# THE NON-CLIMATIC RESEARCH POTENTIAL OF SHIPS' LOGBOOKS AND JOURNALS

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**Abstract.** The large-scale study of ship's logbooks for climatic data has revealed the wide and varied potential of this under-exploited resource for the study of the past. As well as being of utility to climatologists, the daily recording of shipboard information can help illuminate a number of themes of interest to maritime and naval historians. More than this, however, such studies can help inform both more general and other specialized historical studies. Logbooks contain both anecdotal and statistical data relevant to the studies of medical historians, the history of science and navigation, social history, economic history, warfare, imperial history and of course environmental history. Moreover, many of these themes can be studied in a multi-national context and furthermore, if studied in a multi-disciplinary context, can offer many useful insights.

## Introduction

Individual logbooks or journals were kept by all of the officers of a naval vessel, including the captain, the lieutenants and the master or navigating officer. Daily entries in ships' logbooks whether British, Spanish, Dutch or French contained common information concentrating for the most part on the vessels' noon position, course and distance run in the preceding 24 h, and the various wind directions and wind strengths experienced during that time. The keeping of journals was a legal requirement and in the British case the keeping of journals was enforced by regulation and these journals had to be handed in to the Navy Offices for the officer to receive his pay (Lavery, 1998, p. 14, 24, 27). Journals could be used in a courts martial or to settle any dispute over prize money. To protect the probity of officers, any incident that involved the expenditure of public money was also recorded. In many respect these were important state documents and therefore carry with them the authority associated with documents generated by state bureaucracies.

Officers of the English East India Company were instructed and required to keep journals for many of the same reasons as naval officers insofar as the Master and Chief Mate 'shall respectively keep true and exact diaries and journals of the ship's daily proceedings'. More particularly they were to ' . . . keep particular notice in your journal of all new discoveries, remarkable incidents and whatever may occur to you during the course of your voyage not generally known and which may lead to the better knowledge and improvement of the navigation to and from the East Indies . . . ' (Records, 1968, 1960). Such instructions were often issued individually

Climatic Change (2005) 73: 155–167
DOI: 10.1007/s10584-005-6947-3

to EIC officers, in particular those under charter to the Company. As with naval journals, such instructions underline the authority of these important documents.

The primary and immediate reason for such diligent recording was for the purposes of navigation, in particular to determine the ship's longitude. This was both to assist progress in reaching the vessel's destination and to avoid hazards. Much of this information was recorded in a tabular form that made it readily accessible and easy to use. As well as this tabular information, each daily logbook entry had a section containing some form of narrative. This could either be a terse one-word description of the general weather such as 'cloudy' or 'fine' or more detailed accounts noting sea state, incidents of lightning, fog, squalls etc. Some such general or specific description of the weather conditions was rarely omitted, but the narrative section of the logbook was also used, as its usual heading '*Remarkable events etc.*' implies, to record everyday shipboard activities.

These activities might include the setting and reduction of sail, sightings of land and other vessels, a note of the number or names of any ships sailing in company (frequently employed while convoying ships under escort), signals given and received, and battle with an enemy (surprisingly rare even in wartime). All such incidents would be recorded as a matter of course by all of the officers on board. Less frequently recorded, and then usually by the commanding officer, would be the state of provisions on board, the opening of a new cask of beef for instance or the amount of fresh water remaining, and any matters concerning the general management and running of the ship. This information reflected the nature of logbooks and journals as legal documents, a status still current today. At a court martial or any form of enquiry, the journals of officers would be called for as evidence. In the event of wreck or sinking, mutiny or capture by an enemy, formal accounts submitted to the court by the surviving officers would be supplemented by logbooks and journals whenever these were available. These logbooks were therefore a general, and we can assume accurate and truthful, account of the management and progress of a vessel.

