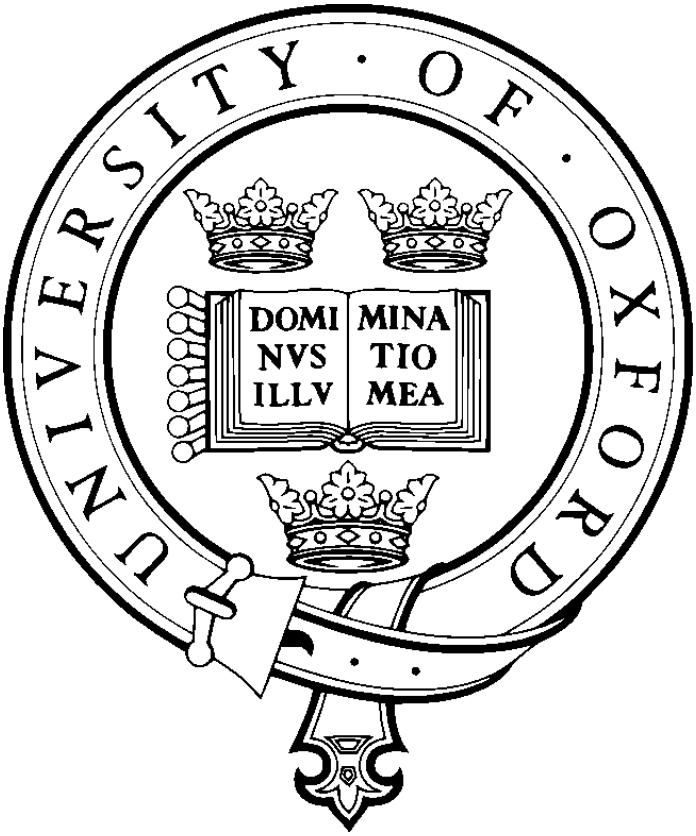
Crossing the Threshold of Empire:
From Ship to Shore in Colonial Madras, 1750-1895



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Submitted: Trinity Term 2023

**This thesis is submitted to the History Faculty,
University of Oxford, in partial fulfillment of the requirements for the degree
Doctor of Philosophy**

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Extended Abstract

This thesis examines the process of moving between ship and shore at the English East India Company port of Madras (Chennai) between 1750 and 1895. It argues that while the history of technology in the British empire has largely focused on the deployment of Western innovations, the daily administration of empire was instead dependent on indigenous technologies and practitioners. Madras's dangerous littoral environment meant that trade was facilitated by masula boats and catamarans, built, manned, and owned by skilled local boatmen.

A littoral framework is utilised to highlight the role of the boats and boatmen of Madras the port's development as an imperial outpost and the ways in which local circumstances and imperial concerns met in the surf. 'Littoral zones' are the spaces lying alongshore, the muddy, porous boundary between dry and wet, but they also serve as a historiographical transitional zone between terrestrial and ocean histories. Global histories of empire have been criticised for an overly terracentric perspective, and while recent works in maritime history have sought to reinsert the ocean into global history, many remain focused on the high seas. Neither fully account for the transition between land and sea, overlooking the mechanics of movement through littorals. The need to pass through littorals created spaces in which indigenous technology and expertise could influence the creation and maintenance of local outposts of empire. The ability to dictate who and what could pass through a littoral zone was a source of power and agency for those who possessed the means to traverse it.

This thesis uses the masula boats and catamarans of the English East India Company port of Madras, in the period from 1750-1895, to argue that the British were technologically dependent on local boat people as the possessors of local technologies, knowledge, and skill. The boatmen and boats at Madras were both facilitators and inhibitors to the passage of trade; their position as mediators through a dangerous yet unavoidable space restricted the Company's ability to effectively establish authority in the surf zone and the international importance of the port in the nineteenth century.

Masulas and catamarans sustained local and international trade at Madras from the city's founding in 1639 through the nineteenth century because of a combination of their design and the environmental conditions of the littoral. Originally used as near-shore fishing craft, masulas and catamarans were used to transport cargo between ship and shore from at least as early as the sixteenth century by the Portuguese at the nearby site of San Thomé. Unlike European-style ship's boats of the Age of Sail, which were constructed by attaching planks to rigid internal frames, masulas were sewn boats designed without any internal frames or keel. This made masulas more flexible than European-style boats, and less likely to break apart in turbid conditions. Catamarans, made up of between two and four shaped logs, were designed to cut through the surf much like a modern surfboard, and remained buoyant in all but the most extreme conditions. Both masulas and catamarans were designed with the specific environmental conditions of the Madras littoral in mind. The second-longest natural beach in the world today still stretches twelve kilometers along the eastern edge of Madras, now the modern city of Chennai, ending abruptly at Chennai Harbour in the north. Chennai Harbour is a purely artificial construction, extending out into the Bay of Bengal from a sandy coastline that until the 1860s stretched over a thousand kilometers with few natural protections or interruptions. The city sits on a coastal plain mere metres above sea level, fully exposed to the force of northeasterly and southwesterly

monsoon storms. The country vessels carrying grain and the Company ships loading bales of textiles, diamonds and indigo that visited Madras in the seventeenth, eighteenth and nineteenth centuries had to anchor in an open roadstead, risking the sudden storms that swept the unprepared out to sea or onto the beach, and left the anchorage riddled with cut anchors and other hazards. Between the anchorage and the beach crashed three parallel lines of waves which could reach nearly two meters in height on any given day and formed an unpredictable barrier impassable by traditional European watercraft.

While the Madras surf zone is literally a small space in the history of the British in India, examining how it was experienced over a long period of time shows how different styles of governance and dominant commercial theory impacted the process of loading and unloading cargo in one particular place. Four key aspects of the surf zone and how the local and imperial experience of it changed over time are addressed in this thesis. First it discusses the environmental context, then indigenous technology, imperial administration, and western-style innovations. Chapter two argues that the environmental context of the littoral influenced Madras's political and commercial trajectory. While Madras was the first English East India Company settlement of significance in India, situated to take advantage of a neighboring textile producing region and the Golcondah diamond mines, its littoral environment made the transport of luxury goods risky. The city's importance as an export centre dwindled as early as the late seventeenth century, but it remained a key strategic outpost during mid-eighteenth-century conflicts with the French due to its location and defensibility from seaborne attack. By the nineteenth century, Madras's importance was as the seat of governance for the now-expansive Madras Presidency, but as a commercial port it paled in comparison to Bombay and Calcutta, hamstrung by dependency on the masula fleet. Presenting the inverse trajectories of Madras politically and commercially alongside the physical and climactic context in which it developed demonstrates the pervasiveness of

environmental factors into spheres of history that are often presented as removed from their physical contexts.

Chapter three examines the ship to shore passage through the lens of the locally developed technology of the masula and catamaran and the local labour force. Using maritime archaeological approaches to boat survey, it lays out the existing understanding of masula and catamaran design, construction, and performance. It finds the traditional view of Madras boats has relied on the impressions of nineteenth century travel writers, who used a European frame of reference to describe the boats as safe, reliable, and indigenous in their construction. Broadening the primary source base to prioritise material informed by longer-term contact with Madras boats and boatmen suggests that masulas and catamarans were still fallible designs; not safe, but safer than European boats; not always reliable but easily repaired; not strictly of local design and local construction but consisting of materials imported from around southern India and Sri Lanka, and influenced by the different demands of cargo transport versus fishing. Chapter three also examines the boat people and their position in the surf zone. While travel writers and administrators referred to the boat people using stereotypical language that placed them at the crossroads of native, unskilled, and maritime labour, the boatmen's continued dominance in the surf zone was predicated on strong communal ties and the transmission of environmental knowledge and navigational skill from older to younger generations of boatmen.

Chapter four shifts from the indigenous technological perspective of crossing through the surf zone to the administration and regulation of the space by the Madras government. Starting in the 1750s, the Madras government attempted to exert control in the surf zone by regulating where and when boats could work, how boat trips were requested and distributed, and how the boatmen were paid. The Madras government struggled to mould the surf zone into an orderly and efficiently run space, however, and

conceived of three primary obstacles to their efforts: a shortage of boats, a shortage of boatmen, and endemic theft. However, the problems government officials perceived in the surf zone were merely the social ramifications of the environment in which the boatmen worked and local control of a necessary technology; this chapter argues that Madras officials were unable to completely gain control over the surf zone because their social, regulatory solutions to unsuited to the techno-environmental nature of the roots of the obstacles they faced.

The boatmen did not remain dominant in the surf zone, forever, though. Chapter five examines the construction of harbour infrastructure in the late nineteenth century, which eventually led to the boatmen's elimination from port operations. While proposals for harbour infrastructure dating from at least as early as the 1770s exist, no attempts to build in the surf zone were made until the 1830s, and the first completed project, a screw pile pier, only opened in 1863. Examining both accepted and rejected proposals for harbour infrastructure demonstrates that shifting rationales for action or inaction were based on changes in imperial governing structures, the influence of the Industrial Revolution on Victorian ideas about the superiority of innovative, Western technology, and the shrinking influence of local and nautical expertise in favour of metropolitan theoretical expertise in the decision-making processes about what or what not to build. While the construction of a pier, and later an enclosed harbour, did first diminish and then eliminate the role played by the boatmen in ship to shore transport, the construction of Western-style port infrastructure was plagued by damage and destruction. The British experience of building port infrastructure at Madras shows that the local physical, political, and commercial context has a major influence on a technology's relative effectiveness. The theoretical innovativeness of a design is unimportant if it has not been adapted to the specific conditions in which it is being applied.

Drawing from a wide variety of source material about the experience of moving through the Madras littoral demonstrates that the East India Company, imperial administrators, and local and international merchants were technologically dependent on local boats and boatmen, and that attitudes towards this technological dependency changed in correspondence to larger-scale shifts in the nature of colonial administration, prevailing commercial theory, and attitudes towards innovation and metropolitan expertise. Piloting guides, climate reports, and descriptions of the surf during storms found in local newspapers and the London-based *Nautical Magazine* aid in reconstructing daily and monsoonal conditions in the littoral. Basic interpretations of the boats, the surf zone and how it was crossed are found in British travelogues published in the eighteenth and nineteenth centuries, while boat models, engravings, paintings, and maps help to visualise the surf zone and how it was understood by local and imperial viewers. Correspondence between the Court of Directors and Board of Control in London and the Government in Council, Board of Trade, and Marine Board in Madras, suggests that the supply of boats and qualified boatmen was a regular concern, but how to address labour shortages and endemic problems like theft changed based on the relative autonomy of the Madras government and domestic economic theories. Different approaches to the surf zone and their relative efficacy is evidenced by decades-worth of suggested and published regulations, and petitions, complaints and strikes on the part of the boatmen. Local public attitudes towards masulas, catamarans, and the boatmen were recorded in articles and editorials published in Madras, other Indian, and sometimes British newspapers. Yearly reports on the Madras Presidency from the late nineteenth century provide overviews of surf zone administration and issues within the fleet. Construction proposals, articles in engineering journals, parliamentary records, and published compilations of correspondence

about pier and harbour construction provide detail about the decisions to build infrastructure in the late nineteenth century, how to build, and why.

This thesis draws theoretically from concepts developed in littoral, environmental, spatial, and global history, imperial histories of technology, and maritime archaeology and anthropology. It finds that the British reliance on masulas complicates older narratives of technological superiority in imperial contexts; local solutions could be more useful than innovative designs exported from the metropole when environmental conditions differed from those in Britain. In other words, local expertise mattered. The reliance on masulas afforded the boatmen of Madras a greater degree of agency than other unskilled labourers, but also led to harsh treatment and anxiety-ridden encounters with Company officials in periods of labour scarcity. The infrastructural engineering undertaken in India after 1858 had a particular local flavor in Madras, where the specificity of the environmental conditions and doubtful financial return on investment had stymied decades of pier and harbour construction efforts prior to 1858 and built resentment towards the boatmen and their connecting role. Crossing through the surf was a distinctive experience for those who visited the city. The varying reactions to the need to trust their lives to the skilled native boatmen immediately upon arrival mirror solidifying British attitudes of racial and technological superiority. The intricate and shifting power dynamics between the masula boatmen, boat owners, Company officials, independent merchants, and visitors, shows how local environments impacted imperial experience.

The experience of empire was driven by the varying ecological conditions of particular places. This specificity was recognised by the East India Company and British imperial actors, which led to a dependency on preexisting locally developed tools and technologies to grow and maintain the empire. This reliance, however, created difficulties for the development of a successful administrative apparatus. Dependency on indigenous

skill and expertise was not in line with the nineteenth-century metropolitan narrative of European technological and cultural superiority. As administration of the empire was centralised and powers removed from local government, as was the case in India after the 1833 Charter Act, the viability of systems dependent on indigenous technologies became more difficult to maintain as localised ecological knowledge became less important to the creation of legislation. As the Industrial Revolution progressed in Europe and travel throughout the Empire became more accessible to the middle classes, ideas about technological and racial superiority increasingly hardened, and the reliance on indigenous technology became less and less palatable.

Focusing on the mediation of in-between spaces connects global phenomena to daily experience. The nature of the mediation of contact through the permeable boundary of the surf at Madras raises questions of control of liminal spaces, the psychological impact of passing through such spaces, and the impact a dangerous crossing had on the nature and volume of trade. A multitude of other examples of similar instances of local boat use from Africa, the Americas and Asia suggests that the dependency seen at Madras was part of a global pattern, not an anomaly. The day-to-day experience of liminal imperial spaces demonstrates that imperial administration was based not on political and technological dominance, but on the flexibility and adaptation of administrators to local conditions and indigenous structures for dealing with the limitations of the environment. The reliance on local boatmen, craftsmen, and watercraft to transit across watery boundaries highlight the importance of locally developed technologies, connecting large scale global histories of empire with local accounts of negotiated, undignified, and flexible lived experience.

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Abstract

This thesis examines the process of moving between ship and shore at the English East India Company port of Madras (Chennai) between 1750 and 1895. It argues that while the history of technology in the British empire has largely focused on the deployment of Western innovations, the daily administration of empire was instead dependent on indigenous technologies and practitioners. Madras's dangerous littoral environment meant that trade was facilitated by masula boats and catamarans, built, manned, and owned by skilled local boatmen.

Prior to the mid-nineteenth century, British dependency on masulas and catamarans allowed the boat people to control the littoral technologically. This thesis argues that the boatmen dictated the speed and volume of trade, and British administrators struggled to introduce regulatory solutions to issues of boat and labour shortages and theft. Merchant dissatisfaction with the boat-based system of movement in the mid-nineteenth century led in part to the eventual construction of port infrastructure. The decision to build in the littoral was the result of both local and imperial impetuses, but a prioritization of metropolitan theoretical expertise over local nautical expertise by Parliament and imperial administrators resulted in the adoption of designs that were ill-adapted to local conditions and repeatedly damaged by daily and monsoonal conditions.

Not only does this thesis find that imperial administrators were dependent on indigenous technology for the daily administration of empire, but its littoral approach to Madras also demonstrates that the relative success of different technologies is based on adaptation to the local physical, commercial, and political context. Acknowledging British reliance on local technologies and skilled knowledge holders for essential day-to-day activities leads to a reevaluation of the nature of empire itself. Rather than based solely on dominance and innovative European technologies, empire required adaptability in its administrators and was maintained by local practitioners and locally developed technologies.

Acknowledgements

Over the past four years I have received the support and assistance of many people and organisations, who encouraged me and helped me to fund my work when the covid-19 pandemic made research feel like a near impossible task. Thank you first to my supervisor, Professor Erica Charters, who even when I tried to back away amid frustrations over lockdowns and access to archives, encouraged me to continue on. Thank you as well to Professor Chris Mckenna—while only my college advisor for a short time, your enthusiasm and confidence was infectious and a boost for the last year. Thank you also to supervisors from my past who continued to ask for updates and provide valuable conversation and advice: Rod Mather, Bridget Buxton, and Kris Bovy. You have been encouraging me since I was a freshman in college, and I am so pleased to still have you to turn to.

I would also like to thank the new friends I've made in Global History and History of Science, Medicine and Technology, who even though I was frequently away from Oxford, were always happy to get a coffee and catch up when I was around; and the old, happy to commiserate over bad handwriting from any era. Most importantly I would like to thank Emma, Sian and the rest of the UCL gang, Jenelle and James, Urvi, and Neil for your enthusiasm and friendship. To my Cambridge friends—Jeff and Brendan, Jonathan and Bethan—thanks for always asking 'how's it going...' with the utmost delicacy. To the upstairs: Emily, Selom, Evie, Shirley, Eli, and Bloomer: thank you for sharing your home, kind words, and lots of welcome distraction.

Thank you as well to the various organisations that helped to fund my research, including the Beit fund, the Oxford History Faculty, the Faculty of Asian and Middle Eastern studies, Oriel and Brasenose Colleges, and the Walter Scott investment group through their funded studentship in the Global History of Capitalism Project. I would also like to thank the Marshall Commission for their support from 2015-2017—without the Marshall, I never would have taken the plunge and continued my graduate work in the UK, or been embraced in such a smart, questioning, supportive and diverse community.

Finally, I would like to thank my family—my mom and dad for being great teachers and unwavering supporters through a long and windy graduate school process; my sister Lauren for well-timed pictures of giant tomatoes and happy dogs; Ginger for always recognizing my voice on facetime and being wildly excited for a visit no longer how long I've been away. And thanks to my partner Drew, who was always positive I could do this and never doubted.

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Chapter 1: Introduction

Mary Sherwood arrived off the coast of India in 1805. She had travelled from Britain with her husband, a captain in a Foot regiment, leaving behind a newborn, her family, and friends. Despite this, she recorded her reaction to the first view of India as one of interest and excitement:

> Not a cloud was seen on the deep yet brilliant azure of the sky. The sun poured its dazzling rays unbroken on the long line of shore, which appeared to be richly scattered with palaces…It seemed now, as I looked upon these scenes, that all the visions of Oriental pomp and luxury in which I had often indulged in fancy during my voyage would now be realized…Oh! How ardently did I long to be there.[1]

Mary Sherwood had been on board the HMS *Devonshire* for over four months, a journey that included intense bouts of seasickness, run-ins with the French navy, an early storm that disabled two of the ship's masts, bad food, and a wet, leeward side cabin that left her in a constant, damp darkness. But now the subcontinent was in sight, and all that was left to do was alight on shore in the English East India Company port of Madras, a port of entry used by many British travellers.

Her first experience of India, like that of many of her compatriots, was not of the 'Oriental pomp and luxury' she had dreamed of, but of the boats and boatmen of Madras. Having endured the deprivations of four months at sea on a naval vessel during wartime, the last hurdle for Sherwood was to cross the formidable Madras surf. Once the *Devonshire* anchored in the Madras roadstead, a catamaran had approached, paddled by a native boatman dressed in a loincloth and large, conical hat. The man was a representative of the Madras Boat Department, come to supply the ship's captain, Captain Fraser, with the rules

[1] Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly*, 281–82.

of the port and to enquire about his need for boats to transport passengers and cargo to shore. Fraser would have anticipated the question of boat transport; boats, or small undecked watercraft powered by oar or sail, were used ubiquitously for maintaining communication between ships, ships and the shore, and on smaller bodies of water and rivers. While as a British naval ship the *Devonshire* would have carried its own ship's boats, at Madras they were no use—rigid, European-style boats were known to break apart in the constant rough surf. Instead, Captain Fraser had to request the service of locally built and manned surf boats, through which all the business of the port was maintained. Once the catamaran-man had relayed Fraser's request for boats to shore, a local masula— a deep-hulled, boxy boat rowed by a crew of eight to ten men—would have approached the *Devonshire* to carry its passengers ashore. A journey of about an hour still remained between Sherwood and the land. This final leg of her voyage coloured her experience of Madras, as she recorded in her journal:

> Never shall I forget the horrors of the roaring surf, or the furious yelling of the boatmen when preparing to meet the dreaded beating of a wave; but the wild howlings of the men and the agitation of the whole fabric of the boat was so overpowering, that there was not time to analyse a single feeling; for all appeared to me one wild scene of terror and confusion until I felt the shock of the vessel against *terra firma*…I was instantly assisted to get out, and at length I found myself standing on solid ground, thousands and thousands of miles removed from my native home.[2]

Sherwood's account is similar to many others written by British travellers, merchants and missionaries in the eighteenth and nineteenth centuries. Traversing the space between ship and shore was a central feature of life in Madras, and in the surf zone the British were fully dependent on both local skilled labour and indigenous technology. This dependency dictated the experience of the littoral for government officials, local and European merchants, and the boatmen themselves. As a result, the region's surf conditions,

[2] Sherwood, 287.

anchorage, and boat technology posed a challenge to nineteenth-century conceptions of British commercial and technological dominance. An examination of local environment, technology and knowledge demonstrates instead that the daily experience of empire required flexibility, adaptation, and reliance on local skilled practitioners.

This thesis reinserts littoral space into the history of the British in India, to look both landward and seaward to reinterpret not only the local history of Madras, but also the global economic, social, and imperial structures into which it is commonly subsumed. Working from a littoral setting, it draws on the history of technology, environment, labour, and empire, as well as historical maritime archaeological and anthropological methodologies to reconstruct the experience of crossing between ship and shore. First, it outlines the environmental conditions of the littoral alongside a summary of the political and commercial history of the city, which demonstrates that the city's physical context negatively impacted its commercial growth and helped to direct the political ambitions of its leaders. Second, it examines the design and function of the traditional technology of the littoral, consisting of masula boats and catamarans, and the boatmen. Rather than using European-style ship's boats, all movement occurred through locally designed, built, and manned masulas and catamarans from the establishment of the port in the 1640s through the late-nineteenth century. That trade was dependent on local technology and practitioners meant that East India Company officials were unable to fully control the system of movement; therefore, the thesis shifts focus to examine the administrative repercussions of technological dependency. It examines three obstacles to trade as they were perceived by imperial administrators and argues that regulatory attempts to neutralise obstacles repeatedly failed because they addressed the social ramifications of the techno-environmental context, rather than the root environmental causes of their difficulties. Finally, it examines the multitude of breakwater, pier, and harbour construction and

reconstruction projects proposed, rejected and undertaken in the littoral, exploring the rationale for accepting or rejecting different plans, and the impact recognisable harbour structures had on the crossing from ship to shore in the later nineteenth century. It demonstrates that the efficacy of technology is dependent on adaptability to distinct physical, political, and social conditions, and on the willingness of practitioners to account for local variation.

While Madras's history as an East India Company port begins in the 1640s, this thesis focuses on the period between 1750 to 1895 as a crucial time in the development of Madras as a major Indian port. Within this period there are multiple perceptible shifts in the administration and appearance of the surf zone, but it also encompasses multiple massive shifts in British commercial involvement in and governance of India. I have chosen to begin in the 1750s not only because the earliest attempt at regulating the surf zone dates from 1755, but also because the 1750s mark the beginning of a shift in East India Company structure from a commercial to governing entity. Working outside of the traditional periodization of the history of the British in India, I continue through to 1895 and the replacement of a boat-based system of ship to shore movement with a built harbour. I chose an extended study period to demonstrate the ways in which the experience of ship to shore movement changed with late-nineteenth century attempts to assert British power through Western innovation, technology, and centralised government.

The Madras surf zone is literally a small space in the history of the British in India, but examining how it was experienced over a long period of time shows how different styles of governance and dominant commercial theory impacted the process of loading and unloading cargo in one particular place. A detailed examination of how to cross between ship and shore at Madras demonstrates the varying ways in which large imperial concerns and ways of thinking mutated to fit the local context. It also highlights the sustained British

dependence on indigenous technology and skilled labour. This suggests that rather than a dominating force, the experience of empire on a granular scale was messy and undignified, characterised by flexibility, adaptability, and dependency on local skilled knowledge holders and technologies.

Historiography

Global history as it was originally conceived is a remarkably terracentric construct when one considers that the surface of the globe is seventy percent water. Global history aims to emphasise mobility and demonstrate longstanding commercial, political, and cultural exchange networks, but until recently did not engage with the fact that most of this connectivity was a result of sea voyages, rather than land transit. Instead the ocean was conceptualised as a blank ahistorical space across which movement happened, rather than a distinct place.[3] Maritime history as global history seeks to rectify this overly inward-facing historiography but still remains Euro- and deep sea-centric.[4] Both terrestrial and maritime histories largely ignore the mechanisms by which people, things, and ideas passed between land and sea and the impact that crossing had on the individual, trading networks, and whole cultures.

In 1985, Michael Pearson attempted to remedy this gap by suggesting a third type of historical space: the littoral.[5] A 'littoral zone' is the space lying alongshore, the muddy, porous boundary between dry and wet, but Pearson also uses it to describe the historiographical transitional zone between terrestrial and ocean histories. Littoral environments are spaces of risk, vulnerability, and continuous movement. They can be

[3] Mukherjee, 'Escape from Terracentrism: Writing a Water History,' 88.
[4] Gillis, *The Human Shore: Seacoasts in History*, 4.
[5] Pearson, 'Littoral Society: The Case for the Coast,' 1–8.

hostile or protected—surf zones can be turbid, calm, or alternate between the two in an instant. Rivers shift course, deepen or silt up; sandbars develop and disappear; coastlines can be protected from or exposed to prevailing winds; natural anchorages or built harbours may or may not be available. Storm seasons vary in predictability, length, and ferocity. All these factors dictate the experience of a littoral and how people are able to move through it. Littoral studies emphasise the history of such in-between spaces, recognising the sea without ignoring the land.[6]

Other historians have since suggested similar terms for the same space, such as 'terraqueous,' 'paramaratime' or 'ecotone' histories, but all stress the distinctiveness of cultures that rely on the exploitation of coastal or interstitial resources.[7] Littoral histories, regardless of chosen terminology, are far more inclusive than traditional maritime history. They focus on societies that are intimately tied to the water but also still of the land—fisherfolk, salvagers, longshoremen, boatbuilders and others, rather than pelagic sailors, explorers, pirates, and navigators.[8] Without ever crossing an ocean, littoral peoples have helped to shape global development and facilitate intercultural contact.

Littoral studies overlap with theories developed by maritime archaeologists that are concerned with the classification of material culture and conception of maritime space in ways that reflect the mindset of users, rather than the modern scholar. Arguments within the discipline over what constitutes a 'maritime' context revolve around the (non)existence of a land-sea boundary; in other words, can things found on land be 'maritime' and things found in water 'terrestrial'? Or is a coastline a hard boundary between terrestrial culture and ways of thinking and maritime culture and ways of thinking? One of the first steps to

[6] Pearson, 6.
[7] Bashford, 'Terraqueous Histories'; Land, 'Port Towns and the "Paramaritime,"'; Chappell, 'Ahab's Boat: Non-European Seamen in Western Ships of Exploration and Commerce,' 75–89.
[8] Mukherjee, 'Revisiting Michael Pearson's Indian Ocean Littoral,' 11.

moving beyond shipwreck excavation towards engaging critically with how to define maritime space and culture for archaeologists was made by Christer Westerdahl in 1992. Westerdahl suggests a 'maritime cultural landscape' approach, in order to extend the purview of maritime archaeologists to all elements of maritime culture (such as harbour installations, fishing gear, quays, and port towns), but argued for a strict land/sea divide that meant that all material culture had to be either 'maritime' or 'terrestrial.'[9] While meant to extend the boundaries of 'maritime,' a cultural landscape interpretation came to be widely criticised for maintaining the artificial divide between terrestrial and maritime space. The concept of 'maritimity,' put forth by David Tuddenham, is meant to blur the hard boundary between land and sea to recognise the importance of shifting or co-existing definitions of spaces and artefacts.[10] Hannah Cobb and Jesse Ransley's 'watery worlds' goes further, in suggesting that 'maritime' and land/sea dichotomies are imposed scientific concepts, favouring instead community-driven interpretations of lifeways that encompass the water.[11] Veronica Walker-Vadillo, Emilia Mataix Ferrándiz, and Elisabeth Holmqvist conceptualise 'down by the water' as 'a physical place of cultural meaning' that can be used to bridge disparate academic fields' understanding of the impact of water transit points on past communities.[12] Such conceptions of maritime borders as fluid or lacking set definition are closely related to theories of littoral space in history. Maritimity, watery worlds, water as place, and littoral frameworks are all useful tools for thinking about liminal zones as places between places, where neither the rules and guidelines of the sea nor those of the land strictly apply.

[9] Westerdahl, 'The Maritime Cultural Landscape,' 3.
[10] Tuddenham, 'Maritime Cultural Landscapes, Maritimity and Quasi Objects,' 9.
[11] Cobb and Ransley, 'Moving beyond the 'scape' to Being in the (Watery) World, Wherever,' 18.
[12] Walker Vadillo, Mataix Ferrándiz, and Holmqvist, *Down by the Water: Interdisciplinary Studies in Human-Environment Interactions in Watery Spaces*, 2.

A littoral framework helps illustrate modes of connectivity between land and the deep sea by divorcing maritimity from the concepts of travel and movement emphasised by global maritime histories. It shows how watery edges are concrete places that are experienced daily, rather than only ephemeral spaces through which travellers pass. As a result, it can be used to supplement survey histories that set out to examine maritime connectivity on a massive scale and therefore cannot practically account for the impact of littoral passages. For example, in *Crossing the Bay of Bengal* Sunil Amrith focuses on the people who moved around the Bay's rim and the repercussions of movement, rather than the people and nature of the boundary spaces through which they passed.[13] Sugata Bose, similarly, conceptualises the Indian Ocean as a 'coherently definable interregional arena' and as a result focuses on large scale movement and trading networks.[14] Deconstructing the Indian Ocean rim into its constituent parts, then utilising a littoral lens to focus on the people, places, and things that facilitate movement without themselves moving, can be used in tandem with larger-scale studies to enrich historians' understanding of how oceanic connectivity occurred and was maintained. Large scale connectivity only works if a mechanism exists for crossing between deep water and shore.

While littoral spaces provide a local perspective on large-scale movement, they are also essential to building inclusive global histories because they are the zones where most intercultural contact has historically occurred. As such, littorals can be places of extreme bodily and societal risk and engender anxiety in those who approach them. Referring to coasts as 'transnational contact zones,' Klein and Mackenthun write that such spaces are where 'disparate cultures meet, clash and grapple with each other, often in highly asymmetrical relations of domination and subordination.'[15] They suggest that these

[13] Amrith, *Crossing the Bay of Bengal*.
[14] Bose, *A Hundred Horizons*.
[15] Klein and Mackenthun, eds., *Sea Changes: Historicizing the Ocean*, 2003, 2.

relationships often tipped in the favour of European newcomers—as in the case of the African slave trade, or the colonisation of the Americas or India. And yet, the negotiated realities of such relationships as they played out in the foreshore are more complicated than traditional imperial or maritime histories imply. Andrew Lipman argues that the frame of reference for European-indigenous contact could be moved off the foreshore and out into the littoral to better understand the nature of the interaction between colonisers and colonised; technological shortcomings, navigational ineptitude, or a cultural disregard for the maintenance of ship's boats often left newcomers at the mercy of the surf and the people on the beach.[16] The arrival on foreign shores was a moment of incredible mental and physical danger for European sailors. It required leaving one's ocean-going home and stepping into a smaller and frailer undecked boat, which, propelled by oar or sail, could land on the beach.

Indigenous boats as diminutive coastal watercraft had negative cultural connotations in Britain from at least the seventeenth century. Peter Walmsley argues that by the early eighteenth century the canoe was already a 'site of contest for ideas about was constitutes "savage" and "civilised,"' and that the spread of the use of the word canoe (originally derived from the word 'canoa' in the West Indian language of Taíno) to denote any boat of native construction converted it into a global byword for savagery, a buffer against the danger of local agency in the surf zone.[17] The globalisation of 'canoe' as savage did nothing to decrease the importance of local boats, however. While Adam Clulow notes that 'the moment of transfer from ship to shore provided the first stage on which to mark out their [the newcomer's] authority and required, for this reason, special care,' the

[16] Lipman, 'Maritime Borderlands,' 77; May, *The Boats of Men of War*, 38.
[17] Walmsley, 'Robinson Crusoe's Canoes,' 2, 5.

significance of local boats as facilitators of contact demonstrates that it was not always possible to mark out such authority in an effective way. [18]

Imperial or colonial reliance on local boats made it more difficult to project dominance in the transitional zone, and the ubiquity of such occurrences complicates narratives of imperial progress by simply elucidating the nature of contact. For example, Andrew Lipman writes about the importance of birchbark canoes in seventeenth-century New England, where they were used extensively by both natives and English settlers. Widespread use of the canoe, easier to construct and maneuver in the bays and inlets of Southern Massachusetts and Rhode Island, left the colonists long struggling to exert control over nearby native groups.[19] Conversely, native leaders allowed on board to examine the English oceangoing ships 'pivoted fairly quickly from awe to appraisal.'[20] There are many other examples of the importance of local boats for crossing the littoral. Napoleon's 1798-1802 Egyptian Campaign was carried out on local Nilotic river craft, specifically *djermes,* which were used by both the French and British to transport troops, supplies, and guns in Egypt's hot desert climate.[21] The West African slave trade, and the subsequent suppression effort by the British Royal Navy, was largely dependent on the employment of the Kru people and use of their canoes to pass between ship and shore and support riverine raids.[22] Colonial whaleboats were used for coastal raids, transport, and piracy during the American Revolution, and other small local riverine craft were adopted on a near-global scale.[23] Even on the coast of Britain, it was normal for coasting vessels to rely on local boats for

[18] Clulow, *The Company and the Shogun: The Dutch Encounter with Tokugawa Japan*, 77.
[19] Lipman, *The Saltwater Frontier: Indians and the Contest for the American Coast*, 57.
[20] Lipman, 77.
[21] Breene, 'Outfitting the Country Boats as Gunboats: Indigenous Vessels and the Egyptian Campaign, 1798–1802,' 106.
[22] Brooks, *The Kru Mariner in the Nineteenth Century: An Historical Compendium*; Burroughs, '"[T]he True Sailors of Western Africa": Kru Seafaring Identity in British Travellers' Accounts of the 1830s and 1840s,' 51–67; Hargrove, 'Krumen and the Suppression of the Trans-Atlantic Slave Trade from West Africa,' 72–98.
[23] Gardner, 'Whaleboat Warfare on the Sound,' 59–68.

unloading and provisioning.[24] The daily experience of life in the littoral, for both visitors and locals, suggests a far less 'asymmetrical' relationship on the individual level than recognised in global histories, or at least a dominance far more grounded in compromise and adaptability on the part of newly arrived Europeans.

Discussions of the nature and experience of contact at the forefront of littoral history are much indebted to terrestrial contact histories. Richard White's *The Middle Ground* established the concept of cultural and political spaces separate from but reliant on the traditions of multiple groups in conversation. The melding of different expectations and experiences, he argued, led to the creation of a new, distinct way of understanding the world. The same concept can be applied to the littoral, or physical middle ground between land and sea.[25] Mary Louise Pratt's seminal book *Imperial Eyes* introduced the term transculturation as a historical concept for identifying the exchange of knowledge and material objects. She uses the term to identify the active selection and invention by subordinated or marginalised groups from materials transported from the metropolis. In a littoral context, where exchange is multi-directional and to an extent environmentally determined, transculturation also encompasses the ability of newly arrived groups to borrow or adapt from the local population.[26] Beyond Michael Pearson, the work of Greg Dening, John Gillis, Rila Mukherjee, and Alison Bashford, among others, emphasises the utility of the littoral as a space in which the ways contact occurred can be explored and compared across time and places.[27]

[24] May, *The Boats of Men of War*, 32.
[25] White, *The Middle Ground: Indians, Empires, and Republics in the Great Lakes Region, 1650-1815*, X.
[26] Pratt, *Imperial Eyes: Travel Writing and Transculturation* (London: Routledge, 1992), 6.
[27] Bashford, 'Terraqueous Histories'; Chappell, 'Ahab's Boat: Non-European Seamen in Western Ships of Exploration and Commerce'; Dening, *Beach Crossings: Voyaging Across Times, Cultures and Self*; Gillis, *The Human Shore: Seacoasts in History*; Mukherjee, 'Revisiting Michael Pearson's Indian Ocean Littoral'; Mukherjee, 'Escape from Terracentrism: Writing a Water History'; Pearson, 'Littoral Society: The Concept and the Problems.'

Despite the potential of Madras for writing a littoral history of empire, there is a limited corpus of modern scholarship engaged with the port's boats and men. Modern ethnographic work on masula fishing communities was conducted by BA Blake in the 1970s, Eric Kentley in the 1980s and Lucy Blue in the mid 2000s, and Charlotte Dixon has written about masula models in British museum collections.[28] Among historians, most work on the boatmen features in larger labour or religious studies. Ravi Ahuja, for example, has written about the boatmen and boat owners as part of a larger research agenda focused on labour relations in colonial Madras, while Aparna Balachandran writes about the legal and religious history of the labouring class in colonial Madras, and has included the boatmen in her work.[29] Susan Neild Basu writes about the *dubashes,* men who travelled out to ships in the anchorage in masulas to hire out their services as translators and guides, but their presence in Madras and her work stretches far beyond the surf zone.[30] By contextualising the boatmen within the labour and religious history of southeastern India, these works have prioritised the ways in which the boatmen are comparable to terrestrial workers or religious communities, while this thesis instead engages with how the littoral setting of their work dictated their relationship with local administration.

Not only does this thesis emphasise the impact of the littoral environment and imperial dependence on indigenous technology, but it also demonstrates that there are parallels between the experience of moving between ship and shore at Madras and larger social movements and attitudes towards imperialism. Remaining tightly focused on the

[28] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State'; Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast'; Kentley, 'Some Aspects of the Masula Surf Boat'; Staples and Blue, 'Archaeological, Historical, and Ethnographic Approaches to the Study of Sewn Boats: Past, Present, and Future'; Dixon, 'Miniaturising Boats: The Case of the Indian Masula Surf Boat.'
[29] Ahuja, 'Labour Unsettled: Mobility and Protest in the Madras Region, 1750-1800,' 396–402; Ahuja, *Die Erzeugung Kolonialer Staatlichkeit Und Das Problem Der Arbeit*, 69–124; Ahuja, 'Labour Relations in an Early Colonial Context: Madras, c. 1750-1800,' 810, 813–16; Balachandran, 'Catholics in Protest: Lower-Caste Christianity in Early Colonial Madras,' 251; Balachandran, 'Petitions, the City, and the Early Colonial State in South India,' 160.
[30] Neild-Basu, 'The Dubashes of Madras.'

space between ship and shore and how it was traversed is an opportunity to think more critically about the role of indigenous technology in the physical and psychological construction of the British empire. A littoral approach to the history of Madras demonstrates a British dependency on indigenous technology, knowledge and skill, which in turn suggests that a wide range of technologies, not just Western innovations, played an important role in imperial expansion.

The technology of the masula boat distinguishes this work from other research into the role of indigenous knowledge holders in British imperial contexts, which often focus on labour. Non-European manpower and expertise at sea on European-style vessels has been identified as key to maintaining British merchant and whaling fleets. Kru, Kanaka (Pacific Islander), lascars, and Chinese sailors made up a significant portion of the British labour force at sea. [31] Scholars like David Chappell have written about the importance of non-European labour and knowledge, but these arguments can be expanded to include nearshore maritime labourers who never went to sea, and crucially, their technology.

The role of technology generally in imperial developments has received narrow critical treatment. Kenneth Pomeranz, who reignited global historical debates with his 2000 book *The Great Divergence,* treats technology as a point of comparison for determining the efficacy of economic systems, rather than focusing on technology as a mechanism of European expansion.[32] CA Bayly, in *Birth of the Modern World*, does not discuss technology at any length at all; it instead shows up only in passing reference, and as symbolic support for other political or cultural successes.[33] Authors who have focused on the importance of the role of technology in imperialism, most importantly Daniel Headrick

[31] Chappell, 'Ahab's Boat: Non-European Seamen in Western Ships of Exploration and Commerce'; Chappell, 'Kru and Kanaka: Participation by African and Pacific Islander Sailors in Euroamerican Maritime Frontiers,' 83–114; Euston, *Lords of the East: The East India Company and Its Ships*; Hackman, *Ships of the East India Company*; Bulley, *The Bombay Country Ships 1790-1833*.
[32] Pomeranz, *The Great Divergence,* 43–68.
[33] Bayly, *The Birth of the Modern World 1780-1914*, 128, 131, 275.

and Michael Adas, focus their arguments on the ways Western technologies allowed Europeans to overcome local actors and environments and how adopting them allowed locals to resist Europeans more effectively. In his work *Machines as the Measure of Men,* Adas argues that Europeans used perceptions of indigenous technology to construct and justify narratives of superiority.[34] Headrick is focused on how the actual, rather than perceived, superiority of European technology allowed imperialists to gain dominance over non-European actors armed with what he terms 'simple' technologies.[35] When viewed in contexts where Europeans possessed no viable alternatives to such 'simple' technologies, however, such sweeping arguments become untenable.

