Steamship Wrecks from the Late nineteenth to Early Twentieth Centuries as Archaeological Sites

Immigrants entering Canada (Sévigny 1995, n.p.)

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Declaration of Candidate

I certify that this thesis does not, to the best of my knowledge and belief, contain nay material previously published or written by another person except where due reference is made in the text; and that it does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university.

__________________________________

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Abstract

Shipwrecks of the late 19th and early 20th century have the potential to provide valuable information as archaeological sites. Due to the recent age of these wrecks, and the availability of historical documentation, these sites are largely ignored by the archaeological community. This study examines these wrecks and the issues involved in their study. This includes the recent age of the sites, abundance of historical documentation, methods involved, what can be learned from these sites and some of the ethical concerns involved in their study.

This thesis examines the wreck sites of steamships and other similar vessels by looking at the historical documentation, photographs of the site, any available archaeological reports and information from dive web sites. There are many areas of study to which these sites could contribute, but due to the brevity of this thesis only one has been used as an example, that of immigration.

This thesis aims to establishes that these wreck sites are archaeologically significant, they can provide information not available in the historical documents, and can, contrary to the beliefs of many, help to answer higher level theoretical questions.
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Associate Professor Mark Staniforth, Postgraduate Coordinator, Department of Archaeology, Flinders University for providing me with my background knowledge in maritime archaeology through the Masters of Maritime Archaeology program at Flinders University. Also for his guidance and ideas regarding this thesis.

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Chapter 1 Introduction

In the mid 19th century steamships began to grow in size and became the foremost method of transportation for people travelling by sea. Passengers aboard such vessels ranged in economic and social status, from wealthy vacationers to poor immigrants and everything in between. The cargos of the individual passengers also included a wide range and variety of personal items, those used while on board the vessel and those stored in the cargo holds until arrival in the country of destination.

Many of these large ships now lie on the bottom of the oceans and rivers upon which they travelled, in some cases the locations are known. These wrecks have incited public interest in varying degrees, from the well known story of Titanic to the lesser known, but equally tragic, story of Empress of Ireland. Although these ships are of great historic and often public interest, very little archaeological work has been conducted on them.

This thesis will examine large ocean-going steamship wrecks of the late 19th and early 20th centuries as archaeological sites. It will address the recent nature of these wrecks with their accompanying abundance of historical documentation, and whether this eliminates the usefulness of archaeological study. Along with this issue, the thesis will discuss the contributions that could be made to our understanding of immigration, through the archaeological study of such wrecks, and the artefacts associated with them. The study of immigration as the area of focus within this document has been chosen because it can help to answer questions on human behaviour and cultural change, not only within the vessel in which immigrants travelled, but also in the broader context of their lives in their original country of origin and the new country.

The study of wrecked steamships is fraught with many methodological difficulties: the scale of the vessels, the depth of the majority of these wrecks and the nature of the wreckage, which may make site interpretation more difficult. Another important issue is that of the ethics involved in studying recent wrecks, which are also considered by many to be graves. These issues will also be given consideration within the thesis.
Some disagreement exists as to the distinction between a steamboat and a steamship, for the purpose of this thesis a steamship will be defined as a large steam-powered ocean-going vessel, whereas a steamboat will be defined as a steam powered vessel, of a generally smaller size, that works on lakes and rivers, and does not traverse the ocean. The terms ‘large’ and ‘small’ used here are relative, the distinction is based primarily upon the intended area of use, inland and coastal versus the open ocean.

Within this thesis both types of vessels will be utilized as examples. Due to the lack of archaeological work conducted on steamships, examples of surveys, excavations, management plans and other work that has been conducted on steamboats is also discussed. The vessels examined in the forthcoming chapters are the Empress of Ireland, Titanic, Yongala, and City of Launceston.

The following chapter will discuss the theory, significance and contributive potential of steamships as archaeology sites. This will be followed by the methods chapter, which will cover the sampling design, research tools and limitations of this thesis. In chapter four the history of steamship development is discussed, followed by a description of the vessels that will be used as examples and the work that has been done on them, in chapter five. Chapters six and seven will examine the methods that could be used in investigating steamship wrecks and the issues surrounding their study.
Chapter 2 Theoretical Contribution

Introduction

One of the possible explanations for the lack of archaeological work on steamships is that it is assumed, by many, that there is little which can actually be gained from this. Within this chapter the potential areas in which the study of steamships can contribute is discussed. An example of how steamships can add to the existing knowledge and understanding of immigration is also presented.

Documentary Preclusion of Archaeology, a ‘Recent’ Archaeological Debate

Late nineteenth and early twentieth century ship building practices included the use of plans and documents. Along with the available ship plans, other historical documents are also accessible, providing information about these ships, their voyages and some of the cargoes and passengers aboard. Some examples of historical sources that exist include, among others; newspapers, bills of lading, investigation reports, passenger lists, books, journals, account books, quarantine station inventories (Staniforth 2003, pp.54-64).

Because of the existence of numerous historical documents, many archaeologists and historians believe the study of twentieth century wrecks to be unnecessary. As stated by Gould (2000, p.8) “Some maritime historians and archaeologists would argue that [it] is not worthwhile to engage in the archaeology of shipwrecks or related materials later than the eighteenth century, when ships’ plans, drawings, and other documents and general written accounts become plentiful for the first time”. It is occasionally assumed that the available documents provide all of the information that could be obtained through surveys and excavations of the wrecks themselves, and that these practices are therefore superfluous (Gould, 2000, p.8; Muckelroy 1980, p.10). According to Keith Muckelroy (1980, p.10) archaeology “becomes redundant at that point in the past after which surviving records, descriptions, plans, and drawings of contemporary objects can tell us more about the culture of the time than we can learn
by digging up a few relics”. At what point is this time reached? As per Muckelroy (1980, p.10) this time is reached in the nineteenth and twentieth century and would therefore include the types of wrecks being discussed within this thesis. This statement is highly debated amongst maritime, and even terrestrial, archaeologists, and there are many who disagree with Muckelroy.

Although a ship may have surviving construction plans it is not a certainty that these would have been followed to the letter. As the ships were constructed, slight changes and variations may have been employed that would not have been in the plans. There were often areas of shipboard activity that were not readily documented, such as the private activities of the passengers, the pastime activities of off-duty crew and any illegal activities. The documentation which does exists is often biased towards specific groups of individuals onboard the ship. As stated by Staniforth (1991, p.23) “For the historian there are numerous written accounts which describe living conditions onboard immigrant ships. The vast majority of these were written by a particular segment of society which can be characterized in the following terms - adult, literate, reasonably wealthy, British males who traveled in cabin (or First) class”. These documents would exclude many of the third class passengers as well as some of the crew members. In such cases maritime archaeology would be helpful in filling the gaps in the documentation, as well as being used to confirm the accuracy of the available historical documents and vice versa;

“Documentary evidence, or studies based upon it, plays two important roles … it provides for the development of background information on the particular …situation, and it is a means for independently testing conclusions derived from the archaeological analysis.” (Lewis 1977, p.155).

Regardless of the availability of documentation and high quantities of information about a specific ship’s construction, routes, activities and events, there are always other areas that are not covered, or are not documented accurately. In these situations maritime archaeology is very beneficial. Not only can it fill gaps in our known history and correct current impressions, it can also provide us with information about specific individuals, their lives, activities and, in some cases, thought processes. “The aim of archaeology is…to look in a different way at man’s behavior in the past and present,
and for this purpose it does not matter how old a site is – the important thing is whether it can be used to answer substantial questions about how man behaves” (Henderson, 1985, p.10)

Higher level theories can go beyond this and create broader generalizations about groups of people that may not be well represented in the historical documents. In the subsequent section an example of the use of maritime archaeology in the study of immigration will be discussed, with the goal of demonstrating the potential of recent steamship wrecks in answering questions about human behaviour.

**Steamship Archaeology in Mid Level Theory; an Example**

The study of steamship wrecks has great potential, as mentioned previously. There are many areas in which these particular wrecks can provide information not found elsewhere. In this section one such area will be discussed, this example will outline how the artefact assemblage from a steamship wreck can be utilized to learn more about the thought processes of the immigrants themselves. The ideas and plans of people that have the least historical documentation can be examined through the materials that they chose to carry with them to their new homes.

Shipwreck sites have been referred to as ‘time capsules’ (Muckelroy 1978, p.56) in that they, and all of their associated artefacts, are the products of a single event, one captured moment of time due to the catastrophic nature of their loss. In most cases all of the artefacts found within a shipwreck site will be contemporary, meaning “that the objects were in use at precisely the same time, to the nearest day, and were considered necessary by a group of persons occupied in certain well-defined activities”(Muckelroy 1978, p.56). In the case presented here the well defined activity would be the process of immigrating from a parent country to a new country, and the group of people would be the immigrants themselves. The objects, or assemblages, being discussed in the case of the shipwreck would be the items thought to be important enough to be carried with the immigrants, either within their cabin for use during the voyage, or in the cargo hold for use upon arrival in the new country. It should be noted that Muckelroy notes the possibility of site ‘contamination’, by
When viewed alone these objects can be very interesting and can provide information of the particularistic variety. They can be used to create databases of objects from the time of sinking which can later be used as a reference. They can also be utilized to provide statistical information and typologies for the timeframe of the wreckage. Throughout the majority of maritime archaeological history this is the extent of the work that has been conducted. According to Bass (1983), it is a prerequisite of mid and high level theory and interpretations of shipwreck material that there is first a solid reference foundation consisting of catalogued artefacts and typologies upon which to base ones hypotheses. Many archaeologists believe that this database is comprehensive enough to begin expanding upon and creating theories that help to explain not only the objects themselves but also the associated behaviours, this work has already begun (Veth 2006, pp.13-26), for an example see Staniforth’s (2003) book Material Culture and Consumer Society. Others do not feel that the lack of typolologies excludes the possibility of higher level theoretical work from beginning and that the cataloguing can occur concurrently. This argument is beyond the scope of this thesis and the recent age of the wrecks being discussed here decreases its necessity. The objects that will be found on such wrecks will not be so old as to make identification and interpretation difficult in most cases.

The process of immigration involves three separate assemblages that are unique in their constitution as well as influences. The first of these assemblages is that of the original home, within the country of origin. This would consist of the objects that an individual or a family unit would utilize in their daily life, as well as those objects that they considered to be of value and importance, such as ceramics that may have been handed down through the family, or personal objects of sentimental value. The items that would exist within the home would be familiar, and possibly common to many of the homes in the area.

The second assemblage, in this process, is that found upon the shipwreck. Cargo space upon ships is limited, therefore passengers must be discerning when choosing which items to bring with them. The objects that immigrants bring with them will be
influenced by several factors, including: whether they are travelling as an individual or within a family, the quantity and quality of belongings they had in their home country, their impressions and ideas of what sorts of items they will require in their country of destination, what they plan on doing upon arrival and occasionally the political situation in which they were travelling. Two areas of this assemblage will exist, the items required during the voyage, which will be in the cabin with the passengers, and the items held in the cargo hold for arrival in the new country.

The third assemblage that can be used to study the full process of immigration is that of the home within the new country. This assemblage will contain the majority of the objects brought over in the ship, as well as items deemed necessary within the new climate or culture. The total assemblage will be a combination of items from the parent culture and the new culture. The newly obtained items found within the home may be objects that were not required in the original country, that could not be shipped with the immigrants, or that perhaps were not available in the parent culture.

These three assemblages are a general model for which many exceptions can be found, but they can be useful as a generalization. One exception that could be taken into account is that of a family travelling separately. If one family member leaves for the new home earlier than the others this would create two individual assemblages for the travelling portion of the immigration process. The total assemblage could be split up in a variety of ways, with various items travelling with the first immigrant and the remaining objects following with the subsequent individuals. The arrival of the first family member in the new country would allow the improved preparation of the remaining members in their travels through communication. In this way the cargo brought over in the second journey could be more specific to the requirements of the new climate or situation. Looking at shipwreck cargoes in this situation, an archaeologist would have only one of the many potential cargo shipments, and may not be aware of this. Situations such as this one can make interpretation more difficult and result in conclusions that are not correct, this possibility should be considered when looking at passenger cargo. It is also worth mentioning that in some cases communication may occur with groups larger than family units. For example, an individual could write home to a town informing many others of the necessities of a new country improving the preparation and prospects of many potential immigrants.
Discerning such an event could be done through studying changes in materials being brought over or possibly through historical letters.

The studies of the other two, non-shipwreck, assemblages also have problems that make their examination difficult. The same problems exists for both assemblages one and three, a lack of remaining evidence after use. When a family or an individual immigrates to a new country they are likely to take with them anything that they believe will be of use or that has value to them, whether monetary or sentimental. If the objects are not taken with them they will likely be moved elsewhere or sold, while items that are abandoned may be scavenged by others. Therefore, the only items that may feasibly remain are discarded broken or unwanted objects and the occasional whole functioning item lost during residency, but a complete assemblage is not likely to ever be found.

Another problem with these assemblages is that of palimpsests. Palimpsest is the mixing of artefact layers, making it difficult to distinguish between those from different time periods, and, therefore, changes that took place over time. The often continued use of the residencies makes it difficult to distinguish between different families and their associated artefacts. These two problems, however, are not as prominent with the shipwreck assemblage. As mentioned above the shipwreck, is essentially a time capsule containing moderately complete assemblages, with the majority of the artefacts close to their original context. It is this fact that makes the shipwreck assemblage the most informative of the three. This is not to suggest that an archaeologist would have to find these three assemblages for one family, but rather three assemblages that would be representative of a group of people of similar social, economic and cultural backgrounds. These assemblages can then be used to make generalizations about that group, and to build theories upon.

Although there are many areas of interest for archaeologists within such wrecks, the focus within this example is on that of the cargo and belongings of the immigrant passengers, most often those in the third class. The third class cargo holds and cabins were generally located in the lowest portions of the ship (see the Empress of Ireland plans in chapter 7, and appendix). This is an advantage to the maritime archaeologists,
as Muckelroy states (1978, p.219); “on any normal wreck-site, it is probably a ship’s cargo and heavy equipment (such as armaments) which stand the greatest chance of survival. Since they will have been in the lowest past of the vessel”. As mentioned above, ships are not always perfect time capsules and this must be taken into account during site interpretation, but at the same time these large metal ships with their internal cargo holds make the possibility of assemblage contamination less likely than their earlier wooden counterparts.

The shipwreck assemblage is the most important of the three groupings. This is not only due to the fact that it is the most complete of the three, but also because it will provide the most complete ideas of what the immigrants were actually thinking about their situation, where they were going, what it was like, what they planned on doing upon arrival and, possibly, why they were leaving. The answers to these questions are not likely to be found solely in the historical documentation, due to the bias towards specific social and economic groups within them. These questions can be best answered when all three assemblages are looked at in conjunction with the historical documentation available. The use of historical documentation and archaeological studies allows each of the sources to confirm or reject the hypothesis created by the other. By using this technique archaeologists can also formulate models that could be useful when looking at wrecks from earlier dates with less documentation.

Other sources of information exist that could also be useful when looking at immigration. For example museum collections and quarantine archival records. The book 1847 Grosse Île a Record of Daily Events by Charbonneau and Sévigny (1997) outlines the daily events of a quarantine station in Quebec Canada. This book displays how the records of such stations could be useful for looking at immigrant cargoes. At the Grosse Île station the belongings of the deceased immigrants were catalogued and reported in the local paper. The paper would list their names, the ships they arrived on and the items that they left behind in hopes that family members may come to claim the items. These lists could be compared to shipwreck assemblages. As useful as this source would be for the study of immigration it must be noted that the information is likely to be biased towards individuals travelling alone. If one member of a family dies during quarantine their belonging will be claimed by other family members. It is less likely, although not unfeasible that an entire family would die. Therefore the
study of the cargo found on a wreck is still necessary to obtain a more representative sample of the material culture of immigrants in all situations.

“*There Are no Cats in America, and the Streets are Paved With Cheese*” (an American Tale); Studying Changes Over Time

The study of steamships within the timeframe discussed in this thesis can be linked to immigration studies from the earliest age of steam and, before this, in the age of sail. This can, again, be accomplished by looking at the material culture found on shipwrecks belonging to immigrants within different time frames.

During the late eighteenth century and the early nineteenth century immigration out of Britain was encouraged for several reasons. The British Isles were greatly overpopulated and moving people out would lessen the strain on the country, as well as help to populate Britain’s colonies (Te Ara, New Zealand Peoples, History of Immigration). It was not only the government that profited from the immigration of people to the new colonies, but also companies that had land they could sell to new arrivals. For example “In 1842 the Canada Company sent out an agent to collect statements from various settlers in the Huron Tract to use as encouragement to other emigrants. Owning a great deal of land, the Company was interested in selling it to new settlers” (Immigrants to Canada).

Advertisements, government aid, laws, policies, and previous settler testaments were used to encourage immigration. Potential immigrants residing in Europe were unlikely to hear of the unfavourable experiences involved in immigration. In the early years the travellers may not have been properly prepared for some of the hardships they would encounter such as the hot dry environment in parts of Australia, or the freezing cold winters of Canada. The objects that some families or individuals may have chosen to bring along with them to the new country could be a reflection of what they believed they would experience based on government propaganda. As time passed, and more people immigrated to the new colonies, other forms of information would spread to potential immigrants. This could occur through correspondence between friends and family members, who had chosen to make the journey, as well as from individuals that chose to return to their country of origin after attempting
immigration. This did not occur very often, especially with immigrants to Australia, as such a voyage would have taken over three months by sail.

