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Viking Seafaring

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October 21, 2001

M.Phil

Maritime Studies



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Acknowledgements

I would like to thank my supervisors Dr. Robert Prescott and Dr. Barbara Crawford for their patience. Many people and institutions have helped me with this project but I would particularly like to mention Babette Pütz, Madeleine Devaney, Bill Choquette Sr., Dr. Colin Martin, Glenn Darrington, the ADU, the Maritime Studies Department, and the Viking Ship Museum in Roskilde Denmark.

Abstract

This dissertation is an analysis of aspects of Viking seafaring. Topics covered include: ship development, ship types, naval organization, shiphandling, captains, and crews. Assertions are based upon literary evidence, ship finds, and other sources. The evidence for the development of Scandinavian ships is found in the archaeological record. This process began long before the Viking age¹ and is a product of need, experience, and conditions faced by shipbuilders and seafarers in Scandinavia. Archaeological and literary evidence cited in this dissertation suggests that there was a diversity of Viking ship types. Furthermore, distinctions between merchant and warships existed at the beginning of the Viking age.²

The Vikings' renown is based not only on the quality of their ships but also upon their organizational abilities and shiphandling skills. Evidence shows that Vikings were organized for naval warfare and raiding initially under the *Lið* concept which was replaced by the *Leidangr* ship levy system. During their diverse and numerous voyages Viking seafarers used a myriad of shiphandling techniques. For example, propulsion by sail and oar as well as the low draught allowed Viking ships to sail almost anywhere. Organization was just as important as shiphandling skill for a safe journey. Viking merchant ships and warships were commanded by captains who had responsibility for decision making and steering their ships. These captains had a diversity of leadership styles that resulted in varied levels of success or failure. Literary evidence points to organizational differences between merchant and warships. Organization on merchant ships was less formal than on warships. The fact that shipboard tasks were shared among crewmembers on merchant vessels and not on warships supports this idea. In summary Viking seafaring represented the best use of available manpower and ships for trading, raiding, settlement, and warfare. The risk of shipwreck was everpresent and at times the cost of Viking seafaring was high in loss of life and in the destruction of ships. Viking seafaring was often perilous but the wide extent of Viking voyages and the wealth found in Viking hoards suggest that these ventures were worth the risks.

¹ Lund 1993 693

² Andersen 1993 653

*Please note that some page numbers for articles are missing because I was unable to check these books for financial reasons at the time of printing.

Introduction

The earliest efforts to understand Viking seafaring began with ship archaeology from burial mounds in Norway and Denmark. These include the: Gokstad, Oseberg, Tune, and Ladby ships. Underwater archaeology in Roskilde, Denmark has provided the Skuldelev wrecks. These excavated vessels showed that the Gokstad, long thought to be the Viking ship, was not the only Viking ship type, thus proving diversity of Viking ships. It is worth considering that there are wide gaps in the archaeological record which do not clearly show how all of the various ship types evolved. For example, most of the early Viking ship finds like the Gokstad (9th century A.D.) are from Norway and most of the late Viking ship finds are from Denmark, consequently one has to be careful about conclusions drawn from these ship finds. A new find could radically change our understanding of Viking seafaring but until this happens conclusions must be drawn from the available evidence.

Building replica Viking ships is one way that has been used to answer questions about Viking seafaring that cannot be answered from the archaeological evidence. Lack of evidence has forced researchers to experiment with hypothetical designs for missing components of Viking ships. For example, few of the ship finds have surviving rigging so various types of rigs have been tested on replicas of varying quality. Many replicas have been built some of the best examples include Captain Andersen's 1893 Norwegian replica of the Gokstad ship and the Danish Saga Siglar replica of the Skuldelev 1, an ocean going trading ship from Roskilde. Some examples of warships include the Danish Roar Edge, a replica of a small warship, a copy of the Ladby ship, and the Raven, a 2/3 scale replica of the Gokstad ship. A replica of the Skuldelev 2, a large warship, is currently under construction at the Viking Ship Museum and will be one of the first full sized replicas of a Viking longship. Scholars such as Alan Binns caution that when seeking evidence about the performance of Viking ships the results of replica voyages must be used carefully because the ships often have modern safety devices, speculative rigging designs, navigation equipment, superior materials, exceptional sailors, and have been sailed in ideal conditions. Therefore, the speed and seaworthiness of Viking ships

may have been exaggerated and any results from replica experiments must be used cautiously.³

³ Binns 1993 in *Medieval Scandinavia: An Encyclopedia* 578-580

The following study answers practical questions of Viking seafaring. Therefore, the following main questions will be looked at:

- 1.1 How did the ships of the Vikings develop?
- 1.2 What types of ships did the Vikings use for trade and for warfare?

- 2.1 What do the organizational concepts of *Lið* and *Leiðang* mean?
- 2.2 How do these concepts apply to naval warfare and raiding?

- 3.1 How did the Vikings operate their ships?
- 3.2 What shiphandling techniques did they use?

- 4.1 What were the crew structures on Viking merchant and warships?
- 4.2 What were some of the characteristics of Viking age captains and how did they make decisions?

Methodology

Problems concerning shiphandling skills, naval organization, and the captains and crews of Viking ships will be investigated. These questions are answered by integrating the existing archaeological and historical information concerning Viking ships with knowledge of the practical methods of manning, organizing, and handling Viking ships for trade and warfare. The available scholarship that deals with Viking ship seafaring is based upon Viking ship finds from Scandinavia and Northwest Europe which has shown how Viking ships were built, how their hulls were shaped, and provides some examples of the origin of and the diversity of Viking ship types. Integrating this information with answers to questions of how the Vikings organized and handled their ships will give a more complete picture of Viking seafaring than has yet existed.

This study will use: ship finds, Viking ship replica projects, along with literary and historical materials, runic inscriptions, sagas of the Icelanders, Medieval Scandinavian laws, ship graffiti, and contemporary scholarship. The archaeological evidence provides hints about the different types of ships and their development. There are existing studies of hulls, rigging, oars, and other components of Viking ships that are brought together here for the first time. This material is presented alongside Viking methods of seafaring in order to explain not just what equipment Viking seafarers possessed but how they used it. Replicas of Viking ships have provided some answers to previously mentioned questions but they have been of varying quality.⁴ Some replica projects have confirmed assertions about Viking ships from written sources, for example the Skuldelev 5 wreck fits the description of a levy ship mentioned in *the older law of the Gulathing*. In this way the written sources and the archaeological evidence can complement and correct each other.⁵

Recent scholarship has examples of attempts to answer practical questions of Viking seafaring. This is possible in the light of knowledge gained from the construction and use of replicas based upon archaeological ship finds. Two examples illustrate points about the replicas. In the first case the Gokstad ship was excavated in the Oslo fjord area of Norway in 1885 and it was assumed at the time that this vessel represented the single

⁴ Binns 1993 578-580

⁵ Crumlin-Pedersen 1997 192-193

type of Viking vessel.⁶ In order to prove the seaworthiness of Viking vessels a replica of the Gokstad ship sailed across the Atlantic from Norway to the United States. Later our understanding of the diversity of Viking ship types changed with the Skuldelev excavations done in Roskilde from 1957-62 where underwater archaeologists discovered different types of Viking ships that had been used as a ship blockage in 1050 A.D. In 1982 a replica of one of these vessels, the deep sea trader Skuldelev 1, was constructed and began a successful voyage around the world. This showed that the Vikings used seaworthy ships for trade that were distinct from warships and could survive very long voyages on the open sea. Recent replica projects have involved mostly merchant ships probably because replica warships being large and more heavily manned require too many resources to replicate.⁷

Language can also reveal facts about Viking Seafaring methods. It has been said that Old Norse, the language of the Vikings, is more saturated with nautical vocabulary than most other languages. This fact supports the idea that maritime culture had a disproportionate influence on Viking society.⁸ A seafarer is “one who earns his living by service at sea, who ‘follows the sea’.”⁹ This dissertation therefore is an attempt to gain improved understanding of some aspects of the ships, methods, and organization of how the Vikings managed to earn their living by following the sea. This will include questions of ship development, ship types, naval organization, shiphandling, captains, and crew structures but it will not concern itself with questions of shipbuilding, river journeys, river vessels, or navigation.

As a consequence of the extreme natural conditions seafaring required high levels of skill and organization.¹⁰ King Harald Hardrada of Norway exemplifies the combination of qualities that underlie the spirit of Viking Seafaring. His shrewdness and resourcefulness in decision making and planning illustrate the qualities that made Viking age seafarers effective. Bravery and luck combined with greed for power and valuable possessions led him and other Vikings on their journeys. King Harald’s generosity

⁶ Andersen 1993 653 ‘At the beginning of the Viking age, two main types were in existence, one for use in warfare, and one for use in trade.’

⁷ Binns 1993 578-580

⁸ Marcus 1980 106

⁹ Ansted 2000 262

¹⁰ Binns 1993 429-430

towards his friends and ruthlessness towards his enemies were necessary qualities in the unstable world of the Viking age.¹¹ In a lifetime King Harald traveled in Russia, Byzantium, Sicily, Jerusalem, Denmark, England, Normandy, Shetland, Orkney, commanded the Varangian guard in Constantinople, became King of Norway, took part in Viking voyages and numerous sea battles. Despite his skills and abilities or perhaps because of them he died at the battle of Stamford Bridge in an attempt to become the ruler of England. His personal qualities provide a useful caricature of Viking seafarers. The types and purposes of Viking voyages changed throughout the Viking age, Smyth's example points out for example, "The Viking Age opened in Scotland, as it did in Ireland and England, with a violent piratical phase as a prelude to more determined and successful attempts at colonization."¹²

Viking civilization was possible because of its sailors, so by asking questions about their seafaring we can increase our understanding of the Viking age.¹³ This dissertation is an attempt to analyze the existing evidence concerning Viking seafaring to see what if any new conclusions may be drawn and to suggest where new research could be undertaken. In order to begin this task it is necessary to introduce the evidence. There are three types of evidence used, archaeological, iconographic, and literary. The archaeological evidence includes Viking ships, ship fragments, and Viking boathouse remains. Only the most important ship finds are discussed that includes the Skuldelev, Gokstad, and Oseberg vessels. Iconographic evidence consists of Gotlandic picture stones and ship graffiti. Literary evidence is the most extensive but the least reliable and it covers: *The Vinland Sagas*, *Heimskringla: Sagas of the Norwegian Kings*, *Orkneyinga Saga*, *The Seafarer*, *Beowulf*, *Egil's Saga*, *Njal's Saga*, *Eyrbyggja Saga*, *Laxdæla Saga*, *Landnámabók*, *The Voyages of Ohthere and Wulfstan*, *runic inscriptions*, and *The Earliest Norwegian Laws: Gulathing and Frostathing*. This dissertation does not include all of the available archaeological, iconographic, and literary materials. Rather selections have been made from important and reliable sources in order to make particular points or to support particular hypotheses. This dissertation is based upon the assumption of technological and organizational continuity concerning matters of seafaring before, after,

¹¹ *King Harald's Saga* Magnusson and Pálsson 1966 160

¹² Smyth 1986 146, Binns 1993 430

and during the Viking age; therefore there is no need to make rigid chronological distinctions which would limit this dissertation to material originating in the 800-1100 AD period. For those captains and crews who survived the shipwrecks and other dangers of their age became exceptional explorers, settlers, warriors, traders, and poets.

¹³ Lund 1993 693

Chapter 1 Ship Development and Ship Types

Viking Ship Development 1.0

Eric McKee has commented that “the shape of boats must depend a great deal upon the personality of the men who build and use them.”¹⁴ In some sense the Viking ships themselves were the physical embodiment of the shipbuilding, seafaring experience and dreams of both the Vikings and their ancestors. The Viking ships were not the products of one generation of seafarers, but they were the result of a long historical development that can be seen from a large but fragmentary archaeological record of ship finds. Consequently, Vikings were the beneficiaries of the trials and errors of their seafaring ancestors. This process led to the seaworthy sailing and rowing vessels that allowed the Vikings to seize the raiding, trading, and settlement opportunities of their period.¹⁵ Furthermore, as John Haywood reminds us the Vikings were one part of a long seafaring tradition who were preceded between the third and seventh centuries by the Franks, Saxons, Angles, Heruls, Frisians, Irish, Welsh who all took part in pirate activities in the North Sea. In Haywood’s words “the wave of Viking piracy which plagued the coasts of Western Europe in the ninth century was a dangerous but by no means unprecedented phenomenon.”¹⁶ However, the Vikings were exceptional in that other peoples of Europe generally did not attempt long open sea voyages that the Vikings so often made and the Vikings traveled over a larger area and discovered more new land than any of the other peoples.¹⁷

The first step of this Scandinavian seafaring development can be seen in the earliest Stone Age rock carvings that are found throughout Scandinavia which show examples of early Scandinavian ship types. Without roads or areas free of harsh weather or dense forest water was the best medium for transport in Scandinavia. One of example of this was the necessity to take to the sea in order to access of the natural resources of the shoreline and the near shore islands of Norway, Sweden, and Denmark.

One of the first pieces of evidence, which is not a rock carving, in the long line of Scandinavian ship improvement is the Hjortspring boat. It is one of the finds that is the

¹⁴ McKee 1983 44

¹⁵ Christensen 1996 81

¹⁶ Haywood 1991 1

¹⁷ Binns 1993 429-430, 578-580

starting point for developments that led to increases in range of operation and seaworthiness. The Hjortspring boat was found in a bog on the island of Als in the south of Denmark. It has been suggested that this ship may have been placed there as part of a sacrifice after a military victory which is supported by the presence of a defensive blockage on the nearby coast. Furthermore, the vessel was transported 3.5 km to a pond and sunk with stones as part of a religious celebration.¹⁸ Estimated to have been built around 350 BC, the ship has been compared with the Stone Age carvings and found to be similar. The key features of the Hjortspring boat include: fore and aft double horns, hewn and sewn planking, reduced weight through the use of the light wood, and propulsion by paddling. It is also thought that she had fore and aft steering paddles. The round bottom hull of the Hjortspring boat was well suited for paddling warriors to clan battles, transporting people, or settling new islands in relatively quiet water.¹⁹

The next stage in Scandinavian ship development is represented by the Nydam vessel found by the Danish archaeologist C. Englehart. This ship, a war victory offering, found in a Danish Bog dates to about 350 AD. The key features of this find include: iron fastened planks instead of sewn, a scarfed bottom plank, increased sturdiness, a shift to rowing confirmed by the presence of rowlocks, and the use of a rabbet groove to secure the planks to the stem and stern posts. The hull shape is less rounded than that of the Hjortspring vessel, therefore it is more seaworthy and the height of the freeboard is lowered for rowing. Instead of fore and aft paddles an unattached steering oar was found with the ship. This vessel had increased range compared with the Hjortspring boat, so that it is possible that it could have accomplished a migration journey across the North Sea despite the fact that it was a rowing vessel whose hull could not have withstood the transverse stresses of a sail..²⁰ This find gave credence to the Norwegian scholar Eilert Sundt's theory that the diversity of Norwegian vernacular craft present in his time developed from a single ancestor. He compared the lashed on rowlocks of the Nydam vessel with those of contemporary Norwegian craft and found that the shape of the

¹⁸ Rieck 1995 127

¹⁹ Christensen 1996 74-75 Ellmers 1973 13

²⁰ Christensen 1996 77

rowlocks in the Nydam vessel and the modern boats showed similarity and therefore continuity throughout time.²¹

The next important piece of evidence is The Sutton Hoo ship burial, dating to about 640 AD.²² It is thought to be the grave of an Anglo-Saxon chieftain. When considering this find it is important to remember that an imprint in the sand was all that remained for excavation; therefore, any conclusions have to be drawn cautiously. Its important features include: a hull that is suitable for downwind sailing, a beamier hull than Nydam, crossbeams fastened with treenails rather than lashing, great length 27m²³, and a bottom plank that is nearly a keel. The ship's seaworthiness, rowing efficiency, and possible downwind sailing ability suggest greater range and thus identify it as the most likely vessel used by Anglo-Saxons to migrate to Britain. The Sutton Hoo ship is clinker built so Viking clinker boat building technology was not limited to Scandinavia as the archaeological report of the Sutton Hoo ship demonstrates.²⁴

The next find comes from Norway, found in a bog in Kvalsund, this ship dating to around 700 AD²⁵ is another step towards the classic Scandinavian ship design because of its bottom L shaped plank which is nearly a keel. A true keel is necessary in the Viking sailing ships in order to turn the transverse energy of the sail into forward motion. Without a true keel the Kvalsund vessel would have had difficulty maintaining directional stability as a shipmaster attempted to sail the vessel on a zigzagging course or at any angle into the wind. The Kvalsund ship's most important feature, however, is the first example of the Viking rudder. A transverse tiller attached to the rudder, which is again secured to the aft starboard gunnel, made it possible for Viking ships to carry both mast and sail. A fixed rudder makes it possible for the control of the ship under sail which would not have been possible with the loose steering oar of the Nydam ship, one of the ancestor's of the Kvalsund ship.²⁶

Important characteristics in the progression of Viking ship development are Kvalsund's high stem and stern posts, an L-shaped keel-plank, lashed ribs to planking, a

²¹ Christensen 1996 76

²² Bruce-Mitford 1975 431

²³ Christensen 1996 78

²⁴ Bruce-Mitford 1975 435

²⁵ Christensen 1996 78

²⁶ Brøgger and Shetelig 1971 36-37

fixed aft starboard rudder, treenailed ribs to planking below the waterline, a low freeboard for ease of rowing, and sharply angled hull strakes which make the hull less rounded than Nydam or Sutton Hoo and give the first hint of the versatile double-ended rowing and sailing vessel that would be the Viking ship. So, it is conceivable that voyages to Shetland and Orkney across the North Sea from Norway, combined with occasional practice and failure with downwind sailing, as well as daring crews led to the development of the first sailing ship discovered in Scandinavia, the Oseberg ship.²⁷

The Oseberg ship²⁸ is the first of the examples mentioned that could be described as a Viking ship, double ended, clinker built, with a true keel, designed for rowing and sailing. All Viking ships involved compromises, whether they favored sail power and cargo carrying as in the case of Skuldelev 1 with a length to breadth ratio of 4:1, or as in the case of Skuldelev 2, a longship, with length to breadth ratio of 7: 1 that was suited to high speed rowing and sailing.²⁹ The Oseberg ship is a compromise between the requirements for rowing and sailing. Important features of the Oseberg ship consist of: high stem and stern posts, a true keel, a V shaped hull made possible by angled strakes near the garboard strake, and oar ports instead of gunnel rowlocks in order to allow for more efficient rowing with a higher freeboard. Additional features include: an ability to sail in directions beyond downwind due to keel and hull shape, a mast slightly forward of the center of the ship, ornate carvings on the prow and stern, a cracked mast fish, low freeboard, a *meginhuftr* which strengthens the hull and joins the two halves of the ship together, and an increased beam.³⁰

The Oseberg ship, a tomb for a queen buried in 834 AD, was a working vessel and a seaworthy ship that represented a ship type of its day; with some modifications for royalty when it was turned into a tomb for a queen. The evidence suggests that it was a both a functional coastal sailing craft and a royal yacht, since exclusively sea-going vessels had not yet developed. Arne Emil Christensen states that the Oseberg vessel was a proper sailing vessel that could journey across the North Sea in summer. It is likely that this vessel developed from the trial and error of seafarers' as Hornell explains his general

²⁷ Christensen 1996 79, Jan 1997 185

²⁸ Christensen 1996 81

²⁹ Olsen and Crumlin-Pedersen 1968 118

theory of ship development.³¹ Critics say that the Oseberg ship is unseaworthy but that overlooks typical Viking sailing practices such as waiting for good weather, patience for favorable winds, and at all costs avoiding sailing in the winter. Evidence for this seaworthiness is supported by two Gotlandic Picture Stones. Stone one shows an Oseberg-like ship with a high stem and stern posts loaded with warriors who are controlling a broad low sail with an intricate web of ropes. It likely but not certain that several of the spider-like ropes are shrouds. The stone also shows the ship sailing on top of what appear to be rather large white caps which would indicate that the ship could sail in challenging conditions and was not just intended for the calm waters of a Norwegian fjord.³² The second stone shows a ship with curved and carved fore and aft stem and stern posts combined with a broad but flat sail. On this stone a group of warriors is sailing on what appears to be a fairly rough ocean with a large splash on the prow, suggesting that this ship could handle significant up and down motion and or large waves while under sail. The web of ropes seems less complete with the helmsman controlling the sail with just one rope.³³ Further support for the seaworthiness of the Oseberg craft comes from the wreck of an Oseberg replica in the Mediterranean in 1992. According to Arne Emil Christensen “in a full gale with waves up to 12m (40 ft) high the ship handled the very severe weather amazingly well, running before the wind, until a great wave broke and filled the ship.”³⁴ However, although the ship sank, it still endured extreme conditions that Viking Age seafarers never would have gotten themselves into in the first place because of their weather forecasting skills, general sense of patience, caution, and willingness to wait for good weather.³⁵

How did the sail become part of Viking ships? Sailing ships appeared in the North around the 7th century AD based upon the evidence from the Gotlandic Picture Stones.³⁶

³⁰ Christensen 1996 83

³¹ Hornell 1946 1 The process of ship development is usually slow and prolonged what may be considered a sudden and radical mutation by the adoption of a secondary invention of revolutionary importance upon the primary conception and design. The cause of this change is often the result of exceptional inventive skill of occasional individuals or communities.