The most frequent entries found in all logbooks within this 'management' framework concerned the discipline and health of the crew. All officers recorded incidents of indiscipline and crime. These could range from the commonly recorded accounts of insolence and drunkenness, to the more serious crimes of theft, striking a superior officer, desertion or mutiny. As well as recording the crime, logbooks also recorded the punishment, and this could range from confinement, to flogging with a cat-of-nine-tails. These crimes and misdemeanours, and their corresponding punishments, were not exclusively features of naval discipline. They were often recorded on East India Company vessels, though such incidents were seldom as common as on ships of the Royal Navy. Royal Navy logbooks always contained entries of this nature though their frequency and magnitude differed from vessel to vessel, depending mainly on the character of the captain and his officers. It is worth noting that while such punishments were severe and barbaric by modern standards, this should always be viewed in the context that life ashore could be equally brutal.

Officers would also diligently record shipboard health and mortality. The name and rank of any fatality was always noted. Death was most frequently the result of disease, though incidents such as falling on to the deck from the yards, falling overboard and drowning, killed in action or meeting with some other misfortune were also, though less commonly, recorded. On occasions, the cause of death was extremely unusual such as one incident where a ship's clerk was murdered by Malay pirates while on shore, (NMM: LOG/C/61, *Dunira*) and another in which an unfortunate sailor, while ashore with a watering party off Charleston, South Carolina, was, according to his shipmates, carried off by an alligator. Yet another logbook recorded the suicide of the captain, who shot himself in his cabin (NMM: ADM/L/L168, *Liverpool*) and another recorded that the captain fell out of an open gunport, in a heavy swell, and drowned (NMM: ADM/L/J81, *Intrepid*).

Shipboard diseases were common and the nature of the recording of health matters was usually dictated by the severity of the problem. Whereas those that died were named, it was not usual to name those on the sick list unless the victim had suffered some accident that was remarkable enough to warrant recording. More usually, where disease was recorded, it would state the general nature of the disease and the number of men incapacitated. An excellent example of this is to be found in the logbook of Captain Peter Rainier (NMM: RAI/2) who, on a daily basis recorded anything up to ninety men on the sick list of the 74 gun *Burford* on a voyage to India in 1779. This was one of the few logbooks to mention scurvy specifically. Almost all diseases were described as either fevers or flux and it is clear that dysentery and typhus rather than scurvy were the most common afflictions.

## Researching Ships' Logbooks

Most research using ships' logbooks has been on an individual ship basis either to research a battle, a voyage or the life of a famous mariner or a particular voyage. Large-scale synthesis of logbook material is unusual, and apart from climatic research, the only other major project involving large numbers of logbooks has been the temporal mapping of the earth's magnetic field (Jonkers, 2003). Despite this, logbooks constitute an under-used resource because, one suspects, of the technical nature of many entries and also because observations were frequently in a language now archaic and often using professional nautical terms unfamiliar to non-specialists. The sheer number of logbooks available for study and the additional, sometimes lengthy process of finding out which ships are in which part of the world at any particular time has made any comprehensive logbook study in the field of the humanities difficult in terms of time and resources. The use of logbooks for scientific investigation has however revealed that logbooks are an equally rich resource for historical as well as scientific studies. It should be stressed however that in both the humanities and the sciences, logbooks should be studied on two different levels. There is much tabular and statistical data to be gleaned from logbooks and more than sufficient numbers of these to draw statistically significant

conclusions about climatology, health, mortality, crime and punishment. Aggregated data from large numbers of logbooks could yield new insights into a number of historical issues just as it has informed the sciences. With such aggregated data however it is possible, unless some care is taken, to overlook the unique experience of individual officers and vessels. One might, to take a meteorological example, use aggregated data to say something significant about the climate of the North Atlantic in the 1790s yet miss the interesting and important fact that the *Andromache* sailed through the eye of a hurricane in the summer of 1795, a tropical storm that does not exist on the current hurricane database simply because it did not make a landfall on the United States. Such incidents are 'background noise' to the bigger climatological picture but it is just such discoveries that make the examination of individual vessels as important, albeit on a different level, as the study of large aggregated datasets. When examining the potential for non-climatological studies of logbooks it is useful to bear these two levels of study and investigation in mind. The remainder of this chapter is concerned with exploring this potential thematically. It will not provide any comprehensive conclusions within each theme but is intended to encourage future research by providing examples and suggestions for further work.