By looking at the material culture found on shipwrecks archaeologists could potentially learn about what the immigrants believed about where they were going. They could also learn about the changing perceptions over time based on the general changes in objects travelling with passengers. Another area of study is that of variation between the different climates of the British Colonies. The difference in preparation between immigrants travelling to Canada and Australia could be looked at to determine what information was immigrants were provided about the climates to which they were headed, and how their preparations changed over time.

**Conclusion**

The study of the artefact assemblage and material culture of the immigrants is important, as not only a catalogue of belongings with specific functions, but as an
insight into the thoughts beliefs and behaviours of specific individuals or groups, thus being not only the archaeology of the event, due to the method of site formation, but also the archaeology of the individual which is often difficult to obtain, and as a piece of the more complete picture of immigration within this time period, as well as over larger periods of time. Steam shipwrecks are an important resource for the study of immigration among other topics. Ignoring these wrecks based on the availability of documentation or due to their recent age would lead to the loss of essential information, and possibly erroneous conclusions.
Chapter 3 Methods

Introduction

This thesis studies ocean-going steamships as archaeological sites. It will accomplish this by looking at similar sites, both those with previous archaeological work and those without, and the site conditions. This information is utilized to create recommendations for survey and excavation of these large wreck sites for studying immigration.

Within this chapter the methods that will be used throughout this document are outlined. The reasons behind the chosen methods and samples are discussed and the limitations stated.

Several wrecks will be discussed within this thesis, some of which have more information available than others. These wrecks include, Yongala, Empress of Ireland, Titanic, and City of Launceston. Details of these wrecks will be discussed in chapter five.

Materials

Materials for this thesis have been obtained from several locations. These include multiple libraries such as; Flinders University library, the South Australian State Library and multiple university libraries from which books can be accessed through inter-library loan. The internet was also utilized as it allows access to a variety of sites ranging from museums to personal interest sites that discuss relevant wrecks. The Parks Canada Library was also referred too, as well as site reports and hull plans for Empress of Ireland held by them.

The Townsville Maritime Museum was also consulted for information regarding Yongala, while Heritage Victoria was solicited for information regarding City of Launceston. Personal communication with David Bright, a frequent Empress of Ireland diver also provided information about the wreck site.
Sampling Design

The sampling method used in this thesis is both criterion and convenience sampling (Rudestam & Newton 2001). The ships mentioned in the previous section were chosen because they fit one or more of the criteria set out below. The criteria are those that will help to provide information for this thesis.

The criteria of the selected ships is that of an ocean-going steamship from the specified dates (late 19th to early 20th centuries), that carried passengers and sank with the cargo. The sinking of the vessels was then followed by successive archaeological research into the ship and its contents, as well as having available historical documentation from which information about ship design can be obtained. Since there are no such ships, those which fulfil portions of these criteria have been selected. A combination of many ships covering the individual conditions will provide enough information upon which to create suggestions for the excavation of a ship fulfilling all, or the majority, of these criteria.

<table>
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<th>Late 1800 to early 1900</th>
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<th>Archaeological work</th>
<th>Management plan</th>
<th>Historical documents available</th>
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<td>✓</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
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<td>Steamship</td>
<td>✓</td>
<td>✓</td>
<td>✓ minimal</td>
<td>-----</td>
<td>✓</td>
</tr>
<tr>
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<td>-----</td>
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<td>✓</td>
<td>-----</td>
<td>Little</td>
</tr>
<tr>
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<td>Steamboat</td>
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</table>

Research Tools

There are no numerical or statistical results involved in this thesis, the research is qualitative and the results will be based upon the documentary research. This is not a pure science and the results will not be absolute and inflexible. The outcomes of this thesis will be suggestions and guidelines for the study of large passenger steamships.
Based on the variables such as location, depth, temperature and condition of the site the resulting guidelines will have to be adapted. These are only to be considered a basis, the groundwork for what is a very complicated and complex area of study, that is relatively new and unfamiliar. As fieldwork develops these suggestions will be changed based upon actual experience, but prior to work beginning, a basic research design always needs to be created and is the intention of this thesis to help in that area.

According to Black and Jolly an effective research design contains five critical elements:
- “A research context
- Explicit research questions
- Definitions of the data you plan to collect
- A plan to present your work and results
- Accommodation to the real world” (2003, p.3)

the last part of this referring to the logistics involved and the association to the political, economic environment in which it is taking place.

For the purpose of this thesis the above mentioned wrecks have been chosen as examples. These wrecks vary in their location, condition, type and in the amount of archaeological work that has been conducted upon them. Historical, archaeological and any other documentation that can be obtained pertaining to these wrecks has been read in order to come to conclusions about the best methods for studying large recent passenger wrecks from an archaeological perspective.

The documentation is from various sources, validation of the reliability of the sources and the information provided from them will be conducted in several ways. Multiple sources have been used for each wreck, allowing the method of triangulation to be utilized. “Triangulation refers to soliciting data from multiple and different sources as a means of corroborating evidence and illuminating a theme or a theory. The different sources may include additional participants, other methodologies, or previously conducted studies” (Rudestam & Newton 2001, p.100). Other methods of validating results will be through peer review, and careful selection of sources based upon the credentials of the author.
With these methods of validating the documentary findings there is still the possibility that they may not be as accurate as desired, especially the historical documentation. This is to be expected, and as discussed in chapter two, is one of the reasons that archaeological work should be conducted upon these wrecks. Archaeology can help to validate or reject assumptions based upon historical documents.

Limitations and Delimitations

Limitations
Many of the wrecks that fall under the characteristics described above are located in deep water. The Flinders University policy states that no divers may descend below 28 feet, thus eliminating the possibility of any survey work on these sites to assess their current condition. Because of this, and also due to monetary constraints, the information presented in this thesis has been obtained through documentary sources only. The available documents are, therefore, also a limitation.

One of the major restrictions to this thesis is the availability of primary source materials. The primary data for many of the vessels mentioned in this thesis have been built in England and used in areas other than South Australia, where this document has been composed. Due to monetary limitations the author could not obtain much of the original documents and has had to rely on many secondary sources found within South Australia. A word limit has been placed upon this text which has contained the overall product.

Delimitations
Due to the brevity of this thesis only one aspect of steamship wrecks could be studied. There are many areas in which these wrecks could contribute to our knowledge of the past:
“One can examine ships’ hulls to see how they were made, how they were used, how they were maintained, how they performed, etc. One can look at fittings – machinery, piping, electricity, rigging, armament etc. Or one can analyse cargoes, crew’s possessions, or look more broadly at trade routes. Many useful questions can be asked about all these issues to gain a better understanding of the past. Shipwrecks to some extent represent a moment in time, so we can look at man's behavior in crises. But a shipwreck also represents processes from before the moment of the disaster, so we can look at aspects of the lives of seamen, of passengers, of immigration etc.” (Henderson, 1985, p.10).

This quote displays the abundance of possible research areas for such vessels. Since the present thesis is limited in length only one of these areas has been discussed in examining steamships as archaeology sites. This is the study of immigration. This area of study is closely related to aspects of human behaviour rather than technology. The study of human behaviour on both large and small scales is the main area of interest in archaeology, this area was also chosen due to the apparent lack of theory in maritime archaeology. Studying immigration can involve low, mid and high level theory, as discussed in chapter two.

**Conclusion**

Through the use of the four example ships this thesis will form a foundation from which a research design for a specific steamship could be created. It will serve as a model for the study of these large and underappreciated archaeology sites.

To begin it is important to have an understanding of the history of these vessels. The significance of this type of ship is closely related to the major role that it has played in the history of immigration and travel. This background information shall be provided in chapter four.
Chapter 4 History of Steamships

Introduction

Prior to the use of steamships in trans-oceanic immigration, passengers crossed the oceans in sailing vessels. These slow moving, cramped vessels could not provide the comfort of the later steam ships, nor even the speed of the earlier steamships, making them a far less attractive and initially more expensive option. The development of the large passenger vessels that are the focus of this thesis occurred over nearly a century. This chapter will briefly outline the history of steamship development as well as the changes in immigration that occurred with the introduction of steam power. The changes in and importance of steamships is relevant to the overall significance of the vessels. In order to study these ships is appropriately an understanding of their background is required.

The Development of Large Steamship Transportation

Early Beginnings

The use of steam for propulsion of watercraft began on the rivers. Steam had a slow beginning, while the technology developed into an efficient means of transportation, with several prototype boats being built throughout Europe and the United States (Wall 1978, p.22). It was in the early 1800s that the first steamboat was put to use as a passenger boat in the United States. The success of this venture led to rapid development in boat and engine designs (Cutler 1961, pp.132-138). By 1812 these boats were being used to carry passengers in Europe as well as North America (Wall 1978, p.22). The use of steamboats in rivers and lakes proved the efficacy of the steam engine. Shortly after this steam was added to ocean going vessels as an auxiliary method of propulsion.

Ocean Hybrids

The first steamship crossed the Atlantic in 1819. Savannah was originally built as a sailing vessel and was later equipped with ‘collapsible’ wooden side wheels. Savannahs’ journey towards Liverpool took 25 days, the ship itself spent most of this time under sail rather than steam power (Adams 1993, p.21; Barratt 1983, p.12; Cutler
This first attempt was later followed by other steam-sailing vessels, with improved technology and competition they grew more efficient and the voyage time began to decrease. “Before the advent of steam, a crossing from Bristol to New York could take anything up to five or six weeks according to weather and wind” (Adams 1993, p. 21).

Steamships were also appearing in the Pacific Ocean. These ships were also sailing vessels with auxiliary steam power. Some of the first vessels were “The Rising Star, 1821, the Enterprise, 1825 and the Curaçao, 1827 (Wall, 1978, p.26).

The first steamship built specifically for use as a passenger vessel for trans-Atlantic crossing was Great Western, built by the Great Western Steamship Company. This vessel was launched in 1837. Its first crossing was expected to be the fastest ever completed. It was also to be the first ship to cross the Ocean under steam alone, this however was not to be the case. A second company, the British and American Steam Navigation Company, was building their own passenger steamer at the same time. The building of this ship however was delayed and in 1838, in order to compete with Great Western, a smaller steamer was hired to make the crossing first. The hired ship, Sirius, left England three days prior to Great Western, but the large passenger ship still pulled into New York only a few hours after Sirius (Wall, 1978, p. 27; Cox, 1979, p.29; Haws & Hurst, 1985, p.21).

The benefits of steam-powered vessels were apparent after this event. Great Western’s average crossing time was 13.9 days (Wall, 1978, p.27). Competition for the fastest and most reliable ships picked up and new companies were formed. The size of the vessels increased rapidly and in 1840 the British and North American Steam Packets Company (commonly known as the Cunard Line) formed with the building of Britannia (Cox, 1979, p.29; Adams, 1993, p.28). In response to this the Great Western Company designed and began to build the first iron hulled ocean-going vessel, Great Britain. The use of iron in these vessels did not take over immediately as the cost of building was higher. Wood was still being used in hull construction in the mid 1800s, in fact, in 1850 the newly formed New York & Liverpool United States Mail Steamship Company, commonly known as the Collins Line, launched four ships, all greater in speed than Great Britain and all constructed of wood. These ships were named Atlantic, Pacific, Arctic and Baltic (Adams 1993, p.32).
As the size of vessels continued to increase it was necessary to use a stronger material than wood for the hull, iron became the material of choice for these large ships in the mid to late 1800s. The last wooden side-wheeler built for the Atlantic service was the Adriatic. A Cunard Line ship, Adriatic was launched in 1856 (Whitney, 1957, n.p.).

**The Age of Iron and Steel hulled Ocean Liners**

The first iron hulled steam vessels were smaller vessels not meant for the ocean. The first of these vessels was Aaron Manby, built by Charles Manby and Captain Charles Napier. The vessel was launched in 1821 for use in the Seine River (McCarthy, 1985(a), p.219). “The first iron vessel to receive a classification (Cladd A) was the London built Marseilles owned, 180 ton, iron steamer Sirius built in 1837” (McCarthy, 1985(a), p. 220). This is the same vessel mentioned above, which was the first to cross the Atlantic using steam power. It was not however, built intentionally for use on the oceans.

As already mentioned above, Great Britain was the first purposely constructed ocean going iron hulled vessel. This ship was launched in 1843 and was originally to be named Mammoth. Great Britain was also the first ocean-going vessel that was equipped with an Ericsson screw propeller, although it retained its auxiliary sails (Charlwood 1978, p.13; Cox 1978, pp.37-38).

In 1858, after many difficulties, the Great Western Company launched the largest steamship ever built. Originally named Levathian, the ship was constructed of iron and was 18915 tons. Before its launch, in 1858, the ship was re-named Great Eastern. This ship had three methods of propulsion, the side paddle wheels, propeller and sail (Cox, 1978, pp.39-43; Wall, 1978, pp.28-33). Great Eastern was not to be surpassed in size for many years.

Although ships were being built using iron by the late 1800s, they were still built as hybrids, being capable of using both steam and wind power. In 1889 the first ocean-going steamship, which relied upon the use of steam alone, was launched for the White Star line. The vessel was named Teutonic, it still had three masts protruding from its deck, but these did not hold sails, only crows nests.
With the development of a stable and strong form of steel used in bridges it was realised that this material could be very effective for use in ships hulls. It was lighter and stronger than iron, but many times more expensive. The first ships that were built with steel were naval vessels and river boats. *Ma Roberts*, a paddle steamer, used on the Zambezi River in 1858, was the first recorded steel-hulled vessel (Birkenhead build: an unrivalled historical legacy, n.d., n.p.). *Ma Roberts* was not an ocean-going vessel. The first steel vessel to cross the ocean was *Banshee*, a stockade runner that crossed to North America in 1863 (Naval Historical Center, Steamship *Banshee*, n.p., n.d.). The first steel ocean liner built was *SS Parisian*, launched in 1880 by the Allan line. This was quickly followed by *SS Servia*, of the Cunard line (Cunard Heritage, *Servia*, n.d., n.p.; Great Ships, *Parisian*, n.d., n.p.).

Steel began to replace iron as the material of choice for ship building, it was stronger and allowed for a greater cargo tonnage. Regardless of its advantages the cost of this material hindered the transition to

![Figure 4.1. The Great Eastern, (Adams, 1993, p.71)](image)

its use as the primary hull construction material. With the introduction of steel in ship construction, vessels continued to grow in size, and very rapidly, by 1903 the Cunard line had produced *Lusitania* and *Mauretania*, 31,550 and 31,938 tonnes respectively. (Cunard Heritage, n.d., n.p.).
Steamship Immigration

Steamships were multipurpose methods of transportation. They served as luxury vacation liners for wealthy and elite as well as being a means to reach a new country and, perhaps, a new life for immigrants. The difference between the class levels aboard a ship were often great. According to Staniforth (1991) the historical documents and archaeology of these vessels often focuses on aspects of the ship other than immigration:

“Traditionally maritime history’s approach to the subject of immigration has rarely considered the actual experiences of the immigrants…. If maritime historians have considered the transportation of people at all, it tends to be largely in economic, rather than social, terms” (1991, p.22).

The main means of immigration was by ship until the mid twentieth century (Staniforth, 1991, p.22). “Between 1815 and 1929, 11.4 million people left Britain for overseas destinations” (Lloyd’s register, immigration and emigration), the majority of these people travelling in steerage (Carrothers, 1965, p315). It is therefore important to study this means of travel as well as the people who utilized it. It should be noted that not only were there people leaving Britain, but there were also those returning after failure in a new country or when seasonal work ended, with no future prospects (Shepperson 1957; Zeni 1998, p.73).

Immigration in the nineteenth century increased in many locations. It reached its height in North America during the potato famine in Ireland. “Between 1847-1854 it is estimated that 1,600,000 Irish left their home land never to return” (Lloyds register, immigration and Emigration). With the discovery of gold in the 1850s, Australian immigration reached its peak. Over 670,000 people travelled to Australia within ten years (Staniforth, 1993, p.51). The competition between shipping companies to accommodate this new influx led to the building of larger, more comfortable and faster liners (Charlwood, 1978, p.6). By 1879 a ship had been constructed that was large enough to hold all the coal required travel to Australia from England, the Orient (Adams, 1993, p.61). In order to make the largest profits ships began to offer more amenities to their passengers and ocean travel became much more endurable. These improved conditions will be looked at more closely within this section.
Quality of Travel in the Age of Sail

During the age of sail intended immigrants would travel to the port within their area and register on a ship as a passenger. The departure date of the ship was not fixed, ships would leave port once they had enough passengers and cargo to make the trip profitable and when the weather was favourable. This resulted in the passengers having to purchase accommodation in the area until the ship set sail, costing them more money.

Conditions aboard sailing vessels in the early 1800s were barely tolerable. Passenger accommodations were located between the decks and consisted of small double wooden bunks in a large room with no privacy. Passengers provided the majority of their own food and had to share a small cooking space. The area was dirty and unventilated leading to the spread of disease and the death of many passengers. Ship-board sick bays were a rarity until laws required their existence. Passengers would be trapped in these living conditions for the entire voyage which took well over a month depending upon the destination and weather (Lloyds Register, immigration and Emigration, n.d., n.p.). That they would endure this is a testament to their desire and need to move to a new country.
In 1817 the first ship ‘line’ was formed, the Black Ball Line. The idea of Jeremiah Thompson, it was the first company that provided scheduled monthly departures, regardless of the quantity of cargo or passengers. The line was very successful and was able to purchase more ships and provide two departures per month. With the success of the Black Ball Line other companies followed, creating competition which led to the improvement of the vessels, with each company trying to offer the most technologically advanced and luxurious ships (Fox, 2003, pp.4-5).