³² Ellmers 1984 28

³³ Ellmers 1973 133

³⁴ Christensen 1996 83

³⁵ Christensen 1996 83

³⁶ Christensen 1996 83

Sailing ships were used in the Mediterranean before this time.³⁷ Sails developed slowly in the north because oars satisfied seafaring needs. Oared vessels can surprise attack in a battle on sea or when raiding the land because they lack high masts and broad sails. Oared vessels do not have to wait for wind, thus they can arrive at a destination in a consistently measurable amount of time.³⁸ However, sail technology made the Viking Age possible for, as suggested by Detlev Ellmers, in the 7th century AD square sails greatly increased the radius of movement for Viking merchants and warriors as exhausting rowing was no longer necessary to cover long ocean distances.³⁹ In order to understand Viking seafaring one must understand why rowing vessels persisted so long in the north, to know what triggered the adoption of sails, and what were the consequences of this development. Westerdahl suggests that the sail developed largely independently in the north and its development can be traced to societal changes, particularly the sail was useful to aspiring kings during the state formation process in the homelands of Scandinavia.⁴⁰ Sails emerged at the same time as raiding of Western Europe began at the beginning of the 9th century, which Westerdahl suggests that the raiding was a by product of the state formation process in Scandinavia. Minor chieftains needed wealth to maintain their followers and they fled from the growing authority of centralizing kings. Fleets and sailing power were prerequisites for kingship so that the state formation process provided stimulation for the development of sailed vessels in the north. Westerdahl believes that the development of the sail in the north, the growth of sailing Viking fleets, state formation, and Viking activity stimulated each other and to a degree made each of these developments possible.

Seafarers have a reputation for conservatism, one example of this is the late adoption of sail in Scandinavia. There were good reasons for this conservatism including the fact the cold temperatures of the North Sea made disaster in the water that much more perilous. Hubert Lamb's article in *The North Sea* points out that winds in the North Sea are often prevailing westerlies but there are frequent periods, whose variations are changeable over time, when Northwesterly winds dominate. These winds can make

³⁷ Andersen 1993 654

³⁸ Westerdahl 1995 41-45

³⁹ Ellmers 1973 13

⁴⁰ Westerdahl 1995 41

wilder seas and larger swells from the long fetch over open water on the shallow North Sea. Rising water levels caused disastrous floods in low lying coastal areas of the North Sea. Lamb's article illustrates the changeability and unpredictability of the North Sea. It is possible that these conditions were not favorable for the adoption of sail.⁴¹

Section 1.1 Ship types of the Vikings

Scandinavian ships can be characterized by uniformity in the period just before the Viking age and a progressive development of a diversity of ship types. The Gokstad ship from the 9th century reflects in part the beginning of this process, and the Skuldelev ships of the late 10th and early 11th century illustrate the later differentiation of ship types in the Viking age.⁴² The Viking Period is defined as the period from roughly 800-1050 AD in this dissertation.⁴³ That being said it is possible based upon a number of excavated Scandinavian shipwrecks, ship graffiti, and historical literature, (nearly all written after the Viking age) to make some educated guesses about what ships were used and which Old Norse terms match the ships from the archaeological record.

When the Norwegian ship burial vessels of Tune(1867), Oseberg (1880), and Gokstad (1904)⁴⁴ were discovered it became the general opinion that the Gokstad ship, because of its seaworthiness and Andersen's 1893 successful Gokstad replica voyage across the Atlantic that Gokstad was the "Viking Ship". After a period of additional ships discoveries this opinion remained relatively unchallenged until the discovery in the late 1950s of the Roskilde Fjord wrecks excavated by Olaf Olsen and Ole Crumlin Pedersen. The diversity of ship types found in these wrecks called into question the prevailing view that the Gokstad ship was the "Viking Ship."⁴⁵ Of course, Ole Crumlin-Pedersen's research and the establishment of the Roskilde Viking Ship museum all contributed to the increasingly influential view that the Viking ships were not like Gokstad, but rather more specialized each with a hull built to serve its purpose: fishing boat/ferry: Skuldelev 6, longship for large scale warfare: Skuldelev 2, the small warship, Skuldelev 5, the seagoing trading vessel: Skuldelev 1, and small trading vessel: Skuldelev 3.⁴⁶

⁴¹ Lamb 1985 28

⁴² Westerdahl 1995 42

⁴³ Roesdahl 1994 113

⁴⁴ Christensen 1996 72

⁴⁵ Binns 1981 287-294

⁴⁶ Olsen and Crumlin-Pedersen 1968

The issue of whether the early Viking merchants had ships exclusively designed for trade is a crucial one and if answered convincingly could tip the balance in favor of a single or diverse early Viking ship types. It is possible that most of the ships of the earliest Viking raiders resembled the Oseberg ship; which is the oldest Scandinavian sailing vessel.⁴⁷ This idea is supported by the appearance of the hulls, sails, and rigging found on the Gotlandic picture stones of the 8th century. The earliest known examples of trading vessels are the Klåstad (980s A.D.) from South Norway and the Äskekarr (960 A.D.)⁴⁸. The Oseberg ship probably operated as a royal barge to transport a Queen and her immediate retainers between various points along the coast of her realm.

Viking ships are classified as merchant vessels or warships.⁴⁹ They share a clinker construction; however their distinct functions mean that their shapes are quite different.⁵⁰ Merchant ships are characterized by round stem and stern posts and a broad hull that has an open cargo hold, which is located between fore and aft, raised platforms. A single square sail supported by a fixed mast provided propulsion. Three to four or more pairs of oars gave added maneuverability in harbors or narrow channels but were incapable of driving the ship. These vessels could carry a small crew of between four to eight men because of their reliance on sail power, which made them less seaworthy than longships when, swamped. This is because the large crew of a longship could bail water quickly and water could drain out from the many oar holes on a longship. Longships are appropriately named because their hulls are narrower than merchant ships, which provides less resistance to the water and thus greater speed because they have a greater length to breadth ratio than merchant ships. Defining qualities of longships include a minimum of 13 pairs of oars and a single mast that could be raised and lowered to suit conditions for rowing or sailing. Along or just under the gunnel a shield rack displayed the crews shields and act as a barrier against enemy projectiles during a battle. Benches for pairs of oarsmen replaced raised platforms and hold benches over the crossbeams. Both warships and merchant ships had very low draughts which means that they could sail into very shallow areas near beaches or far up rivers. In practice this meant that they

⁴⁷ Christensen 1996 79

⁴⁸ Westerdahl 1995 42, Andersen 1993 653, Binns 578-80

⁴⁹ Andersen 1993 623

⁵⁰ Olsen and Crumlin-Pedersen 1978 101

had access to most of Europe. The evidence for this flexibility is a longship, from the Skuldelev ship blockage that has wear on the planks near the keel which must have come from being dragged on and off beaches.⁵¹ Merchant vessels required a deeper anchorage adjacent to a beach because dragging them onto a beach with a full cargo was impractical, especially considering the likelihood that the ship had a small crew.⁵²

There are two broad categories of ship types used by many scholars. These are: *kaupskips* (merchant ships)⁵³, and *langskips* (warships)⁵⁴. The archaeological record of Viking ship finds is incomplete and difficult to match with the Old Norse terms that describe various types of vessels. It is not entirely clear whether the Old Norse terms always refer to a specific type of ship or the sort of task that the ship was used for in a particular situation. This ship terminology is taken from the sagas that were written after the Viking period; therefore this material must be used with caution. This literary evidence contains information about ships: size, prow ornaments, and shiphandling methods and sails.⁵⁵

Crumlin-Pedersen has completed the most thorough and careful comparison of the Old Norse terminology with his and Ellmers catalogue of Viking shipwrecks. A group of 24 ships was divided into functional aspects, geographical aspects, or a combination of these two. He established three geographical categories: NW Scandinavian, South Scandinavian (Danish, South Swedish), and Baltic. One problem with this catalogue of wrecks is that most of them are from after the Viking Period (800-1050) which would mean that some of these terms might not apply to Viking ships. Old Norse terms are the following for each category: *langskip*: *karfar*, *skütur*, *snekkjur*, *askr*, *skeitur*, and *kaupship*: *byrðingr* (Skuldelev 3), *knärr* (Skuldelev 1), and *buza* (Kalmar wreck).⁵⁶ As Crumlin-Pedersen explains it has not been possible for him to match all of these terms with the archaeological record. In his chart Crumlin-Pedersen matched the types against a scale with an increasing number of oarsmen. Most of Crumlin-Pedersen's analysis was

⁵¹ Olsen and Crumlin-Pedersen 1978 112

⁵² Binns 1993 429-430, 578-580, Andersen 1993 653-654

⁵³ Olsen and Crumlin-Pedersen 1968 118 Trading ship's had a length and breadth ratio of about 4:1.

⁵⁴ Olsen and Crumlin-Pedersen 1968 118 Warships had a length to breadth ratio of about 7:1. For example, the Skuldelev 2 warship wreck has a length to breadth ratio of 6:1.

⁵⁵ Brogger and Shetelig 71 165

⁵⁶ Crumlin-Pedersen 1981 279

based upon the work of Hjälmar Falk, some of this information may be found in Falk's *Scandinavian Archaeology*.

The wrecks fall into the following for warship categories:

Tune=	<i>skútur</i> (10 pairs of oars),
Skuldelev 5=	<i>skútur</i> (12 oars),
Oseberg/Ladby=	<i>karfar</i> (15/16? Oars),
Gokstad =	<i>karfar</i> =also = <i>sessur</i> /longship(16 oars),
Skuldelev 2 = longship=	<i>snekkjur</i> /and or <i>skeidir</i> (20-25 oars),
Tranen(995 AD)=longship	<i>sessur</i> = <i>dragon</i> (30 oars),
Mariasuden (1182)=longship/	<i>sessur</i> = <i>Dragon</i> (34 oars) ⁵⁷ , and
Orme Lange(1000)=longship/	<i>sessur</i> = <i>Dragon</i> (34 oars). ⁵⁸

These classifications are only educated guesses and indicate that ship names are matched with the number of oars rather than type of hull, rigging, speed, or function.

The most basic terms for classifying Viking ships beyond the distinction between merchant and warships include the following: *kaupskip* refers to trading ships in general, *ferya* is a ferry, *byrdingr* describes a small cargo ship which has characteristically high bulwarks so that trade goods could be easily stored during a journey. A *knärr* was a large ocean going trading vessel, which had a fixed mast, fore and aft raised platforms and a large hold for carrying cargo. A *skúta* comes from the word *skjóta* 'shoot' that suggests that this vessel was long and narrow with up to 30 oars so that it might be the fastest Viking ship. The Oseberg and Gokstad ships are examples of the *karfi*, its 12-32 oars make it smaller than a longship which means that or this ship type was a royal barge for travel up and down the Norwegian coast.

⁵⁷ Note according to N.A.M Rodger there should be "no unfounded assumptions about the relationship between size of ship, size of crew, and number of oars." He suggests that historians who claim that a sixty oared ship of King Alfred's defense fleet had sixty crewmen is not reliable and that it is possible that these ships were crewed with 2 or 3 men per oar. This would make these ships twice as long as Danish warships which would necessitate a crew of several hundred warriors in order to be useful in battle. Rodger 1995 402-403

⁵⁸ Crumlin-Pedersen 1981 279

Sexoringr and tölforingr which mean respectively six oared boat and twelve oared boat illustrates how boats smaller than 13 oars were named by their number of oars. The following passage from *the Older Law of the Gulathing* explains the difference between classifying a boat by the number of oars or the number of benches, “One may use the land to provide a ship for his needs, only one not so large that the oar benches must be counted; (that is a warship with 13 or more oars) if he builds one so large that the benches need be counted, he builds it for him who owns the land. If it has as many as thirteen benches; smaller ships are otherwise described.”⁵⁹ Furthermore, the narrower beam of these boats made it possible for one man to row a pair of oars whereas on larger vessels a man could manage only one of a pair of oars because the ships were broader. Boats from between 12 and 32 oars were classified by naming them after the number of oars on each side that could include up to 32 oar boats. Anything larger than 32 oars would have had a different description. Classification of Viking ships was flexible, overlapping, and not always consistent. “During the Viking Period, and perhaps even earlier, the size of a ship was measured by the number of rooms as they called them- the number of spaces between each deck beam. Each of these rooms on a fighting ship meant a pair of oars, and for each pair of oars there was a thwart.”⁶⁰ An oar bench was known as a *sess*, *hamla*, or *halfrimi*. According to Larson “the place of a rower on a ship was the oar bench. The *sess* is the oar bench, but the word also refers to the place of the bench in the ship. The size of a ship is indicated by the number of benches; thus, a twenty bencher (*tvútugsessa*) would have seats for twenty pairs of oarsmen. The *hamla* was a rope or strap which held the oar in place; the word was also used to point out that part of the ship where the rower sat, though the more correct term would be ‘*halfýimi*’⁶¹ halfroom.”

As can be seen from this chapter investigations into Norse literature have provided some hypotheses about the relationship between Viking ship names and types. Research and excavation of Viking ship finds support for the hypothesis of a diversity of Viking ship types that is further suggested by literary evidence. The Vikings used distinctive merchant ships and warships. This work has shown what types of ships the

⁵⁹ *The Older Law of the Gulathing* Larson 1935 92 The English text does not use these terms so Larson's comments are used here.

⁶⁰ Landstrom 61 64

⁶¹ *The Earliest Norwegian Laws* Larson 1935 424

Vikings used and what some of those ships were called, but this evidence cannot explain how the Vikings organized themselves for expeditions and battles which is the subject of the next chapter.

Primary sources describing Viking naval organization seems non-existent because of a lack of evidence, however, certain words found in Norse sources and a few other sources provide some hints to explain how the Vikings organized their vessels for rowing expeditions. Viking military expeditions have their origins in four forms of organization that come from the Norse Saga world. In order of development, the four levels defined groups on Viking raids were the following: *lið* and *leidangr*. The *lið* was the model of organization that Viking raids and early naval battles used for groups of Vikings. Lund defines the *lið* as a naval force that any chieftain in the Viking period could gather. Originally a *lið* was somebody's band, it designated a force under a single leader. By the eleventh century it was capable of referring to a large army, often a sea going one.¹⁶³ There is a continuing controversy concerning whether the concept of *liðangr* originates before or after the Viking period. A *leidangr* refers to a complex system of mixing men for offensive and defensive fleets of warships. In this paper it is assumed that the *leidangr* is a medieval model found in the *Gulatingur* and *Frostatingur laws* reflect practices that created Viking fleets and raiding ships in the Viking age.¹⁶⁴

These words particularly the *lið*, describe the lord-retainer relationship. The members of the crews of the raiding ships were expected to defend to the death their lord against his enemies in exchange for the opportunity for glory and treasure. To a lesser degree the loyalty implied by the *lið* relationship, also governed merchant crews when they were forced to defend themselves against pirates.¹⁶⁵

Viking expeditions, known as *lið* could involve one or more than just a few ships.¹⁶⁶ The crewmen, who made up the fleet were motivated by honor to fight bravely for their comrades. These men were part of brotherhoods that crewed each individual ship in the *lið*.¹⁶⁷ According to Haywood Viking armies were simply groups of *lið* that parted company when their military campaign was finished. Members of the crew were known

¹⁶³ Lund 1991, p. 17.

¹⁶⁴ Lund 1991, p. 18, 22.

¹⁶⁵ Lund 1991, p. 17, 20.

¹⁶⁶ Jackson 1987, p. 20. The Norse sources describe the efforts of one leader of a *lið*. "The brothers were angry at the boy because he had taken a girl with him, treated her like a slave, and he fell in with one of the *lið* leaders." According to the Norse sources, of "husk-eyr, the best."

Chapter 2 Viking Naval Organization

2.0 Introduction

At first glance describing Viking naval organization seems problematic because of a lack of evidence, however, certain words found on rune stones and in historical accounts provide some hints to explain how the Vikings organized themselves for naval warfare. Viking raiding expeditions have their origins in four forms of organization that come from the North Germanic past. In order of development the terms that defined groups on Viking raids were the following: *lið* and *leiðangr*. The *lið* was the model of organization that Viking raids and early naval battles used for groups of Vikings. Lund defines the *lið* "as a naval force that any chieftain in the Viking period could gather. Originally a *lið* was somebody's band, it designated a force under a single leader. By the eleventh century it was capable of referring to a large army, often a sea going one."⁶² There is a continuing controversy concerning whether the concept of *leiðangr* originates before or after the Viking period. A *leiðangr* refers to a complex system of raising men for offensive and defensive fleets of warships. In this paper it is assumed that the *leiðangr* recruitment model found in the *Gulathing* and *Frostathing laws* reflect practices that raised Viking fleets and raiding ships in the Viking age.⁶³

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⁶² Lund 1993 119

⁶³ Malmros 1993 389-90

⁶⁴ Lindow 1975 37-38

⁶⁵ Jansson 1987 58-60 This stone describes the efforts of one leader of a *lið*. "The brothers were among the best men on land and out in the host, treated their retainers well. He fell in action east in *Garðariki* (Russia), the host's captain, of 'land-men' the best."

individually as *skipara*, and this term is found on Danish rune stones from the Viking Period.⁶⁷ Those crewmen who fought bravely for their *lið* and served their lord without fleeing were known as ‘good’ *drængr*⁶⁸; men who fulfilled their manly obligations well.⁶⁹ It seems that an important part of being a good ‘*drængr*’ was defending members of the *lið* in times of battle.⁷⁰ A good man in the culture of the Vikings was evaluated in terms of his prowess as a sailor, fighter, his eloquent speech, his honor⁷¹ and his generosity.⁷² Therefore, the military values of the kings such as loyalty to both leader and comrade in battle are part of a long historical development.

