic collections, British Library)



**Figure 182** Two annas six pies stamp, Burma Postage ‘Royal Barge’, 1930s (In the Philatelic collections, British Library)





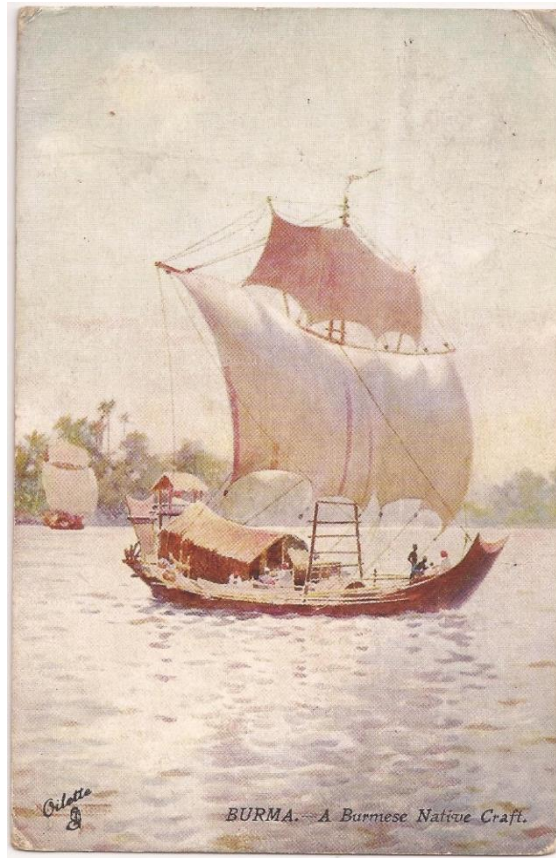
**Figure 183** K1 stamp, Socialist Republic of the Union of Burma, depicting a royal barge, 1977 (In the Philatelic collections, British Library\_



**Figure 184** 50p stamp, Socialist Republic of the Union of Burma, depicting a royal barge, 1977 (In the Philatelic collections, British Library)

### ***Postcards and photographs***

With the increase in Europeans present in Burma from the 1880s, particularly due to tourism, there was an ever-increasing demand to capture sights that would have been visually unusual for foreigners (Singer, 1993: 7-9). As a result, photography and postcards illustrating local scenes increased, some of which depict traditional watercraft, as shown in Figure 185 and 186. This iconography again captures aspects of watercraft that can help us to understand traditional vessels and to compare them with the models identified as well as highlight the value of these objects from a European perspective.



**Figure 185** Postcard, Burma – a Burmese native craft. On the reverse it says ‘In addition to the steamers of the Flotilla Company on the Great River Irrawaddy, there is a large number of native craft similar to the one in the picture employed in carrying products of the plantations and forests’  
c. 1911-1912. Raphael Tuck & Sons



**Figure 186** Photograph taken in the early twentieth century of a man spearing fish on Lake Inle. Notice how he stands on the slightly raised stern to carry out this activity similarly to the banknote in Figure 179. There is also a conical fish trap on the boat (Dell, 2000: 48)

### ***Newspapers***

Finally, another source depicting traditional Burmese watercraft can be found in the form of newspapers. Sketches found in newspapers like *The Graphic* dating from 1885, for example (see Figure 187), illustrate Irrawaddy Flotilla Company steamers alongside traditional working watercraft as seen in the foreground. These vessels have the raised sterns that seem to be iconic among the models.



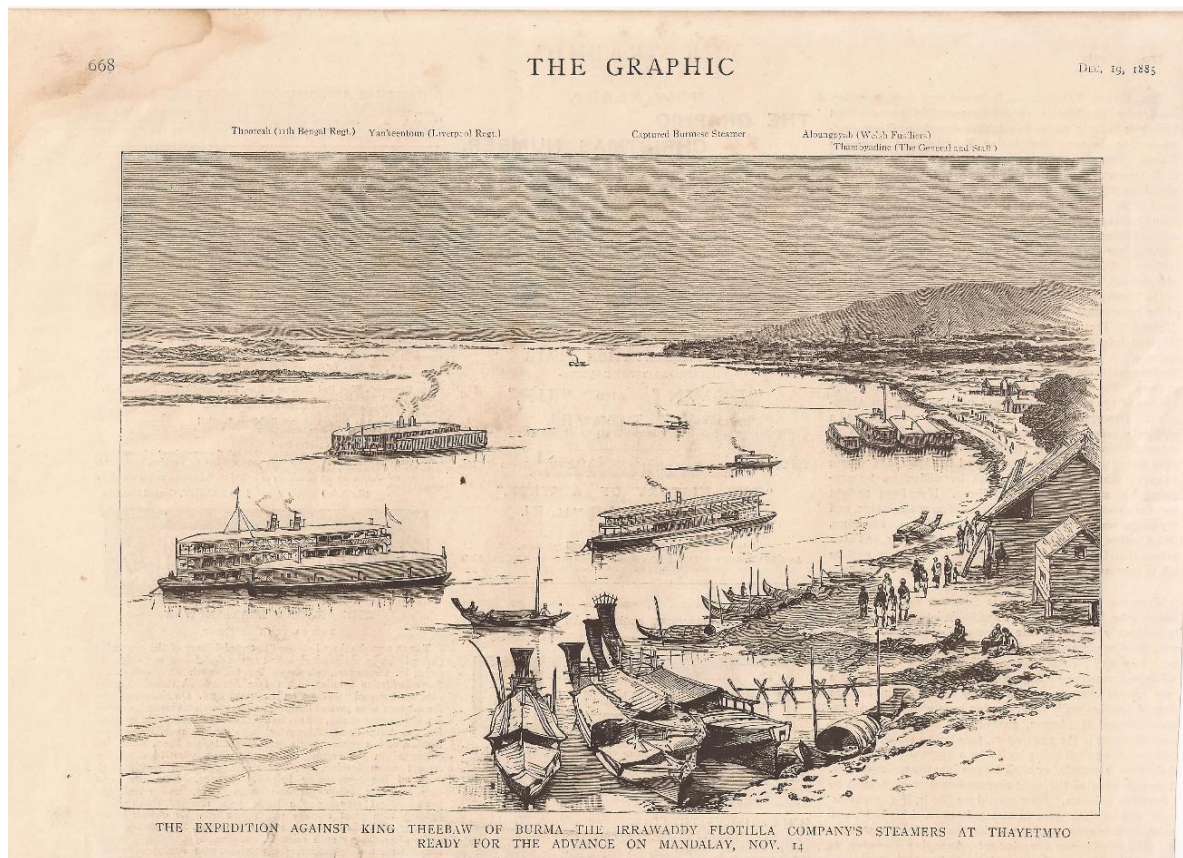


Figure 187 Burmese boats on the Irrawaddy River. Drawing from *The Graphic*, 1885

### ***Different iconographic materials and their potential for studying traditional Burmese boats***

Traditional boat iconography, present on banknotes, stamps, postcards, photographs and newspapers since at least the late nineteenth century, should not be underestimated as potential sources for studying watercraft. These sources can be used alongside models to help identify if they portray full-size vessels or if there are traits that seem to be only stylistic on models. Models as well as other iconography thus have the potential to help us understand traditional craft that have otherwise been little studied. There is not time within this research to investigate these sources further but there is certainly potential to study these different sources in detail in the future. It is hoped this section has at least demonstrated the range of sources available to be taken into consideration for future studies of Burmese watercraft.

Whilst some of this material was manufactured on a local level the majority of these sources were created at a time of British rule by British companies. It was British collectors who amassed the models identified in this research and postcards, photographs and some newspapers were aimed at a European

audience. It is thus important to acknowledge here that the depiction of particular types of boats in multiple forms may have meant that these vessels were considered to be iconic of Burma from a British perspective, and not necessarily from a local perspective. It is interesting to observe that several of the sources shown here post-independence depict royal barges and racing vessels. This could link to the idea of promoting the regatta festival as a symbol of national unity during a time of political instability.

As well as the wooden model boats identified in this chapter Pyro made a brightly coloured plastic hobby craft kit in the 1950s of a Burmese paddy boat (shown in Figure 188). This further demonstrates how significant these vessels were for a European market, or at least how different they were to contemporary European vessels, and perhaps reflects what Europeans deemed to be iconic of Burma, or Myanmar, at the time. Overall this array of evidence and inferred value of vessels further reinforces how there is an urgent need to study and record traditional Burmese watercraft that are still made and used today or that no longer exist.