## History of Navigation

The large-scale study of many logbooks in the age of sail can give a number of insights into the history and development of navigational science and the corresponding responses to technological innovation. Conducted on a multi-national level, logbook studies provide the opportunity for comparative research between the naval and mercantile services of competing maritime powers. The information on navigation, much of it in tabular form, might not lend itself easily to the historian more often used to narrative accounts but will, with careful analysis and observation, demonstrate the increasing knowledge of mariners and the efficiency of sailing vessels in crossing vast tracts of ocean. Of particular interest here is the development of various methods for determining longitude, that is, the position east or west of any given meridian. What is clear from a cursory survey of many thousands of logbooks is that the East India Company officers, were more precise in recording navigational detail generally and apparently more responsive in adopting new ideas and technologies than their naval counterparts. Further research will be needed to determine to what extent, and how, this is so and an earlier chapter has already drawn attention to the more sophisticated system of wind observations used by officers of the EIC. East India Company officers would have had a wider experience than many naval officers in terms of the geographic extent of their knowledge and experience of the sea, though it should be noted that many young or aspiring naval officers took service with the Company during peacetime. One such individual was Peter Rainier. At the outbreak of the Revolutionary War in 1793, he was the only Royal Navy officer of rank with sufficient experience of the eastern seas, and a

willingness to serve there. Rainier who had spent most of his professional career in those waters, was made commander in chief of the East Indies station and remained there for a decade until superseded in 1804.

EIC logs however reveal much more than the wide experience of the Company's officers. The logbooks though not necessarily better kept, were as already remarked, more precise in their recording. The standard EIC pre-printed logbook pages contained daily entries such as 'meridian distance', and 'difference in longitude'. This was a degree of detail that was not usual in most naval logbooks. Evidence from the many logbooks examined suggests that EIC vessels were carrying marine chronometers many years before Royal Naval vessels regularly took them to sea. Few were supplied by the Company and in common with charts and navigational instruments, individual captains supplied their own timepieces (Cook, 1985). Even as late as the 1790s royal naval vessels were not carrying marine chronometers even on distant voyages. Peter Rainier, for instance was still applying for a chronometer from the Admiralty six weeks before sailing to Madras in 1794, and it is clear from his logbook and those of his officers that no chronometer was on board the *Suffolk* as there were frequent references to longitude by dead reckoning and by lunar distance but no mention of a timepiece whatsoever. Furthermore, during the voyage Rainier would often check his position by signal with one or more of the EIC vessels he had under convoy (Wilkinson, 2005).

The precision with which EIC officers recorded their position makes it possible to study the use and accuracy of the marine chronometer itself. Many officers would record their longitude by both chronometer and by dead reckoning. Many also recorded position by lunar as well, giving three possible positions. Comparing these observations over the course of an entire voyage and then noting any landfalls indicates quite clearly the general accuracy of chronometers and the limitations of navigating by dead reckoning alone. Differences of up to four or five degrees between estimated and observed longitude can be noted, an error of up to several hundred miles depending on the vessel's latitude.

Another navigational observation recorded in logbooks was magnetic declination (usually noted as magnetic variation). This was the difference in degrees of an arc between magnetic north as indicated by the compass and true north. The compass on English ships was uncorrected and the magnetic declination formed part of the mathematical equation used to calculate leeway, important in determining the ship's position. The Dutch apparently corrected their compasses for this variation. In English logbooks, declination was not usually recorded until it exceeded about 10° or approximately one compass point, indicating the scale of resolution in the mathematics required for safe navigation. In the 1750s, one ingenious EIC officer successfully navigated his ship from India to England by the daily recording of his latitude and the magnetic variation. He presumably used one of the later editions of the isogonic chart produced by Halley in the late 17th century to determine his longitude. If the Earth's magnetic field had been constant, this would have proved a simple method of determining longitude making the invention of

the chronometer unnecessary. It was a method of navigation still advocated as late as the 1790s (Churchman, 1794). Such accounts give insights into the quest for accurate methods for determining position at sea.