European technological 'superiority' and innovation as effective tools of empire abroad have been questioned because of the many alternative explanations for imperial success and examples of the failed application of metropolitan technology in colonial contexts. Rather than the driver of early imperial expansion in the Americas and Asia, JC Sharman argues that innovative European technology was ultimately irrelevant to the modes by which expansion actually occurred. The different environmental and cultural circumstances of extra-European expansion, he notes, meant that the military techniques and technologies developed during the 'military revolution' were not useful and therefore not used.[36] Failure in colonial contexts also complicates the narrative of European technological superiority. In his study of steamboats on the Indus, Clive Dewey disagrees with the assertion that the application of European technologies resulted in successful conquest abroad. On the Indus, steamboats were a hindrance rather than a source of power; the dramatic seasonal change in water level and need for fuel meant they were outcompeted

[34] Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*, 10–12.
[35] Headrick, *Power over Peoples: Technology, Environments, and Western Imperialism, 1400 to the Present*, 3–5.
[36] Sharman, 'Myths of Military Revolution: European Expansion and Eurocentrism,' 498.

by, and led to a resurgence in, local boatbuilding.[37] He argues that studies of Western technological domination lack systematic analysis of factors that determined the introduction and use of Western technology in conquest and the empire.[38]

Despite alternative explanations for the role and failure of European technology in imperial contexts, the role of indigenous technology in empire still presents a historiographical blind spot. The limited attention paid to indigenous technology as a viable alternative to European options means that each instance reads as an exception to the rule, rather than the norm. This trend is further intensified by the fact that indigenous technologies are often discussed in histories of exploration, and therefore appear to be standalone contributions rather than the norm. Traditional accounts of the search for the Franklin Expedition, for example, romanticise the British naval officer by way of technology, including such statements as 'it was a form of cheating to use animals for transport' and 'to the English there was something noble, something romantic, about strong young men marching in harness through the Arctic wastes…' But by examining the writing left behind by members of the expedition, William Barr argues that the opposite was true, and that search parties readily adopted dog sledges for the movement of supplies and people.[39] Likewise Peter Martin's note that explorers in Northern Alaska at the turn of the twentieth century found *umiaks* (Iñupiat sealskin boats) more maneuverable, durable and repairable, demonstrates that European acknowledgement of dependency on indigenous technology is present in the documentary record.[40] Other examples of dependency and hybridity come from across the British empire; the development and deployment of the Congreve Rocket, for instance, also demonstrates the importance of local environmental

[37] Dewey, *Steamboats on the Indus: The Limits of Western Technological Superiority in South Asia*, 142.
[38] Dewey, 241.
[39] Barr, 'The Use of Dog Sledges during the British Search for the Missing Franklin Expedition in the North American Arctic Islands, 1848–59,' 257.
[40] Martin, 'Indigenous Tales of the Beaufort Sea: Arctic Exploration and the Circulation of Geographical Knowledge,' 30.

and technical knowledge in the production of useful technology. Simon Werrett argues that while Congreve believed that expertise and infrastructure in London outweighed consideration of the vastly different environmental conditions in India, East India Company officials stationed in India considered his British-produced rockets dangerous, and in need of local adaptation and hybridisation.[41] An understanding of the local (peripheral) environmental, political, and social context, therefore, was as essential for the successful deployment of technology as the theoretical efficacy of metropolitan design.

Traditional metrics for technological success and superiority do not account for the British experience of the Madras littoral. Innovative technology, while deployed in the surf zone, did not dramatically change how it was crossed for decades, instead repeatedly failing to produce the expected outcome of increased ease and cheapness of movement. In 1858, the construction of a screw pile pier, designed by the renowned Irish engineer and pioneer of the screw-pile design, Alexander Mitchell, was begun to the excitement of Madras's international merchant class. The pier was heralded as an alternative to the lumbering masula boats, meant to remove the burden of dependence on the local native population to conduct seaborne trade.[42] But in practice the pier was a dismal failure, badly damaged by cyclones and shipwrecks multiple times in the 1860s. As early as 1864, only a year after it was officially opened to commercial traffic, the *The Homeward Mail* bitterly referenced the pier as that 'melancholy looking, deserted structure [which] bids fair to be practically a monument to skill and money thrown away… generally speaking, everything has gone wrong with it, to the great disgust of Government.'[43] Mitchell's screw pile design, no matter how innovative, was no match for the violence of Bay of Bengal monsoons, and could not

[41] Werrett, 'Technology on the Spot: The Trials of the Congreve Rocket in India in the Early Nineteenth Century,' 604; 612.
[42] 'The Madras Pier,' *The Homeward Mail* [London] no 160, (6 December 1860), 9 col a; Lutenegger, 'Historical Application of Screw-Piles and Screw-Cylinder Foundations for 19th Century Ocean Piers,' 4.
[43] 'Madras Local News,' *The Homeward Mail* [London] no 311, (12 February 1864), 8 col a.

replace the masula fleet as a safe means to cross between ship and shore. The pier was supposed to be superior because it was new and complex while masulas were ancient and comparatively basic, but the outcome of this early attempt to build European-style infrastructure casts doubt on innovation and complexity as the only metrics of 'superiority.' The British experience of reliance and construction at Madras suggests that across the empire, technological 'superiority' was based not on complexity alone, but on the adaptation of technologies to a plethora of local social, political, commercial, and environmental scenarios.

Any littoral culture situated on a dangerous coastline could be used to make the argument for British dependency and adaptability in such spaces. Colonial Madras, however, is a particularly evocative case study for questioning the applicability of traditional imperial or technological determinist historical narratives. The longevity of contact and reliance on masulas at Madras is unlike other examples of local boat use—masulas were used for over two hundred and fifty years and were enveloped into a regulated system of movement. Other examples appear ad hoc, exist for shorter periods of time, or require the boats and their operators to move out of their traditional range, stretching the boats beyond their original capabilities. Egyptian *djermes,* for example, were used as gun boats, to transport troops, and to carry messages during Napoleon's Egyptian Campaign at the turn of the nineteenth century. Designed to transport grain along the Nile, *djermes* were used as gun platforms at the 1799 siege of Acre, a small harbour in modern Israel, a novel use for the vessel type at a site far outside its traditional range of use.[44] On the Coromandel Coast in the region of Madras, on the other hand, sixteenth-century Portuguese accounts from San Thomé suggest that masulas had already long been used for crossing the surf in

[44] Breene, 'Outfitting the Country Boats as Gunboats: Indigenous Vessels and the Egyptian Campaign, 1798–1802,' 110.

exactly the same way they would be used by locals and Europeans alike through the nineteenth century.[45]

When writing to the East India Company Court of Directors in London in 1639 urging them to support his signature of a lease for the land that was to become Madras, Francis Day reassured them that access to the sea and shipping would be straightforward. He wrote optimistically that the site was 'a high plotte of ground adjoyneinge to the sea, where a ship of any Burthen may ride within Muskett shott, Close by a river which is Capeable of a Vessell of 50 tonns...'.[46] This was a mistake. Rather than an asset, Madras's sea access was perpetually its greatest limitation. The transshipment of all goods between ship and shore in masula boats dictated and restricted the volume of trade that could move through the port. Its exposure to monsoon winds limited the time each year during which any trade could occur, and the difficulty of ship to shore travel and lack of safe careening facilities forced the Royal Navy to wholesale abandon the site in 1817.[47] The pre-twentieth century history of Madras is informed by its relationship to the sea, the limitations of its littoral, and the technological prowess of its local native people. A history of the Madras littoral demonstrates how the city's formation as a British colonial hub was shaped by dependence on local knowledge-holders and technology in the transitional zone between ships and the shore. Furthermore, the British perception of the littoral was determined by the ineffective outcomes of the application of imperial governing practices and expectations of metropolitan technological expertise to the passage through the space.

Sources and Methodology

[45] Love, *Vestiges of Old Madras, 1640-1800; Traced from the East India Company's Records Preserved at Fort St George and the India Office, and from Other Sources, by Henry Davidson Love. Published for the Government of India*, 1913, 1:299.
[46] Love, 1:20.
[47] Day, 'British Admiralty Control and Naval Power in the Indian Ocean, 1793-1815,' 276.

Previous references to the Madras littoral in recent scholarly work tend to rely on nineteenth-century travel writing for information about the crossing and how it was experienced, lending the space a quaint and one-dimensional quality.[48] This thesis draws out several themes in littoral experience, including the prominent role of the environment, technological dependency, and the importance of context in the success or failure of innovations to enrich the existing impressionistic historiography of the Madras littoral. I have used a variety of source material to examine the passage through the surf zone from different angles. A large portion of the archival documents used are from the India Office Records collection in the British Library and include manuscript correspondence between the local Madras Government and the Court of Directors and Board of Control in London, internal correspondence and reports between different committees at Madras, and specific reports written in response to requests from the governor-in-council or London boards. The East India Company collection also includes complaints, suggestions, and petitions that were submitted by local merchants and the boat people for consideration by the Boat Department and the central government. In conjunction with these archival documents, this thesis draws on published material, such as the *Fort St George Gazette*, annual reports of the administration of the Madras Presidency, piloting guides, almanacs and magazines, collections of Indian legislation, compiled collections of construction reports, articles in engineering journals, and local, Indian, and British newspapers. I also use travelogues and visual and material sources, such as paintings, prints, and maps as supplementary material.

To reconstruct the littoral environment, I use a mixture of contemporary and modern sources, prioritising contemporary sources where possible. These include newspaper reports about surf conditions and extreme weather events, almanacs, naval reports,

[48] See, for example, Colley, *The Ordeal of Elizabeth Marsh*; Nechtman, *Nabobs: Empire and Identity in Eighteenth-Century Britain,* 31.

compilations of shipwrecks, petitions from grain merchants and boat people, and harbour construction reports. I supplement these with historical climatology studies and geologic, oceanographic, and climatologic studies on the modern Coromandel Coast. Even with allowances for changes to the environment based on climate change, infrastructure, and population growth, weather and environment remain comparable between today and the nineteenth century.

Evaluating the technological and administrative aspects of the Madras littoral should be approached with caution despite the breadth of material utilised. All the material used here was written or translated into English at the time it was produced; most of the local newspapers used, for example, represent the views of the British at Madras, and not necessarily those of native merchants and labourers. Although the thesis stresses the contributions of indigenous knowledge and skill, it is based entirely on material about the boats and boatmen of Madras produced by writers employed by or belonging to an imposed Western administrative hierarchy. None of the material used in this thesis was directly produced by the boatmen themselves—even the suggestions, petitions and complaints that appear in chapter four are translations that were collated into Company correspondence about the boats, rather than original copies. Very few boatmen are identified by name in either Company sources or newspaper articles, and boatmen are never named in travel writing, creating the impression that the boat people operated as an undifferentiated bloc. This lack of material produced by the boat people means that there are limitations to this reconstruction of the surf zone. How boatmen viewed the taking of goods that the Company labelled ‘theft’, for example, or what responsibility owners felt they needed to take for repairing boats or compelling boatmen to work on a given day, remains obscure. The internal social structure of the boat people, which clearly shifted over time, is also ambiguous in the documents.

Internal East India Company correspondence, newspaper articles, and travelogues furthermore may skew the modern reader's view of the daily experience of life on the beach towards chaos, where others might have seen general cooperation. The Boat Department appears most often in East India Company correspondence at times of perceived crisis—an increase of theft, lack of boatmen or boats, the looming threat of conflict, or rough monsoon seasons. The travelogues, written by people who experienced the surf zone only in passing, lack detail and reflect the often-racist attitudes of their expected readership. Available newspaper articles are either editorials, which in general are in favour of decreasing cost and increasing efficiency and are therefore often dismissive of or negative towards the boat people, or short reports on incidents in the surf zone that include very little detail. Local newspapers rarely, if ever, reported on days where everything ran smoothly, creating an impression of dysfunction. Therefore, the gaps in all these sources must be read as well, as compelling evidence that chaotic days were the exception, rather than the norm. Furthermore, most of these texts were not produced by technical observers in the design, construction, and handling of masulas and catamarans—while simple, the boats were technologically sophisticated and highly designed to answer the nature of the surf zone. This means that reports are written in most cases by authors who do not fully understand what they are witnessing, which may result in errors or inconsistencies. An author's perspective is also an important consideration; newly arrived officials or travellers, with a metropolitan frame of reference, may paradoxically think of the boats as primitive and 'admirably adapted' if comparing them to European ships and boats, while local viewers—either native merchants or boatpeople, or European merchants and officials having lived at Madras over longer periods—may instead compare the performance of a boat or crew to other local boats and crews. Even within the class of writers that may primarily be seen as

'European,' whether their writing reflects a predominantly metropolitan or peripheral perspective varies based on expertise and length of contact.

Regardless of the shortcomings of the available material, it still allows for a reconstruction of the littoral and the ways in which it was perceived by the colonial administration, merchants, occupants of the city and visitors. Using such a range of types of material, over a long study period, is a way of combatting the biases in the source material. A littoral methodology prioritises topic and setting over genre or date in identifying sources. This broad approach helps rectify patchy coverage from one source type to the next. Government documents, for example, provide fascinating material on the discussions and arguments that occurred around decisions to do with changes in the surf zone, but often discuss the impact of those changes months or years after they took place, if at all. Newspaper articles and editorials fill that gap with reactionary and more immediate reports and editorials which suggest the ways in which changes were experienced in real time. A littoral approach is also a means to incorporate material produced both locally and abroad, while maintaining a sharp focus on the passage through the surf zone. Incorporating material produced both locally and abroad reflects the historical reality that over time British imperial holdings were drawn into increasingly tighter orbit with the metropole; people in Britain were interested in Madras and its development and made efforts to contribute to safety and port construction efforts across the nineteenth century. Engaging with the Madras littoral in both its local and imperial contexts required using both local and internationally produced material.

A littoral framework also allows for an extended time scale; indeed, littoral histories often cover long time periods to demonstrate the nature of continuity and changes in a small defined space. In this case I searched across the study period for travelogues and artwork and then again compared these to the undulations of administrative records and newspaper

accounts to look for shifts in British attitude towards the surf, and to contextualise those shifts within the changing administrative structure of the surf zone. An extended study period also demonstrates that British technological dependency was longstanding. But while dependency was sustained, the reactions of later writers and administrators to earlier decisions about the regulation and construction of the surf zone shows that the relationship between boat people, between boat people and the government, and between boat people and merchants was not static, and that these relationships changed as British attitudes towards dependency worsened.

A littoral framework provides the means to recreate the experience of a specific space despite the temptations of a long study period and wide base of material; the boundaries of littoral space facilitate tightly focused research and interpretation. In this case I used the framework to prioritise sources *about* moving through the littoral over a broader interpretation of what could be 'littoral' at Madras. For example, this work does not address in depth the types, volumes, and treatment of cargo that moved through Madras, or examine the letters and notes carried by catamaran-men back and forth through the surf. Both could be considered aspects of the littoral experience, but to limit the potential scope of this project to technology and practitioners, I focus on how movement happens, instead of what it is that is moving.

Finally, a note about place names and terminology. Throughout this thesis, I use eighteenth- and nineteenth-century place names, rather than modern place names. Madras, for instance, was renamed Chennai in 1996 in recognition of the supposed wishes of the *nayaka* who originally granted the East India Company the right to build a factory and trade at Madras, and as part of a larger effort to move away from Anglicised placenames and

spellings.[49] I have chosen to use Madras, rather than Chennai, to maintain consistency with the documentary record from which I work and to reduce confusion. Chennai is used infrequently and explicitly in reference to the modern city. I have taken the same approach to other place names, for example 'Bombay,' 'Calcutta,' and Ceylon, rather than Mumbai, Kolkata, and Sri Lanka. On the first mention of other places and features I also include the modern place name.

It is also important to recognise the way in which I use the terms 'indigenous' and 'local.' Indigenous is not a neutral term, particularly in an Indian context. In India, it was first used by colonial ethnographers in the eighteenth and nineteenth centuries to describe and denigrate nomadic hunter-gatherer groups in the forests and hills of the central plateau.[50] These groups, referred to today as 'Adivasis,' were characterised by British ethnographers and administrators as primitive, backwards, isolated, timeless, criminal and barbaric.[51] This classification has continued to carry currency despite calls for a postcolonial overhaul of attitudes towards the Adivasis, and these communities still face labour exploitation, removal from traditional lands, and discrimination based solely on their 'indigenous' identity.[52] To recognise the specificity of the concept of indigeneity and its repercussions in the Indian context, I typically refer to the boatmen as 'local' rather than indigenous. I describe the boatmen as local in the sense that they made up a cohesive group of native Indians who belonged to a coastal community with roots in the region that predate the arrival of Europeans.

[49] The Sanskrit term *Nāyaka,* or *Nāyak* in Hindi, was used to refer to 'a leader or chief;' Yule, *Hobson-Jobson*: *A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical, Geographical and Discursive,* 470.
[50] Bhukya, 'The Mapping of the Adivasi Social,' 103.
[51] Bhukya, 109; but see also Kennedy, 'Guardians of Edenic sanctuaries: Paharis, Lepchas, and Todas in the British mind,' 60, 76-7. Kennedy argues that some highland tribal groups were idealised by early British writers, particularly in missionary writings and medical texts.
[52] Tete, 'Industrialization and Marginalization of the Adivasis: A Study of Sundergarh District, Odisha, India,' 168.

While I refrain from the use of 'indigenous' to describe the boat people directly, I do, however, persist in referring to their communal knowledge as 'indigenous knowledge.' This choice is in line with conceptualisations of indigenous knowledge found in the history of science, anthropology, and development studies. 'Indigenous knowledge' has variably been defined as 'local knowledge unique to a given culture or society;' knowledge that is 'scattered and associated with low prestige rural life;' 'common sense knowledge and ideas of local peoples about the everyday realities of living;' 'non-Western;' traditional/primitive/local/native/aboriginal/folk/ethno- knowledge; or as knowledge that is 'locally acquired and organized.'[53] I prefer indigenous to 'local' knowledge to maintain the distinction between what and how the boat people knew about the surf and how to cross it, and the knowledge gained by imperial administrators through long-term occupation and contact.[54] The boat people's understanding of the surf and how to cross it can be effectively characterised as an indigenous knowledge system in that it is local to the Coromandel Coast, unique to their community, and based on multi-generational contact with specific environmental conditions.

Structure

[53] Agrawal, 'Dismantling the Divide between Indigenous and Scientific Knowledge,' 416–18; Chambers and Gillespie, 'Locality in the History of Science: Colonial Science, Technoscience, and Indigenous Knowledge,' 233; Tilley, 'Global Histories, Vernacular Science, and African Genealogies; or, Is the History of Science Ready for the World?,' 115; Safier, 'Global Knowledge on the Move: Itineraries, Amerindian Narratives, and Deep Histories of Science,' 41.

[54] I maintain the distinction between 'indigenous' and 'local' knowledge in line with Chambers and Gillespie's argument that a 'locality' approach can contain both 'indigenous' and 'Western' ways of doing science, resulting in a more 'equitable comparison' (Chambers and Gillespie, 235.) Because I am writing not only about the knowledge of native local boatmen, but also at times about knowledge of the surf and ideas for technological solutions expressed by locally experienced but Western-educated imperial administrators, I use 'indigenous knowledge' to distinguish between the two. I use 'local knowledge' when referring to ideas derived specifically from spatial experience regardless of cultural or educational background. For example, in chapter five I use 'local' to contrast ideas put forward by locally experienced imperial administrators with those of metropolitan experts.

This thesis is structured thematically around key aspects of the approach to the Madras littoral zone between 1750 and 1895. Chapter two argues that the Madras surf zone played a defining role in the development of Madras as a commercial and political hub. It presents a political history of colonial Madras alongside a description of the climate and environmental conditions of the littoral, how the space of the littoral was divided for shipping, and an idealised description of how to move between ship and shore. These four facets of life at Madras in the colonial period are presented together to demonstrate the pervasive nature of the environment into spheres of history that are often presented as removed from their physical context.

Chapter three examines the Madras littoral as a technological system comprised of masulas, catamarans, and the builders, boatmen, and catamaran-men who facilitated all ship to shore movement. It finds that the experience of crossing the Madras surf zone challenged notions of European technological superiority and diffusionist models of technology in empire. The second half of the chapter finds that the boatmen, while described by travel writers and administrators using stereotypical language common to discussions of native peoples, unskilled labourers, and maritime labourers, used strong communal ties to maintain their control over the construction of the boats and the transmission of environmental knowledge and skill. Finally, this chapter argues that the historiographical emphasis on innovation and the importation of new ideas in colonial histories obscures the use of local technologies, and the consequences of relying on local skilled knowledge holders and technologies.

Chapter four argues that the Madras Government struggled to effectively exert control over the system of movement between ship and shore because of a disconnect between the obstacles they perceived and the techno-environmental causes of their difficulties. Three major perceived obstacles to trade are explored in this chapter: a

persistent shortage of boats, theft during the passage, and labour supply. By examining administrative efforts thematically over time, this chapter finds all three of these issues are in themselves a result of the nature of the surf zone. Unable to legislate wind and waves into submission, the Madras Government was incapable of dominating the surf zone technologically *or* administratively. This forced the government to engage collaboratively with the boat people as the possessors of essential expertise, rather than treat them as a dispensable or replaceable labour force.

Chapter five addresses the eventual construction of harbour facilities at Madras by examining the pre- and post-construction surf zone as a continuity. It argues that the effective application of a technology requires an intimate understanding of and adaptation to the local physical, political, and social context. It finds that as imperial rule consolidated over the course of the nineteenth century and the role of Madras-based officials in the decision-making process about if and what to build diminished, so too did the voices of local and nautical experts relative to those of domestic engineering experts. The consolidation of power, demands of steam shipping, and the Victorian conviction of technological superiority combined in the second half of the century to saddle Madras with harbour facilities poorly suited to the city's specific context.

Chapter six concludes by tracing the early-twentieth century efforts to complete the harbour and reversion of the boat people to full-time subsistence fishing practices. To trace the masulas and catamarans in twentieth-century British popular memory, it utilises the Pitt Rivers Museum catamaran, brought to Britain for the 1924 British Empire Exhibition and subsequently displayed as an ethnographic object. The chapter argues that the original purpose of the catamaran's display—as an ancient and primitive fishing craft—obscures two centuries of British dependency and belies their contribution to a global imperial trading network. Finally, it summarises the thesis and its contributions to littoral,

technological, and imperial historiography, arguing that the British dependency on masulas calls into question our understanding of the very nature of empire. Adaptability and reliance on others, not domination, dictated the day-to-day experience of imperial spaces.

This thesis argues that the British were dependent on indigenous technology at Madras, and that adaptability and indigenous knowledge were key to imperial success more broadly. It finds that local physical conditions dictated the relationship between local and coloniser in environments like the Madras surf zone which demanded specifically adapted technology. It also argues that environment and technology should be integrated into broad social and economic histories as important context for the localised decision-making processes of leadership traditionally viewed as belonging in a global imperial context. When decision-making processes are widened beyond those with an intimate knowledge of the specific environment, outcomes are sometimes not as expected, even if the outcome was predicted by those who do have local knowledge.

When Mary Sherwood arrived off the coast of Madras in 1805, her assessment of the surf zone and the boat people was rousing but cursory. It fills only a few pages of her nearly six-hundred-page memoir, reflecting other contemporary accounts and the modern treatment of the Madras surf zone in the historiography of British India. Sherwood's brief contact with the Madras littoral, however, belies the realities of a complex system of movement based on local technology, knowledge, and skill. A littoral approach to reconstructing the experience of the Madras surf zone between 1750 and 1895 demonstrates British dependency on contextually superior technology and indigenous knowledge holders in a dangerous environment. It also documents the English East India Company's struggle to temper that dependency by defining and controlling the surf zone through legislation and the construction of port facilities. It shows that a consideration of the local environment and recognition of indigenous knowledge and skill is key to understanding the trajectory of

Madras as a colonial port city. To better understand the global trajectory of ports and how they evolved structurally over time based on local factors, ports should be viewed in their specific local contexts as well as in their role as nodes or points of contact in global systems. For Madras, its place in local and global commercial structures was dictated by the cooperation of local knowledge holders and the use of their boats, rather than by the application of innovative technological solutions. This dependency meant that larger imperial social structures—such as changing attitudes towards labour, native peoples, and expectation of technological superiority—had to be reworked to fit the reality of utilising the port. As a result, the nature of empire should be understood as negotiated, reliant on others, and oftentimes undignified, rather than a domineering, superior force.

Chapter 2: Defining the Madras Littoral

In February 1808, an independent merchant named Sebastian Greig submitted to the Government of Madras a plan for building an experimental pier off the beach outside his home. He wrote that he had observed the surf and felt that a pier would serve as a much-needed improvement to communication between ship and shore.[55] The plan was forwarded to the Madras Board of Trade and the Military Board's Chief Engineer, both of whom roundly rejected it. A member of the chief engineer's office, E. Trapand, was especially scathing in his remarks on the plan, writing that while he agreed in concept that better communication was needed with the shipping, he was 'at a loss as to what [Greig's] intentions are.' Trapand continued that Greig failed to take full account of the fact that Madras was 'exposed to the weight of the great Indian Ocean, and the tempestuous part of the Bay of Bengal.' In short, Trapand concluded, 'it appears to me not very probable that Mr Greig's short residence upon the beach should have furnished that practical knowledge which is necessary for so great and important an undertaking.'[56]

Greig's was one of many early plans for 'improvement' to the port of Madras that was rejected on the grounds that the project was an impractical answer to the harsh littoral environment abutting the city, and its dismissal demonstrates the ways in which considerations of the environment permeated the commercial and political decision-making processes of its leadership. At Madras, the nature of the environment is crucial to contextualising the history of the city as an international port and how it grew and changed in the eighteenth and nineteenth centuries. However, the ways in which practical considerations of environment impacted the construction of ports are not always visible in

[55] 'SH Greig Esq to Governor in Council' 17 Feb. 1808, British Library (BL), IOR/F/4/1580/64266.
[56] 'Report of E Trapand Esq. Chief Engineer on letter from Mr S. Greig,' 7 June 1808, BL, IOR/F/4/1580/64266.

the broader historiography of port cities. The historiography of port cities instead stress a global context for ports as mediators, 'connective nodes,' or as 'imperial bridgeheads,' a view of ports Sujit Sivasundaram has criticised as reducing them to 'placeless coordinates in a globalized system.' [57] Stressing the high-traffic and ephemeral aspect of life in colonial port cities blurs the fact that a port is in fact, a *place*, rooted in its local social, political, commercial—and environmental—contexts. This thesis instead emphasises the ways in which Madras's history was deeply rooted in place, shaped by those for whom the port was always a 'here' and not often a 'there.'[58]

This chapter combines a political and commercial overview of Madras, a description of the littoral environment, and discussion of how it was visually constructed by locals, administrators, and visitors at different points in its history. First, it summarises Madras's political and commercial development from the foundation of the city in 1639 through the end of the nineteenth century, focusing on situations that influenced or were influenced by the nature of the port and seaborne trade. Second, it describes the climate and environmental conditions of the foreshore that affected the growth of the port. Third, it details the systematic spatial organisation of the nearshore anchorage into defined areas for conducting trade. Finally, it outlines the 'ideal' process of traversing the littoral by masula boat. The chapter draws on a combination of twentieth-century histories and compilations of East India Company administrative documents, newspaper accounts, engineering reports, maps, historical and modern climate studies, travelogues, and artwork to lay the contextual groundwork for the remainder of the thesis. This shows that a combination of dangerous environment and local technological expertise dictated how trade through

[57] Darwin, 'Imperialism and the Victorians: The Dynamics of Territorial Expansion,' 629; Sivasundaram, 'Towards a Critical History of Connection: The Port of Colombo, the Geographical "circuit," and the Visual Politics of New Imperialism, ca. 1880-1914,' 347; Suzuki, 'Agency of Littoral Society: Reconsidering Medieval Swahili Port Towns with Written Evidence,' 78; Darwin, *Unlocking the World: Port Cities and Globalization in the Age of Steam, 1830-1930*, 215.
[58] Gillis, *The Human Shore: Seacoasts in History*, 4.

Madras happened in the seventeenth, eighteenth, and nineteenth centuries, and helps explain how Madras simultaneously rose in importance in regional and international politics while stagnating commercially.

The structure of the chapter is also employed to argue that the political, commercial, environmental, and visual organisational contexts of the port of Madras, when viewed in tandem, demonstrate that the local colonial conception of the littoral reflects the larger imperial context in which Madras was situated. Administrative decisions about where, when, and how seaborne trade could occur were dictated simultaneously by a combination of practical local factors—weather, surf conditions, the availability of labour—and imperial concerns, such as war, competition with domestic textile producers, and attitudes towards indigenous technology and knowledge. Local and imperial demands together led to a twisting of colonial motives and goals into something minutely specific to Madras. The chapter draws on Isabel Hofmeyr's argument for reading imperialism in port cities both 'above and below the water line,' by which she means integrating ecological and technological history with an economic or social approach. A holistic view of port cities, she argues, demonstrates the ways in which a port's environment impacts how it is used and altered over time.[59] As Chief Engineer Trapand argued, to understand a place one must embed oneself in its sand. Doing so shows that the nature of the surf zone forced a longstanding British dependency on both local labour and local technology that limited the city's commercial development while simultaneously helping to facilitate its political growth.

Commercial and political context

[59] Hofmeyr, 'Imperialism Above and Below the Water Line: Making Space Up (and Down) in a Colonial Port City,' 1033.

Madras developed as an imperial trading port in spite of its location. Fort St. George, the original English East India Company factory at Madras, was established in 1639 by Company agent Francis Day on land leased from the Telugu *nayaka,* Darmala Venkatappa. At the time, Day was serving as agent at Armegan, a settlement to the north that Day found poorly appointed and unable to compete with more established Dutch and Portuguese trading posts in the same region.[60] Day was drawn to the location for Fort St George for its proximity to existing villages of weavers, the availability of local labour, and proximity to other ports controlled by rival European trading companies, such as the Portuguese-controlled San Thome and French or Dutch controlled Pondicherry to the south. He was also interested in the favorable rate and concessions offered by Venkatappa, but the agreement was also lucrative for the *nayaka*, who saw the establishment of a European trading factory as a cheap and effective means for attracting trade to his district.[61]

In February 1640, Francis Day arrived at the three-mile strip of coastal land granted by the *nayaka* accompanied by Andrew Cogan, the agent at Masulipatnam, several other Company representatives, a small group of native merchants, and a military garrison of twenty-five Company soldiers. By April, construction on the fort had begun, and by 1646 a substantial settlement had arisen around the structure. This settlement, called Madras, may have derived its name from the small fishing village extant on the site, known as Madraspatnam, but the etymology of the site's name is unconfirmed.[62] While East India Company officials in London were initially unsupportive of Day's decision to move their east-coast factory from Armegan to Fort St George, it was nonetheless declared the Company's eastern seat of governance, or 'Presidency' capital in 1652. This early

[60] Love, *Vestiges of Old Madras,* 1:20.
[61] Basu, 'Madras in 1800: Perceiving the City,' 222.
[62] Basu, 228; Ramaswami, *The Founding of Madras*, 5.

recognition by the Company helped to sustain Madras's importance as the East India Company expanded its presence in India over the next century and a half.

In the 1650s Madras was still the only significant port held by the Company in India. Fort St George dealt primarily in local brightly dyed and patterned textiles, which were in high demand in Europe. The most lucrative of these textiles was 'Masulipatnam chintz,' colored with a vegetable dye unique to the Masulipatnam region.[63] Alongside chintz, muslins and printed calicoes were shipped to Europe, and an illicit trade in diamonds mined in the nearby region of Golcondah also expanded over the course of the seventeenth century.[64] Madras gained international recognition for its access to luxury goods in high demand in Europe, but the port also supported a robust coastwise trade in grain and rice. The focus on cotton and textile production encouraged by the East India Company reduced the number of subsistence farms in the immediate area, and most of the city's food was imported by sea in native craft known as *dhonies.* The growing population of Fort St George and the surrounding settlements were reliant on their access to the sea and the ability of nearby farming communities to grow sufficient food to support both themselves and the city. On several occasions in Madras's history, this reliance on seaborne trade for subsistence goods led to food shortages and famine, brought on by bad weather and military blockades.[65]

Famine correlated with the movement of enslaved people, particularly children, through the port. Enslaved people were exported from Madras to serve as domestic servants elsewhere along the coast in the seventeenth century, but complaints led to the prohibition of trafficking in 1683. The practice was revived in 1687 and subject to export duty of one pagoda per enslaved person— in September 1687 alone, six hundred and sixty-five

[63] Ramaswami, *The Founding of Madras*, 6.
[64] Mentz, 'English Private Trade on the Coromandel Coast, 1660-1690: Diamonds and Country Trade,' 166.
[65] Ives, 'A History of the Monsoon in Southern India between 1730 and 1920 and Its Impact on Society: With a Particular Focus on Tamil Nadu,' 104.

enslaved people were exported from Madras to other regions on the southeastern coast.[66] Enslaved people were also purchased by the East India Company at Madras to serve as domestic servants and in the port's boats in the late 1680s.[67] A sanctioned or illicit coastwise slave trade probably existed all the way through to the mid-nineteenth century. While prohibited, numerous cases of coastwise trafficking of children by native, English, French and Dutch traders was uncovered in the early 1790s, and in the 1830s, groups of children were found on board native vessels passing through Madras destined for sale in Malaysia, along the coast of Sumatra, or the Straits of Malacca. [68] The enslavement of children was tied contemporaneously to famine periods, such as 1832-1834 and 1839-1840, during which children were either sold by their parents in desperation or left orphaned and easy targets for slave traders. [69] A well-publicised case from 1839, in which the then-Master Attendant Christopher Biden discovered thirty-two children under the age of ten on board the *Maydeen Bux*, a coasting vessel flying a British flag, led to the inclusion of a clause in the 1842 Boat Regulations authorizing agents of the Boat Department to search any native coasting vessel and all persons on board for illicit cargo, including enslaved children.[70]

The European population of Fort St George was kept low by famine and repeated attacks from local rulers until the 1680s.[71] Company agents renegotiated their land lease in 1672, when control of the region passed to the Sultan of Golcondah, leading to a period of uncertainty and violence. The settlement had to again be renegotiated in 1687, when

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[66] Love, *Vestiges of Old Madras,* 1:545.
[67] Love, 1:545.
[68] 'Slavery in India,' *The Asiatic Journal and Monthly Miscellany,'* [London] vol 26, (July 1828) 664-5; 'Judicial Letter No. 4,' 7 June 1842, BL, IOR/E/4/958.
[69] East India Company, *Returns of All Copies or Extracts of Correspondence between the Directors of the East India Company and the Company's Government in India, since 1838, on the Subject of SLAVERY IN THE TERRITORIES UNDER THE COMPANY'S RULE; Also Respecting the Slave Trade Therin; Also of All Orders and Regulations Issued, or Any Proceedings Taken by Order or under the Authority of the Company, with a View to the ABOLITION OF SLAVERY AND THE SLAVE TRADE; Also of Any Correspondence between the Board of Control and the Court of Directors on the Said Subjects*, 106.
[70] 'Judicial Letter No. 4,' 7 June 1842, BL, IOR/E/4/958; Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43
[71] Love, *Vestiges of Old Madras,* 1: 547.

Golcondah fell to the Mughals, but the Mughal emperor granted the East India Company the right to hold and trade in Madras.[72] The population of the city and its international exports rose with the security afforded by the Mughal grant of Company rights to the land Fort St George was built on.

The export of textiles produced in the Carnatic region to Europe remained the primary source of income for Fort St George throughout the seventeenth century.[73] But to compete with the French East India Company, which operated out of the port of Pondicherry a mere one hundred and fifty kilometres to the south, Madras officials began extending into local politics. The French were attempting to secure better land leasing and trading agreements with Carnatic rulers through political and financial influence, so agents at Fort St George worked to lure weavers, local merchants, and commerce away from European and native rivals, marketing the city as a secure haven in a politically tense and shifting environment. Not only did this marketing campaign work, but the Carnatic rulers began to rely financially on the English East India Company to fund their ongoing conflicts with the Marathas. Small local subsidiary rulers began granting villages to the East India Company to benefit from the increase in trade a Company presence engendered.[74] From this perspective, the location of Fort St George was favorable: it was easily accessible by land or sea for migrating merchants and weavers and was surrounded by ample flat coastal plain for the construction of new settlements. There was also an already-growing 'Black Town' outside the walls of the Fort, where local and Portuguese traders lived and traded. Easy access to a palace of the local Mughal subsidiary, located only several kilometres

[72] Newell, *Madras: The Birthplace of British India. An Illustrated Guide with Map*, 17.
[73] The 'Carnatic' refers to the region between the Eastern Ghats and the Bay of Bengal, and in the British colonial period encompassed Karnataka, the southern Deccan plateau, and stretched to Cape Comorin in the south.
[74] Basu, 'Madras in 1800: Perceiving the City,' 222.

from Fort St George, also provided the opportunity for ingratiation into local politics and finances.[75]

Madras's importance to the East India Company continued to grow under the leadership of Thomas Pitt, who governed the Presidency from 1698-1709. Pitt fostered a rapidly growing textile trade with England and the illicit trade in Golcondah diamonds, and the international commercial status of the town rose.[76] By the 1720s, however, the city had begun to fall in importance. As a centre for weaving and painted calico, its export market was badly damaged by the Calico Acts of 1700 and 1721, passed in England to assuage English wool and silk producers who could not compete with the large volume of superior textiles imported from India. The Calico Acts banned the importation of Madras's most important export, and local officials blamed a rise in unemployment on the reduction in European demand.[77] Rather than its commercial prowess, the early insertion of the Company into local political and financial affairs kept the outpost afloat in the early eighteenth century.

By the mid-eighteenth century, the Presidency had grown to encompass 40-square miles (103-square kilometres) of the surrounding area, acquired piecemeal from small grants of land from local rulers in exchange for access to an international market, and the population of the city itself had grown to 250,000 people.[78] The city of Madras's growing jurisdiction and proximity to French Pondicherry meant that the site was implicated in mid-century European and North American wars. It was captured by the French in 1746 during the War of Austrian Succession and was only restored to the East India Company in 1749

[75] Love, *Vestiges of Old Madras, 1640-1800; Traced from the East India Company's Records Preserved at Fort St George and the India Office, and from Other Sources, by Henry Davidson Love. Published for the Government of India*, 1913, 3:529.
[76] Mentz, 'English Private Trade on the Coromandel Coast, 1660-1690: Diamonds and Country Trade,' 166.
[77] Ives, 'A History of the Monsoon in Southern India between 1730 and 1920 and Its Impact on Society: With a Particular Focus on Tamil Nadu,' 19.
[78] Basu, 'Madras in 1800: Perceiving the City,' 222.

as part of the treaty of Aix-la-Chapelle and renamed the Company's principal factory in southern India in 1752.[79] Several years later, Madras was the scene of several events in the Third Carnatic War, fought as an extension of the Seven Years War between 1756 and 1763. In 1757, Robert Clive and Admiral Watson planned the expedition to Calcutta which culminated in the Battle of Plassey while stationed at Madras.[80] In 1759, the city was attacked directly by French forces under the Comte de Lally, but unlike a decade earlier the attack was rebuffed.[81] The capitulation of the allied French-Bengali forces in 1763 resulted in the acquisition of broad taxation powers for the East India Company. This led to a shift in the Company's business model from profitable trade to tax collection, a shift that suited Madras's declining international trade and already-significant involvement in local politics. The city was attacked once more by Hyder Ali in 1767 during the First Anglo-Mysore War, but his forces were rebuffed; and while not a direct attack, the naval blockade of timber and grain production centres by Hyder Ali and his French allies in the early 1780s prevented vital supplies from reaching the city and left its still-growing population on the brink of starvation.[82] International political motives may have driven the French and Mysorean attacks on Madras, but its local importance as the only major British coastal holding in Southeastern India assured its defense.

Tipu Sultan, son of Hyder Ali, led the last major resistance to widespread British rule in India in the late 1790s, but died at the Battle of Seringapatnam in 1799. After Tipu's death, the East India Company annexed the lands of the Nawab of the Carnatic in retaliation for his support of Tipu, alongside Mysorean land including Nellore, North and South Arcot, Madura and Tinnevelly. By 1801, as a result of these territorial acquisitions, the Madras

[79] Love, *Vestiges of Old Madras, 1640-1800; Traced from the East India Company's Records Preserved at Fort St George and the India Office, and from Other Sources, by Henry Davidson Love. Published for the Government of India*, 1913, 2:362, 431.
[80] 'Madras Public Proceedings,' 5 Sept. 1756, BL, IOR/P/240/14.
[81] Love, *Vestiges of Old Madras,* 2:545.
[82] 'Madras Public Proceedings,' 2 June 1783, BL IOR/P/240/56.