**Figure 188** Burmese paddy boat model making kit by Pyro. Comprising various plastic components, c.1950s (photograph taken by Charlotte Dixon, 2016)

## 7.4 Conclusions

Through a review of the literature available about traditional Burmese boats and the presentation of seventy-one models it is hoped this chapter has raised awareness of how little has currently been done in the study of these vessels and the potential of models. Few vessels have been discussed in any great detail in the literature that has been identified and this is usually part of a wider discussion, rather than focused entirely on watercraft. The vessels that have been discussed in the literature are limited in date, ranging predominantly in the early and then late twentieth century with little evidence for these vessels in the nineteenth century or mid-twentieth century. Furthermore, the discussions are limited to riverine vessels omitting lake craft and with very little reference to sea-going boats. The focus tends to be on racing or ceremonial / war boats, vessels that were used in regattas and for their aesthetic processional value.

The models, however, range in date from the mid-nineteenth to late twentieth century which is highly significant as they have potential to inform us about Burmese watercraft where there is no other identified literary evidence. Beside this, the greatest potential of models in the study of traditional boats is their ability to inform us about a range of watercraft. For example, there is one model described as a sea-going vessel and a model of a fishing boat with hinged 'Chinese net' which are little represented in the literature. Examining the biographies of these objects has been interesting revealing that a variety of vessels were represented in miniature at the Glasgow International Exhibition of 1888. These vessels are highly detailed and were made to accurately depict full-size vessels that were in use at the time.

An examination of construction techniques has also proven interesting supporting Ferrars and Ferrars (1900) notion of the dugout log and side and end extended logboats as well as carvel planking on larger vessels. Furthermore, multiple models have metal staples securing the stem and stern pieces which is only mentioned briefly in the literature. This could provide evidence to suggest that this form of fastening was indeed used showing similarities with the hooked nails used in Bangladeshi boats.

Ultimately, this chapter has started to form a basic classification of Burmese watercraft with a discussion of sub-classes. It has not, however, been possible to explore these in a detailed manner within the remit and time scale of this

research project and therefore require more attention in future studies. It has likewise been briefly demonstrated how a variety of iconographic sources, including banknotes and stamps, depict traditional vessels which could be used in conjunction with the models to further explore aspects of traditional boats including the range, propulsion techniques and particular features. A preliminary examination of features on the models proved useful supporting the steersman's chairs or platforms that were mentioned briefly in literature such as Folkard (1906), as well as the outboard platforms or gangways and other features such as the bipod mast.

Whilst this chapter has started to identify traits associated with traditional Burmese boats there is still a lot of research to be done. Regardless of this, however, this case study has helped to answer some of the key research questions set out in Chapter 1. The models can indeed help us to learn about Burmese vessels, particularly in terms of their range, variety and construction. The objects are highly detailed and, when considering their purpose, collection and assessing them in conjunction with literary and other iconographic depictions, seem to be relatively accurate in terms of their depiction of full-size vessels. Thus, they should not be underestimated as a potential source for studying these vessels. Furthermore, the models were collected at the height of Burma's colonial history so can be used to understand colonial relations and the significance of watercraft for the European collector.





## **Chapter 8 – Conclusions: the value of model boats**

This Collaborative Doctoral Award funded PhD research explored how models of boats in UK museums can contribute towards studies of traditional watercraft from the Indian Ocean. It is the first doctoral study of its kind to explore non-European boat models in terms of their value for traditional boat studies. Not only does it support and make an original contribution to a growing aspect of Maritime Archaeology and Ethnography – the study of boats and boat building traditions in their cultural and historical context, but it also contributes to the history of collecting and the use of models in museums.

The original proposal for the project outlined how models of vessels from the Indo-Pacific region are present in museum collections in the UK yet they are poorly understood. The purpose of the research was to ask what value do these models have with regards to aiding an understanding of boat building traditions and, more generally, to promote the importance of these collections for research and display. Initially the research incorporated regions around the South China Sea, including China, Thailand and Vietnam. However, as the research progressed the high volume of models identified necessitated the restriction of the geographic area of study. This study therefore focused on the Indian Ocean spanning the region from East Africa through to Western Australia including the Red Sea, Persian Gulf, Malaysia and Indonesia. Throughout the thesis it became apparent that models have the ability to inform us not only about the construction of traditional vessels but they can also be valuable evidence for different types of vessels, their features and cultural significance.

The research demonstrated the potential of model boats and how they can be used to understand traditional watercraft that are little studied or no longer exist. The importance of these objects for both museums and researchers has been emphasised. It is anticipated the methodology used to study model boats in this thesis will be adopted by scholars studying traditional watercraft in the future. This concluding chapter summarises the key findings of the research to answer the question proposed in Chapter 1. It then identifies areas that require further research and, finally, summarises the importance of model boats for museums and how they can be utilised in displays.

## **8.1 How useful are models as a tool for studying traditional boats from the Indian Ocean?**

The overall aim of the research was to answer the question *how useful are models as a tool for studying traditional boats from the Indian Ocean?* To answer this comprehensively six further questions were identified in Chapter 1 that were approached throughout the thesis. The first two of these questions were about the purpose and collection of the models and why these objects ended up in museums. This was an essential approach used to understand the biographies of the objects before analysing what they physically represent in terms of traditional watercraft.

As well as answering the initial research question, the study identified other uses and values of model boats that further reinforce how important it is for these objects to be used by researchers and museums and for them to be retained, not disposed of. Models are not only evidence of traditional watercraft but also have potential to address wider issues including colonial collecting, the appeal of models and the miniature and the cultural significance of boats. As the research was primarily concerned with answering the specified research question it was only possible to identify and briefly explore some of these avenues. It is thus hoped that these issues and uses of models will be considered in future studies, an idea that is discussed further in section 8.2.

### **8.1.1 Models in their wider contexts**

This research has contributed to material culture studies, collecting histories and object biographies by supporting the concept that objects are inherently entangled with narratives that extend beyond the physical object itself. Chapters 4, 6 and 7 explored the contexts of the models in terms of why they were made and collected. This revealed that the models were not acquired for one generic reason but they were amassed by 134 different collectors. To enable a discussion of all the models a classification system was adapted from Pearce's typologies (1994: 194). This showed how the models could be loosely divided into different collecting types comprising systematic commissioning; systematic boat model collecting; general systematic collecting and souvenir collecting. Deciphering collecting histories was a crucial approach used to understand the models in their wider contexts and it is hoped this will be adopted in future studies of traditional watercraft. Once the purpose and history of a model was understood it helped to ascertain how much information might be obtained about the larger vessel they

represent. This is particularly evident in the models that were identified as being commissioned for the specific purpose of display in international exhibitions, such as the Great Exhibition of 1851 and the Colonial and Indian Exhibition of 1886. Models commissioned for these exhibitions were made, often by boat builders, as technical miniature representations of full-size watercraft to depict technologies and traditions used by regions outside of the UK. This context implies these objects are accurate and technical depictions of vessels and could therefore be used as evidence for traditional boats in terms of their construction, overall form and features for example.

Other concepts that emerged by studying the histories of these objects was how many were collected during the height of the British Empire by colonial officials, anthropologists, scientists and leisure travellers, for example. These collecting histories have potential to help us understand the notion of colonial collecting, providing insights into material culture exchange and the narratives these objects can evoke about colonial histories from both a local and western perspective, as well as the broader imperial endeavour. While this has been acknowledged throughout the thesis, the research focused primarily on the models as tools for understanding traditional watercraft rather than concentrating entirely on their biographies. Colonial collecting is a concept Wintle (2013; 2015) discussed in depth in terms of material culture exchange and collecting in the Andaman and Nicobar Islands, and in terms of the ethnographic boat model collections at the National Maritime Museum. It would be interesting to apply these techniques to further study collecting histories of the models in the future.

### **8.1.2 Models as representations of traditional boats**

The other questions asked throughout this thesis were about the physical models themselves. This included how accurately the models represent watercraft in miniature. With this question in mind it also asked what can models tell us about different types of boats, their construction techniques and if these changed over time and space. In addition, the research considered what models can tell us about the importance of boats in local or western cultures. Approaching these questions really helped the overall assessment of the value of models in the study of traditional boats.