Large-scale studies of logbooks might further indicate the possible consequences of these improvements in navigation. From the mid-1780s onwards journey times from Europe to India and China generally decreased and by the early 19th century they were up to 25% shorter than they had been before 1780. Some of this was due to improvements in ship design, but it is equally likely that improvements in the determination of longitude and therefore a greater certainty of the ship's position meant that captains could sail their vessels harder, confident that they were not going to strike some navigational hazard. This point is offered with the caveat that until well into the 19th century, marine charts were not based on the same degree of accuracy as that provided by surveys carried out with the assistance of the chronometer. A number of ships came to grief because the accuracy of their charts did not accord with the accuracy of their position finding. By using logbook information, it will also be possible to calculate the average speed of passage to places such as Madras or Barbados. It would further be possible to examine the speed of different classes of vessel, based on the distance made good each day and taking into account the ship's location either in the trade winds, westerlies, variables etc.

There is also evidence from logbooks to suggest that sailing routes altered slightly, also improving journey times. Before about the 1780s, the usual route to India was through the Mozambique Channel. Both naval and EIC vessels would use this route stopping at the Comoro Islands both for refreshment and more importantly to fix their position before embarking on the remainder of their voyage. Comoro was frequently used as a zero meridian by English ships on this final leg of their voyage. Gradually this route fell out of favour, except for those vessels bound for Bombay, and ships bound to Madras or Calcutta would usually make a wide sweep out into the Southern Ocean to about the longitude of Sri Lanka before making a northerly course for the Bay of Bengal. This was a shorter route, made best use of the prevailing winds and was made easier by a more accurate determination of longitude by lunar observation and chronometer. Again a more a useful discussion of these changes and their circumstances can be made by close studies of logbook data.

## Medical History

Logbooks routinely recorded mortality, always naming the victim, giving their rank or occupation and usually the cause of death. This is a feature of all logbooks, naval and mercantile. Cross referencing this information with the ship's muster, many of which have survived in English archives, will often provide the victims age, where he joined the ship or from which vessel he was transferred. In later muster books there might be a note of his place of birth or origin. In the case of

the East India Company, the muster was frequently bound with the corresponding logbook and included a passenger list. Between them, log and muster books have the potential to yield much statistical information useful for the study of disease and mortality amongst seafarers. As noted in the introduction the most common terms recorded were fever, flux or dysentery. Scurvy was seldom mentioned though it must have been common given the amount of contemporary literature on the subject in particular the works of Lind and Blaine (Lloyd, 1966). The most noteworthy feature to emerge from the examination of many logbooks is the shocking rate of shipboard mortality and disease in the mid 18th century. This was not just confined to very long voyages in the tropics. The fleet commanded by Edward Boscawan, which in 1755 was sent to make a pre-emptive strike against the French reinforcements sent to Louisbourg, Nova Scotia, had thousands sick after a voyage in May and June of that year. Vessels making voyages through the tropics in the 1750s and 1760s, could routinely expect to bury the dead at sea on an almost daily basis.

What is most noticeable however is the remarkable improvement in mortality rates by the end of the 18th century in both naval and EIC vessels. The last decades of the century saw significant improvements in ventilation, diet and hygiene (Morriss, 2003). This holistic approach was largely one of organization, with the gradual introduction on naval vessels of the divisional system whereby both commissioned and junior officers were made responsible for the welfare of the men directly under their command (Lavery, 1998). Advances were made in ventilation, first in the 1740s with Sutton's air pipes, and later with the introduction in the 1750s of the Hale's mechanical ventilators (Zuckerman, 1976). Critical of course were improvements in the supply of victuals. From the large number of logbooks available it is possible to measure and quantify the progress of these various measures. It is possible to measure the effectiveness of individual commanding officers in keeping their men healthy, in particular making comparisons between vessels sailing in close company on long voyages.