Viking women did not generally participate in the *lið*; however, they made the expeditions possible through their work managing farms at home. The contributions of the Swedish housewife in the Viking Period were memorialized in several runic inscriptions.⁷³ The support that Viking women provided for the *lið* is one example of the wide logistical network that although not directly involved in the fighting was vital to keep the fleet supplied and Viking society fed.

⁶⁶ Haywood 1995 84

⁶⁷ Jacobsen and Moltke 1947

JUTLAND 40 “SØNDER VINGE STONE 1. N.N. erected (this stone or the like) to his ‘*skipara*’, Thiri and Tofi.82”

BLEKENGE 60 “STURKÖ STONE. Guthi’s ‘*skipari*’ erected N.N. stone. 363”

Scania 54-275 “SOLBERGA STONE Brothir erected this stone to Æsbiorn (or Isbiorn), his brother; he was N.N.’s ‘*skipari*’ ..)”

⁶⁸ Jacobsen and Moltke 1949 34 “*dræng* m: especially in the connection ‘a very good (i.e. highborn) Jansson *dræng*’, probably a fixed term for a young member of the *hirð* (bodyguard) of a king or chieftain (c.f. *thægn*) A genitive connected with *dræng* only in one inscription, Swedish) denotes the one with whom the person in question is a *dræng* (similar to *swen* occurring only once. The plural version can be translated as warriors.”

35 *thæng* m. probably a fixed term for an older member of a *hirð* (bodyguard) of a king or chieftain; especially in the connection ‘a very good (i.e. highborn) *thæng* c.f. *dræng*

1949 80 “To England had the young ‘*dræng*’ fared, then at home lamented died.”

⁶⁹ Jansson 1987 128 Transjå stone (Småland) “He was among men the most un-dastard. He in England lost his life.”

⁷⁰ Jansson 1987 86 “He fled not at Uppsala. ‘*Dræng*’s’ set up after their brother the stone on the rock, stayed with runes. To Toke Gorm’s son they marched closest.”

⁷¹ Jansson 1987 128 “This stone was put up by Vimund in memory of his brother Sven: gentle towards his people, and generous with food, in great esteem with everyone.”

⁷² Jansson 1987 128 a rune stone at Krageholm in Sövestad parish in Skåne “he was the best of men and freest with food.”

⁷³ Jansson 1987 129 “There will not come to Hassmyra a better mistress who holds sway over the farm. Balle the Red cut these runes. To Sigmund was Odindisa a good sister.” 129 “Åso has wrought what no wife will ever afterward in husband’s memory. Hjölme and Hjölle hewed these runes.”

The establishment of the Danelaw in England and the Viking settlement in Normandy are evidence for the military success of the *lið*. This supports the seagoing nature of the *lið* as these areas are separated from Scandinavia by large bodies of water. The dual qualities of loyalty to the leader and an absence of fear of death made it possible for the Vikings to take great risks.⁷⁴ Individuals acted contrary to these values so there were moments of cowardice as this passage from *Orkneyinga Saga* demonstrates.⁷⁵

2.1 The Lið

A type of Viking raiding organization was called a *lið*.⁷⁶ Evidence for this arrangement comes from rune stones. The writing on one stone describes Ragnvald and his leadership of the host in Greece which provides a prototypical example of a *lið*. This evidence implies that a *lið* was a gathering of a large number of warriors that traveled overseas under a single leader.⁷⁷

Contemporary evidence for the *lið* is rare. Available materials include fragmentary memorials carved into rune stones, chronicles written by the victims of the Vikings and Norse sagas. A group of rune stones from Sweden describes a successful *lið* led by a single leader, Ragnvald who traveled by sea to Greece with his host in pursuit of glory and treasure.⁷⁸ His trip was a success because he returned alive and was able to finance the building of a rune stone. In this case Ragnvald returned with treasure and his host. Most of the 3,500 rune stones in Sweden were raised as memorials to those who did not return.⁷⁹

One of the best known failed *lið* expeditions has provided some of the best evidence for the size and composition of a *lið*. According to Jesch “the choice of runic inscriptions (especially memorial inscriptions in stone) as sources for the late Viking Age

⁷⁴ *Heimskringla* Hollander 1964 243 “Chapter 113. *The Earls Eirík and Svein Are Given the Rule of Norway* After the battle Earl Eirík took possession of the Long Serpent and much booty, and sailed away with it when the battle had ended.”

⁷⁵ *Orkneyinga Saga* Edwards, Paul and Hermann Pálsson 1978 187 “On the morning of Michaelmas day, Harald and his men saw a longship coming towards them and, expecting trouble, they ran from their own ships and into the fortress that used to stand there. There was a man called Arni Hrafnsson who was so scared, he ran from the Earl’s ship all the way to Kirkwall before he realized, when he got stuck in the church door, that he still had his shield on his back- a man called Thorgeir was in the church when it happened. Arni’s companions thought he was lost and searched for him two days.”

⁷⁶ Lund 1993 693

⁷⁷ Jansson 1987 42 “Ragnvald let the runes be cut. He was in Greece, was leader of the host.”

⁷⁸ Jansson 1987 42 “Ragnvald had the runes cut in memory of Fastui, his mother, Onām’s daughter. She died in Ed. God help her soul. Ragnvald let the runes be cut. He was in Greece, was the leader of the host.”

raises no particular questions, they are contemporary documents and can usually be roughly dated and fairly closely localized.”⁸⁰ In brief, Ingvar’s *lið* was an expedition from central Sweden to Serkland (Abbasid dynasty, Baghdad) which took place during the first half of the eleventh century. Apparently, the journey was a disaster from which no one returned. To honor those lost nearly 30 rune stones were raised mostly in the Mälär area of Sweden. Apparently, Ingvar’s reputation encouraged many men to voyage with him. None of the rune stones from this group mentions men returning home alive.⁸¹ Evidence from rune stones describes mostly failed voyages, one may conclude from this that successful voyages may have been equaled or surpassed by the number of failed voyages.

In the fictional *Yngvar’s saga* Ingvar’s *lið* contained up to 30 ships. Only the rune stones present reliable evidence for the *lið*, and none of these rune stones mention the number of vessels involved so it is probably impossible to know how many sailed to Serkland in Ingvar’s *lið*. However, the fate of those who sailed with Ingvar’s *lið* is clear from the inscriptions.⁸² It is necessary to discuss the *leiðangr* levy system to build a more complete picture of Viking naval organization.

2.3 The Leiðangr

The *leiðangr* ship levy replaced the *lið* as the basis for the organization of defensive and overseas naval expeditions in Scandinavia around the year 1000 as kings asserted their authority over the *liðs* of individual chieftains.⁸³ However, Lund suggests that the *leiðangr* was a separate and unrelated development of the expansion of centralizing royal power in Scandinavia rather than a body that emerged from the Viking *lið*. However, this analysis relies too much upon historical evidence and overlooks the

⁷⁹ Jansson 1987 Forward

⁸⁰ Jesch 1994 295

⁸¹ Jansson 1987 63

“Skarde, their brother. Went east from here with Ingvar. In Serkland likes the son of Öjvind.” 64-65 Gripsholm stone. Set up by Tola in memory of her son, Harald. The runes explain that Harald was Ingvar’s brother. “They fared like men far after gold and in the east gave the eagle food (killed enemies). They died southward in Serkland.”

Jansson 1987 67 Varpsundet stone in Uppland “(Ship’s captain) Gunnlev knew well how to steer a ship but was killed in the east with Ingvar.”

Jansson 1987 68 “Tjälve and Holmlög had all these stones set up in memory of Banke, their son. He had a ship of his own and steered eastward in Ingvar’s *lið*. God help Banke’s soul. Äskil carved.”

⁸³ Barfod 1993 717, Malmros 1993 389-90

presence of ship finds from the Viking age that fit the description of levy ships mentioned in the *Gulathing law*.⁸⁴ Lund provides a useful description of how the *leiðangr* operated in Denmark.⁸⁵

According to Lund the *leiðangr* involved a sense of civic obligation that was not present in the Vikings⁸⁶ but Ole Crumlin-Pedersen believes that the *leiðangr* existed during the Viking age.⁸⁷ According to Haywood the *liðs* of provincial chieftains provided the pool from which the levies for the *leiðangr* were taken. The *leiðangr* rose with the centralizing efforts of the Scandinavian kings who asserted their authority over a whole nation using ‘ship levy’ as a permanent tax and as a method for the control of Viking naval activity.⁸⁸ The age of the *leiðangr* system is rather uncertain, and some historians tend to date its emergence to the end of the 12th century, for example Niels Lund in his book *Lið, leiðangr og landeværn*, but this is much too late.⁸⁹ The Norwegian sources indicate that the King could use the *leiðangr* for defensive purposes in Norwegian waters, but needed special agreements to take it abroad.⁹⁰ According to Christensen traditionally, the *leiðangr* is said to have been established by Hákon Adalsteinsfostre in the 10th century. As there are few 9th century examples of Viking raids organized by the Kings, and no proof of the *leiðangr* existing as early; therefore, *leiðangr* is an improbable source for organizing raids. Therefore, one may conclude that both the *lið* and the *leiðangr* existed during the Viking age but they had different

⁸⁴ Lund 1993 693, Crumlin-Pedersen 1997 192-3

⁸⁵ Lund 1996 291, Lund

⁸⁶ Lund 1996 295

⁸⁷ Crumlin-Pedersen 1997 192-193 “In his recently published book on the *leiðangr*, Niels Lund has questioned the levy ship mentioned in *the Older Law of the Gulathing* interpretation of Skuldelev 5 wreck – not because he is able to provide equally good or better category to fit the ship into but because this archaeological evidence from the mid-11th century of a low status warship which may have been built as a duty by the farmers on orders from the king is too early to fit into his ideas on the origin of the *leiðangr* system, which are based upon the historical sources.”

⁸⁸ *Heimskringla* Hollander 1964 113

“Chapter 20. King Hákon Sets the Ship-Levies and Orders Beacons Installed

After this battle King Hákon incorporated into the laws for all the land along the seas, and as far inland as the salmon goes upstream, that all districts were divided into “ship-levies”; and these he parceled out among the districts. It was stated in the laws how many ships there were in every district, and how many large ones were to be furnished when a general levy was called; and a general levy was enjoined whenever a foreign army was in the land. Along with this was ordered that whenever there was a general levy, beacons were to be lit on high mountains, so that one could be seen from the other. It is said that news of the levy traveled from the southern-most beacon to the northernmost borough in seven nights.”

⁸⁹ Lund 1996

⁹⁰ Hollander 1964 113

purposes and represented earlier and later stages of political and military development respectively.

There is a connection between the *lið* obligations owed to individual chieftains and the *leiðangr* which required ship districts to provide men and a vessel for the use of the king.⁹¹ This *leiðangr* practice was limited by custom. It may be seen from the archaeological evidence that Viking naval organization obligations became increasingly proscribed and royal as evidenced by the *leiðangr*. This differs from the informality and personal nature of the obligations of the *lið*. The best explanation is that the *lið* describes Viking naval organization at the start of the Viking age and the *leiðangr* the state of naval organization at the end of the Viking age. In the early Viking age a chieftain conducted his own expedition unless he joined a loose alliance of other chieftains. These men owed allegiance to a single leader only for the duration of a campaign.

⁹¹ Malmros 1993 389-390

Chapter 3 Warship and Merchant Shiphandling

3.0 Naval Warfare

The previous chapter explained how Vikings organized themselves for naval warfare. This leads to the question of how they handled their ships. The tactics of naval warfare are dealt with first, followed by general aspects of the handling of square sailed vessels and matters pertaining to merchant voyages. The early Viking age 800-900 AD was dominated by raiding rather than naval battles that were more characteristic of the late Viking age and the Middle Ages.

The purpose of Viking raiding and naval organization was twofold. Firstly, raiding was conducted as the gathering by a chieftain or magnate of a number of men loyal to him and with expectations for some treasure and an opportunity for glory. Secondly, in the case of naval battles, they occurred due to the process of state formation in Scandinavia during the Viking Age. The basis of authority in Scandinavia was the ship and fleets of these ships that were prepared to impose the will of a king on a region or individual who opposed this centralizing process. Therefore, early state formation and its imposition by force by early Scandinavian kings on formerly independent local rulers was the cause of many naval battles. This organization was known as a *lið*,“ Later in the Viking Period some kings began trying to establish their authority over whole kingdoms such as Harald Fairhair in Norway. The process of the development of national kingship required the king to establish his authority throughout the kingdom he wished to rule.⁹² Opposition leaders had to be confronted, defeated, and offered friendship or death. The development of kingship in Denmark, Norway, and Sweden was the cause of many naval battles. A passage from the *Gulathing Law* though from the 11th or 12th century may hint at the composition of a Viking fleet.⁹³

Naval warfare during the Viking Period was conducted under the leadership of kings whose ships were commanded by *stýramenn* either loyal to one of the king’s chieftains or magnates or appointed directly by the king.⁹⁴ If the two fleets engaged then the *stýramann* of each ship would steer the ships into position and lash their ships together. Another important position was the stempostman who was usually the largest

⁹² *Heimskringla* Hollander 64 222

⁹³ *The Older Law of the Gulathing* 1935 200

⁹⁴ Larson, 188 “299. CONCERNING THE COMMAND OF SHIPS*"

and finest fighter of the crew that he fought alongside. He was the first to confront the enemy when ships met stem to stem. Stempostmen on opposing ships would batter away at each other in order to clear the way onto the enemy vessel.⁹⁵

The evidence from medieval literature suggests that battles had a predictable order that can be described here. The battle began with preparation, an arrow was sent around the community of a chieftain or several communities ruled by a king.⁹⁶ Then ships and men gathered at a particular location, probably each region had a gathering place where local people prepared to defend against invaders. In *Heimskringla* Kings sometimes gave a speech to inspire their soldiers before confronting the enemy.⁹⁷ In order to communicate the whole force assembled on land to listen. After the speech, the fleet set out to find the enemy and to engage in a suitable place, a quiet fjord or the lee of an island. Once the sails of the enemy were sighted then the two fleets would engage one another; or one of the two would attempt to flee with varying degrees of success. One fleet in particular was able to escape because the pursuers ships were waterlogged. One explanation for this is that the slower ships hulls had not been taken out of the water and stored in a boat noost during the previous winter. These ships were heavier in the water.⁹⁸

Occasionally, fleets met at sea but landed at a convenient island or peninsula where they could fight more easily than on the water. It seems that land fighting was preferred to fighting on the water, as naval warfare of the Viking age can be described as land warfare carried out on floating platforms.⁹⁹ Sometimes a king himself would mark out a battlefield on land and tell his enemy where to meet him.¹⁰⁰ In this way, Viking ships and fleets acted as troop transports rather than true warships designed for fighting on the ocean.

⁹⁵ *Heimskringla* Hollander 64 64 “In the spring King Harald had his ships put in readiness. During the winter he had a large dragon ship built and outfitted richly. On it he quartered his bodyguard and berserkers. Most carefully he chose his forecastle men, because they carried the king’s banner. The space from the forecattle benches back to the bailing space was called *ǣ rausn* [forecattle room], and there the berserkers were quartered”

⁹⁶ *Heimskringla* Hollander 64 156-7

⁹⁷ *Heimskringla* Hollander 64 280-281

⁹⁸ *Heimskringla* Hollander 64 606 “Then both parties rowed with all of their might. The Danes had faster-rowing vessels, whereas the ships of the Norwegians were both waterlogged and very deep in the water, so that the distance between them grew less.”

⁹⁹ *Heimskringla* Hollander 64 112

¹⁰⁰ *Heimskringla* Hollander 64 115

When the battle commenced the ships now played the role of fighting platforms. During this period archers, spear throwers, and stone throwers would hurl projectiles at the opposite fleet.¹⁰¹ Warriors would then attack each other from stem to stem, as the stempostman cleaved and jumped his way onto the enemy ship leading the other warriors along. Success meant clearing the deck of an enemy ship, proceeding until the enemy was killed, surrendered, or fled. Victory usually came when the enemy leader was killed, asked for mercy, or fled. The leader usually a king was protected by a shield wall of loyal followers who were pledged to defend him at the cost of their own lives. Tactics in this kind of warfare are essentially ship maneuvering, numbers of warriors, and fierceness in hand to hand combat. A passage in *Heimskringla* suggests that the quality of the crew was a key to successful naval warfare.¹⁰²

What were the tasks involved handling the Viking ships during warfare and voyaging? In the Scottish poem *the Birlin* the tasks of crewmen on a Hebridean galley were clearly defined and provides a hint as to what tasks were necessary to the running a Viking longship. It is likely that these roles were similar to those tasks that had to be completed on Viking ships. In the poem the men are seated and the fore oarsman sets them rowing with a boat song. From the embarkation point the men rowed the ship to the sailing point where they raised the mast and sail and every man set to his particular task: the helmsman, a rigging man, a sheet man, a fore-sheet man, a lookout in the bow, a teller of the waters, balers, a halyard man, two backstay haulers to guard the sail being carried away by wind, six in reserve to replace those washed overboard. After the men set to their task the sail was hoisted and the ship sailed on its way.¹⁰³

Shiphandling may be defined as “to manage a boat well is to sail and generally to work in a seamanlike fashion.”¹⁰⁴ The seamanship of the Vikings has been considered second to none in the history of the sailing ship. The legacy of the superior shiphandling

¹⁰¹ *Heimskringla* Hollander 64 180-181 “Then the fleets clashed together, and there began a most savage battle, with great loss of life on either side, but with much greater loss on the part of Hákon’s; because the Jömsvíkings fought boldly, fiercely, and hard, shooting right through the shields; and there was such a shower of missiles which struck the earl that his coat-of-mail was shot to pieces and became useless, so that he cast it off.

¹⁰³ Nicolson in MacAulay 1997 75-97

¹⁰⁴ Ansted, 2000 123

skills of the Vikings, which until recently could still be seen in Norway¹⁰⁵ and in the Shetlands,¹⁰⁶ lends support to G. J. Marcus's following description of Viking seafarers.

As it might be expected, in the main a remarkably high standard of seamanship prevailed among the Norse mariners. The crews had confidence in themselves, and instinctive resource and skill born of long years of experience on the coast and on the high sea, in well founded craft and good gear- and the event, and for the most part justified this confidence.¹⁰⁷

According to Phillips-Birt seamanship may be defined as the handling of a ship at sea and finding the way; which means then that shiphandling is one of the key components of seamanship.¹⁰⁸ Navigation is not discussed in this chapter because it is a topic that deserves a separate study. In order to have effective shiphandling master and crew must know the performance limits of a vessel and the relevant features of the natural environment where the ship has to perform. It is necessary to know the refinements and techniques involved with skills like sail handling, steering, or ocean rowing. Just as importantly effective mariners, the Vikings are considered to have no superiors in seafaring given their record, must have the foresight to anticipate a crisis and thereby avoid it.

Vikings amphibious experience¹⁰⁹ gave them foresight that was a product of endless experience on the water.¹¹⁰ It also meant that those that survived many journeys developed the highest levels of shiphandling skill. The combination of oar and sail power

¹⁰⁵ Thowsen 1968 70 "It is therefore probable that from the Viking age until the beginning of the twentieth century there existed continuous shipping and shipbuilding traditions among the farmers in the wooded coastal districts of Norway. The main part of this tradition was centered around the vessel called *jakt* or *jekt* in Norway."