The Sri Lankan outrigger case study in Chapter 6, for example, used ethnographic drawings of boats available in published studies to compare different aspects of the models. This technique revealed that models of these vessels are relatively

accurate portrayals in terms of their features, general shape and method of construction. As a result, models could be considerably useful to understand these particular attributes of full-size *oru* (i.e. construction and features). Models could thus be used as a proxy for full-size vessels for those interested in construction and features of traditional boats. This comparative analysis, however, also brought to attention an aspect of the vessels that do not accurately depict the full-size watercraft. This is in terms of scale. This demonstrates a limitation of these miniature objects and should be considered when using models to study traditional watercraft in the future. For example, the stitching technique used on the models replicates the overall pattern and style that was documented in published studies of these vessels as being used in the construction of full-size *oru*. However, there are far fewer stitches on the models and their length has been exaggerated. It was hypothesised in Chapter 6 that this could be purposeful as a way to highlight the importance of this feature and construction technique that differed to techniques used to build contemporary European boats. This links to the ideas discussed in Chapter 2 about the act of miniaturisation and how a model maker can decide to exaggerate or reduce features depending on the purpose of the model. Another theory for this discrepancy in scale could be due to the practical issues of miniaturisation and the time and skills required to accurately portray the size and quantity of these stitches in miniature.

Comparisons of models from Myanmar with literary evidence was limited due to the lack of scholarly studies available about watercraft from this region. This case study, presented in Chapter 7, demonstrated how models can still be used as valuable evidence in the study of traditional boats from Myanmar, regardless of the lack of publications available for comparisons. In this chapter the models were compared with each other and other iconographic depictions where possible. Analysis of the models' accuracy as representations of full-size watercraft was, however, more of a challenge than analysing the models researched in Chapter 6. However, placing the models in their wider contexts and investigating their collecting histories did help to start gauging how representative the models are of full-size watercraft. For example, some of the models were commissioned for an international exhibition held in Glasgow in 1888. These models were made to depict technologies of Burmese watercraft and could therefore be used to interpret information about these vessels such as the different types, their features and method of construction. Several of the models,

including those made for the 1888 international exhibition in Glasgow, include the use of metal staples in the assembly of the stem and stern posts. This is a construction technique so far omitted in literature about Myanmar with the exception of a brief mention of “dee nails” (Ferrars and Ferrars, 1900: 137). Models can therefore be used to help us to understand Burmese boat building traditions that are otherwise not recorded.

Overall, the models researched depict a range of different construction techniques: the majority were not simply carved from one piece of wood. Some of the models from Myanmar were constructed with carvel planking fastened together with dowels or nails, whereas models of outriggers from Sri Lanka portray logboats extended with washstrakes, sewn together using linking cross-stitches. Chapter 3 demonstrated how other models, such as the *masula*, were made using a sewn technique, basket boats were woven together in the case of *qufa*’s or *guffa*’s and some rafts were lashed together such as the Indian *kattumaram*. In addition, the models depict logboats hollowed out of wood and logboats with double outriggers. Models are therefore highly useful tools in the study of boat types and their construction techniques that were once employed in different regions around the Indian Ocean.

Aspects of watercraft, such as propulsion and use, can also be explored by studying models. The idea of propulsion can be particularly informative if, for example, the rigging on a model sailing boat is intact and has not undergone repairs. However, items such as sails and paddles can be fragile and detached from the model itself so it is possible that these components may have been lost or broken during, or before, its life in a museum. It is therefore useful to look out for repairs or signs of broken or missing components when studying models. The notion of use can likewise be informative if a model has equipment, such as fishing nets or whaling spears for example, that can be indicative of the use of a vessel. However, where additional equipment is not available in model form we are reliant on museum documentation to see if use of the vessel depicted in miniature was recorded. As noted throughout this thesis, the extent of information available in museum records is considerably variable and information about use is often not documented.

In addition, the research has demonstrated how models can be used to learn about features found on full-size watercraft and how they can reveal new features previously unidentified. This can be seen in the example of the bench atop the

gunwales found on several *oru* models (as discussed in Chapter 6). Both case studies have also been able to provide new information about the range of, and variations among, Sri Lankan *oru* and Burmese boats. This has revealed new types of watercraft that had not been identified previously in the literature. Although the categorisation of vessels has its limitations (referred to in Chapter 3), the research has proven how models do at least reflect a variety of watercraft – they are not limited to only representing one type. Having said this, there must also be caution to understand that the models represent a selective range of watercraft that were chosen to be reproduced in miniature for a variety of reasons. They are not representative of all the types of vessels in use in a given region and there could be biases in which vessels were depicted in model form. For example, they may not necessarily reflect the most commonly used forms of water transport but models of certain boats could have had an appeal for the souvenir market. This will be elaborated on in the subsequent summary about cultural value.

Overall, it would seem the strengths of the models are their potential to reveal information about different types of watercraft, their features and construction. The models are generally more limited as a tool to understand scale, propulsion and use of traditional watercraft. This is, however, a generalised comment based on the analysis of a selection of model boats, but as each model is different their use should be assessed on a case by case basis.

### **8.1.3 Models, miniaturisation and the cultural value of watercraft**

This research has contributed to concepts about miniaturisation including why objects are miniaturised and the skill of the craftsman involved in making an object at a reduced scale. The previous section demonstrated how, when working at a reduced scale, certain aspects can be exaggerated or omitted. While this research argues that models can be used as evidence for full-size watercraft, a reflection on the act of miniaturisation in Chapter 2 highlighted how these objects cannot be exact copies in miniature. The very process of working at a reduced scale might require a different skillset or different tools and materials in order to produce the object than would be required to build a full-size vessel. However, it has also raised awareness about how models of boats can be interpreted by exploring contextual aspects, such as their purpose, as indicators of what types of models they are. For example, the majority have been identified as technical models, but funerary models (like the Singaporean Taoist joss paper models) have also been identified. The latter of these types are not able to inform

us about specific details about watercraft but they can, however, imply that these vessels were deemed significant and had meaning for the deceased.

This idea of meaning and value has also been considered in the case studies in Chapters 6 and 7. In addition to the identification of models of *oru* from Sri Lanka and cargo and ceremonial vessels from Myanmar, other forms of iconographic depictions of these specific vessels, such as postcards, postal stamps and banknotes for example, have started to be identified. With depictions of certain vessels, queries were raised about why particular vessels were chosen to be depicted and what it implied about their meaning / status. It can be postulated that certain vessel types were particularly significant for the locals who produced the vessels in miniature. In addition, this research has highlighted how western views influenced the production of models of particular vessels which were also depicted in other iconographic forms, such as postal stamps. Certain vessels seem to have been depicted as symbolic of a particular culture, like the *oru* which appears on numerous postcards. By considering this wide representation of boats it would seem that models have potential to help us to understand meanings and the importance of vessels within a given culture.

### 8.1.4 Summary

The models identified in this research and discussed in Chapter 3 are highly detailed depictions of a wide range of watercraft from a number of different locations around the Indian Ocean. The main ideas that have emerged throughout this research are how models can be used as evidence to learn about different types of traditional watercraft, their features, construction and their significance as cultural symbols. They can also tell us about vessels in the nineteenth and twentieth centuries, often providing evidence that predates the majority of literature on traditional watercraft.

Ultimately, however, models of boats have the ability to inform us about aspects of traditional watercraft from the Indian Ocean that may no longer be built or used. They are therefore crucial evidence for traditional boats and the maritime cultures they helped to support and should not be overlooked or underestimated as evidence in future studies. This thesis therefore supports Stewart's statement as discussed in Chapter 2, that "a reduction in dimensions does not produce a corresponding reduction in significance" (1993: 43): just because the boats in this study have been miniaturised does not mean they are not significant as evidence for full-size vessels.

What has become apparent throughout this research is that different models may be able to produce different levels of information about traditional watercraft and this must be considered when using models to study full-size vessels in the future. Models from Myanmar, for example are particularly useful in starting to gauge an idea about the range of watercraft that were in use. Sri Lankan outriggers can, however, be assessed more critically in terms of their overall shape and accuracy as there are drawings and information that can be used for comparison. The approach that is used to study different models must therefore be adapted on a case by case basis.