Beginning in 1819, governments began introducing acts to regulate the conditions aboard passenger ships in response to the numerous deaths and illnesses. The United States government was among the first to create such an act. The United States Passenger Act of 1819 was enforced upon any U.S. or foreign vessel transporting passengers into the United States. According to this Act no more than two passengers were allowed aboard a vessel for every 50 tons of ships berth. It also regulated the amount of food and water that was to be provided for passengers (Passenger Act of 1819, n.p.)

Following this, in 1828 the United Kingdom passed the Passenger Act. This act affected all ships voyaging to or for any land in possession of the United Kingdom, as well as those voyaging towards North America. The Act stated that a ship could carry no more than three people, including crew, for every four tons of ships berth. (Passenger Act of 1828, n.p.).

These acts were improved upon over time:

“In 1846, according to American law…Each passenger was allowed a minimum space of twenty inches wide. In 1849, tea sugar and molasses were to be given twice a week, and ships were directed to provide twelve square feet for each passenger. In 1855 the new American Act stated that ships’ masters were to be fined $10 for every passenger who died during the crossing” (Prêteseille 1999, n.p.).

British passenger acts also improved, increasing the space provided for passengers, food rations and, in 1859, adding sick bays. Although these new laws were enacted, they were difficult to enforce. Ships would only be boarded and inspected occasionally due
to a lack of officers for the number of ships (Lloyds Register, Immigration and Emigration).

With the introduction of steam powered vessels, conditions on board began to improve. The voyage time decreased dramatically, improving the state of the passengers upon arrival, as they were not subject to the shipboard lifestyle for as long. The competition between steam companies encouraged the improvement of steerage conditions. Initially, only the wealthier immigrants and travellers could afford to cross the ocean aboard a steamship, but over time this to changed as the sailing vessel became a thing of the past.

**Quality of Travel in the Age of Steam**

An investigative report into the steerage class of ships voyaging towards America, conducted by the Immigration Commission in 1911 concluded that:

“The high percentage of sickness and death which attended immigration by sea during the sailing-vessel period has been practically eliminated by reducing the length of time required for the voyage, and perhaps also in part by the greater precautions in this regard taken by steamship companies” (Herkner, 1911, n.p.).

It found, however, that in many steamships steerage conditions were the absolute minimum required by law. Although steamships were preferable to the sailing vessels, they were not always the luxurious ocean liners people think of today. Even in the early twentieth century the steerage, or third class, travelling the majority of these vessels was not a pleasant experience. The report prepared by the Immigration Commission grouped steamships into three steerage categories, those with the ‘old type’ accommodation, those with the ‘new type’ and vessels which had both.

The ‘old type’ of steerage consisted of large rooms accommodating up to 300 people. Passengers were separated into three groups, males, females without a male escort and families, each of these groups were placed in separate rooms. The beds were six by two feet with an overhead height of two and a half feet. There were no places provided for on-board luggage, so passengers would have to share their bed with their bags. In general, these rooms were poorly ventilated and rarely, if ever, cleaned during the voyage. The vessels that had the ‘old steerage’ were not fitted with a dinning room.
Passengers would have to collect their food and eat it in their sleeping quarters or on the deck, weather permitting. With regards to the food, the report stated that “The preparation, the manner of serving the food, and disregard of the proportions of the several food elements required by the human body make the food unsatisfying, and therefore insufficient” (Herkner, 1911, n.p.). Lavatories were provided, as required by law, but they were not cleaned nor were they sufficient for the number of passengers (Herkner, 1911, n.p.).

The ‘new steerage’ was much more satisfactory than the old, it was not, however, found on many steamships in 1911. The new steerage was only on vessels from Northern Europe. Instead of one large room for the passengers, these vessels provided rooms that slept two to eight people, allowing families some privacy and space other than their beds for their belongings. Some of the rooms had their own washstands, helping to clear traffic from the lavatories, which were far more suitable and clean. The air was still very stale in these rooms, but the ventilation was better. Dinning rooms could be found aboard these ships, providing more space when the weather did not permit the use of the deck. The food was described as being “abundant and when properly prepared wholesome. It seldom requires reinforcement from private stores or by purchase from the canteen” (Herkner, 1911, n.p.).

Overall, this report found that:

“The replacement of sails by steam, and the consequent shortening of the ocean voyage, has practically eliminated the problem of a death rate at sea. Many of the evils of ocean travel still exist, but they are not long enough continued to produce death.” (Herkner, 1911, n.p.).

It should be noted, however, that although the steerage was generally only upgraded to the level required by law, the first class accommodations were being improved on a large scale. This included not only improvements in the berths, but also the common areas. By the time of Atlantic, in 1850, for example, steamship quality of travel had already increased by leaps and bounds from the original wooden sailing vessel. Atlantic was carpeted, it had stain glass windows and marble tables, as well as luxurious sitting rooms (Adams 1993, p.32).
Logistics of Travel Aboard Steamships

Cargo Storage Aboard Steamships

For the purpose of studying immigration aboard such vessels the passenger cargo has the potential to provide abundant information. Because of this, it is important to understand how the cargo was stored aboard the large ocean vessels. Aboard Empress of Ireland passengers were asked to place tags on their luggage. On the tags were written WANTED or UNWANTED. Using these, the stewards could then identify the baggage that was to be placed in the cargo holds for the duration of the trip and the luggage that would stay with the passengers in their rooms. The unwanted baggage would be placed in luggage holds by class (Zeni, 1998, p.62).

The manner of loading and collecting cargo varied slightly according to the company. The Cunard Company building in Liverpool served as a drop off site for passengers unwanted baggage. The baggage would be stored in the basement of the building until it was loaded into the holds of the ship (BBC Liverpool, Cunard building). The same was done at the Thingvalla Steamship Company in Norway. Passengers were given a pamphlet describing all aspects of the voyage which they were about to embark upon.
These pamphlets described the cabins, meals and procedures of arrival in New York. They also informed passengers of their luggage allowance and where and when to drop it off, the company stores 12 hours prior to departure (Voyages, Norway-Heritage). With both the Thingvalla Company and Empress of Ireland, passengers were allowed 20 cubic feet of cargo space before having to pay excess baggage fees (Zeni, 1998, p.62, Voyages, Norway-Heritage).

Figure 4.4. Promotional pamphlet for the Thingvalla Steamship Company in Norway, 1887 (Voyages, Norway-Heritage)

Once immigrants arrived at the port of destination their baggage was removed by stevedores and then would go through customs before being picked up.
The loading of passenger luggage would have been done in a manner that would ensure even distribution in the holds, for stability. It would also have been loaded so as to be easily retrievable upon arrival, with the first class baggage being removed first. On Titanic and Olympic:

“The post office and baggage accommodation [was] arranged compactly on the lower and orlop decks forward, with a view to expediting the reception and dispatch of the mails and the transportation of passengers’ baggage on the departure and arrival of the ship” (Olympic and Titanic, 1983, p.121).

The luggage was loaded through several openings in the ships hull. The main cargo hatches on the deck were used for some baggage, but mostly large heavy to carry items that required the use of the winch to be lowered to the hold. The smaller, manageable, pieces of luggage were carried by hand and wheelbarrows up gangways and loaded into the holds through side doors (Zeni 1998, p.62).
Economics of Travel

First class passage was much more expensive than that of the third class, but due to the increased number of passengers in the third class (see appendix), it was more profitable for the ship companies. The price of tickets varied greatly between classes as well as different lines and vessels within the lines. Table 2 shows some of the prices of tickets for the different classes and companies for several different years. The table includes both the British cost as well as the American cost, depending upon the direction of travel.

Table 2. Fares for passengers of various classes on different steamship companies in the years 1882 and 1895, in American and British currency.

<table>
<thead>
<tr>
<th>Year</th>
<th>Company</th>
<th>Voyage</th>
<th>Saloon</th>
<th>Second</th>
<th>Third</th>
<th>Steerage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882</td>
<td>North German Lloyd SS Co.</td>
<td>Southampton – New York</td>
<td>£23</td>
<td>£15</td>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>1882</td>
<td>Monarch Line</td>
<td>London – New York</td>
<td>£12</td>
<td>-----</td>
<td>£5</td>
<td>--------</td>
</tr>
<tr>
<td>1882</td>
<td>Allan Line Royal Mail Steamers</td>
<td>Liverpool – Montreal</td>
<td>£12 to £18</td>
<td>£8 8s</td>
<td>£6 6s</td>
<td></td>
</tr>
<tr>
<td>1882</td>
<td>Cunard Line</td>
<td>Liverpool – New York</td>
<td>£12 to £18</td>
<td>-----</td>
<td>-----</td>
<td>£6 6s</td>
</tr>
<tr>
<td>1882</td>
<td>National Line</td>
<td>Liverpool – Montreal</td>
<td>£10 to £12 &amp; 21 guineas</td>
<td>-----</td>
<td>-----</td>
<td>£5</td>
</tr>
<tr>
<td>1882</td>
<td>Anchor Line</td>
<td>Glasgow – New York</td>
<td>£10 to £14 &amp; 16 guineas</td>
<td>-----</td>
<td>-----</td>
<td>6 guineas</td>
</tr>
<tr>
<td>1882</td>
<td>American Line</td>
<td>Liverpool – Philadelphia</td>
<td>12 to 21 guineas (intermediate)</td>
<td>£8 8s</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>Cunard Line</td>
<td>New York – Liverpool</td>
<td>$75 to $175 USD</td>
<td>$35 to $50 USD</td>
<td>$15</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>White Star</td>
<td>New York – Liverpool</td>
<td>$90 to $150 USD</td>
<td>$40 to $45 USD</td>
<td>$10</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>American Line</td>
<td>New York – Southampton</td>
<td>From $85 USD</td>
<td>$35 to $60 USD</td>
<td>$10</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>Allan Line</td>
<td>Montreal – Liverpool</td>
<td>$50 to $90 USD</td>
<td>$30 USD</td>
<td>$15</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>Anchor Line</td>
<td>New York – Glasgow</td>
<td>$45 USD</td>
<td>$25 USD</td>
<td>$10</td>
<td></td>
</tr>
<tr>
<td>1895</td>
<td>North German Lloyd SS Co.</td>
<td>New York – Southampton</td>
<td>$60 to $100 USD</td>
<td>$50 to $60 USD</td>
<td>$16 to $18</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.6. Contract of Employment with the Allan Line displaying the salary of an office employee in 1913 (Musk 1981, p.27)

Figure 4.6 shows a 1913 offer of employment by the Allan Line, giving a three year contract to a Mr. Auld. The letter states that his annual salary working in the office was £12 pounds his first year, £18 his second and £24 on his third (Musk, 1981, p.27). An understanding of the cost of immigration can be achieved by comparing this income to the price of a ticket aboard a steamship. In 1903 the price of a ticket on the Canadian Pacific Line was £10 for cabin, £7 for cabin and £5.10 for steerage (also known as the ‘old steerage’ discussed above) (Musk, 1981, p.24). One ticket would have been a large percentage of a families annual income.

Conclusion

The late nineteenth century was an age of improvements in the quality of steamships. They grew rapidly in size, and began to provide many new amenities not previously
available. The increased speed of the steamships over sailing vessels helped to eliminate many of the deaths and illnesses incurred on the long and unsanitary journeys by the immigrants. Historical documentation can provide much information on steamship travel but there are still areas in which documents are lacking, it is here that archaeological research is necessary. The uses of archaeology in the study of immigration will be discussed further in the next chapter.
Chapter 5 Site issues

Introduction

Before discussing some of the major issues involved in the excavation and survey of a large passenger steamship, this chapter will outline some of the, non-methodological issues involved. Many steamship wreck sites are not only areas of archaeological, historical and public interest, but they are also often graves. With the deaths of passengers involved in the sinking of a vessel, comes the issue of ethics. Another issue involved in their excavation is that of destruction. Excavation is destruction. A site, be it on land or under the water, can only be excavated once. As techniques are constantly improving, and wreck sites are a limited, albeit currently numerous, resource, what justifies the destruction/excavation of a site? These two issues will be discussed within this chapter, as well as the management and legalities surrounding such wreck sites. Both of these two topics are exceptionally important in the conservation, protection and study of, not only steamship wrecks, but all wreck sites.

Ethics

The sinking of many steamships led to a loss of life for some of the passengers and crew. At times, the number of deaths that resulted were in the hundreds. As potential archaeology sites, this raises concern of the ethical treatment of the site as a grave. This is also a concern when a site is attractive to divers, salvers and treasure hunters. Due to the recent age of the wrecks being discussed within this thesis, there may still be relatives of passengers or crew that would be affected by any interaction with the site and this should be considered before any work is done.

Amongst the public, wrecks that occurred under more tragic circumstances often accrue more interest, for example, the wreck of Titanic. This can lead to more interaction with the site, more divers, more media, and, due to the interest, more treasure hunters. Occasionally divers are unaware of the fact that the wreck is a grave site, or they are minimally aware of the circumstances:
“the wreck of the SS Yongala now sits in 30m of water near Townsville, remarkably intact and undeniably one of Australia’s most popular wreck dives, with almost 10,000 local and international visitors annually. Visitors are briefly told of the circumstances of the wreck and the tragedy of the 120 deaths, while visible human bones are indicated in brochures and during the dive. However, there seems little apparent concern or interest, and the minimal level of information provided by dive operators is apparently limited by their own ignorance. Descendants have indicated that they see the site as significant, although there has been no move to implement a strategy for surviving remains.” (Gibbs 2005, p.57-58)

This is not, however, always the case. At times the public perceives these wreck sites as graves that should be respected and left alone, unfortunately without laws protecting the sites this is not considered:

“Despite an international plea that the wreck [Titanic] be respected as a mass grave and archaeological site, a further expedition removed artifacts from the site in 1987 and later on a private venture retrieved an additional 1,800 artifacts from the wreck.” (UNESCO, Information Kit, p.6)

The major problem concerning remains is that there are few policies on the issue. According to McCarthy, there is a general consensus in the archaeological community that work that involves the disruption of grave sites, with a significant link to the present, should not occur without the acquisition of informed consent from those concerned (McCarthy 1999, p.61).

There have been efforts on national levels to create policies regarding this matter. For example, “in 2001 the British Government established a Working Group on Human Remains to advise on policy issues regarding such remains in government funded museum, galleries and other collections in the United Kingdom” (O’Keefe, 2002, p.55). On the international level there have also been attempts to come up with a less assailable guideline for the treatment of human remains. This can be seen in the UNESCO Convention on the protection of underwater cultural heritage. Rule five of the convention states: “Activities directed at underwater cultural heritage shall avoid
the unnecessary disturbance of human remains or venerated sites” (UNESCO Convention, 2001, p.16). In addition to this section 2-9 includes that remains should be treated with respect. Aside from this, there is little explanation of what activities are acceptable or inappropriate on sites containing remains (UNESCO 2001, p.4). Does this exclude diving or archaeology? There are cases where the re-burial of remains would help to protect them. The bodies found on the wreck of Mary Rose, which was raised and is not part of a museum exhibit, “were reburied with full military honours after a dual Catholic and Protestant service” (O’Keefe, 2002, p.54). However, this particular vessel sank in 1545, a great deal earlier than the wrecks being discussed in this thesis, which may still have living survivors or living family members of the deceased. Similarly, the bodies found aboard H.M.S. Pandora are of a much later age (1791), one of which was re-buried in an obelisk on the sea floor near the wreck. The other two recovered remains were tested for DNA analysis, but may also be buried in a similar fashion (O’Keefe, 2002, p.54). A standardized set of guidelines should be produced that outlines clear and specific rules regarding archaeological work with or near human remains. Until this is accomplished it is best to avoid working in areas of a recent wreck that contains remains when possible.

Aside from the ethics involved in the matter of human remains, there are also other ethical obligations. These include the responsibilities of the archaeologist to the site, the public, colleagues, employers and the field in general. These are more clearly defined than that of human remains, for example the Australian Institute for Maritime Archaeology (AIMA) code of ethics provides a complete outline of these responsibilities (AIMA 2000, pp19-21) (see appendix for the code of ethics). Another important document that covers this is the ICOMOS Charter On the Protection and Management of Underwater Cultural Heritage 1996, this is “a standard guide to the ethics and practices of underwater archaeology throughout the world” (Grenier, 2001, n.p.).

**Archaeological Destruction**

The process of excavation is a form of destruction. Once a site has been excavated and the artefacts removed it can never be repeated. Any mistakes that are made in recording the context of an object cannot be corrected. Over time archaeological
techniques improve, the methods and theory utilized in early underwater archaeology are not the same as today. The technology is constantly improving and in the future it will be more efficient than it is today. It is for these reasons that recent archaeology has promoted less destructive techniques and reduced excavation.

The recording of context can be slightly different in shipwreck sites than on terrestrial sites. Due to the nature of the wrecking event, many of the artefacts are redistributed within the ship. In more recent and intact wrecks these items may still be in their original room, but not their original location within that room. The specific location of an artefact may not be as relevant in a shipwreck as it may be on land. The concept of intra-site recording is discussed in chapters five and seven, as a method utilized in the excavation of City of Launceston wreck. This does not mean, however, that the excavation techniques utilized in intra-site excavation could not and will not improve. On the contrary, it must be taken into consideration when excavating that later improvements will occur, and that our current technology and methods incur a loss of information.