¹⁰⁶ Sandison 1994 26 "North of Shetland a boat had the misfortune to lose her mast. It rolled overboard when it was being set in a heavy sea. It may be thought that this would end their sailing, but no, they parbuckled it aboard somehow, and got it set." "This brings to mind the recent remark of a Shetland youth, when he asked if he had found a certain job difficult. "It had to be easy", was his reply, "because it had to be done." Until the twentieth century mariners in the Shetlands sailed square sailed boats of Viking heritage in conditions similar to those faced by Viking age sailors. These two examples may reflect the high level of seamanship and resourceful attitude that was necessary for the success of Viking seafaring."

¹⁰⁷ Marcus 1980 100

¹⁰⁸ Phillips-Birt 1971 9

¹⁰⁹ Ellmers 1974 13

¹¹⁰ This passage from *Orkneyinga Saga* shows how on just one sailing campaign King Rognvald of Orkney added three years to his sailing experience. Some Viking sailors may have spent several decades living continuously on the water. Pálsson and Edwards 1978 221 "At that time King Rognvald was the greatest fighting man in all the western lands. For three whole years he had lived aboard longships and not spent a single night under a sooty roof."

gave the Viking seafarer an advantage that his contemporaries in sail dependent vessels did not have “It is likely that a combination of rowing and sailing propulsion has been used extensively, since this type of combined propulsion may often improve the effective horsepower generated by the sail significantly.”¹¹¹ It is also worth noting that aspects of shiphandling which must happen while a ship is not on the water, like timely maintenance and the collection of necessary supplies were equally as important as sailing experience to successful shiphandling.

The Vikings needed a way to put some order upon the featureless environment of the open sea. Their solution to this problem was a compass rose based upon wind direction that was in relation to the southwestern part of the Norwegian coast. Many Vikings came from this area, and settled Iceland, as well as the other Atlantic Islands. A compass rose can have between 16 and 32 points; and the basis of this rose were the inter-cardinal and cardinal points. *Nordr*, *Landnordr*, *Austr*, *Landsudr*, *Sudr*, *Utsudr*, *Vestr*, and *Utnordr* complete the cardinal and inter-cardinal points of the Viking compass rose. The people of the Atlantic Islands continued to use the Norwegian system even though it was created in relation to the north to south portion of the southwestern coast of Norway. This system described for example, NW winds blowing SE as winds from the North. The northerly wind from the sea, *Utnordr*, came out from the north. Winds between major winds, which were known as *Midmunastadh*, meaning mid-way between northern winds that came from the land were called, *Landnordr*, meaning landnorth.¹¹²

At the same time that the *Norsemen* had to fix points of direction in the featureless environment of the sea they also measured the distances that they sailed and this required the creation of a system of nautical distance units. In short, six nautical miles or the unit known as a *Viku*, was the base unit for their system.

36 nautical miles =	6 <i>vikur</i> =	½ <i>tylfti</i> =	1 day's rowing
72 nautical miles =	12 <i>vikur</i> =	1 <i>tylfti</i> =	1 <i>half-doegr</i>
144 nautical miles =	24 <i>vikur</i> =	2 <i>tylftis</i> =	1 <i>doegr</i> ¹¹³

¹¹¹ Smitt 1986 176

¹¹² Morcken 1986 55-57

¹¹³ Morcken 1986 55-57

There has been some academic controversy concerning the meaning of the word *doegr*. Morcken suggests that it could mean either 144 nautical miles or 72 nautical miles in saga literature. This was the case because in the late Viking age the meaning of the word became 144 nautical miles, but in the literature the word could still refer to either distance. *Doegr* also could refer to a period of time; its most accepted meaning is 12 hours but some scholars have suggested that it stands for a day's sail or 24 hours.¹¹⁴

The shiphandling skills and accomplishments of Viking age captains and crews; suggest that the superhuman skills attributed to them are exaggerated. With their development of the techniques of sailing just prior to the dawn of the Viking age, the shallow draft of Viking ships, and their twin forms of propulsion allowed the Vikings to practice their shiphandling skills virtually anywhere in Europe. The Vikings could attack a target by running their ships onto a beach until the keel hit sand, then the men could wade the rest of the way towards their target. When leaving the beach if they did not have the right amount of wind they could row away. No defensive force could respond fast enough as the Vikings could take their loot and slaves, put the booty on the ships and float away with the tide or if necessary push, roll, and pull their ships into deeper water. The shallow draft of Viking ships also meant that their markets and trading towns could have shallow draft access that would exclude the deeper draft vessels of their competitors, and their markets were located on any convenient beach.¹¹⁵ Early Viking raids were seasonal; however the raiders realized that if they established bases at the mouths of rivers like the Seine they could more easily continue their activities throughout the winter. Most of the Vikings' enemies had ships that required deep water anchorage's which made the Viking island bases nearly unapproachable by enemy ships. Once on a river Vikings had the advantage of being able to row up a river without having to stop for extra men or supplies.¹¹⁶

¹¹⁴ Morcken 1986 55-57

¹¹⁵ Owen 1999 26-27

¹¹⁶ Almgren 1962 1-13

3.2 Propulsion

Part of the effectiveness of Viking shiphandling originated in the flexibility of the methods of propulsion that included, rowing, sailing, or a combination of the two. It was when sailing against the wind when the advantages of this arrangement were evident.¹¹⁷ In a storm Viking seafarers could lower the sail and mast, point their head to wind, and the crew could keep the ship seaworthy as long as their strength would hold out at the oars and for the maintenance of bailing.¹¹⁸

3.3 Rowing

In the event that wind conditions did not allow for sailing Viking ships resorted to the collective muscle power of the crew who transmitted their energy to the oars. According to Eric McKee pulling rather than rowing is the correct term to use because it took a single man to pull an oar on a Viking ship and “In salt water a man is said to be rowing when he is working a pair of oars, one in each hand, but pulling if he is working with both hands on one oar”¹¹⁹ but the problem remains that most scholarship particularly scholarship from Scandinavia describes Viking use of oars as rowing not pulling. This reinforces McKee’s belief that “scholars, who are more likely to be wet-bobs than salts, persist in writing about ‘rowing’ in sea-going oared vessels, one thing that could not have been done.”¹²⁰ Since this dissertation was written by a wet-bob rather than a salt and rowing is the accepted term in the academic literature then the term rowing rather than pulling will be used in this dissertation. It is worth considering whether the Vikings should have adopted a way of muscular propulsion different from the oars that they used. Attractive alternatives include the efficiency of the Eskimo kayak, where a double paddle and low freeboard mean improved use of muscle power. In the case of another alternative arrangement, Canoes have an advantage over oared vessels because the steering and propulsion are done by a single paddle that means that muscles rest while alternating between rowing work and steering work. The rough nature of most of the marine areas where the Vikings operated meant that the kayak and canoe alternatives were not practical alternatives because of the high freeboard that the Vikings needed to maintain

¹¹⁷ Pálsson and Edwards 1976 57 “said the King, “though there are people who say that while it may be plain sailing all the way north, you’ll be needing your oars on the way back.”

¹¹⁸ Halcrow 1950 8-9

¹¹⁹ McKee 1983 135

seaworthiness.¹²¹ According to Gjessing thwart level, foot position, and oar movement must be carefully balanced along with a proper hull, the bearing of the oarsman, the position and type of oar in order to ensure an efficient use of muscle power for rowing. Viking ships often made extended rowing journeys covering long distances which meant that they required a combination of oars, rower's bearing, and hull shape that was suited not to high speed but rather to slow and steady rowing that could be maintained over a long period of time.¹²²

Gjessing explains that "rowing work is mechanical work and the work involved in rowing a stroke is best understood when described as the product of force times displacement, i.e., the tractive force in the stroke multiplied by the length of the stroke." The maximum power is a result of the three factors tractive force (pulling power), displacement, and frequency, which means the number of oar strokes per minute. Important factors in the operation of a rowed vessels include the squaring of the oar blade, the rowlock level, the length of the stroke, the frequency of the strokes, and the types of work which collectively make up the work capacity of a particular vessel and crew.¹²³

The squaring of the oar blade is of critical importance to the relationship between the horizontal angle of the rowers arms and the angle at which the oar blade strikes the water. On Viking ships, the carefully curved oar blades, like those found with the Gokstad ship, had a shape ideally suited to the demands of the oarsman and the freeboard of the ship to ensure efficient rowing and balanced pressure on the whole body. In a rough sea with rolling and wave crests the rowlock must be of the appropriate height so that the oar may pass freely over the wave crest where it may start a new stroke unhindered. Broad and sizeable vessels like many of the Viking ships, require especially high freeboard because the size of the vessel makes it more prone to rolling. In order to adjust to this situation a correctly positioned rowlock will allow for a slight tilting of the

¹²⁰ McKee 1983 135

¹²¹ Gjessing 1986 160

¹²² Gjessing 1986 160-1

¹²³ Gjessing 1986 161-2

oar and an appropriate pressure is directed on the rower in order to have sustained rowing.¹²⁴

In order to ensure a correct length of stroke the oarsmen must keep his rear end of the thwart because this would waste rowing effort on body movement instead of forward motion transmitted from the oars to the ship. In order to avoid this situation this means he must avoid overstraining on a particular stroke to maintain efficiency. An ideal distance between the rowlock and the floorboard allows the oarsman to use a stroke that is shorter than what is possible but allows for efficient and sustainable rowing. It is not the case that increased number of strokes equals higher performance because this increase would come from less time for carrying the oar forward to the next stroke that would not allow for sufficient rest time in the stroke. It is likely that the effort of maintaining more strokes would mean an unsustainable increase in the frequency of strokes. Instead, a rower could pull harder against the water at a lower frequency that would create useful energy in the oar without wasting effort of the body and the oar in unproductive movement of the oar in the air and the oarsman in the boat. Vikings required a hull and rowlock relation suited to sustained long distance rowing so that the oarsman could pull the oar forward with a short and quick stroke and have sufficient space to rest between pulls. The Viking oarsman was not a sprinter but rather a long distance athlete who preferred a slow cruising pace of rowing.¹²⁵

The tedium and physical hardship associated with rowing has meant that, if the scarcity of written accounts of this activity from the literature of the Viking age and afterwards is any indication, rowing was something that was a necessary evil and was properly overshadowed by the memories of sailing with a good wind.¹²⁶ There have been few occasions where long distance rowing journeys have been recreated and modern rowing clubs have not always had success trying to row Viking ships. “The ratio between the length inboard of the pivot and that outboard of it is known as the gearing. Most rowers can manage a gearing of 1:3, but tire more quickly if this is exceeded.”¹²⁷ The sea

¹²⁴ Gjessing 1986 164-5

¹²⁵ Gjessing 1986 164-6

¹²⁶ Pálsson and Edwards 1978 195 This passage from *Orkneyinga Saga* illustrates the dreary nature of rowing during the Viking age. “When Svein had reached almost due west of the Point of Stoer, he told his men not to wear themselves out any more at the oars, but to change course and hoist sail.”

¹²⁷ McKee 1983 136-137 The gearing of oars is described in detail on the pages cited.

trials of the replica of the Gokstad *faering* built by the British National Maritime Museum in 1974 indicates that “there was a need for a different style of rowing from that in current use.”¹²⁸ It is also likely that it takes a great deal of time for a crew to learn how to work the oars efficiently as a team; which suggests that the crews of longships could not be put together without intensively trained men who had rowed together for some time. However, it is possible that men of the Viking Age were sufficiently fit for long distance rowing because some of their daily transport involved the use of oars. According to Hasløv the muscles of the back and the efficiency of the lungs require four years of sustained rowing training in order to make long distance rowing journeys.¹²⁹

3.4 Sailing/Theory of Sail

This section clarifies what information is reliable with regards to the performance of Viking sailing ships, sails, and rigging. It is hoped that this section will answer these questions and identify what current research suggests is reliable information concerning these matters. Viking ships made use of a single mast supporting a single square rigged sail; which probably was rectangular rather than square in shape. A sail is an aide to transportation, a surface attached to a mast for the intention of transferring the force of the wind from the sail to the hull of the vessel in order to propel the vessel across a body of water from the point of departure to the intended destination. As the commercial age of sail is long over most sailing done today is for recreational and racing purposes. These tasks demand that a vessel that be easily controlled so that it can turn sharply around racing markers which requires efficient tacking and sailing into the wind. Fore and aft rigged sails meet these requirements, so most sailing vessels today employ this type of sail arrangement. Recreational sailors avoid bad weather and rough seas with effective monitoring of weather forecasting so that storm sailing seaworthiness is not the first consideration of sail and hull design. However, to Viking sailors who operated without the benefit of weather forecasting technology and encountered very rough sailing conditions in many of the areas where they sailed seaworthiness was paramount. There is some evidence that suggests that square-rigged sails as they bisect the hull provide more stability in heavy weather. Of course, this is a key factor that explains why the Vikings

¹²⁸ McGrail 1974 34

¹²⁹ Gjessing 1986 167

used square-rigged vessels. According to Smitt Square sails have the advantage that they may be able to better keep a course relative to the wind than a yacht with a divided sail plan because they have more leeward wind pressure under a weather helm “It is, however, easy to show that in this respect the single low aspect ratio, square sail may have had outstanding qualities.”¹³⁰

In the case of the performance of square sails it may be useful to consider the relative proportion and size of the sail to the hull, the curvature of the sail, the apparent wind angle, wind force, and sail material and texture. A square sail therefore has a rectangular shape that is equally distributed transversely on port and starboard sides of the vessel. The mast is attached to the sail by a connection to the yardarm known as a parrel. The bottom sides of a square sail are controlled by port and starboard braces that help to control the position of the sail in relation to the wind. Standard rigging includes the braces and sheets.

3.5 Fore and aft sail vs. square sail

The square sail rig was used by the Vikings and survived in use on ships into the twentieth century because they have lifting qualities which means that they pull the hull up against oncoming waves providing greater seaworthiness. The square sails of the Vikings met lifting needs better than of the depressing qualities of fore and aft rigged sails. Fore and aft sails press the prow of a hull down against oncoming waves, thus are more vulnerable to swamping and therefore are less seaworthy. According to Gillmer, "the angle to the apparent wind was limited in a square rig by the angle to which the yard arm could be rotated on the mast. These facts point out the differences between and the advantage of the square rig compared with the fore and aft rigged sails. This difference was minimized by boats that retained few shrouds and particularly those with running shrouds.”¹³¹

3.6 Rigging

Numerous scholars, both amateur and professional have attempted to explain partially or in full the nature of the rigging of Viking age ships. It is also worth noting that “in the Viking Age and the Middle Ages wool was the commonly used material for

¹³⁰ Smitt 1986 174

¹³¹ Gillmer 1979 177

sails on the various Nordic ship-types.”¹³² There are two schools of thought concerning the nature of Viking age rigging; in the first case most current scholarship has identified the square sail of 19th century Norwegian vessels which have a heritage that can be traced back to the Middle Ages as the most likely model for the Viking sails and rigging. On the other hand a smaller group of scholars has suggested that the sails and rigging on the Gotlandic picture stones though they are more complex and older represent the true rigging and sail arrangement from the Viking age. Arne Emil Christensen suggests that if this second concept is correct then nearly all of the rigging and sail arrangements on contemporary Viking ship replicas are not accurate.¹³³

Early attempts at re-creating Viking age rigging were made by Danish Boy Scouts starting in 1963. These ships have been equipped with square sails, some of the ships have added a lower as well as an upper yard to their sail but there is as yet no evidence of how this affected sailing performance. In order to take advantage of the light and flexible Viking age hulls the correct balance between hull, sail, and rigging must be found. It is unclear whether this has happened yet. Most of the sails used on replicas have been based upon 19th century Norwegian vernacular rigging and square sail arrangements.¹³⁴

In 1974 the Viking Ship Museum at Roskilde acquired an original Nordland boat, a square sailed vernacular vessel which is connected with the Viking boatbuilding tradition. Erik Andersen has tested and measured the dimensions and performance of this vessel and the data that has come from his work forms the basis of the sails and rigging of Danish and Norwegian Viking ship replicas. This work has supported the hypothesis that Viking age ships were fast and could sail into the wind. However, other scholars such as Haasum of Sweden, have attempted to downgrade the capabilities of Viking ships through wind tunnel experiments using model sails that have no archaeological basis. She compared these Viking ship models with models of contemporary yachts and found that the modern vessels performed better. Her conclusions suggest that Viking ships had a very difficult time tacking.¹³⁵

¹³² Andersen 1995 249

¹³³ Christensen 1979 191-2

¹³⁴ Christensen 1979 191-2

¹³⁵ Christensen 1979 191

Åkerlund has been a pioneer in theories about Viking ship rigging. In his view spreader booms, long poles inserted in port and starboard blocks, improved sailing efficiency by stretching the sail for sailing downwind or tacking into the wind. He also suggests that the system of ropes from the Gotlandic picture stones represent brails used to shorten the sail instead of having a role as sheets.¹³⁶

Early works with regards to Viking age sails and rigging vary widely in their hypothesis. Brøgger and Shetelig, observed the strength of the mast step and mastfish arrangement and concluded that standing rigging was not needed. Other scholars have suggested, based upon the fore-and aft alignment of the sails on the Gotlandic picture stones, that the Viking square sail was rigged fore-and aft, using a lower yard arm, which was adjusted using the elaborate system of ropes that may be seen on the picture stones.¹³⁷

The four types of evidence for Viking Period rigging and sails suggest that much of what has been suggested is hypothetical and not based upon reliable evidence. The sources of evidence include ethnological comparative material based upon ships from the North and West of Norway where the square sailed ship tradition survived longest. Some of the men who used these vessels have reported their experiences to scholars and many of the boat types and their sails have been carefully recorded. These traditional boats have been used to build Viking age replica vessels. Both replicas and vernacular craft have provided equally useful information about the sailing performance of Viking ships.¹³⁸

The second source of knowledge about Viking age ships includes post-Viking literary sources such as Norse sagas, scaldic poetry and old laws. Post-Viking iconographic evidence can provide clues to the later development of the Viking ship tradition. However, it is not clear how representative this material is so it must be handled carefully. Mast supports and parts of rigging form the basis of the archaeological evidence for Viking age sails and rigging but the fragmentary nature of this material makes it difficult to draw firm conclusions about its meaning. What is known is that the Vikings likely used “a square sail, spread by a yard on a mast amidships. The mast had

¹³⁶ Christensen 1979 191

¹³⁷ Christensen 1979 191

shrouds, and possibly a stay; the sail was hoisted by a simple halyard and controlled by sheets; and the luff was stretched by a tacking boom or bowline or both.”¹³⁹

It is likely that the Viking period halyard system had a hole at the top of the mast where a heavily tallowed single rope could be rove through securing it to the mast. Medieval masts have the halyard hole arrangement and some examples include unpublished mast and model evidence from Bergen.¹⁴⁰

Archaeological evidence for Viking age masts is fragmentary and incomplete. Contemporary Norwegian vernacular masts and medieval evidence suggest that Viking age masts had a wide lump at the top and a round profile. This profile narrows before reaching the lump which reinforces the halyard hole. This provides support to the parrel at the point where the yard arm meets the mast.¹⁴¹

Archaeological evidence is not sufficient to provide any certainty about the nature of Viking age running rigging. Cleats have been identified on the forward sections of the Gokstad and Oseberg ships. These cleats may have been used to belay the running rigging but no archaeologist has devised a convincing rope arrangement for the running rigging. The tacking spar or *beitiass* may have been a key to the running rigging of Viking age ships because during tacking a pole would have been required to stretch the luff of the sail. Skuldelev 1 and Gokstad have forward port and starboard interior blocks with socket holes that could have supported a tacking pole.¹⁴²

Ballast was not systematically deposited in Viking ships. It seems probable that Viking seamen developed experience with the different types of cargo and the way the vessel performed as a result of the cargo's weight and placement. High density cargo and better storing patterns combined with an improved hull shape meant that Viking seafarers could overcome some of the weaknesses of their unsystematic ballasting. Nevertheless this system of ballasting required a shorter mast and a sail that was broader than it was high in order to maintain stability.¹⁴³

¹³⁸ Christensen 1979 183

¹³⁹ Christensen 1979 191

¹⁴⁰ Christensen 1979 190

¹⁴¹ Christensen 1979 189

¹⁴² Christensen 1979 190

¹⁴³ Gillmer 1979 175

3.7 Hafvilla

Norse mariners operated without charts, weather forecasting equipment, compass, radar, or most any navigational aides that have been developed since the Middle Ages. Viking ships were frequently unsure of where they were, particularly due to fog or after having been blown greatly off course by a storm. This condition was known in Old Norse as *hafvilla*.¹⁴⁴

3.8 Harbor and Landing

Steadily increasing volume and bulk of trade was a characteristic feature of the Viking age. Harbors were originally sandy beaches that were flat enough to pull trading ships and longships onto a safe area above the tidal zone. *The Older Law of the Gulathing* mentions that men were sometimes killed pulling a ship on land or shoving it into the water. In both cases men were crushed beneath the beams of the ship.¹⁴⁵ If it was a shorter visit then the cargo could be carried by the crew through the shallow water between the boat and the beach. Long flat beaches were ideal early Viking trading centers but even during the early Viking age piers of stone allowed for deeper draughted ships to stand further of from a flat beach to unload cargo. Increasing cargoes and the necessity of building quays changed the trading geography of the Viking world. The location of Viking age trading centers could no longer be accommodated on flat beaches so these trading places were overshadowed by areas where quays could be constructed adjacent to deeper water.¹⁴⁶

3.9 Heavy weather

Sailors of the longships were the key element in a shiphandling crisis. While using their rowing, steering, and other shiphandling skills they could keep a longship seaworthy in the worst storm. Years of shiphandling experience bred familiarity with the handling habits of their fellow crewmen. This knowledge was essential amid the crashing waves and mountainous swells of the North Atlantic and other areas where the Vikings sailed. Quick decisions by the helmsman were necessary. In order to make his decisions count he had to rely upon and understand exactly the response of the halyard men. Error free teamwork was the factor that ensured survival in a storm. The helmsman would

¹⁴⁴ *Njal's Saga* Hollander 1998 160 "They had such stormy winds from the north that they were driven off their course to the south, and they ran into such a dense fog that they did not know where they were going."