Presidency had reached nearly its full extent of 140,000 square miles (362,600 square kilometres). [83] But at the same time that Madras was reaching an apex of political importance as the Company capital in southern India, both the international and domestic commercial importance of the city itself continued to founder.

The 1813 Charter Act renewed the East India Company's charter and Company rule but ended its monopoly on goods other than the tea and opium trade with China. The curtailing of Company influence reflected the increase in British state power and territorial holdings in India. It also opened India to Christian missionaries, increased the power of provincial governments and courts over European subjects, and provided for Indian education. Despite the opening of Indian markets and the expansion of private trade, Madras's importance still lay in its political and administrative prominence. The city itself struggled to become the dominant port on the southeastern coast as a result of constant competition with smaller, better-appointed ports on the eastern Indian seaboard now under British jurisdiction. [84] Regional power and influence did not align with the local commercial prospects of its seat.

The 1833 Charter Act consolidated power in the Governor-Generalship of Bengal, curtailing the authority of Madras and Bombay.[85] This resulted in legal standardisation across British India where before there had been regional variation. Lord William Bentnick, the first Governor-General to hold the expanded powers of the position, was a proponent of Utilitarian thought, and attempted to 'Westernise' British rule and increase the efficiency of the financial regulation of India.[86] The centralisation of power in Bengal placed the port of Madras under the jurisdiction of the 1839 Port Duties Act, which standardised port

[83] Prothero, *The Development of the British Empire*, 28.
[84] Arasaratnam, *Maritime India in the Seventeenth Century*, 117.
[85] Ehrlich, 'The Crisis of Liberal Reform in India: Public Opinion, Pyrotechnics, and the Charter Act of 1833,' 2012.
[86] Anushree, 'The East India Company and the Regulation of Corruption in Early Nineteenth-Century India,' 86.

charges in India. Standardised shipping and port regulations ill-fitted the peculiar environmental conditions at Madras, and resulted in abrupt changes in policy and attempts to build port infrastructure that had previously been deemed unsuitable.

Madras continued to maintain its importance primarily by way of its position as regional seat of governance through the mid-nineteenth century. While much of the mid-century influx of British travellers into India passed through the port, the limited number of international trading vessels that called at Madras concerned both its government and its resident merchants.[87] Without the protection of a natural or artificial breakwater, ships at Madras sat in an open anchorage exposed to shifting weather. Madras also lacked infrastructure on the beach to process incoming and outgoing goods efficiently, further sinking the port in the esteem of many independent international merchant houses. Most vessels calling at Madras were instead small domestic coasting vessels, carrying grain, rice, and timber. Between 1864 and 1871, for example, native coasting vessels represented anywhere from sixty to seventy-four percent of the vessels that used the port in a given year.[88] But the international merchant houses that did continue to operate out of Madras, such as Parry's of Madras, were committed to the port's growth and continued existence; the first breakwater building project, attempted in 1835, was largely funded by private donation.[89] But further building projects in the Madras littoral were too costly to attempt

[87] 'Respecting the construction of a Breakwater in the Madras Roads,' 23 Feb. 1835, BL, IOR/F/4/1580/64265.
[88] Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1864-65*, ccxviii–ccxxi; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1865-66*, cxxxii–cxxxv; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1866/67*, cxiv–cxvii; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1867/8*, cxliv–clxvii; Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, cxlvi–cxlix; Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*, clvi–clvii; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, cl–cliii.
[89] 'East India Intelligence, Madras Breakwater,' *Naval and Military Gazette and Weekly Chronicle of the United Service* [London] no. 146 (14 November 1835) 4 col c; 23 Feb. 1835, BL, IOR/F/4/1580/64265.

without the guarantee of future commerce and an efficient means of processing and delivering landed goods, and multiple plans were rejected on these grounds.

The 1857 Rebellion had little military impact on Southern India, but the resultant transfer of all Company lands and military assets to the British Crown increased the funding available and willingness to undertake construction projects in the Madras surf zone. Concerns over cost, local adaptability, and engineering difficulties had stymied all previous suggestions for the construction of breakwaters, piers, and artificial harbours, but after 1858, a new willingness to fund infrastructure projects in India led to a series of construction projects meant to increase the safety and attractiveness of the port to international shipping. However, these projects were plagued by difficulties, accidents, and massive destruction up to the 1920s, and the modern port at Chennai was not constructed until the 1960s.

Today, Chennai is the sixth most populous city in India and boasts the second largest port in India by volume of cargo processed. But this modern status as international shipping giant conceals the earlier tenuous nature of efforts to carve a port out of a blank line of coast. Madras in the colonial period was a major East India Company outpost in spite of its location, rather than because of it. Placing the political and commercial growth and stagnation of Madras in the context of the physical environment of the city's littoral reveals the centrality of the environment to the definition, regulation, and construction of the port of Madras. A confluence of dangerous environmental conditions and the dominance of local technological expertise dictated the volume and speed of trade out of the port in the seventeenth, eighteenth, and nineteenth centuries, and helps explain how Madras became simultaneously important to regional and international politics, and commercially inert.

Physical and social landscape of the Madras littoral

That Madras would remain a commercial and civic centre for the East India Company and its successors was far from obvious for much of its early history.[90] The environmental conditions of the Madras region, both on and offshore, discouraged seaborne trade. This resulted in a fragmented export system that could not be consolidated into one or two larger ports and limited the capacities of any sized port. Even a modern piloting guide, dating to 2017, provides strict instructions for cargo ships anchoring in the Chennai roadstead to prevent accidents and wrecks.[91] The following section outlines the littoral environment, including the geographic, climatic, and oceanic factors that influenced the physical nature of the nearshore region.

Madras was built on the southeastern coast of India, on a section of the Eastern Coastal Plains (ECP) known as the Coromandel Coast. The ECP divided the Bay of Bengal and the Eastern Ghats, which rise from the plain between 80 and 120 kilometres inland. The ECP are low lying; the modern city of Chennai has an average elevation of just six metres above sea level, while the average elevation across the width of the ECP is just eighty metres above sea level. The original Fort St George was built to the north of the Triplicane (now Cooum) river. The Triplicane river emptied into the sea but was too shallow for European ships to enter and was not used for trade. Not only was Madras built at the edge of a wide, low plain, but it was also located at a narrow point on the continental shelf, which extended only fifty kilometres out from the coastline before dropping off

[90] As noted in the introduction, Madras was renamed Chennai in 1996, which creates some trouble when trying to clearly describe the climatic and environmental features of the city and the littoral. In the following section, I have continued to refer to the city as 'Madras,' in keeping with the historical source material and period under discussion, except when referring explicitly to the modern city. However, the sources I have used to reconstruct the climatic and environmental features include *both* 18th and 19th-century data and modern data. To be as accurate as possible, I have tried to limit the use of modern data, however do keep in mind that the conditions I discuss here in the past tense—such as prevailing wind patterns, seasonal wave heights and directions, and the timing of monsoon seasons, persist today.
[91] National Geospatial-intelligence Agency, *Pub. 173 Sailing Directions (Enroute) India and the Bay of Bengal*, 174.

abruptly.[92] Furthermore, the Coromandel Coast is oriented northeast-southwest, and the coast around Madras lacked the natural coastal features often found at harbours—no protected bay, no headland, and no cliffs to block winds or reduce the impact of storms.[93] The combination of wide, flat plain and narrow continental shelf influenced the wind and weather experienced at Madras, and therefore its suitability for shipping. Ocean-going sailing ships were at a particular disadvantage in such an environment; larger than the coasting *dhonies* that brought locally grown foodstuffs, it could take weeks or even months to fully unload, load, provision, and water European ships, wasting valuable time and increasing the likelihood of loss from stormy weather or unexpected winds.

The climate and dominant weather patterns on the Coromandel Coast also impacted trade. The city was built in a tropical wet and dry climate and laid within the Bay of Bengal Tropical Cyclone Area. The region was hottest in May and June, with average daily temperatures reaching 32-38° Celsius, and coolest in January, when temperatures reached only a balmy 24-28° Celsius.[94] Average annual rainfall was 1400mm, the vast majority of which fell during the northeast and southwest monsoon seasons. The northeast (NE) monsoon had a greater impact than the southwest (SW) monsoon, as the winds travelled across the Bay of Bengal and first made landfall on the southeastern coast. The NE monsoon lasted from late October through December and was responsible for up to sixty percent of annual rainfall and significant movement of coastal sediment southward. Many of the major cyclones and tropical storms that hit Madras occurred during this period, though massive storms did not occur every year. The SW monsoon, which occurred between June and August, typically had a less significant impact, as it crossed the subcontinent from the western Indian Ocean and had lost much of its strength by the time

[92] Faruque, Vaz, and Mohapatra, 'The Continental Shelf of Eastern India,' 223.
[93] Faruque, Vaz, and Mohapatra, 221.
[94] Rao, 'The Climate of the Indian Subcontinent,' 76–84.

it reaches the east coast. Roughly thirty percent of annual rainfall totals were recorded during the summer months.[95]

Monsoon systems on the Coromandel Coast interacted with daily wind and wave patterns, which increased the volatility of such systems for shipping. Daily land and sea breeze systems counteracted light monsoon winds and created unexpected cross currents in the near shore region. Land breezes blew outward across the coastal plain overnight and through the morning before a dominant sea breeze switched the direction of the wind to blow inland off the water in the early afternoon. The land breeze flowed with and strengthened SW monsoon winds, but ran counter to NE monsoon winds, which led to a backing to the north or northwest depending on the strength of the monsoon wind. The sea breeze did the opposite, strengthening the NE monsoon winds in the afternoon, but running counter to SW monsoon winds, which led to south or southeast winds depending on the strength of the monsoon.[96]

Currents further complicated the process of landing. The alongshore current travelled at about two and a half knots, but occasional and unexpectedly strong currents could have severe consequences. A three-knot current reported in 1864 was called 'unusually strong,' and a cause for caution.[97] Unexpected currents could take even experienced boats' crews by surprise and could wreak havoc when running in opposition with the wind. For example, in 1803 the *Madras Courier* reported that an army colonel and his daughter drowned proceeding to the ship *Union* 'when the current, running strongly from the northward, and being met by a Southerly wind, the boat broached to, near the outer surf, and which striking the Boats side, beat it instantly to pieces.'[98]

[95] Walsh, Glaser, and Militzer, 'The Climate of Madras during the Eighteenth Century,' 1025–26.
[96] Walsh, Glaser, and Militzer, 1026.
[97] 'Coast of Coromandel—Current,' *Nautical Magazine and Naval Chronicle* [London] (1864), 611.
[98] 'The Courier,' *Madras Courier,* [Madras] no 942, (26 October 1803) 2 col b.

The combination of wind and current would have been hard to predict on a day-to-day basis historically, and were liable to change quickly, sometimes before wave direction. This meant that dominant wind direction could run counter to dominant wave direction, making the safety of the anchorage and crossing uncertain. In conjunction with shifting winds, Madras was well known for its constant triple bar of surf, or the fact that waves broke in three successive bands as they approached shore. Where these bands broke varied based on weather conditions; for example Alexander Findlay wrote in his 1866 *Indian Ocean Guide* that, 'In fine weather the surf breaks about three hundred feet from the shore, in squally weather about four hundred and fifty feet, but during gales from the East, nearly a thousand feet' (91, 137, or 305 metres, respectively.)[99] Wave approach also varied based on wind direction; the shallow and narrow continental shelf meant that wave action was largely dictated by the wind rather than current. During the NE monsoon, waves approached the beach from the northeast at a 136-146° angle, before shifting to hit the beach perpendicularly. Waves during the SW monsoon approached from the southeast at a 54° angle, and also shifted to hit the beach perpendicularly in shallow water. But outside of these monsoon seasons, wave angle could still vary dramatically and swing abruptly. For example, JS Mani notes that waves approach the coast at a shallow, 14° angle in October, before swinging around to a 146° northeasterly angle with the start of the NE monsoon in November. The waves were not just constant, but also large on the Coromandel coastline: while average wave heights varied by month, they typically ranged between one and a half and three metres in height. During monsoons wave heights could greatly exceed these averages.[100]

[99] Findlay, *A Directory for the Navigation of the Indian Ocean: With Descriptions of Its Coasts, Islands, Etc., from the Cape of Good Hope to the Strait of Sunda and Western Australia: Including Also the Red Sea and the Persian Gulf, the Winds, Monsoons, and Currents, and the Passages from Europe to Its Various Ports*, 854.
[100] Mani, 'A Numerical Study on Coastal Defence at Chennai and Related Management Strategies,' 525, 531.

Monsoon and daily wind conditions led to the formation of dangerous cyclones in the Bay of Bengal. A number of storms were recorded in the colonial period, most occurring between the months of October and December. Between 1754 and 1890, at least forty-nine storms and cyclones of note hit Madras, causing shipwrecks, destruction of property, and the loss of lives both at sea and on shore (see appendix 1). One hundred and fifty fully laden native grain ships were lost in a storm in October 1782 while waiting to unload their cargo. When Captain Lennon of the engineering corps submitted a plan for a pier and breakwater in 1798, he cited the losses incurred in this and other storms as a main reason for constructing a barrier to protect the shipping.[101] His plan was rejected, and another storm in May of 1811 wrecked two naval store ships and between fifty and ninety native and merchant vessels.[102] Forty years later, the *Illustrated London News* published a striking image of the HM Barque *Successor* wrecked on the foreshore in an unexpected storm in 1852.

The *Successor,* carrying camp followers and government stores destined for Burma (Myanmar), was one of three ships lost in the vicinity of Madras in the same storm which resulted in the death of sixty-four sailors and passengers.[103] Between 1843 and 1853 alone, twenty-seven European vessels and an unknown number of native vessels sank or were lost because of the insecure anchorage at Madras, either foundering in the roadstead or slipping the anchorage during severe weather and sinking elsewhere on the coast. One hundred and ninety-five lives, 104,864 tonnes of shipping, and nearly 1.7 million rupees (£170,000) were lost in just this ten-year period.[104] That shipping through Madras was seen as

[101] 'Madras Public Proceedings,' 11 Nov. 1782, BL, IOR/P/240/55; 'Proposals for building a Pier or Harbour in Madras Road From Captain Caulfield Lennon of Engineers to the Honorable the President in Council,' 25 June 1798, BL, IOR/F/4/1580/64266.
[102] 'Letter from Peter Puget, Naval Commissioner at Madras, to the Chief Secretary to the Supreme Government, Fort William,' 3 May 1811, National Archives (TNA), ADM 1/3441.
[103] 'Wreck of the "Successor" in the Madras Roads,' *Illustrated London News* [London] no 601, (1 January 1853), 12-3 col c-a.
[104] 'List of Ships lost at or near Madras between October 1842 and March 1853 owing to the insecurity of the anchorage,' March 1853, Cambridge Centre for South Asian Studies (CCSAS), Microfilm no. 42.

particularly dangerous is also evident in insurance practices. By the late nineteenth century, approaching the port between the 15th of October and the 15th of December vitiated all insurance.[105] During the planning period for the construction of a harbour in 1874, a Lloyd's insurance representative, while declining to discuss insurance rates in detail, delicately confirmed that 'Madras does bear a bad name among underwriters.'[106]

Nearshore sediments played a significant role in the development of the Madras port. When a portion of the anchorage was dredged for harbour construction in 1918, the resulting stratigraphy illustrated some of the difficulties faced by earlier ships anchored in the open roads. In nine to twelve metres of seawater, the 1918 project dredged through ten feet (3 metres) of loose sand before hitting a sand and clay mixture, hard clay at forty-seven feet (14 metres) and bedrock at eighty-three feet (25 metres). The sand covering the anchorage was fine, with median grain sizes only 0.4 millimetres in diameter; such a fine sand is difficult to anchor in because it provides no resistance to hold an anchor in place.[107] The sand also created difficulty for the recovery of lost cargo—a load of tin slabs lost outside the surf in 1765 was only partially recovered because most of the slabs sank into the shifting sands before divers could reach them.[108] Only two and a half to three kilometres offshore did the bottom change to mud and allow for safer anchorage. But even in these depths, the anchorage was fouled by wreckage, cut anchors, and other shipping debris, and sweeping for debris before dropping anchor was highly recommended.[109]

Currency conversions throughout the thesis are based on Marsden, *The Madras Almanac and Compendium of Intelligence, for 1839*, 229; Roy, *The Economic History of India, 1857-2010,* Exchange Rate 1800-1947. Conversions for weights and measures are based on Prinsep 'Useful tables, forming an appendix to the Journal of the Asiatic Society' (1840).

[105] 'Memorandum on the Madras Harbour,' 13 Feb. 1875, BL IOR/C/138.

[106] 'Madras Harbour Departmental Minute,' 14 Oct. 1874, BL IOR/C/137.

[107] Spring, 'The West Quay of Madras Harbour,' 4.

[108] 'Madras Public Proceedings,' 29 April 1765, BL, IOR/P/240/23.

[109] Anonymous, *Sailing Directions for the East-India or Oriental Pilot, for the Navigation between England and the Cape of Good Hope*, 56.

Tidal range had little impact on the surf zone; with a difference between high and low tide of less than two metres, it is classified as a 'microtide,' and does not influence sedimentation or erosion.[110] Sedimentary drift, on the other hand, was an important consideration for the development of Madras. The north-south orientation of the Coromandel Coast meant that no natural sedimentary catchment zones existed for over 1,600 kilometres of coastline, which resulted in massive amounts of fine sediment movement up and down the coast throughout the year. Most littoral drift occurred during the monsoon seasons. Drift was directed northwards between February and October, and southwards from November to January. The highest monthly rate of drift occurred in November, when strong monsoonal winds and cyclones generated large waves, pushing an average of 420,000 cubic metres of sand southward along the coast. The gross littoral drift of an average year on the Coromandel Coast is 2.56 million cubic metres of sediment; while larger amounts of sediment are moved southwards during the NE monsoon, the longer duration of northward movement means that net movement is still northward by 540,000 cubic metres.[111] Any manmade structure oriented perpendicularly with the shore, no matter how small, has the potential to significantly impact the flow of sediment, resulting in extreme accretion and scouring to either side.

[110] Spring, 'The Remodelling and Equipment of Madras Harbour,' 90.
[111] Prasad and Reddy, 'Near-Shore Sediment Dynamics around Madras Port, India,' 208.

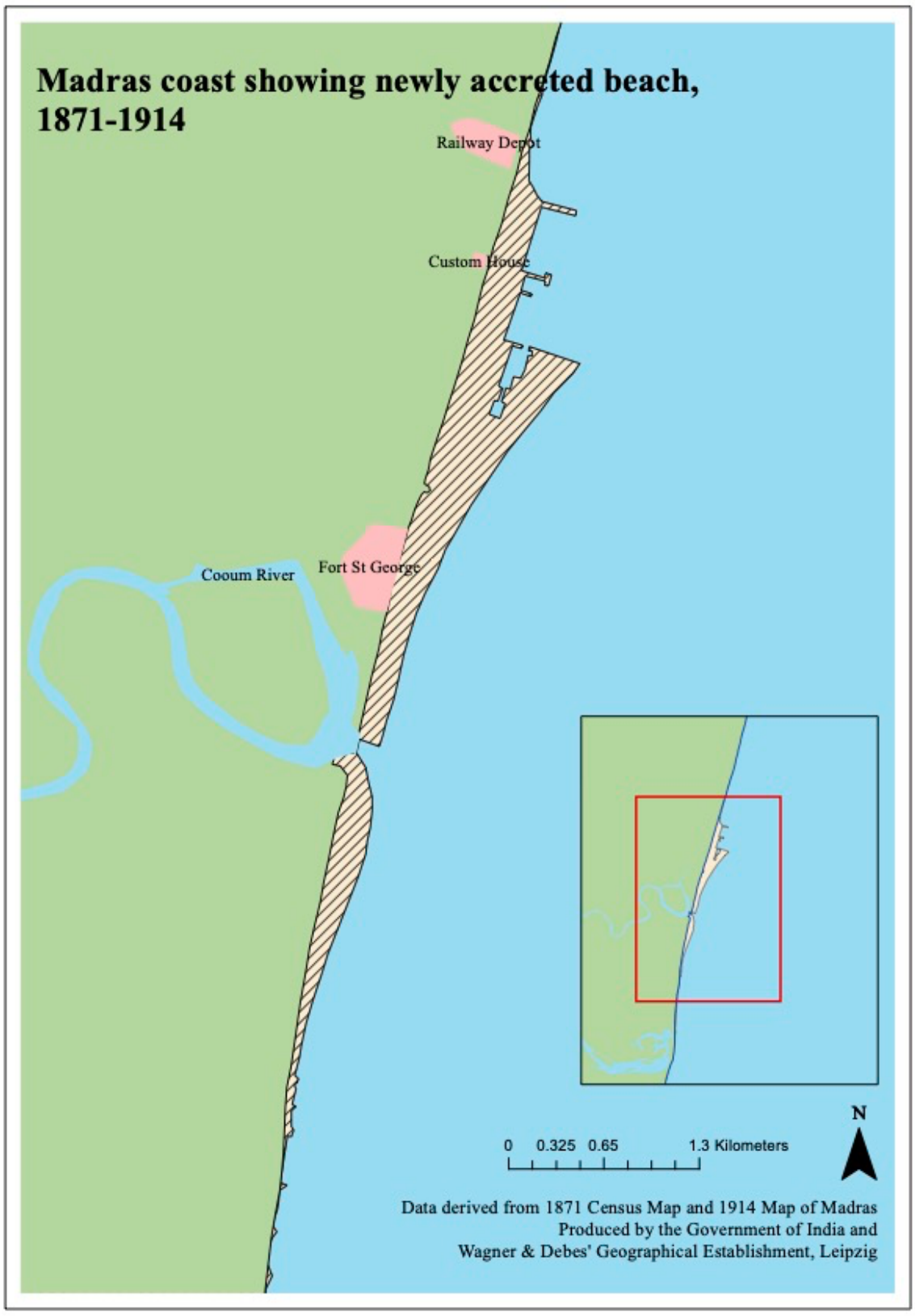

Figure 1: Significant changes to the coastline at Madras occurred after the construction of the Madras Harbour, seen in this comparison of a census map from 1871 and a 1914 map of Madras included in Karl Baedecker's Indien, p. 80. Newly accreted beach is shown in hatched yellow.

Littoral drift had little impact on trade at Madras until construction began on a harbour in the 1870s. The beach on the southside of the harbour advanced rapidly; between 1876 and 1880, the shoreline moved out 162 metres, and by 1910, had advanced 700 metres and resulted in the creation of 1.8 million square metres, or nearly three-quarters of a square mile, of new land between the south side of the harbour and the Triplicane River. To the north of the harbour, the beach was severely scoured, resulting in the loss of beach and several villages to the sea.[112] Siltation within the harbour remained a problem with the construction projects of the early twentieth century, and the mouth of the harbour had to be moved from the eastern side to the north-eastern side in 1905 due in part to increasing siltation in the harbour and shallowing of the harbour mouth. Even the north-eastern entrance eventually shoaled up and had to be regularly dredged.[113]

Daily conditions at Madras posed a profound challenge to European transport techniques and tools. Prior to the completion of a harbour, deep draughted ocean-going vessels could not anchor close enough to shore to load or unload cargo quickly or safely, pushed offshore by heavy waves, a fine, sandy bottom, and the risk posed by the daily shift of strong winds. Changing winds sometimes unexpectedly ran counter to the perpetual wave action, creating dangerous cross currents that flipped boats. The crashing of the surf during transit destroyed rigid European-style ship's boats and damaged the delicate textiles, bales of cotton, and foodstuffs that made up most goods moved through Madras, reducing profits.[114] The danger posed to ships remaining in the open roadstead during the NE and SW monsoon seasons completely stopped or severely curtailed the operation of the port for

[112] Prasad and Reddy, 210–14.
[113] Mackenzie, *Official Papers Concerning the Construction of the Madras Harbour*, 66.
[114] 'Accident,' *Madras Courier* [Madras] no 1110, (14 January 1807), 2 col c; Macgeorge, *Ways and Works in India,* 515.

periods of each year.[115] The daily wind and wave patterns meant that European ships could not use their own boats in case of emergency, to obtain fresh water, or to revictual.[116]

The littoral environment at Madras posed less of a problem, however, for local communities of boatbuilders and fishermen. Well acquainted with the wind, waves, and seasonal storms of the Coromandel coast, to local littoral communities this 'dangerous' environment was simply *the* environment. Trade at Madras was therefore fully dependent on the technology and continued participation of local boat builders and boatmen. The passage between ship and shore had to be made in masula boats and catamarans, fishing boats and rafts designed to answer the intensity of the Madras littoral. But relying on the expertise of a small group of local boat people limited the volume of trade that could move between ship and shore. The East India Company, Royal Navy, independent and native merchants, and the government of Madras were all heavily and unavoidably reliant on the masulas, catamarans, and the people who built and operated them prior to the turn of the twentieth century. From the arrival of the British in the 1640s, all goods, dispatches, private letters, emigrants, officials and travellers arriving or leaving Madras by sea were obliged to travel either in a masula or on a catamaran.

The physical nature of the Madras littoral and how it was crossed is central to the formation of the city's commercial, military, and political identity in the seventeenth, eighteenth, and nineteenth centuries. Unable to commercially outcompete other European trading posts by way of a safer or more efficient anchorage in the seventeenth century, Madras officials turned to ingratiating the city into local politics and finances. When plans for a pier were floated in the eighteenth century, a major concern was that if the need for

[115] Brown, *Parry's of Madras*, 5–6.
[116] Attempts to land in European-style ship's boats ended disastrously. An 1848 article in the *Bombay Times* conveyed the sad news of 'loss of life owing to the incautious use of a ship's boat' which the author hoped would 'operate as a salutary warning to Commanders of vessels frequenting this coast…[as] the break of the surf may take persons in charge of boats completely by surprise.' 'Madras.' *Bombay Times* [Bombay] (18 October 1848) 789.

masulas was eliminated, attacking forces could too easily enter the city (conversely, a draft of instructions for the French Naval and Military Commanders in India written in the 1790s mused that if the British had possession of Negapatam, a Dutch outpost north of Madras, 'there appears to be no point…where we could procure the chillingas [masulas] and seamen of the country without which it is impossible to land.')[117] In the nineteenth century, the lack of port infrastructure became a point of fixation for Madras politicians and government officials, who saw the unmarked coastline as an imperial failure.

The physical attributes of the Madras littoral have been overlooked in political and commercial histories of the British presence in India. However, the time spent traversing the space between ship and shore was a defining feature of the contemporary experience of the place. Descriptions, depictions, and considerations of the anchorage, the surf, masulas and catamarans, and the boatpeople, dot the official records, personal reminiscences, and ethnographic collections of generations of Britons, and can be used to contextualise higher-level shifts in political, commercial, and technical decision making at and about Madras. But the physical realities of the surf zone are only part of what is necessary to understand how the port of Madras developed and how it operated. The visual organisation of the space of the anchorage by administrators and utilisers is necessary not only to understand the port's commercial and social development, but also the ways in which empire was experienced.

Organising space: visualising movement between ship and shore

Madras was built on what is still today the second longest stretch of natural uninterrupted beach in the world. Standing on the beach in the colonial period, the casual British viewer could look out to sea and find few visual markers to demarcate where the 'port' of Madras ended and the open ocean began. 'Port' is in quotations because there were none of the

[117] 7 June 1808, BL, IOR/F/4/1580/64266; Richmond, *The Navy in India, 1763-83,* 411-12.

physical characteristics—breakwaters, piers, jetties—one might expect of a harbour space. Instead, the Madras port was an imagined space imposed on the open beach and open roads, as pointed out in 1873 by a port officer, who commented that the 'designation is, strictly speaking, a misnomer for an open roadstead.'[118] Only the clustering of large oceangoing trading ships, men of war, and smaller coasting *dhonies,* would suggest it was a place of commercial importance. Turning one's back to the sea would offer more clues about such vessels' presence. Along the line of the beach were several large structures relating to trade: the Sea Gate of Fort St George, through which all commodities passed in and out before the construction of the beachside Sea Custom House in 1799; a growing number of Company and private warehouses; and the villages of Chepauk to the south and Royapooram to the north, where the boatmen resided and worked in the eighteenth and nineteenth centuries respectively.[119] A lighthouse to the north of the city, erected in 1844, gave a further clue as to the importance and the danger of the place.

But turning back to the sea, newly arrived Britons struggled to make sense of the spatial organisation of the ships and small vessels that dotted the Madras Roads. Eliza Fay, who arrived in Madras in 1780, wrote that the roads 'were very full', that the eight ships of the line and sixty-odd other vessels present 'form[ed] a magnificent spectacle.'[120] Julia Maitland observed in 1836 that, 'The scene in the Madras Roads is the brightest and liveliest possible. The sea is completely studded with ships and boats of every size and shape, and the boats filled with crews even more quaint and picturesque than themselves.'[121] Artwork from the eighteenth and early nineteenth-centuries also suggest that the organisation of space in the roads was lost on the viewer. But this confusion and

[118] Dalrymple, 'Letter from HDE Dalrymple, Esq., Master Attendant, to Chief Secretary to the Government of Madras, Marine Dept. Communicating Remarks on the Nautical Bearing of the Proposed New Harbour at Madras--No.7489, Dated 20th December 1873,' 43.
[119] Love, *Vestiges of Old Madras,* 3: 518, 528.
[120] Fay, *The Original Letters from India of Mrs Eliza Fay*, 119.
[121] Maitland, *Letters from Madras: During the Years 1836-1839*, 17.

jumble of vessels does not reflect the actual ordering of the space of the anchorage that developed and strengthened over time as a result of both environmental and social factors. To trained local eyes the space of the anchorage was divided up increasingly clearly over the course of the latter half of the eighteenth and early half of the nineteenth century, a part of efforts to secure the timely unloading of cargo and equal opportunity for work and pay for all the boatmen. The space of the anchorage was defined relative to onshore markers, depth, and distance along and from shore.

Figure 2: Shipping off Madras. Adam Callender, circa 1790. National Maritime Museum (NMM), BHC_1890.

The demarcation of nearshore space was important to Madras's colonial administrators, ship captains, and boatmen. The division of space was partly a result of nearshore environmental characteristics. As a result of the coastwise movement of silt, the water deepened more quickly to the south of the city and stayed shallow further out to the

North.[122] Anchoring in shallow water at Madras was dangerous for large ocean-going ships; quick changes in the wind or groundswell over time pushed many ships anchored too close to the beach onto the shore.[123] This led to the loose division of the off-shore space into two anchorages, or roadsteads: European deep-draughted oceangoing merchantmen and men of war needed to anchor to the south of the fort and further away from shore in the 'South Roads' to ensure their safety, while shallow-draughted native *dhonies* could anchor to the north of the fort and closer to shore, in the 'North Roads.' Where these two zones met and how concrete this division of space was changed over time.

The natural delineation of safe anchorages ultimately evolved into an official division of space. Prior to the 1760s, the North and South Roads were not clearly defined as separate areas of service, which led to tension within the merchant and boat people communities. Before 1766, a single standard rate of hire was charged on every boat trip, regardless of the distance from shore a vessel was anchored. This greatly impacted the flow of trade to the disadvantage of European shipping. President-in-Council Pigot complained in 1755 that because

> the usual hire has been six fanams for every trip to and from a vessel in the roads whether far or near, those which venture nearest the shore are always first served to the prejudice of those which are obliged to lye further out, so that large ships frequently meet with very prejudicial delays and detention to the great hurt of the trade of the settlement.[124]

The boat owners could make the same amount per trip regardless of whether the trip was to a *dhoney* several hundred metres offshore, or a merchantman over three kilometres out. A trip to a deep-draughted European ship could take two or three times as long without the bonus of a higher rate of pay.

[122] Manohar, 'Sediment Movement at Indian Ports,' 369.
[123] 3 May 1811, TNA, ADM 1/3441; March 1853, CCSAS Microfilm no 42.
[124] 'Madras Public Proceedings,' 30 Dec. 1755, BL, IOR/P/240/13.

Some boat owners took advantage of the standard rate of hire by building 'fishing' masulas that were too small or delicate to handle the longer trips to European merchantmen in the South Roads, monopolising the trips to the closer native *dhonies* in the North Roads.[125] George Baker, an early official of the Boat Department, found in 1762 that small unlicensed 'fishing' masulas were attracting men away from the South Roads and leaving the Company service understaffed. Baker took a step towards regularising the transport of cargo through Company-contracted masulas, writing that 'no boats shall be built for the service of the port of certain dimensions that they may be incapable of carrying the weight assigned there being at present many less than the rest built so purposely to excuse their serving in the southern road,' but even after the illicit fishing masulas were technically shut down, complaints about the division of labour and opportunities between the two zones persisted.[126]

In March 1775, Messrs Stowe and Jourdan, members of the Board of Trade, filed a report in response to President-in-Council Alexander Wynch's request for information on the boat establishment in which they noted that two 'fishing' boats, 'although they were not near so large' as the masulas used in the port, were being sent to the North Roads, monopolising 'the most advantageous service [and] depriv[ing] the other boats of their share of it.' [127] The easier and more lucrative service of the North Roads, Stowe and Jourdan found, continued to disrupt the service of the South Roads. Stowe and Jourdan also suggested two new rates of hire to the North and South Roads, rather than to European versus local traffic. Where the two zones met, their extents along the coastline, and outer limits were still left unspecified, however.[128] This means that it still would not have been immediately clear on arrival where a vessel could or should anchor and still receive timely

[125] 'Madras Public Proceedings,' 5 Oct. 1762, BL, IOR/P/240/20.
[126] 5 Oct. 1797, BL, IOR/P/240/20.
[127] 'Madras Public Proceedings,' 24 March 1775, BL, IOR/P/240/39.
[128] 24 March 1775, BL, IOR/P/240/39.

service from the masula fleet without risking damage in storm conditions or shifting winds. Despite the newly introduced fees, a piloting guide published in 1781 described the anchorage at Madras without specifying the division between the North and South roads and resultant difference in fees.[129]

The depth and distance from shore of the safe anchorage were also likely first established by custom. The 1781 piloting guide, for example, notes that ships should anchor 'in 10 fathoms, off-shore 1 ½ or 2 miles,' but the outer limits of the anchorage were not codified until the mid-1790s. [130] Regulations written in 1794 specified that ships anchored in water deeper than eight fathoms were not to be serviced by the masula fleet, though provisions were made for deeper anchorage during approaching storms, and in 1797 an allowance was made for the supply of water and provisions at double the normal rate of hire to ships anchored outside of eight fathoms.[131] Regulations from 1797 also included different rates of hire for transshipment between ships. To transship cargo between ships in the same roads cost 10 fanams 50 cash, while to transship cargo between roads would cost an extra two fanams 10 cash per trip, suggesting that there was some understood point where the two roads met, but where this point was remained unspecified.[132]

This lack of clear division within the roads from the perspective of shipping suggests that the division between 'north' and 'south' was not so fixed as the division between rates of hire for European ships and native *dhonies.* Instead, rates of hire were dictated by the ways small versus large vessels used the space. Milburn's *Oriental Commerce,* a piloting guide published in 1813, offered new definitions for the space of the two roads and rates of hire that were previously unspecified. Milburn stated that, 'Vessels

[129] Anonymous, *Sailing Directions for the East-India or Oriental Pilot, for the Navigation between England and the Cape of Good Hope*, 56.
[130] Anonymous, 56.
[131] 'Regulations for the Boat Department,' *Madras Courier* [Madras], no. 434 (31 January 1794) 1 col. c; 'Madras Public Proceedings,' 24 Feb. 1797, BL, IOR/P/241/70.
[132] 24 Feb. 1797, BL, IOR/P/241/70.

only lying in the north of the southernmost line of buildings nearest to the North Esplanade, are to be considered as lying in the North Road. Vessels also lying to the southward of this line, are to be considered as lying in the South Road.' But he goes on to note that, 'Vessels commanded by Europeans, and lying in the North Road, to be charged as has been usual, the hire of vessels that lie in the South Road.'[133] Despite the division of the two zones, the type of vessel, and therefore the expected distance from shore, was more important in determining landing costs.

The full extent of the Madras Roads was finally codified in the 1842 Boat Act. It stated that native vessels and *dhonies* were to anchor in the North Roads, which extended from the northern angle of Fort St George to Royapooram, the boatmen's settlement, in the north. The South Roads stretched from the northern angle of Fort St George to the Master Attendant, or port officer's, flagstaff, and was the anchorage for all other ships. It also reset the maximum depth of service at nine fathoms, instead of eight, and allowed for full service outside of nine fathoms for an extra fee.[134]

[133] Milburn, *Oriental Commerce: Containing a Geographical Description of the Principal Places in the East Indies, China, and Japan, with Their Produce, Manufactures, and Trade*, 2:60.
[134] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 533–34.

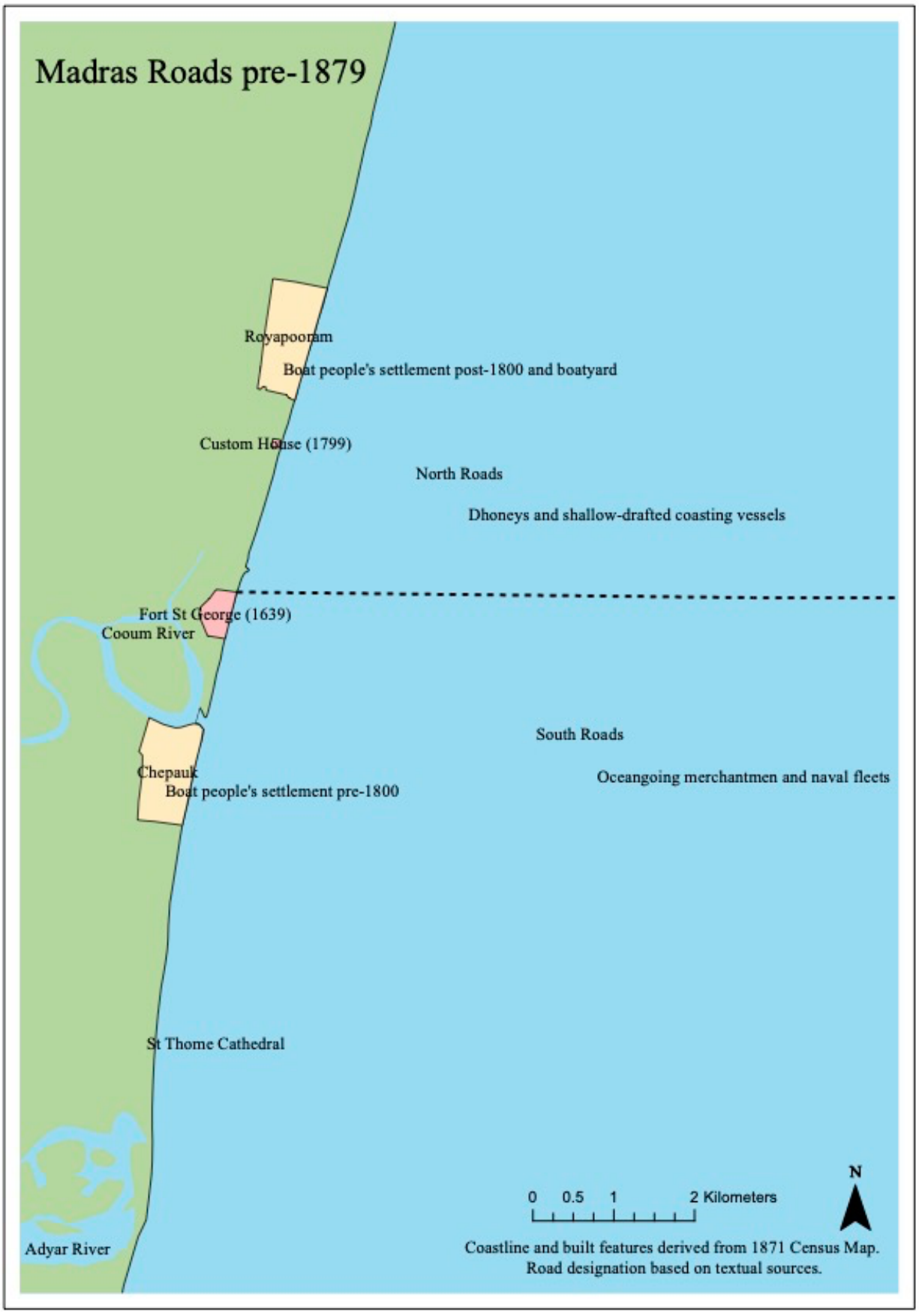

Figure 3: Suggested division of the roads before the construction of a harbour in 1879.