Furthermore, this research has wider implications in the field of archaeology. Iconography in this discipline can essentially be defined as “visual imagery” (Knight, 2013: 3) and can take many forms, from models to stone carvings for example. Such visual imagery can similarly range significantly in terms of date. This thesis has highlighted approaches to interpreting iconographic depictions of boats that could be applied to the wider discipline to explore other representations of watercraft, of varying dates, within maritime archaeology. It could also potentially influence studies of iconography of varying subjects in the broader field of archaeology. The questions presented in this study, including about the context of the objects, what they show and what they omit, could be applied to other forms of iconography. For example, do we know what the imagery was intended for? What does it depict, could this be accurate? Are there details that might have been omitted on purpose or due to the physicality of making the image? What can it tell us about the object it depicts and about the moment in time when it was made? The research also identified some of the benefits and similarly the limitations with such data which could help to inform future studies. This thesis thus has the potential to contribute to research methods used to understand and interpret iconography in the wider discipline.

### **8.2 What has emerged from this research that requires further study?**

While this research successfully demonstrated how models can contribute to the study of traditional boats it also highlighted how these objects can be utilised in a number of other ways to explore the wider socio-cultural significance of watercraft. Due to limitations of the research in terms of timescale and scope, however, it was not possible to investigate all of these avenues in depth and thus the potential of model boats has yet to be fully realised. This research, therefore,



not only achieved what it set out to do in terms of demonstrating the value of models in the study of full-size boats, but it also identified four particular areas where models could be used in future studies. These are:

1. Further study of boat types and regions
2. Traditional boats as cultural symbols
3. Object biographies, collecting histories and colonial encounters
4. How model boats have been exhibited by museums in the past

### **8.2.1 Further study of boat types and regions**

The first of these ideas is essentially a continuation of this research - to study models of boats as a way to learn about full-size traditional watercraft. Several types of vessels and regions were identified in this thesis as potential areas of research, such as the Indian *masula* and Malaysian vessels. As the thesis was limited to two case studies there is a need to incorporate models of other vessels identified in this research within studies of traditional watercraft and to realise their potential as evidence for the boats they represent. Furthermore, the number of museum collections researched had to be capped at thirteen as there was not enough time to approach every single museum in the UK and the dataset was already larger than anticipated. It is highly likely that models of boats from the Indian Ocean are present in other UK museums. With this in mind, future research could incorporate other UK museums to build up an exhaustive catalogue of models from the Indian Ocean.

Some preliminary searches also identified a wide range of model boats from the Indian Ocean in museum collections outside of the UK such as Holland, Australia and the USA for example. There is therefore potential for traditional watercraft from the Indian Ocean to be studied using collections from around the world. In addition, French, Dutch, Spanish and Portuguese museums, for example, may have in their collections models of boats representative of regions around the Indian Ocean that are different to the regions represented in UK museums. This would be an interesting avenue to compare to see if these objects are reflective of different European colonial endeavours.

While this research can be used as a framework for the study of traditional vessels from the Indian Ocean it can also be applied more broadly to the use of models to study watercraft from other regions around the world. The research, in its initial phase, included regions in Southeast Asia such as Thailand, Cambodia,

Taiwan, Vietnam and China. Several models of vessels from these regions, particularly China, were identified at the beginning of this research but were not included due to the high volume of models already forming the dataset. There is great potential, therefore, for models, from both ethnographic and archaeological contexts, to be used as evidence in the study of traditional watercraft in several regions around the world. This research could thus have wider implications for the use and interpretation of boat models in the field of maritime archaeology.

Another notion that became apparent throughout this research is the need, where possible, to continue to conduct ethnographic studies of remaining traditional watercraft. Although the literature review in Chapter 5 demonstrated that there has been an increase in ethnographic studies of traditional boats around the Indian Ocean since the late twentieth century, it also highlighted how there are still many vessels and regions that are considerably poorly understood yet are under threat of extinction due to the use of new materials and technological developments. It is therefore critical that traditional vessels are recorded in some capacity before they are lost forever. This is particularly apparent in the case of Myanmar where Chapter 7 showed how there have been virtually no systematic academic studies of watercraft from this region to date.

### **8.2.2 Traditional boats as cultural symbols**

The second area that requires further study became particularly apparent throughout the case studies in Chapters 6 and 7 – the notion of watercraft as cultural symbols. When searching for information about Sri Lankan *oru* it became clear that depictions of these vessels featured on a number of materials including postcards, stamps, banknotes, and in newspapers and photographs of Sri Lanka. While Sheriff (2010) discussed the idea of ‘dhow cultures’, where the Arab sailing boat was seen as a symbol of the development of trade, cultures and interactions around the Indian Ocean, the cultural symbolism of other vessels around the Indian Ocean is poorly understood. After initial discoveries of *oru* depicted on a number of materials, preliminary research was conducted to see how many vessels from around the Indian Ocean were depicted in varying iconographic forms. This revealed, for example, that vessels from India, Sri Lanka, Bangladesh, Yemen, Myanmar and the Maldives were depicted on banknotes and vessels from different regions were also depicted on postal stamps. With this in mind it would be interesting to question the meaning of particular vessels. This idea of cultural value could be explored on two levels. Firstly, in terms of the meaning of the boats for the locals who built and used them. This concept could also be

extended to consider the international appeal of particular types of boats for them to be depicted on items such as postcards that were distributed internationally. Did the image of a particular vessel denote a certain meaning? Was it seen as symbolic of a particular region or culture? Why were certain vessels chosen to be depicted over others despite the use of a range of vessels in a given region? Does the representation of particular vessels link to the boats represented in model form? Whilst this thesis started to introduce some of this material relating to Sri Lankan and Burmese vessels it was not in the remit of the research to study this notion in depth. However, the full extent of iconographic depictions of watercraft from the Indian Ocean is still unknown so this is an area that certainly requires attention in future studies. Models of boats, along with other forms of iconographic depictions of vessels, therefore have potential to inform us about issues beyond the physical vessel itself, to delve into the wider meanings and cultural value of vessels.

### **8.2.3 Object biographies, collecting histories, colonial encounters and indigenous agency**

Chapter 4 explored biographies of the models in terms of how they were collected and why they ended up in museums in the UK. Although this was a fundamental part of the methodology, to understand why the models were made and collected and how this could impact their interpretation as evidence for full-size vessels, it only formed one chapter in the thesis. The research could, however, have taken an entirely object biographical approach by focusing on the models' collecting histories. Wintle used a similar approach when studying models of boats from the National Maritime Museum (2015) and objects from the Andaman and Nicobar Islands (2013). This revealed how objects collected at a time of British imperialism have the potential to inform us about the colonial endeavour, cross-cultural exchange and the lives of people in local communities (2013: 1-3; 2015). As it was not possible, in the remit of this research, to explore these concepts in detail it would be interesting to study these ideas in the future by focusing on object biographies to see what they can reveal about colonial collecting and the exchange of material culture and, in the broader sense, about empire and the colonial endeavour.

Furthermore, the overarching question in this thesis which aimed to show how models can be useful for understanding full-size boats was predominantly rooted in the discipline of Maritime Archaeology. It is acknowledged, however, that different culturally specific ways of understanding the models as objects in

themselves are also valid but have not been fully addressed in this research due to time constraints and the remit of the research questions. Aspects such as indigenous cultures of miniaturisation for example, could provide another avenue to focus on in future research

#### **8.2.4 How model boats have been exhibited by museums in the past**

The last area that requires further study as a result of this thesis is the way models of boats were displayed in the past. Models on display when the research was conducted are acknowledged in this thesis but the scope of the project did not include an in-depth exploration of their use in museums in the past. It would therefore be interesting to investigate how models have been used in exhibitions and what stories they told. In doing so it could help to raise awareness of the potential use of these objects and to address questions about how they could be physically displayed. For example, images of the models exhibited at the Great Exhibition in 1851 would make an interesting case study. The stories told by the models that were displayed at this exhibition could have differed to those used in other exhibitions, such as the Native Boats exhibition at the Science Museum in 1933. In addition, Fenner's doctoral study (2014) about the models displayed in the Science Museum until 2012 could help to identify the different narratives that can be told through the display of model boats in museum contexts. This leads on to the next section about the value of models for museums and why it is important to continue to preserve, and not to dispose of, these objects.