¹⁴⁵ *The Older Law of the Gulathing* Larson 1935 136

expect perfect support from the crew whether he was running a breaking sea, avoiding rogue waves, easing off or pressing his sails.

In the worst storms no sail could handle the wind force so that the Vikings would *andoo*, which means pointing the prow of the vessel into the wind and waves thereby maintaining a steady position through rowing using half the crew. In the case of the Gokstad ship this would be about 8 men. An extremely dangerous gale could require the rowing efforts of the whole crew to keep the vessel from falling into the trough of a wave and capsizing. When half the crew was at the oars the rowers occupied the aft rowing positions to better keep the bow pointing into the wind. The other half of the crew therefore could sleep under the floorboards or watch for danger. The small adjustments of the ship by the helmsman had no margin for error in a gale so that his choice of ‘easy to starboard’, ‘hard to port’ or ‘pull hard to larboard’ had to be perfectly timed with the conditions of the sea in order to avoid disaster. Unlike the rest of the crew there could be no rest for the helmsman in such a situation.¹⁴⁷

3.10 Sigla til brots

Since the discovery of the grave ships of the Oseberg, Tune, and Gokstad ships in Norway archaeological opinion hypothesized that the Gokstad and Oseberg ships were the typical Viking ships. In light of Andersen’s successful voyage in a modified Gokstad replica across the Atlantic from Norway to America it was assumed that the Vikings made settlement voyages to the Faroes, North America, and Iceland in longships like the Gokstad. The finds at Skuldelev show that a seaworthy Viking merchant type existed which was known broadly as *hafskip*. This classification relied solely on sails for its propulsion that relied on its *bulki* (cargo) to ensure proper ballasting amidships. In situations of necessity fore and aft rigged oars could maneuver the ship in harbor or to accelerate going about. In heavy weather these oars would not keep a vessel head to wind or prevent it from being dashed on a lee shore. Complex sailing maneuvers in heavy weather were not possible because the sail rig necessitated *sigla til brots*.¹⁴⁸

¹⁴⁶ Owen 1999 26-27

¹⁴⁷ Halcrow 1950 8-9

¹⁴⁸ Marcus 1980 61-2

In the event that a Viking period ship was on the verge of wrecking on a shore a practice known as *sigla til brots* was used.¹⁴⁹ This was possible because the light weight double ended and flexible hulls of a clinker built vessel had a shallow draft that would make it possible for a shipmaster to risk cutting through a line of surf to reach the shore. This measure was only taken as a last ditch effort to save the crew by sacrificing the ship and probably the cargo as well.¹⁵⁰ The flexible ribs and bast cord or withy lashings flexed rather than broke under the strain of this maneuver. Only the most skilled seamen could attempt such an operation.¹⁵¹ If the vessel was turned abeam to face a wave then it would capsize while running through surf under sail. The ship might also slew around when running before the wind which would result in the boat's head running to windward. This condition could cause the vessel to be knocked down or end up on its beam-ends.¹⁵² In other cases it was possible for a Viking age ship to drop a sea anchor from the stem in order to keep the bow of the vessel pointing into the wind and the whole ship stationary because winds would have been too strong to hoist any sail.¹⁵³

3.11 Planning

Viking age ships have been described by some as the fastest sailing ships that have ever sailed the ocean but others such as Haasum have tried to downplay the speed and handling of the Viking ships. When raising the question of just how fast Viking ships were it is worth examining the planning maneuver to see whether it is the source of the high speed characteristics of the Viking age ships. To plane "a term used to describe the action of a boat which attains sufficient speed to cause the forward part of the hull to rise

¹⁴⁹ Pálsson and Edwards 1976 152 "Late one day, with darkness falling and a strong gale blowing, they suddenly found themselves with breakers both to seaward and ahead, so there was nothing for it but to make straight for the shore, which is what they did, deliberately wrecking the ship when they made land in the Humber estuary. Everyone aboard was saved along with most of the cargo, but the ship was broken to matchwood."

¹⁵⁰ *Orkneyinga Saga* Pálsson and Edwards 1978 157 "On the Wednesday a fierce gale blew up and that night they made landfall. It was dark by then, but they could see breakers on all sides. So far they had been sailing close together and now they had no choice but to sail both ships ashore with the risk of wrecking them, so that is what they did. The place was rock-strewn along a narrow strip of foreshore and sheer cliffs rose above it. All hands were saved but they lost a lot of cargo, though some of it drifted ashore during the night."

¹⁵¹ Marcus 1980 '*Sigla til brots*' Notes Mariners Mirror 36 1955 159-60

¹⁵² Clissold 2000 38

¹⁵³ *Orkneyinga Saga* Pálsson and Edwards 1978 172 "Next they sailed south along the coast of Spain, running into a fierce gale which forced them to lie at anchor for three days. The weather was so rough they came near to wrecking their ships, and the Earl made this verse. '*While ship-stays don't snap, no storm strains me, lady not while leathery anchor-line lasts out.*'"

and for the boat then to run along the surface of the water. In order to start planning the hull must be of a suitable form and very light in weight in relation to its sail area or power available.”¹⁵⁴ Planning is the source of the high speed attributed to Viking ships.¹⁵⁵

3.12 Merchant Crew Shiphandling Tasks

Trade was the purpose of most merchant voyages during the Viking age. In simple terms merchants transported goods that were available in one place and in demand in another. The best cargo’s were high value and low volume products like furs¹⁵⁶ but bulk goods were also traded. These included items like flour¹⁵⁷, honey, and timber¹⁵⁸ that were traded in larger quantities towards the end of the Viking age. Olwyn Owen points out that much of the Vikings trade took place at informally agreed upon beach markets but there were exceptions. For example, the town of Kaupang is “the only Norwegian site to qualify as a Viking market place earlier than the eleventh century.”¹⁵⁹ In order to trade they met customers and other merchants at agreed locations that could be as informal as a beach on a headland or a purpose built large port like Dorestad in Frisia. As the following example makes clear some of these trading sites were unpleasant, dull, and muddy. These were conditions which made a young merchant miss the sea.¹⁶⁰ Merchants, who were sometimes Vikings themselves, could also face piratical threats from Vikings that could cost them their ship, their cargo, and sometimes their lives.¹⁶¹

¹⁵⁴ Kemp 1976 652

¹⁵⁵ Binns 1993 578-580

¹⁵⁶ *Egil’s Saga* Pálsson and Edwards 1976 50 “The biggest cargo-ship in the whole of Halogaland was loaded at Sandness in the spring, and Thorolf claimed the entire cargo, nearly a full load of furs it was carrying, I think, with more beaver and sable pelts than

¹⁵⁷ *Egils’s Saga* Pálsson and Edwards 1976 165 “So King Athelstan gave Egil a fine trading ship and loaded it with a cargo of flour, honey, and plenty of other valuable things.”

¹⁵⁸ *Egil’s Saga* Pálsson and Edwards 1976 142 “While they’d been at the assembly, Egil’s wife Asgerd had been staying with Arinbjorn, who gave Egil a fine ocean going ship and had it loaded with a cargo of timber.”

¹⁵⁹ Owen 1999 26-27

¹⁶⁰ *Orkneyinga Saga* Pálsson and Edwards 178 109-110 “When Kali was fifteen he went in the company of traders westward to England, with valuable merchandise aboard, and they sailed to a town called Grimsby. There was a large gathering of people there from Orkney, Scotland, and the Hebrides. After that Kali went back east in the same ship. The made landfall at Agder, then sailed north to Bergen, where Kali made this verse: *Five weeks we’ve waded through wetness and filth, mud wasn’t missing in the middle of Grimsby: now our spirits are soaring as our fine ship skims, in bow bounds, an elk of the billows, to Bergen.* When they reached the town there was quite a gathering of people there from the north and south of the country, and many too from overseas, bringing all sorts of good things with them. So it went on for several years, with Kali going on trading trips in the summer and wintering at home or with his kinsman Solmund.”

¹⁶¹ *Orkneyinga Saga* Pálsson and Edwards 1978 215 “Next they (a Viking ship) sailed to Ireland and started plundering there. On their way south towards Dublin they came across two merchant ships in route from

The tasks required to run the ship, the leadership of the captain, the quality of orders given by the captain, and the methods sharing of tasks were shared all influenced the structure and effectiveness of merchant crew structures. A crew structures was organized so that each crewmember had a specific task to accomplish. On a merchant vessel task distribution was influenced by the fact that both the captain and crew were likely to have been owners or part owners of a ship. Shared ownership meant tha Viking ships work was divided more or less equally among crewmembers through a system of task rotation. It is uncertain whether the captain participated in the task rotation system because of his ongoing duty of directing the ship. Very little of the details of shipboard life were written down during the Viking age but there are later references to tasks necessary to operate a Hebridean Galley. During the late 19th century a Dr. Nicholson translated a poem called *The Gael* from Scots into English. The Hebridean Galley survived in the Hebrides into the 16th century as a useful ship and was descended from the Viking longships.

The Gael describes a voyage by highland warriors from south Uist to the sea and to another Hebridean Island. The sequence of seafaring begins with a blessing of the ship and then the armor of the crewmembers. This is followed by a song meant to encourage the crew to row quickly to the place where they could raise the sail. One of the crewmen, the fore-oar man, led the crew in a boat song that set the rowing pace and contributed to the rhythm and motivation of the crew. Upon reaching the sailing point they raised their sails and the change from rowing galley to sailing ship began. Each member of the crew had a position in the ship. The helmsman moved to his aft position before the others, suggesting that his work was especially important.¹⁶²

A crewman then moved to his task of managing the rigging. He was ready to lower the yard arm when the wind became strong enough to damage the sail and tackle. Next, a clever and handy man took charge of the sheet to let out the sheet or haul it as need be. In concert with sheet man another member of the crew controlled the foresheet by raising and lowering the sail and securing it with a belaying pin on the windward side

England loaded with a very valuable cargo of English broadcloth. Svein made for the ships and challenged them, but they offered little resistance, and Sveing and his men robbed them of every penny they had. The only things they left the English were the clothes they wore and some food and after that they rowed away.

¹⁶² *The Gael* Nicolson in MacAulay 1997 75-87

of the galley. When bad weather threatened a lookout man took up responsibility to keep an eye on any dangerous developments east, west, north and south of the vessel. This was done from the bow of the ship. He was also responsible for keeping an eye out for landmarks that would help the helmsman steer the ship on its rightful course. Another man needed to take responsibility for the halyards shortening the sail when winds rose, adjusting the sail with a slipknot tightening or loosening the halyard as necessary. In particularly bad weather a teller of the waters, seated next to the helmsman, whose responsibility it was to tell the helmsman where the squalls and showers were coming from and whether the squall was coming before or after the rain. The teller of the waters required the quality of timidity but not cowardice combined with sharp eyes to predict any dangers from winds or breakers. It was important that he remain calm, avoid panic, and convey clear words of description to the helmsman.¹⁶³

Wooden ships often have leaks so a man of tireless energy and determination was required to keep the hull dry as a bailer. In extreme weather two men were commanded to haul the backstays in case the sails were being torn away by fierce winds. They remained vigilant watching the strain on the back sail ropes ready to spring into action and loosen the pressure on the ropes. As there was the danger of crewmembers washing overboard six men were placed in reserve, ready to replace any missing men.¹⁶⁴

The poem emphasizes the importance of devoted teamwork to make the voyage safe: each man (a hero in the poem) carried out his work quickly and without fear. The crew raised the sail after everyone was in their assigned place and fought their way across the rough water to their destination. The poem is the clearest description available of the work of a whole crew on ship that was similar to the vessels of the Vikings. Of course the Hebridean Galley was a longship capable of rowing and sailing under its own power so that it is not as useful for describing the tasks required to run a *knarr*, which was a sailing ship without recourse to oars.¹⁶⁵

Merchant seafaring of the Viking Age may be divided into two periods: Early Viking Period and the Late Viking Period. During the early Viking period both trading, raiding and seabattles were generally conducted in general purpose type vessels like the

¹⁶³ MacAulay 97 89-95

¹⁶⁴ MacAulay 97 97-99

Oseberg and Gokstad ship as well as specialized merchant ships.¹⁶⁶ As Scandinavian countries became unified kingdoms and slowly integrated into the economic and cultural life of Europe demands for ships with heavier carrying capacity developed and ships became more specialized. This progression can be seen from the Oseberg ship, first general type sailing vessel in Scandinavia, 834 AD, to Gokstad an improved version of the general type vessel (date), to Skuldelev 1 1040 AD, a ship with only three pairs of oars reliant upon sail with a deeper hull with a greater cargo carrying capacity than Gokstad. Ships like Skuldelev 1 were used for bulk trade, settling the Atlantic Islands, and keeping up trade links between Norse communities in the Baltic, Irish sea, North Sea, and the North Atlantic.¹⁶⁷ Even this *knärr* (Skuldelev 1) was eclipsed by the higher sided and greater capacity *kögg* with the rise of the Hanseatic League. The ships are important to the discussion of crew structures because the ship type determined the number of crewmembers and the tasks that they had to carry out on a voyage.

Merchant ships were managed by a *styrimaðr*¹⁶⁸, one that leads the way.¹⁶⁹ In some of the saga sources the captain consulted the crew at the mast in order to make important decisions.¹⁷⁰ In Ohthere and Wulfstan's account of their voyages the authority of the captain appears less consensual as there is almost no mention of the crew and both men seem to be uncompromisingly both owner and commander. There is no mention of shared decision making or shared cargo. Ohthere took charge of the ship's course and the search for walrus skins and tusks with no apparent reference to consulting the crew.¹⁷¹ In

¹⁶⁵ MacAulay 97 99

¹⁶⁶ Andersen 1993 653

¹⁶⁷ Bill 97 189-190

¹⁶⁸ Shetelig, Falk, and Gordon 1937 348

¹⁶⁹ Falk, Shetelig, and Gordon 1937 348

¹⁷⁰ *The Saga of the People of Laxdæla* Hreinsson 96 370 "Eyjolf and Thorgeir Hofleysa bought a ship in Norway and set out for Iceland as soon as they were ready to sail. They were tossed about at sea for quite some time and finally arrived at Borgarfjord late that autumn, but were divided in opinion as to where to put ashore. Eyjolf wanted to let the ship drift and see whether the winds might carry them past the glacier and on to Dagverðarnes. They went to the mast and asked how many of the crew were in favour of sailing towards land and how many wanted to let the ship drift, and since the men were tired of being at sea the majority elected to sail towards land. The foster-brothers were so angry that they went for their weapons, but the crew made sure that they did not fight. Then they sailed toward Straumfjord."

¹⁷¹ *Two Voyagers at the Court of King Alfred* Lund 1984 18

"Ohthere told his lord, King Alfred, that he lived the furthest north of all Norwegians. He told how he once wished to find out how far the land extended due north or whether anyone lived to the north of the unpopulated area. He went due north along the coast keeping the uninhabited land to starboard and the open sea to port continuously for three days." 19-20 "His main reason for going there, apart from exploring

the account of Ohthere's voyage he had a small crew of five men who are mentioned casually when references to bringing tusks to King Alfred are mentioned. The crews total is mentioned in a reference to whale hunting, as a total of six.¹⁷² The captain's approach was more egalitarian than that found on a warship for the following reasons. It seems likely that the captain selected the members of the crew personally.¹⁷³ Since nearly all crewmen were likely to own a portion of the cargo which is suggested by the frequent descriptions of cargo ownership found in the sagas of the Icelanders and other sources he was expected to consult the crew before making important decisions.¹⁷⁴

3.13 Life Aboard Ship

On a merchant ship the following tasks had to be performed: tending the helm, giving orders to the crew to tell them what tasks to accomplish, managing the sail through the yard arm ropes, bailing, repairing, cleaning and storing equipment, keeping watch, and rowing.¹⁷⁵ According to Falk all of this work was shared in a rotating schedule which kept the ship working in harmony. In order to consult the crew on important decisions or to give orders the captain gathered the crew at the mast.¹⁷⁶ For that matter

the land, was for the walrus, because they have very fine ivory in their tusks-they brought some of these tusks to the king and their hide is very good for ship rope."

¹⁷² *Two Voyagers at the Court of King Alfred* Lund 84 20 "The best whale-hunting is in his own country; those are forty-eight ells long, the biggest fifty ells long; of these he said that he, on of six, killed sixty in two days."

¹⁷³ *The Saga of Erik the Red* Hreinsson 1996 25 "Thorstein Eiriksson now wished to sail to Vinland to retrieve his brother Thorvald's body and made the same ship ready once more. He selected his companions for their strength and size, taking with him twenty-five men and his wife Gudrid. Once they had made ready, they set sail and were out of sight of land."

¹⁷⁴ *The Saga of the People of Laxdæla* Hreinsson 1996 19-20 "Olaf boarded his ship and they sailed out to sea. They had poor winds during the summer, the breezes light and blowing from the wrong direction, and spells of thick fog. They drifted long distances at sea. Most of the men on board soon lost their sense of direction. Eventually the fog lifted and a wind came up. The sail was hoisted and a discussion began on which direction to take to head to Ireland. There was no agreement among the men on the question: Orn (the captain) was of one opinion but most of the men were opposed and declared that Orn was wrong and that the majority should determine their course.