The 1842 Boat Act was the first piece of legislation for the Boat Department passed after the 1833 Charter Act, which led to the standardisation of guidelines for Indian Ports. The 1842 Boat Act is in part a reflection of an imperial effort to define and centrally govern Indian ports rooted in the 1839 Port Duties Act, in which the Government of India specified the rate of port dues for Madras and simultaneously decreed that equivalent dues were to be levied at all ports under the central government's jurisdiction.[135] These legislative changes drew Madras more tightly into an overarching imperial structure, and as a result made it more important than ever for the littoral to look administratively more like a port and less like an open beach. The Boat Act was also passed in a period of intensifying conversations around the construction of port facilities, mirroring the desires of the government and private merchants to define and construct out of blank surf zone a recognisable, physical harbour.[136] How Madras's littoral space was visualised and organised is reflective of increasing administrative oversight, the growing anxiety about Madras's continued existence as a viable centre of commerce, and the need to balance facilitating the continued cooperation of the boat people against the demands of the merchant community for fast and efficient service. In the administrative imagining of the port is reflected the larger political, commercial, and imperial realities impacting Madras as both a city and Presidency capital.

The written regulations which organised the space of the open roadstead also provided guidance on how to go about landing cargo and passengers. Ideally, when a vessel anchored in the Madras Roads, a catamaran manned by an employee of the Boat

[135] President of the Council in India, Port Duties Act.
[136] 'Respecting the construction of a breakwater in Madras Roads,' 1837, BL, IOR/F/4/1580/64265; 'Proceedings connected with Captain Lennon's proposal for building a pier or harbour; with Mr Greig's plan for constructing a wharf, and with that of Mr Lindeman for creating a Breakwater in Madras Roads,' 1837, BL, IOR/F/4/1580/64266; 'The Proposed Madras Breakwater,' *Taunton Courier and Western Advertiser* [Taunton] no 1534, (10 January 1838) 5 col a; Cotton, "Report by Captain Cotton on the Proposed Breakwater at Madras"; 'Marine Consultations No. 11 (1842) and No. 9 (1843),' 2 Aug. 1842 and 21 June 1843, BL, IOR/E/4/960; 'Marine Consultations No. 7,' 22 Sept. 1844, BL, IOR/E/4/961; 'Marine Consultations No. 1,' 13 Feb. 1845, BL, IOR/E/4/963.

Department would approach. It was this man's job to ascertain what ship had arrived, what cargo was on board, which port it was coming from, and what the needs of the captain were, in terms of watering or taking on other supplies or ballast, and disembarkation of passengers or loading and unloading of cargo. The catamaran-man would then relay that information and the need (or not) for masulas back to a Boat Pay Office. A ship's officers could also go ashore themselves or communicate by signal flag to indicate the need for service. If masulas were available, the weather was good and it was early enough in the day, unloading could begin. If the weather was bad, the flag atop the Boat Pay Office would be lowered, signaling to all boats in the roads to return to shore for the day. Even if the weather was fine, if it was too close to six in the evening (the latest masulas were allowed to leave the beach) or no boats were available, the ship would have to wait. To call for a masula the next day or signal a need for communication, a ship's boat could be rowed to the back of the surf to attract attention, staying clear of breaking waves.

Once a masula had been called and approached, unloading could begin. To unload cargo, the captain could either provide his own labour, or hire *lascars* from the port, who would come out to the ship in the masula. Boatmen were not allowed and could not be compelled to exit their boats to assist with loading. Once a boat was loaded with no more than two tons deadweight or fifteen passengers, the crew would head back towards shore.[137] When approaching the triple bar of surf, the *tindal*, or boat captain, would stop the crew and monitor the surf, before directing them to row when he deemed it safest to pass through the first bar. At this point crews would often start to sing, which helped to maintain a steady rowing rhythm and increase the safety of the passage.[138] Depending on wave height and direction, the *tindal* would stop the crew before each set of rollers. In crossing the final bar

[137] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 542.
[138] Stocqueler, *The Hand-Book of India: A Guide to the Stranger and the Traveller, and a Companion to the Resident*, 568.

of surf, the goal was to have the wave carry the boat high onto the beach, head on, for the safest landing. The boat would slam into the sand, and beach *peons* would come to immediately pull the boat out of the surf to begin unloading the cargo. Loading and unloading cargo required dozens of masula trips, lasting days or even weeks.[139] Most cargo was unloaded unceremoniously on the beach before being carried through Fort St George's Sea Gate or to the godown in the Sea Custom House, a process that could take weeks or months further still.[140] Only after cargo had been processed by the Sea Customer could it be retrieved by its owner.

Disembarking at Madras as a passenger was not much different than unloading cargo. The amount of time it took to cross the three-kilometre-wide surf zone depended on the weather and state of the surf. William Hickey, an eighteenth-century memoirist, reported that in embarking one July morning in 1780, his boat trip took several hours; departing just before dawn into a 'prodigious' set of rollers, he and his grateful companions got on board ship 'around eight,' a likely duration of slightly over two hours.[141] His captain, on the other hand, departed at one o'clock that afternoon, and was on board ship by two o'clock. Hickey also thought disembarking was a faster journey because the boat moved with the surf, rather than 'meet[ing] the enemy directly in your teeth.'[142] Upon landing on the beach, whether it took an hour or two or more, passengers would either have to wade through the shallows, or be carried ashore.

The visual organisation of the littoral was imagined, dictated by the depth of the coastal water in different areas, the difference in draught between coastal and oceangoing vessels, and an attempt to limit the extent of the space of the roads for service. Ultimately, the experience of the roads was dictated by the physical characteristics of the littoral and

[139] 'Madras Public Proceedings,' 15 May 1772, BL, IOR/P/240/33.
[140] 'Landing Charges,' *Madras Mail* [Madras] no. 104, (4 May 1877) 3 col c.
[141] Based on 7 July 2021 sunrise time of 5:48am for Chennai.
[142] Quennell, *The Memoirs of William Hickey*, 118.

dependency on masulas and boat people, whose abilities placed limits on when, where, and how ships could receive service.

Conclusion

While port histories often emphasise the imperial context of ports as 'nodes' in a global network, ports are also grounded in their local physical context. Atiya Kidwai argues that the success or failure of a port is due to a combination of the port's 'site' and its 'situation'—in other words, both its physical and its commercial, political, and social contexts.[143] Despite this, histories of port cities give preference to situation when framing ports as nodes or transmission points in a global system. But the site of a port, regardless of broad imperial or commercial theoretical desires, helps determine its success or failure. Presenting Madras's local environmental, imperial, and commercial contexts simultaneously illustrates the importance of considering the global and the local equally in writing spatial history. For Madras, the nature of the littoral helped to create the port's commercial woes even while the city remained politically important as Presidency capital in southern India; the persistent low volumes of both international and coastal trade were most basically due to the unfavourable position of the port on an open and unprotected beach. The reliance on a small hereditary workforce that limited the number of trips that could be made even on good weather days further restricted the prospects of the port.

While Madras's local political position was persistently tenuous in the seventeenth century, it rose to international prominence based on its access to prized Indian textiles and diamonds in high demand in Europe. To better secure its local position and outcompete other nearby European trading company outposts, Madras officials branched out into local politics in the late seventeenth century, ingratiating the Company through financial support

[143] Kidwai, 'Conceptual and Methodological Issues: Ports, Port Cities and Port-Hinterlands,' 12–13.

of local subsidiaries and by accepting small grants of land in exchange for access to international markets. The limitations placed on textile imports to Britain in the early eighteenth century damaged the city commercially, but its physical and political position in southeast India meant it remained a target during the mid-century global imperial wars between Britain and France. By the turn of the nineteenth century, the Presidency of Madras had grown to nearly its full extent through Company annexation of Carnatic and Mughal land, but the city continued to struggle in international commercial markets, kept afloat instead by its political prominence. The nineteenth-century explosion of Bombay and Calcutta as centres of trade and political power concerned Madras officials, who began investigating the construction of artificial harbour installations in earnest as a means to raise the city's commercial standing.

Madras's fluctuating political and commercial standing over the seventeenth, eighteenth and nineteenth centuries was shaped by its climatic and geographic context. Its site, on a long stretch of beach with no natural barriers to wind and waves complicated the process of seaborne trade. A persistent triple bar of surf precluded the use of rigid European-style ship's boats, and even the locally built and adapted masulas and catamarans were limited in how quickly and how often they could travers the surf, elongating the process of loading and unloading cargo, watering, and victualling. During the dual NE and SW monsoon seasons trade was brought to a near-complete halt; insurance for ships stranded in the roads during this period was waived and many foundered on the beach or were lost at sea during intense cyclones.

The space of the anchorage was organised according to its physical features and to ensure equal pay and opportunity for the port's boatmen and timely service for all the shipping. Coasting *dhonies,* smaller and shallower-draughted than European ocean-going ships, anchored closer to shore in the shallower North Roads, while merchantmen and naval

ships anchored further from shore in the South Roads. To ensure that both *dhonies* and oceangoing ships received timely service, rates of hire were separately set for the North and South Roads from the 1760s onward, but the more important difference appears to have been the type of vessel requesting service and the depth of the anchorage, rather than its exact location relative to alongshore markers. Totally reliant on the boatmen for their technology and continued cooperation, the administrative structuring of the space of the anchorage reflects not only the physical features of the space, but also the demands of the boatmen for equivalent pay regardless of the location or types of vessels on a given day. The functional experience of trading by sea through Madras, limited by environment, technology, and the need for particularly knowledgeable and skilled labourers, can be used to contextualise the city's political and commercial growth and stagnation in the eighteenth and nineteenth centuries.

In the following chapters, the site-specific environmental and technological context of the littoral will be used to explain the Madras Government's reactions to perceived unruliness in the surf zone. These ranged from unsuccessful attempts to build and import better, European-style boats, to the passage of regulation after regulation to dictate the experience of passing through the surf, to pier, breakwater, and harbour building projects. In the correspondence of the East India Company these decisions are all locally contextualised and suggest a firm grasp of the realities of working in the littoral. And yet, viewing the decisions made in reaction to the littoral conditions strictly in the local environmental context hides the impact of larger, shifting imperial motives and thought on labour, commerce, and engineering. Littoral conditions necessitated British dependency on local expertise and technology; changing British cultural attitudes towards empire and colonial subjects dictated how that dependency was viewed. The need to satisfy both local and imperial requirements led to a disconnect between an idealised vision of the littoral and

the messy reality of a wide-open roadstead traversable only by a small, closed community of boat people. The following chapters examine the outcomes of that disconnect between expectation and reality, and the frustration it resulted in. This includes the continued reliance on boats, that were, while well adapted, not immune to the dangers of the surf zone; the failure to effectively regulate the passage between ship and shore; and the drawn-out process of building port infrastructure. In the Madras surf zone, the global reach of the British Empire contorted to fit the physical realities of the place.

Chapter 3: Indigenous technology and knowledge in the surf zone

In 1834, a Chatham shipyard manager named John Edye presented a paper to the Royal Asiatic Society. Edye, previously stationed at the Trincomalee (Sri Lanka) naval base, had written a description of the various classes of vessels constructed and used on the Coromandel and Malabar Coasts and the island of Ceylon. Published in the Society's journal, the paper was an early example of several studies and accounts of Indian native craft that appeared in European publications in the nineteenth century.[144] Edye's account included a long description of masulas, which were further highlighted in the introduction to the article written by Sir John Malcolm. Malcolm—a former army officer, governor of Bombay, and member of Parliament who had started his career in Madras—mused on the significance of the masula:

> …many of the vessels of which he [Edye] gives us an account…are so admirably adapted to the purposes for which they are required, that, notwithstanding their superior science, Europeans have been unable, during an intercourse with India of two centuries, to suggest, or at least to bring into successful practice, one improvement. I may adduce the masula boats…in proof of this assertion…both talent and skill have laboured in vain to improve the shape and construction of those vessels.[145]

Malcolm's description of Indian boats, and masulas in particular, reads as a point of frustration with the shortcomings of British technology and innovation in the Madras surf zone. Malcolm is not the only author to describe masulas as such; the basic outline of construction method and performance features heavily in the writings and artwork disseminated to Britain. But the goals of the British travel writer—to package and present a foreign imperial India for a domestic audience—and their colonial perspective, resulted

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[144] For example, Folkard, *The Sailing Boat: A Treatise on Sailing Boats and Small Yachts, Their Varieties of Type, Sails, Rig, Etc*; Paris, *Essai Sur La Construction Navale Des Peuples Extra-Européens*; Shortt, 'The Fishermen of Southern India.'

[145] Edye, 'Description of the Various Classes of Vessels Constructed and Employed by the Natives of the Coasts of Coromandel, Malabar, and the Island of Ceylon, for Their Coasting Navigation,' 2–3.

in narratives that while useful for understanding changing attitudes towards native labourers and technologies, offer only limited insight into the long-term functionality of Madras's ship to shore transport system. Aimed at producing a detailed description of how people and goods moved between ship and shore, this chapter uses travel writing only as a starting point from which to build a fuller picture of the technology of the Madras littoral.

This chapter examines the Madras littoral as a two-part technological system, consisting of the boats and the boatmen.[146] The chapter identifies three persistent impressions about the boats used at Madras as perpetuated in travel narratives—their safety, reliability and longevity, and 'indigeneity'—then contextualises these assumptions with material informed by sustained contact. Records of the Boat Department, correspondence with the Madras Government in Council, local newspaper accounts, editorials, and yearly published reports demonstrate that masulas were not so much safe, as *safer* than the European-style alternative; not long-lasting but easily and frequently repaired; not constructed with local materials but the product of interregional coastal trade. Unpacking the assumptions about masulas and catamarans perpetuated by travel writers shows that while their designs may have been simple and old, they were based on experience, ingenuity, and regional connectivity. While their function as cargo vessels did lead to the construction of larger, stronger, and slightly more complex versions of the pre-existing fishing masula, the overall changes in form were minimal despite colonial administrative oversight. The case of the Madras masula and catamaran demonstrates that for a technology

[146] The 'technological system' as a conceptual framework in history and sociology of technology arose out of an 1984 interdisciplinary conference and volume edited by Wiebe E. Bijker, Thomas Hughes, and Trevor Pinch (*The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology,* 1987). Thomas Hughes defines technological systems as systems made up of physical artifacts, organisations, legislation and sometimes natural resources that are both socially constructed and socially shaping. He argues that the components of technological systems interact to solve problems using 'whatever means are available and appropriate'. (Hughes, 'The Evolution of Large Technological Systems,' 46-7). Here, the components of the system include masulas and catamarans, the boatmen, the Boat Department, and legislation concerning the port and transport. This chapter is focused on the boats and boatmen as the main components of the system, but see chapter four for a more detailed examination of the Boat Department and port legislation and regulation.

to be ‘useful’ in empire, it did not have to be innovative or Western, and that the best-suited design was not always the newest or most complex.

The chapter then turns to the boatmen. It examines the tropes relied on by travel writers, which ranged from characterising the boatmen as lazy, primitive and animalistic to appreciative comments about their skill and experience. These descriptions are situated within a broader history of the boat people’s experience of living near and working for the East India Company at Madras, which focuses on the tightly bound nature of the boat people’s social/work community, the role of religion in their relationship with government officials, and how British perceptions of their work ethic and alcohol use impacted the structure of the system of ship to shore movement. Travel writers deployed a mixture of stereotypical language that is reflective of the boatmen’s position as native, maritime, labourers, responding to reader expectations about colonised people, unskilled labour, and mariners simultaneously. Company accounts produced over decades of contact, on the other hand, show that the community cohesion of the boat people was the most significant factor in how the boat system developed and changed over time.

Methodology and framework

The widespread availability of travel accounts in the eighteenth and nineteenth centuries and today makes them an accessible starting point for examining the design and functionality of Madras boats. Travelogues are also a useful type of source to begin with because they reflect changing domestic attitudes towards imperial India, the expectations of travellers, and their impressions of foreign people and places. The masula features helpfully often, as for many British travellers, particularly in the first half of the nineteenth century, Madras was the first port of call on the voyage from Britain. An author’s journey in a masula boat often appeared in the first chapter of their Indian travelogue, serving as

both the narrative and physical entrance to a new and foreign experience. But the transitiveness of their experiences led to the production of passing and impressionistic descriptions. Because the primary aim of this chapter is not to examine broad British attitudes towards Madras boats and boatmen, but to unpack their design, construction, functionality, and experience, travelogues here serve as a basis from which to expand.

With the emphasis on design and functionality, questions derived from a historical maritime archaeological approach to boat survey were invoked to guide this 'expansion.'[147] When conducting ethnographic watercraft surveys or documenting shipwrecks, anthropologists and archaeologists deploy a range of research questions. These include questions about age of a vessel, dimensions, the materials used in construction, where materials were sourced, evidence of repair and scarcity of resources, the mode and location of construction, the presence or suggestion of cross-cultural influences, propulsion, typical use, capacity, predicted performance in different conditions, decoration, and many others.[148] They seek to answer these questions both using the survey vessel in question, and other supplemental sources when available, like dockyard records of construction, repair and materials, written descriptions of the vessel or vessel type, blueprints, other examples from the same or similar time period and place, and visuals, including paintings, prints, graffiti, postcards, maps, sketches and models.[149] Maritime archaeologists rarely work from one source or type of source alone to reconstruct the function and use of a vessel, and while this chapter does not involve any survey of an existing masula or catamaran, this multi-pronged approach and focus on design and materiality has been adapted to the variety of written and visual sources that exist from the eighteenth and nineteenth centuries.

[147] Flatman and Staniforth, 'Historical Maritime Archaeology,' 168–69.
[148] Mcgrail, 'Aims and Methods,' 16–18.
[149] Orser, *Historical Archaeology*, 18; see for an example, Cvikel, 'The 19th-Century Akko Tower Wreck, Israel; a Summary of the First Two Excavation Seasons.'

The application of an archaeological approach to thinking about the design and function of masulas historically is supported by the interest taken in them by several ethnographers and archaeologists in the late twentieth and early twenty-first centuries. BA Blake, an ethnographer who studied masulas in the 1960s described the dimensions, mode of construction, materials, propulsion and repair cycle of modern masulas as part of a larger study of Coromandel Coast fisherpeople.[150] Eric Kentley revisited Madras masulas in the 1980s and early 2000s, with a particular focus on variation in the mode of construction along the coastline and between settlements.[151] Maritime archaeologist Charlotte Dixon studies historic masula models in British museum collections.[152] She compares the mode of construction of the models to life-size examples to argue that the striking similarities mean that models can be used to predict historic construction methods when there is limited or no access to full-size examples today.[153] These studies provide useful information about the dimensions and methods of twentieth-century fishing masula construction, but as Kentley acknowledges, the physical form of modern examples with a different function, may not be a perfect corollary for the boats used in the port in the eighteenth and nineteenth centuries.[154]

What is harder to reconstruct from an archaeological perspective is the usefulness of a particular design in a particular place—just because a boat existed does not mean it served its assumed purpose well.[155] Historians of technology, however, have argued that

[150] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State.'
[151] Kentley, 'Some Aspects of the Masula Surf Boat'; Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast.'
[152] Dixon, 'Miniaturising Boats: The Case of the Indian Masula Surf Boat.'
[153] Dixon, 115.
[154] Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 127.
[155] Bischoff, 'The Oseberg Ship: Reflections on the Choice of Methodology When Testing Experimental Archaeological Reconstructions,' 290–92. Bischoff grapples with design efficacy in the context of experimental archaeology. Numerous alterations to the design of the Oseberg ship reconstruction took the form of the ship's hull and propulsion mechanisms far from extant archaeological remains to "improve" its maneuverability, leading Bischoff to wonder whether the reconstruction was wrong, or if the original was simply a poor sailor. She argues that the perfect usefulness or adaptation of the original should not

usefulness is an important metric for evaluating the relative importance of different technologies and provide a framework for identifying and evaluating 'useful' technology. David Edgerton argues that use, not innovation, should be the primary driver of the history of technology, because it takes the emphasis off newness and complexity and places it on the objects that are used consistently in everyday life, and are therefore more likely to have a societal or cultural impact.[156] Emphasising use rather than innovation also makes way for 'simple' and/or well-established technology that may have been important, but invisible when the focus is on newness and complexity. Usefulness is an especially important category for examining the history of indigenous technology in imperial contexts, where the traditional historiography is focused on the role of Western innovations in imperial expansion.[157] A useful technology framework also emphasises the importance of skilled practitioners—a well-designed and contextually-adapted technology is still only as effective as its operator. Who has skill and experience, how it is obtained, maintained, and shared, is equally important to understanding the usefulness of a technology as its theoretical design and function. As a result, this chapter is framed as a two-part system—the first, the boats themselves, the second, the self-contained community of skilled boatmen who operated them.

A document-based approach to the technology of the surf zone can contribute to the existing literature on the physical form, function, and usefulness of masulas and catamarans as cargo boats. This chapter joins an archaeological research approach to form and function, a 'useful technology' framework, and a wide-ranging base of documentary evidence to evaluate and add nuance to the persistent impressions of travel writers. Company

necessarily be a baseline assumption. This shows the limitation of an archaeological survey-based approach to determining efficacy on the basis of form alone.

[156] Edgerton, 'From Innovation to Use: Ten Eclectic Theses on the Historiography of Technology,' 112.

[157] Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century*; Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance.*

correspondence forms the base of the document-based research, including internal correspondence of the Boat Department, minutes of the Board of Trade and Government in Council, correspondence with the Board of Control and Court of Directors in London, and special reports on mismanagement of Boat Department resources. In 1762, the Boat Department was established, which was tasked with overseeing the masula boats and boatmen and employing catamarans. This meant that officials of the Boat Department were concerned with construction and repair, and reported on the acquisition, cost, and volume of supplies needed to keep the fleet in working order. They were also responsible for licensing boats and contracting with boat owners, which means that the Boat Department correspondence includes discussion of the boat people's community, religion, and complaints about ill-treatment or pay. Government documents furthermore provide information about extreme weather and its impact on the fleet, and provide explanations for why the size of the fleet rises and falls over time, such as damage from storms or overuse, lack of supplies, rates of hire, and periodic discontent with working conditions.

Government documents are supplemented by other types of contemporary sources. Unfamiliar or alternative names for timber types, properties, and traditional ranges, for example, were found in various nineteenth-century lumber catalogues. Local newspaper reports on the yearly 'muster of boats' gave further insight into the size of the fleet at different times and the prevalence of repair. Reports on injury, death, and loss of cargo, also found in local newspapers, provides a different perspective on risk and safety than the personalised accounts of travellers or the bigger-picture government approach to the surf zone. Nineteenth-century ethnographies, like those of John Edye, Edmond Pâris, and John Shortt provide information about dimensions and mode of construction that can be used to make suggestions about how the size and structure of masulas changed in response to changing function. Yearly published government summaries of the state of the Presidency

occasionally provide rationales for why the number of boatmen employed rose or fell in a given year, and census data from the 1870s suggests continuities in the makeup of the boat people's community despite a dearth of mid-century material. The aim in selecting sources was to find material either produced in Madras or after a demonstrable and sustained contact with the boats, boatmen, and littoral context. To balance impressionistic travel accounts, I tried to select other sources that resulted from constant, long-term, and informed proximity.

Masula and catamaran design and function

Indian Ocean sewn boat traditions date back thousands of years, and encompass a multitude of structural designs, sewing patterns, and uses. Sewn craft vary in size from dugout canoes with a single plank added on to a carved base, through to large, oceangoing merchant ships that carried goods on coastwise trading routes.[158] Sewn boats were used for coastwise trade, fishing, intersettlement communication, and travel on rivers and other inland bodies of water. Sewing is an effective means of fastening hull planks together, especially on coasting craft, because it allows for quick and easy repairs even if supplies are limited. Hull design, sewing patterns, and naming conventions vary widely.[159]

While sewn boats have an ancient history in the Indian Ocean, at the time of European contact there were very few examples of sewn craft in Europe and the British Isles. The most famous sewn boat type from Britain and Ireland in use in this period is the coracle, a small riverine craft either woven or sewn from animal skins and stretched over a rounded form, but this is a very different craft from the masula in material and construction. There were no sewn plank boats that Europeans could use as a cultural corollary when

[158] Varadarajan, 'Indian Boat Building Traditions. The Ethnological Evidence,' 548.
[159] Staples and Blue, 'Archaeological, Historical, and Ethnographic Approaches to the Study of Sewn Boats: Past, Present, and Future,' 269–85.

encountering the sewn boats of the Indian Ocean. This likely accounts for the regularity with which European writers commented on the form of the sewn boats that carried them from ship to shore at Madras, which they referred to as 'masula' boats. The origin of the term 'masula' is unclear—it may refer to a nearby fishing village, Masulipatnam (modern Machilipatnam), but there is no definitive evidence for this. Spellings of the term masula vary widely in the documentary record, including *masulah, massoola, mussolah, macule, massowla, mossel, masuli,* and in French *chelingue* and *chillinga.* In the 1980s, when Eric Kentley conducted ethnographic research on the boatmen of the Coromandel Coast, he found that the term was unknown to contemporary builders and boatmen. Instead, Tamil speakers referred to them as '*padagu',* while Telugu speakers referred to them as *'padava.'* [160] In neither case, however, was the term used to describe strictly the class of boats that Kentley considered to be a 'masula.' For sake of consistency with the documentary record, I will be using the term masula, but it is important to remember that this term and classification is derived from a European perspective and does not necessarily reflect the ways in which historical or modern Indian boatbuilders and boatmen would have viewed or classified these boats.

[160] Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 121.

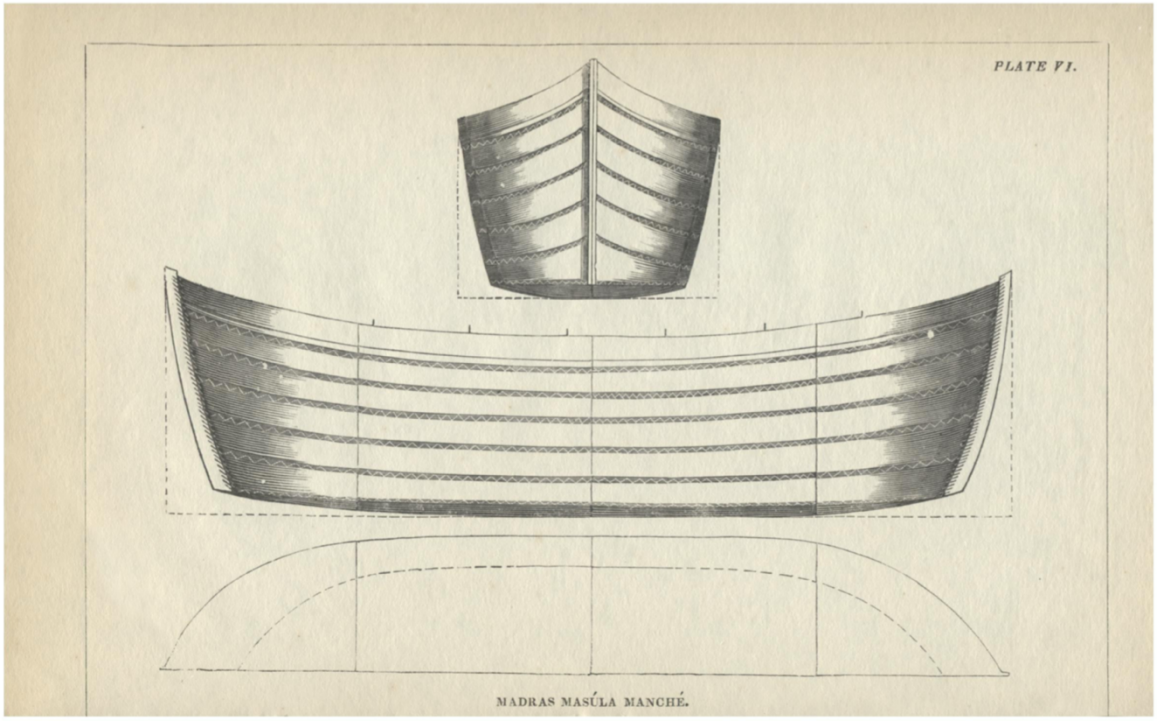

Figure 4: Line drawing of a Madras Masula. Produced by John Edye, circa 1834. 'Description of the Various Classes of Vessels Constructed and Employed by the Natives of the Coasts of Coromandel, Malabar, and the Island of Ceylon, for Their Coasting Navigation,' plate VI.

Madras masulas of the eighteenth and nineteenth centuries had several distinct features. They were distinguished by their lightness of construction, achieved by omitting internal frames that would add weight and lateral stability. Masulas did not have keels and were flat bottomed; while this reduced maneuverability, it also reduced weight and made for a better cargo boat. The flat bottom made a masula easier to load and to land on the beach—the boat would not tip to either side as it was pulled up on to the beach, and the omission of a keel meant that the weight of the cargo was evenly distributed, rather than concentrated on a point. Masulas had high sides which flared out from a right-angled chine and came to a point at both the bow and the stern. This flare meant that the beam was significantly wider at the gunwale than at the chine (at the upper edge of the planking than where the planking met the floor.) They were approximately thirty to thirty-five feet (9.14-10.66 metres) in length, and six to nine feet (1.83-2.74 metres) in breadth. Rather than the combination of fibres and resinous material for caulking typically used in European construction, masulas were caulked with cotton or coconut fibres alone pressed between

the planking. And most importantly—and most distinctively—to European observers, the planks of masulas were sewn together rather than nailed, achieved by drilling holes across the top and bottom of each plank and weaving coir, a rope made of coconut fibre, through to attach the planks to each other. Innes Munro, for example, noted that 'when the ships anchored in Madras Roads Masula boats came off to us, formed…expressly for crossing the surf, having high sides and a few timbers of thin planks sewed together with the bark of the cocoa-nut tree,' while James Johnson recorded that masulas were 'flat bottomed, high, and the planks sewn together by a fibrous substance.'[161]

Figure 5: This close-up of a masula model held in the National Maritime Museum illustrates the way in which the planks were 'sewn' together. No nails were used to attach the planks to each other or internal fittings. NMM AAE0176.

The light, pliant planking, lack of internal frames and hard joins, and flat bottom design was well suited to traversing the surf, as it allowed the boat to bend and let in small amounts of water without breaking up or capsizing. If the sewn joints weakened and the boat began to let in too much water, it could be disassembled, dried fully, and resewn with new coir, without the need for an entirely new, and much more costly, boat.[162]

Internal fittings were minimal in common masulas. Eight crossbeams were attached under the gunwale, on four of which boatmen would sit to row double banked (two men per crossbeam, one rowing on each side of the boat,) and a platform at the stern of the boat allowed the tindal, or boat captain, to control the large steering oar and monitor the surf.

[161] Munro, *A Narrative of the Military Operations on the Coromandel Coast*, 17; Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 16.
[162] For example, see 'Madras Public Proceedings,' 25 May 1783, BL, IOR/P/240/56.

Boatmen used oars consisting of long bamboo poles and small, wide palm blades which reduced drag when paddling through the surf, while tindals used a long steering oar with a large but slender blade. Common masulas were dunnaged with brush to protect cargo from the leaky hull, and tarpaulins were provided to further protect cargo from salt spray.[163] A second class of masula first appeared in the 1790s, called 'accommodation boats,' which were larger than common masulas and included benches for passengers under an awning on a platform aft. Accommodation boats may also have had a small keel for added stability.[164] These were used for carrying European passengers.

The size of the masula fleet fluctuated dramatically during the study period due to available work force and serviceable boats, the volume of trade, and shifting Company policy. The following table shows the general outline of the fleet across the study period. Boat numbers were reported more frequently during times of conflict, such as the early 1780s, a reflection both of their importance during these periods for transporting troops and supplies, and anxieties about their numbers shrinking due to damage and loss. The significant increase in the size of the fleet from the late 1820s to the 1870s reflects the growth in volume of trade through Madras and the rise in importation of prefabricated ironworks from Britain. The quickly shifting numbers of the 1870s, however, illustrate the growing precarity of work in the masula boats, as competition from a newly-constructed pier and the beginnings of a built harbour provided alternative means of transport.

[163] 'Regulations for the Boat Department' (31 January 1794).
[164] 'Papers relative to the Disputes between Messrs Adderley & Abbott, late Master Attendants at Madras, vol 1 of 2,' 9 Dec. 1795, BL, IOR/F/4/2/626; 'Investigation into maladministration and corrupt practices in the Master Attendant's Department at Madras, vol 2 of 3,' 14 Nov. 1828, BL, IOR/F/4/1188/30856.

Masula Boats and Boatmen Employed 1755-1880				
Year	Number of Boats	Number of men	Number of Tindals	Number of bailing boys
1755	33	est. 330	est. 33	est. 33
1756	50	est. 500	est. 50	est. 50
1762	56	est. 560	est. 56	est. 56
1781	40	est. 400	est. 40	est. 40
1782	142	est. 1420	est. 142	est. 142
1783	52	est. 520	est. 52	est. 52
1783	108	975	est. 108	est. 108
1783	75	est. 750	est. 75	est. 75
1783	66	est. 660	est. 66	est. 66
1784	80	680	est. 80	est. 80
1792	100	est. 1000	est. 100	est. 100
1796	125	est. 1250	est. 125	est. 125
1821	80	est. 800	est. 80	est. 80
1819	88	est. 654	88	88
1827	102	est. 757	102	102
1828	80+	est. 800	80	80
1869	228	2528	est. 228	325
1870	170	est. 2210	est. 170	170
1876	342	4298	est. 342	440
1877	275	3560	est. 275	275
1880	122	est. 1220	122	122[165]

[165] 5 Sept. 1756, BL, IOR/P/240/14; 5 Oct. 1762, BL, IOR/P/240/20; 'Madras Public Proceedings,' 16 Nov. 1782, BL, IOR/P/240/55; 2 June 1783, BL, IOR/P/240/56; 'Madras Public Proceedings, 27 June 1784, BL, IOR/P/240/59, 'Regulations for the Boat Department' (31 January 1794); 'Madras Public Proceedings,' 4 Nov. 1796, BL, IOR/P/241/68; 'Investigation into maladministration and corrupt practices in the Master Attendant's Department at Madras, vol 1 of 3,' 4 Sept. 1827, BL, IOR/F/4/1188/30855; 30 June 1828, BL, IOR/F/4/1188/30855; Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*, 94; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, 124; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1875-76*, 124; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1877-78*, 110; 'Muster of Boats,' *Madras Mail* [Madras] no 34, (10 February 1880), 2 col g. Table values without 'est.' are exact values found in archival and published contemporary documents. Some report only the number of boats, while others provide the number of boatmen, tindals and bailing boys as well. Where only one or some values were directly reported, I have estimated the remaining figures based on the number of men needed to operate the given number of boats. These estimates may be inaccurate but are the minimum numbers needed to operate the given number of boats. The table also

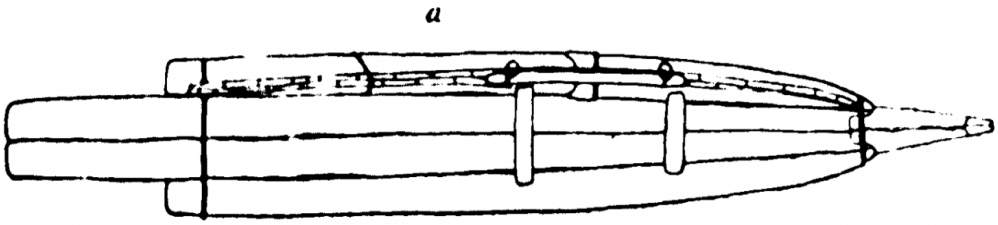

Figure 6: Plan view of a Madras catamaran sketched by James Hornell circa 1920. Note how the prow is shaped into a point and the timbers are lashed together. Hornell, The Origins and Ethnological Significance of Indian Boat Designs (1920.)

Catamarans (*cattymarans, katamarans*) were used alongside masulas at Madras. Catamarans originated as fishing craft and were widely used around the coasts of southern India and Sri Lanka, however they varied significantly in size and construction technique.[166] Descriptions of catamarans in the port of Madras suggest a very simple and maneuverable craft that was specific to the immediate area and varied in size based on function. Catamarans used to service the port consisted of between two and four logs lashed together with coconut-fibre coir. The middle log was the longest and shaped to form a wave breaking prow, and the side logs were shaped slightly to create a taper at either end. [167] Catamarans came in two sizes, 'small' and 'large;' 'small' catamarans, usually manned by one man, were used for safety and communication between ship and shore, while 'large' catamarans, manned by two men, were used to transport goods that were too heavy or awkward for a masula, and as dive platforms for recovering lost cargo and anchors. Unlike fishing catamarans, port catamarans were not equipped with a mast and sail, instead powered solely by oar. Oars consisted of a wide, flat blade made of coconut wood attached

includes all the fleet size information that I have without smoothing uneven coverage over time. I chose not to take averages because this shows the ways in which fleet size sometimes fluctuated dramatically over short periods of time due to war, storms, destruction of boats from harsh use, and competition from the pier.

[166] Hornell, 'The Origins and Ethnological Significance of Indian Boat Designs,' 169.

[167] Edye, 'Description of the Various Classes of Vessels Constructed and Employed by the Natives of the Coasts of Coromandel, Malabar, and the Island of Ceylon, for Their Coasting Navigation,' 4.

to a bamboo pole. Between trips, catamarans were disassembled on the beach to dry fully, because if the wood became overly imbibed with salt water, they would sink.[168]

Unlike the masula fleet, the number of catamarans that served the port at any given time is uncertain. Catamaran-men were employed directly by the Boat Department, but the number of catamarans in use is never directly reported. This may be because less coordination was required to keep the catamaran fleet in service—rather than relying on ten men to all report for duty to operate, catamarans were operated by only one or two men.

Travel writers' impressions of Madras boats in Britain

This picture of masulas and catamarans is consistent with travel texts and accounts of masulas found in British newspapers produced between 1670 and 1893. The descriptions offered are all nearly identical and compare European and local design: only masulas were able to cross the surf because they are sewn, rather than nailed together like European boats. European boats sank; masulas afforded safe passage. European designs fell apart in the conflicting forces of the surf; masulas were rarely damaged. Masulas and catamarans were local inventions and require local expertise, while European sailors do not have the skill needed to maneuver them. The consistency from account to account over decades makes it impossible to assess how the boats were used and how they performed on a daily basis. Daily experience, rather than a one-off passage, is more useful in assessing function and efficacy over a long period of time.

Not only are the descriptions of Madras boats in travelogues consistently brief, but they also convey more about the mindset of the writer than the technology of the crossing. Furthermore, nineteenth-century travel writing reflects an increasingly condescending attitude towards indigenous technology that further complicates an assessment of daily functionality. As the nineteenth century progressed, and domestic excitement over the new

[168] Graham, *Journal of a Residence in India*, 2nd ed. (London: Constable, 1813), 127.

and innovative technologies of the Industrial Revolution grew alongside theories of racial classification and civilisational hierarchy, discomfort with the use of masulas became more prominent in the language used to describe them. Travel writers focused on how the boats were constructed as a means of reinforcing wider notions of cultural inferiority, a theme that was repeated more broadly by British authors who were critical of British dependency on masulas. For example an anonymous editorialist in the *Nautical Magazine* lamented the reliance on masulas in 1840, writing that the fact that naval officers had to go ashore in masulas 'rendered our men-of-war, not merely dependent on others for a very important duty…but the defects in their boats, tends in some measure to give barbarous people a somewhat mean opinion of our boasted superiority.'[169] John McCosh went further in his evaluation of the masula in 1856, writing that their use signified Britannia's willingness 'to give up her Trident to primitive bare-bottomed natives, and place herself under their command!'[170]

This language is reflective of the wider British use of the canoe as a by-word for savagery, and in fact comparisons between catamarans and canoes were made in both writing and print in Britain.[171] The *Illustrated London News* published multiple prints in which catamarans were depicted as canoes. Artists, even those reportedly working from Madras, relied on an established visual currency, rather than accuracy, to portray the boats for a British viewing public and play off cultural connotations of inferiority.

British travel writers used a variety of value-laden language to describe masulas. They were referred to as 'ill shap'd, 'of very rude construction,' 'awkward looking

[169] 'Atlantic Steam Navigation,' *Nautical Magazine and Naval Chronicle* [London] (1840), 433.
[170] McCosh, *Advice to Officers in India*, 305.
[171] 'The Catamaran Postman,' *Illustrated London News* [London] no 946, (20 November 1858), 474-5; 'Eastward Ho! No. III,' *Sheffield and Rotherham Independent* [Sheffield] no 7666, (15 April 1879), 8 col a-b; 'A Catamaran Race at Madras,' *Illustrated London News* [London] no 1468, (8 February 1868), 13-4 col c-a; 'Illumination of the Surf at Madras,' *Supplement to the Illustrated London News* [London] no 1903, (15 January 1876) 65; Walmsley, "Robinson Crusoe's Canoes," 2.

machines,' 'lumbering,' 'suspicious,' and 'monstrous uncouth looking things.'[172] The *Madras Mail,* an English-language paper that often criticised the fleet, referred to masulas as 'that primitive article' and 'great lumbering and primitive craft' in the late nineteenth century.[173] The *Mail's* derision for the masula fleet grew in the context of several decades of pier and harbour construction efforts stretching from the early 1860s through the 1890s. The slow pace of construction and repeated destruction of the harbour works by cyclones and wave action, and consequent continued need to rely on the masula boatmen strained the public's acceptance of the boats as a technological alternative to European-style infrastructure projects. To contemporary metropolitan observers, the innovative and the new, in theory, should have outperformed the old and the simplistic; that it did not immediately do so increased discomfort with the reality of dependency.