Furthermore it is entirely possible to measure the effect of specific environmental conditions on the health of crews. The length of a voyage would often depend on the weather conditions and a slow passage across the equator could have many consequences for shipboard health. Skill was needed to reach the equatorial line in the Atlantic at the most advantageous time of year and especially within the narrow band of longitude where the doldrums were least troublesome (Seller, 1703). A possible case study is that of the EIC vessel *Busbridge* which made three voyages to the East Indies between 1785 and 1789 (BL: L/MAR/B 413a–c). During these three voyages her progress from England towards the equator varied from a matter of weeks in one instance to several months in another. The question to be addressed is how the varying length of the passage, the environmental conditions, and the approach to the equator affected the health of the crew. Another worthwhile case study is that of HM ship *Colchester* (NMM: ADM/L/C165). In 1757, 1758 and 1760, the *Colchester* sailed to St. Helena in the South Atlantic to collect and escort the East India Company's ships home to England. On all three voyages she sailed

much the same route at much the same time of year yet on one voyage her crew suffered heavy rates of mortality and on another voyage relatively few of the crew were taken sick. There was a change of officers and one of the voyages recorded the working of the new mechanical ventilators. These factors along with a study of the duration of the voyage and the general weather conditions would yield interesting insights and possibly explain the remarkable difference in death rates between two of the voyages. There are literally hundreds of similar case studies that can be re-constructed from logbooks of vessels in all latitudes and all parts of the world, both naval and mercantile. Furthermore, information on health and mortality rates was recorded in Dutch, French and Spanish logbooks making it possible to conduct multi-national comparative studies.

Logbooks should also prove useful in informing studies concerning the relationships between infectious disease and climate variability in the past. The El Niño/Southern Oscillation (ENSO) has been linked to outbreaks of disease, in particular those borne by insect vectors such as malaria and yellow fever. Changes in the amount and distribution of precipitation, a particular feature of ENSO events, would affect the number of insects dependant on water to breed (Diaz, 2001). Vessels serving in the tropics, in India and particularly the West Indies, frequently suffered from malaria or yellow fever when engaged in operations that involved prolonged contact with the shore. Europeans were particularly prone to these diseases and therefore severe outbreaks recorded in logbooks might usefully be correlated against known ENSO events.

## Shipboard Crime and Punishment

Ships were floating communities and like communities ashore suffered petty crime, unsociable behaviour, drunkenness and violence. Crews were for the most part made up of young men living in cramped and often damp conditions with little to do off watch apart from sleeping, drinking or gambling. Officers needed to maintain discipline either by earning the respect of the men or, if lacking skill in leadership, by maintaining discipline by force. Maintaining perfect order was impossible and the general impression from many logbooks is that vessels were fairly disorderly societies that nevertheless worked effectively in any crisis. Notably, petty crimes and misdemeanours occurred most frequently when there was little to engage the attention of crews. Easy or slow sailing or being becalmed for long periods would often betoken trouble whereas rough weather or any sort of crisis would keep a crew active and individuals out of mischief (S. Bailey, personal communication).

It was the responsibility of the captain and his subordinate officers to keep the crew busy at all times in order to maintain a reasonable degree of order. In English logbooks the phrase ‘men usefully employed’ was frequently used to indicate that the officers were not neglecting this part of their duty. Unfortunately such useful employment might include the mind-numbing task of picking oakum or ‘working up junk’. Junk was pieces of old rope used to make matting or swabs and oakum

was unravelled rope, picked apart in order to caulk or seal gaps in planking. When any sort of crime was recorded in a logbook the offender and his rank or position was always noted. The most frequent crimes were insolence, neglect of duty, mutinous expressions, fighting and drunkenness. Less frequent and far more serious crimes were desertion, theft, striking a superior officer and mutiny. Violent crime such as a stabbing, or murder were not unknown but were very rare. Punishments recorded were usually some form of public flogging, often a dozen lashes or more. Punishments exceeding a dozen lashes were common as several crimes would often be committed together. Drunkenness for instance would nearly always lead to the additional acts of insolence and neglect of duty.