The question was put to Olaf, who said, "Let the man of best judgement determine our course; the counsel of fools is the more misguided the more of them there are."

The question was considered decided by Olaf's words, and from then on Orn decided on their course.

¹⁷⁵ Shetleig, Falk, Gordon 37 348

¹⁷⁶ Falk, Shetelig, Gordon 1937 348

any important matter that concerned the mission of the ship or the affairs of the crew was announced at the mast.¹⁷⁷

The importance of this shared system is shown in *Grettir's Saga* during an incident where Grettir hides under the ship's boat refusing to bail, tend the sail, or anything else that he was supposed to do towards the proper running of the ship. After Grettir refuses to buy himself out of his work the captain intervenes by conveying the anger of the crew suggesting that if Grettir does not start working the crew will throw him overboard. Even after this Grettir refuses to cooperate, and makes matters worse by hurling scaldic taunts at the crew from underneath the ship's boat.¹⁷⁸ Taunts are exchanged between Grettir and another crewmember called Hafliði whose remarks finally convince Grettir to do his duty in bailing.¹⁷⁹

Bailing was one of the most important tasks on the ship because the flexibility of the ship's hull eased the stresses of the waves but allowed for more leaks. Thankfully, Viking ships were low sided so that water could be carried out in buckets. In later larger merchant ships of the medieval period the water was expelled in tubs raised with a spar; in the bilge the bucket was filled and another man dumped the bucket over the side from the deck. On Viking ships two buckets were used; usually one man filled the bucket and the other dumped it over the side.¹⁸⁰ On land this procedure was much easier because

¹⁷⁷ *Landnámabok* 1972 90 “197. Crow-Herder There was a man called Crow-Herder, the son of Offing Dangle-Beard, son of Oxen-Thornier. Herder and his father got their ship ready and sailed for Iceland. When they made landfall Herder *went up to the mast* and said he wasn't going to throw his high seat pillars overboard as he thought it a stupid way to make one's decisions. Instead he would ask for Throe's guidance on where to settle, and that if it was settled there already, he was ready to fight for the land.”

¹⁷⁸ *Grettir's Saga* Fox, Denton, and Hermann Pálsson 1974 32 “The ship was leaky and ill suited for running before the wind, and the crew became worn out by the cold and the wet. Grettir flung his lampoons about, which infuriated the others. One day the weather was cold and stormy, and the men called out asking Grettir to be of some use, ‘for our fingers are numb with cold.’ Grettir looked up and said: *A lucky thing, If every finger, Of all these numbskulls, Is numbed to death.*”

¹⁷⁹ *Grettir's Saga* Fox and Pálsson 74 34 Hafliði “*Get out of your cosy corner! The ships keeps on ploughing, A deep furrow through the sea, As you brag to the woman. Now she'd basted up your sleeves, For comfort, and she's like you, to be brave for once, While there's no land in sight.* Grettir stood up at once and said: *The ship pitches hard, But I will stand up, I know the woman will grieve, If I lie here idle. She, chaste and fair, Will take it badly, If I let others do my duty.* 34

¹⁸⁰ *Grettir's Saga* Fox and Pálsson 74 35 “At that time there were no pumps in ships, but the crew had to bail with casks or tubs; it was a wet and exhausting job. Two buckets were used, and one was carried down while the other was being carried up. The men asked Grettir to fill the buckets for him, but before long they were completely exhausted. Then four men took over, and the same happened to them. Some people say that eight men were bailing against him in the end, and the ship was made dry.”

Viking ships were pulled up on a beach stern first and a plug in the bow was removed allowing the water to drain out.¹⁸¹

Watches were another important part of crew tasks. Particularly on coastal journeys in Norway, constant vigilance was necessary to avoid hitting skerries or being surprised by pirates. The latter problem sank Grettir' ship which may be partially explained by the discipline problems that were happening a board ship which may have distracted the lookout and led to a collision with a rock.¹⁸² A man chosen for the watch had to be quick spoken and observant. In order to be able to keep careful track of the movements of the ship the watchman placed himself in the prow of the ship during his watch.¹⁸³

Cooking responsibility was also shared on board but crews usually had only hot meals when they sailed near land and stopped for the night because there was not a fireplace on board ship.¹⁸⁴ However, 19th century Norwegian sailors had small cook fires on their ships, so that it is conceivable that the Vikings used them as well.¹⁸⁵ Falk suggests that ships food included: gruel (a mash of oats, meal, and butter), dried fish, and bread if supplies were available. This supports the idea that shipboard food was uncooked. Drinking water stored in casks, with smaller amounts of whey or beer kept the crew from thirst. It is thought that when ships stopped for the night they would cook shipboard rations or roast whatever local animals they found; these were called strange cattle, *strandhögg*.¹⁸⁶ This custom is reflected in the *Older Law of the Frostathing* in this

¹⁸¹ Falk, Shetelig, Gordon, 37 348

¹⁸² *Grettir's Saga* Fox and Pálsson 74 "Afterwards they drifted eastward, and a dense fog came on, until one night without warning the ship ran on to a rock, so that the lower part of the prow broke off. They put out the ship's boat and rescued the women and all the loose goods. There was a small island near by, and during the night they ferried there as much as they could of their belongings." 35

¹⁸³ Falk, Shetelig, Gordon, 37 349

¹⁸⁴ *Eygrbyggja* Pálsson, Hermann an Edwards 1973 35-36 "That same summer Thorleif Kimbi arranged for his passage with some traders who were getting their ship ready in Straum Fjord, and their leaders invited him to take meals with them. In those days it was'nt usual for traders to have cooks aboard, but all those who shared a table used to cast lots from day to day to decide which of them should do the cooking. There was a common supply of water for the whole crew from a cask with a lid on it, which stood near the mast. Extra water was kept in barrels and emptied into the cask as the water there was used up."¹⁸⁴

¹⁸⁵ Crumlin-Pedersen 1984 207

¹⁸⁶ *Eygrbyggja Saga* Pálsson and Edwards 73 They had a good passage, and after they made landfall in Hordaland, they sailed up to a rocky island and went ashore to cook a meal. It was Thorleif's turn to do the cooking, and he was supposed to make porridge. Arnbjorn was already ashore, cooking porridge for himself in the pot that Thorleif was to use after him. Thorleif went ashore and told Arnbjorn to give him the pot, but the porridge wasn't quite ready, and Arnbjorn stirred away, refusing to budge. The Norwegians on

case for the resupply of levy fleets except that in this case they had to pay for what they ate, "If the men of the coast defense in sailing homeward find themselves in need of provisions, they may kill with impunity two head of a farmer's cattle, each to the value of one cow; and let them leave behind the head and the hide and two oras of silver in current coin."¹⁸⁷ The shipmaster was not responsible for supplying the crew with food.

Crewmembers were divided into groups of two or three men who pooled their resources together to supply food for their journey, a relationship called *motunautar*.¹⁸⁸

As Viking ships are open boats and they tended to operate in relatively cold waters, sleeping accommodations were limited and sometimes unpleasant due to weather. It is likely that most Viking seafarers owned a sleeping bag.¹⁸⁹ Most ships stopped at night when they could to cook a hot meal and to sleep at anchor in sleeping bags under a ship tent or in tents on the shore.¹⁹⁰ However, Wulfstan's describes sailing continuously for seven nights so it seems that non-stop voyages were made.¹⁹¹ It is thought that the crew spent the night under the deck or under the sky. There is some space under the deck planks of the Gokstad ship. When the ship was lying at anchor a canvas covering was put up over the whole deck or part of the deck depending upon circumstances. Upper right fore and aft supports called stanchions¹⁹² held the pole and canvas. Additional support for the long pole and stanchions by two planks from the port and starboard sides that were secured in holes to the gunwale. It is thought that some cabins existed on some ships but

board started shouting at Thorleif, telling him to get on with the cooking. They said he was just like all the other Icelanders, far too slow at everything. Thorleif got into a temper, grabbed the pot and flung it down, spilling Arnbjorn's porridge and burnt Thorleif's neck.

¹⁸⁷ *The Older Law of the Frostathing* Larson 1935 322

¹⁸⁸ Falk, Shetelig, Gordon 37 349 Falk suggests that *motunautar* became in modified form the word for sailor in several languages: Dutch: matroos, French: matelot, and English: messmate. This means that the more modern term "mate" probably has seafaring and Norse origins.

¹⁸⁹ *The Saga of the People of Laxdæla* Hreinnsson 96 "At that very moment, the wind that had been blowing inland for so long suddenly dropped. Ingolf had their *leather sleeping sacks* taken onto the ship and all of them hurried aboard." 353 vol 1 *Orkneyinga* Pálsson and Edwards 1978 137 "We'll spread out our sleeping bags. Twenty of you are to get in them while the other ten row."

¹⁹⁰ *Two Voyagers At the Court of King Alfred* Lund 1984 21

"In the south part of Norway there is a trading town called *Sciringes heal*. He said that a man could scarcely sail there in a month, assuming he made camp at night, each day had a favorable wind. He would sail by the coast the whole way." 18 "He went due north along the coast, keeping the uninhabited land to starboard and the open sea to port continuously for three days."

¹⁹¹ *Two Voyagers at the Court of King Alfred* Lund 84 22 "Wulfstan said that he traveled from Hedeby, arriving in Truso after seven days and nights, the boat running under sail the whole way."

¹⁹² Kemp 1976 828

there is little supporting evidence except for the burial chamber on the Oseberg ship and excerpts from sagas and poems.¹⁹³ It is unclear whether the captain had his own sleeping arrangements but if he did that would be an early indicator of the development of physical and social division of officers and crew.¹⁹⁴

The continuity of the number of rowers on Scandinavian warships over time is an identifiable theme. Unlike warships the merchant ships abandoned a reliance in the Viking age on oars, making do with a few in order to maneuver in harbor, to become primarily sailed vessels which reduced the number of crewmembers required. This change can be seen in the difference between the Gokstad ship (16 pairs of oars), which could be considered a general vessel of the Viking Period and Skuldelev 1 a vessel with roughly four pairs of oars. Ellmers points out the continuity of crew structures on board Scandinavian ships from prehistory to the church boats of 19th century Scandinavia. He shows that on rock carvings of the bronze age boats similar in shape to the pronged prowed Hjortspring boat are shown with 16 paddlers, the Nydam vessel had 16 rowers, the Oseberg ship 15 rowers, and the Gokstad ship 16 rowers. This continuity comes to an end with the development of the Skuldelev 1; it is clear, with the absence of many oar ports that there was a dramatic reduction in crew size with the development of this ship type.

¹⁹³ Falk, Shetelig, Gordon 37 349 According to Falk it is thought that the old Norse term *avenge* is associated with the Norwegian word *Venn* where in some parts of Norway it means the aft cabin of the ship that could be erected or removed according to need. 349

¹⁹⁴ Falk, Shetelig, Gordon 1937 349 The word is *viða* which means mast and was used as an abbreviation of *viðhús*.

Chapter 4 Captains and Crews

4.0 Introduction

All ships require a captain and crew in order to function properly as a medium of transportation. A crew structure may be defined as the management through which authority is organized in order to accomplish the tasks that make a successful sea-voyage possible. The captain provides planning, management, and decision-making, and the crew executes necessary tasks with varying degrees of influence upon the decision making process.¹⁹⁵ This is true in both merchant ships and warships. The ship made the Viking Age possible “hull, mast, and sail, and starboard rudder, finally have merged into one, into a well tuned little orchestra where every voice is part of the united harmony. The hull, built of the thinnest planks over a skeleton of frame-timbers, makes of the ship a perfectly elastic instrument at sea.”¹⁹⁶ but the little symphony was only possible with captain and crew to provide the guiding hands of conductor and orchestra.

Without the ships and their crews there would not have been a Viking Age. In light of the importance of the ship in the Viking age much has been written about the ships themselves. This is particularly true about the important archaeological ship remains such as Gokstad¹⁹⁷, Oseberg¹⁹⁸, and the Skuldelev¹⁹⁹ finds. The ships and their potential performance have been carefully analyzed but amidst this research the crews and the captains have been mostly overlooked. Examining the concrete remains of vessels is a clearer challenge than trying to conjure up the spirit and organizational structure of the crews from what is fragmentary evidence. Those will create a picture of the captains and crews on both Viking trading and warships. The evidence includes: scaldic poetry, sagas of the Icelanders, early Medieval Scandinavian laws, ships, ship fragments and secondary literature. The usefulness of this evidence rests upon the assumption of continuity of crew structures throughout Scandinavian history and Ellmers

¹⁹⁵ *Egil's Saga* Pálsson and Edwards 1976 109 Merchant example, “They put it to the rest of the crew, asking whether or not they should make a landing, and got a mixed reception. Some were all for it, others raised objections, so that the matter was referred to the leaders.” Warship example, *Heimskringla* Hollander 1964 “As soon as the king had made this decision all his men concurred with him. They turned their ships about and hoisted their sails.”

The crew told Egil their journey was in his hands, so they hoisted sail and made for Herle Island where they found a good anchorage, set up the awnings and spent the night.”

¹⁹⁶ Brøgger and Shetelig 1971 48

¹⁹⁷ Brøgger and Shetelig 1971 72-103

¹⁹⁸ Christensen et al. 1992 138-153

assertion that “the basic pattern of the discussed crew system remained very stable for more than 3,500 years. But at the same time it remained flexible enough to meet all of the requirements of multipurpose use in peace or in war, for religious festivities or simply for transportation of people, alive or dead.”²⁰⁰

Warship crewmen were known as *skipari* or *háseti*. “On merchant ships the crew was frequently made up of those who had taken passage or were shipping freight on the ship. The oarsmen on a ship of the coast defense were usually called *hásetar*.”²⁰¹ Warship crewmen were part of a ship district or *skipreiða*, “a district, the inhabitants of which had the duty to provide crew and equipment for one ship of the coast defense.”²⁰²

Most crewmen on Viking ships came from the bonder farmer class (*karls*) in Scandinavia; with jarls (or kings) led the Viking fleets. Jarls would also serve as crewmen and usually captain their own ships in battle; however, they were a small group and could never have contributed the bulk of crewmembers.²⁰³ Thralls (slaves) made up the third and lowest class in Viking age society and they generally did not serve on warships and did not go on merchant voyages. There were exceptions, however, because a farmer could send a thrall in his place to serve as a cook on board a levy ship.²⁰⁴

4.1 Merchant Crews

Since the search for material goods and their transport was an important stimulus to seafaring this analysis will begin with the roles of captain and crew on board trading vessels. The captain makes seafaring possible through his organizational abilities that help him to secure a ship, cargo, crew, and destination, the captain begins this process by selecting ship and crew. The *King's Mirror*, suggests when gathering a crew to “keep your ship attractive, for then capable men will join you and it will be well manned.”²⁰⁵ Consequently captains’ had to be knowledgeable about the individual sailor’s point of view. In the poem *the Seafarer*²⁰⁶ the viewpoint of the average crewman is

¹⁹⁹ Crumlin-Pedersen and Olsen 1978 93-128

²⁰⁰ Ellmers 1995 239

²⁰¹ *The Earliest Norwegian Laws* Larson 1935 413

²⁰² *The Earliest Norwegian Laws* Larson 1935 427

²⁰³ Foote and Wilson 1970 65-89, 135

²⁰⁴ *The Older Law of the Gulathing* Larson 1935 191

²⁰⁵ *The King's Mirror* Larson 1917 84

²⁰⁶ Though this is an Anglo-Saxon poem, it was written within the Viking Age and expresses sentiments that were likely shared by his Viking contemporaries as they faced the same hardships and call of the sea.

expressed which goes at least part of the way towards explaining why a man might begin a self-imposed exile as a member of a merchant crew on a long sea-voyage. In this work a sailor conveys his thoughts on the hardship of his life and the barrier of experience between the ways of the landsmen and the sailor.²⁰⁷ He speaks to the isolation that he experiences on his long voyages with only the terns, gulls, and whales to keep him company. The author explains why he returns to the sea despite its hardships and loneliness with his desire to see foreign lands and the promise of opportunity and adventure.²⁰⁸ The forces of nature, rather than an authoritarian captain were the greatest enemies of the sailor. By contrast the experiences of a captain seem very different. Egil, a Viking age captain, appears more concerned about his ship and the responsibilities of command than hardship or isolation. This is expressed in a verse of scaldic poetry that is attributed to him.²⁰⁹ The condition of each ship influences whether individual crewmen would join a vessel.²¹⁰ The number of men and the time required to bail a boat may have been key factors in determining the quality of a ship, which meant that the seaworthiness of a ship.²¹¹ Additionally, the way that a ship was loaded²¹² and how provisions were made for crewmen's cargo determined the quality of a ship.²¹³

The crew structure on merchant ships was less formal than on warships. It is characterized by pragmatic, egalitarian, and consensual decision making which was a

²⁰⁷ *The Seafarer* Crossley-Holland 1994 50 "I have often endured a time of hardship, how I have harbored bitter sorrow in my heart and often learned that ships are homes of sadness. Wild were the waves when I often took my turn, the arduous night watch, standing at the prow while the boat tossed near the rocks. He who lives most prosperously on land does not understand how I, careworn and cut off from my kinsmen, have as an exile endured a winter on the icy sea."

²⁰⁸ *The Seafarer* Crossley-Holland 1994

²⁰⁹ *Egil's Saga* Pálsson and Edwards 1976 154 "Headlong I came, hard tacking, My ocean horse, Eagerly to King Eirik, On England's Isle"

²¹⁰ This passage shows how Thorolf, a captain from *Egil's Saga*, took great care to make his vessel presentable. *Egil's Saga* Pálsson and Edwards 1976 49 "Thorolf had a big, ocean going ship. Great pains had been taken over it. It was richly painted above the sea line, the rigging was of the highest quality, and it had a blue and red striped sail."

²¹¹ *The Older Law of the Frostathing* Larson 1935 310

²¹² A ship that was not being loaded properly was probably avoided by seamen who sailed only with the best ships. *Njál's Saga* Hollander 1998 25 "Thorvald was busy loading the skiff and his men were carrying the goods down to him. At this moment Thjóstoff came up, jumped on the skiff, and began to help with the loading. Then he said: 'You don't have the necessary strength for this work, and besides you don't know how to load anyway!'"

²¹³ *The Older Law of the Gulathing* Larson 1935 125 "Now if the ship is loaded too heavily, the owner shall return his own wares [to the shore] and those who have taken passage shall have the necessary room. If they [still] think it unseaworthy, those who took passage last shall remove their effects, and each one shall have six oras for breach of contract."

disadvantage if merchants were forced to fight a sea battle.²¹⁴ However, there were exceptions to this consensual arrangement, particularly when the captain owned all of the cargo and chose his crew from his household staff.²¹⁵ The key positions on a ocean going merchant vessel included the *stýrimaðr* (captain or skipper) and a *stafnbói*(stempostman) that could include up to four men on larger vessels. The bulk of the crew tended the sail and managed the oars and a bailer handled the removal of water. Additional crewmembers were required if a captain did not know the waters of a particular area. If one was available captains occasionally employed a pilot who became a temporary member of the crew.²¹⁶ The relationships between these men were organized around problem solving in order to accomplish necessary tasks on board in a manner that shared the work equally.²¹⁷ The work was done in an egalitarian way because of the shared ownership of vessels and cargo by members of the crew. Therefore when important decisions had to be made the crew had to be consulted as owners rather than inferiors.²¹⁸ This equality was also represented by a shared workload, and consequently all members of the crew rotated between tasks,²¹⁹ the only exception being skilled jobs that only some

²¹⁴ *Njál's Saga* Hollander 1998 161-2 "Now we shall tell about Grím and Helgi, the sons of Njál. They sailed from Iceland the same summer as Thráin and his men. They had taken passage on ship which belonged to Bárð and Ólaf Elda-Ketilsson. They had such stormy winds from the north that they were driven off their course to the south, and they ran into such a dense fog that they did not know where they were going. They saw thirteen ships sailing out toward them. 'What shall we do now?' asked B-rd. 'It looks as though these men were going to attack us!' They took counsel as to whether they should defend themselves or surrender, but before they could make up their minds the Vikings were already upon them."