### **8.3 The value of models for museums – why keep them?**

The original proposal for this research estimated there were around 200 models of boats in total from the Indian Ocean in the British Museum and other museums around the UK. One of the major outcomes of this research was the sheer volume of models that were actually identified – 667 in thirteen museum collections. This was so much higher than initially anticipated that the geographic border of the study area in the eastern Indian Ocean was reduced (to not include China, Cambodia etc.) and the museums researched capped at thirteen. There are thus likely to be more models of boats from the Indian Ocean in museums in the UK and other collections around the world. This research demonstrates that there is also potential to use models of boats from other parts of the world to study traditional watercraft from other regions such as the South China Sea, regions around the Pacific Ocean, or North America for example. Yet these objects are so rarely displayed and at risk of disposal

During the course of the research there was an unfortunate case where the International Sailing Craft Association in Eyemouth (EISCA), a collection of both model and full-size boats from around the world that was privately funded as a charity, went bankrupt. Nineteen models from this collection, fourteen of which were on display, are included in the dataset in this study: EISCA was one of the thirteen collections used in this research. As a result of this bankruptcy the entire collection was sold off through a public auction. These objects, some of which were displayed at Eyemouth Maritime Museum (see Figure 189), have since been purchased by unknown collectors and sent to unknown locations. Without being able to make a record of where these objects are we have witnessed the disposal and breakdown of an entire collection. With the loss of this collection we have lost information about traditional vessels which was once accessible in the public domain. The documentation, photographs and catalogue produced as a product of this research is therefore invaluable as a lasting record for the models that once formed part of the EISCA collection.



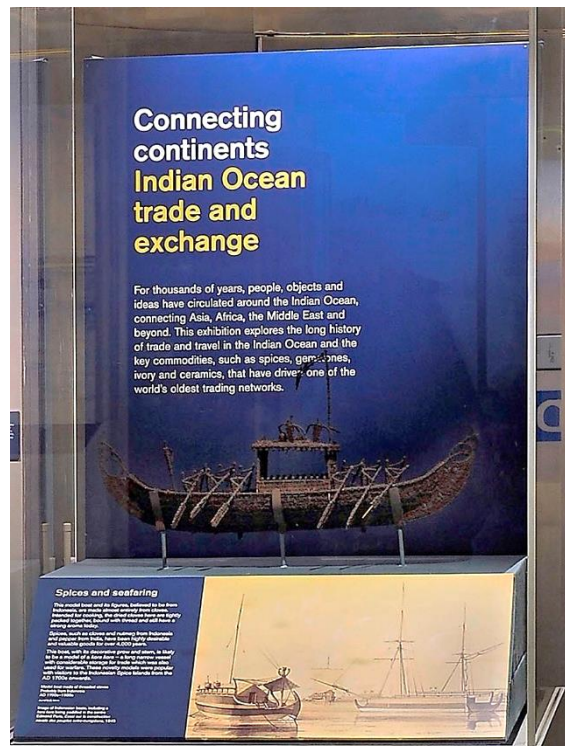
**Figure 189** Models of non-European boats on display at Eyemouth Maritime Museum, from the International Sailing Craft Association's collections (EISCA), in June 2014. This collection has since been disposed through a public auction and the models are no longer on display (photograph taken by Charlotte Dixon, June 2014)

This unfortunate scenario demonstrates the fragility of ethnographic collections. While the breaking up of collections in a private museum is an exceptional scenario, this is a threat many public museums are facing. The retention of models of boats in ethnographic collections face particular challenges. This is because of their size and the nature of their organic material having implications on their storage and preservation. In addition, they are rarely used in displays and it is often felt that visitors are not interested in viewing them. The real challenge of ethnographic boat models in museum collections is therefore to understand what narratives they can tell about the vessels they represent, the societies that made and used them, and how they can tell other stories such as about the experiences of empire.

This research has demonstrated how models are an important part of museum collections, not only for understanding traditional watercraft but also for the wider stories they can help to tell about maritime cultures, colonialism and museum collecting, for example. It is thus hoped that the thesis will encourage museums to utilise model boats in their collections within museum displays and to maintain and care for these objects for future researchers. Ultimately, it is hoped that the potential of model boats that may have been at risk of disposal will be realised and for these objects to be preserved in museums for future generations.

A direct result of this research has been the inclusion of models of boats in temporary exhibitions at the British Museum and Western Australian Museum which proves how useful these objects can be at relaying stories of watercraft and their wider social contexts. In 2014 a model of an Indonesian boat made from cloves was displayed in an exhibition *Connecting Continents: Indian Ocean Trade and Exchange* at the British Museum (see Figure 190). This model was used to tell a story about seafaring around the Indian Ocean as well as the use and trade of spices. Following the success of the model in the exhibition, I went on to write a blog post for the British Museum inviting readers to get in touch if they had a boat model made out of cloves. This received a considerable response with individuals from around the world getting in touch with images of their own models and out of general interest about these objects. This research has helped to raise the profile of models made from cloves (not just models of boats but models of a wide range of objects from tea sets to containers to a horse and cart). A particular outcome, as a direct result of this study, was assisting Western Australian Museum to acquire their own model of a boat made from cloves which

was displayed in 2016 to tell stories of travel and trade in the Indian Ocean. This demonstrates the widespread appeal model boats have and how they are not only valuable for academic researchers but also for a wider audience.



**Figure 190** A model boat, known as a *kora kora*, from Indonesia on display at the temporary exhibition *Connecting Continents: Indian Ocean Trade and Exchange*, at the British Museum, November 2014 – March 2015. This model, which formed part of the data set researched in this thesis, is made out of dried cloves and was used in the exhibition to tell a story of seafaring as well as the spice trade (inventory number As1972,Q.1944; photograph courtesy of David Agar, the British Museum)

Later, models of boats identified in this research were included in an exhibition, *Travellers and Traders in the Indian Ocean World* at the Western Australian Museum, 2016-2017. These objects were used to demonstrate traditional boat building techniques, the different types of watercraft that were in use and the role they played in communities around the Indian Ocean. The selection of model boats used to tell these stories in the exhibition were a direct result of this research. These models, at the start of the research, were poorly understood and stored out of public sight. The model in Figure 191 for example was shown in Chapter 1 in a drawer in the British Museum's store. As a direct result of the research it has since been conserved and was temporarily put on display in Australia as a way of demonstrating traditional watercraft in the Indian Ocean. It is hoped that this research will enable and encourage the use of model boats to tell a range of stories in museum displays in the future.



This research proves that models of boats have considerable potential to be used as evidence for traditional watercraft. It also demonstrates how these objects, the majority of which are stored out of public sight, have potential to be used by museums. These miniature artefacts can be used to tell narratives about boats, the cultures that built and used them and their significance. They can also be used to tell wider narratives about the colonial endeavour, collecting, the formation of museums and about the cultural practice of miniaturisation. Models of boats are therefore multifaceted objects with complex biographies that can help us to learn about different aspects of the past. Used in conjunction with ethnographic studies of watercraft or other iconographic depictions of vessels, they can make a significant contribution to studies of traditional boats, not only from the Indian Ocean, but worldwide.



**Figure 191** A model of an Indian *masula* surf boat on display at the temporary exhibition *Travellers and Traders in the Indian Ocean World*, Western Australian Museum, October 2016 – April 2017. This model was included in the exhibition as a result of this research, to tell the story of seafaring and boat building in the Indian Ocean (inventory number As1849,0904.1, the British Museum; photograph taken by Charlotte Dixon, November 2016)



## **Appendix A – Catalogue of boat models from the Indian Ocean**

Please see the CD presented with this thesis for Appendix A. This presents a catalogue of all the models from the Indian Ocean identified in the thirteen museum collections identified for this dataset. Each entry is ordered alphabetically by the name of the museum first followed by the alphabetical and numerical ordering of the accession number. As this information is provided for each image throughout this thesis the models can be cross-referenced by searching for museum and then accession number.



## **Appendix B – Challenges: working with museum objects**

While placing museum objects at the forefront of this thesis is integral to the research, it also poses many challenges. This section will explore the difficulties encountered in the data collection process and how these have been dealt with. It is important to highlight these alongside the discussion of data in Chapter 3 to allow for a deeper understanding of how and why particular processes occurred.

### **A.1 Challenge One: databases**

The first stage of data collection used a range of databases to search for model boats in museums. This raised numerous challenges in terms of the terminology input into the database – both by the museum and by myself. This refers to the name given to an object which is often not as simple as ‘boat model’ and the name used in the search tool bar. The challenge here is predetermining what an object may have been called prior to searching for it.