There is huge scope for statistical studies of crime and punishment at sea on board vessels of both the naval and East India services. Some synthesis of this material has already been carried out for a study of discipline in the Royal Navy in the Leeward Islands (Byrn, 1998). Strict discipline however was not just a feature of naval vessels but can be found in the EIC ships as well. There is more than adequate material to construct datasets to examine the frequency and nature of shipboard crime, both over periods of time and on particular types of vessels or under different environmental conditions at different latitudes. It would be possible and particularly fruitful to track officers from vessel to vessel to examine their ability to maintain discipline. Some officers were particularly severe such as Penhallow Cumming who commanded the *Blandford* in 1758 (NMM: ADM/L/B103) and who was dismissed from the navy for oppression (Rodger, 1986, 212). Yet others, such as Hugh Pigot of the *Hermione*, inflicted such brutality that the crew murdered him and his officers (Pope, 1963). Such extreme instances are rare but there are several hitherto unknown examples of severe mutiny and disorder such as that on board the sloop *Hope* in 1799 when her commander Augustus Brine and his officers were forced to maintain an armed watch on the crew for several weeks, and survived an attempt to poison them, before reaching the Cape of Good Hope where most of the crew were placed under arrest. (NMM: ADM/L/H21) Such studies would put such events as the great naval mutinies of 1797 within a wider context and usefully form the basis of a revision of the social history of the British navy. Logbooks would be especially useful for a study of social history at sea after the Napoleonic wars, a time when more officers were drawn from the upper classes and evangelical religion was spreading. Social history at sea could be usefully studied alongside domestic social movements.

## Warfare, Conflict and Commerce

The study of large numbers of naval logbooks has indicated a number of factors of interest to the naval and maritime historian. One gets a striking impression of the vastness and emptiness of the oceans. It is apparent that even during wartime, contact between opposing vessels was an infrequent occurrence. The CLIWOC study period from 1750 to 1850 included the Seven Years' War from 1756 to 1763,

the War of American Independence from 1776 to 1782 and the French Revolutionary and Napoleonic Wars 1793–1801, 1803–1815. It was rare for the UK research team to abstract the logbook of a ship involved in action with an enemy vessel unless the incident was already known and the logbook was one of the very few pre-selected with this in mind. This reflects the fact that the abstraction process for climate data covered for the most part the deep oceans and most naval actions, whether between fleets or single vessels, occurred close to land. Even in the major shipping routes there were virtually no sightings of other vessels in the deep oceans, all such instances were recorded near major landfalls whether islands, capes or ports. The emptiness of the ocean is further reflected by the fact that during the months of November and December it would be very unlikely to find a single British or Dutch vessel traversing any part of the South Atlantic. This is primarily due to the nature of the circulation patterns in the Indian Ocean. Nearly all sailings to and from the Indian Ocean were seasonal and dependent on the monsoon to give a fair wind. The timing of sailings to and from Europe and the East reflected this seasonal pattern meaning that towards the end of any particular year, no Dutch or British shipping entered the South Atlantic. Such things seem obvious when attention is directed to them but it is through the study of logbooks and thereby the individual sailing and trading patterns of vessels that these points are highlighted.

The KNMI has produced a number of plots showing the daily positions of vessels by nationality over the CLIWOC study period. Individual ship plots are also available through the website (www.knmi.nl/cliwoc). These plots not only show the national differences in shipping routes but clearly indicate those areas of the ocean where there were larger concentrations of vessels such as the approaches to the English Channel, the Cape of Good Hope, Cape Finisterrre, the Azores, Canary and Cape Verde Islands, Barbados and the Cape of Florida. These shipping routes were of course determined by the circulation patterns of the atmosphere and the ocean. The route to and from Europe and the West Indies for instance were dictated by the sub-tropical anti-cyclone usually centred near the Azores. The route to the West Indies made use of the NE trades on the eastern and southern side of the circulation. The return voyage made use of the westerlies on the northern side of the circulation. The nature of these winds was well known to mariners, as were the most likely landfalls to be used by shipping. Such knowledge was useful to detect and intercept enemy vessels as well as to prevent an enemy preying on your own shipping. For the historian, knowing this helps to understand and evaluate strategic and tactical decisions and more importantly to appreciate how and why events took place when and where they did. For example, it should be no surprise to find that the American frigate *Constitution* should choose to cruise for British merchantmen off the Cape Verde Islands in March 1815. It was after all the month when outward-bound Indiamen might be passing close by before the next leg of their voyage south towards the Cape of Good Hope. It is equally unsurprising that the Royal Navy frigates *Leander*, *Newcastle* and *Acasta*, in pursuit of the American, should also be directed to these waters (James, 1859). The *Constitution* managed