In some cases sites are only partially excavated, removing enough material to answer specific research questions, while leaving the majority of the site untouched for future excavation. An example of this can be seen in the excavation of William Salthouse. The barrels in the cargo hold of this wreck were partially excavated from two test trenches. The whole barrels were left in situ and measures were taken after the excavation to protect what remained on the wreck (Staniforth, 1987, p.71; Harvey, 1996, p.127).

What situations justify the complete excavation of a site? According to Lenihan and Murphy:

“It appears that two conditions must exist to justify such a complete excavation. In regard to the material remains, there must be readily programmed funds for stabilization, analysis, interpretation, and display for the benefit of the public. In regard to data recovery, a report should be generated that explicitly documents a research approach which is designed to address a full range of historical and anthropological questions and which can
Lenihan and Murphy deem an excavation acceptable so long as it has a clearly defined research plan and follows all of the currently accepted procedures for excavation, allowing future archaeologists to utilize the results to answer other questions. Some archaeologists believe that the only justifiable reason for a full excavation is rescue archaeology. Rescue archaeology is a term used for archaeological work at a site that is being destroyed, or is going to be destroyed. This could be caused by development, environment, or other human interaction with the site. The majority of surveys and excavations that are conducted in underwater archaeology are not research driven, but are conducted out of necessity. There are many wreck sites that are under threat, even those that are legally protected often require surveying and removal of lose artefacts to prevent their loss to scuba divers. This results in the disregard of less threatened wrecks that may have research potential.

The ratification of the UNESCO Convention on the Protection of Underwater Cultural Heritage will provide an international guideline for archaeological work conducted on shipwrecks. Rule four of the UNESCO convention on the protection of underwater cultural heritage states:

> “Activities directed at underwater cultural heritage must use non-destructive techniques and survey methods in preference to recovery of objects. If excavation or recovery is necessary for the purpose of scientific studies or for the ultimate protection of the underwater cultural heritage, the methods and techniques used must be as non-destructive as possible and contribute to the preservation of the remains.” (UNESCO, 2001, p.16)

This rule allows for excavation not only for the purpose of rescue archaeology, but also for research. It does assert that all excavation be kept to a minimum and be as non-destructive as possible, it “reflects article 5 if the ICOMOS Charter for the Protection and Management of the Archaeological Heritage” (O’Keefe, 2002, p.161). Each site is distinctive and can provide a unique set of data and artefacts that once show sufficient rational for the decision to fully, rather than partially and selectively, excavate the site.” (Lenihan & Murphy 1998, p.237)
removed from the wreck lose their context, and some of their value as an informative tools. Careful consideration must be paid to this and to all available options prior to excavation of a wreck site.

**Site Management**

Once a site is found, it becomes vulnerable to treasure hunters, and divers looking for souvenirs. The responsibility for managing a historical wreck falls on the government of the country in which it is located, unless the wreck is in international waters, which currently have little to no protection. Not all governments have the resources and ability to deal with these wreck sites. In countries with protective legislation, managing all protected sites is still a difficult to impossible task, and the resources are often allocated to those wrecks which are deemed to be most significant and under the greatest threat. The procedure for designating significance to a wreck is not clearly defined and is greatly biased.

In the paper ‘The Submarine as a class of Archaeological Site’, McCarthy makes several possible suggestions for the management of submarines. Some of these suggestions are applicable to steamship wrecks as well. The first of the potential options is to do nothing. This is dependant upon some form of protection to prevent any interaction with the site, which would change it from its natural state. McCarthy’s second option builds on the first, to include diver access to a naturally decaying site as a form of tourism. This may require some adjustment of the site to improve safety, or to provide interpretive materials. The third option is to conduct an external survey of the wreck and to continue monitoring the site. This would also include the decision to proceed with option one or two after the survey is complete (McCarthy 1999, 65).

McCarthy’s next option is for use when a submarine is to be raised. Within the context of this thesis it is applicable if a site is threatened by development or destruction due to environment or other human interaction. This alternative is to conduct a full scale, pre-disturbance survey including “physical, biological and electrochemical study such that an informed comment can be made as to the extent of corrosion, concretion and animal growth on the wreck” (McCarthy 1999, p.65.). This would include all areas of the vessel both internal and external. The final applicable
alternative is to extend upon option four, above, by creating an in situ conservation plan including the use of sacrificial anodes (McCarthy 1999, p.65).

These options have been utilized at various wreck sites, and some of them will be discussed in more detail below. The selection of one of these management options is based on funding, other resources such as archaeologists to conduct work and rangers to monitor sites, the environment, site condition and site location.

**Non-Management as a Management Option**

It has been suggested by McCarthy that a potential management option for protected sites is to allow them to run their natural course with little interference (see above). Since the majority of wrecks that fall under the category discussed in this thesis have little protection this is not an ideal situation, there may be many intervening human factors that would alter the state of the wreck. Unfortunately, with many countries not having the appropriate funding or resources, and many of these wrecks being located in international waters this does occur, and it can have unfortunate affects. These effects can be seen in the cases of Empress of Ireland and Titanic.

Prior to the protection of Empress of Ireland, divers removed large quantities of artefacts from all over the wreck, including deep within the vessel (McMurray, 2004). These artefacts cannot be replaced and their context has been permanently lost, and since the legislative protection on the wreck is not retroactive, the removed artefacts remain unconserved in divers’ homes. The Steamship Titanic is located within international waters off the coast of Newfoundland, Canada. Due to its location within international waters there is no legal protection for this wreck and, as mentioned above, many artefacts have been removed from the site by multiple companies. The removal of these artefacts is conducted in a non-archaeological manner, and although some are conserved they are sold to the general public and disseminated throughout the world.

**Diver Satisfaction, Tourism and Education**

“The key to site management is to establish a balance between the needs of humans (public, academic, past, present and future) and the site itself” (McCarthy, 1985(b), p.21). Protection of a culturally significant site is important, but it is also important to
consider the desires of scuba divers. Divers can cause severe damage to a wreck site, but on the other hand they could also be a part of the protection and management of a site (Nutley, 1996, p.271). There are several ways in which the diving community can be involved with a wreck site in a positive way. Public education programs are an important part of shipwreck management plans. These can help not only a specific wreck but many wrecks. They provide scuba divers with information about the wreck as well as the protective legislation that may be in place. Informing people about the wrecks as an important part of their heritage may help to build an appreciation for them as having cultural value, and as belonging to they, the public (McCarthy & Garratt, 1998, p.283; Nutley, 1987, pp.324-327). “It will also, hopefully, have benefits in terms of wider public awareness of maritime heritage as a non-renewable resource” (Moran & Staniforth, 1998, p.321).

Informing the public can be accomplished through books, pamphlets, wreck trails, including signs for terrestrial and in situ interpretation (McCarthy & Garratt, 1998, pp.282-289; Jeffery, 1990, p.317-319), other forms of media like television and popular magazines such as national geographic or diving magazines. Other programs to inform the public can include university programs such as degrees or information sessions, public talks and wreck diver programs (McCarthy, 1985(b), p.21)

By allowing divers onto a wreck site, there is always potential for theft of objects from the wreck. Divers will remove even the most seemingly uninteresting parts of a wreck in order to have a souvenir. To help prevent this popular wreck sites need to be monitored. They also require monitoring to maintain diver safety, particularly on older wrecks with potential penetration diving. “Regular policing, and visits by rangers, boat inspections, the attachment of mesh fences over access hatches or holes, and even a diving permit system such as that in practice on the William Salthouse in Victoria may be part of the answer” (McCarthy, 1985(b), p.21). Diving permit systems have shown some success on other wreck sites as well. For example, Fort Louisbourg in Canada is a popular diving site that is protected by legislation. This site has many loose artefacts that may be attractive to some divers. In order to allow dive tourism, while maintaining the integrity of the site, a permit system is utilized whereby a select number of charter boats have permits to take divers to the site. In order to retain their permits they must ensure that their divers do not raise materials
from the site (Scott-Ireton, 2005, p.62; La Roche & Waddell 1999, p.12). This is further enforced by occasional boat inspections, since the permit is a requirement for their income, boat operators adhere to the legislation and monitor their divers. This same permit system has been successfully implemented on other sites such as *Lady Darling* wreck in New South Wales, Australia (Nutley, 1998, p.280).

Where close monitoring of a site is not possible “the need to remove loose and attractive surface material from the chosen sites is an obvious requirement and leaves the question of conservation housing and display of the material raised.” (McCarthy, 1985(b), p.21)

**Other Aspects of Site Management**

The process of excavation or the removal of loose artefacts from a dive wreck leads to the requirement for conservation and storage of these artefacts, with the possibility of display, depending upon the objects themselves. This can lead to difficulties with funding, and finding space for the objects. Conservation is a long and expensive process and after its completion objects must still be maintained and they should be monitored in case of further deterioration.

The site itself must also be monitored for deterioration, after measures have been taken to ensure the survival of the site. There are various ways of protecting a site, the methods chosen will depend upon initial site condition, extent of survey or excavation conducted, funding and the surrounding environment. Some examples of different methods of site protection can be seen on *William Salthouse* in Victoria, Australia and *San Juan* in Red Bay, Canada. During the excavation of *William Salthouse* it was noted that the silt was being removed from the site by the environmental conditions. The silt helps to protect the site from oxygen, divers, and certain biological life forms that damage the wreck. In order to remedy this the State of Victoria purchased artificial seagrass that was placed around the wreck, this allowed the accumulation of silt over the wreck site (Harvey, 1996, pp.126-132).

The wreck of *San Juan* was excavated completely, with all timbers removed from the wreck. Once the timbers had been thoroughly recorded they were reburied in Red Bay. This saved the cost of conservation of the timbers as well as storage. The timbers
were also buried in such a way that they could be continually monitored for oxygen levels and shipworm. Their location is also known and the layout of the timbers is recorded so that, if required, they can be removed for research (Stevens & Waddell 1987). Another common technique is that of the sacrificial anode, used to decrease the metal corrosion of a ships hull. This works by placing a metal of lower nobility (usually zinc) against the metal of the ship, the less noble metal will corrode in place of the metal in the ships hull (Nutley, 1996, p.273; Rodgers 2004, p.75).

Not only is it important to properly manage sites that have been excavated or studied in some way, but it is also necessary to manage sites of known location that have not yet been studied. These sites may still be under the influence of detrimental factors and require attention. It should be understood that although a site may not appear informative immediately, it could provide valuable information at any point in the future, depending upon the research questions posed.

A requirement to the successful management of a site includes laws to protect it. Some of these have already been mentioned above, such as those pertaining to the area of responsibility, but the specific laws governing the treatment of these wrecks sites deserves its own sub-heading as it is an important and vital requirement for the conservation and protection of these sites and their cultural value.

**Legalities**

Shipwrecks located in international waters cannot be protected by national laws used to govern wrecks within territorial waters. This leaves a large proportion of the worlds wrecks vulnerable to treasure hunters. In this section two international conventions which deal with submerged cultural heritage will be discussed. This will be followed by a brief description of some of the national legislation that is protecting wrecks in territorial waters.

The Law of the Sea Convention (LOS) is an United Nations convention passed in 1994. According to this convention all coastal nations are responsible for the resources, including cultural heritage resources within its domestic and contingency zones (domestic to 12 nautical miles, contingency from 12 to 24 nautical miles)
This convention does not state how these resources should be protected, it only delegates the responsibility. It is also vague as to what would fall under the category of a ‘cultural resource’, and therefore, what objects are protected (Zander & Varmer, 1996; Blumberg, 2005, n.p.; United Nations Convention on the Law of the Sea 1982).

The LOS has been expanded upon regarding the protection of cultural heritage in the UNESCO Convention on the Protection of Underwater Cultural Heritage, 2001. This convention covers the protection of underwater cultural heritage which has been submerged for a minimum of 100 years. The convention is a very important step in the protection of cultural heritage, it covers may aspects of the protection and management of sites that fall within its conditions. “The figure of 100 years is found in much national legislation dealing with cultural heritage and has been adopted here in order to be consistent with that legislation” (O’Keefe, 2002, p.42). This indicates that much of the existing national legislation will exclude the wrecks which occurred after 1906 (as of 2006), including many of the wrecks being discussed in this thesis, or that this thesis could be applicable towards.

One of the issues with this convention is the definition of what is protected under the legislation, although it is much more straightforward than the law of the Sea, there could still be debate over what is considered as having “a cultural, historical or archaeological character” (UNESCO Convention on the Protection of Underwater Cultural Heritage 2001, p.2). This could be interpreted differently to different stakeholders. O’Keefe suggests that a general blanket declaration would help to clear this up (O’Keefe, 2002, p.42). In this case, regardless of what the object under the water is, it would be protected after a specific age, in this case 100 years, eliminating the possibility of debate over what objects have the qualifying characteristics. Another problem with the convention is that it is not retroactive (O’Keefe, 2002, p.34). This entails that any artefacts removed from the sea prior to the ratification of this convention (which has not yet occurred) are not protected.

Some countries have protective legislation for cultural resources within their own territorial waters. These laws vary from country to country and even between the various states and territories in a country. For example, the province of Ontario,
Canada has legislation that protects underwater cultural heritage that has been submerged for 50 years. This rolling date would cover the wreck sites described within this thesis. On the federal level there is currently no legislation specifically for underwater cultural heritage, although a new act is in the works.

The protection of underwater sites would benefit from standardization of legislation and the improvement of the existing acts on the national levels. It will also greatly improve upon the ratification of the UNESCO convention. Although there are some issues of semantics in the convention it is a large step forward.

**Conclusion**

Each of the above mentioned issues needs to be taken into consideration when discussing wreck sites of any type. They are specifically important within the context of steamship wreck sites, as these wrecks are likely to be the grave sites of a few or many people, they often produce great public interest, especially those with tragic endings. Steamship wrecks are also relatively unprotected by international and even domestic laws (due to their relatively recent age), and like all archaeological sites they can only be excavated once.
Chapter 6 Previous Work

Introduction

There are several different groups with an interest in steamship wrecks, these include historians, archaeologists and treasure hunters, as well as scuba divers. The interest of each of these groups often compete with one another regarding the same vessels. Some of the work that has been conducted upon the ships, via these various forms, will be discussed. This examination will provide more details as to what historians, archaeologists and treasure hunters have contributed to our understanding of the wrecks. This information can be used in order to determine what sort of conditions and difficulties may be encountered during an archaeological investigation of a steamship wreck. The wrecks discussed here include: City of Launceston, Yongala, Empress of Ireland and Titanic.

Before discussing the specific wreck sites, some clarification is necessary as to the difference between archaeology and treasure hunting. The association and difference between archaeology and history has been discussed previously in chapter 2.

Archaeology Versus Treasure Hunting

Treasure hunting is often mistaken and misrepresented in the public media as archaeology. This is not the case these two fields, although utilizing the same resource, are vastly different. Archaeologists’ interest in shipwrecks is based upon what can be learned and added to the already existing historical knowledge, as well as the correction of existing falsehoods. Archaeology utilizes the materials found on wrecks to learn more about the individuals to whom they belonged. Treasure hunters gather and collect these items to sell them for profit.

The methods used by treasure hunters are also immensely different from those in archaeology. Archaeological excavations attempt to retrieve items in an
ordered and well recorded manner, as it can only be done once. Excavation is also as non-destructive as possible, and often not of a complete site. Treasure hunter expeditions retrieve items in the most economical fashion, which is usually destructive. Treasure hunters will use explosives, prop washes, underwater blow torches and any other devices that will quickly retrieve valuable objects. In doing this there is no regard for the context of objects whatsoever, and once removed much of their informative value is lost. Items of informative, but non monetary value are left or occasionally destroyed in the process.

Occasionally treasure hunting companies will hire archaeologists to write reports on some of the findings. These reports are not as thorough as those written from an actual excavation and do not provide as much information. Having an archaeologist in the company gives false credibility to the treasure hunters and occasionally helps to increase the value of some of their finds.

Treasure hunting also happens on a small non-company scale. Scuba divers often take souvenirs from wreck sites and some remove objects on a larger scale for display or sale purposes. This is often done regardless of protective legislation.

Shipwrecks

This section will cover the details of the shipwrecks being used as examples in this thesis. The areas that will be discussed include; the history of the vessel, any salvage attempts that may have been made, treasure hunting that occurred on the site, the overall condition of the wreck, archaeological work conducted and available documentation on the vessel.

City of Launceston

History of the Vessel

City of Launceston was an iron hulled steamboat, built in Glasgow, Scotland in 1863. The vessel was purposely built for the coastal Australian passenger and mail routes (Heritage Victoria, n.d., n.p.). The vessel’s main route was from
Melbourne, Victoria to Launceston, Tasmania. On November 19 1865 *City of Launceston* collided with *Penola* in Port Phillip Bay. The vessel sank with no loss of life (Heritage Victoria, n.d., n.p.).

**Salvage Attempts**

When *City of Launceston* sank all of the passengers possessions were on board, as well as the mail bags headed to Launceston. Divers were hired shortly after the wrecking to retrieve the mail, and in doing so, they were also able to recover some of the passenger’s boxes (Heritage Victoria, n.d., n.p.).