British travel writers also portrayed the simple appearance of catamarans as a cultural negative separate from their performance. They were described as 'unsightly,' 'frail,' 'a simple contrivance,' 'small and contemptible,' and 'strange looking…unwieldy machines.'[174] They are said to 'float on the water like waterfowl,' and writer James Johnson was unsure they deserved the title of watercraft.[175] Catamarans and catamaran-men were sometimes treated as one continuous object—Johnson noted that catamarans were 'frequently instrumental in saving the lives of Europeans.'[176] A travel guide written in 1919

[172] Lockyer, *An Account of the Trade in India*, 10; Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 16; Caunter, *The Oriental Annual, Or Scenes in India*, 3; Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly*, 286; Campbell, *My Indian Journal*, 38.
[173] 'Correspondence: The Harbour Question;' *Madras Mail* [Madras] no 255, (29 October 1877) 3 col e; 'Boat Hire in the Madras Harbour,' *Madras Weekly Mail* [Madras] no 9, (3 March 1892) 20 col a.
[174] Caunter, *The Oriental Annual, Or Scenes in India*, 2; Marwell, *Narrative of Voyages to New South Wales and the East Indies in 1840, 1841, 1842, and 1843, and to New York and the West Indies in 1843 and 1844*, 25; Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 2; Quennell, *The Memoirs of William Hickey*, 108.
[175] Campbell, *My Indian Journal*, 41; Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 17.
[176] Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 17.

called catamarans 'crude craft' in which fishermen 'breast the surf with a skill tantamount to instinct, and which is a legacy from remote antiquity.'[177]

The focus on their 'unsightly' and 'undeveloped' forms often coexists with praise for the performance of both catamarans and masulas in the surf zone. To travel writers, there was a disconnect between the appearance and mode of construction of the Madras boats and how well they performed. Masulas were called 'well calculated to storm the violence of the surf,' 'strong and serviceable,' and 'admirably adapted,' often within the same texts that portray their form in such unflattering ways. [178] Catamarans, too, were admired: Walter Campbell wrote that 'of all the extraordinary craft which the ingenuity of man has ever invented, a Madras "Catamaran" is the most extraordinary, the most simple, and yet, in proper hands, the most efficient.'[179]

This paradox is a key problem with relying on travel writers for descriptions of masulas and their use in the Madras surf. Primitivised and placed in the context of the natural world, the boats and the boatmen were reduced from a population of highly skilled men equipped with boats calibrated to best fit their environmental needs to instinctual beings operating in harmony with the natural world. The description of the Madras surf zone for a metropolitan audience was not meant to be an accurate depiction so much as it was meant to highlight the distance and difference between India and Britain, to simultaneously depict an alien landscape and explain the lack of a British alternative to crossing the surf zone. British travel writers protected their own interests and pre-conceived notions of Western technological superiority by depicting the native boats as holdouts from deep history. This treatment belies the fact that the sustained use of masulas as cargo boats

[177] Newell, *Madras: The Birthplace of British India. An Illustrated Guide with Map*, 6.
[178] Fay, *The Original Letters from India of Mrs Eliza Fay*, 123; Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 2; Campbell, *My Indian Journal*, 38.
[179] Campbell, *My Indian Journal*, 37.

changed not only the function, but design, employment patterns, and Company policy, and downplays the role played by the masula fleet in the heated arguments over infrastructure projects in the mid nineteenth century.

Three alternative readings of masula boats

Incorporating a wider range of sources beyond travelogues paints a very different picture of the passage through the surf in Madras. This section addresses three aspects of the standard travel narrative that are challenged by the inclusion of a wider range of material and change in perspective on the surf zone: the safety of masulas, their reliability and durability, and the local indigenous nature of their design and construction.

Safety

The safety of masulas was commonly commented upon in both eighteenth and nineteenth century texts. Edye wrote, 'masula-boats receive their cargoes and passengers from the ships outside the surf; and land them in perfect safety;' Norman Macleod observed that 'There is really no danger in these boats;' and Walter Campbell noted that they 'rode in safety over the giant waves… the operation of landing is attended with little if any real danger.'[180] Samuel Marwell assured his readership that 'they seldom meet any accidents,' and William Campbell found the safety of the masula to be in spite of its 'Hindoo pilot and Hindoo sailors.'[181]

[180] Edye, 'Description of the Various Classes of Vessels Constructed and Employed by the Natives of the Coasts of Coromandel, Malabar, and the Island of Ceylon, for Their Coasting Navigation,' 8; Macleod, *Peeps at the Far East: A Familiar Account of a Visit to India*, 120; Campbell, *My Indian Journal*, 39.
[181] Marwell, *Narrative of Voyages to New South Wales and the East Indies in 1840, 1841, 1842, and 1843, and to New York and the West Indies in 1843 and 1844*, 25; Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 2.

While safer than passage in a European-style ship's boat would be, shifting perspective suggests that masulas were not as extraordinarily safe as some writers suggested. Masulas were sometimes caught and flipped in cross currents, regardless of the experience and skill of the crew, and rough waves occasionally tipped out passengers or cargo. Crossing during the monsoon season, which in the 1780s was briefly incentivised with higher pay, greatly increased the risk of accident.[182] But the crossing on any day was a physical and exhausting job for the boatmen—with a round trip distance of up to six and a half kilometres for each crossing and passage through difficult surf on both ends, boatmen were limited in the number of trips they could make each day, both by regulation and by their own bodies. Boatmen and passengers were injured and died, cargo was lost, and ships sat for weeks in the roads waiting for service and hoping that storms did not develop before they had a chance to unload.

That masula passage was riskier than some travel writers would have their audiences believe is suggested by numerous newspaper articles and reported losses in the records of the Madras Board of Trade and Marine Board. Major storms hit Madras in the 1680s and 1690s that led to destruction and death amongst the fleet. Fourteen masulas were broken up and lost in a 1684 storm, and in 1695 the entire fleet was either blown away or broken up, and a quarter of the boatmen's houses were washed away by a high high tide. In 1697, the ship *Tavistock* arrived during monsoon season, and in an attempt to unload chests of silver, 'One of the Mussolas overset and broke into pieces…Mr Davenport saved himself by swimming; Mr Pearson was drowned, and his body not found.'[183] A cargo of saltpetre bound for the *Fox* was lost when the masula carrying it overset in 1762; two years later, the Master Attendant, or European officer in charge of the masula fleet, paid 104

[182] 'Madras Public Proceedings,' 6 Dec. 1782, BL, IOR/P/240/55.
[183] Love, *Vestiges of Old Madras,* 1:588.

pagodas (Rs. 364, £36) for boatmen's medical expenses after the men were injured in Company service.[184] By 1765, a fund to support 'maimed and sick' boatmen was formalised, suggesting a need for such support.[185]

The drownings and loss of cargo continued inexorably through the nineteenth century. Three native passengers drowned en route to the *Hillsborough* in 1795; the ships surgeon was saved 'with much difficulty.'[186] An 1803 accident left several members of two families dead when their accommodation boat was caught between a strong northerly current and southerly wind, broached to, and was beat to pieces by the surf.[187] The mail boat overset in May of 1824, drowning a *peon;* two boatmen drowned in 1831 after their masula was 'crushed in the surf.'[188] Seven people—naval officers, women, servants and boatmen—were killed in back-to-back accidents in rough surf in June of 1837.[189] Even Master Attendant Clarence Dalrymple died as the result of an injury obtained in the wreck of a masula in rough surf in 1839.[190] The mail boat was lost again in 1855, costing the lives of a post master, R. Tackaberry, and an unnamed *peon.*[191] Two masulas swamped without casualties in 1869 while carrying ballast and cargo; a third accident in 1869 resulted in the loss of two passengers and the significant amount of money they had carried.[192] A bailing boy named Curpen died in 1870 when he was pushed under his boat by a strong wave.[193] A masula was 'dashed to pieces' by the surf in 1874, all crew and passengers saved; the

[184] 5 Oct. 1762, BL, IOR/P/240/20; 'Madras Public Proceedings,' 17 Jan. 1764, BL, IOR/P/240/22.
[185] 'Madras Public Proceedings,' 25 Feb. 1765, BL, IOR/P/240/23.
[186] 'The Courier,' *Madras Courier* [Madras] no 520, (23 September 1795) 2 col c.
[187] 'The Courier,' (26 October 1803.)
[188] 'Public Consultations No. 17,' 26 May 1824, BL, IOR/E/4/929; 'Madras. The Gazette—Nov. 26,' *Bombay Gazette* [Bombay] no 2166, (7 December 1831) 13 col a.
[189] 'Madras Intelligence,' *Bombay Gazette* [Bombay] no 2701, (10 June 1837) 3 col b-c.
[190] 'Deaths,' *Nautical Magazine and Naval Chronicle* [London] (1839), 70.
[191] 'The loss of the mail boat in the surf, the melancholy fate of the two good men who (in the discharge of Public Duty) were drowned, and an urgent appeal for the relief of those who are sufferers by this sad event,' *Madras Athenaeum* [Madras] (1 January 1856) CCSAS, Microfilm No. 42.
[192] 'Boat Accident,' *Madras Mail* [Madras] no 153, (23 June 1869) 2 col e; 'Boat Accident,' *Madras Mail* [Madras] no 282, (25 November 1869) 2 col d; 'Coroner's Inquest,' *Madras Mail* [Madras] no 284, (27 November 1869) 3 col a.
[193] 'Accidental Death,' *Madras Mail* [Madras] no 83, (7 April 1870) 3 col a.

surf was so heavy in January 1875 several masulas were wrecked; cargos of skins and iron were lost later the same year.[194] Another masula capsized in 1877, nearly drowning a marine police *peon* and dumping twenty-five bags of rice into the sea.[195] Two boatmen drowned in the third surf in 1889, when their boat capsized and sank while proceeding to the *Cyphrenes* to offload kerosene oil.[196] In 1918, during the construction of a new West Quay in the harbour, well diggers unearthed a treasure trove of lost cargo, including bundles of tangled iron bars, hardwood beams, sling and anchor chains, a Burmese bell and an eighty-pound bronze Buddha statue.[197]

The 1918 finds demonstrate that this is an incomplete list of the accidents that occurred in the Madras surf zone and around masulas. But these examples show that despite the uselessness of European-style boats, masulas were not as miraculously well adapted to the surf conditions at Madras as a metropolitan reader might have assumed from travel accounts alone. They also suggest that danger was most often the result of regular, rather than extraordinary, use; most injuries and deaths were those of boatmen. The overarching message of safety projected in travel accounts is a result of the fact that the passage was riskiest for those who made it often and safest for those who made it only once or twice. Evaluating the travel writers' impression of safety in light of broader and more sustained types of source material suggests that regular use carried the risk of accident or loss.

The danger of working in the masulas is evidenced by the existence of the Disabled Boatmen's fund. Three hundred and one pensioners or their families were being paid in 1817, but the government was actively trying to reduce the number of pensioners on the scheme and by 1820 the government was only paying 206 pensions, though 108 families

[194] 'The Courier,' (23 September 1795); 'Rough weather at Madras,' *The Homeward Mail* [London] no 859, (11 January 1875) 8 col a-b; 'Boat Accidents,' *Madras Mail* [Madras] no 171, (21 July 1875) 3 col b-c; 'A masula boat capsized,' *Madras Mail* [Madras] no 271, (13 November 1875) 3 col b.
[195] 'Boat Accident,' *Madras Mail* [Madras] no 161, (14 July 1877) 2 col f.
[196] 'Loss of a masula boat and two of its crew,' *Madras Mail* [Madras] no 184, (6 August 1889) 5 col b.
[197] Spring, "The West Quay of Madras Harbour," 25.

were further supported by an additional fund.[198] By 1835, the pension scheme was only supporting fifty male and fifty-five female pensioners, or about nine percent of the boatmen working in the port at the time. This was not because the safety of the boats had increased; rather, mismanagement of the fund meant that no more than 105 individuals could be supported, and a long waiting list of injured boatmen were ready to take slots on the scheme if any of the existing pensioners died or were able to return to work.[199]

Administrative engagement with the issue of danger in the passage between ship and shore is further apparent in efforts to redesign masulas or introduce alternative boats. Deputy Master Attendant John Atkinson was given Rs. 600 (£60) in 1831 to build a prototype 'masula-whaleboat-lifeboat' hybrid, which he based off a model of a lifeboat designed by Captain Palmer and used successfully on the coasts of Britain. Atkinson's design incorporated Palmer's ideas with masula construction, resulting in a boat differing from a common masula 'in its having a keel piece, and…from the planks, or thwarts on which the rowers sit firmly fixed in the gunnel…' His design also included boxes of air in the bow and stern and a canvas bag around the outside of the boat to add buoyancy.[200]

Atkinson's lifeboat was completed and tested in August 1831. The *Nautical Magazine* reported to a British audience in July 1832 that the lifeboat had been 'found to answer remarkably well, and is entirely free from all danger.'[201] A note later published in the same magazine, however, suggested this report was premature. The acting assistant Master Attendant, JF Mckennie, wrote in the *Nautical Magazine* in 1838 that Atkinson's lifeboat was instead an utter failure: 'she has never been found to realise the expectations

[198] 'Remarks of the Marine Board,' 13 Sept. 1827, BL, IOR/F/4/1188/30856.
[199] 'Statements of the Disabled Boatmen's, Catamaran-men's and other funds,' 2 Aug. 1836, BL, IOR/F/4/1727/69723. While the term 'pensioner' typically is used to refer to a person or their relative continuing to draw pay after they are no longer able to work, the above statement discusses the possibility of some current pensioners returning to work in the boats after a recovery period.
[200] 'Construction of a Masulah lifeboat at Madras under the direction of Captain John Augustus Atkinson, Deputy Master Attendant,' 11 Nov. 1831, BL, IOR/F/4/1373/54534.
[201] 'Nautical Miscellany-Naval Intelligence,' *The Nautical Magazine* [London] (July 1832), 263.

formed of a boat of this nature,' he wrote, 'beyond her being buoyant…she has not answered better than a common masulah boat.'[202] Mckennie also noted that Atkinson's successor, Clarence Dalrymple, had tried to retrofit the lifeboat as a masula with a simple band of cork around the outside for extra buoyancy, but, 'she was again tried in the surf and completely turned over when put broadside to…she is not adapted for a surf boat, and is only fit to be broken up and burnt.'[203] A comment on the supply of a new alternative lifeboat made by the Board of Control in 1840 suggests Atkinson's boat did indeed have an inauspicious end; the Board asked that, regardless of its usefulness at Madras, the new boat not '[be] suffered, like the former boat, to lie idle until it became unserviceable.'[204] Unfortunately, the boat supplied in 1839 is likely the one referred to in an 1843 excerpt from a Madras paper in the *Nautical Magazine,* which reflected that 'it appears to us that the [life boat] tried on Saturday was in no way superior to those which were tried before it…indeed we think that if a life boat is at all to be established, it must be manufactured on the spot and its construction left to our own beach authorities.'[205]

Back-to-back fatal accidents in 1837 prompted concerned citizens to write into the local papers with proposed improvements to the masula fleet. Some suggested replacing masulas with whaleboats, double-ended ship's boats popular for their stability, but tests showed whaleboats broke up quickly in the surf. Other suggestions included running a cable from shore to pull masulas back to the beach, and the installation of railings on the boats to decrease the likelihood of passengers being thrown overboard when hit by an unexpected wave. It was also suggested that masulas should be built narrower, longer, and shallower, but this would have eliminated the masula*'s* most useful attributes and made

[202] 'Masulah Boats at Madras,' *The Nautical Magazine and Naval Chronicle* [London] (December 1838), 836.
[203] 'Madras Lifeboat,' *The Nautical Magazine and Naval Chronicle* [London] (May 1839), 326-7.
[204] 'Marine Consultations No. 7,' 15 July 1840, BL, IOR/E/4/954.
[205] 'The Life Boat Experiment,' *The Nautical Magazine and Naval Chronicle* [London] (1843), 372.

them less stable in the waves. The suggestions were so misguided as to spur McKennie to publish yet-another disgruntled rebuttal in the *Nautical Magazine,* and there is no evidence of any of these designs being taken up.[206]

In 1850, *The Artizan,* an engineering magazine, published a report on the efficacy of a new lifeboat designed by Messrs Lamb and White and tested at Madras, in which a Captain Engledue reported:

> I witnessed the trial of one of your life-boats, *in the surf,* at Madras; and I was delighted with its performance. In fact, from its construction, and the admirable arrangements of the air-tight compartments, it is impossible to capsize it…I consider the shape and construction to be as near perfection as possible.[207]

Master Attendant Christopher Biden, however, gave a less glowing review, writing that it frightened the native crew, who were unused to a boat that would not capsize if it filled with water. He continued,

> On *Bentnick*'s return I shall send back the life-boat. We made several trials with her when the surf was high, but as she is too shallow by two streaks, the first surf filled her, and the crew jumped overboard: but to render a life-boat serviceable here, she ought to be manned by a European crew.[208]

Despite these efforts, masulas and catamarans remained the only useful transport and rescue craft at Madras. The only alteration to the common masula form resulting from its use as passenger vessel was the introduction of the slightly enlarged accommodation boat, the benches and awnings the closest thing to 'protection' from the elements that passengers ever enjoyed at Madras.

Reliability and Longevity

Not only were masulas conceptualised as safe, but they were also portrayed as reliable and long-lasting, rarely subjected to damage in the surf. Eliza Fay wrote in 1815 that masulas

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[206] 'Masulah Boats at Madras.'
[207] 'Life-Boats,' *The Artizan: A Monthly Journal of the Operative Arts* [London] (1850), 113.
[208] 'Life-Boats.'

were 'well-calculated to storm the violence of the surf;' while William Campbell called them 'strong and serviceable' in 1839.[209] James Massie claimed they were 'most suitable for the surf,' while Thomas Twinning believed their pliancy was 'indispensable to their being able to pass through the three lines of tremendous waves which break upon the Coromandel shore, and which would overwhelm a *stiff* European boat of greater strength.'[210] Walter Campbell described them as 'pliant and elastic as a basket; so that they…ride in safety over the giant waves.'[211] Henry Folkard wrote that while nailed and framed boats would quickly loosen and become leaky from the forces of the surf, 'the Massoolah boat…remains for a long time almost as uninjured from the thumping and bumping as if made of leather.'[212] George Blake, in a 1956 text on the centenary of the British and India Company, described the masula as 'pliable as an eel; it can take a hard knock against a big ship's plates and merely shudder a little.'[213] Hobart Caunter expanded on the reliability of masulas, writing that they were

> so extremely lithe, that the planks yield readily to the percussion of the waters, and thus, by diminishing the resistance, so break the force of the concussion, that they sustain little injury from the lashing of the surf, which is so terrible in its might and violence that a European boat has scarcely ever been known to pass through it without being dashed to pieces.[214]

Locally produced sources, however, suggest that masulas were not nearly so reliable or infallible in the surf as these authors would suggest. In the context of one or two trips, the boats may well have appeared perfectly pliant or impervious to the waves, but over long

[209] Fay, *The Original Letters from India of Mrs Eliza Fay*, 123; Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 3.
[210] Massie, *Continental India: Travelling Sketches and Historical Recollections, Illustrating the Antiquity, Religion, and Manners of the Hindoos, the Extent of British Conquests, and the Progress of Missionary Operations*, 77; Twining, *Travels in India a Hundred Years Ago: With a Visit to the United States*, 52.
[211] Campbell, *My Indian Journal*, 40.
[212] Folkard, *The Sailing Boat: A Treatise on Sailing Boats and Small Yachts, Their Varieties of Type, Sails, Rig, Etc*.
[213] Blake, *B.I. Centenary, 1856-1956*, 38.
[214] Caunter, *The Oriental Annual, Or Scenes in India*, 3.

periods of hard use masulas were still vulnerable to damage or destruction. Despite being more flexible than European boats, the repeated action of the surf on the hulls of masulas over time significantly damaged them, and they required near constant repairs. Governor-General George Pigot complained in 1755 that the fleet was in poor repair, because the Head Boatman charged with keeping the boats in working condition squandered the advances paid by the Company instead of spending them as intended.[215] In a letter to Pigot six months later, Robert Orme, Robert Clive and John Smith reported that the cost of maintaining each boat was a high bar for potential owners, who were at the expense 'of paying for the first cost of the boat, for keeping it in constant repair and scarce a day's work passes without requiring some, and to rebuild the Boat if lost or when worn out.'[216] The same year, the Company's carpenter, John Line, estimated that thirty six of the fifty boats working in the port needed to be completely rebuilt and the rest repaired at the high rate of 1,478 pagodas 30 fanams 50 cash (Rs. 5175, £517), at a time when each boat trip only cost 6 fanams.[217] Line later estimated that the supplies needed to keep the fleet in repair for a mere nine months amounted to nearly 700 pagodas (Rs. 2,450, £245), or the equivalent of the cost of nearly 5,000 boat trips.[218] The first Master Attendant, George Baker, included carpenters in the employ of the new Boat Department to constantly keep the boats in 'proper repair.'[219]

Repair remained an issue for the Company in the following decades. The boat owners' responsibility to keep their boats repaired was codified in regulations beginning in the 1760s, but the owners struggled to keep the entire fleet in working order. The presence

[215] 30 Dec. 1755, BL, IOR/P/240/13.
[216] 'Madras Public Proceedings,' 19 July 1756, BL, IOR/P/240/14.
[217] 19 July 1756, BL, IOR/P/240/14.
[218] 'Madras Public Proceedings,' 30 Oct. 1756, BL, IOR/P/240/15. Each boat trip in 1756 cost 6 fanams. 42 fanams were equal to 1 pagoda, 7 trips per pagoda, 7*700=4,900. It therefore could have taken 50 days of work just to pay for the supplies.
[219] 5 Oct. 1762, BL, IOR/P/240/20.

of a naval fleet at Madras during the Second Anglo-Mysore War put added stresses on the hulls of the masulas. Naval vessels anchored further out than merchantmen and required constant service and the transport of heavier supplies, which damaged and destroyed a number of masulas. The number of serviceable masulas was 'much decreased,' in the spring of 1782, due to the 'hard service of the ships of war,' and the destruction of fifty-nine boats in a gale.[220] Boat maistries, or overseers, complained to the Board of Trade that Master Attendant Alexander Cuthbert was forcing them to overload the boats, causing more damage and destruction. The maistries begged for monetary support for rebuilding their boats, a task complicated further by the breakdown in trade caused by the war and lack of supplies available in the general vicinity of the city. The very next year more boats were again destroyed in the service of the naval fleet, reducing the masula fleet to 66 old boats that continually broke as soon as another was repaired. This was blamed on the boat owners, who the Master Attendant believed were choosing not to repair the boats as quickly as they were able.[221]

The Company continued subsidising repairs in the nineteenth century. Receipts for repair costs are included in the minutes of the Marine Board in 1820, 1827, 1834 and 1836 before the structure of the Boat Department changed and owners, instead of the department, became responsible for all damages.[222] Monthly inspections of the masula fleet for damages, which began in the 1790s, persisted after the restructuring of the department in 1842.[223] While the results of these inspections are difficult to find, those that do exist suggest that the issue of repair continued through the nineteenth century. The *Report on the*

[220] 'Madras Public Proceedings,' 22 Nov. 1782, BL, IOR/P/240/55.
[221] 2 June 1783, BL, IOR/P/240/56.
[222] 'Public Consultations No. 42,' 18 Feb. 1820, BL, IOR/E/4/923; 14 Nov. 1828, BL, IOR/F/4/1188/30856; 'Public Consultations No. 28,' 4 June 1834, BL, IOR/E/4/944; 'Marine Consultations No. 2,' 39 Jan. 1839, BL, IOR/E/4/952.
[223] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43.

Administration of the Madras Presidency for 1868 mentions that the masula fleet consisted of 228 boats, 180 of which were in working order, while the *Madras Mail* reported in 1880 that 'of the 122 masula boats presented for inspection, 101 were passed for service, four rejected or passed for repair; and seventeen passed for sewing repair, [and] thirteen masula boats were not presented for muster.'[224] The many reports of accidents reinforce the idea that masulas were not particularly robust; a boat was 'crushed in the surf' in 1831; another was 'damaged' in 1869 and a third 'dashed to pieces by the waves' in 1874. A year later a boat 'went to pieces in the third surf' and another capsized.[225]

The shortcomings of masulas in rough weather are also indicated by the measures the Board of Trade and the Marine Board took to ensure the safe passage of goods and people. Between the 1790s and 1837, the Boat Department dismantled the flagpole used by vessels to take their bearing during the monsoon season, and while it was down 'no insurance could be effected on bottom or cargo and all insurances already existing were void.' [226] When the flagpole was up, it was used to convey messages about the surf conditions, including instructions on when masulas were required to abandon the shipping and return to shore immediately.[227] An incentive for working in the more dangerous monsoon months of November-January was introduced in the 1780s but quickly morphed into a fund to support the boatmen during the monsoon season, so that they could remain safely on land making repairs while still having an income.[228] These measures suggest not only an understanding of the extreme danger storms at Madras presented to ships in the roads, but also an awareness of the shortcomings of masulas. While better able to handle

[224] Madras Presidency, *Annual Report of the Administration of the Madras Presidency During the Years 1869-70,* 94; 'Muster of Boats.'
[225] 'Madras. The Gazette—Nov 26'; 'Boat Accident' (25 November 1869); 'Miscellaneous,' *The Friend of India* [Calcutta] no 2066, (15 October 1874), 11 col b;' 'Boat Accidents'; 'A masula boat capsized.'
[226] Brown, *Parry's of Madras*, 6; *The Madras Almanac and Compendium of Intelligence for the Year of Our Lord 1837*, 211.
[227] *The Madras Almanac and Compendium of Intelligence for 1844*, 431.
[228] 4 Nov. 1796, BL, IOR/P/241/68.

the everyday conditions of the Madras surf zone, masulas were still not a 'perfect' answer to all conditions.

Contrasting regular, daily use as recorded in administrative documents with the one-off experiences recorded by travel writers shows that rather than a strikingly robust vessel, masulas were in reality fragile craft—the lack of internal framing that made them more flexible in the waves also meant there was no internal support. Constant movement wore on the seams, and salt water loosened the stitching that held the planking of the hull together. Heavy cargo loads and multiple trips a day exacerbated the impact of rough surf conditions. Even accommodation boats, less frequently overloaded, needed regular and expensive repairs; the Marine Board paid 952 rupees in 1834 to rebuild and repair twenty common masulas and six accommodation boats.[229] To note their fallibility is not to diminish the qualities of the masula as a cargo craft, or suggest that it was anything less than essential to the continued function of the port of Madras. It instead demonstrates that the 'perfect' solution to the Madras surf as portrayed by so many travel writers was instead simply a better adaptation than European-style ship's boats that had been designed for very different purposes.

Indigeneity

Travel writers expressed little knowledge or curiosity about the construction of masulas beyond the key tenets of high sides and sewn hulls. Some travel writers did comment briefly on some of the materials used in masula construction, most commonly the use of coconut fibre coir for sewing the planks together.[230] A few others described the wadding used to

[229] 4 June 1834, BL, IOR/E/4/944.
[230] Hoole, *Madras, Mysore, and the South of India: Or, a Personal Narrative of a Mission to Those Countries: From MDCCCXX to MDCCCXXVIII*, 28.

waterproof the hull, but referred to a number of different materials—cotton, coconut fibers, straw, or straw and mud.[231] None gave a name for the type of wood used in construction, though Walter Campbell described it as a 'soft spongy wood which yields like cork and does not split.'[232]

This lack of detail in the travelogues means that the potential of the masula to illustrate connectivity and shifting trade relationships with other South Indian coastal settlements and Sri Lanka have generally gone unnoticed by modern historians and ethnographers. Eric Kentley, who has performed the only significant ethnographic work on modern masulas since the 1980s, includes information on construction materials in his work but cites sources no older than the 1960s and focuses on building technique, rather than material sourcing.[233] Charlotte Dixon, a second archaeologist to engage with masulas, this time in the form of models, was again most concerned with sewing technique and how it varies along the Coromandel Coast, rather than building material and sourcing.[234]

Identifying the materials used in masula construction and their origins demonstrates that masula construction was dependent on ancient regional trade networks encompassing the Coromandel and Malabar coasts and Sri Lanka. The minutes of the Madras Board of Trade and the Marine Board occasionally include details about the timber and other supplies needed for building and repairing masulas. In 1782 Master Attendant Alexander Cuthbert wrote to the Government in Council that it would be

> highly necessary to commission the chief at Anyengo (Anchuthengu) to purchase and send here as soon as the season will permit one thousand assance and mango planks of each one half, according to dimensions which I will furnish

[231] Folkard, *The Sailing Boat: A Treatise on Sailing Boats and Small Yachts, Their Varieties of Type, Sails, Rig, Etc*, 447–48; Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly*, 286; Hoole, *Madras, Mysore, and the South of India: Or, a Personal Narrative of a Mission to Those Countries: From MDCCCXX to MDCCCXXVIII*, 28; Malcolm, *Travels in South-Eastern Asia, Embracing Hindustan, Malaya, Siam and China*, 2:53.
[232] Campbell, *My Indian Journal*, 38.
[233] Kentley, 'Some Aspects of the Masula Surf Boat,' 309; Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 126.
[234] Dixon, 'Miniaturising Boats: The Case of the Indian Masula Surf Boat,' 102.

> also 130 Candy (29,000 kg) of the best coir yarn, to repair the large boats now unfit for service, build others, and lay up a store against want. [235]

The request was necessary because the yearly supply of plank and coir usually sent from Travancore had not been sent due to 'an apprehension of being stopd by the enemy.'[236] Having still not received any building supplies eight months later, Cuthbert's successor Thomson wrote to the Board of Trade to specify that he required four mango planks and six 'assilum' planks for each boat—hoping to increase the fleet by sixty boats, he needed a total 240 mango and 360 assilum planks of at least ten cubits (4.5 metres) in length. He noted that he was able to secure some planks from Tranquebar on his own account, but that these were too short for building and could only be used for repairs.[237] Building supplies recorded in Company correspondence from the 1820s suggest changes in the construction technique or availability of supplies. In need of material to repair the Boat Department's six accommodation boats, Master Attendant William Majoribanks requested Rs. 5,000 (£500) for mango, assina, 'Trincomalee timber,' and 'country timber' planks, grass rope, coconut husk and 'plugs,' additional building supplies, and labour.[238] In 1838, amidst the debate over the cessation of the Boat Monopoly, an estimate for the cost of building four new accommodation boats included 'aini' and mango planks, 'Trincomally wood,' loose coir, coconut husks and labour.[239]

Other than 'country timber,' these supplies could not be obtained locally. Mango, or *Mangifera indica,* was imported from Travancore, along with 'assina,' 'assilum,' or 'assance.' James Gamble, in *A Manual of Indian Timber,* wrote that *M. indica* was used in

[235] 'Madras Public Proceedings,' 16 Nov. 1782, BL, IOR/P/240/55; Prinsep, 'Useful Tables, Forming an Appendix to the Journal of the Asiatic Society,' 88. Prinsep states that one Madras Candy is equal to 500 pounds.
[236] 16 Nov. 1782, BL, IOR/P/240/55.
[237] 25 May 1783, BL, IOR/P/240/56.
[238] 14 Nov. 1828, BL, IOR/F/4/1188/30856.
[239] 'Measures in progress for throwing open the Boat Monopoly,' 24 Aug. 1838, BL, IOR/F/4/1806/74212.

the construction of canoes and masulas; mango wood is still used today for its water resistance and durability, and is probably the slightly 'spongy' wood that Walter Campbell noted in his account of the crossing.[240] Company documents do not use consistent spellings for 'assina,' but it refers to *Terminalia tormentosa,* or 'assana' in Hindi. Gamble noted that *T. tormentosa* grows in the Western Ghats and was used for boat building in northern and central India.[241] BA Blake, in his ethnographic survey of fishing craft in the Madras region conducted in the 1960s, found that masulas were constructed from a combination of 'asnamaram' that was 'shipped from Kerala' and mango. Blake wrote that 'approximately three-fourths of the masula boat is made from this wood, while the upper one-fourth is made from mango wood.'[242] This would be largely consistent with Thomson's request in the 1780s for four mango planks and six assilum planks per boat. Eric Kentley later identified 'asnamaram' as *T. tormentosa*. [243] Blake and Kentley's observations in the late twentieth century suggest a long continuity in building materials and design, and consistency in construction methods for both cargo masulas and fishing masulas.

Masulas were not only constructed of mango and *T. tormentosa,* however, which suggests shifts in supply or the preferences of different boatmakers. The 'aini' wood mentioned in 1837 is not *T. tormentosa.* Edye mentioned in an 1835 description of Malabar coast timber that 'angely' or 'angilica,' was used in sewn boats including masulas 'in consequence of being very tough' and able to sustain the drilling of holes for the sewing process.[244] Kentley found in the 1980s that masulas were constructed using 'aini,' or *Artocarpus hirsuta,* and in Gamble's *Manual of Indian Timber* both 'ayni' and 'anjalli' are

[240] Gamble, *A Manual of Indian Timbers*, 212.
[241] Gamble, 183.
[242] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State,' 58.
[243] Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 126.
[244] Edye, 'Description of the Sea-Ports on the Coast of Malabar, of the Facilities They Afford for Building Vessels of Different Descriptions, and of the Produce of the Adjacent Forests,' 362.

listed as vernacular names for *A. hirsuta.*[245] Gamble does not identify *A. hirsuta* as a wood used in boat building, but does say that it is used in ship building. The multiple mentions of *A. hirsuta* in the 1830s but not before may suggest a change in building preferences or a limited availability of *T. tormentosa,* since both were shipped from the same region. Coconut fibre and coir were also obtained in Travancore, even though coconut was cultivated widely during this period and may have been available at Madras. Edye noted that coconut trees 'densely covered' the areas surrounding Allepi, the timber export port of Travancore, which were used to produce 'koir (sic), cordage, oil &c, which form the general exports and trade of the port.'[246]

'Trincomalee wood,' requested in the 1820s and 1830s, refers to *Berrya ammonilla,* or Halmilila, which was a major Sri Lankan export in the nineteenth century. Edward Balfour described *B. ammonilla* as 'highly esteemed for its lightness and strength…straight grained, slightly pliant, tough and little affected by the atmosphere, [it] is employed in the construction of the massoola boats of Madras.'[247] Gamble noted in 1881 that it was used in Madras 'for masula boats, and is much esteemed for toughness and flexibility.'[248] It appears that it was requested for use repairing internal fittings, rather than outer planking, however, in both the 1820s request to the Marine Board for funding and the 1837 report.[249]

The materials used to build catamarans in the eighteenth and nineteenth century do not appear in government documents. An early twentieth-century catamaran held by the Pitt Rivers Museum at the University of Oxford was identified as 'malai vemboo,' or *Melia*

[245] Kentley, 'Some Aspects of the Masula Surf Boat,' 309; Gamble, *A Manual of Indian Timbers*, 331.
[246] Edye, 'Description of the Sea-Ports on the Coast of Malabar, of the Facilities They Afford for Building Vessels of Different Descriptions, and of the Produce of the Adjacent Forests,' 327.
[247] Balfour, *The Timber Trees, Timber and Fancy Woods, as Also the Forests, of India and of Eastern and Southern Asia*, 35–36.
[248] Gamble, *A Manual of Indian Timbers*, 56.
[249] 14 Nov. 1828, BL, IOR/F/4/1188/30856. This document includes two separate lists of materials: one for hull repairs and the second for internal fittings. Trincomalee wood only appears on this second list, suggesting it was only used on the internal fittings in this instance; 24 Aug. 1838, BL, IOR/F/1806/74212. This document lists 'Trincomally wood' under the heading 'For making Sitting Benches.'

azedarach. Gamble defined *M. azedarach* as a deciduous member of the mahogany family that was widely cultivated in India, but did not mention as used for boat building.[250] John Shortt wrote that fishing catamarans at Madras were constructed out of *M. azedarach* in 1867, but did not speculate on where the wood was obtained.[251] It may be more likely that because of their smaller size and less demanding construction requirements that catamarans were built from locally available materials.

Identifying the building materials used in the construction of masulas ties the fleet into longstanding regional trade networks and undermines the impression given in many travelogues of the boats as timeless, unchanging, and in a state of nature. The building materials shifted over time, particularly in times of conflict, when traditional materials were unobtainable. They also represent an understanding of the properties of different timbers and their usefulness for constructing different parts of the hulls and internal fittings. Michael Mann has noted that the timber export system from the Malabar Coast was both well established by the arrival of Europeans and complex. Timber moved through the hands of multiple middlemen before reaching the coast, suggesting that the construction and repair of masulas was both and expensive and precarious—shortages, damaged or lost shipments, and conflict could all derail the building process.[252]

Because travel texts describe a momentary engagement with masulas, they are also of limited use for assessing the functional alteration masulas underwent from fishing to cargo-carrying craft. Changes in the form of the masula reflect the particular needs of the Company for landing goods and people at Madras. Not accessing sources that suggest these shifts led Kentley to evade the question of historical development of the masula, observing

[250] Gamble, *A Manual of Indian Timbers*, 70.
[251] Shortt, 'The Fishermen of Southern India,' 199–200.
[252] Mann, 'Timber Trade on the Malabar Coast, c. 1780-1840,' 419.

merely that 'it is more than likely that some changes in design and construction have taken place:'

> although Hornell (1920) is the first writer to mention fishing masulas, it cannot be concluded that the omission of this observation in earlier accounts means that the fishing masula has been developed, relatively recently, from the cargo/passenger carrier. Fishing masulas may have always existed alongside the carrier and may even pre-date the carriers.[253]

Company documents show that fishing masulas at the very least existed alongside cargo masulas in the eighteenth century and created a headache for the Boat Department. Unlicensed fishing masulas operated in the North Roads in the 1760s and 1770s—their owners took advantage of the smaller size of their craft in comparison to the cargo masulas to service only the native grain *dhonies* that sat closer to the beach, rather than deep-draughted European vessels.[254] Having found the fishing masulas monopolising the North Roads shipping, the first Master Attendant, George Baker, specified in the original regulations for the boat department that

> No boats shall be built for the service of the Port of certain dimensions that they may be capable of carrying the weight assigned there being at present many less than the rest built so purposely to excuse their serving in the southern road.[255]

Continued complaints from the owners of licensed boats and the European leadership of the Boat Department about fishing masulas attracting men away from the main body of the masula fleet with easier working conditions and higher earnings suggest this had little immediate effect on the standard dimensions of the cargo masulas.[256]

Master Attendant Cuthbert reneged on the idea of large cargo masulas during the building material shortage in 1781-2. He suggested the Company purchase fishing masulas from settlements to the north of Madras to make up for the shortage of serviceable craft but

[253] Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 127.
[254] 5 Oct. 1756, BL, IOR/P/240/20; 24 March 1775, BL, IOR/P/240/39.
[255] 5 Oct. 1762, BL, IOR/P/240/20.
[256] 5 Oct. 1762, BL, IOR/P/240/20; 24 March 1775, BL, IOR/P/240/39.

recognised that 'most of the boats that may be expected from the northward will neither be so large, nor so strong as those built as Madras and unfit for any service of the Fleet or carriage of large packages from Company ships.' Cuthbert also commissioned a former head of the catamaran-men, Polycondah, to return to Madras with thirty masulas to assist, agreeing to Polycondah's stipulation 'that the boats being small, and the people unaccustomed to Europeans, they should not be sent to ships of war, nor Company's ships…'[257]

Sources are contradictory about the size of masulas and just what 'small' and 'large' may have referred to. James Massie, who traveled to Madras in the early 1820s, put masulas at 'twenty or twenty-four feet long, four feet wide, and of an equal depth,' while Elijah Hoole, who visited around the same time claimed that they varied from twenty to thirty feet in length, and were six feet in depth and breadth (6-7.5 metres long, 1.2 metres wide; 6-9 metres long, 1.8 metres in depth and breadth.)[258] Edye set the average length of cargo masulas at thirty five feet (10.6 metres) in 1834, but Deputy Master Attendant John McKennie reported in 1838 that the average dimensions of an accommodation boat (which he said were slightly larger than the common cargo boats) were thirty one feet eight inches in length, nine feet two inches in breadth, and four feet five inches in depth (9.7 metres in length, 2.8 metres in breadth, 1.3 metres in depth.)[259] The 1842 Boat Act specified that boats less than thirty or more than thirty-three feet in length (9-10 metres) would not be licensed to operate in the Roads.[260]

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[257] 'Madras Public Proceedings,' 3 Dec. 1782, BL, IOR/P/240/55.
[258] Massie, *Continental India: Travelling Sketches and Historical Recollections, Illustrating the Antiquity, Religion, and Manners of the Hindoos, the Extent of British Conquests, and the Progress of Missionary Operations*, 77; Hoole, *Madras, Mysore, and the South of India: Or, a Personal Narrative of a Mission to Those Countries: From MDCCCXX to MDCCCXXVIII*, 28.
[259] Edye, 'Description of the Various Classes of Vessels constructed and employed by the natives of the coasts of Coromandel, Malabar, and the Island of Ceylon, for their coasting navigation,' 8; 'Masulah boats at Madras.'
[260] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 531–32.