²¹⁵ *Egil's Saga* Pálsson and Edwards 1976 49 Household staff probably would not have been consulted by their master when he made decisions. "Thorolf had this ship made ready and manned it with his household servants." Cargo follows

²¹⁶ *Njál's Saga* Hollander 1998 159 "The earl's son Eirík assisted them, examining both the crew and the supply of arms and making such changes as he thought necessary. When they were ready to sail Eirík procured a pilot for them. They then sailed south along the coast." *Egil's Saga* Pálsson and Edwards 1976 140

²¹⁷ The following is an example of the type of trading voyage that was probably common during the Viking age. *Egil's Saga* Pálsson and Edwards 1976 49-50 "[Thorolf] He put Thorgils Gjallandi in charge of the ship and told him to sail it west to England to buy cloth and other commodities that he needed. They sailed the ship south along the coast, then out into the open sea, an landed in England where they did good business. They loaded their ship with flour and honey, wine and cloth, and sailed back home in the autumn. They had a favorable wind and put in at Hordaland."

²¹⁸ *Heimskringla* Hollander 1998 180 *Eyrbyggja Saga* Pálsson and Edwards 1972 49 "That summer a ship from overseas put in at Salteyarar Mouth. Some Norwegians owned a half-share in it, and their captain Bjorn went to stay the winter with Steinthor of Eyr. The other share belonged to a group of Hebrideans, and their captain, Alfgeir, went to Mavahlid and stayed with Thorarin the Black."

²¹⁹ *Eyrbyggja Saga* Pálsson and Edwards 1972 103

members of the crew were qualified to do such as skipper²²⁰ or lookout. The shared nature of profit and opportunity on board Viking Age merchant ships is one factor that contributed to the trading dynamism, energy, and entrepreneurial spirit of the Viking Age.²²¹ Crew arrangements, ownership, and protocol were shared throughout the Viking world because of the mobility of Viking ships and the regularity of travel and trade on Viking trading routes such as the 1,000 miles of open ocean between Faroe and Greenland.²²² It is quite possible that some members of the crew of a ship on the Greenland trade route might have had experience in the Irish Sea, the Baltic, and the rivers of Russia because trading ships and sailors were some of the most mobile objects and men of the Viking age.

4.2 Warship Crews

The relationship between the *stýrimaðr* (shipmaster) and the crew on warships was more formal and authoritarian than that found on merchant ships particularly since ship captains were appointed directly by the king and as such shared a measure of his authority as much as a ship captain represented the authority of the king.²²³ However, it was not beneath the warship captain to take a turn at the oars when this was necessary.²²⁴ The *stýrimaðr* (shipmaster) selected the members of the crew. According to law unmarried men were selected first and when the supply of these men in a district was exhausted the farmers with their own workers filled out the roster.²²⁵ If none of these men were available then every two of three farmers would join the levy and the third would

²²⁰ Sailors on Viking ships supplied their own food and when someone's food ran out mateship had its limits. A captain had to be able to act to defuse an explosive situation between members of the crew. This is an example of the kind of quick thinking and decisive ability that only a skipper would have. *Njál's Saga* Hollander 1998 "Hrapp's supply of food ran out on the journey, and so he helped himself to the food of those who sat nearest to him. They jumped up and cursed him, and the result was that they came to blows, and in almost no time Hrapp had two of them down. This was reported to Kolbein [the captain] He then invited Hrapp to share his food and he accepted."

²²¹ *Grænlendinga Saga* Pálsson and Edwards 1965 "In the end he [Karlsefni] decided to sail and gathered a company of sixty men and five women. He made an agreement with his crew that everyone should share equally in whatever profits the expedition might yield."

²²² Marcus 1980 96

²²³ *The Older Law of the Gulathing* Larson 1935 190 "The man whom the king appoints shall command the ship."

²²⁴ *The Saga of the Jomsvikings* Hollander 1955 103 "At that time Sigvaldi [a warship captain] was drawing back from the fleet. Sigvaldi had become chilled, so he took to the oars and rowed while another man steered."

²²⁵ *The Older Law of the Gulathing* Larson 1935 190-1

remain to look after his and the others farms.²²⁶ Viking raiders made sure that the crew that they selected was a fighting crew that was not content simply with trading.²²⁷ Perhaps, earlier in the Viking Age the crew was selected by a local chieftain who was the leader of a *lið*.²²⁸

Men's roles on a warship included a *stýrimaðr*, one or more stempostmen²²⁹, bailers, the sailor/oarsmen and the addition of a cook who was a slave (thrall) given by a karl (yeomen farmer).²³⁰ It is also likely that Viking ships had men assigned to watch at anchor²³¹ and at sea but it is not clear exactly how the watches were arranged. Unlike merchant crews warship crews were not fluid. This meant that their composition did not change greatly over time. For example, a crew came from one area, *fylki*,²³² that supplied a vessel and crew. It is likely that these men knew each other as neighbors and may have helped each other from time to time with farming, fishing, and trading. The men received some benefits for participating in the ship levy for "no man who contributes to the coast defense shall pay harbor dues."²³³ Close association and continuity over time were essential for the crew of a longship because it took years of practice and conditioning to enable a group of men to efficiently row a longship together. Of course, there must have been exceptions to this rule when merchants or Viking raiders used hastily gathered crews to carry out their business. It is likely that even these groups were recruited men from a local area or from the crew of a levy ship. Such a crew would be motivated for more profitable purposes than the defensive service of a king or chieftain.

²²⁶ *The Older Law of the Frostathing* Larson 1935 316

²²⁷ *Laxdæla Saga* Magnusson and Pálsson 1969 89 "Gunnhild now had a ship prepared, and hired a crew, but asked Olaf to decide how many men he would like to take with him on the voyage. Olaf fixed the number at sixty, adding that he thought it imperative to choose men who were more like warriors than merchants."

²²⁸ *The Older Law of the Gulathing* Larson 1935 189-90 "The man whom the king appoints shall command the ship." There is little mention of shared responsibility and no possibility of shared ownership. However, a levy ship was a shared effort because the local men contributed their labor or their money to maintain a levy ship. "When a general levy is called, every seventh man shall be called into service." Larson 1935 189 Failing to pay dues or participate in the crew of a levy ship led the punishment of outlawry. Larson 1935 190

²²⁹ *Njál's Saga* Hollander 1998 12 "Ásolf was the name of Atli's forecandleman. He leaped aboard Hrút's ship and killed four men before Hrút became aware of him and turned on him."

²³⁰ *The Older Law of the Gulathing* Larson 1935 191

²³¹ *Egil's Saga* Pálsson and Edwards 1976 140 "In the morning before it was fully light, the men on watch saw some big ships rowing towards them. As soon as Egil learned about this he got up, and saw very quickly that trouble was on the way."

²³² *The Older Law of the Gulathing* Larson 1935 188-9

²³³ *The Older Law of the Gulathing* Larson 1935 126

The number of men on a ship varied with the size of the vessel, which was measured by the number of benches on the ship. The *Gulathing* and *Frostathing* laws state that the twenty bench ship was the standard for defense fleets, and if this was the most common type of warship, then it may have made up the majority of the ship types on Viking raids as well.²³⁴ Without the required number of crew warships were helpless because they relied upon the strength and skill of a full crew of trained men.²³⁵ The importance of a full crew is shown by the following example. A twenty-bench ship was considered unseaworthy if on a twenty bencher there were at least five empty benches.²³⁶ In a district where there were not enough men to fill a twenty-bench ship then the keel was shortened so that the vessel could carry a full complement.²³⁷ If this was not possible then the men would offer to serve in another ship. Failing that they would provide supplies for other ships by giving food to the local sheriff who would then pass the supplies to those ships that needed them.²³⁸

The captain and the members of the crew had individual responsibility for equipment and supplies that supported a warship from each district. For example, the captain had to bring on board the steering oar and the tiller. This association with the captain shows the importance of this equipment.²³⁹ It is possible that these two items were stored in the captain's own house. All members of the crew were required to bring weapons with them including the captain and they had to supply a bow, string and arrows at each thwart.²⁴⁰ In the *Frostathing Law* an unmarried man's required equipment included: a broadax or sword, a spear, and a shield with a minimum of three small iron plates laid across it with the grip attached on the inner side.²⁴¹ Additionally, each thwart must have had a bow, string, and two dozen shafted or square pointed arrows.²⁴² It was specified that axes and spears must have handles and shafts, so it seems that crews

²³⁴ *The Older Law of the Gulathing* Larson 1935 191

²³⁵ *Egil's Saga* Pálsson and Edwards 1976 141 "While some of the King's men went for the merchant ship, and took everything of value before they set fire to it, others chased after Egil, working hard at the oars, two men to each, for there were plenty of hands on board. Egil's ship was not well crewed, with only eighteen of them in the skiff, so the distance between the two soon started to narrow."

²³⁶ *The Older Law of the Gulathing* Larson 1935 191

²³⁷ *The Older Law of the Gulathing* Larson 1935 192

²³⁸ *The Older Law of the Gulathing* Larson 1935 191

²³⁹ *The Older Law of the Gulathing* Larson 1935 196

²⁴⁰ *Egil's Saga* Pálsson and Edwards 1976 99

²⁴¹ *The Older Law of the Frostathing* Larson 1935 319-20

attempted to overlook this requirement through the use of faulty equipment. The unproductive nature of the defense ships and the fines associated with not providing equipment suggests that there was resistance to the costs of these obligations.²⁴³ This points out the coercive and unprofitable nature of some aspects of warship service that may have meant lower levels of morale and enthusiasm amongst warship crews.

During a battle, crewmembers were assigned particular places where they were supposed to stay and fight during the battle. For example, accounts in *Heimskringla* suggest that crews were divided into three areas during a fight. On Olaf Tryggvason's ship the Long Serpent men were assigned to the forepart of the ship, the middle compartment of the vessel, and in the compartment before the mast.²⁴⁴ Men in each section were selected for different qualities, the men in the forepart of the ship were selected for their strength and fierceness so that they could support the standard bearer who was also the *stafnbú* and bore the brunt of the fighting.

4.3 Viking Captains

By examining some of the experiences of the following captains the qualities of Viking age captains will become clearer. Bjarni Herjolfsson and Leif Eriksson are two captains who exemplify the explorer tradition in Viking Seafaring. Harald Finehair with his victory at Hafrsfjord and Olaf Tryggvason at the battle of Svöld, manifest the heroic qualities and sometimes-foolish tactics of the warship captain.²⁴⁵ Egil Skalla-grimsson personifies the infamous Viking qualities of a raider, although he was involved in merchant ventures as well. Ohthere, the voyager to King Alfred's court, is an example of the geographic knowledge of the merchant captains of the Viking Age. The following paragraphs will provide evidence for these claims.

The account of the voyage of Ohthere is one of the earliest and has been considered one of the more reliable accounts of Viking seafaring. Therefore his performance as captain will be considered first. The account begins with Ohthere describing King Alfred as his lord.²⁴⁶ During the early Viking period mariners had

²⁴² *The Older Law of the Frostathing* Larson 1935 319

²⁴³ *The Older Law of the Frostathing* Larson 1935 319

²⁴⁴ *Heimskringla* Hollander 1964 227

²⁴⁵ Barford 1993 718

²⁴⁶ *Two Voyager's at the Court of King Alfred* Lund 1984 18 "Ohthere told his lord, King Alfred, that he lived the furthest north of all Norwegians."

several possible occupations which included farmer, trader, and raider. On merchant ships there was a lack of distinction between raiding activity and trading activity.²⁴⁷ Viking merchants acted prudently if they were prepared for a fight.²⁴⁸ Like the nineteenth century fishermen of Orkney and Shetland many Vikings played several roles. Instead of fishing and farming Vikings raided and traded during the summer and farmed during the planting and harvesting months.²⁴⁹ When Ohthere presents himself to the king he emphasizes curiosity and commerce as his chief pursuits but it may be that he has tried to hide his raiding activities from King Alfred who was a declared enemy of the Vikings. King Alfred might not have received him at court if Ohthere admitted to and was known for piracy. Curiosity and exploration were certainly important aspects of Ohthere's goals as a captain.²⁵⁰ Curiosity could prove profitable for Ohthere in that while he was exploring new territory he could find sources of walrus and furs.²⁵¹ However this curiosity was gratified only because Ohthere was a risk-taking captain.²⁵² Ohthere prospered because he combined risk taking with patience and foresight. In the first case he waited for the right wind to take him where he wanted to go and foresight because he avoided sailing into settled areas without permission because unwanted mariners could easily be enslaved or killed.²⁵³

²⁴⁷ *Egil's Saga* Pálsson and Edwards 1976 81 "Bjorn Brynjolfsson was a man of outstanding talents and a great seafarer. He divided his time between Viking raids and trading voyages." 44

²⁴⁸ *Njal's Saga* Bayerschmidt and Hollander 1998 8 162

²⁴⁹ *Orkneyinga Saga* Pálsson and Edwards 1978 "This was how Svein used to live. Winter he would spend at home on Gairsay, where he entertained some eighty men at his own expense. His drinking hall was so big, there was nothing in Orkney to compare with it. In the spring he had more than enough to occupy him, with a great deal of seed to sow that he saw carefully himself. Then when that job was done, he would go off plundering in the Hebrides and in Ireland on what he called his 'spring-trip', then back home just after mid-summer, where he stayed till the cornfields had been reaped and the grain safely in. After that he would go off raiding again, and never came back till the first month of winter was ended. This he used to call his 'autumn trip'.

²⁵⁰ *Two Voyager's at the Court of King Alfred* Lund 1984 18 "He told how he once wished to find out how far the land extended due north, or whether anyone lived to the north of the unpopulated area."

²⁵¹ *Two Voyager's at the Court of King Alfred* Lund 1984 19 "His main reason for going there, apart from exploring the land was for walrus."

²⁵² *Two Voyager's at the Court of King Alfred* Lund 1984 18 "He was then as far north as the whale hunters go at their furthest. He then continued due north as far as he could reach in second three days. There the land turned due east, or the sea penetrated the land he did not know which but he knew he waited there for a west-north-west wind, and then sailed east along the coast as far as he could sail in four days."

²⁵³ *Two Voyager's at the Court of King Alfred* Lund 1984 18 "There he had to wait for a due northern wind, because there the land turned due south, or the sea penetrated the land he did not know which." Caution "A great river went up into the land there. They turned up into the river, not daring to sail beyond it without permission, since the land on the far side of the river was fully settled."

As captain he combined a profitable search for walrus skin and tusks with knowledge of the natural world that he needed to hunt.. He describes the geographic distribution of the *Beormas* people with a comparison of their language with the language of the Finns.²⁵⁴ Ohthere shows caution and a surprisingly modern critical approach to the information that he gathered on his travels. As a merchant Ohthere knew a great deal about the behavior of his prey the walrus.²⁵⁵ Ohthere combined many different activities to sustain himself as a chieftain as well as a mariner.²⁵⁶ His wealth in reindeer was supplemented with trading at Sciringes heal and there are clues that he may have supplemented his peaceful activities with Viking raiding or tribute taking. It seems unlikely that the *Finns* would have offered Ohthere tribute unless he was militarily stronger than they would and showed a willingness to use force. Thus Ohthere provides an example of the many skills and trades that early Viking seafarers were required to know in order to prosper.

In contrast, Egil Skalla-Grimson typified the contradictions of the stereotypical Viking captain. He was reckless yet became a wise and cautious judge of the law in Iceland and he was able to peacefully gather information from fishermen.²⁵⁷ He killed savagely²⁵⁸ and without remorse yet also practiced healing and folk wisdom.²⁵⁹ Egil illustrates the versatile, multifaceted, an informal nature of a captain's roles during the Viking age. He sailed merchant *knärrs*, longships, ferrys, and fast skiffs.²⁶⁰ He excelled as a Viking²⁶¹, a mercenary for the king of England, Aethelstan²⁶², a merchant²⁶³, scald to

²⁵⁴ *Two Voyagers at the Court of King Alfred* Lund 1984 19 "The *Beormas* told him many stories both about their own country and the lands which surrounded them, but he did not know how much of it was true because he had not seen it for himself. It seemed to him the *Finns* and the *Beormas* spoke almost the same language."

²⁵⁵ *Two Voyagers at the Court of King Alfred* Lund 1984 20 "The whale (i.e. walrus) is much smaller than other whales, it is no more than seven ells long."

²⁵⁶ *Two Voyagers at the Court of King Alfred* Lund 1984 20

²⁵⁷ *Egil's Saga* Pálsson and Edwards 1976 143

²⁵⁸ *Egil's Saga* Pálsson and Edwards 1976 175 During a duel with Atli the short "Egil leaned over and bit right through his throat, and that was how Atli died." Whether this incident really happened or not is uncertain but it does suggest that Egil had a reputation for savagery in a fight.

²⁵⁹ *Egil's Saga* Pálsson and Edwards 1976 191 "Egil carved some runes and placed them under the pillow of the bed where she was resting, and it seemed to her that she had woken from sleep."

²⁶⁰ *Egil's Saga* Pálsson and Edwards 1976 87, 131, 133, 136

²⁶¹ *Egil's Saga* Pálsson and Edwards 1976 115

²⁶² *Egil's Saga* Pálsson and Edwards 1976 116

²⁶³ *Egil's Saga* Pálsson and Edwards 1976 165

kings, judge, and farmer. His ruthlessness and willpower at an early age made him well suited to the demands of the Viking period.²⁶⁴

Egil was both a cautious shipowner and someone who fell into frequent rages, yet he was always in command of his crew.²⁶⁵ He was calm in a crisis whether he was surviving a shipwreck on the river Humber²⁶⁶ or in the midst of a life or death battle during a Viking raid.²⁶⁷ He was always in charge and decisive and yet he still shared profits and cargoes with others.²⁶⁸ Ultimately, Egil was also a skilled sailor who knew the business of operating and hard tacking a vessel on the sea.²⁶⁹

Bjarni Herjolfsson provides a cautious contrast with the impulsiveness of Egil. After being blown off course traveling from Iceland Bjarni became the first recorded European to spot the American continent. As captain Bjarni was less authoritarian than Egil and there is evidence that he consulted his crew where Egil tended to act expecting others to follow his lead and example.²⁷⁰ However, Bjarni's approach does not mean that he was unable to take decisions for himself because he was able to refuse his crew's request to land in America in order to search for firewood and water.²⁷¹ Bjarni showed his foresight and caution as a captain by not landing in the unknown land that he had discovered. His decision not to land in America made sense because he knew that there

²⁶⁴ *Egil's Saga* Pálsson and Edwards 1976 94 As a child Egil killed a playmate after a quarrel "Egil ran up to him and drove the axe into his head right through to the brain." He composed this verse about himself "My mother wants a price paid, To purchase my proud-oared ship; Standing high in the stern, I'll scour for plunder, The stout Viking-steersman, Of this shining vessel: then home to harbour, after hewing down a man or two."

²⁶⁵ *Egil's Saga* Pálsson and Edwards 1976 144 "The crew told Egil the journey was in his hands, so they hoisted sail and made for Herle island where they found a good anchorage, set up the awnings and spent the night."