Likewise, when searching the British Museum’s database, Merlin and Collections Online (The British Museum Collection Online, 2015), the results varied considerably when adding terms such as ‘outrigger’ or ‘canoe’ and ‘model’. This raises the question of how many models may have been missed when conducting the initial database searches. As a range of terms have been used depending on the institution and the data inputted it is probable there are model boats from the Indian Ocean region that may have been identified under a different terminology to those searched or potentially misidentified, and therefore omitted from this research.

#### **Dealing with the challenge**

Taking the abovementioned challenge into consideration the methodology was adapted by using a set range of terms to search for model boats in the databases. These were (terms also include alterations on the word ordering):

- Model boat
- Model canoe
- Model outrigger

- Model ship
- Toy boat
- Boat
- Canoe
- Ship
- Model
- Outrigger

A thorough search was conducted using these terminologies throughout all the institutions where there was access to the databases. It is anticipated this list of terminologies has allowed for an extensive search, but it must be noted that some models may have unknowingly been omitted. However, this data still successfully demonstrates the large quantity, range and intricate details of model boats in museum collections; if there are more it only goes to further reinforce the need for this research and the significance of the vessels represented in miniature.

### **A.2 Challenge Two: documentation**

Step two of the data collection (researching museum documentation) highlighted further challenges. While some museum records contain extensive information regarding the production and movement of the boat model prior to its acquisition into a museum collection, other records are somewhat limited. In some cases the record simply states that it is a boat model so we do not know the context of its production, field collection or acquisition details. This is often because the documentation has not been able to be matched up to the object or because, and likely in early examples, such information was never documented.

Another potential challenge in terms of documentation relates to the question of who made the records. This poses questions about the accuracy of the model's identification. Did the collector of the object provide details about the model which was recorded or did a museum professional create the record based on their own knowledge? Did the recorder have knowledge of the boat the model represents in order to identify it accurately?

### **Dealing with the challenge**

Where the records for a model boat were minimal there was sometimes no further action that could be taken other than to note the limited information accessible. However, when there was a small amount of information available, such as the name of a donor, it was sometimes possible to delve further into the museum documentation. For example, there were records in some museums about particular donors. In these files it was possible to identify a collection of objects donated by a particular donor and sometimes to gain an insight into the biography of the donor.

## **A.3 Challenge Three: access to collections**

Another challenge identified was in the third phase of data collection – physically accessing the models. In some museum stores accessibility was not an issue, however, I did come across some model boats that were not able to be accessed due to a variety of reasons. These were either: the object could not be located; the model was inaccessible within the museums' store or because the stores were inaccessible; the staff time required to facilitate a visit making it either not possible to view any of the models or not possible to view all of the models within a collection.

In addition to museum restrictions for accessing models there was also the challenge of time faced within the research. As there are 667 boat models forming the core data for this research and each museum visit takes time to organise, travel to, view and photograph the models it was not possible to access every single model boat within the given time restraints of the thesis.

### **Dealing with the challenge**

To overcome the challenge of accessibility it was decided, for the overview of data, to view samples of models from museum collections when the whole collection of boat models could not be accessed. The model boats forming the case studies in Chapters' 6 and 7 were prioritised as it was important to view and document these particular models in order to make analyses. For the remaining models priority was given to those that were known to have been made for international exhibitions. This is due to potential accuracy of the models, as discussed in Chapter 4. Other models were chosen to be viewed to represent a range of models from different locations to familiarise myself with a wide range

of boat models. Overall a large number of boat models were viewed from a range of different regions around the Indian Ocean.

#### **A.4 Challenge Four: time**

The final challenge identified during the data collection phase links to that discussed in challenge three and in the methodology in chapter four – time. Not only were there issues relating to seeing all the 667 boat models identified for the research, there was also the problem of time when identifying which museums to research. Given an unlimited amount of time all museums within the UK would have been approached in order to compile a comprehensive list of all the boat models in all museums in the UK. However, to do such a study would not be possible within the given time frame for the thesis.

##### **Dealing with the challenge**

As a method to deal with this particular challenge of time the methodology presented in Chapter 3 identified key museums likely to contain model boats in the UK. This allowed a *sample* of the boat models originating from the Indian Ocean in UK museum collections to be researched and the thesis has been cautious to not make any claims to say this is an extensive list of all the relevant boat models in all museums in the UK.

## Appendix C - Territories of the British Empire

The territories of the British Empire including the region, dates of acquisition, autonomy and independence (adapted from Lloyd, 1996: 426-433).

Name of state or colony	Former name of state or colony	Date of acquisition	Date of autonomy*, responsible government, dominion status or membership of the Commonwealth	Date of ending relationship with Empire or Commonwealth
South Yemen	Aden	1839		1967
Australia, formed in 1900 from:				
New South Wales		1788	1852-6	
Queensland		1859	1859	
South Australia		1835	1852-6	
Tasmania	Van Dieman's Land	1825	1852-6	
Victoria		1851	1852-6	
Western Australia		1829	1890	
Bangladesh	East Pakistan until separation		1972	
British Indian Ocean Territories		1815		
(part of) Somalia	British Somaliland	1884-7		1960
Myanmar	Burma	1826-85		1948
Egypt		1882-1914		1922
India		1757-1842	1947	
Iraq		1918-23		1932
Malaysia, formed in 1963 from:				
Malaya		1786-1909	1957	
Sabah		1862	1963	
Sarawak		1841-1946	1963	
Maldives		1887	1965	
Mauritius		1815	1968	
Mozambique			1995	
Pakistan	separated from India	1947		1972-89

## Appendix C - Territories of the British Empire

<b>Name of state or colony</b>	<b>Former name of state or colony</b>	<b>Date of acquisition</b>	<b>Date of autonomy*, responsible government, dominion status or membership of the Commonwealth</b>	<b>Date of ending relationship with Empire or Commonwealth</b>
Seychelles		1814	1979	
Singapore		1819-24	1963-5	
South Africa formed in 1910 from:				
Cape Colony		1795-1815		
Natal		1843		
Orange Free State		1854-1902		
Transvaal (South African republic)		1852-1902		
Sri Lanka	Ceylon	1815	1948	
Sudan		1898		1954
Tanzania formed in 1964 from:				
Tanganyika		1919	1963	
Zanzibar		1870-90	1963	

\*(highest level of self-government accessible) – responsible government, dominion status or membership of the Commonwealth



## Appendix D – Basic Hull Type and Location

Table cross-referencing location data with the basic hull types represented by the models (discussed in Chapter 3).

Location	Basic hull type												
	Raft	Basket boat	Bundle boat	Logboat				Planked					Unknown
				Single logboat	Double logboat	Logboat with single outrigger	Logboat with double outrigger	Carvel	Clinker	Reverse clinker	Planked - method unknown	Planked with single outrigger	
Andaman Islands				4		7							
Arabia								11					
Bahrain													5
Bangladesh				3				2	1	1			15
Bengal (West Bengal is now part of India, East Bengal Bangladesh)				1	1			2			1		5
Borneo				9				1					6
Cocos (Keeling) Islands				1									3
Comoros						1							
Egypt									1		1		2
India	15	1		26	4	5		19	2		5		33
Indonesia				9		2	4				1		18
Iran											1		
Iraq		3									1		2
Kenya				2		2		5			1		2
Kuwait								1			1		5
Madagascar				1		3							9
Malaysia	4			27		1		11	1		3		63
Maldives	3			6		2		2					21
Myanmar (Burma)	3			38				8			2		22
Nicobar Islands				5		7							2
Oman								4					
Pakistan								2			1		4
Persian Gulf													13
Qatar													2
Saudi Arabia									1				1
Seychelles				1									
Singapore						1							6
Sri Lanka				3	6	73		15				2	7
Sudan	2		1	1							1		
Tanzania				1		1							
UAE													2
Western Australia						1			1				
Yemen													3
Zanzibar							4	1					2
Unknown or unsure													12











## **Appendix E – Collecting types**





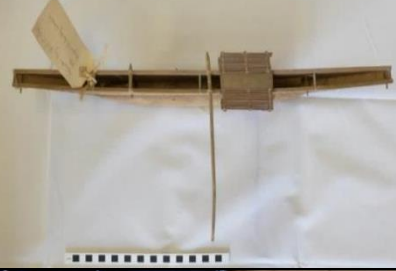

Please see the CD presented with this thesis for Appendix E. This displays the different types of collectors who acquired the model boats in this dataset. These collecting types are discussed in Chapter 4.









## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
British Museum	As1857,04.14.9	Oru - Type A	1857	Money, G.A	250	
British Museum	As1895,06.16.1	Oru - Type A	1895	Rose, Stanley H.	950	
British Museum	As1907,-.67	Oru - Type A	1907	Thomas, N.W.	778	
British Museum	As1929,03.04.18	Oru - incomplete so sub-type unidentified	1929	William Hesketh Lever, 1st Viscount Leverhulme	707	
British Museum	As1933,11.10.1	Yathra dhoni	1854	Sievwright, Lieutenant	407	
British Museum	As1972,Q.1499	Oru - incomplete so sub-type unidentified	Unknown	Unknown	483	
British Museum	As1972,Q.1501	Oru - incomplete so sub-type unidentified	Unknown	Unknown	488	
British Museum	As1972,Q.1521	Oru - incomplete so sub-type unidentified	Unknown	Unknown	565	






## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
British Museum	As1972,Q. 2253	Oru - Type A	Unknown	Unknown	1240	
British Museum	As1981,Q. 47	Oru - Type A	Unknown	Unknown	778	
British Museum	As1997,Q. 189	Oru - incomplete so sub-type unidentified	Unknown	Unknown	705	
Eyemouth International Sailing Craft Association Ltd	EISCA_6	Yathra dhoni	Unknown	Unknown	486	
Eyemouth International Sailing Craft Association Ltd	EISCA_2	Oru - incomplete so sub-type unidentified	1870s/80s	Royal Albert Memorial Museum (RAMM)	510	
Eyemouth International Sailing Craft Association Ltd	EISCA_21	Oru - Type 4.4	Unknown	Unknown	448	

## Appendix F – Models of Sri Lankan outriggers







Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Eyemouth International Sailing Craft Association Ltd	EISCA_26	Oru - Type A	Unknown	Unknown	761	
Eyemouth International Sailing Craft Association Ltd	EISCA_27	Oru - Type 4.5	Unknown	Unknown	387	
Eyemouth International Sailing Craft Association Ltd	EISCA_28	Oru - Type 4.1	Unknown	Unknown	480	
Eyemouth International Sailing Craft Association Ltd	EISCA_3	Oru - Type D	1870s/80s	Royal Albert Memorial Museum (RAMM)	480	
Glasgow Museums	1881.44	Oru - Type A	1881	Campbell, John		
Glasgow Museums	1888.29	Oru - incomplete so sub-type unidentified	1888	Hunter, John L.	905	

## Appendix F – Models of Sri Lankan outriggers








Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Glasgow Museums	1892.114	Oru - Type A	1892	Bacon, Andrew, E.	480	
Glasgow Museums	1904.95	Oru - Type A	1904	Melvin, John		
Glasgow Museums	1888.62cg	Oru - incomplete so sub-type unidentified	1888	International Exhibition of Science, Art & Industry, Glasgow		*not located / no photo*
Glasgow Museums	1888.62f	Oru - incomplete so sub-type unidentified	1888	International Exhibition of Science, Art & Industry, Glasgow		*not located / no photo*
Glasgow Museums	1906.99.a	Oru - incomplete so sub-type unidentified	1906	Lumsden, Robert	980	
Glasgow Museums	A.1953.136.bc	Oru - Type A	1953	Watt	1050	
Glasgow Museums	A.1994.19	Oru - Type 4.5	1994	Hancock, Geoff		









# Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Glasgow Museums	ETHNN.467	Oru - sub-type unidentified	1966	Head, H.W.	530	
Glasgow Museums	ETHNN.468	Oru - Type A	Unknown	Unknown	1210	
Glasgow Museums	ETHNN.470	Oru - incomplete so sub-type unidentified	Unknown	Young, Dr A.		
Glasgow Museums	ETHNN.472	Oru - incomplete so sub-type unidentified	Unknown	Unknown	550	
Glasgow Museums	ETHNN.473	Oru - incomplete so sub-type unidentified	Unknown	Unknown		
Horniman Museum and Gardens	986	Oru - incomplete so sub-type unidentified	1898	Unknown		






## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Kew	49495	Oru - Type C	1874	Thwaites, GHK	480	
Museum of Archaeology and Anthropology	1949.681	Oru - Type A	1949	Hornell, J.		
Museum of Archaeology and Anthropology	E 1918.215.27	Oru - Type A	1912	Stanmore		
Museum of Archaeology and Anthropology	Z 37402	Oru - Type A	1894	Aldridge, D.		
National Maritime Museum	AAE0001	Oru - Type A	1958	Unknown	1026	
National Maritime Museum	AAE0006	Oru - Type C	Unknown	Mercury Collection - training school (often naval models)	1380	
National Maritime Museum	AAE0011	Oru - Type B	Unknown	South Kensington Museum	467	






## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
National Maritime Museum	AAE0021	Oru - Type 4.4	1955	Given to HRH the Duke of Cornwall by Miss Ida Moonemallene, The Old Place, Kurunegala, Ceylon		
National Maritime Museum	AAE0033	Oru - Type A	1869	South Kensington Museum	600	
National Maritime Museum	AAE0034	Oru - Type B	1869	South Kensington Museum	479	
National Maritime Museum	AAE0035	Oru - Type B	1869	South Kensington Museum	471	
National Maritime Museum	AAE0036	Oru - Type B	1869	South Kensington Museum	460	
National Maritime Museum	AAE0091	Oru - Type A	Unknown	Royal Naval Museum Greenwich	650	

## Appendix F – Models of Sri Lankan outriggers








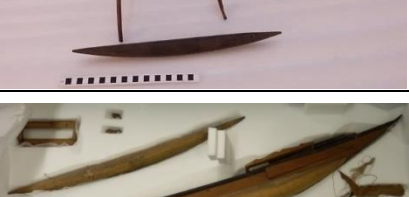
Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
National Maritime Museum	AAE0145	Oru - Type 4.5	Unknown	Unknown	600	
National Maritime Museum	AAE0158	Oru - Type 4.1	1975	Evans, Dr JB	567	
National Maritime Museum	AAE0183	Oru - Type D	Unknown	South Kensington Museum	485	
National Museums Scotland	RSM TY1893.456	Oru - Type A	1890	Unknown	1257	
National Museums Scotland	T.1901.265	Oru - sub-type unidentified	1900	Unknown	488	*no image*
National Museums Scotland	T.1938.71	Oru - sub-type unidentified	1938	Unknown	514	*no image*
National Museums Scotland	Unregistered 10	Oru - incomplete so sub-type unidentified	Unknown	Unknown	373	

## Appendix F – Models of Sri Lankan outriggers






Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
National Museums Scotland	Unregistered 11	Oru - Type A	Unknown	Unknown	1010	
National Museums Scotland	Unregistered 6	Oru - Type A	Unknown	Unknown	1050	
Pitt Rivers Museum	1884.54.51	Oru - type unidentified	1874	Unknown	625	*location unknown*
Pitt Rivers Museum	1884.81.26	Oru - Type A	1874	Pitt Rivers, Augustus Henry Lane Fox	625	
Pitt Rivers Museum	1884.81.47	Oru - incomplete so sub-type unidentified	1884	Pitt Rivers, Augustus Henry Lane Fox	519	
Pitt Rivers Museum	1888.11.1	Oru - Type 4.1	1888	Gordon, Arthur Charles Hamilton	750	
Pitt Rivers Museum	1939.3.7	Oru - Type A	1939	Turner, Ruth	498	




## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Pitt Rivers Museum	1949.8.40	Oru - Type 4.5	1864	Lugard, Frederick Grueber	370	
Pitt Rivers Museum	1966.1.11 67	Oru - Type A	1966	Unknown	758	
Pitt Rivers Museum	1966.1.11 68	Oru - incomplete so sub-type unidentified	1966	Unknown	1030	
Pitt Rivers Museum	1966.1.13 66	Oru - Type A	1966	Unknown	1680	
Pitt Rivers Museum	1969.8.1	Oru - Type A	1969	Unknown	590	
Pitt Rivers Museum	1969.8.2	Oru - Type A	1969	Unknown	1030	
Pitt Rivers Museum	1969.8.3	Oru - Type A	1969	Unknown	760	
Plymouth City Museum and Art Gallery	AR.1984.1 518	Oru - incomplete so sub-type unidentified	Unknown	Unknown		

## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Plymouth City Museum and Art Gallery	AR.1984.1 519	Oru - incomplete so sub-type unidentified	Unknown	Unknown		
Plymouth City Museum and Art Gallery	AR.1984.1 525	Oru - incomplete so sub-type unidentified	Unknown	Unknown		
Science Museum	1881-46	Yathra dhoni	1881	Watson-Howen, Count		
Science Museum	1924-783	Oru - sub-type unidentified	1924	Bompas, C.S.M. Esq.		*not located*
Science Museum	1924-784	Oru - Type 4.1	1924	Bompas, C.S.M. Esq.		
Southampton	Unaccessioned_1	Oru - Type A	Unknown	Unknown	1036	








## Appendix F – Models of Sri Lankan outriggers

Museum	Accession Number	Vessel type / sub-type*	Earliest associated date	Collector	Overall length (in mm)	Image
Southampton	Unaccessioned_2	Oru - Type A	Unknown	Unknown	772	


\*(authors classification based on Kapitän et al., 2009 and the models)









## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
British Museum	As1919,0717.39	Working	1919	Kidd, William, Rev	
British Museum	As1919,0717.40	Working	1919	Kidd, William, Rev	
British Museum	As.3955	Ceremonial / war	1860	Christy, Henry	
British Museum	As1919,0717.41.c	Working	1919	Kidd, William, Rev	
Glasgow Museums	1888.109.ui	Ceremonial / war	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.uj	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.uk	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	


## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Glasgow Museums	1888.109.ul	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.um	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.un	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.uo	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	*no image*
Glasgow Museums	1907.43.b	Ceremonial / war	1907	Wilson, Alec	
Glasgow Museums	A.1940.6.ag	Working	1940	Lang, John	






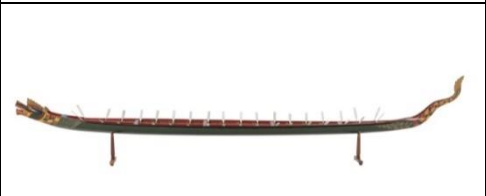
## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Glasgow Museums	A.1952.24	Working	1952	Markie, Mr P.S.	
Glasgow Museums	ETHNN.1386	Working	Unknown	Unknown	
Glasgow Museums	ETHNN.471	Working	Unknown	Unknown	*no image*
Glasgow Museums	ETHNN.475 (or 471?)	Working	Unknown	Unknown	
Glasgow Museums	1888.109.uh.1	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Glasgow Museums	1888.109.uh.2	Working	1888	International Exhibition of Science, Art & Industry, Glasgow	
Horniman Museum and Gardens	1968.610i-viii	Working	1968	Coffin, Dr. Stephen	

## Appendix G – Models of boats from Myanmar







Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Horniman Museum and Gardens	1975	Working	1895	Ming Bah Wai, Judge	
Horniman Museum and Gardens	1987	Working	1898	Horniman, John Frederick	*no image*
Horniman Museum and Gardens	3015	Working	1898	Ming Bah Wai, Judge	*no image*
Horniman Museum and Gardens	3017	Working	1898	Horniman, John Frederick	
Horniman Museum and Gardens	985	Ceremonial / war	1898	Horniman, John Frederick	
Horniman Museum and Gardens	nn5536	Working	Unknown	Unknown	
Museum of Archaeology and Anthropology	Z 42693	Working	1894	Aldridge, D.	*no image*

## Appendix G – Models of boats from Myanmar




Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
National Maritime Museum	AAE0196	Ceremonial / war	1963	Mathew, G. Felton Esq.	
National Maritime Museum	AAE0068	Working	Unknown	Taylor, Kepple	
National Maritime Museum	AAE0081	Working	1913	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0057	Ceremonial / war	Unknown	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0065	Working	1913	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0080	Ceremonial / war	1913	Royal Naval Museum, Greenwich	





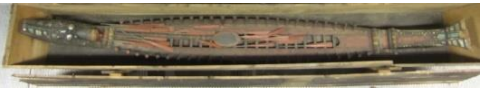

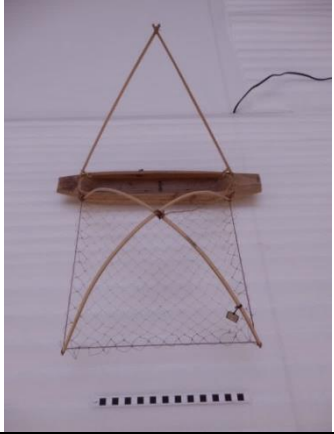
## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
National Maritime Museum	AAE0059	Working	1913	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0079	Ceremonial / war	1906	Royal Artillery Institution	
National Maritime Museum	AAE0061	Ceremonial / war	1890	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0022	Working	1880	India Museum	
National Maritime Museum	AAE0045	Ceremonial / war	1890	Unknown	
National Maritime Museum	AAE0066	Ceremonial / war	1913	Royal Naval Museum, Greenwich	

## Appendix G – Models of boats from Myanmar




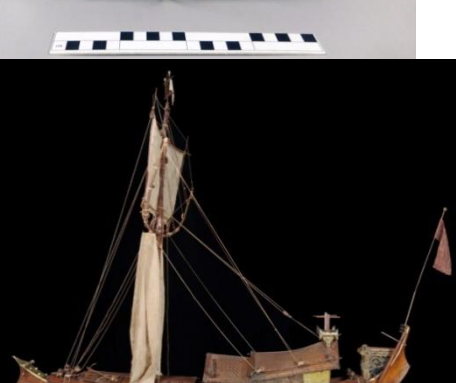
Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
National Maritime Museum	AAE0063	Ceremonial / war	Unknown	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0010	Ceremonial / war	Unknown	Royal Naval Museum, Greenwich	
National Maritime Museum	AAE0067	Working	1913	Taylor, Kepple	
National Maritime Museum	AAE0013	Ceremonial / war	1869	Seppings, Robert	*no image*
National Maritime Museum	AAE0060	Working	1913	Royal Naval Museum, Greenwich	*no image*
National Museums Scotland	RSM AA1897.307	Working	1897	Muir, Grant	*no image*
National Museums Scotland	RSM TY1938.78	Working	1900	Robertson, James	
National Museums Scotland	RSM TY1938.55	Ceremonial / war	1938	Wellcome, Henry	*no image*

## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
National Museums Scotland	RSM TY1946.13	Working	1884	The Secretary of State for India	
National Museums Scotland	RSM TY1968.101	Working	1968	Brown, Norman .F.	
National Museums Scotland	A.420.1-4	Ceremonial / war	1859	Royal Society of Edinburgh	
Pitt Rivers Museum	1884.81.17	Working	1873	Pitt Rivers, Augustus Henry Lane Fox	
Pitt Rivers Museum	1889.9.35	Working	1889	Temple, Richard Carnac	






# Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Pitt Rivers Museum	1889.29.41	Working	1889	Temple, Richard Carnac	
Pitt Rivers Museum	1889.29.42	Working	1889	Temple, Richard Carnac	
Pitt Rivers Museum	1889.29.43	Working	1889	Temple, Richard Carnac	
Pitt Rivers Museum	1889.29.40	Working	1889	Temple, Richard Carnac	

## Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Pitt Rivers Museum	1969.8.6.1-2	Working	1969	Unknown	
Pitt Rivers Museum	1969.8.7.1-2	Working	1969	Unknown	
Pitt Rivers Museum	1884.81.2	Working	1873	Pitt Rivers, Augustus Henry Lane Fox	
Pitt Rivers Museum	1884.81.3	Working	1884	Pitt Rivers, Augustus Henry Lane Fox	
Pitt Rivers Museum	1922.28.7.1-2	Working	1922	Annandale, Thomas Nelson	*no image*
Pitt Rivers Museum	1936.19.2	Working	1936	Coltart, Alan Herbert	
Pitt Rivers Museum	1977.3.1	Working	Unknown	Ashmolean Museum	
Plymouth City Museum and Art Gallery	AR.1984.1517	Working	1937	Unknown	

# Appendix G – Models of boats from Myanmar

Museum	Accession Number	Basic type	Earliest associated date	Collector	Image
Plymouth City Museum and Art Gallery	D47x	Working	1902	Unknown	
Science Museum	1894-184	Working	1894	Longstaff, Major F.V.	
Science Museum	1903-56	Working	1903	Arnot, Capt. W.P.	*no image*
Science Museum	1916-17	Working	1850	Unknown	*no image*
Science Museum	1929-1109	Working	1880	India Museum	
Science Museum	1929-1110	Working	1880	India Museum	*no image*
Science Museum	1929-1111	Working	1957	Unknown	



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