The sizes suggested by Edye and the 1842 Boat Act exceed the dimensions of fishing masulas ethnographers observed in the twentieth century. Hornell described a fishing masula from Pondicherry as twenty-eight feet in length with an eight-foot beam and four foot depth in 1920 (8.5 metres in length, 2.4 metre beam, 1.2 metre depth.)[261] Blake wrote that the fishing masulas he observed varied in length from fifteen to twenty five feet (4.5-7.6 metres) and in depth and breadth from five to six feet (1.5-1.8 metres), while Kentley suggested fishing masulas vary from twenty four to thirty five feet in length (7.3-10.6 metres).[262] The reduced dimensions of fishing masulas suggests that the boats of the cargo fleet were enlarged over time to better suit the needs of the trading community. The further enlargement, likely addition of a small keel, and additional internal fittings of the accommodation boats first built around the turn of the nineteenth century were alterations triggered by an interest in improving the experience of crossing the surf for European visitors specifically. The use of masulas at Madras as cargo and passenger carriers, therefore, noticeably impacted the form of the boat type over time in a way that is not apparent in the 'naturalistic' descriptions of many travel writers.

The safety, reliability, longevity, and indigeneity of Madras masulas and catamarans were not as complete or ancient as travel writers led their readership, contemporary and modern, to assume. Just like any watercraft, they were fallible—the surf and weight of cargo still placed strain on their hulls that damaged and destroyed them. The need for timber from other parts of southern India and Sri Lanka tied masulas into a regional trade network that put stressors on the fleet during supply shortages and times of war, leading to the introduction of alternative sources and types of wood. Their forms were also impacted by their use in the port; rather than a holdout from ancient history, their function

[261] Hornell, 'The Origins and Ethnological Significance of Indian Boat Designs,' 174.
[262] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State,' 59; Kentley, 'The Masula-- A Sewn Plank Surf Boat of India's Eastern Coast,' 127.

as cargo craft led to the construction of bigger, stronger, and more complex examples than those used for fishing. However, the boats were only one-half of the system of ship to shore movement at Madras, and we now turn to the other, the boatmen.

Boatmen

The masula boatmen have predominantly appeared in modern secondary literature in the context of labour history. Ravi Ahuja has included the boatmen in several studies on the development of labour relations in eighteenth-century Madras, and Aparna Balachandran and Jangkhomang Guite have both discussed their Catholic identity in the late seventeenth and early eighteenth centuries.[263] But in other historical texts, the boatmen either are not mentioned or are included only via brief token descriptions of the surf zone. While Sinnapah Arasaratnam has considered the impact of the rough surf zone on trade at Madras, he does not mention the existence of the boatmen, writing instead that 'the transport of goods was done by *Masoola* boats that were beached on landing,' as if there was no human involvement at all in the process.[264] Blake and Kentley were both focused on the masulas themselves, and while they provide some detail about the boatmen that they consulted in their fieldwork, they do not write about the historical boatmen who worked in the port. This lack of engagement with the boatmen means that the skill and knowledge held exclusively by this group of men has not previously been viewed as the other half of the technological system that enabled the crossing of the Madras surf.

[263] Ahuja, 'Labour Unsettled: Mobility and Protest in the Madras Region, 1750-1800,' 396–402; Ahuja, *Die Erzeugung Kolonialer Staatlichkeit Und Das Problem Der Arbeit*, 69–124; Ahuja, 'The Origins of Colonial Labour Policy in Late Eighteenth-Century Madras'; Ahuja, 'Labour Relations in an Early Colonial Context: Madras, c. 1750-1800,' 810, 813–16; Balachandran, 'Catholics in Protest: Lower-Caste Christianity in Early Colonial Madras,' 251; Guite, 'From Fishermen to Boatmen: The Mucquas of Madras, 1650-1750.'
[264] Arasaratnam, *Merchants, Companies and Commerce on the Coromandel Coast, 1650-1740*, 21.

The boatmen were not well served by European travel writers. They were rarely mentioned at all in seventeenth- and eighteenth-century texts.[265] Other early texts focused strictly on the masula boats and not on the men who crewed them. In nineteenth-century texts however, the boatmen played a much larger role. They were treated tangentially or as caricatures, stripped of their agency, and their extensive skill and training was reduced to instinct. These descriptions exoticise the crossing to the Indian coast particularly by focusing on the men's singing, dress, and skill in the water.

Descriptions of the boatmen's songs were used to create anxious excitement about the culmination of the writer's journey to a strange and exotic India. Some writers claimed that the boatmen's songs were meant to scare the passengers, but their descriptions would have served the same purpose for their metropolitan audience. The songs were described as '[rivalling] the war-hoop of the American savages;' a 'wild and plaintive cry;' a 'rude tune;' a 'queer kind of howl;' a 'horrid sound;' 'strange, hurried chaunt;' 'demi-moslem exclamation' and 'hideous yell.'[266] Only James Wathen, writing in 1814, seemed to enjoy the song, describing it as having a 'pleasing, though melancholy effect,' and only Joachim Stocqueler observed that their song helped them keep time and row in unison.[267]

Even more than the masula boatmen, the catamaran-men were regularly stripped of their agency and humanity and viewed more as a source of entertainment or evidence of the foreignness of the Indian coast. The abilities of catamaran-men were often ascribed not

[265] An exception is John Lockyer, who referred to the boatmen as 'merry birds' in his 1712 travel account; Lockyer, *An account of the trade in India,* 11.
[266] Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 16; Graham, *Journal of a Residence in India*, 123; Malcolm, *Travels in South-Eastern Asia, Embracing Hindustan, Malaya, Siam and China*, 2:53; Maitland, *Letters from Madras: During the Years 1836-1839*, 17; Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly*, 286; Campbell, *My Indian Journal*, 42; Massie, *Continental India: Travelling Sketches and Historical Recollections, Illustrating the Antiquity, Religion, and Manners of the Hindoos, the Extent of British Conquests, and the Progress of Missionary Operations*, 79; Quennell, *The Memoirs of William Hickey*, 107.
[267] Wathen, *Journal of a Voyage, in 1811 and 1812, to Madras and China, Returning by the Cape of Good Hope and St. Helena; in the H.C.S the Hope, Capt. James Pendergrass*, 27; Stocqueler, *The Hand-Book of India: A Guide to the Stranger and the Traveller, and a Companion to the Resident*, 568.

to practice and skill, but rather to instinctual, sometimes animalistic, familiarity with the water. Hobart Caunter wrote that they 'perch like gull[s] on the water,' while William Hickey wrote that they are 'like fishes in the water.'[268] John Shortt wrote that '[the boatmen] are like amphibious animals, for they can live on land or sea, and are from morn to night naked and exposed to cold and wet.'[269] According to Norman Macleod, the sharks of the roads posed no danger to the catamaran-men, unlike Europeans, because the sharks could detect and disliked the taste of low-caste flesh.[270] Julia Maitland, while finding the dexterity of the catamaran-men impressive, also found their skill magical, as they 'dance at their ease in the fiercest surf.'[271] Johnson found the men 'highly entertaining to watch,' while William Campbell professed it difficult to 'keep your gravity while you look on the grotesque appearance of the [catamaran-men].'[272]

Writers used the minimal clothing and exposed skin of the boatmen and catamaran-men to highlight the racial difference between themselves and Indians, while also relying on established stereotypes about skilled maritime labourers to draw connections to archetypal figures their readers would recognise. Mary Sherwood found that, 'from their slender and even delicate forms, and black complexions, [the catamaran-men] looked better in their light clothing than could well be imagined,' while the *Illustrated London News* accompanied an illustration of a catamaran-man with the observation that sailors familiarly referred to catamaran-men as 'Catamaran Jack,' connecting the boat people to the familiar British Jack Tar.[273]

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[268] Caunter, *The Oriental Annual, Or Scenes in India*, 4; Hickey, *Memoirs of William Hickey (1749-1775), Edited by Alfred Spencer*, 1:166.
[269] Shortt, 'The Fishermen of Southern India,' 199–200.
[270] Macleod, *Peeps at the Far East: A Familiar Account of a Visit to India*, 120.
[271] Maitland, *Letters from Madras: During the Years 1836-1839*, 17.
[272] Johnson, *An Account of a Voyage to India, China, &c. in His Majesty's Ship Caroline*, 17; Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 2.
[273] Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly,* 283; 'The Catamaran Postman.'

Walter Campbell also utilised the 'Catamaran Jack' moniker while describing the catamaran-men's clothing to draw attention to the differences in European and local practice:

> The figure of 'Catamaran Jack'… is perfectly naked, with the exception of having a piece of twine tied round his loins, to which is fastened a strip of cloth about four inches wide—this, being passed through the legs, is tucked through the twine girdle behind…thus equipped honest Jack thinks himself quite respectably dressed, and fit to be presented to any society.[274]

Campbell continued, noting that by the time a catamaran-man boarded a ship, his outfit struck 'the European eye as being somewhat scant, and the least shade in life too transparent.' Writing from the comfort of thirty years on from his passage, Campbell used the man's clothing and bearing, and the reaction of his fellow female passengers, to poke fun both at the boatmen and European sensibilities. When the catamaran-man stepped on board, Campbell remembered, he did so 'with an air of an admiral,' at which point he 'was saluted with a general scream of horror, mingled with smothered exclamations of "Nasty naked wretch!' 'Horrid black monster!' etc.: and the ladies…rushed back in a body to their cabins, where they remained for the rest of the morning in earnest consultation as to the possibility of landing in boats manned by such indecent savages.'[275] Throughout his description of his passage, Campbell catered to European expectations of Indians while deriding his shipmates' extreme reactions.

Like for Campbell, in many accounts such descriptions were presented alongside a recognition of the catamaran- and boatmen's skill. Catamaran-men were lauded as 'expert swimmers,' as in possession of 'inconceivable' dexterity, and as 'fearless.'[276] Writers remarked on the boatmen's 'astonishing to see dexterity;' 'display [of] energy and skill

[274] Campbell, *My Indian Journal*, 40.
[275] Campbell, 38.
[276] Munro, *A Narrative of the Military Operations on the Coromandel Coast*, 18; Fay, *The Original Letters from India of Mrs Eliza Fay*, 123; Sherwood, *The Life of Mrs Sherwood, Chiefly Autobiographical; with Extracts from Mr Sherwood's Journal during His Imprisonment in France and Residence in India. Edited by Her Daughter, Sophia Kelly*, 282.

scarcely to be surpassed' and possession of 'great judgement and skill.'[277] Even these recognitions of the boatmen's prowess in the surf zone were tinged by derogatory overtones—William Hickey, who called the boatmen 'adroit,' also wrote that the tindal 'stamped his feet and roared like a Bedlamite.'[278] Walter Campbell called the tindal in his boat 'a cunning rogue' and wrote that upon landing, 'the willing crew jumped overboard with the agility of monkeys,' but was also appreciative of the crew's 'wonderful skill and presence of mind.'[279] William Campbell was distressed to find himself in an unusual watercraft manned by 'Hindoos' in a situation in which a British jolly boat, manned by British tars, would be dashed to pieces.[280] He made explicit what many other writers left unsaid: the unfamiliarity of the craft, the people, and the dangers of the surf left them feeling culturally vulnerable and in physical and emotional distress while transitioning from a British shipboard life to a terrestrial Indian one.

East India Company documents do not offer a much more nuanced portrait of the boat people. With the exception of a few of the head boatmen and boat owners who interacted more frequently with Company officials, the boatmen were treated as a unit in Company correspondence. Official documents concerning the boatmen usually revolved around the issues of attendance and pay and used generalising stereotypes in considering the behaviour of the boatmen and potential changes to the Boat Department. Company documents refer to the boatmen as lazy, unreliable, unwilling to work unless necessary, and alcoholics who should not paid above a subsistence wage.

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[277] Caunter, *The Oriental Annual, Or Scenes in India*, 3; Malcolm, *Travels in South-Eastern Asia, Embracing Hindustan, Malaya, Siam and China*, 2:53; Twining, *Travels in India a Hundred Years Ago: With a Visit to the United States*, 53.
[278] Hickey, *Memoirs of William Hickey (1749-1775), Edited by Alfred Spencer*, 1:165, 167.
[279] Campbell, *My Indian Journal*, 42–43.
[280] Campbell, *British India in Its Relation to the Decline of Hindooism, and the Progress of Christianity: Containing Remarks on the Manners, Customs, and Literature of the People*, 2–3.

The boatmen's propensity for alcohol use is referred to repeatedly in Company documents despite rarely appearing in travel literature.[281] They were called 'extremely addicted to drunkenness' in 1756, and 'a troublesome set of people very negligent and given to drink' by Master Attendant George Taswell in 1784.[282] JC Wroughton, a newly arrived member of the Marine Board, expressed his concern in 1836 that regardless of recent improvements to the port policing provisions '[n]either theft, nor the use of spirits has been suppressed.'[283] *Instructions to Commanders of Ships Arriving in the Roads* published in 1843 asked commanders to be watchful of 'irregular practices amongst the crews of Boats or Catamarans, especially if such persons or others are detected conveying spirits alongside any ship or Vessel.'[284] Despite this professed concern for the boatmen' overindulgence, drunkenness on the beach or in the boats might not actually have been rampant, or at least not severe; Master Attendant Clarence Dalrymple claimed in response to Wroughton's attack that in the five months between May and September 1836, only two of the 1200 boatmen working in the port had been punished for drunkenness.[285]

Travel literature and Company documents describe the boatmen using a combination of tropes derived from stereotypes about maritime labourers and colonised people. Accusations of laziness and drunkenness combined with rhetoric that undermines individual agency is documented in both contexts. Sitting at the intersection of native and maritime identities, the boatmen were subjected to the stereotypical British expectations of both. The assertion that sailors referred to all boatmen as 'Jack' ties them into a broader

[281] For an exception, see Shortt, 'The Fishermen of Southern India.' Shortt refers to the boatmen as "great experts in robbing the cargo in their boats...as well as tapping casks of beer or spirits. As a class, they are greatly addicted to drink." (200).
[282] 'Madras Public Proceedings,' 5 Sept. 1756, BL, IOR/P/240/14; 'Madras Public Proceedings,' 10 May 1784, BL, IOR/P/240/58.
[283] 'William Raylett Esq. to Chief Secretary, Complaining of an overcharge in the hire of boats supplied to him,' 27 Oct. 1836, BL, IOR/F/4/1806/74212.
[284] *The Madras Almanac and Compendium of Intelligence for 1843*, 467.
[285] 'Secretary to the Marine Board to the Chief Secretary, Forwarded minute of the 2nd member on the subject of employing boats crews to work on board ships, together with one forwarded by the 3rd member in explanation,' 28 Oct. 1836, BL, IOR/F/4/1806/74212.

maritime labour tradition in which stereotypes were both pejorative and idealistic. Writers who referred to boatmen as 'Jack' were calling on a British trope of Jack Tar as drunk, impious, self-serving *and* obedient, brave, dexterous and skillful in their maritime element.[286] Like Jack Tars, the boat people encompassed their own social and cultural category as a result of their distinctive skill sets; the cooperative nature of their labour created opportunities for collaborative action and disobedience against the desires of administrators. The similarities between the setting of British maritime and Madras littoral labour were used to draw larger parallels between the attitudes, skill and cooperative labour of the boatmen and common seamen.

How the boatmen were described, however, also firmly situates them as 'native' and racially different from the British author of both travel writing and official Company documents. The use of primitivising language alongside references to indolence, drunkenness, comfort with being minimally clad and symbiosis with the natural environment are all tropes that were used to degrade and set non-Europeans apart from European colonisers.[287] The reliance in travel writing on stereotypical portrayals of both maritime labourers and native peoples makes them useful for understanding what British travellers expected their domestic audiences wanted to read. Because of such writers' fleeting interaction with the boat people during the short passage between ship and shore, however, their impressions should be viewed in tandem with other material with a basis in sustained contact.

Moving beyond the caricature

[286] Rodger, *The Wooden World: An Anatomy of the Georgian Navy*, 15; Reineke, 'Three Sheets to the Wind: The Jolly Jack Tar and Eighteenth-Century British Masculinity,' 6.
[287] Arnold, 'Race, Place, and Bodily Difference in Early Nineteenth-Century India,' 255; Damodaran, 'Colonial Constructions of the 'Tribe' in India: The Case of Chotanagpur Vinita Damodaran, 2006,' 51; Mangan, 'Images for Confident Control: Stereotypes in Imperial Discourse,' 310–11; Wheeler, *The Complexion of Race: Categories of Difference in Eighteenth-Century British Culture*, 24.

Working in the masulas demanded both strength and skill. Despite the limitations of published and Company documents, these records offer insight into the lives of the boatmen and their relationship with the Company that can help further flesh out their existence. The community of boat people pre-dated the Company at the site of Fort St George. The fort was built next to a fishing village, which Henry Davidson Love believed was the 'Arkoopom' noted on a map commissioned by Governor General Pitt in 1733.[288] In the seventeenth century, the boatmen were referred to in Company documents as 'Muqwa,' 'Macwaes,' or 'Machua,' from the Tamil word *mukhavan,* or fisherman.[289] A 1706 list of castes referred to the boatmen as 'Polliwarr (*palli vāru),'* or 'Correalawarr,' alias 'mucquas.'[290]

The term 'muqwa' fell out of use in the early eighteenth century, last appearing in a European source in 1711.[291] Portuguese merchants at nearby San Thome had converted the boatmen to Catholicism as early as the sixteenth century, and their Catholic identity may eventually have led the boat people to eschew their *muqwa* caste identity.[292] In 1707, the boat people used their Christianity to distance themselves from a caste dispute that was disrupting movement and labour.[293] The boatmen claimed that they were involved at 'the instigation and ill advice of some designing people' and pledged 'now that the Governor and Council promise that we shall have their protection and all priviledges as Christians…we will never hereafter adhere to any castes of the Gentues…'[294] From this point forward, Company documents refer to the community simply as 'boat people' or 'boatmen,' but some documents in the nineteenth century identify the boat people as

[288] Love, *Vestiges of Old Madras,* 1:92.
[289] Love, *Vestiges of Old Madras,* 1:143, 299.
[290] Love, *Vestiges of Old Madras,* 2:11.
[291] Lockyer, *An Account of the Trade in India*, 10.
[292] Balachandran, 'Catholics in Protest: Lower-Caste Christianity in Early Colonial Madras,' 245.
[293] Love, *Vestiges of Old Madras,* 2:29.
[294] Love, *Vestiges of Old Madras,* 2:29.

members of a broader caste of fisherpeople. Elijah Hoole, whose travel memoir from the 1820s was published in 1844, identified the boat- and catamaran-men as 'kareiars,' a term that reappears in the 1871 census.[295] This census identified the boatmen generally as 'Kareiyan,' or 'Karayár,' from '*Karay*,' meaning 'the shore.'[296] According to the census, *Karayár* were a subset of the fisher caste, or *Sembadevan*. While statistics for the religious practices of different castes was not delineated beyond *Sembadevan,* 28.5% of the fisher caste identified as Roman Catholic, the largest percentage of any single religion amongst the fishermen and the largest proportion of Catholics in any caste.[297]

The boat people lived together as a distinct community, separate from Fort St George and Black Town. In the seventeenth and eighteenth centuries, they lived in settlement called Chepauk, several kilometres south of the fort. [298] Officers of the Boat Department sometimes complained about the boatmen arriving late on the beach due to their long commute, but the boat people stayed at Chepauk until the turn of the nineteenth century.[299] In 1799, the boatmen chose to move their settlement to Royapooram, in the vicinity of the newly-constructed Master Attendant's office and anticipated Custom House. The boat people were allotted sixty acres 300 yards (274 metres) to the north of the northern ramparts of Black Town and were compensated for the move and the construction of new houses and a boatyard.[300] After the construction of the Custom House, Royapooram was integrated into a newly consolidated port district, signaling spatially their centrality to the act of trade at Madras.

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[295] Hoole, *Madras, Mysore, and the South of India: Or, a Personal Narrative of a Mission to Those Countries: From MDCCCXX to MDCCCXXVIII*, 29–30; *Census of the Town of Madras, 1871*, 78.
[296] *Census of the Town of Madras, 1871,* Appendix 1, iii. This was likely not in general parlance, however. Other government documents and newspaper accounts consistently refer to them as 'boatmen' through the end of the nineteenth century.
[297] *Census of the Town of Madras, 1871*, 82.
[298] Love, *Vestiges of Old Madras,* 1:92.
[299] Love, *Vestiges of Old Madras,* 3: 528.
[300] Love, *Vestiges of Old Madras,* 3:518; 'Incursion of the Sea at Royapooram,' *Madras Mail* [Madras] no. 240, (12 October 1876) 3 col b; 'The masula boatmen of Royapooram,' *Madras Mail* [Madras] no. 118, (21 May 1877) 3 col c.

Training occurred within the closed communities of Chepauk and Royapooram. Crews were made up of eight to ten men, a *tindal,* or boat captain and pilot, and a bailing boy. Bailing boys were sometimes referred to as apprentice boatmen, but with only one bailing boy per crew this cannot be the only method of training utilised.[301] Clive, Orme and Smith reported to Governor in Council Pigot in 1757 that 'the owner pays the Crew 30 cash to each able man for each trip and 20 cash to such as are not quite so perfect,' suggesting that boatmen went through a training period where they were paid a lower rate, but under the Boat Department boatmen pay was supposed to be equally distributed amongst the crew.[302] This was a chief cause for complaint over the state of the Boat Department in the 1830s, at which point it was argued equal pay disincentivised boatmen to exert more than the bare minimum effort and placed enterprising men on the same footing as 'dissolute and idle' individuals.[303] The 1869 *Report on the Administration of the Madras Presidency* claimed that the boatmen had largely stopped training their sons as boatmen in favor of other employment, leaving the port short of skilled labour, as a justification for renewed efforts to build a breakwater.[304] The committee reviewing proposals for the breakwater lamented the fact that the boatmen were a 'limited and peculiar class of skilled labourers' who could not easily be replaced; mere strength, they continued, could 'always be had on easier terms than strength and skill combined.'[305]

The boatmen's importance to the port is clear even if how they trained is not. The treatment of the boatmen during mid-eighteenth-century tensions with Catholic France

[301] 'Investigation into maladministration and corrupt practices in the Master Attendant's Department at Madras, vol 3 of 3,' 4 Jan. 1828, BL, IOR/F/4/1189/30857.
[302] 5 Sept. 1757, BL, IOR/P/240/14.
[303] 27 Oct. 1836, BL, IOR/F/4/1806/74212.
[304] Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 89.
[305] Carpendale et al., 'Report of the Committee for the Preparation of Plans and Estimates for the Proposed Break-Water,--Dated 16th January 1869,' 14.

demonstrates how essential their presence was perceived to be.[306] In 1749, following the Treaty of Aix-la-Chappelle and the return of Fort St George to the East India Company, Company commissioners were conflicted about what to do with the Catholic priests settled in Madras and 'believed to have played a treacherous part.'[307] The commissioners concluded that while they believed it was in their power to confiscate the property of the Church and those who had lived under its protection during the French occupation, it was not in their power to expel all Catholics back to Europe. This was largely because of the boatmen's value to the port; they concluded that 'as most of our Boat People are of that Communion, We think that allowing them to Dwell in some part of our Bounds, and to have a small Church with a priest, a native of Portugal, cannot be of any Great Detriment to the Company's Affairs.'[308] They later stipulated that the church at Luce (Chepauk), could remain open, because 'our Boatmen are all settled near it…'[309] Finally, the commission found that it was important to allow a Catholic church within the bounds of Fort St George because, 'our Boat people, who are of that Communion, may probably be induced to leave us should we expel them Our Limits… Its Agreed to comply with their request, and that the Romish Church situated at Milend be delivered over to them…'[310] The boatmen had in the past, and would again, leave Madras to show their displeasure with Company regulations, making the decision to keep the community satisfied a sensible one.[311] In 1806, the boatmen petitioned the Council for a new priest; having paid themselves for the construction of a church in their new settlement, they demanded 'a priest who could speak

[306] Balachandran, 'Catholics in Protest: Lower-Caste Christianity in Early Colonial Madras,' *Studies in History* 16, no. 2 (2000): 245.
[307] Love, *Vestiges of Old Madras,* 2:394.
[308] Love, *Vestiges of Old Madras,* 2:394.
[309] Love, *Vestiges of Old Madras,* 2:397.
[310] Love, *Vestiges of Old Madras,* 2:404.
[311] Ahuja, 'Labour Unsettled: Mobility and Protest in the Madras Region, 1750-1800.'

Tamil and who was of their caste.' The government-appointed priest, the French friar Lambert, they claimed, was 'rude and ill-behaved.'[312]

While the skill of the Catholic boatmen exempted them from expulsion, their religion still affected their relationship with the Madras government in the eighteenth century. The boatmen filed a complaint against Master Attendant Alexander Cuthbert in 1782, claiming he treated them poorly. Cuthbert alleged that instead, the boatmen resented the fact that he had imported 'one Policonda with boats from Durgarāzpatnam,' who was not a Christian. The committee concluded that Policonda should remain as head of his boatmen in the North Roads, and 'the Christian chiefs must confine themselves to the South.'[313] The Christian *maistries* (boat overseers) were angered by the decision to give the foreign, non-Christian boatmen exclusive access to the more lucrative North Roads. The Christian boatmen refused to work until given control of the new boatmen and were accused of beating the new boatmen and destroying their boats. Cuthbert was far more willing to work with the Hindu boatmen under Policonda, as he viewed the Catholic boatmen of Madras as lazy, corrupt, and calculating.[314] While certainly the result of the fraught personal relationship between Cuthbert and the Catholic head boatman, Tomeapah, Cuthbert's impression of the Catholic boatmen may have been influenced by wider anti-French and anti-Catholic sentiment.[315] By the 1820s, relative perceptions of the Catholic

[312] Balachandran, 'Petitions, the City, and the Early Colonial State in South India,' 160.
[313] Love, *Vestiges of Old Madras,* 3:518.
[314] 'Madras Public Proceedings,' 3 Dec. 1782, BL, IOR/P/240/55. Tomeapah was repeatedly at odds with the officers of the Boat Department. A head boatman in the 1740s and 1750s, Tomeapah was dismissed from service in the 1760s by the second Master Attendant, Reynold Adams, after persistently protesting the imposition of the Boat Department on the boat people ('Madras Public Proceedings,' 8 Dec. 1775, BL, IOR/P/240/42.) Tomeapah petitioned the Government in Council in 1780 complaining of ill treatment by Master Attendant George Taswell, who retorted that Tomeapah's complaint was a last-ditch effort to retain his position as head boatman and oust Taswell, who felt Tomeapah was lazy and treated the boatmen poorly ('Madras Public Proceedings,' 8 Sept. 1780, BL, IOR/P/240/51.) When Tomeapah again petitioned the Governor in Council accusing Cuthbert, Taswell's successor, of ill treatment, Cuthbert penned a scathing response, accusing Tomeapah of 'backwardness, and total indifference' to the struggling state of the port, and of inciting the Christian boatmen to beating Policonda and his men, destroying their boats, and ultimately causing them to flee Madras.
[315] Haydon, *Anti-Catholicism in Eighteenth-Century England, C. 1714-80: A Political and Social Study*, 164.

and Hindu boatmen had reversed. An 1827 report on the change in relative earnings of different boat crews between 1819 and 1827 compared 'Christian' and 'Heathen' boats. The report found that in 1819, fifty-four of the boats had been Christian and thirty-four 'heathen,' and in 1827, sixty-three boats were manned by Christians and thirty-nine boats manned by 'heathens'. The individual earnings of the 'heathen' boats were slightly higher than the Christian boats, but the Christian boatmen as a group ultimately earned more than the heathen boatmen—about 1% per month in 1819 and 0.75% in 1827. But while finding that the earnings of the two groups was almost on par, the report went on to speculate about the possibility of different rates of theft:

> As however more than half the Establishment of Masulah Boats, vizt 63 of 102 appertain to Christians, it may be practicable to ascertain by comparing the separate records of offenses hereafter committed, whether the crime of theft is more prevalent in one class than another, which may possibly lead to the detection of the cause and the means of a remedy not yet discovered for ensuring the better moral government of the boatmen.[316]

It does not appear that the Marine Board ever followed up on this suggestion, but it does demonstrate a change in attitude towards the two groups in favor of the Catholic boatmen. It is also the only document that refers to the Hindu boatmen as 'heathen'—earlier references referred to them instead as 'Gentoo' or 'Malabars.'[317] Where Cuthbert and his successor Thomson had favored the Hindu boatmen in the 1780s—giving them proprietorship over the more lucrative North Roads station, praising them in relation to the Catholic boatmen and punishing the Catholic head boatmen for their mistreatment of the Hindu boatmen—the Boat Department of the 1820s was apparently more suspicious of the

[316] 4 Sept. 1827, BL, IOR/F/4/1188/30855.
[317] For example, 22 Nov. 1782, BL, IOR/P/240/55. On the Coromandel Coast, 'Gentoo' or 'Gentue,' a corruption of the Portuguese *Gentio,* was used to refer to Telugu-speaking Hindus, while 'Malabar' was used to refer to Tamil speakers, the result of early Portuguese confusion about the distinctions between the Coromandel (southeast) and Malabar (southwest) coasts of India. The boatmen referred to at Madras as 'Malabars' were most like *not* from the Malabar coast. (Yule, *Hobson-Jobson*: *A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical, Geographical and Discursive,* 359; 542.)

non-Christian boatmen. Despite this, the Catholic and Hindu boatmen seem to have sometimes acted as a cohesive body in their dealings with the Company, such as when the whole fleet went on strike in 1827 and 1828.[318]

Regardless of periodic group cohesion, it appears that animosity between the Catholic and Hindu boatmen was longstanding. Disagreement over the Royapooram Church Fund in the 1840s suggests that the Catholic boatmen continued to hold greater communal financial resources and more power in the surf zone than the Hindu boatmen in the nineteenth century. The Royapooram Church Fund was established in 1810 to raise money for a new Catholic church in the boatmen's settlement of Royapooram, but contributions were only meant to come from the pay of the Catholic boatmen, not the Hindu boatmen. In 1842, a change in the structure of the Boat Department threw the possibility of boat ownership open to all Madras residents. The Master Attendant's office encouraged boatmen to buy or build their own boats for use in the port, promising a truncated licensing process. Existing owners obtained licenses, in addition to several of the Catholic boatmen, but only one Hindu boatman, Yagappen, was able to gather his and his friends' financial resources to obtain a boat and license. This meant that most of the Hindu boatmen were forced to continue working in boats owned by the Catholic boatmen, and they discovered in December of 1842 that owners had been garnishing their wages to support a church they did not use. Angry, the Hindu boatmen petitioned the Master Attendant's office for a return of their wages and pledged that if the government was to repurchase boats and reestablish a government fleet, they would man it exclusively. Their suit was ultimately refused, but it led to a requirement for increased clarity about where funds withheld from the boatmen's

[318] 'The humble petition of the undermentioned (102) tindalls and boats crew,' 14 March 1827, BL, IOR/F/4/1188/30855; 'Extract Fort St George Public Consultations,' 22 July 1828, BL, IOR/F/4/1188/30856.

pay could be used.[319] The episode suggests that Catholic boatpeople still dominated the ship to shore transport system, and that Hindu boatmen were less likely to have the community resources necessary to transition from working in to owning a boat.

Working as a boatman in the port of Madras was physically demanding and relatively low paying, subject to changes in the weather, government policy and the whims of owners. Begrudging admiration for their skill and reliance on their continued cooperation was slowly replaced in the nineteenth century with frustration and disdain on the part of British travel writers and European officials and merchants operating out of the port. Part of the reason for the worsening opinion of the boatmen was their strong community cohesion—the boatmen lived together, worked together, and used intergenerational training to control the pool of skilled boatmen. Their social, religious, and economic community ties helped them to maintain their dominance as skilled knowledge holders in the littoral.

Conclusion

A historical maritime archaeological approach to boat survey combined with a 'useful technology' framework has been used to reconstruct the design, function, and use of eighteenth and nineteenth-century cargo masulas and port catamarans, and the boatmen as a closed community of skilled labourers. While historians of technology in empire have focused primarily on the impact of innovative European technologies in the acquisition and maintenance of colonies, the small, sometimes simple, often local, technologies deployed in day-to-day administration had a profound impact on the experience and nature of empire. Masulas, catamarans, and boatmen facilitated and restricted trade through Madras from the

[319] 'Extract—Fort St George Marine Consultation of the 11 July 1843,' 29 Dec. 1842, BL, IOR/F/4/2038/92567.

1640s through the second half of the nineteenth century. Despite the limitations in carrying capacity, the need for a distinctly skilled labour force, and seasonal monsoonal breaks, no alternative for passing between ship and shore existed until the 1860s.

This chapter used travel writing as a starting point for unpacking the design, function and usefulness of masulas and catamarans. However, though travel texts are widely available and give valuable insight into the mindset and expectations of European travellers on their arrival in Madras, their authors were rarely well versed in boat construction. Furthermore, they wrote in a prejudiced social context for a metropolitan audience with a specific set of expectations about India, Indian people, and Indian technology. This chapter has been aimed at contextualising the surface-level impressions of masulas, catamarans and boatmen recorded by travellers using material produced over long periods of sustained contact. This has shown that passing viewers and locals utilised different frames of reference for evaluating boat performance—travellers compared masulas to European-style boats, while local administrators and merchants compared masulas and boatmen to each other. This led travellers to see the boats as safe, reliable, long-lasting, and indigenous, when daily experience over time taught that it was impossible to fully mitigate risk, repairs were constant, and construction was dependent on interregional trade networks.

The skilled boatmen employed to operate masulas and catamarans make up the second half of the technological system of ship to shore transport. British travel writers' impressions of the boat people, coloured by their imperial perspective, relied on widely used tropes about native peoples and maritime and unskilled labour. Stereotypical descriptors based on passing contact, however, do not fully account for the boat people's experience of working at Madras and how it changed over the course of two centuries. The boatmen made up a closed hereditary community of labourers who not only worked

together, but lived together and shared social, economic, and religious bonds that strengthened their communal bargaining position when dealing with the Company. Viewing ship to shore transport as a technological system demonstrates the extent and nature of British dependency of local knowledge holders and technology in foreign environments.

Chapter 4: Obstacles to the control of the surf zone

Madras's seaside location meant that the physical nature of the surf zone dictated its trajectory as a port city. The incessant winds and waves lie at the heart of all efforts by the Madras Board of Trade, and later the Marine Board, to forcibly reshape an undelineated zone of open water into something identifiable as a port on paper. Between 1755 and 1895, nearly two dozen sets of regulations aimed at imposing order on the surf zone were introduced, suggesting both an unwavering belief in the efficacy of legislation and consistent, repetitive failure to write regulations that had any major effect on the experience of movement through the space of the port. Unable to regulate heavy surf and surprise storms out of existence, the Company instead attacked a series of proxy obstacles that had their roots in the environmental conditions under which trade had to be conducted. These perceived obstacles, and Company approaches to them, remained largely consistent over time; in fact, when drafting new versions of regulations, Company officials occasionally reflected that had the previous set been adhered to, their current efforts would have been unnecessary.[320] But because their environmental problem went unsolved, solutions to other, resultant 'obstacles' foundered repeatedly.

[320] 24 March 1775, BL, IOR/P/240/39; 28 Nov. 1820, BL, IOR/F/4/1188/30855.

Regulations for the Boat Department, 1755-1869	
Year	Regulation
1755	Representation and New Plan for Regulating the Boats
1756	Regulations for the Management of the Boats of this Place
1762	Regulations Proposed Relating to the Masoolah Boats
1766	Revisions to the Regulation of the Masoolah Boats
1775	Regulations respecting the Boats employed in this port
1777	Revisions to the Regulations respecting the Boats employed in this port
1782	1782 Revisions to the Regulations respecting the Boats employed in this port
1792	Regulations for the Boat Department
1794	Regulations for the Boat Department (1794)
1797	Regulations for the Boat Department (1797)
1809	Rules for Conducting the Beach Department
1813	Regulations for the Beach Department as abstracted in Milburn's Oriental Commerce, Volume 2
1820	(1) Rule ordinance or regulation for the good government of the Port of Madras, for the due control of the shipping resorting thereto and for the protection of the trade thereof; (2) Rules for the control & management of the Massulah Boats, for the collection and distribution of their hire, for determining the amount of the several charges to be made, and for the general management of the affairs of the port of Madras.
1821	Revisions to the Rules for Conducting the Beach Department
1828	Regulations from the 1831 Madras Almanac
1836	Revisions to the Regulation for the Boat Department
1842	Act IV of 1842, An Act for the better Management of Boats and Catamarans in the Madras Roads, and for the Amendment of certain Harbour Regulations
1846	Amendment to Act IV of 1842
1866	Findlays Indian Ocean Guide—Madras Harbour Rules
1869	Act IV of 1869, Amendment to the 1842 Boat Act[321]

[321] 30 Dec. 1755, BL, IOR/P/240/13; 6 Sept. 1756, BL, IOR/P/240/14; 5 Oct. 1762, BL, IOR/P/240/20; 'Madras Public Proceedings,' 6 June 1766, BL, IOR/P/240/24; 24 March 1775, BL, IOR/P/240/39; 6 June 1783, BL, IOR/P/240/56; 28 Sept. 1792, BL, IOR/P/241/34; 'Regulations for the Boat Department' (31 January 1794); 4 Nov. 1796, BL, IOR/P/241/68; 'Extract Fort St George Public Consultation no. 10,' 28 Nov. 1820, BL, IOR/F/4/1188/30855; Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43; Clarke, *The Regulations of the Government of Fort St. George, in Force at the End of 1847*, 659–71; Findlay, *A Directory for the Navigation of the Indian Ocean: With Descriptions of Its Coasts, Islands, Etc., from the Cape of Good Hope to the Strait of Sunda and Western Australia: Including Also the Red Sea and the Persian Gulf, the Winds, Monsoons, and Currents, and the Passages from Europe to Its Various Ports*, 853–57; Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*.

This chapter outlines three major obstacles to trade at Madras as they appear in Company correspondence: the maintenance of a sufficient fleet of masula cargo boats, endemic theft during the crossing of the surf zone, and the maintenance of a sufficient skilled labour force, which all appear at face value to be socially driven issues dictated by the boat people's (un)willingness to cooperate within an idealised Company system of efficiency. For much of the period between the 1750s and 1890s, government officials tried to solve these perceived problems administratively, rather than via infrastructure or technological means. This chapter focuses on administrative perceptions of the boat system and regulatory attempts to exert control, using internal government correspondence, minutes of the Government in Council, published regulations, summary reports requested by the Court of Directors and Board of Control in London, newspaper articles and editorials, petitions submitted by the boat people, Madras almanacs, and piloting guides. These types of sources, and in particular the administrative documents on which the bulk of this chapter is based, are useful when looking for problems or obstacles, as the existing system would not otherwise appear in government correspondence. If things were running smoothly, there would be no need to comment; there are very few mentions of the boat system, for instance, in Company documents from the first decade of the nineteenth century. This could be explained by an 1808 comment about the 'present well-regulated state of the Beach Department,' which at the time was found 'adequate at all seasons, throughout the year, to perform the duties of the port.'[322] When topics of concern appear repeatedly, over decades, accompanied by a variety of proposed regulatory solutions, the persistence of certain issues and struggle to mitigate them become clear. Administrative correspondence supplemented by public reaction over a 150-year period is used to argue

[322] 'Board of Trade to the Governor in Council,'19 April 1808, BL, IOR/F/4/1580/64266.

that rather than simply socially dictated, the 'obstacles' perceived by Company officials were ultimately the result of the risky littoral environment in which the boat people operated.

Company officials worried about boat shortages, theft, and labour shortages because they restricted the volume and nature of seaborne trade and threatened the city's ability to land troops from, rewater and victual naval vessels. Without enough boats to load and unload cargo and supplies, ships could wait at anchor for weeks, in danger of exposure to unexpected storms, grain spoilage, starvation, or attack in times of war. Theft in the boats and on the beach was unavoidable due to the slow and largely unsupervised nature of the crossing and the close-knit community of the boat people. Ensuring that there were enough boatmen to man all serviceable masulas also posed a problem for the Company; short crews were at greater risk while crossing the surf due to insufficient manpower, and the crews could not be replaced with non-maritime laborers who lacked the expertise developed through a lifetime of training in the masula boats.