²⁶⁶ *Egil's Saga* Pálsson and Edwards 1976 152

²⁶⁷ *Egil's Saga* Pálsson and Edwards 1976 105-8

²⁶⁸ *Egil's Saga* Pálsson and Edwards 1976 144, 147, 152, 163

²⁶⁹ *Egil's Saga* Pálsson and Edwards 1976 154 "Headlong I came, hard-tacking, My ocean horse, Eagerly to King Eirik, On England's isle."

²⁷⁰ *Grænendinga Saga* Pálsson and Edwards 1965 53 In this case they is used to refer decisions made by the ship's crew rather than referring to Bjarni himself "Then the fair wind failed and northerly winds and fog set in, and for many days they had no idea what their course was. After that they saw the sun again and were able to get their bearings; they hoisted sail and after a day's sail they sighted land." Here Bjarni discusses what to do next with the crew. "They discussed amongst themselves what country this might be. Bjarni said he thought it could not be Greenland. The crew asked him if he wanted to land there or not; Bjarni replied, 'I think we should sail in close.'

²⁷¹ *Grænendinga Saga* Pálsson and Edwards 1965 53 "They closed the land quickly and saw that it was flat and wooded. Then the wind failed and the crew said that they thought it was advisable to land there, but Bjarni refused. They claimed they needed both firewood and water; but Bjarni said, 'You have no shortage of either.' He was criticized for this by his men."

would be little return for such a risk and a great possibility of danger or mishap. Bjarni epitomized prudence and economy of action as a merchant captain. He proved this through his retirement to a farm in Greenland after his voyage to America because he had earned the money that he required.²⁷² Bolder men followed Bjarni because the knowledge of the new land quickly spread in Greenland. Bjarni was severely criticized by the community in Greenland for not having enough curiosity especially since he could tell them nothing about the new land.²⁷³ Yet still Bjarni's decision to sail from Iceland on the Greenland Sea, (a decision considered foolhardy by many in his community because he and his crew had never sailed it before), qualifies him as bold explorer.²⁷⁴

As Bjarni personified foresight his decision not to land in America foreshadowed the trouble that future Viking explorers would have with the existing American population.²⁷⁵ In contrast to Bjarni, Leif Eiríksson was a model of bold risk taking in exploration. Leif knew the risks of exploration because his own father, Eirik the Red had discovered Greenland, the land in which he lived. Leif knew the risks of such voyages because of 25 ships that sailed with Eirik from Breidafjord in Iceland to Borgarfjord in Greenland only 14 arrived, some sank and others turned back.²⁷⁶

Leif Eiríksson, known as Leif the Lucky,²⁷⁷ earned his fame by being the first European to explore America and by rescuing a group of men who had been shipwrecked.²⁷⁸ Upon learning of rumors of new land west of his home in Greenland from Eirik and Bjarni, Leif quickly organized an expedition to explore it. He was clearly in command of this expedition as it was he who made the decisions about where to land. He also named the three areas he explored Helluland, Markland, and Vínland. The latter is derived from *Grænlandinga Saga*. However, in *Eirik's Saga* there is a captain called Karlsefni who does the naming. Leif set foot in North America in Helluland the first area of rocky land that he discovered. On his voyages he expressed interest in the natural resources of the land he found and made observations concerning the difference in the

²⁷² *Grænlandinga Saga* Pálsson and Edwards 1965 54 After his return from America "Bjarni now gave up and stayed with his father, and carried on farming there after his father's death."

²⁷³ *Grænlandinga Saga* Pálsson and Edwards 1965 54

²⁷⁴ *Grænlandinga Saga* Pálsson and Edwards 1965 52

²⁷⁵ *Eirik's Saga* Pálsson and Edwards 1965 99-101

²⁷⁶ *Grænlandinga Saga* Pálsson and Edwards 1965 50-1

²⁷⁷ *Grænlandinga Saga* Pálsson and Edwards 1965 59

²⁷⁸ *Grænlandinga Saga* Pálsson and Edwards 1965 53,58,59

amount of daylight that he observed in the new land. He showed resourcefulness in Vinland when he managed to return home with new knowledge, his whole crew, and some cargo as well.

Leif is described as being tall, strong, and very impressive looking. He may well have been more authoritarian in his leadership style as there are few references to his consulting the crew. He is usually seen ordering the crew to two groups, one to explore the area of Vinland and the other to remain building the settlement. Once grapes and self-sown wheat were discovered, Leif ordered his men to gather grapes and to cut vines on alternate days as well as trees as cargo for his ship with no hope of profit for his crew.²⁷⁹ Leif kept his crew firmly together, accomplished his goals of exploration, rescued shipwrecked sailors, and even made the profit of a cargo of timber.²⁸⁰ Leif avoided the fate suffered by Thorhall in *Eirik's Saga* because after feeling misled by the hardships suffered in Vinland Thorhall led a group back to Greenland only to die beaten and enslaved along with his crew after being shipwrecked in Ireland.²⁸¹

Captains of merchant vessels made choices that affected only their ship or small group. This was not true for warship captains and particularly in the case of kings acting as captain and fleet leader. Decisions made had far reaching consequences for nations and the lives of thousands of men. Foresight, preparation, and caution are the marks of successful warship captains. The cases of Harald Fairhair at the battle of Hafrsfjord and Olaf Tryggvason at the battle of Svöld provide examples that suggests that foresight and preparation are rewarded while fatalism in the face of overwhelming odds leads to disaster for a ship captain and fleet commander.

Olaf Tryggvason was faced with three separate fleets that joined together to destroy him. The three fleets were led by King Svein of the Danes, King Olaf of the Swedes, and Earl Eirík. They planned to reward themselves with a third of Norway each

²⁷⁹ *Grænlandinga Saga* Pálsson and Edwards 1965 56-57

²⁸⁰ *Grænlandinga Saga* Pálsson and Edwards 1965 57-8 "Leif said to his men, 'Now we have two tasks on our hands. On alternate days we must gather grapes and cut vines, and then fell trees, to make a cargo for my ship.' This was done. It is said that the towboat was filled with grapes. They took on a full cargo of timber; and in the spring they made ready to leave and sailed away."

²⁸¹ *Eirik's Saga* Pálsson and Edwards 1965 97 "These oak-hearted warriors, Lured me to this land, With promise of choice drinks; Now I could curse this country." "Let us head back, To our countrymen at home."

On the return journey "they ran into fierce headwinds and were driven right across to Ireland. There they were brutally beaten and enslaved; and there Thorhall died."

if they defeated Olaf. He should never have confronted three Viking fleets simultaneously but his sense of honor drove him to attack the allied fleet.²⁸² This decision reflected contemporary attitudes about honor and the following example summarizes this belief. The warrior Brihtnoth's philosophy at the battle of Maldon reflects Olaf Tryggvason's attitude that when the odds were against him, "Thoughts must be the braver, heart more valiant, courage the greater as our strength grows less."²⁸³ Viking longship captain's knew that death was inevitable whether from the sword, disease or old age and they preferred not to die in bed. This sentiment may have contributed to Olaf's decision to confront the allied fleet and in defeat to dive from his ship into the water never to be seen again.²⁸⁴ King Harald Finehair provides a more successful example of a Viking warship captain. He is distinguished from Olaf Tryggvason by his superior preparation and timing. At the battle of Hafrsfjord Harald Finehair had superior intelligence gathering before the battle which helped him to prepare a fleet large enough to defeat his enemies.²⁸⁵

The captains and crews of the Viking age employed a diversity of methods of leadership and a resulting variety of outcomes from the decisions originating from these styles. Warships and merchant ships had different purposes and this is reflected in the organization and composition of their crews. Despite their small numbers the Viking seamen were masters of seafaring and dominated the waters of Europe from 800-1100 A.D. to such a degree that many European peoples such as the Irish, French, and English adopted some of their ship designs and methods. Europe was unable to conduct sea borne trade or to protect its coastline and many Vikings took advantage of the situation. When the opportunities in Europe were exhausted they explored and settled land in the Atlantic as far away as Greenland and North America.²⁸⁶

²⁸² *Heimskringla* Hollander 1964 233 "When King Olaf's men saw that they begged the king to sail along and not engage such a huge host in battle. The king answered aloud as he stood high upon the raised stern deck, 'Lower the sail!' Let not my men think of fleeing. I have never fled in battle. May God dispose of my life, but I shall never flee.' They did as the king commanded."

²⁸³ *The Battle of Maldon* Whitelock 1979 324

²⁸⁴ *Heimskringla* Hollander 1964 240

²⁸⁵ *Heimskringla* Hollander 1964 73

²⁸⁶ Binns 1993 429-30

Conclusions

The origins and types of ships used by the Vikings, the shiphandling methods employed, and the organizational models used for war and trade analyzed in this dissertation allows scholars to understand the practical methods necessary to make a Viking voyage. The different types of voyages included travel from Norway to Ireland, a raid on a Frankish trading town, a naval battle in the Batlic during the Viking age and many others. As a result of the study of literature the understanding of the practical and human aspects of Viking seafaring has increased to balance the information that is already known about the Viking ships from the archaeology and other sources. Without numerous physical skills, and particular organizational structures Viking seafaring would have been impossible even with the most seaworthy vessels. This research shows that Viking seafaring should not be seen as the product of simply superior ships but rather as the collective expression of specialized work that required the timely completion of many tasks within the constraints of a hostile sea and a skillfully made vessel.

This dissertation includes a combination of sources which has not before been used to study practical shiphandling methods and organization of Viking merchant and naval seafaring. Previous hypotheses about the diversity of Viking ship types have been confirmed in literary sources. Examples of naval battles from the sagas have supported what is already known about the tactics of Viking naval battles involving large fleets. Use of these battles and early Norwegian laws shows the specific descriptions of the tasks and qualities of crewmen who fought the naval battles. Material concerning sailing and rowing has been discussed together for the first time. The combination of rowing and sailing scholarship reveals that there is a relative lack of material concerning Viking rowing.

This dissertation has combined existing knowledge about concepts of Viking seafaring with evidence from runic inscriptions. Secondary scholarship has been consulted to describe not just naval organization but to suggest what ideas motivated the men to make the *lið* and the *leiðangr* work. Runic evidence implies that many Viking seafaring expeditions ended in disaster due to numerous causes and that the perception of the frequency of successful voyages and the image of the Vikings as mariners second to none is exaggerated. The Vikings' seafaring success was due to the willingness of young

men to risk voyages despite the high risks and the unseaworthiness of their vessels. Research has also shown a pattern of increasing scale and formality in Viking seafaring and command and control of crewmen based upon a comparison between the earlier runic evidence which shows fewer numbers of ships more loosely organized than the evidence from the later Norwegian laws.

Viking ships developed slowly through trial and error stimulated by the changing needs of seafarers which is shown in the archaeological record. The progression of finds proceeds from the Hjortspring vessel, to the Nydam ship, to the end of rowing development and the first hints of sailing ships shown by the existence of a true keel on the Kvalsund. The progression of Scandinavian ships of the Vikings can be traced back to the 7th century AD as evidenced by the Gotlandic picture stones. Though not connected with these stones the Oseberg ship is the first Scandinavian sailing ship and the earliest known excavated Viking ship. Therefore, this ship represents the state of ship technology at the dawn of the Viking age as it has both oar and sail propulsion, a true keel, and a starboard side rudder. Trial and error was part of sailing early Viking ships which was dangerous because the open boats of the Vikings could easily fill with water. A large but unknowable percentage of early Viking voyages must have ended in disaster, therefore one must treat assertions about the superior seaworthiness of Viking ships with caution. Furthermore, the Viking expansion occurred not because of superior ships rather that the Vikings were more willing to accept losses from shipwrecks than other peoples. The promise of Valhalla for brave warriors and seafarers must have increased the willingness of Vikings to take risks because a glorious death would allow them to be taken to Valhalla by the Valkyries. The people of Scandinavia adopted this belief in the 8th century A.D. just prior to the dawn of the Viking age.²⁸⁷ The promise of Valhalla supports the hypothesis that fearlessness was as important as the ships themselves as a contributing factor to the success of Viking seafaring. The tradition risk taking necessitated by a seafaring life by the ancestors of the Vikings in Scandinavia, the fearlessness produced by a belief in Valhalla, the emigration of chieftains fleeing royal power during the state formation process in Scandinavia, and overpopulation all contributed to the development of Viking ships.

²⁸⁷ Ellmers 1995 165-171

There were a diversity of Viking ship types.²⁸⁸ At the dawn of the Viking age there were two types of vessels merchant ships and warships. The Gokstad and Oseberg vessels show the components of the warships class which are the following: rows of oars, a mast that can be raised or lowered to meet the demands of circumstances, an aft starboard rudder, stem to stern planking or benches on crossbeams, and a narrow beam. There are no existing merchant ship finds contemporary with Oseberg and Gokstad but later wrecks such the Skuldelev 1 and 3, Äkeskarr, and Klastad are Viking merchant vessels that have common features. These ships have fore and aft raised platforms, a cargo hold amidships, three or more pairs of oars, a fixed mast, a broader beam than the longships, and a dependence upon sail for propulsion. Small boats have been found with Viking ships but they are not part of this discussion.

Later in the Viking age ships became more specialized for trade and warfare. The Skuldelev ships reveal some of these types: Skuldelev 6 (ferry or fishingboat), Skuldelev 3 (coastal trader), Skuldelev 1 (Ocean going trader), Skuldelev 5 (a small warship), and Skuldelev 2 (a longship).²⁸⁹ These ships show the growing distinctions between the vessels. For example, Skuldelev 1 shows how merchant ships had grown broader to accommodate larger cargoes. In contrast to the broadening of the merchant vessel the warships have become narrower and longer by returning to the dimensions of the rowing vessels such as Nydam and Sutton Hoo. The absence of later Norwegian Viking ship finds and earlier Danish ship finds means that the representitivity of Norwegian finds for Denmark and Danish finds for Norway must be asserted cautiously. However, Skuldelev 1 (ocean going cargo vessel) is made of pine which means that it was most likely made in Norway where there is an abundance of pine and not in Denmark where there are few pines suitable for boatbuilding. There is no archaeological evidence for the very large longships called Dragon ships. These are mentioned in *Heimskringla* and the appearance of these large vessels in medieval literature suggests that they did exist. The Dragon ship was the largest of ship types that met the needs of Viking seafarers for trade and for warfare.

²⁸⁸ Olsen and Crumlin-Pedersen 1978 101

²⁸⁹ Olsen and Crumlin-Pedersen 1978 101

The question of how the Vikings organized themselves for naval warfare has been answered decisively. *Lið* and *leiðangr* were the organizational models of Viking raiding and naval warfare. The *lið* describes an informal leadership structure dominated by a chieftain who offered loot and glory to his followers which dominated Viking naval organization in the early Viking age. This group could vary in size from two ships to two hundred. The *leiðangr* depicts the state of naval organization at the end of the Viking age. *The Earliest Norwegian Laws* detail the legalistic and systematic state of late Viking age naval organization. This is clearly demonstrated by the existence of ship districts which had legal obligations to provide a warship and crew for the use of a king. The *lið* entirely different from the *leiðangr* because it was organized as a single campaign or season of raiding designed for the purpose of rewarding the followers of a chieftain with loot and glory. The *leiðangr* was a tool that could be used annually by a king, though it must have been easier to use it as an offensive tool because of the potential rewards of such venture. Maintaining defense annually in each ship district must have been unrewarding, expensive, and unpopular.

It was not only the elegant ships but the skill of their crews that made Viking seafaring successful. The best example of taking advantage of the design of a vessel is the *sigla til brots* beach landing. In this maneuver, a ship about to be dashed in heavy weather onto a lee shore drives itself directly onto a beach in hopes of saving the life of the crew by sacrificing the ship and cargo. Though the low draught of the ship contributes to the success of this maneuver, it is possible because of the great skill of the crew. In an open boat even a slight deviation to port or starboard made while passing through a surf zone would turn a vessel broadside to a wave, capsizing it. Perfect timing saves the crew from death from drowning or exposure.

The Vikings operated their ships with large crews on their warships and smaller numbers on sail dependent merchant ships. Merchant sailing ships were less seaworthy if they had fewer crewmen to manage the sails in heavy weather. Most Viking voyages were made in sight of land, during the day, and in good weather. Bad weather, darkness, long open sea voyages and winter sailing on unfamiliar waters were generally avoided but Viking seafarers could sail in such conditions if they had no other choice.

The following is a description of the components and particular qualities of Viking shiphandling. Viking ships used square sails because of their lifting qualities which gave the boats greater seaworthiness. Open boats can be swamped by a large wave so they need uplifting square sails to keep the bow high and the water out. The Vikings lacked mechanical aides to navigation so they were frequently lost which was known as being in a state of *hafvilla*. Propulsion by sail and oar combined with a low draught meant that Viking ships were sailed virtually anywhere in Europe and the known world, on rivers, coasts or open seas. This gave Viking seafarers great flexibility therefore Viking seafarers could use a sandy beachfront as a market place or sail into deep-water ports. Since Viking longships used both oars and sails they had an advantage in heavy weather because they could *andoo* which meant lowering the sail and pointing the bow into the wind and waves until conditions improved. Shiphandling skill combined with shallow draught sail powered rowing ships meant that Vikings could sail almost anywhere in Europe.

The arrangement of crew structures on warships and merchant ships consisted of a captain (*styrmann*), a lookout (*stempostman*) and crew. The captain controlled the aft starboard rudder and gave orders about decision making and had authority over all matters relating to the smooth operation of his ship. The *stempostman* or lookout was responsible for helping the ship avoid obstacles and pirates. On warships he was the strongest warrior because he met the enemy first from his position on the bow. The crew participated in decision making and spoke to the captain at gatherings around the mast. The crew was responsible for bailing, managing the oars and sails, and for carrying out all tasks that were necessary for the smooth running of the ship.

There are few certainties with regards to the numbers of oarsmen on Viking ships. The number of oar holes from a ship find represent at least one man and probably several more per oar. Therefore a Viking ship with 16 oar holes to a side would have had at least 34 men, 32 rowers, a *styrmann*, and a lookout. Victory in Viking naval warfare required men to clear the decks of enemy ships, so during battle ships would have packed their decks with men in order to overwhelm the enemy by sheer force of numbers. Since Viking sailing ships had just several pairs of oars it is difficult to count the number of men required to handle a Viking sailing ship. These ships must have had a captain who

acted as a *stýramann*, and a stempostman who performed lookout duties but it is not known how many men were required to handle a Viking sailing ship.

Violent piratical raiding is only one part of the Scandinavian heritage from the Viking age. This means that the characterization of the Vikings' exclusively as violent pirates should be further amended by the realization that they were seafarers first and not pirates before anything else. Jon Godal provides an example from vernacular seafarers in twentieth century Norway that shows the endurance nearly to this day of methods of seafaring that date from the Viking age.²⁹⁰ The impact of Viking seafaring may be measured by the scale of the Viking voyages and the endurance of Viking seafaring traditions in many areas.²⁹¹ Viking voyages required a symphony with a background of hundreds of years of development that included a variety of ship types, formalized organization for naval warfare in the *lið* and the *leiðangr*, numerous shiphandling methods as well as capable captains and crews.²⁹² This synthesis reaffirms the Vikings reputation as skilled seafarers whose mastery of elegant ships left an enduring legacy of deeds, methods and an abundance artifacts.

²⁹⁰ Godal, Jon "Recording Living Traditions of Square-Sail Rigged Norwegian Boats" in *Sailing into the Past* (eds.) Ole Crumlin-Pedersen and Max Vinner (Roskilde, 1984) 194-197

²⁹¹ Binns 1993 429-430

²⁹² Binns 1993 429-30

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