In 1866 an effort was made to raise the hull of the vessel using chains, but this was unsuccessful. Following this a ‘Maquay lifting device’ was employed to attempt to raise the hull, this too failed (Heritage Victoria n.d., n.p.; *City of Launceston*, Heritage Victoria).

*City of Launceston* was not a steamship but rather a steamboat, and it does not fall into the date range of vessels discussed in this thesis. Regardless of this, as a passenger vessel which has had archaeological work conducted upon it, it is a useful example. The technique of excavation, which is discussed below, may be useful when studying larger vessels and it is for this reason that it is being utilized.

**Treasure Hunting**

No major treasure hunting has been undertaken on this vessel, and, due to its restricted access (see below), very little material has been removed.

**The Wreck Site**

In 1980 the wreck site was discovered by the Maritime Archaeology Association of Victoria (Heritage Victoria, n.d., p.4; *City of Launceston*, Heritage Victoria). The wreck is in 21m of water and is almost upright. The hull of the vessel had been covered by silt from many years of dredging operations and is therefore in good condition, with the walls of the hull intact. Silt fills the interior of the hull, protecting the artefacts within from divers and the environment. There is no visible remaining wood on the deck, as it has been exposed and
deteriorated. Sections of the main deck have collapsed into the hold (Heritage Victoria n.d., n.p.; City of Launceston, Heritage Victoria).

The discovery of the wreck site led to the creation of the Victorian Historic Shipwrecks Act of 1981, in order to protect this and other shipwrecks within Victorian waters. After this, the site was declared a protected zone and diver access was restricted. In March of 2006 Heritage Victoria opened up the wreck in a trial access program. Divers wishing to see the wreck must apply to Heritage Victoria for a permit (SS City of Launceston Protected Zone Trial Public Access Program, Media Release, 2006).

Archaeology

The site has been surveyed and test excavated by Heritage Victoria. According to the excavation strategy (Coroneos & Riley, 1998), the excavation was to focus only on items and areas relating to the passenger accommodations and objects concerning life on board the vessel for a passenger. This was accomplished by excavating from the stern towards the bow, depending upon time constraints, focusing on the cabins, pantries and stores toilet cubicles, and the saloon. All artefacts relating to the construction or engineering elements of the vessel were not a priority in this excavation. The items to be raised during excavation were prioritized based on their use and context, if they fit the criteria of interest (passenger life) and if they could be conserved appropriately (Coroneos & Riley, 1998).

Prior to the excavation, the layout of the ship was predicted based upon historical texts, images of similar vessels and what could be seen of the wreck site (Coroneos & Riley, 1998, pp.7-9). All artefacts that potentially could be found and/or recovered were predicted in the plan, this included personal items of passengers and passenger luggage.

It was determined that the stern section of the wreck was at the most risk, due to exposure, and that the excavation would begin there. The hold would most likely not be excavated since it was well protected by the silt build up and not at risk of exposure. Within the hold the passenger baggage is expected to be in
good condition. Heritage Victoria suggested that excavation within the hold would be possible, although more difficult (Coroneos & Riley 1998; Heritage Victoria n.d., p.6).

The excavation plan included the use of intra-site contexts or recording, based on units, (rooms), rather than a grid system. This meant that the exact location of artefacts within a cabin or unit would not be recorded, rather the unit number in which it was found would be. This is because the area in the unit from which the artefact is recovered will not be the original context, due to the wrecking event, but since the walls of the units are expected to be intact the artefacts will be in their original unit. Based on this, and the limitation on time in underwater archaeology it was not seen as necessary to use a three dimensional grid recording system. The location of the object will be recorded in relation to the vessel, based on which cabin it was in, but not specifically what area of that cabin (Heritage Victoria n.d.; Coroneos & Riley 1998, p.19).

Literature
There are no existing plans for City of Launceston remaining today (City of Launceston, Heritage Victoria). Other primary historical documents exist in the forms of newspaper articles, giving details of ship’s movements. There are very few literary sources on this vessel, one example is a book published by Heritage Victoria in 2000 entitled ‘Silts in the Sight Glass: Protectors and Raiders of the SS City of Launceston (1865)’, authored by Shirley Strachan. This book covers all of the survey work that Heritage Victoria has conducted as well as the history of the vessel (City of Launceston, Heritage Victoria). Other sources include the 1996 Maritime Association of Victoria project report ‘City of Launceston’ (Arnott). Similar report style documents exist through Heritage Victoria. An easily accessible source of information on the wreck is the Heritage Victoria website, which abbreviates the history of the vessel, as well as some of the archaeological work which has been conducted (City of Launceston, Heritage Victoria).

*Empress of Ireland*
History of the Vessel

The steamship Empress of Ireland was built by the Fairfield Shipping and Engineering Company of Glasgow for the Canadian Pacific Railway. The vessel was launched on January 27, 1906, and was intended for the Quebec City to Liverpool mail and passenger route. Empress of Ireland spent its eight year career on this route and “carried more than 500,000 immigrants to Canada … almost one in ten Canadians could trace their lineage to an ancestor who had crossed the ocean on one of the two Empress ships” (McMurray, 2004, p.50), the sister ship being Empress of Britain (Ljungstrom, Empress of Ireland, The Great Ocean Liners, n.d.). The vessel itself was 569.8 feet long, 65.5 feet wide and could carry 1650 passengers. It was considered a moderate class of vessel for the time period. (Musk 1981, p.243; Investigating the Empress of Ireland; La Roche & Waddell, 1999, p.7; Musee de La Mer, Empress of Ireland).

In the early morning of May 30, 1914 in the St. Lawrence River, the Norwegian vessel Storstad collided with the starboard side of Empress of Ireland, causing her to sink in 14 minutes. Of the 1477 passengers and crew aboard 1012 people died (Investigating the Empress of Ireland; Ljungstrom Empress of Ireland, Great Ocean Liners). It is estimated that the vessel is still the resting place of between 547 to 634 bodies (La Roche & Waddell 1999, p.9).

Salvage Attempts

In June of 1914 lead weighted salvage divers were sent down to the wreck to recover bodies, as well as the pursers safe and 212 bars of silver that were being transported to London. The ship owners were hoping to find many of the claimed objects in the safe for which they were being sued. These salvers made it into the hull of the ship using the canvas and hard helmets of the time. They did not, however, make it into the sections of the ship in which the third class passengers were accommodated, due to the technology they were using (McMurray, 2004, pp.45-50).

During the salvage attempt a hole was blasted into the port side of the hull of the ship to allow entrance by the salvage divers, and removal of the pursers safe (Ljungstrom, Empress of Ireland, Great Ocean Liners; Zeni 1998, p.173).
Treasure Hunting

During the early years of diving on Empress of Ireland one of the main attractions was the numerous pieces of intact china that lined the inside of the vessel. Initially divers began to remove the china, as well as other items, from the wreck around the blast hole entrance to the vessel, once these were depleted they began to move further into the hull to collect items. Some of these artefacts have since been donated to local museums, while others remain in private collections and some have been moved out of Canada (McMurray 2004; La Roche & Waddell 1999, p.10).

In 1968 a group of divers attempted to remove and re-sell one of the propellers from Empress. They were successful in the removal, and attempted to transport the gigantic propeller to shore by towing it under the water. The propeller hit the bottom of the river and broke off one of the blades, making it almost worthless (Zeni 1998, p.178)

![Figure 6.1. Propeller of Empress of Ireland after removal (Zeni 1998, p.178)](image)

In the early 1990s a salvage crew took advantage of the available teak decking that remained on the Empress, and the lack of legal protection. “He [Michel
Tadros] and his rough bunch of salvage divers from Halifax were aboard Tadros’s boat, the *Gesmere*, moored over the *Empress*. They were surreptitiously stripping the wreck of its teak” (McMurray, 2004, p.116). The stripping of the deck was never completed, but portions of the teak decking are missing from the wreck on the stern of the vessel (La Roche & Waddell 1999, p.10).

In 1999 the wreck was granted protection by the provincial government of Quebec, this was done by declaring it a historic monument. Before this “whoever wanted could take objects on the wreck and could have them turned over by the receiver of wrecks within one year” << quiconque le voulait pouvait prélever des objets sur l’épave et pouvait se les voir retournés par le receveur des épaves au bout d’une année.>> (La Roche & Waddell 1999, p.11). Since this form of protection does not have an effect on the artefacts removed prior to its establishment those in private collections have remained there.

The Wreck Site

The wreck site is located 11km off of Point-au Pere Quebec, in the St. Lawrence River. It lies at an angle of 64 degrees and a depth of over 45m. The currents in this area are generally strong making the visibility low and the decent difficult (La Roche & Waddell 1999, p.1; Investigating the *Empress of Ireland*).

The hull of the ship is intact and in good condition. The hole blasted in the side of the ship by the salvage crew is now used by divers to enter the vessel. This hole leads into the first class dining room on the shelter deck and can be used to access the first and second class gallery, and the pursers office on the upper deck (McMurray, 2004, p.95; Ljungstrom, *Empress of Ireland*, Great Ocean Liners). Divers have managed to use this hole in the vessel to access other deeper sections of the wreck, such as the aft cargo holds and bulk stores, near the third class state rooms (see plans in appendix)(McMurray 2004, p.96).

Other holes have also been created in the hull structure by divers using underwater torches, these were probably created to allow access to other interior sections of the vessel. These holes have not yet been examined by archaeologists (La Roche & Waddell 1999, p.10).
Aside from the holes that have been created and the damage caused by the teak salvage, the Parks Canada preliminary inspection found that “the Empress is in a completely remarkable state of conservation” <<l’Empress est dans un état de conservation tout à fait remarquable>> (La Roche & Waddell, 1999, p.7). The later side-scan and multi-beam sonar survey by Parks Canada (2004) also determined that the hull is not fractured and that the debris scatter is minimal.

There has not yet been any corrosion tests conducted on the vessel to determine its stability, but over all it was found that the hull of the vessel is in good condition, the main deck has broken down, but the interior decks are still intact (La Roche & Waddell 1999, p.10-11).

Archaeology

In 1994 the Minister of Culture and Communications of Quebec had an evaluation of the site conducted by Alain Frank. Following this, in 1998, Parks Canada conducted a preliminary investigation of the site to determine an appropriate management plan for the Ministry.

In the summer of 2000 Parks Canada, in collaboration with the Institut Maurice Lamontagne, of the Canadian Hydrographic Service and the Institute of Nautical
Archaeology conducted a two part remote sensing survey (Harris & Waddell 2004, p.1). This project used a multi-beam and a side scan sonar to survey the wreck and surrounding area. The main goals of this survey were to determine the area of the debris field, as well as the “assessment of the extents of the collapsed deck structure” (Harris & Waddell 2004, p.1).

After the survey was conducted it was discovered that the Canadian Navy also produced multi-beam and side-scan images of Empress of Ireland in 1994. The side-scan images that were produced were of very high resolution and show many details of the wreck site.

Figure 6.3. Empress of Ireland side scan sonar image of the stern (Harris & Waddell 2004, p.14)
Literature

Aside from the initial newspaper articles on the wrecking event and the Lloyds list of the vessels movements, there are many other documents available on this ship. These include original ship plans, which are available for purchase, articles on the wreck by Parks Canada and many books. The books have many different purposes. One that has been referenced here is Dark Descent (McMurray 2004). This book, written by a scuba diver, discusses the ‘adventures’ of diving Empress of Ireland. Large sections of the book discuss the allure of this wreck to thrill seekers looking for a challenging dive, as well as an experience that can provide impressive souvenirs. Being written by a diver the book details the items taken off the wreck, where these were found, and their value, as well as the people who have dived on the vessel. It is dramaticized and the dangers are illustrated in a way meant to grip a reader from the general public or diving community. The book is still useful in that it displays what can occur when a wreck site is
neglected and not provided legal protection due to its recent age. Now that the wreck is considered historically valuable there are very few remaining artefacts to protect. It also discusses the areas of the wreck that are penetrable by divers, providing insight into the possibilities of archaeology on this vessel.

Some of the other books that are available on this vessel discuss it from a more historical perspective, while others are in a narrative form. An example of a book that looks at the history of the vessel and some of its passengers is David Zeni’s Forgotten Empress: the Empress of Ireland Story (1998). This book includes deck plans of the vessel and a number of photos. Some other examples of books include Empress of Ireland: the Story of an Edwardian Liner, by Derek Grout (2001) and Losing the Empress: a Personal Journey The Empress of Ireland’s Enduring Shadow by David Creighton (2000).

This wreck has attracted other forms of media. There have been several videos made, the first in 1965, “The film aired on the Canadian Broadcasting Corporation (CBC) intermittently through the late 1960 and early 1970s” This film was 28 minutes and entitled ‘Empress of Ireland’. Another film made that included this wreck was ‘St. Lawrence: Stairway to the Sea’, created in 1980 by Jacques Cousteau. ‘Lost Liners’ by Robert Ballard (2000) also included the Empress.

**Yongala**

History of Vessel

The steamboat Yongala was built for the Adelaide Steamship Company and was launched on April 29 1903. The vessel was built in Southampton and travelled across the ocean to reach Australia, carrying Australian-bound passengers (Gleeson, 2000, p.19; Moran, 2001(b)). The vessel was 3663 gross tons, and had accommodations for 110 first class and 126 second class passengers, as well as being equipped with electric lighting (Gleeson, 2000, pp. 21-22; Townsville Maritime Museum, SS Yongala; Moran 2001(b)).
On the last leg of the last voyage the ship left Flat Top Island on the 23 March 1911, heading for Townsville with 121 people aboard. (Gleeson, 2000, p.34). On this night a strong cyclone developed, forcing other vessels to seek shelter, Yasgala was never seen again. All passengers and crew were lost. The only body found was that of a racehorse being transported on the vessel (Townsville Maritime Museum, SS Yongala).

Salvage
In 1958 the vessel was investigated by two salvage divers in hard hat gear, this was later followed by an attempt to gain salvage rights to the vessel. One of the salvage divers was approached by the Queensland Underwater Research Group (Q.U.R.G.) who wished to explore the vessel using aqua lung equipment (Gleeson 2000, pp.96-98). In order to identify the vessel the Q.U.R.G. divers raised the pursers safe. Using the serial numbers on the interior of the safe the vessel was identified as Yasgala (Gleeson 2000, p.101).

In 1962 permission to salvage the wreck was granted by the Adelaide Steamship Company to Doug Tarca, although no attempts were made until many years later. His intention was to remove and sell the propeller. It was later discovered that the prop had already been removed in 1971 by others. Tarca later lobbied for protected status of the wreck as a marine national park (Gleeson 2000, pp.103-104; Moran 2001(b)).

Treasure Hunting
The wreck has been protected under the Historic Shipwrecks Act since 1981. Prior to this several divers removed items from the wreck, such as portholes and the ship’s bell. Many of these items are now in a museum, while many remain in private collections, after being declared to the government under amnesty of the Historic Shipwrecks Act (Moran 2001(b), pp.22-24). It is likely that further items still remain undeclared, in private collections illegally.

As well as being protected by the Historic Shipwrecks Act this vessel also falls under the under the Great Barrier Reef Marine Park Act 1975. This prevents any fishing or collecting of marine life from the area (Moran 2001(b), p.58)
The Wreck Site

The wreck site was first discovered during WWII when, in 1943, mine sweepers found an obstruction believed to be a shoal. In 1947 an echo sounding in the same area by anti-submarine ships discovered that it was, in fact, a large wreck site, this, however, was not further investigated at the time. (Gleeson 2000, p.95; Moran 2001(b))

The site is located 12 nautical miles off Cape Bowling Green, Queensland. The vessel lies approximately 30m below the waters surface, at an angle of 55 degrees (Gleeson 2000, p.40; Moran 2001(b)). The wreck site is designated by marking buoys, which serve as a mooring point for dive vessels, allowing them to remain over the site without using anchors, which could cause damage (Moran 2001(a), p.4). The hatches of this ship were constructed of timber and held in place by strapped down tarps, these may have blown off or aside during the storm creating a point of access into the interior of the wreck (Gleeson 2000, p.106). Another point of access is a two meter hole located under the starboard anchor leading into the upper forward hold.

As mentioned above, although it is possible to enter the hull of the vessel, penetration diving has been banned by the government as the vessel is no longer stable enough to be considered safe. The ship is in an advanced state of deterioration, due to its popularity as a dive site, which has hastened its declining condition (Gleeson 2000, p.109, Moran 2001(b), pp.40-43).

Archaeology

_Yongala_ is under the management of the Queensland Maritime Museum. Although there have been no excavations conducted on this vessel there have been several investigations, beginning in 1981 (Moran 2001(b), p.45). These included the use of video and still cameras. The successive, yet independent, inspections have allowed the archaeologists at the Queensland Museum to follow the deterioration of the vessel’s structure since 1981 in the management plan (Moran 2001(b)). The investigations have also led to the conclusion that hull
structure is not stable enough to allow divers access to the interior of the vessel (Moran 2001(b) pp.40-43).

Artefacts have been recovered from the wreck on two separate occasions by the Queensland Museum. This was done to prevent divers from taking objects that were exposed through natural processes. Artefacts and other materials are on display at the Townsville Maritime Museum and the Queensland Museum, as well as other small local institutions.

During the investigations it was noted that many artefacts are present in the forward hold, indicated by the presence of geometric forms under the silt (Moran 2001(b), pp.46-47). The location of these objects, and their form, could mean that they are luggage. Further archaeological investigation of the vessel could determine this.