These obstacles become apparent in a longitudinal study of the Boat Department that covers numerous Company administrations and their struggles for demonstrable control and order. Administrative documents, including correspondence internal to the Board of Trade, with the Governor-in-Council of Madras, and communication between the Madras Government and the Court of Directors and Board of Control in London, provide a detailed picture of the workings of the surf zone between 1750 and 1895. Organising a discussion of such documents by obstacle, rather than chronologically, makes the consistency of Company struggles in the surf zone more obvious. It also makes clearer the fact that the responses of successive generations of administrators were dictated by the broader, shifting global imperial context. Changes were made in line with the expansion of Company rule in India, the worsening of British attitudes towards labour and indigenous

technology as the Industrial Revolution progressed and global power increased, and the spread of new metropolitan economic and imperial theories concerning free market forces and Western racial and cultural superiority. And finally, this structure highlights the centrality of a confluence of skilled labour, indigenous technology, and environment to the repeated failures of the Company to ensure the safe and efficient movement of goods and people between ship and shore. Attempts to solve a techno-environmental problem with social and regulatory solutions at no point successfully mitigated the risks and uncertainties of trading at Madras.

Administrative Structure of the Boat Establishment

An overview of the development of the Boat Establishment provides some structure in which to view the obstacles faced by the Company in the surf zone. Prior to the 1760s, there was no administrative oversight of the boats by the Madras Government in Council; instead, the Company relied on head boatmen and boat owners to supply and regulate the establishment on their own. President-in-Council George Pigot attempted in 1755 to wrest control of the boats away from the owners with no success; not until 1762 was the Madras Board of Trade able to create a Boat Department headed by a European official that the owners agreed to cooperate with.[323] The Board of Trade appointed a Master Attendant to oversee not only the masula fleet, but also to fulfill the traditional roles of the office, typically housed in a Royal Navy dockyard, of supervising the marine yard, inspecting landed goods, and supervising repairs.[324] Supervision of the masula fleet remained in the hands of the Master Attendant until the office was abolished in 1866 and replaced with a

[323] 30 Dec. 1755, BL, IOR/P/240/13.
[324] 'Regulations for Yards (Madras),' 1797, TNA, ADM 106/3103; 5 Oct. 1762, BL, IOR/P/240/20.

Superintendent of Marine.[325] As the boundaries of the Presidency of Madras expanded, the Master Attendant became responsible for the Presidency's many out ports, and day-to-day supervision of Madras itself was passed to the deputy or assistant Master Attendant.[326] The Master Attendant oversaw a 'boat establishment,' which usually consisted of a European deputy, assistants, and Boat Paymaster (who was sometimes also the deputy Master Attendant). The establishment employed native clerks, beach *peons* for loading and unloading cargo on the beach, watching *peons* or *conicopolies* (who were employed to travel in the boats with cargo to prevent theft), and sometimes catamaran-men, who were employed to recover anchors and lost cargo, carry messages, and monitor masulas during the crossing.

Beginning in the 1770s, the Master Attendant was expected to own and keep up several of his own masulas in case of emergency, but boat owners, up until 1842, were contractors whose boats were licensed to carry cargo.[327] Until 1842, boatmen were employed by the owners but paid by the boat paymaster—boatmen were not salaried but rather paid by the trip. The Master Attendant reported to the Board of Trade in the eighteenth century and was a sitting member of the Marine Board, first conceptualised in 1779 and consisting of the Master Attendant, the Sea Customer, and the Sea Gate Register.[328] The Marine Board became the overseeing body of the Master Attendant's Office in the early nineteenth century.[329] In 1794, responsibility for the masula fleet was passed from the Master Attendant to a 'Beach Master,' but this position was abolished again in 1796.[330] The Master Attendant's department is referred to at different times as the

[325] Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70,* 93.
[326] 28 Sept. 1792, BL, IOR/P/241/34.
[327] 22 Nov. 1782, BL, IOR/P/240/55; Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43.
[328] 'Madras Public Proceedings,' 28 Sept. 1779, BL, IOR/P/240/48.
[329] 21 March 1827, BL, IOR/F/4/1188/30855.
[330] 'Regulations for the Boat Department' (31 January 1794); 'Public Consultations no. 28,' 5 Aug. 1796, BL, IOR/E/4/882.

'Boat Department' or 'Beach Department,' but the responsibilities and officer structure remained the same until 1842. In 1842, the 'Boat Monopoly,' or contract system by which the rate of hire was set and boatmen were paid directly by the Boat Department, was abolished and the boat establishment was thrown open.[331] The Master Attendant remained the supervisor of the masula fleet in the sense that it was his and his deputy's job to keep work on the beach moving smoothly and with minimal conflict, but it was no longer the responsibility of the office to ensure the fair pay of the boatmen or equal distribution of the working boats amongst the ships in the roads.[332]

There is more ambiguity in the different roles of the boat people. Crews in the boats consisted of between eight and ten men—six or eight rowers, one bailing boy, or apprentice boatman, and one *tindal*. The rowers were all on equal footing and received equal pay, while the *tindal*, who was responsible for steering the boat, directing the boatmen when to row, and overseeing their behavior while in the boat, received a double share. The bailing boy, who was sometimes an apprentice boatman, received a half share. *Tindals* did not own their boats. The structure of boat ownership was flexible and is difficult to outline clearly. Until the mid-1790s, the direct overseers of boats were boat *maistries,* or masters, who were hired by the owners to oversee their crews, ensure everyone arrived on the beach on time, and often distributed pay. *Maistries* were replaced by *conicopolies* by the Boat Department in the 1790s. *Conicopolies* were native clerks who the Company believed would be less likely to collude with the boatmen to evade regulations than the *maistries,* because they were of a different caste.[333] The *conicopoly* system was also ended in the early nineteenth century due to collusion and apparent misuse of power.[334]

[331] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43.
[332] 'Duties of the Master Attendant,' 1840, CCSAS, Microfilm 42.
[333] 24 Feb. 1797, BL, IOR/P/241/70.
[334] 'Madras Public Proceedings,' 12 Jan. 1798, BL, IOR/P/242/2.

Above the *maistries* or *conicopolies* in the eighteenth century were head boatmen, or leaders in the community of boat people who were usually the point of interaction between Boat Department officials and the boat people. Some head boatmen were also owners of boats, but it is unclear if at any point the two roles were synonymous. While chosen by the boat community, by the 1790s the Company had some degree of control over the head boatmen, because a report found that *conicopolies* were misusing their influence to force the dismissal of head boatmen they did not personally like, weakening the social structure of the boat community.[335] It is unclear if the head boatmen retained any power in the nineteenth-century boat system, as Company records stop mentioning them.

The Company also dealt with boat owners. Boat owners made up a wealthier subset of the community that could afford the costs of operating a boat. In the eighteenth century, it seems that most boat owners owned only one or two boats each, meaning that the Company was often dealing with sixty or more individual owners with different ideas about their level of responsibility to the port.[336] By the 1820s, however, a subset of five boat owners had purchased the majority of the fleet—these owners became known as 'Boat Contractors,' who then leased boats out to others with less capital who still wanted to participate in the boat system. These renters, confusingly, were referred to by the Boat Department as 'boat owners,' even though department officials were well aware that none of the boat 'owners' actually owned their boats. Boat 'owners' in the 1820s were more similar to the old *maistries,* in that they directly oversaw and were responsible for one or two boats, but with more opportunity to make a profit and more personal financial responsibility in the case of stolen or damaged cargo.

Contextualising littoral administration

[335] 27 Sept. 1792, BL, IOR/P/241/34.
[336] 5 Sept. 1756, BL, IOR/P/240/14.

The evolving structure of the Boat Department and relationship between administrators and the boatmen is reflective of global imperial shifts. Although the Madras littoral is a small space, both literally and figuratively, in the history of the East India Company, Company officials contextualised it in their writings within broader movements in imperial economic, military, and social thought. Correspondence surrounding the writing of regulations dating from the 1750s to the 1780s, at which point the Company was still in the process of cementing its political position in India, show that the government of Madras was more concerned with the military ramifications of the continued operation of the port than it would be in the nineteenth century. The first report on the status of the masula fleet, written in 1756 by Robert Clive, Robert Orme, and John Smith, was compiled in preparation for the expedition to Bengal that culminated in the Battle of Plassey and seismic shift in Company policy that was the result of victory.[337] In the early 1790s, when the British public was gripped by the trial of Warren Hastings, and, as Nicholas Dirks argues, empire itself, the Madras Boat Department faced its own corruption scandal, suggesting a heightened awareness of the perception of the expertise and moral behavior of Company officials both in Britain and amongst the local community.[338] A second crackdown on corrupt Company officials occurred in the 1820s, identified by Anubha Anushree as a result of both growing debts incurred in the Burma War of 1824 and a desire to project an image of honor and morality. This again had its corollary in the Madras Boat Department, when, despite clear strictures against officials exacting emoluments from their office, the head of the

[337] 5 Sept. 1756, BL, IOR/P/240/14; Bowen, *The Business of Empire: The East India Company and Imperial Britain, 1756-1833*, 3.
[338] Dirks, *The Scandal of Empire: India and the Creation of Imperial Britain*, 85; March 1797, BL, IOR/F/4/2/626; 'Public Consultations nos 8 & 9,' 3 Feb. 1796, BL, IOR/E/4/881.

department was found to have embezzled thousands of rupees through government contracts.[339]

Larger swings in economic policy were mirrored in the surf zone as well. The decade after the passage of the Charter Act of 1833, which consolidated power in the office of Governor General of India and further diminished the autonomy of the governments of Madras and Bombay, was a turbulent one for the Boat Department.[340] The distribution of boats to ships anchored in the roads, which since the 1760s had been handled by the Boat Department in conjunction with a small group of monopolistic boat owners, was not in line with the Utilitarian, free market bent of the first Governor-General of India, Lord Bentinck.[341] Much of the decade was taken up with conversations around whether to abolish the Boat 'Monopoly,' which utilised terminology suggestive of the larger arguments around free market models and the economic liberty of labourers that had been engrossing metropolitan philosophers and economic theorists alike since the 1810s.[342] Opponents of the Boat Monopoly, counting in their number members of the Board of Trade, independent merchants, and the Governor of Madras, Lord Elphinstone, argued that continued oversight of the masula fleet propped up lazy boatmen to the detriment of industrious ones, disincentivised owners to keep up their boats, and was detrimental to the efficient unloading of cargo. The law of supply and demand, they argued, was sufficient to ensure that the size of the fleet remained in balance with the needs of the port, and competition amongst the boat owners would cause the price of landing cargo to decline.

[339] Anushree, 'The East India Company and the Regulation of Corruption in Early Nineteenth-Century India,' 85; 'Minutes of the Governor in Council,' 21 March 1827, BL, IOR/F/4/1188/30855; 18 Sept. 1829, BL, IOR/F/4/1188/30856.
[340] Ehrlich, 'The Crisis of Liberal Reform in India: Public Opinion, Pyrotechnics, and the Charter Act of 1833,' 2031–33; Mukharya, 'Centralised Legislation and the New Legislative Procedure, 1833-42,' 481.
[341] Bearce, 'Lord William Bentinck: The Application of Liberalism to India,' 234–35.
[342] 'Boat Monopoly at Madras' *Bombay Gazette* [Bombay] no 2986, (3 April 1839), 4 col a-b; 'Madras in 1839 (The Boat Monopoly Abolished),' *Madras Weekly Mail* [Madras] no 84, (12 June 1886) 12 col a; 'Marine Consultations No. 5,' 13 May 1840, BL, IOR/E/4/953; 27 Oct. 1836, BL, IOR/F/4/1806/74212; Peart and Levy, 'Post-Ricardian British Economics, 1830-1870,' 134; Cremaschi, 'Ricardo and the Utilitarians,' 378–79.

The Court of Directors voiced their support for the cessation of the Boat Monopoly in favour of a free market in 1839, calling it a 'needless responsibility [that] impos[es] many vexatious restrictions on Individuals,' favoring instead a system governed by 'the extent of the demand and free competition' and the restriction of government interference to 'the preservation of good order, the prevention of smuggling, and the general protection of life and property.'[343]

The passage in 1842 of *An Act for the better Management of Boats and Catamarans in the Madras Roads* finally codified the death of the Boat Monopoly and is the major break along which the two eras of Company policy in the Madras surf zone can be delineated. The 1842 Boat Act greatly reduced government interference in the masula fleet with the expectation that fostering competition would increase the earning potential of the individual labourer, decrease the overall cost of shipping, and encourage boat owners to keep their boats in good repair. In practice, individual earning decreased, a new, de facto monopoly arose, and prices skyrocketed. But this policy of reduced government intervention meant that in the period after 1842, while the masula fleet remained essential to the operation of the port for another fifty years, the attention paid to theft, the maintenance of a sufficient fleet, and the size of the labour force decreased.

After 1858, and the official end of Company rule in India in favour of a British state, investment in infrastructure projects rose as the means by which the British Raj attempted to assert dominance and economically exploit India. The same was true of the approach to the Madras surf zone: most major port construction projects were undertaken in the period after 1858, and the relationship between the Marine Board and the people of the littoral shifted to become largely couched in technological, rather than regulatory terms. While this chapter does cover the period after 1858 in passing, the change in dynamic

[343] 'Marine Consultations No. 8,' 21 March 1836, BL IOR/E/4/952.

concurrent with construction efforts in the surf zone will be covered more fully in chapter five.

The remainder of this chapter examines three main obstacles as suggested by Company correspondence—fleet size, theft, and labour supply. It then examines proposed solutions, including the attempted recruitment of boatmen from other Coromandel Coast ports, standardising and raising the rate of boat hire, introducing prizes and support funds, and financial and corporal punishment. While at first glance both the obstacles and attempted solutions appear to be based on the social relationship between the boat people and the Company, their persistence and the fact that these 'solutions' did not result in complete Company control of the littoral space and process of ship to shore transport, demonstrates that the obstacles instead had their basis in the complex nature of the littoral environment. Without a means to address the waves themselves, the Company could never fully control the experience of ship to shore movement.

Obstacle 1: Fleet Size

The number of boats available to service the shipping in the roads was of great concern to the Company in the eighteenth century but fell in relative importance to concerns over theft and labour supply in the nineteenth century. Company officials were constantly fighting against owners who chose to send their boats to fish instead of servicing the port; damage and loss in storms; hard use; inaccessible supplies for repair; boat owners disinterested in repairing their boats and conflict amongst the boatmen that led to damages.

The number of boats was viewed as a problem distinct from the number of boatmen available to man the boats. Damaged or insufficient boats were portrayed as a failing of the boat owners; President-in-Council Pigot complained in the 1750s that the funding provided to the head boatmen for repairs was instead repeatedly squandered and the fleet left in poor

shape.[344] George Baker, the first Master Attendant, addressed the need for repairs and new boats in the regulations he devised on taking office. In 1762, he stipulated that the Master Attendant would have a number of carpenters under his direct supervision for building and repairing boats and encouraged all boat owners to build additional craft. Baker made it the responsibility of the Master Attendant's office to report to the government the number and condition of all licensed boats to ensure the port remained well supplied.[345] Encouraging the boat owners to increase the size of the fleet proved difficult, however. In 1775, Master Attendant Reynold Adams felt that additional incentives were needed to get the boat owners to build, suggesting that an additional half fanam, on top of the three they were already receiving, be given to the owners per trip.[346]

Madras continued to suffer from a shortage of boats, however. In November 1782 the Government in Council argued over how best to increase the size of the fleet, reduced by a shortage of available building supplies carried on trade routes cut off by the Second Anglo-Mysore War. John Turing, member of the council, suggested that boats be built on the Company's account at settlements further to the north and sent to Madras, while the President in Council pointed out that the strain was compounded by the presence of the naval squadron and its high demand for boats. Alexander Cuthbert, the Master Attendant, noted that the number of boats was 'considerably decreased, many having been broke, and entirely lost, in hard service to the ships of war, and not less than fifty-nine destroyed, or rendered unfit for use, by the gale of the 15th ultimo.' He further noted that the plank and coir needed to build masulas, which was usually brought from Travancore, had not been sent due to anxieties over the war, suggesting instead that boats and crews be brought from the northward, despite the fact that these boats 'will neither be so large, nor so strong as

[344] 30 Dec. 1755, BL, IOR/P/240/13.
[345] 5 Oct. 1762, BL, IOR/P/240/20.
[346] 24 March 1775, BL, IOR/P/240/39.

those built at Madras and unfit for any service of the Fleet or carriage of large packages.' To Cuthbert, it was essential that planking and coir yarn from the north be sent as soon as possible to repair and build new boats to the specifications needed at Madras.[347]

At the same time Cuthbert was urging the Council to increase the number of boats in the fleet by hiring boats and boatmen from other settlements, the Christian boat owners native to Madras complained to the Board of Trade that Cuthbert had raised the weight limit per trip, leading to an increase in damaged and lost boats. The owners requested funds from the Board of Trade to rebuild the boats damaged by Cuthbert's poor management—but Cuthbert protested, arguing that when he had taken up office the port had no more than forty boats fit for service, and to help rectify this he had advanced a significant sum for repairs from his private funds, repeatedly offered the owners more money for repairs, and instructed his servants to lend money to the boat owners interest free. Cuthbert accused the owners of purposefully suppressing the number of boats available, 'because the greater the scarcity the larger the presents made to them for a few additional trips which…they take from the poor labourers on the boats, and appropriate to themselves.' The Board was only able to soothe the angry Christian boat owners by entering into a contract with them in which the owners agreed to build and maintain for three years fifty new boats in exchange for the full profit derived from the boat trips completed in those craft. The contract proved to be yet another source of frustration for the Company, as disagreements arose once again over who was responsible for paying maintenance costs.[348]

John Thomson, Cuthbert's successor as Master Attendant in 1783, was perhaps the Master Attendant most concerned about maintaining the fleet, but also was in charge for a period of remarkable difficulty. He reported to President in Council George Macartney in

[347] 16 Nov. 1782, BL, IOR/P/240/55.
[348] 15 Dec. 1782, BL, IOR/P/240/55.

June 1783 that when he had arrived in February, the fleet was only 52 masulas strong, and he had therefore 'considered the cutting up and fresh sewing of the boats to be a thing of the utmost consequence.' By April, he had the fleet up to 108 masulas, but the naval squadron, again in the Madras Roads, worked the boats hard, reducing the serviceable number to 75. A series of accidents and the needs of the naval fleet to the southward reduced that number even further to 66. Those 66 were mainly old, 'breaking as fast as others are repaired,' and Thomson was unable to coerce the owners into repairing the boats more expediently. Their 'great neglect,' he complained, meant that the number of usable boats was shrinking rapidly; they were, he said, 'always deserting their work and making frivolous excuses.' Thomson also lacked supplies—the planking ordered from Travancore under Cuthbert the previous year had still not arrived, and he worried that without the assistance of the government, he would be unable to complete the full establishment of 150 boats they had requested. His concerns were echoed by Robert Barclay, a member of the Board of Trade, who urged the Board to apply once again to the King of Travancore for additional supplies. Barclay worried about 'the present distressed condition of the vessels now in the roads, for want of boats even to supply them with the common necessaries,' but warned that, 'it is probable their difficulties bear no proportion to those which will be sustained when the Squadron returns.'[349]

Despite Thomson's efforts to build new boats and compel owners to keep their boats in repair, damaged and unsafe boats remained a limiting factor on the volume of trade that could pass through Madras, even after the cessation of the second Anglo-Mysore War and the relief of the port from the strain of supporting a naval squadron. The imbalance between the amount of work and the number of masulas and crews available to carry it out was only compounded by the weather and environmental conditions—though far better able to

[349] 2 June 1783, BL, IOR/P/240/56.

sustain the waves, wind, and powerful cross currents at Madras than European boats, masulas were still in need of near daily repairs. The power of the boat owners to ultimately dictate the size of the fleet through neglect or slow construction meant that no matter what effort the Master Attendant's office made to increase the number of masulas, at any given time a number of boats were out of service.

The lack of control over the boat owners, and therefore over the number of boats, was identified in a 1792 report as a key 'irregularity' in the running of the port of Madras.[350] The report found that while the Master Attendant's office had kept a public register of the state of each boat under repair and what day it became unserviceable for the previous ten years, the owners were under no express obligation to answer for losses or keep their boats in good repair and properly manned. The solution in 1792 was to enter a direct contract with six Principal boat owners, Parausoody, Annathy, Anthony, Chindatry, Polecatten and Chennatomboo, who would have control over the entirety of the Madras fleet—but were required, on the condition of a penalty of 5000 pagodas, (Rs. 17,500, £1,750) to keep one hundred boats in good condition and take responsibility for all losses.[351]

Giving over so much control over the state of the fleet to a defined subset of the boat owners did not, however, result in a positive outcome for the port. In practice, the owners failed to take responsibility for losses and the contract meant that other potential boat owners were not allowed to enter into agreements with the Company and increase the number of boats available. The six owners treated their boatmen poorly and barely kept the boats repaired—the exclusive contract was terminated in 1794 by Deputy Master Attendant William Abbott, who saw the owners as corrupt and profiting off the public want for boats.[352] While Abbott himself was later dismissed for corruption and maladministration

[350] 28 Sept. 1792, BL, IOR/P/241/34.
[351] 28 Sept. 1792, BL, IOR/P/241/34.
[352] 7 Dec. 1795, BL, IOR/F/4/2/626.

of the Boat Department, the Company refrained from naming contractors in future sets of regulations, instead setting a total number of boats needed from 'the contractors' as an unspecified body.

The Company reverted to a revised contract system in 1809 through which it dealt with six contractors, who in turn leased their boats to a large number of owners who could not afford a newly levied security fee required by the Marine Board. The contractors agreed to keep eighty boats in repair but delegated this task to the 'owners' (meaning leasees.) A detailed investigation launched in 1827 into the workings of the Boat Department found that this renewed contract system had again become corrupt, the boat contractors scamming the Company, their leasees, and the boatmen simultaneously and failing to adequately keep up their boats.[353] As a result of the poor management of the boat contractors and a resultant strike in 1828, the Marine Board decided to once again attempt direct control over the construction and manning of the fleet, purchasing and building twenty of their own masulas, and taking a subset of the boatmen on as salaried employees. Records from the investigation include the cost of building supplies and pay for skilled labourers; while no longer concerned about access to materials due to conflict like in the 1780s, the Marine Board was again sourcing materials from around India, including 'Trincomally timber' from Sri Lanka, mango planking sourced from the Malabar Coast, and 'country' timber from the surrounding area.[354]

Direct control of the masula fleet by the Marine Board did not last long. In 1834, a committee of Madras merchants suggested that the boat office be put on an 'efficient and economical footing' by doing away with the deposit for hire of the boats on arrival, a reduction in the expense of the Native Establishment of the Boat Paymaster's office,

[353] 4 Sept. 1827, BL, IOR/F/4/1188/30855.
[354] 14 Nov. 1828, BL, IOR/F/4/1188/30856.

regulation of the wages and number of boatmen, and an increase in the number of government-owned boats from twenty to thirty, for an expected gain of Rs. 340 (£34) per month, instead of a loss of Rs. 549 (£55) per month.[355] When the expected increase in revenue and decrease in crime both failed to pan out, the Marine Board executed an abrupt about-face and sold all thirty of its masulas and abandoned the salary system for the boatmen.[356]

Despite abruptly relinquishing all direct control of the fleet in 1835, the government continued to provide funding for repairing boats damaged in rough weather and accidents until the Boat Monopoly ended in 1842, but investment in the fleet never again reached the heights of the 1780s or the 1820s.[357] These two periods of most apparent government concern over maintaining the needed number of masulas reflect related concerns over the need for a serviceable fleet in times of war. But circumstances at Madras had changed dramatically between the 1780s and 1820s, altering the government's stance on the boats and why they felt it necessary to take on the task of construction. While in the 1780s Madras itself was directly threatened by conflict, in the 1820s Madras was merely an embarkation/disembarkation point for British soldiers recruited for the war in Burma. Madras's naval base had been moved to Trincomalee in the interim; without the need for masulas to constantly service and resupply the entire squadron, the fleet no longer sustained the volume of damage complained of in the earlier period. The immediate incentive for taking on construction responsibilities also changed—in the 1780s, the Board of Trade was obtaining supplies for masulas that would ultimately end up the property of native owners, while in the 1820s the Marine Board was interested in building boats to employ salaried boatmen to improve living conditions while reducing the incentive to strike or steal from

[355] 23 July 1834, BL, IOR/E/4/944.
[356] 'Public Consultation No. 35,' 27 May 1835, BL, IOR/E/4/945.
[357] 'Marine Consultation No. 2,' 30 Jan. 1839, BL, IOR/E/4/952.

the boats. With the cessation of the Boat Monopoly in 1842, repair and rebuilding shifted from the perspective of the Company from a practical to a theoretical concern—the government continued to concern itself with ensuring boats were in good repair, but not overseeing those repairs themselves. The requirement that the Master Attendant's office inspect the fleet monthly continued; reports on the state of the fleet appear in the *Madras Mail* as late as the 1880s.[358] But in both decades, and throughout the entire period, damage and the need for repairs was ultimately an environmental issue. The action of the surf on the hulls of the boats and the repetitive slamming of the hull onto the sand, combined with the weight of cargo and multiple trips a day, could not be mitigated by regulating the process of repair and reconstruction.

Obstacle 2: Theft/Crime

The theft of cargo and personal belongings in the boats was a point of obsession for the Board of Trade and Marine Boards from the 1750s through the nineteenth century. Theft by the boatmen was facilitated by the environment in which they worked. The time spent waiting alongside vessels while loading or unloading cargo and the time spent waiting for the proper surf conditions to land could both be long periods of low or no supervision in the presence of valuable Company goods, foodstuffs, and personal belongings. Catamarans could move around the roads with ease and remove goods illicitly from masulas without being noticed. Cargo unloaded on the beach, particularly grain stores, were often left on the open beach for hours or days at a time, a prime opportunity for petty theft.[359]

Thefts in the boats bear a resemblance to the practice of contested perquisites in other British maritime contexts, for example the collection of 'chips,' or small offcuts of wood,

[358] 'Muster of Boats.'
[359] 'Letter about the boatmen and their families,' 10 July 1857, CCSAS, Microfilm no. 42.

in British naval dockyards or tea sweepings and textile bale wrappings in the East India Company's London docks.[360] Indeed on multiple occasions Company writings suggest that European officers in the Boat Department believed that the boatmen viewed theft as a means to supplement their low incomes, and responded both in the 1760s and the 1820s by raising the wages of the boatmen explicitly to deter theft.[361] But theft in the boats differed from perquisite systems in other British maritime contexts. Where the collection of chips, tea sweepings and textile bale wrappings were either initially sanctioned or grudgingly-allowed activities that continued illicitly after rises in real wages, boatmen at Madras were never officially allowed to take a cut from the goods in their boats. It also does not appear that the boatmen themselves necessarily considered it their right to steal from the boats, but rather also considered it an illicit, if regular, activity. Master Attendant Thomson, frustrated with his lack of control over the boatmen in 1783, told a newly arrived captain of a grain ship to save himself the trouble of dealing with thefts and simply give the boatmen rice: 'all of a sudden those boats could make four trips a day, notwithstanding the blowing weather at the time and strong currents and in the rice season when every man can steal his cloth of rice at each trip they will then work as fast as ever.'[362] But Thomson's suggestion in this instance does not appear to have been the norm. When large-scale thefts of valuable goods were uncovered, for example in the 1680s and again in the 1790s, the boat people either left Madras en masse for fear of punishment or went unpunished out of the Company's fear that if investigated, the entire group would flee and leave the port unable to function.[363]

[360] Knight, 'From Impressment to Task Work: Strikes and Disruption in the Royal Dockyards, 1688-1788,' 6–7; Bowen, '"So Alarming an Evil:" Smuggling, Pilfering and the English East India Company, 1750-1810,' 23.
[361] 'Madras Public Proceedings,' 12 April 1766, BL, IOR/P/240/24; 30 June 1828, BL, IOR/F/4/1188/30856.
[362] 2 June 1783, BL, IOR/P/240/56.
[363] Love, *Vestiges of Old Madras,* 2:33; 'Madras Public Proceedings,' 17 Dec. 1796, BL, IOR/P/241/68.

Regardless of the Marine Board's and Board of Trade's obsessions over thefts, specific examples are rare. Perhaps most thefts could be classed as subsistence theft—if most thefts were of foodstuffs that were quickly consumed, they may not have warranted attention in the newspapers, instead representing small losses that were either recovered or reimbursed quickly. The specific examples of theft in the documentary record are usually of personal items, luxury Company goods, or alcohol. As early as 1687, a crew of boatmen was accused of stealing coral from chests they were bringing ashore. Boatmen who were detected opening bales of calico during shipment in 1707 were to be 'whipt round the Town, stand Three several days in the Pillory...and the last day have their ears cutt off, and kept prisoners till the ship goes to the West Coast (Sumatra) and then sent thither.'[364] In 1796, nearly the entirety of the boat people were implicated in a massive theft of Company goods from the *Wycombe,* and in 1817, Francisco, Mallyappen, Peria Parasooramen, Chinna Parasooramen, Arroolappen, Royappen, and Choury Mootoo were convicted of 'feloniously stealing sundry articles' from General Sir John Chalmers.[365] Six boatmen were accused in March 1827 by the merchant Nuttoo Perthan of 'having stolen a small quantity of long pepper in their boat on the 20th of February;' in 1887, ten members of a boat crew were convicted of broaching cargo and stealing four pints of Martell's brandy and subjected to 'six stripes, which punishment they preferred to being sent to jail.'[366] None of these thefts, reported in the *Madras Courier,* were of grain, rice, or other subsistence items, despite the fact that native grain merchants complained repeatedly about the theft of their cargoes during transportation.[367]

[364] Love, *Vestiges of Old Madras,* 2:33.
[365] 'The Courier,' *Madras Courier* [Madras] no 1649, (13 May 1817) 2 col c.
[366] 'Memorandum for the Superintendent of Police,' 9 March 1827, BL, IOR/F/4/1188/30855; 'Correspondence: The Harbour Question'; 'Broaching cargo,' *Madras Mail* [Madras] no 15, (19 January 1887) 5 col a.
[367] 11 Nov. 1782, BL, IOR/P/240/55; 'Madras Public Proceedings,' 17 April 1784, BL, IOR/P/240/58.

A slightly more extensive picture of theft in the boats is available in the form of investigations and complaints from the 1820s. The Marine Board of the 1820s was dealing with a Boat Department that was plagued not just with allegedly thieving boatmen, but endemic mismanagement and corruption on the part of European officials. The resultant investigations into the behavior of Master Attendant James Grant addressed his role as the beach magistrate and as a result include some crime statistics on the beach from his tenure (1821-1827.) The investigation into Grant found that over Rs. 9,000 (£900) worth of cargo had been lost in the boats between 1821 and 1825, and that in 1826 alone Grant had heard 370 cases of misconduct on the beach concerning 1,160 people.[368] The Marine Board report also found, however, that the boatmen's pay had been subject to unsanctioned deductions under Grant, which the acting Master Attendant believed gave the boatmen 'strong motives to supply the deficiency by plundering the property in the boats.'[369]

Limited theft statistics were again included in larger arguments around the state of the Boat Department in the mid-1830s. In the debate over the Boat Monopoly, JC Wroughton, the acting second member of the Marine Board, wrote in favor of cessation, claiming that since arriving at Madras five months previously, he had 'witnessed the infliction of more corporal punishment…than [he had] during many years of service in the interior.' Not attributing such punishment to any 'vice inherent to the natural character of the Christian Boatmen,' Wroughton instead blamed the rate of punishment on the system in place having 'repressed virtuous and industrious habits amongst the Boatmen, [and] artificially propogated idleness and engendered crime.' Master Attendant Clarence Dalrymple pushed back against Wroughton's assertions, writing that in the five months since Wroughton had arrived at Madras, only twenty-seven boatmen had been flogged for theft on the beach, and

[368] 'Extract Public Letter from Fort St George (1825),' 'Letter from EJ Gascoigne Esq., Acting Master Attendant, to the Secretary of the Marine Board J. Daniel Esq. (1827),' 9 March 1825, 20 June 1827, BL, IOR/F/4/1188/30855.
[369] 'Public Consultation No. 22,' 5 Nov. 1830, BL, IOR/E/4/939.

two for drunkenness; he continued, 'the number of boatmen being about 1,200 gives an average of about 2 1/2 percent punished…in 5 months.'[370]

While the true prevalence of theft in the boats is not well documented, concern over theft is apparent in all the regulations put forth in the eighteenth and nineteenth centuries. That theft was addressed consistently and from a number of different angles suggests that it was a persistent problem for the Company that the Board of Trade and Marine Board both struggled to solve—in some cases, even worsening crime rates instead of mitigating them. There are several approaches to theft that appear repeatedly between the 1750s and 1842.

The first regulatory approach to deterring theft was the requirement that all boats operating in the roads be licensed, and all licensed boats be numbered. Henry Davidson Love claims that the numbering system was first introduced in the 1680s after a large theft implicated a number of the boatmen.[371] It is unclear if this requirement was continued unbroken into the mid-eighteenth century, but Baker notes in his analysis of the boat establishment in 1762 that there were thirty-six numbered boats working. His regulations include a provision for numbering all of the boats, and the numbering system was maintained in every set of regulations through to 1842. Despite the Master Attendant's office no longer overseeing the distribution of the boats after 1842, the numbering system was kept in place to help with identifying theft and other crimes.[372] From at least the 1790s, crews were also expected to work in one specific boat, rather than move between them; in his defense against a complaint that he was forcing boatmen to work in his own boats

[370] 27 Oct. 1830, BL, IOR/F/4/1806/74212.
[371] Love, *Vestiges of Old Madras,* 1:545.
[372] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 531.

instead those of the other owners, deputy Master Attendant Abbott pointed out that it has been his idea to require the men to embroider the number of their boat on their hats.[373]

A second regulation aimed at deterring theft was the limitation on landing times, which was meant to restrict boatmen from operating after dark, when it would be easier to remove items from the boat without being noticed. Regulations from 1762, 1777, 1797, 1813, 1828 and 1842 all specify the hours of operation for the boats. In 1777 the regulations also restricted where boats could land on their last trip of the day, stating that 'all masoolah boats are to land in the evening abreast and to the southward of the town after their work in the road is finished. Any boat detected to the northward of the fort after gun fire in the evening the people will be severely punished.'[374] All of the regulations set the last departure time about five or six pm, except the 1797 regulations. These were written with extensive input from the independent merchants of the city and set the latest departure time at eight pm after protests that the boatmen's working days were not long enough and in light of other suggestions for deterring theft.[375]

A third provision for deterring theft was assigning responsibility for thefts to the owners of the boats. In 1756, owners were made responsible for any negligence or disorder in their boats, and in 1762 Baker took it upon the office of the Master Attendant to enquire into behavior on the beach, but punishment was carried out by the owners.[376] Owners were made responsible for paying for thefts in their boats in 1777 to discourage boat owners from overlooking or profiting from theft, and in 1792 this provision was reinforced. A portion of the rate of hire was also set aside beginning in the 1790s to reimburse individuals for lost goods, but an investigation into the fund in the 1820s showed that because guilt had to be proven before the fund was paid out, only about a third of losses had been repaid.

[373] 7 Dec. 1795, BL, IOR/F/4/2/626.
[374] 'Madras Public Proceedings,' 6 Dec. 1776, BL, IOR/P/240/42.
[375] 24 Feb. 1797, BL, IOR/P/241/70.
[376] 5 Sept. 1756, BL, IOR/P/240/14; 5 Oct. 1762, BL, IOR/P/240/20.

Boat owners further used the fund as an excuse not to monitor their own boatmen for thefts, since they were no longer personally responsible for reimbursing lost cargo.[377] The 1797 regulations further required the Master Attendant to personally investigate all thefts and present them to the Board of Trade and empowered the Master Attendant to punish petty crimes on the beach without trial.[378]

Pay increases were also sometimes identified as an effort to deter theft. A 1766 pay raise for the boatmen was framed as a deterrent against theft; the Board wrote that the pay raise was meant 'to prevent their pilfering from the boats, which has ever been too frequent and owing as we are willing to imagine to the smallness of their pay, as we have frequently been obliged to make severe examples which have not had the desired effect.'[379] In 1797, a charge was added to the boat hire for an 'assessment for boat people during the monsoon,' aimed at providing off season pay in the hopes that this would deter theft of foodstuffs and merchandise.[380] In 1828, a rise in the boatmen's portion of boat hire was again portrayed as a safeguard against rising rates of theft.[381]

Beyond these basic provisions against theft, the Board of Trade experimented with a long series of measures for preventing theft in the boats. Watching *peons* were first hired in the 1760s to ride in the boats and monitor the boatmen, but it was found that they were a poor deterrent against theft (and in many cases active participants.)[382] In 1776, Tomeapah, the Christian head boatman, placed a new plan for the reduction of theft in the boats before the Board of Trade in which he argued that the best way to deter theft was to make losses the responsibility of the boat owners, rather than relying on hired *peons* to monitor the cargoes. He argued that '*peons* will never be a sufficient check on the boat men…a very

[377] 20 June 1827, BL, IOR/F/4/1188/30855.
[378] 9 Dec. 1796, BL, IOR/P/241/68; 'Madras Public Proceedings,' 25 May 1797, BL, IOR/P/241/72.
[379] 12 April 1766, BL, IOR/P/240/24.
[380] 9 Dec. 1796, BL, IOR/P/241/68.
[381] 30 June 1828, BL, IOR/F/4/1188/30856.
[382] 24 March 1775, BL, IOR/P/240/39.

small matter will be a sufficient inducement for the *peons* to join the boatmen and be accessory to the thefts.' He also suggested an increase in the number and pay of the deputies under the head boatman, wanted to ban catamarans from approaching masulas, and wanted to preserve a greater percentage of the boat hire for the crew in trips to the North Roads. Master Attendant George Taswell was angered that the Board chose to use Tomeapah's plan; he had his own ideas about how best to deter theft, which included charging the boat owners the full value of any stolen cargo; a reward for the man who reported the theft; increase in the establishment of beach *peons,* inspections of all boat loads; and punishment for damaged goods or failure to allow inspection. Tomeapah's plan was cheaper, at least in the short term and from the perspective of the Board, and Taswell's measures were not allowed to stand.[383] A 1782 complaint about theft by the grain merchants suggests that Tomeapah's measures were not overly successful.[384]

A 1792 report to the Board of Trade claimed that the port was in a state of 'disorder.' The authors of the report found that boat owners were neither under enough pressure to keep their boats in good repair and properly manned, nor under an express obligation to answer for the losses that occurred in their boats. The owners constantly rearranged the crews of the boats, and as a result most thefts were going unsolved—the officers of the Boat Department found it impossible to discern who may have taken what after the fact. Furthermore, the beach *peons*, hired to monitor loading and unloading and reduce thefts, had begun colluding with the boat crews on robberies.[385] The resultant regulations reintroduced the watching *peons* in the boats, each of which were required to wear a badge of the Master Attendant's office and report directly to the deputy Master Attendant, who was made responsible for investigating all losses and ordering any due reparations.[386]

[383] 6 Dec. 1776, BL, IOR/P/240/42.
[384] 22 Nov. 1782, BL, IOR/P/240/55.
[385] 28 Sept. 1792, BL, IOR/P/241/34.
[386] 'Regulations for the Boat Department,' *Madras Courier* [Madras] no 368, (11 October 1792), 1 col c.

In 1796, a large amount of cargo from the Company ship *Wycombe* was found in the boatmen's houses. Fearing a mass exodus of boatmen right before the expected arrival of a naval squadron, the Master Attendant's office refrained from investigating the theft for weeks—when the conspiracy was finally investigated, so many of the boat people, watching *peons*, boat *maistries* and owners were found to have been involved that it was impractical to punish them all, and only a few suspected ring leaders were punished.[387] The massive loss of cargo and failure to investigate demonstrated to the Board of Trade that the 1792 deterrents against theft were inadequate. The 1797 regulations accordingly reinforced earlier efforts to limit theft, including holding the Master Attendant responsible for investigating thefts and the owners for paying for losses. Watching *peons* were still employed in the boats, but private individuals were also encouraged to hire their own *peons* as well. Finally, *conicopolies* replaced the boat *maistries,* or managers. The *maistries*, it was found, had been more likely to collude with the boatmen to carry out thefts than prevent them; the Board of Trade hoped that by replacing them with *conicopolies*, who were not from the same caste as the boatmen, collusion would be reduced. Robert Darwell, who wrote a 1796 report on the state of the Boat Department and drafted the 1797 regulations, wrote that, 'Abuses were more likely to be detected by striking directly at the root of the combination which I cannot but consider the appointment of searching *conicoplies* as effectually doing by providing for the maintenance of the Boat people, and affording them in all cases ample Justice…'[388] Despite this hope, thefts persisted, and Darwell petitioned the Board to introduce an additional provision allowing for corporal punishment on the beach shortly after the 1797 regulations went into effect.[389]

[387] 17 Dec. 1796, BL, IOR/P/241/68.
[388] 24 Feb. 1797, BL, IOR/P/241/70.
[389] 'Madras Public Proceedings,' 24 June 1797, BL, IOR/P/241/73.