to escape her pursuers. A more familiar example is that of Admiral Robert Calder's interception off Cape Finisterre of the Franco-Spanish fleet on its return from the West Indies in the summer of 1805. This was a few months before the defeat of this fleet by Nelson at Trafalgar. Cape Finisterre was the most likely landfall to be made by the ships of the Combined Fleet as they negotiated the northerly side of the Azores anti-cyclone, and the logical place for the British to attempt to engage them. Naval officers were concerned with the weather and navigation more than anything else and this was factored into all their decision making whether on board ship or in the Boardroom at the Admiralty. The close study of logbooks, with their attendant preoccupation with navigation and weather, brings the historian closer to his or her subject, giving a clearer appreciation of the problems and challenges faced by mariners and a better understanding of a course of action.

## Environmental History

Logbooks have proved an essential resource for the study of historical marine climatology and the only resource that can give high-resolution daily and even hourly meteorological data over the oceans. Equally, logbooks provide a unique place to begin to study the environmental history of the oceans and seas. Not only does the plotting of hundreds of ship tracks clearly indicate how the ocean and atmosphere circulations were exploited but, more important to the historian at least, it indicates how those circulations were perceived and understood. Many subjects of interest to environmental historians have been touched on above particularly health and mortality but the study of the environmental history of the sea, an area largely ignored, can give insights into patterns of trade and colonization, with of course their attendant spread of diseases, plants and animals, culture and ideas.

The course of exploration, trade, colonization and imperial conflict impacted on the environment but was itself partly determined by the environment. The confinement of most Spanish imperial expansion to the western hemisphere was a political decision dictated by the Treaty of Tordesillas in 1494. Apart from this however the patterns of territorial acquisitions of the French, Dutch and British must in some degree have been environmentally determined particularly when 'discovery' as the term implies, is usually by chance rather than design. Once an acquisition was deemed strategically or commercially advantageous it became an object of desire amongst competing imperial powers. Barbados for instance was an important landfall on the route from Europe to Jamaica or the Antilles and was to windward of the French, Dutch and Spanish West Indies. Barbados was therefore of strategic as well as commercial advantage to Britain. Likewise the Cape of Good Hope was an important waypoint between Europe and Indonesia for the Dutch East India Company, to the extent that Britain acquired the place by force of arms first in 1795 and again in 1806. There is no better example of the environment determining the importance of a colony than St. Helena in the South Atlantic. It served as a place of refreshment for homeward bound Indiamen but more importantly provided a navigational

reference for the final leg of the voyage to Europe. It was also the point during wartime where the British Royal Navy would meet the homeward bound fleets to provide armed escort. Its utility was entirely dictated by its position in the SE trades nearly midway between the Cape and the Equator. Had the prevailing winds blown from some other direction it would have been of less interest to a maritime power like Britain.

Caviedes (2001, pp. 61–88) presents a further aspect of environmental history through his examination of the teleconnections between historic ENSO events and severe weather events in other parts of the world. One of the ways he did this was to study accounts of shipwrecks particularly off Chile, South Africa and in the North Atlantic. Although incidents of shipwreck, if used selectively, are a perfectly acceptable proxy for severe weather, the examination of logbooks can yield a far greater quantity of data and be much more precise concerning the location and severity of weather events

## Conclusion

The daily recording of events at sea, across the world's oceans, have been preserved in the logbooks and journals of mariners. Many of these have survived and are stored in various national archives. They have proved of great utility in the study of historical climatology but more than this, they are a unique and under-exploited resource for the study not only of maritime history but medical, social and environmental history as well. What makes them particularly valuable is the fact that they have survived in large numbers in the national archives of the major imperial and maritime powers, thus providing an opportunity for multi-national as well as multi-disciplinary studies.

## Acknowledgments

The author acknowledges the essential assistance given by the UK research team of Simon Bailey, Ellie Gatrill-Smith and Catharine Ward in drawing his attention to the many interesting and unusual events recorded on the English logbooks. Thanks are also due to Dr. Huw Bowen for providing useful references to EIC regulations.

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(Received 14 June, 2004; in revised form 9 February 2005)