**Literature**

The majority of available documentation on this wreck is in the form of pamphlets and guides for scuba divers. The Queensland Museum has produced a management plan that gives information on the history of the vessel, the wreck, the site conditions, the legal protection and management options that may be put into place (Moran 2001(b)). Other superseded management plans are also available, but have since been replaced by the above publication. Aside from this, other older reports are also available, such as the ‘Cursory examination of the wreck of the S.S. Yongala’ (Coleman 1981).

A descriptive book has also been published on Yongala. This book entitled *S.S. Yongala: Townsville’s Titanic* is written and published by Max Gleeson (2000), and is geared towards general audiences and scuba divers.

**R.M.S. Titanic**

**History of the Vessel**

The story of *R.M.S. Titanic* is well known to many, as it is the most famous shipwreck disaster of the twentieth century and, perhaps, of all time. *Titanic* was
built for the Oceanic Steam Navigation Company, commonly known as the White Star Line, by Messers Harland and Wolff. The ship was launched in 1911, and departed on its first and last voyage on April 10 1912. The vessel measured 852 feet in length and was 46328 tons (The Ships List, White Star Line; Ljungstrom & Othfors, n.d., The Great Ocean Liners, *Titanic*; The Stationary Office, 1999, p.12). The vessel was able to accommodate 2566 passengers and 892 crew members and was the largest ocean liner in the world at the time (Maritime Museum of the Atlantic, *Titanic Specifications*).

On April 14 1912 *Titanic* struck an ice-burg and sank within two hours and forty minutes. Of the 2201 people on board, 885 were crew and 1316 were passengers. Out of this number 711 individuals were saved (Maritime Museum of the Atlantic, The unsinkable ship and Halifax).

**Salvage**

At the time of the wreck no salvage was undertaken.

**Treasure Hunting**

*Titanic* has been in the middle of a large debate over treasure hunting and preservation for many years. Currently over 6000 artefacts have been raised by RMS Titanic incorporated. This company has exclusive salvage rights over the vessel. For many years now the company has been selling coal from the wreck, but not the artefacts that it has removed (Elia, 2000, n.p.). In January of 2006 the courts ruled that the artefacts that they have raised do not belong to them, they are merely the ‘caretakers’ of these objects and that they cannot be sold by the company (Felberbaum, 2006, n.p.).

The company is also limited by the *R.M.S. Titanic Memorial Act* passed by the United States government, which states that “no person should conduct any research or exploration activity which would physically alter, disturb, or salvage the RMS *Titanic*” (*R.M.S. Titanic Maritime Memorial Act 1986*, section 7). The courts have also prevented the company from actually cutting through the hull of the vessel, as they have desired to do, to retrieve more artefacts (Elia, 2000, n.p.).
In August of 1998 a large, 20 ton piece of Titanic's hull was raised by RMS Titanic Inc., in conjunction with the Discovery Channel. This action was protested by survivors and descendants. The piece that was raised had broken off during the sinking event, and therefore no legal action could be taken, as it fell within the company’s salvage rights (BBC News, Titanic Salvage Hits Storm of Protest).

In 2001 the US National Oceanic and Atmospheric Administration (NOAA) published an agreement, entitled Titanic Guidelines on the Research, Exploration and Salvage. This agreement was created in collaboration with Canada, France and the United Kingdom and has since been signed by the United Kingdom. These guidelines promote in situ preservation of the wreck, with minimal artefact retrieval, based on the site being a maritime memorial (Varmer 2006, pp14-16).

The Wreck Site

The wreck site was found in 1985 by Robert Ballard. It is located 523 km from the coast of Newfoundland, Canada in 3650m of water (Warshawsky, 2004, n.p.). The site is in state of rapid deterioration due, in part, to the tourists whose submarines often land on the wreck itself causing damage, and the treasure hunters who also cause damage to the wreck. The site is also accumulating new artefacts dropped from the boats floating above it (Warshawsky, 2004, n.p.).

Previously believed to have broken into two pieces, it has recently been discovered that the hull of Titanic is in three pieces on the bottom of the ocean. Two large pieces, and one smaller 100 ton section from the centre of the wreck have been found (Viegas, 2004, n.p.).

Archaeology

No official archaeology has been conducted upon this wreck, meaning that no studies have been undertaken specifically to learn more about the people on board the vessel through the remaining material culture. There have, however, been expeditions which call themselves archaeological.
If one considers the study of site deterioration a form of archaeology, as it does contribute to the basic knowledge which will aid archaeologists, then the 2004 NOAA expedition with Robert Ballard could be included under this heading. During this expedition a site assessment was conducted using ROVs, stereoscopic imagery and high definition video (RMS *Titanic* expedition). This expedition also mapped the bow and stern structures to assess the damage that has been done by treasure hunters and underwater tourists to the site since 1986, and is trying to determine what has been caused by natural and cultural factors (Warshawsky, 2004, n.p.).

**Literature**

Many sources of primary documentation in the form of newspapers and inquiry papers exist on this vessel. A book created by the London Stationary office is an accessible re-print of the original government inquiry into the sinking, this is entitled *The Loss of the Titanic 1912* (1999). Aside from these, there are numerous publications on this vessel. The majority of these are historical, primarily recounting the events of April the 14, 1912, and discussing the people on board the vessel that night.

Although many sources exist there are still inconsistencies in some of the information. Ship specifications are the most contradictory. The size of the vessel and the passenger accommodations being the most debated. For this thesis the specifications have been taken from the reproduced inquiry documents and the Maritime Museum of the Atlantic, a government website.

Aside from published documents there have also been many videos made on *Titanic*. Utilizing the latest submersible technology documentary films have been created to bring an inaccessible wreck site to public audiences.

**Conclusion**

Very little is documented about the wrecks of many of the steamships that sank while carrying immigrants. This fact makes it more problematic to determine what difficulties and conditions might be encountered when
conducting archaeology on these sites. It is for this reason that vessels which may
not have been immigrant carrying steamships are being examined and discussed
in this thesis. These vessels, whose sites have been described, can be used to
determine potential difficulties and conditions that may be encountered, as well
as to examine the techniques that have been used in their study, techniques which
may be applicable to certain steamship wrecks.

The vessels described above are mentioned in this thesis because information
on the sites is available. Some of the vessels will be utilized more, while others
may only be mentioned as examples of techniques or possible conditions.
Chapter 7 Examples and Approaches: Techniques of Steamship Excavation

Introduction

As has been illustrated in the previous chapters, the techniques utilized in studying a large steamship wreck will vary depending upon several factors including wreck condition, environment, wreck location, area of study on the wreck, funding, and the research question being proposed. The example area of study in this thesis is immigration. In terms of survey and excavation this would involve survey and, potentially, excavation within the third and perhaps second class cargo holds, as well as the accommodations. As excavations on this type of vessel have not occurred it is difficult to assess what procedures would work best, especially considering the wide range of possible site conditions that could be encountered. This chapter will discuss the possible methods that could be useful in surveying and excavating large steamships, and will examine one particular vessel and which of these methods would be best for its excavation.

Utilizing Available Documentation

Many sources of historical documentation can be found for these recent wreck sites. As discussed in previous chapters this is not a hindrance, but rather an aid to the archaeological investigation of these sites. Aside from providing background information on the vessel itself for determining its appropriateness in answering research questions, this information can also aid in the research design and planning of the survey or excavation of the wreck. For example, ships plans are most helpful in determining the most likely location of items of interest on a ship prior to the sinking of the vessel. The plans of Empress of Ireland indicate the location of the third class accommodations, as well as the third class cargo hold, where unwanted luggage would be placed for the duration of the voyage. Using these plans a strategy can be formulated as to the easiest, safest and most convenient ways to reach areas of interest. More specific information can make the recovery of artefacts even more precise. For example, passenger lists are available for many of these vessels, some of which list the berth location of the individuals aboard. This information is available for Yongala which sank...
in 1911 (Gleeson 2000, pp.110-115). The areas of specific individuals can be ascertained and, although the wreck site formation process may make it impossible to determine that exact spot in the wreck, an approximate area may be determined. It should be noted however that passenger lists are not always correct or complete. On Empress of Ireland extremely wealthy first class passengers would bring along their own servants. These individuals were not properly recorded as passengers on the ships lists. They were listed as their occupation after the name of the person or family they were travelling with (Zeni 1998, p.65)

Other sources include newspapers covering events such as the sinking, or prior to this, other events such as the launch of vessels. Of particular interest prior to a survey or excavation could be any documents written by or about salvage of the vessel or recreational diving. These sources can provide basic information about the wreck, such as location, orientation etc. On top of this they can, and have for the purpose of this thesis, provide an insight into the state of the wreck, contents of the debris field, access points for penetration of the wreck, traffic on the site by divers, and what sort of damage is being inflicted on the vessel by divers. This could then be used in conjunction with the vessel plans to create a research design and survey or excavation strategy. They may also indicate if ‘rescue archaeology’ is required on a vessel to prevent the further loss of artefacts from a dive site. Included in this source are also the photos of the site taken by divers, which can be very helpful, especially when compared to historical images of the vessel.

Interpreting and Using Site Formation Processes

For a more justifiable interpretation of a wreck and its associated artefacts it is necessary to consider all of the factors that have an effect on the site and its materials. Having a clear understanding of these factors allows archaeologists to better understand the reasons behind the present state of the wreck which they are examining and to make inferences as to the state of the ship prior to the wrecking. Site formation is a process which occurs throughout the existence of a wreck site and which produces the present state of the wreck. According to Muckelroy, the process begins with the input of the vessel and its associated materials, which is then acted upon by different factors or forces that affect the site (Hardy 1990, p.25; Muckelroy 1978, pp.158-159). Prior to the beginning of this site formation process is the wrecking event, which plays a large part
in the interpretation of the site, the site conditions and the understanding of the wreck (Hardy 1990, p.25).

Muckelroy divides the forces acting on a wreck into extracting filters and scrambling devices, based on how they affect the wreck site. These can also be divided into natural or cultural factors, based on their origin. Extracting filters are actions that remove materials from a wreck site while scrambling devices are those which rearrange materials on the wreck site (Muckelroy 1978, p.159).

![Figure 7.1. Muckelroy's flow chart of the evolution of a shipwreck (Muckelroy, 1978, p.158)](image)

This work has been expanded upon to include more of the cultural factors that affect a wreck site in the 1990 paper ‘A century on the sea-bed: the Centurion’ by Debbie Hardy.
In the article ‘A New Process-based Model for Wreck Site Formation’ (Ward et al., 1998), more biological elements were incorporated in the site formation processes.
In this section the factors that act on a wreck site will be presented and the manner in which they could affect any archaeology that may be conducted will also be discussed.

**The Wrecking Event**

The wrecking process is considered by Muckelroy to be an extracting filter, as it leads to the loss of material. The assemblage found within a shipwreck will not be complete and this needs to be considered as it may affect the interpretation. As summed up by Murphy: “the nature of wreck dispatch is important. Obviously a vessel lost as a result of fire would produce a different record from one that foundered at sea… Analysis of site environs and consultation of historical documents when available will enable more accurate site assessment and interpretation” (Murphy, 1983, p.80).

The wrecking process is also very important to the creation of an excavation or survey plan. For example, it was previously believed that during the wrecking of *Titanic* the hull of the vessel broke into two large pieces, with the pieces sinking at different times. It is now known that there are, in fact, three pieces of the hull structure on the ocean floor, due to a smaller section breaking off one of the larger ones (Viegas, 2004, n.p.). Knowing, from first hand accounts as well as recent expeditions to the wreck, that the large break in the vessel occurred and that this caused many of the artefacts to be spilled out onto the sea floor effects a potential survey plan. Retrieval of objects from the wreck could be done through the open sections, or from the debris field that was created.

**Disintegration of Perishables**

Organic materials on a ship are greatly affected by particular conditions within the underwater environment. The three major categories of the affecting factors are physical chemical and biological (Ward et al. 1998). The biological dynamics include both direct and indirect effects of organisms. For example an indirect effect would be weeds surrounding the wreck site, these could aid in the accumulation of silt which in turn will help to preserve the wreck. Direct effects include the micro-organisms that consume wood or other organic products on a wreck, or those which feed off of iron, for example; “Inside a rusticle, a mix of different bacterial communities feed on iron, extracting it from the ship's refined steel structure. This turns the steel back into a type of pig iron, weakening the ship” (Handwerk, 2004, n.p.). Biological factors depend
upon the oxygen levels in the water as well as other elements such as water salinity and temperature.

The physical dynamics include the scour of silt and sand, hydraulic conditions including wave and current sedimentary conditions, basically those elements involved in sea bed movement, which is included in Muckelroy’s flow chart. These can lead to the disintegration or damage of materials on the wreck, as well as the loss of these materials via the current. Another physical factor that can play a role on the site depending upon its depth and location is the weather. Yongala is located in an area that experiences many cyclones, depending on their severity these can effect the sea floor. The chemical factor is the reaction between the materials of the vessel and the environment for example the oxidation reaction that occurs on metal in the water (Ward et al. 1998).

**Salvage**

Salvage can include both contemporaneous and modern removal of materials. After a wreck insurance companies often attempt to retrieve valuable objects from the wreck. This process can have many effects on the site. For example, with Empress of Ireland it meant the creation of a large hole in the vessel. On City of Launceston the salvers left behind the Maquay lifting devices, which are still on the site today. In some cases the wrecks are not salvaged after loss, such as Yongala, the location of this vessel was not known until a much later date. Modern salvage, or treasure hunting also affects the site. The removal of many of the objects considered to be of monetary value can change the interpretation of a wreck site if the archaeologist is not aware that this has occurred. It can also decrease the archaeological value of a site depending upon the questions being asked and the materials that have been removed. Historical documents will need to be consulted to obtain information on the level of salvage that has occurred on a site, and which sections of the vessel are likely to have been most effected.

**Material Left on the Site**

With increased interest in a wreck site by scuba divers and charter boats comes an increase in the amount of material left behind on a site. It is especially important to be aware of this with recent wreck sites as newly deposited material may be similar to the wreck materials.
Damage by Fishing Boats or Nets

Wreck sites often attract sea life such as fish. This in turn can draw fishermen to the site to gather the fish. The use of nets over the wreck site can have a damaging effect. It can also cause the re-distribution of materials in the debris field. Anchors from fishing boats as well as dive boats can also cause damage to a site (Hardy 1990, p.29).

Interpreting Factors

All of the above components of the site formation process need to be considered prior to the development of an excavation or survey plan. The end result of the site formation process will have an effect on the archaeology that will be conducted and more importantly on the interpretation of the site. The extracting filters will remove some of the materials from the wreck, this could change the results of any statistical analysis that might be conducted, it could change the overall sample making it non-representative. This is especially significant in the case of wrecks which have suffered from treasure hunting.

When dealing with these recent wreck sites there is likely to be less deterioration of the site. This is very dependant upon the conditions in which the site is found in. “Iron wrecks are more likely to deteriorate as a result of physical and chemical processes” (Ward et al. 1998, p.4). The conditions that would be most detrimental would be highly saline waters in a very hydro-dynamically active area, with little sedimentation. The site conditions must also be considered when trying to identify artefacts as they can make it more difficult. Many artefacts will be covered by sediment or concretions which can hide them.

The site formation process may have resulted in a site that is not intact, with the majority of the artefacts strewn about the sea floor, this can create problems when grouping artefacts based on class sections on the ship. If this occurs another method of determining to whom (or which class) which objects may have belonged. This could include certain statistical methods and/or comparative analysis of the cargo objects with those found on land at places such as museums, terrestrial sites or quarantine station inventory lists. An examination of the site formation processes will also contribute to the task of determining the original context of a set of artefacts.
Certain types or classes of artefacts may also be diagnostic in this case. First class passengers (who are often tourists) will have different materials than individuals immigrating. Another useful method is looking at any existing documents that could indicate to which compartment an artefact scatter or cluster belongs. An example of this can be seen in the documentation from Empress of Ireland where a moose head was one of the objects stored with the first class ‘unwanted’ goods (the objects not required for the duration of the trip). Such an object is clearly identifiable and unlikely to be found in any large quantity elsewhere in the ship. The moose head has been found and removed by divers, indicating the location of first class storage (McMurray 2004).

It must be considered if conducting statistical analysis on objects for indicators such as value, that immigrants may also be bringing along with them their most valued objects. This may make it more difficult to distinguish first class and third class artefact scatters, although it will not be impossible.

Deep Water Archaeology

In recent years the availability and use of deep water technology has increased. With the realization that the majority of the world’s shipwrecks are in areas of the oceans that are too deep to be accessed by scuba the importance of submersible technology has been realized. In this section some of the available equipment for use in deep water environments will be discussed.

Submersibles are small submarine vessels that can accommodate one or more people allowing them to travel to great depths to see or search for a vessel. Submersibles can have exterior still or video cameras, they can also be equipped to take underwater environmental recordings. Some of these are outfitted with robotic arms that are capable of lifting objects up to 200 lbs. One of these vessels is Alvin. Alvin is capable of reaching depths of up to 14764 feet and has been used in Titanic expeditions (Alvin, Ocean Explorer, NOAA). Another example is Shinkai submersible from Japan, which can reach depths of 6500m and Nautile from France which can dive to depths of over 6000m (Walden 1997, pp.409-411).

Remotely operated vehicles (ROV) are unmanned water craft that can, often, exceed the depths reachable by scuba divers. These are controlled from the surface through an
umbilical. Often ROVs are equipped with still and or video cameras and movable arms that can be used to recover artefacts. In addition to this, some are able to take temperature, salinity, and current recordings (Handwerk 2004, n.p.). ROVs can reach depths of over 2400 feet and even in shallower water they are much safer than using scuba divers. The only downside to ROVs is that the umbilical can occasional hinder the work that is being done (ROV, Ocean Explorer, NOAA). But the umbilical can be used as a guide for the ROV to follow when retracing its steps out of an enclosed area.

The solution to the problems caused by the umbilical is the autonomous underwater vehicle (AUV). “AUVs are unmanned, untethered submersible ROVs that are capable of carrying out work autonomously” (Green 2004, p.60). A Pre-programmed activity or survey pattern can be uploaded into the AUV and it will follow this on its own and then return to the ship. Some examples of these include the Odyssey and the autonomous benthic explorer, owned by the Woods Hole Oceanographic Institute. These two are capable of making recordings and taking photographs. The major problems with AUVs are that the data is not collected until it returns to the ship, and that it is very costly. (Gould 2000, p.5; Autonomous benthic explorer, Ocean Explorer, NOAA).

Other types of equipment include survey tools such as side scan sonar or multi-beam sonar, both of which have been used on Empress of Ireland, among many other sites. Another survey tool is the sub bottom profiler. This device “transmits low-frequency impulses downward into the seabed as it is towed slightly above the bottom, and these impulses are differentially reflected back and processed” (Gould 2000, p. 46). It is used to determine what is located below the ocean floor, under the silt covering.

Some other types of submersible vessels that have been used include ARGO and JASON. ARGO is a towed vehicle with sonar and video capabilities to 20,000ft. Jason is a smaller unit that works off of ARGO while tethered to it (WHOI History web page).

The sonic high accuracy ranging and positioning system (SHARPS) is another tool that is showing promise. SHARPS can be used to accurately map points underwater using triangulation, this may make the work underwater faster allowing more to be done in less time, the technique requires divers under the water, and is therefore limited by depth. It also allows ROVs to conduct very specific search lines as the system is capable
of locating the position of one of these vehicles to within a few centimetres (Foley & Mindell 2002, p.3)

With the exception of submersibles and SHARPS the above mentioned techniques do not require people to be in the water. This allows them to be used at greater depths than those obtainable by divers. On sites where it is possible for divers to reach the wreck these tools are still beneficial because they, unlike divers, can remain on the site for long periods of time. In addition to this they are also much safer.

The largest detriment to the use of the above mentioned equipment is the cost. The cost of many of these is in the tens of thousands per day. Fortunately with improving technology, and greater availability of equipment, the cost is coming down. For example the miniROVER system, created by Deep Sea Systems International, is one tenth the cost of other ROVs. This system contains sonar devices and video cameras and can reach depths of 250m (Walden 1997, pp.409-411). Another method of lowering the costs associated with this type of equipment is to conduct joint projects with oceanography institutes and or marine biologists.

Deep water archaeology has been successfully conducted. One of the first full scale projects is the Skerki Bank Project which ran from 1989 to 2003. This project included not only survey but also excavation and artefact recovery (Foley 2005, n.p.).

Wreck sites located in deep water have the same, if not more archaeological potential than other, shallow, wreck sites. The information is still accessible, even if in a more expensive manner, and the artefacts are often better preserved and protected from scuba divers. The techniques discussed above could be used for very deep wrecks as well as those that may still be accessible by divers. The use of ROVs is not only a safer option, it could also be better for the preservation of the wreck. With divers come air bubbles, these bubbles can become trapped inside of the wreck and can cause damage to the metal structure. This does not occur with ROVs and they should be given consideration for archaeological projects where funding is available.

**Saturation Diving**

Saturation diving is a specific type of deep water technique. Saturation diving is defined as “the situation where one is at depth or pressure for a long enough period of
time (12 hours or longer) to have the partial pressures of the dissolved gases in the body at equilibrium with the partial pressure of those in the ambient atmosphere” (Vorosmarti, 1997, n.p.). This type of diving can be used to reach great depths for long periods of time. Divers would reach the wreck by way of a pressurized capsule such as a habitat, submersible or tethered deep-diving system (Office of technology Assessment 1987, p.49). They would remain on the bottom as long as necessary, in some cases living in the habitat. When the divers surface they do so in the pressurized capsule and undergo one long decompression.

Specialized training is required for saturation diving, which is generally beyond that of most maritime archaeologists. It is also a very expensive procedure and for this reason it has not had much use in archaeology, although treasure hunting companies do used it.

The majority of government institutions or universities, the most likely bodies to take on this research, are unlikely to have regulations that allow there divers to be involved in saturation diving.

**Penetration Diving**

Steamship wreck sites are often in good condition due to there age. Many areas of interest to archaeologists would be inside the intact hull of the vessel. To retrieve artefacts from third class cabins or luggage belonging to third class passengers from the hold, divers may have to enter the vessel. This is a difficult and dangerous task, but certain techniques can be used to help decrease these dangers. Many of the techniques and equipment used in penetration diving have been borrowed from cave divers. The major concerns when cave diving or penetration diving are light, silt-outs and disorientation.

The use of lifelines when entering the interior of a ship can help to prevent accidents when disorientation occurs. By tying a line to the exterior of the vessel and the reel to the BCD, the diver has a path that can be followed back out of the vessel. Often small arrows are fixed to the line in the direction of the exterior of the vessel making the possibility of disorientation even smaller. In some cases the lifeline can also be used as
a basic communication device by way of a series of tugs between divers at different ends of the line (Marfleet 1985, p.70).

Within the interior of the vessel there is little to no light available, this is even more the case when the wreck is in deeper water. This requires the use of strong and durable lights (Marfleet 1985, p.70). A backup light would also be beneficial in case, although this should not be required of the equipment is reliable, batteries are new and the diver has a buddy with their own light as well.

Training in penetration or cave diving would be valuable as this would provide the archaeologist with finning techniques that would be the least disruptive to any potential silt that may exist within the hull. A silt-out could be very dangerous in a confined space, causing disorientation and blinding. Penetration diving is often conducted on Empress of Ireland. There are certain areas of this vessel that contain silt and whose entry way can be very dangerous. In fact several divers have died while diving on this wreck.

As with saturation diving many government institutions or university regulations may not allow divers to conduct penetration diving, due to the dangers involved. One potential solution to this is the use of commercial or navy divers. These divers, trained in saturation and/or penetration diving could be trained and guided by archaeologists to conduct surveys or simple excavations on vessels that would otherwise be unreachable by most archaeologists. This has been done on the wreck of Secca de capistello in Italy, in an INA SUBAQUA joint project (Frey, 1977, n.p.). One of the major problems with this is the cost. A project involving the use of these techniques or hired divers would cost large amounts of money and could therefore only be conducted on wreck sites considered to be very significant.

Other Safety and Methodology Issues

Some other important factors that should be considered in the archaeological study of steamship wreck sites includes: time limitations under the water, visibility, communication and nitrogen narcosis. The time a diver can remain under the water is limited by their air supply as well as the depth at which they are working. Both of these have been mentioned in previous sections. As mentioned before saturation diving is one
possible way around the depth limitation. As to the problem of air supplies one alternative is to use surface supplied air. Another way of getting around the time limitations is the use of ROVs, described above. ROVs can spend a limitless amount of time on the bottom, restricted only by the availability of remote control operator on the boat.

Communication underwater is an advantage. There are several systems available that can be used by divers to communicate with the surface or with each other. The implementation of these devices can greatly benefit the archaeology being conducted. Divers would be able to ask the surface for advice, speaking with the director of the excavation or with divers that may have been working in the same area on a previous shift. This would eliminate questions that would generally have to wait until surfacing. Being able to communicate with a dive partner also allows clarification of any issues while submerged, and can also help to increase the safety of a dive operation.

Scuba divers must always be wary of the possibility of nitrogen narcosis. Nitrogen narcosis is defined as “a stuporous condition variously characterized by disorientation, euphoria, and loss of judgment and skill, attributed to nitrogen entering the blood during breathing of normal air at increased pressure, as occurs with deep-sea divers” (Nitrogen narcosis, Medical-Dictionary, n.d., n.p.). This is a very individual problem occurring at different depths for different divers. Diving with a partner can help to limit some of the dangers that can be caused by this. Since this can also occur to varying degrees it is a good idea to have the recording techniques simplified so that they are basic and repeated. The fewer objects required under the water the better. This is another area where communication with the surface would be valuable. Asking the diver questions from the surface it would be possible to tell if they are having problems with nitrogen narcosis. Communication to the surface could also be used as a recording device instead of underwater paper (mylar), clipboards and pencils. The process could be greatly simplified, reducing the possibility of errors, by having the diver read out measurements to the surface where they would be recorded.

There is no real solution to the problem of low visibility, divers must simply be aware that this site condition may exist making work more difficult. The use of strong lights may help in this area, but if visibility is a problem other techniques will have to be implemented in order to have a better overall understanding of the vessel conditions.
One such technique is the use of photomosaics. A photomosaic is a combination of overlapping photographs that when placed together in the correct arrangement creates a larger image that may not be obtainable by a single photograph. These can allow archaeologists to see an overall site image that cannot normally be seen due to poor visibility. When creating a mosaic the photos must be taken from a single height and perpendicular to deck of the vessel.

![Figure 7.4. Photomosaic from the Skerki Bank project (Foley & Mindell 2002, p.8)](image)

A similar but more precise technique, called photogrammetry, involves the use of photos taken of one area simultaneously from different positions. By placing two cameras on a frame so that they remain at a constant distance from one another and the surface of the area being photographed a three dimensional image can be produced. These images are precise enough to allow the recording of measurements to be taken off of them.

The use of isometric drawing can help solve some of the problems presented by photography such as the distortions created by shadows and the lack of detail on site plans due to the perspective from which they are drawn (directly above) “The isometric is the only way a site can be effectively shown as a whole in one diagram. It is inexpensive to produce. The results are known before leaving the site. Low visibility does not hamper results. Equipment is minimal and not subject to mechanical failure that would normally stop recording” (Riley, 1985, p.68). The creation of isometric drawings requires a diver with excellent drawing abilities, something that many do not
possess. It should also be noted that these drawings are not exact, they simply allow an overall perspective of the wreck site.

![Isometric drawing of Yongala wreck site sketched by Leon Zann in the 1974 site inspection (Moran 2001(b), p.57)](image)

**Figure 7.5. Isometric drawing of Yongala wreck site sketched by Leon Zann in the 1974 site inspection (Moran 2001(b), p.57)**

### Site Variability, a Case by Case Approach

Every wreck site will vary from the next. The conditions of the site will determine the methods that will be used. The methods that were discussed above can be used in conjunction or separately depending on what is required by the site. For example penetration diving will not be required, or may not be safe if a wreck is not in good condition. On an unsound site it would not be advisable to send divers into the hull of a ship whose walls may collapse, such as *Yongala*. On a wreck that was damaged during sinking or through site formation processes informative artefacts may be found outside of the hull structure, the only requirement would be identification of their original context. The wreck of *Titanic* for example has been explored by documentary film makers, treasure hunters and adventurers many times. Submersibles and ROVs have scanned much of the exterior and even the interior of the site. This particular wreck is in three pieces, the vessel itself having fractured during the sinking process. Between the two major portions of the hull is a debris field with many artefacts strewn about the ocean floor, including passenger luggage fragments (Viegas 2004, n.p.).

Since there is such variability among wrecks an example site will be used to determine which of the above techniques would be useful, and how they would be used on that one particular site. The site chosen for this is *Empress of Ireland*. 
Case Study: *Empress of Ireland*

*Empress of Ireland* has been briefly discussed in chapter 4, but in this section the vessel will be discussed as a potential archaeological site. The methods that have been described above will be discussed within the context of possible uses on *Empress of Ireland*.

The above techniques are very expensive, they would require the allocation of many resources. It is for this reason that only steamships determined to be of archaeological significance are likely to be studied, such as *Empress*. The sinking of *Empress of Ireland* was the greatest maritime disaster in Canadian history, this vessel also played a large role in the development of Canada, making it significant to that country. *Empress* also has connections to many other countries, not only did it transport immigrants to Canada, but also the United States of America, via Quebec. Immigrants that boarded this ship were from many different European nations, and the vessel itself was built in Scotland. Due to the condition of the site it still contains the passengers luggage and many of their personal belongings. This makes it suitable for the study of immigration. Other vessels, considered to be of greater importance, such as *Titanic*, also contain luggage and would be suitable. *Empress of Ireland*, in contrast to these vessels, is at a shallower depth, making it cheaper to work on and more easily accessible. Although it is not surrounded by the same allure as *Titanic*, *Empress* shares many commonalities and is equally archaeologically significant.

The research plan developed for *Empress* would vary according to the question that was being asked. For this section it will be assumed that the question would have to do with third class immigrants. The collection of information on *Empress of Ireland* used within this section has been outlined in chapters 3 and 6. It should be noted that it has not been acquired from first hand fieldwork.

The first step in studying *Empress of Ireland* would be to investigate the vessel in detail. The investigation should include a corrosion analysis in order to determine if the walls of the hull are stable and safe for divers to proceed further. From the available information on the wreck site it appears as though penetration diving is possible and occurs often, but that it is not very safe. Several divers have died within the vessel (McMurray 2004; D. Bright 2006, pers. Comm., 30 May).
The major entrance into the vessel is through the blast hole created by salvage divers leading into the first class dining room. There are other openings into the vessel, these include the open gangway doors and the open cargo doors in the side of the vessel. As previously mentioned there are also entrances created by divers. Figure 7.6 shows the known entrances in purple. It also shows the areas which are known to have been penetrated by divers in green and the areas of potential interest outlined in pink. The areas of potential interest include third class and steerage accommodations as well as the cargo holds.

The following areas are known to have been penetrated by divers:

- 1 class dining rooms
- 1 & 2 class galley
- 2 class dinning room
- 2 class smoking room
- barber shop
- stewards dormitory
- crews quarters
- stewards lavatory
- engineer quarters
- bulk stores
- mineral and water room pantry
- 3 class dinning room
- 3 class quarters
- main cargo hold

(McMurray 2004; D. Bright 2006, pers. Comm. 30 May; Shipwrecks the Time Capsule of Human Civilization, Blogs).

The entrances that have been used by divers and areas in which they have dove include more than what is shown in Figure 7.6, but the ones shown here are certain (see appendix for complete plans).
Figure 7.6. Empress of Ireland plans indicating known entrances in purple, areas of interest in pink and known areas of penetration in green (Zeni 1998).
The next step would be to investigate the potential entrances into the vessel. These would have to be examined as currently little is written about them, where in the vessel they lead and if they are safe. Many of the interior hallways and cargo hatch openings are partially obstructed. One solution to this could be the removal of stray wires from these halls. This would not be greatly damaging to the archaeological value of the site as these wires and cables are not in their original location in the vessels (as they were obviously not lying about the hallways), and it would increase the safety of the vessel as a dive site.

Figure 7.7. Photo of a cargo loading hatch in the midship section (North Atlantic Dive, Empress of Ireland Photo Gallery 2003)

An interior survey of the vessel could be performed by archaeologists, commercial divers (if required) or remotely operated vehicles. Surveys of Titanic have shown that it is possible to enter the vessel using small enough ROVs. This would be equipped with a video camera and a strong lighting system. It could also be used to take readings from the interior of the vessel on oxygen content, temperature and salinity. The survey would help to determine if retrieval of artefacts is feasible, where it is possible and if it can be done in a manner that does not disturb any human remains. Sections of third class accommodations contain the remains of many individuals (D. Bright 2006, pers. comm., 30 May) and this requires consideration in the development of a research design. Selecting articles of baggage from the cargo holds, which are less likely to have remains, may be the most ethical proposal.
An exterior survey of the vessel could be conducted in a less complicated manner. For this the techniques of photomosaics, or photogrammetry could be employed. ROVs could also be utilized over the exterior vessel. With one or more of these techniques an accurate site plan could be created. The survey can also contribute to a site formation analysis.

Some of the major influences on the site formation of Empress of Ireland wreck site include the wrecking event, salvage attempts, scuba divers, water conditions, silt build up and marine life. Water conditions include the salinity, temperature and depth. These influences and their effects can be studied during the survey.
If it is determined that excavation is possible, would contribute to the study and can be funded (including conservation costs), penetration diving could be employed. Archaeologists, or trained commercial divers (if need be) could enter the hull, most likely through the blast hole and proceed towards their destination, possibly the third class accommodations or the cargo holds. Using the same methods as on the *City of Launceston* excavation plan (discussed in chapter 5), baggage could be retrieved and recorded based upon which unit they were in. This would require the demarcation of individual units (rooms) in the vessel based on the site plans and the survey.

Once the prescribed artefact(s) is retrieved it can be carefully raised to the surface where it will be conserved and studied in order to answer the proposed research questions. If the raised artefacts include trunks or luggage, these could be ‘excavated’ on the surface. The contents of the luggage could be carefully recorded and removed from the trunk or suitcase under the observation of a conservator.

Following the archaeological work a management plan should be implemented. This should include regular investigations of the wreck to monitor the effects of divers as well as the safety of the vessel as a dive site. If it is found that divers are removing materials from the wreck perhaps a permit system can be implemented, similar to the one at Fort Louisbourg, Canada (discussed in chapter 6). *In situ* conservation of the wreck site can also be considered in a management plan. Further studies would be required to determine how this could be achieved.

The methods that would be best for the excavation of *Empress of Ireland* are impossible to determine for certain without an initial survey of the site. From what is known about *Empress of Ireland* many of the previously described techniques could be very useful, including penetration diving, the use of ROVs, photomosaics, photogrammetry, and intra-site context method of excavation.

**Conclusion**

Overall the techniques that will be used in the study of a steamship wreck will depend upon the individual conditions of the site, its location, available funding, and the questions being asked. For all site types the use of available historical documentation and site formation analysis are necessary for a reliable interpretation.
The study of cargo from a vessel will be very difficult especially in recent and intact wrecks. The issue of safety is paramount and many of the techniques described above have safety concerns. They can still be done, but careful consideration must be made as to how they can be conducted in the safest possible way.

The most important function of the excavation and study of archaeological sites is the interpretation of the finds. Regardless of the vessels being studied, the techniques used should conform to an appropriate research plan in order to reach the end goal of answering pre-formed research questions. They should also conform to the available codes of ethics and be conducted in a responsible, thorough manner that will contribute to the field of archaeology.
Chapter 8 Conclusion

Many of the ideas within this thesis, and certainly all of the techniques are well known to the archaeological community. The application of these to steamship wrecks has not previously been attempted. This thesis has demonstrated the value of steamship wrecks as archaeological sites. This has been achieved by describing the potential contributions these sites can provide, the role they played in the development of many new countries, the methods that can be used to study them and the issues related to their investigation.

The assessment of significance is important as the majority of resources to protect and study wreck sites would be allocated to sites considered the most significant. “All too often the assessment of significance relies primarily on the age of the site…. It is twentieth century shipwreck sites…that seem to be considered less significant and therefore are rarely protected by legislation” (Staniforth 2002, p.145). This would include many of the wrecks covered by this thesis. The use of age as a measure of significance should only be one of the criteria. Significance should be based upon other factors as well, this can include the importance of the vessel in history, its influence upon an area, country or culture, its relevance to the development of a country, its ability to provide information, its public interest (including recreation), as an example of uses of specific technology among many others (Staniforth 2002, p.146). There are many ways in which these vessels can be considered significant, and therefore require protection. These vessels, like any older wrecks, are unique and capable of providing information that may be relevant to a specific research question. They should not be considered less important because of their recent age.

The goal of archaeology is to explain human behaviour, not to simply describe structures and artefacts. Through the study of their nearly complete, and often well preserved assemblages, steamship wrecks can provide the materials to gain
understanding of human behaviours and to create generalized theories. These sites should not be neglected or disregarded in the field of archaeology. Overall these sites, in combination with other site types from the same period and the available historical documentation, have the potential to create high level theories about economic, social, political and cultural changes that may have contributed to immigration and the lifestyle of the people aboard these vessels. In addition to this steamships, as well as other types of ships are some of the only sites in which archaeology of the individual is possible.

These vessels played a significant role in the development of many post-colonial countries, including Canada, Australia and the United States. Their technological development created a safer, faster and more hygienic method of travelling to new countries for people who previously would have had to use sailing vessels.

Work conducted upon these sites, as non-renewable sources of information, must be done in a systematic, well recorded manner based on a solid research design with specific questions in mind, as it would be with any other type of site. It must not disregard potential artefacts or information that does not specifically contribute to the solution of the proposed research questions as all information may prove useful for answering other questions at a later date.

The study of these vessels would include the use of historical documentation, any archaeological reports as well as any attainable documents or images produced by divers. Following this background research a solid research design, based on the research questions being asked would be created. This design would outline the procedures to be followed. The procedures should include surveys of the wreck possibly utilizing the techniques discussed in chapter seven, and analysis of safety, where diving is involved, as well as a site formation analysis. There may be excavation involved if this is required to answer the research question and if funding, and resources allow.
All archaeological work should be followed up with the creation of a management plan that is feasible and that would help to protect, preserve and monitor the site as well as promote its cultural and historical value through education and heritage tourism. The results of the archaeological work should be disseminated so that further research can be conducted by various parties.

Steamship sites have specific qualities that can be regarded as both beneficial and detrimental. These include the condition of the hull, the richness of artefact materials, the depth of many of the sites and popularity amongst the diving community. The recent age of these sites, the method of wrecking and the conditions in which several of them are found has resulted in many of them having intact hulls. This is beneficial because it keeps the majority of the materials inside the vessel, closer to their original context. It also helps to protect some of the materials from loss due to scuba divers, currents or other extracting filters. The archaeological investigation of these sites is, however, made more difficult in some cases when the hull is intact, it requires the use of penetration diving or of ROVs to survey the interior of the hull.

The quantity of archaeological material on steamship wrecks will often be greater than that found on terrestrial sites. It will also be greater than that found on smaller wooden vessels, because of its size and the material of the hull, which does not disintegrate as quickly as wood. This is a great benefit for archaeological interpretation. On the other hand it attracts many treasure hunters to the sites because of the greater potential gain caused by the greater amount of material.

The depth of these sites makes archaeological investigations more costly, difficult and in some cases more dangerous. But this to is beneficial in the protection of the wreck site and its associated materials. Overall these sites can provide large quantities of information, but they require protection from treasure hunters, and more effort from archaeologists.
McCarthy has concluded that: “where sufficient reason, commitment and funds can be obtained to enable due consideration to be given to the ethical, legal and conservation issues, a submarine can be considered to be an archaeological site” (1998, p.69). This statement is also applicable to steamship wrecks. This thesis has only scratched the surface of the potential of these wrecks as archaeological sites, it has focused on only one area of these vessels, the third class accommodations and holds, and on one research theme, immigration. These vessels can be studied for the purpose of gaining insight onto many other areas and should be considered for future research.
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Table displaying the number of passengers crossing to non-European countries from 1876 to 1912, with the class breakdown (Carrothers 1965, p.315)
Boats and Drill

After Lord Mersey's inquiry into the cause of the Titanic disaster, certain regulations were made by the Board of Trade to ensure the greater safety of vessels and passengers. We understand that those were all conformed to by the Canadian Pacific Railway Company, and that as far as possible the recommendations of the International Conference also have been or are in process of being carried into effect. One of the most important of the new rules of the Board of Trade is that there should be boats for all. The Empress of Ireland had 16 steel lifeboats accommodating 764 persons, 20 Englehardt collapsible boats, accommodating 920, and four Berlitz boats accommodating 176—a total of 1,800. It will be seen therefore that there were boats for hundreds more than could possibly need them on this occasion. The vessel had also 2,212 adult life-jackets, 150 children's life-jackets, and 24 life-buoys.

Mr. Kersey, managing chief of the Ocean Services of the Canadian Pacific Railway and Allan Lines, yesterday made the following statement to a representative of The Times:

"I was at Liverpool at the Board of Trade inspection of the Empress of Ireland on Friday, May 15, when all the boats were very smartly swung out in less than a minute. Then they had bulkhead drill, when every single bulkhead door of the ship was closed. Then there was fire drill. The men were then drilled at sea during the voyage. There was a bulkhead door drill every day. Fire drill, boats and bulkhead door drill were gone through by the crew the day before the vessel left Quebec on her homeward voyage, and when the boats were cleared crews were put into them and rowed about in the river.

In addition to these preventions we have recently appointed Captain Stowton, R.N.R., from the Orient Line, one of the marine superintendents, with the special duties of inspecting boats and life-saving appliances for the whole service. He is required constantly to travel to and fro. He is now in Montreal, putting three ships through their drill, seeing to the lowering of boats, the putting of crews in, and trying to make every one of the crew—saloon, firemen, and stewards—into efficient boat hands."
NOTICE TO THE PUBLIC.
We are deeply distressed to have to announce that at 2.20 this morning the Empress of Ireland, homeward bound from Canada, was in collision with the steamer Storstad, off Father Point in St. Lawrence river. She sank immediately. Two steamers were at once on the scene. A large number of passengers were picked up and landed at Rimouski.

This is the extent of the information so far. Further particulars will be advised to the public as received.

Crowds assembled round the windows to read this notice, and for the rest of the day it was with difficulty that one could approach sufficiently near to read the subsequent messages, which were posted as soon as they could be typed. Many of the public flocked into the offices in the hope of learning later details. Meanwhile particulars as to the passengers and crew had been received from Canada by the company, and the following notice was issued:

We have just been informed by cable from Montreal that the Empress of Ireland apparently carried the following passengers:

First class—78.
Second class—210.
Third class—496.
Total—794.

In addition, the crew numbered 415, making a total of 1,111 souls. It is rumoured that out of these 257 have been saved.

Early in the afternoon the flag flying over the company’s offices was lowered to half-mast.
Lloyds Movement of Liners showing the movements of the Empress of Ireland on its last successful voyage towards Quebec city where it was re-loaded prior to beginning its final voyage.

(London Times, Shipping News May 23 1914, p.24)
Advertisement for Canadian Immigration (London Times May 25 1914, p.3)
AIMA Code of Ethics

Definition: A Maritime Archaeologist is a person who:
- holds an honours or other post-graduate degree in Maritime Archaeology or in another area of Archaeology with a major in Maritime Archaeology; or
- has gained recognition by Australian State, Commonwealth of New Zealand governments as a maritime archaeologist plus a minimum of two and a half years of full time professional experience applying the theories, methods and practices of Maritime Archaeology to the identification, evaluation, documentation or treatment of maritime archaeological sites in Australia (one year experience in maritime archaeology must be under supervision of a maritime archaeologist); and products and activities that demonstrate the successful application of acquired proficiencies to the practice of maritime archaeological preservation.

A. CODE OF ETHICS

1. The AIMA Member’s Responsibility to the Public

1.1 Members shall:
   a) Recognise a commitment to represent archaeology and its research results to the public in a responsible manner;
   b) Actively support conservation of the archaeological resource base;
   c) Be sensitive to, and respect the legitimate concerns of, groups whose cultural histories are the subjects of archaeological investigations;
   d) Avoid and discourage exaggerated, misleading, or unwarranted statements about archaeological matters that might induce others to engage in unethical or illegal activity;
   e) Support and comply with the terms of the ICOMOS Burs Charter;
   f) Support and comply with the terms of the UNESCO Convention on the Protection of the Underwater Cultural Heritage.

1.2 Members shall not:
   a) Engage in any illegal or unethical conduct involving archaeological matters or knowingly permit the use of her/his name in support of any illegal or unethical activity involving archaeological matters;
   b) Give a professional opinion, make a public report, or give legal testimony involving archaeological matters without being as thoroughy informed as might reasonably be expected;
   c) Engage in conduct involving dishonesty, fraud, deceit or misrepresentation about archaeological matters;
   d) Undertake any research that affects the resource base for which he/she is not qualified, nor represent themselves as archaeologists without the appropriate qualifications or professional recognition as outlined in the definition.
   e) Engage in nor support any illicit or unethical trade in archaeological material from any nation, including the commercial excavation, salvage or recovery of archaeological material for irretrievable dissemination and/or sale.

2. The Archaeologist’s Responsibility to her/his Colleagues

2.1 An archaeologist shall:
   a) Give appropriate credit for work done by others;
   b) Stay informed and knowledgeable about developments in her/his field or fields or specialisation;
   c) Encourage less qualified or experienced co-workers to develop skills and experience through participation in archaeological projects;
   d) Communicate and co-operate with colleagues having common professional interests;
   e) Give due respect to colleagues interests in, and right to, information about sites, areas, collections, or date where there is a mutual active or potentially active research concern;
   f) Know and comply with all laws applicable to her/his archaeological research, as well as with any relevant procedures promulgated by duly constituted professional organisations;
   g) Report knowledge of violations of this Code to AIMA and other appropriate authorities.

2.2 An archaeologist shall not:
   a) Falsely or maliciously attempt to injure the reputation of another archaeologist;
   b) Commit plagiarism in oral or written communication;
   c) Undertake research that affects the archaeological resource base unless reasonably prompt, appropriate analysis and reporting can be expected;
   d) Refuse a reasonable request from a qualified colleague for research data.

3. The Archaeologist’s Responsibility to Employers and Clients.

3.1 An archaeologist shall:
   a) Respect the interest of her/his employer or client, so far as is consistent with the public welfare and this Code of Ethics;
   b) Refuse to comply with any requests or demands of an employer or client which conflict with this Code of Ethics;
   c) Recommend to employers or clients the employment of other archaeologists or other expert consultants upon encountering archaeological problems beyond her/his own competence;
   d) Exercise reasonable care to prevent her/his employees, colleagues, associates and others whose services are utilised by her/him from revealing or using confidential information. Confidential information means information of a non-archaeological nature gained in the course of employment which the employer or client has requested be held in confidence, or the disclosure of which would be embarrassing or likely to be detrimental to the employer or client. Information ceases to be confidential when the employer or client so indicates or when such information becomes publicly known.

3.2 An archaeologist shall not:
   a) Reveal confidential information, unless required by law.
b) Use confidential information for the advantage of himself or a third person, unless the client consents to full disclosure.

c) Accept compensation or anything of value for recommending the employment of another archaeologist or other person, unless such compensation or thing of value is fully disclosed to the potential employer or client.

d) Recommend or participate in any research that does not comply with the requirements of the Standard of Research Performance.
B. STANDARD OR RESEARCH PERFORMANCE PREAMBLE

The research archaeologist has a responsibility to attempt to design and conduct projects that will add to our understanding of past cultures and/or that will develop better theories, methods, or techniques for interpreting the archaeological record while causing minimal attrition of the archaeological resource base. In the conduct of a research project, the following minimal standards should be followed:

1. The archaeologist has a responsibility to prepare adequately for any research project, whether or not in the field. The archaeologist must:

   1.1 Assess the adequacy of her/his qualifications for the demands of the project, and minimize inadequacies by acquiring additional expertise, by bringing in associates with the needed qualifications, or by modifying the scope of the project.

   1.2 Inform herself/himself of relevant previous research;

   1.3 Develop a scientific plan of research which specifies the objectives of the project, takes into account previous relevant research, employs a suitable methodology, and provides for economical use of the resource base (whether such base consists of an excavation site or of specimens), consistent with the objectives of the project;

   1.4 Ensure the availability of adequate staff and support facilities to carry the project to completion, and to adequate curatorial facilities for specimens and records;

   1.5 Comply with all legal requirements, including, without limitation, obtaining all necessary governmental permits and necessary permission from, landowners or other parties;

   1.6 Determine whether the project is likely to interfere with the program or projects of other scholars and if there is such a likelihood, initiate negotiations to minimize such interference.

2. In conducting research, the archaeologist must follow her/his scientific plan of research, except to the extent that unforeseen circumstances warrant its modification.

3. Procedures for field survey or excavation must meet the following minimal standards:

   3.1 If specimens are collected, a system for identifying and recording their provenances must be maintained.

   3.2 Uncollected entities such as environmental or cultural features, depositional strata, and the like, must be fully and accurately recorded by appropriate means and their location recorded.

   3.3 The methods employed in data collection must be fully and accurately described. Significant stratigraphic and/or associational relationships among artifacts, other specimens, and cultural and environmental features must also be fully and accurately recorded.

   3.4 All records should be intelligible to other archaeologists. If terms lacking commonly held references are used, they should be clearly defined.

   3.5 If possible, the interest of other researchers should be considered. For example, upper levels of a site should be scientifically excavated and recorded whenever feasible, even if the focus of the project is on underlying levels.

4. During processing, analysis, and storage of specimens and records in the laboratory, the archaeologist must take precautions to ensure the correlation between the specimens and the field records are maintained, so that provenance, contextual relationships, and the like are not confounded or obscured.

5. Specimens and research records resulting from a project must be deposited or placed under the control of an institution with permanent curatorial facilities.

6. The archaeologist has responsibility for appropriate dissemination of the results of her/his research to the appropriate communities with reasonable dispatch.

   6.1 Results viewed as significant contributions to substantive knowledge of the past or to advancements in theory, method, or technique should be disseminated to colleagues and other interested persons by appropriate means, such as a publications, reports at professional meetings, or letters to colleagues.

   6.2 Requests from qualified colleagues for information on research results ordinarily should be honoured, if consistent with the researcher’s prior rights to publications and with her/his other professional responsibilities.

   6.3 Failure to complete a full scholarly report within 10 years after completion of a project shall be construed as a waiver of an archaeologist’s right to primacy with respect to analysis and publication of the data. Upon expiration of such 10-year period, or at such earlier time as the archaeologist shall determine not to publish the results, such data should be made fully accessible for analysis and publication to other archaeologists.

   6.4 While contractual obligations in reporting must be respected, archaeologists should not enter into a contract which prohibits the archaeologist from including her or his own interpretations or conclusions in contractual reports, or from a continuing right to use the data after completion of the project.

6.5 Archaeologists have an obligation to acquiesce to reasonable requests for information from the news media.

7. Archaeologists have a responsibility to prevent the publication of precise site locations, whenever such publication might lead to vandalism of the sites.

References:
Australia I.C.O.M.O.S. The Burra Charter, I.C.O.M.O.S., 1961

Boat Deck of the Empress of Ireland (Zeni 1998, Appendix)
Upper and Lower Promenade decks on the *Empress of Ireland* (Zen 1998, appendix)
Upper and Shelter decks of Empress of Ireland (Zeni 1998, appendix)
Empress of Ireland

Empress of Ireland plans (Zeni 1998, appendix)

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