Revisions were made to the regulations in 1809 which gave the reappointed Master Attendant George Taswell the Beach Magistracy and introduced a marine police force.[390] The Beach Magistracy position enabled Taswell to adjudicate cases on the beach and inflict corporal punishment for petty thefts in the boats, but when Taswell's successor, Robert Anderson, was *not* appointed Beach Magistrate, the efficacy of the marine police system working in conjunction with the Master Attendant's office declined. In 1812, Anderson complained to the Marine Board that the existence of a Superintendent of Marine Police rendered his position powerless—he argued that it 'deprived him that salutary control over the boat owners and the crews in the exercise of which, as the Head of the Department, he undoubtedly felt ought to have been continued.'[391] The boat owners, observing that Anderson had no means of inflicting punishment on them, no longer considered themselves liable for losses, exposing merchants to 'depredations committed on their property' without hope for redress. Even the Superintendent of Police, when called to testify, admitted that 'the protection which the public were led to expect from the establishment of the Marine Police, has not been efficient in any way commensurate with the extra charge which was added to the Boat hire.'[392]

The answer, in 1812, was to appoint the Master Attendant and Deputy Master Attendant as rotating Justices of the Peace and to require the boat owners to deposit a security of Rs. 1,000 (£100) with the Marine Board to be used to 'meet claims for losses sustained by robbery or embezzlement in the boats on proof of such loss being made to the satisfaction of the Master Attendant.' But this security did little to dampen thefts in the boats, because few boat owners had the cash at hand to pay it—which allowed several boat 'contractors,' or the wealthiest of the boat owners, to act as middlemen between the Marine

[390] 'Letter from the committee for enquiring into the Beach Department to Mr Chief Secretary Wood,' 28 Nov. 1820, BL, IOR/F/4/1188/30855.
[391] 28 Nov. 1820, BL, IOR/F/4/1188/30855.
[392] 28 Nov. 1820, BL, IOR/F/4/1188/30855.

Board and smaller owners. The Contractors paid the Rs 1000 security, and then rented boats out to smaller boat 'owners,' who were responsible for behaviour in the boats, and paid out (occasionally) when thefts were proven. This meant that the indemnity was no barrier at all, because the Boat Contractors had removed themselves from the responsibility of reimbursing petty thefts and did not care if theft occurred. Smaller boat owners were also disincentivised to prevent thefts, both because they could benefit alongside the boatmen from the proceeds of petty thefts, and the reality that many thefts went unproven and claims unprocessed.[393]

The security clearly not a sufficient deterrent against theft, in the early 1820s a charge was added to the boat hire under the heading of 'compensation for losses', which reduced the boatmen's wages in favor of creating a fund from which losses could be reimbursed. But this plan also backfired. Following an uptick in theft, the acting Master Attendant Edward Gascoigne reported to the Marine Board that instead of reducing losses from theft, the existence of the Compensation Fund increased instances of theft:

> the owners and boatmen in particular consider that the stoppage of pay under the head of compensation for loss being so much money deducted from their daily earnings, is a fund upon which they can draw by any act of theft which they or their comrades may commit, they therefore are induced to think that honesty is bad policy and that he who is most honest, suffers most by the system now in force and vice versa.[394]

Gascoigne was also critical of the role of the Marine Police in reducing theft on the beach, writing that the officers and *peons* of the department were unreliable, absent unexpectedly from the beach for days or even months at a time, and sometimes colluded with the boatmen to commit thefts. The issues that had surfaced in the watching *peon* system in the eighteenth century had simply resurfaced under a new name.

[393] 'Proceedings on the above letter, [statement of thefts discovered by the Marine Police Department on the beach] dated 3 Nov. 1826,' 20 June 1827, BL, IOR/F/4/1188/30855.
[394] 20 June 1827, BL, IOR/F/4/1188/30855.

Theft, like the pay of the boatmen and the supply of boats, was no longer a main point of concern for the Marine Board after the cessation of the Boat Monopoly in 1842.[395] The 1842 Boat Act contained no specific provision against theft; rather, it continued to limit the hours of operation of the port and stipulate punishments for boatmen who refused to operate their boats without good reason and for smuggling. An almost-immediate amendment, however, did provide instructions for commanders in the roads who witnessed or were subject to 'irregular practices' on the part of the boatmen, such as petty theft or drunkenness.[396]

Despite its disappearance from the regulations in 1842, theft continued to be an issue on the beach and in the boats. In 1857, in an effort to deter petty theft, the police issued an order to refuse access to the beach to the families of boatmen, who would deliver lunch to save the men time during the day and keep them at their work on the beach. Master Attendant Christopher Biden angrily asked that the order be rescinded, and wrote that while he agreed that any person guilty of petty larceny should be charged, 'a number of idle persons of both sexes, prowl along the beach and are in the constant habit of that very offence… the number of *peons* stationed between Clives' Battery and the Tunnel, is in my opinion, very inadequate to such an extent of supervision.'[397] Biden worried that restricting family access to the beach would do more harm than good; he thought it could lead to lower attendance rates and increased wait times for service. A new Marine Police bill, introduced in 1858, required every boat carrying cargo or goods to carry an officer of the police force, perhaps in response to an uptick in theft. In the case of any boat found carrying cargo without an officer, or if a crew hindered an officer from joining their boat, the owner,

[395] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43.
[396] *The Madras Almanac and Compendium of Intelligence for 1843.*, 467.
[397] 'Letter about the boatmen and their families,' 10 July 1857, CCSAS, Microfilm no. 42.

tindals, and boatmen would be punished (the owner with a fine, the boatmen with a flogging.)[398]

Why theft was seen as so widespread and why the Company failed repeatedly to tamp it out is unclear, but there are several hypotheses worth addressing. The first would be mere opportunity. Insufficient or complicit supervision in the boats would have tempted some boatmen to theft; Isabel Hofmeyr calls pilfering a 'part of the informal economy of any port.'[399] In at least one instance the perpetrator of a theft cited opportunity as his motive— the boatman found with four bottles of Martel's brandy in 1887 merely confessed that, 'he wanted to enjoy himself with his comrades for the Pongul.'[400] Theft could also sometimes supplement insufficient wages; the Board of Trade itself suggested that low pay was at fault for increasing thefts several times.[401] The risk of severe punishment was low; skill and group cohesion made the boatmen difficult to prosecute and next to impossible to dismiss. While theft sometimes resulted in a flogging on the beach, the boatmen likely saw it as a low-risk, high reward means of increasing their earnings or putting food on the table. Petty theft in the boats at Madras also bears a strong resemblance to the theft from East India Company ships upon their arrival in London discussed by Huw Bowen; in both cases, individuals explicitly hired to reduce theft instead contributed to it, and the reliance on contracted boats and boatmen on either end of the journey resulted in losses in transitional spaces.[402]

The Company's particular difficulties with theft at Madras can be tied explicitly to the environmental conditions of the surf zone. The power and unpredictability of the surf

[398] *The Madras Almanac and Compendium of Intelligence for 1859*, 290.
[399] Hofmeyr, 'Imperialism Above and Below the Water Line: Making Space Up (and Down) in a Colonial Port City,' 1040.
[400] 'Broaching Cargo.'
[401] 12 April 1766, BL, IOR/P/240/24; 30 June 1828, BL, IOR/F/4/1188/30856.
[402] Bowen, '"So Alarming an Evil:" Smuggling, Pilfering and the English East India Company, 1750-1810,' 11.

left the Company fully reliant on a single skilled cohesive community; this left trade vulnerable to boatmen and owners willing to take the risk of stealing to increase profit or for subsistence in the knowledge that they could not be dismissed and were unlikely to be caught or badly punished. The opportunity for theft was also a direct result of the environment; transport times could not be reduced or standardised because of the constant changes in surf conditions that could strand a masula on the backside of the surf for long periods of time, providing ample opportunity to the boatmen or more nimble catamarans to offload cargo. The periodic scarcity and reduction in boatmen's earnings during the monsoon season likely also drove theft. Even after the introduction of a Monsoon Fund to support boatmen during the offseason, boatmen were paid only a fraction of their already small wages to support their families during the monsoon. Periodic un/underemployment as a result of weather patterns could also have induced boatmen to steal grain or other subsistence items to help support their families. Like the difficulties surrounding boat construction and repair, theft can ultimately be tied to the particular ecological and environmental conditions faced by the Company in the Madras littoral zone and be viewed as a proxy insecurity for the larger and insurmountable difficulties with centralising the process of transporting cargo safely and cheaply between ship and shore.

Obstacle 3: Labour Supply

Tindals, boatmen, and bailing boys were recognised by the Board of Trade, independent merchants, visitors to Madras, and the Court of Directors in London as absolutely essential to the operation of the port of Madras. Vincentio Corbett and Hugh Boyd, who replaced Thomson as joint Master Attendants in late 1784, observed that working in the boats was 'a laborious and dangerous employment and requires both time to acquire sufficient skill and habitual courage to exercise it so that those only who are trained and educated in it can

be depended upon as really useful or serviceable.'[403] In 1796, in response to the news that deputy Master Attendant William Abbott had been taking a share of the boatmen's earnings as a personal emolument, the Court of Directors scolded the Madras Board of Trade for overlooking the reduction in the boatmen's earnings, writing, 'the more secure this necessary and useful description of Men are in regard to their own Earnings, and the better they are paid, the more secure the port of Madras will be in having a preference to other Ports in their Esteem.'[404] Christopher Biden noted in 1842 'the natural difficulties opposed to the employment of any other class of Boats or Boatmen' in forwarding ideas to the Marine Board for monitoring the boatmen on the beach and in the roads.[405]

But while the boatmen's skill was valued, they were also seen as a limiting factor to the volume of trade that could pass through Madras. They were characterised by British observers as 'lazy' and 'drunk,' a common derogatory view of manual labourers in domestic economic thought.[406] The boatmen were also portrayed as poor money managers undeserving of high pay; Clive, Orme and Smith called the boatmen 'ever unwilling to work whilst they have anything to spend' in 1756, while eighty years later Lord Elphinstone chided proponents of the Boat Monopoly for 'brand[ing] the whole class of boatmen as thieves.'[407] In the context of the Madras littoral, this paradoxical portrayal of the boatmen as both facilitators and uncooperative gatekeepers meant that Company discussions and resultant regulations demonstrate a sense of anxiety around their need to rely on the continued presence of the boatmen. It was only the need for the very specific skills of the

[403] 'Madras Public Proceedings,' 31 Dec. 1784, BL, IOR/P/240/59.
[404] 3 Feb. 1796, BL, IOR/F/4/2/626.
[405] 'Respecting the system for the better management of boats and catamarans in the Madras Roads,' 19 Sept. 1842, BL, IOR/F/4/2001/89156.
[406] Coats, 'Changing Attitudes to Labour in the Mid-Eighteenth Century,' 35; Thompson, 'Time, Work-Discipline, and Industrial Capitalism,' 80–81.
[407] 5 Sept. 1756, BL, IOR/P/240/14; April 1839, BL, IOR/F/4/1806/74212.

boatmen that put their expertise in such high demand; they were irreplaceable because of the combination of the rough surf conditions and their boats.

Labour supply was framed in Company discourse around the need for sufficient crews to load and unload cargo and service a naval fleet in times of conflict. Short-handed boats were at greater risk of accident in the surf, and without enough boatmen, or boatmen working for only part of the day, ships were forced to sit in the roads for weeks while their cargo was slowly unloaded. Without enough boatmen to carry messages and passengers across the surf, communication was stilted, a particular risk in times of war or impending bad weather. Not only was the Company administration at Madras concerned about a lack of boatmen, but a shortage of skilled boatmen to service the port was a frequent reality, particularly in the eighteenth century. The Madras Government was forced to overturn the very first attempt to regulate the masula fleet in 1755 over a lack of access to labour—the boat owners, who were stripped of their power by the regulations, had abandoned the port and taken the boatmen with them.[408] With the impending expansion of the Seven Years' War into the region, the need to maintain reliable communication with ships in the roads led the governor-in-council to rescind the regulations in the well-founded hope that restoring power to the owners would convince them to return with the boatmen.

In the 1770s and 1780s, labour concerns were discussed at length in the consultations of the Madras Government. In November 1782, Madras was more than usually short of boatmen because of the number of boats and crews that had been 'taken for the use of the Squadron from their usual employ in the Port Service;' the Board feared the distress that would be felt in January and February if insufficient boats and crews were available to unload the expected grain shipments from Bengal and the Northern Circars.[409]

[408] 5 April 1756, BL, IOR/P/240/14.
[409] 16 Nov. 1782, BL, IOR/P/240/55.

A fleet of Royal Navy transports sat in the roads that winter, in constant need of boats and leaving few crews available to service the *dhonies* carrying crucial grain supplies for the city. Indeed, grain merchants petitioned the Board of Trade four times between 1772 and 1784 complaining about the lack of boats for unloading their cargo. In 1772, the complaint asserted that their cargoes were spoiling as they sat in the roads for weeks waiting for service while the boats were monopolised by the naval fleet; in 1775, the long wait resulted in the loss of a number of grain vessels during a storm at the beginning of the monsoon season.[410] The two 1784 petitions again noted the merchants' 'distress for boats,' complaining that because a sufficient number of boats had previously been provided, they had been encouraged to make a second shipment in the same season—but now that second shipment sat waiting in precarious weather. One hundred and fifty of the grain vessels were subsequently lost in a storm with their full cargoes, and the remainder left in poor condition.[411] The commander of the naval transport *Veteran* had made a similar complaint in 1783, but where the council resolved to assist the grain merchants in any way possible, his suit was dismissed by Master Attendant John Thomson on the grounds that his ship was already serviced by the maximum number of boats the *Veteran's* crew could reasonably load each day.[412]

Thomson, who served as the fourth Master Attendant during the Second Anglo-Mysore War, repeatedly expressed anxieties over maintaining the requisite number of boatmen. After the loss of nearly forty of the one hundred and eight boats available at the port in a mere two months in the spring of 1783, Thomson complained that he could not keep enough men working to build new boats at an adequate pace; writing to the Board of Trade:

[410] 15 May 1772, BL, IOR/P/240/33; 24 March 1775, BL, IOR/P/240/39.
[411] 17 April 1784, BL, IOR/P/240/58.
[412] 17 May 1783, BL, IOR/P/240/56.

> with all my attention in setting *peons* over them and such people as I have under my authority I am not able to get this [construction] carried into execution, they are always deserting their work and making frivolous excuses—I have now taken into pay two Portuguese at 10 pagodas each per month to supervise this business, supposed them not connected with the boat caste of people.[413]

Thomson also calculated that with 'thirty six sails of King's ships to victual, store and water, and a large army upon the coast to provision for which everything is imported by sea' the port was in need of at least two hundred boats, 'but how they are all to be manned is a difficulty I fear not easily accomplished; my Dubash thinks the contractors never can man more than 130 boats.' He also struggled with boat owners lying about their crews running away, men fishing instead of coming to the beach early to transport cargo, and complained of 'the very material injury to the service [that arose] from the later hour in the morning at which the boatmen come to work.'[414]

In 1792, the Board of Trade commissioned a report on the Boat Department and new regulations 'calculated for remedying the abuses and irregularities arising from the former system of management....' The report found that the 'disorders' in the Boat department were caused by boats frequently leaving the beach with too few hands, so that in heavy surf they were more likely to be overset and the goods on board spoiled or damaged; the collusion between crews and watching *peons* to commit theft; and disputes between the different classes of boatmen.[415] In 1796, the *Wycombe* theft was left uninvestigated because of the fear that

> so many of the boat people had been concerned in it that the prosecution of the enquiry at that time when a 2nd fleet of Indiamen were expected would be attended with the risk of desertion on the part of the Boat people and the business of the port, thereby impeded, and recommended that the inquiry might be deferred until the departure of the expected ships.[416]

[413] 6 June 1783, BL, IOR/P/240/56.
[414] 6 June 1783, BL, IOR/P/240/56.
[415] 28 Sept, 1792, BL, IOR/P/241/34.
[416] 17 Dec. 1796, BL, IOR/P/241/68.

Concern over maintaining an adequate number of boatmen does not appear to have been as significant in the early nineteenth century, perhaps due to the Company's strengthened position on the Coromandel Coast and the diminished threat of military action following the death of Tipu Sultan at Seringapatam in 1799. In 1834, a desire to monitor the number of boatmen resurfaced in suggestions made by mercantile men aimed at ensuring the smooth operation of the port.[417] Their suggestions were not long in force, however, before the 1842 Boat Act opened boat ownership up to the public at large, ended government oversight of the pay and retention of boatmen, and ended the Company's concern with labour availability altogether.

Proposed solutions to labour shortages

In response to potential labour shortages and the need to keep boatmen working in the port, several regulatory trends and extra-regulatory efforts developed. The Company encouraged labour recruitment from smaller fishing settlements, particularly in response to conflict in the 1770s and 1780s, but the regulations of the Boat Department were focused on retention, rather than recruitment. Regulations before 1842 stipulated the rate of hire for each boat trip, allocated a portion of the hire for distribution amongst the crew, and introduced several different plans for how and when the boatmen were paid. Funds were also set aside for several charitable efforts to support the boatmen in case of poor weather, injury, or death. Finally, later nineteenth century regulations against willful neglect and refusing to work when able reflect anxieties over labour availability, but not efforts to retain boatmen for the service of the port. Corporal punishment on the beach to discourage slowdowns was allowed but not specifically codified in the regulations.

[417] 23 July 1834, BL, IOR/E/4/944.

Recruitment

In November of 1782, in the midst of the Second Anglo-Mysore war, John Turing delivered minutes concerning the boat establishment to governor-in-council Lord Macartney. Turing observed that the fleet was in growing disrepair, the squadron anchored in the South Roads was monopolising the service of the boats, and not enough boatmen were available to meet the needs of the grain merchants arriving with supplies for the city and the army. Macartney solicited the response of Master Attendant Cuthbert, who advocated for a concerted effort to collect as many available boats and crews from the surrounding settlements as possible. On Cuthbert's advice, the Board of Trade resolved to write to the Company agent Mr Hamilton, the chief at Ingeram, to send crews with their boats and families to supplement the workforce available at Madras. A patch of land was set aside for their settlement, and the Board stressed that the Ingeram boatmen would be 'put under such regulation only, as they themselves shall consent to, and of their own free choice of their head men, with a sufficient allowance of rice and liberty to fish on catamarans when their service was not wanted in their boats.'[418] Desperate to increase the number of boatmen working at Madras, the Board was willing to exempt newcomers from the oversight they had pushed so hard to establish.

Cuthbert's successor Thomson also attempted to attract crews to Madras in response to his problems with labour supply. He wrote to the Board of Trade twice in the spring of 1783 to express his concern over the lack of boatmen, noting that without additional crews he would have no way to 'ward off the blow' when the grain merchants arrived.[419] Boat owners from Madras acted as contractors, travelling to surrounding settlements and returning with crews and boats to supplement the Madras fleet. The owners

[418] 16 Nov. 1782, BL, IOR/P/240/55.
[419] 2 June 1783, BL, IOR/P/240/56.

paid many of the men large advances in return for a lifetime of service, effectively enslaving the boatmen of the outer ports to their boats at Madras. The boatmen likely did not fully understand the agreement they were entering into; Ravi Ahuja has argued that many considered the job a temporary wartime contingency.[420] In May 1784, the Board of Trade ended a 13 fanam per day *batta,* effectively hazard pay, that had been added to the boatmen's salaries during the Second Anglo-Mysore War at the request of grain merchants who felt the cost of unloading cargo at Madras had gotten too high.[421] This sudden reduction in their wages 'gave a general discontent amongst the boat people,' and of the 975 men who had worked in the boats during the war, 295 absconded, leaving enough men to crew no more than eighty boats.[422] The Boat owners, failing to coerce the men back themselves, petitioned the Board of Trade for their forced return. The owners argued that the men were deeply indebted to them and complained that the boatmen had left before fulfilling the terms of service of their advances. Master Attendants Corbett and Boyd considered the desire of these boatmen to remain in their home districts, but concluded:

> We are of the opinion that the necessary public services on the beach will be extremely endangered if the men are permitted to go away. They are considerably indebted to the boat contractors who have purchased their future services by large advances of money and if they have opportunity by being sent into the country of obtaining other employment with new wages they will hardly return to work out those they have already received. Justice therefore to the contractors seems to require that these men should be retained, beside the necessity of the public service, which we are of opinion cannot otherwise be supplied. The district of Madras alone cannot supply more than from 15 to 20 boats not the fifth part of the number which has been found necessary.[423]

The skill of the boatmen, argued Corbett and Boyd, made them irreplaceable. While the boatmen could easily go back to 'cultivating the land,' they noted, 'only those who are

[420] Ahuja, 'Labour Unsettled: Mobility and Protest in the Madras Region, 1750-1800,' 385.
[421] 22 April 1784, BL, IOR/P/240/58.
[422] 27 June 1784, BL, IOR/P/240/59.
[423] 31 Dec. 1784, BL, IOR/P/240/59.

trained and educated in [the boats] can be depended upon as really useful or serviceable.'[424] It took months—and physical coercion—for the boatmen to return to Madras, but many likely did settle permanently in the city, as boat owners who petitioned the Board of Trade in the 1790s described themselves as descendants of the Hindu boatmen brought to Madras.[425] After the cessation of the Third and Fourth Anglo-Mysore Wars in the 1790s, the practice of hiring boatmen from outports to work at Madras faded away, and the discussion shifted to focus on retention.

Boat hire

Standardised boat hire through a Boat Pay Office was a tool for ensuring merchants and passengers were charged fair rates, paying the officials of the Boat Department, and paying the boatmen adequate wages. In 1762, Master Attendant Baker suggested raising the boatmen's wages on every trip, and paying crews held alongside a ship for a full day the equivalent of four trips for their wasted time. His regulations stipulated that 'each boat shall be paid the whole of her earnings every evening on applying to a Person at the Sea Gate appointed for the purpose by the Master Attendant,' but did not specify who can collect the earnings for the boat.[426] This meant that boat owners or their representatives would collect pay on behalf of each boat and then distribute it as they pleased, rather than in alignment with the Company's rates of hire.[427] The theoretical rate of pay for the boatmen was raised in 1766 to reflect 'their very laborious employs, and the risk they run, through the raging and perpetual surf,' and the numerous days on which the surf prevented them from making

[424] 31 Dec. 1784, BL, IOR/P/240/59.
[425] 1795, BL, IOR/F/4/2/626.
[426] 5 Oct. 1762, BL, IOR/P/240/20.
[427] 3 Dec. 1782, BL, IOR/P/240/55.

more than one or two trips a day; but no changes were made in how pay was distributed, so it is unclear whether the boatmen saw any increase in their wages.[428]

Messrs Stowe and Jourdan advised Governor-in-Council Wynch in 1775 that because of a recent rise in the price of provisions and 'from the fatigue and danger attending their employ,' the boat people required another raise. At the same time, they suggested that pay should be distributed nightly at the Master Attendant's house, to finally ensure each man received his specified cut for the day, which the Board of Trade approved of as 'encouragement for the boatmen.'[429] The pay structure was changed again in 1792, when a new set of regulations stipulated that wages would be distributed to the boat *maistries,* who were then to redistribute the funds amongst the crew, owners, and *tindals* according to set proportions, rather than individual boatmen collecting their own pay.[430] This did not result in the fair distribution of wages, but individual payment was not reinstated until 1797.[431] The reversion to an individualised payment scheme was meant to not only ensure the boatmen were receiving their full proportion of the boat hire per trip, but also to keep them from absconding the settlement and to reduce theft as a means of supplementing lost income.[432]

While the rate of hire and pay of the boatmen was altered several times between 1792 and 1842, it was not a part of Board of Trade and Marine Board conversations around the Boat Department as it had been earlier in the eighteenth century. Pay did however remain a concern for the boatmen themselves. The entire fleet struck in both 1827 and 1828 in protest of their low earnings and working conditions. The Secretary of the Marine Board wrote to the Government in Council on the morning of March 14, 1827, that 'at a muster

[428] 12 April 1766, BL, IOR/P/240/24.
[429] 24 March 1775, BL, IOR/P/240/39.
[430] 'Regulations for the Boat Department' (11 October 1792).
[431] 'Regulations for the Boat Department' (31 January 1794).
[432] 24 Feb. 1797, BL, IOR/P/241/70.

of the Masulah Boats this morning, the whole of the crews refused to work and have since absconded from the beach altogether…it appears that their only grievance is the insufficiency of their hire.'[433] On the 15th, the Marine Board met with ten of the *tindals* leading the strike, and discerned they 'had no real grievance to bring forward on the occasion, and that their only motive for refusing to work, was to obtain an increase of hire.' The Marine Board agreed to put their petition before government, on the stipulation that the boatmen return to work the next day. Master Attendant Edward Gascoigne was ordered to further investigate the claims of insufficient pay, but he found that the boatmen's earnings had risen in the previous ten years and reported no need to fulfil their demands.[434]

This rebuttal did not stop the boatmen from striking again in June 1828. The *Asiatic Journal and Monthly Register* attributed the 1828 strike to 'the very low wages they receive for their arduous employment,' and noted that 'not a boat could be got by fair means or foul to land the troops from the H.C.'s ship *Fairlie*…all business was at a stand owing to this untoward event.'[435] The Secretary of the Marine Board provided more detail to the Government in Council later in July, explaining that the boatmen could not be enticed back to work by force, but instead returned only after the Master Attendant, William Majoribanks, agreed to pay their demanded wage increase out of his own pocket. The Marine Board ultimately decided that the amount agreed to by Majoribanks, which amounted to an eighty five percent raise in the South Roads and a ninety percent raise in the North Roads, could not be allowed to stand. But they also recognised that the earning potential of the boatmen, due to a decrease in the number of ships arriving at the port, had fallen from an estimated four trips per average day to three. The solution was to give over the Company portion of the Boat hire to the boatmen, instead of raising the fees passed on

[433] 12 March 1827, BL, IOR/F/4/1188/30855.
[434] 20 June 1827, BL, IOR/F/4/1188/30855.
[435] 'Mutiny Amongst the Boatmen,' *The Asiatic Journal and Monthly Miscellany* [London] vol. xxvii, (January 1829), 95 col a-b.

to shipping. A lengthy investigation into the management of the Boat Department under James Grant, Master Attendant in the 1820s, vindicated the boatmen's displeasure over their real wage rates; the investigation found that during Grant's tenure, 'the pay of the boatmen was subjected to various improper and arbitrary deductions which left the men without a sufficiency for subsistence, to which their pay under just and fair management would have been adequate.'[436]

The 1842 Boat Act ended government intervention into the wages of individual boatmen. The Boat Act, which was a result of nearly ten years of debate surrounding the Boat Department, ended the 'Boat Monopoly,' through which the government contracted with a specific list hereditary boat owners and controlled the pay of the boatmen through a Boat Pay Office without actually employing any individual boatmen. Pay versus performance was a popular theme in the debate surrounding the Boat Monopoly; anti-monopolist members of the Marine Board felt that by equally distributing boat trips through the Boat Pay Office, industrious boatmen were placed on the same footing as lazy or incompetent boatmen, and that it was unfair that none were given the opportunity to earn more than others through greater effort. Those in favour of the monopoly felt that the equal distribution of trips by the Boat Pay Office helped prevent the service from being dominated by a particular owner or subset of the fleet.[437] The anti-Monopoly faction eventually won out, but the abolition of the Boat Monopoly was ultimately detrimental to the earning potential of most, if not all, of the boatmen, and negatively impacted shipping in the roads more generally.

The end of the Boat Monopoly resulted in new pay-related pressures on the masula fleet. While the new system of management was supposed to encourage industrious

[436] 5 Nov. 1830, BL, IOR/E/4/939.
[437] 27 Feb. 1839, BL, IOR/F/4/1806/74212.

boatmen and rely on principles of supply and demand to ensure the number of boats and crews available would mirror the needs of the shipping in the roads, it instead led to ever-rising prices that soared far beyond the set maximum rate of hire, the monopolisation of the fleet by a small subset of powerful owners, and a reduction in earning potential of individual boatmen. The 1842 Boat Act removed protections that the boatmen had relied on to make a sufficient income, especially in periods of low trade volumes. Crews repeatedly broke sections eight and eighteen of the Boat Act, which dictated the maximum rate of hire and prohibited boats from going alongside ships before they were anchored and the Master Attendant's boat or catamaran-man had made preliminary contact.[438]

Prosecutions under section eight for overcharging for services did not act as sufficient deterrent, and in 1869, in response to the increasing prices of boat trips, the Boat Act was revised to increase the legal rate of hire.[439] This was met with criticism in the English language press at Madras, which claimed that the increase in price would simply embolden the boatmen to demand an even higher rate.[440] Instead, it led to an increase in violations of section eighteen in the 1860s and 1870s. Madras' economic fortunes were suffering from the opening of the Suez Canal and the lack of completed and usable port facilities.[441] Trade volumes changed dramatically year-to-year in this period, and the number of boatmen employed by the fleet shifted accordingly, dropping from 2,528 adults and 325 boys in 1869-70 to 2,210 men in 1870-1, then rising precipitously to 4,289 men

[438] 'A Boat Accident,' *Madras Mail* [Madras] no 259, (30 October 1871) 3 col c; 'A Floating Nuisance,' *Madras Mail* [Madras] no 228, (18 September 1869) 3 col c; 'Boat owners in trouble,' *Madras Mail,* [Madras] no 262 (31 October 1870) 3 col a; 'The Collision in the Harbour,' *Madras Mail* [Madras] no 273, (20 November 1880) 7 col g; 'Prosecution of Masula Boatmen,' *Madras Mail* [Madras] no 254, (29 October 1887) 5 col a; 'Rash Navigation,' *Madras Mail* [Madras] no 48, (26 February 1889) 5 col a; 'The Boat Act,' *Madras Mail* [Madras] no 190, (13 August 1889) 4 col b; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, 119.
[439] Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1870-71,* 119.
[440] 'The Boat Act.'
[441] Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*, 93.

and 440 boys by 1876, only to fall again the next year to 3,560 men and 275 boys.[442] This meant that from year-to-year, the number of masulas was either too small or too large to meet the merchant demand. In times where there were too few boats, complaints from the merchant community about overpriced transport increased. In years where there were too many masulas, boatmen were unable to make sufficient wages, leading to a reduction in the fleet and increasingly desperate maneuvers to obtain business. Competition within the masula fleet was fierce. In 1871, a year of economic downturn for Madras and a masula fleet that was too large for the needs of the port, the administrative report for the Presidency noted that a subset of boat owners, who also served as dubashes, were undercutting the new rate and outcompeting the other owners. A group of boat owners had approached the Board of Commerce to request the Boat Pay Office be reinstated to prevent the dubashes from undercutting the rate and monopolising the boat traffic.[443] The monopolisation of the fleet by a subset of the owners, the unpredictable year-to-year trade volumes, and the eventual construction of a pier drove some owners to push their crews to approach ships early, risking fines under section eighteen in order to do any business at all.

Several court cases around violations of section eighteen were reported in the Madras newspapers in the 1870s and 1880s. Masulas tying up to ships before they had anchored were portrayed in the *Madras Mail* as a great irritant; an article from 1869 detailed a violent altercation between a steamer captain and boat *tindal*, who with his crew took 'possession of her deck as if it were their own.' In this instance, the *tindal* was fined Rs. 15 (£1.10.0.).[444] In a similar case from October 1870, three boat owners, Soobaroyaloo Naick,

[442] Madras Presidency, 94; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, 124; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1876-77*, 124; Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1877-78*, 110.
[443] Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, 124.
[444] 'A Floating Nuisance.'

Cundasawamy Naidoo, and Ramdoss Moodly, were fined 20, 10 and 10 rupees (£2/£1) each, for 'allowing their boats to run alongside the steamer *Oriental* before she was anchored.'[445] A decade later, Govindu Naidoo and John Teddy were also charged under section 18 for 'holding communication by boat…with the ship *Ixopo* before the Master Attendant's catamaran had boarded the said vessel.' Both were fined 20 rupees, but Teddy was required to return the following day to be charged for a second offence, lying alongside a vessel after hours.[446] Eight *tindals* were charged in 1887 for the 'rash and negligent act in going along the B.I. Steamer *Scindia* as she was entering the harbour.' Three of the eight had been charged on similar offenses in the past, and their fines reflected their prior offenses—two men received the high fine of either 25 rupees (£1.17.9) or seven weeks' rigorous imprisonment.[447] Other reports of crews approaching ships before they were anchored include the collision between two masulas and the steamer *Himalaya* in 1871, when one of the masulas was smashed in the ship's propeller, and a second accident in 1880 when a masula prematurely tied up to the ship *Asia* was smashed when the *Asia* collided with the *Scindia* on the approach the harbour.[448]

Prizes and Support Funds

The assurance of daily pay and a living wage was just one incentive offered to the boatmen to keep them working for the port of Madras. They were occasionally rewarded for one-off instances of service—for example, in 1820 the Marine Board spent 150 pagodas (Rs. 525, £52.10.0) on wool hats as rewards for good conduct and in 1828 Rs. 100 (£10) were granted to several boatmen who recovered treasure lost in crossing the surf.[449] Travel

[445] 'Boat Owners in Trouble.'
[446] 'Marine Prosecution,' *Madras Mail* [Madras] no 170, (22 July 1880) 3 col b.
[447] 'Prosecution of Masula Boatmen.'
[448] 'A Boat Accident'; 'The Collision in the Harbour.'
[449] 'Public Consultation No. 41,' 18 Feb. 1820, BL, IOR/E/4/923; 'Public Consultations,' 3 Sept. 1828, BL, IOR/E/4/936.

accounts and journals also occasionally record prizes given to the boatmen. James Wathen, writing of his 1811 trip to Madras, mentioned that catamaran-men received medals for saving the lives of passengers, and Maria Graham recorded in 1813 that 'Medals are given to such of the boatmen as have saved drowning persons, or have distinguished themselves by fidelity in carrying papers or conveying provisions and passengers through the surf in dangerous weather.'[450]

Besides small and irregular signs of appreciation, there were also established funds to support the boat and catamaran-men. An increase in wages during the monsoon season introduced in 1782 was meant to incentivise the boatmen to work in poor weather.[451] An alternative monsoon fund, or 'assessment for boat people during the monsoon season' introduced in 1798 was meant to instead support the boat people when they were unable to work due to rough weather.[452] This version of the monsoon fund was continued until it was joined with a Disabled Boatmen's Fund in the 1842 Boat Act to become the 'Modern Disabled Boatmen's Fund.'[453]

The original Disabled Boatmen's Fund developed out of Master Attendant Baker's 1762 regulations, which stipulated that half a fanam from each boat trip be put into a fund for 'the relief of such as have been disabled or are grown old and infirm in the service.'[454] Extra Sunday charges had been collected from at least the early 1750s on behalf of the church and used to fund a school, but in 1765, the minister asked that all Sunday extra hire be put towards helping maimed and sick boatmen.[455] The Disabled Boatmen's Fund was reimagined in 1775 as a means of ensuring good conduct—Master Attendant Reynold

[450] Wathen, *Journal of a Voyage, in 1811 and 1812, to Madras and China, Returning by the Cape of Good Hope and St. Helena; in the H.C.S the Hope, Capt. James Pendergrass*, 27; Graham, *Journal of a Residence in India*, 128.
[451] 6 Dec. 1782, BL, IOR/P/240/55.
[452] 9 Dec. 1796, BL, IOR/P/241/68.
[453] 22 Sept. 1844, BL, IOR/E/4/961.
[454] 5 Oct. 1762, BL, IOR/P/240/20.
[455] 25 Feb. 1765, BL, IOR/P/240/23; Love, *Vestiges of Old Madras,* 2:433.

Adams was instructed to give certificates of approbation to boatmen whose 'diligence and good behaviour should merit it.' These certificates then had to be presented with any application to the Disabled Boatmen's Fund, and only those with documented good conduct, and no record of theft or other petty crime, would be given funding.[456]

According to its critics, the mere existence of the fund did not mean it was of great use to the boatmen, however. It was poorly managed and the collection of extra hire was sometimes neglected. An investigation into the management of the fund by the Court of Directors in the 1830s found that there was confusion over who was supposed to be managing the fund and that the money collected had not been properly invested as directed. The Marine Board had overdrawn the fund paying medical bills, was unable to assist many of the boatmen and their families who asked for access to the fund, misappropriated funds collected for other purposes, and put the burden of supporting injured boatmen on the boat owners, sixty-one of whom signed a letter complaining about mismanagement.[457] This mismanagement was seen as a symptom of wider overreach into the operation of the boats by those against the Boat Monopoly more generally.

As a result, the Disabled Boatmen's Fund was overhauled as part of the modernisation of the Boat Department in the early 1840s. The 'Modern Disabled Boatmen's Fund' combined the old Disabled Boatmen's Fund, the Monsoon Fund, and the Compensation Fund, originally conceived as a means for repaying owners whose cargo had been lost or stolen in transit.[458] The new Fund was dependent on license fees, mulets and fines, in addition to the extra Sunday boat hire.[459] Any person connected with the Boat Department who could produce certificates explaining their claims for relief would be admitted as a pensioner and receive funding relative to their needs on the first day of each

[456] 24 March, 1775, BL, IOR/P/240/39.
[457] 'Petition to Captain C. Dalrymple, Master Attendant,' 27 April 1837, BL, IOR/F/4/1727/69723.
[458] *The Madras Almanac and Compendium of Intelligence for 1843.*, 458–59.
[459] 22 Sept. 1844, BL, IOR/E/4/961.

month. The Monsoon Fund, which previously had been paid out to all boatmen during the winter months, was now instead based on voluntary contributions of whatever proportion each boat crew decided. Any boatmen who wanted to participate in the Monsoon Fund had to register with the Master Attendant's office, and if an individual did not wish to participate, he would not be entitled to the monsoon fund for that year.[460]

How effective these funds were at ensuring the continued presence and good conduct of the boatmen is not easy to ascertain without the testimony of those who used—or were unable to access—the funds. If the funds were really limited to those with no petty crime or theft on their record, the number of boatmen eligible may have actually been quite small, as it appears that whole boat crews were considered complicit in instances of theft in the boats.[461] In 1835, only fifty male pensioners and fifty-five female pensioners were being paid monthly, and the fund was incapable of supporting new pensioners until an existing pensioner died or returned to work.[462] At a period where there were an estimated 1,200 boatmen working in the port, this represents less than nine percent of the boatmen or their families, suggesting that the reach of the fund was limited and therefore may not have been a large incentive for the boatmen to remain at Madras.[463] A set, relatively protected income, opportunities for supplementing that income through theft, and the perhaps limited threat of punishment, may have been more significant motivators for boatmen to remain at Madras, at least in the period prior to the end of the Boat Monopoly.

Punishment

[460] *The Madras Almanac and Compendium of Intelligence for 1843.*, 458.
[461] 20 June 1827, BL, IOR/F/4/1188/30855.
[462] 'Arthur J Maclean Esq., Secretary to the Marine Board, to the Chief Secretary to Government, Fort St George,' 28 July 1836, BL, IOR/F/4/1727/69723.
[463] 27 Oct. 1836, BL, IOR/F/4/1806/74212.

Punishment on the beach was also used to maintain order in the fleet. Ravi Ahuja has argued that in the eighteenth century, coercion and threat of corporal punishment were seen as necessary to 'enforce discipline and obedience on plebians,' and that European merchants and officials considered a Master Attendant who was not able to inflict corporal punishment when necessary ineffectual.[464] While floggings and other public punitive actions were used to keep the boatmen in line, the offenses that merited punishment and the nature of the punishment was not codified in all of the regulations. For example, Baker's regulations from 1762 stipulated that, 'the Master Attendant is diligently to enquire into the Behaviour of the Boatmen, cattamaran, and Head and Back cooleys,' but punishment was left to the owners. Complaints about the Master Attendant carrying out punishments on the beach himself appeared several times in the following decades.[465] George Taswell was accused of unjustified beatings by the catamaran-men and anchor divers in 1777, but he maintained 'that they were never flogd by him or his order…that they are a troublesome set of people very negligent and given to drink, and have frequently obliged [him] to employ others on account of their being absent when required for the work of the road.'[466] The owners complained in 1782 that while under Baker, 'when any of the coolies were found guilty of any misdemeanor your petitioners were sent for to see them punished' now under Cuthbert,

> his usage of us has been cruel in the greatest degree, continually flogging us without the least faults or reason and many of the coolies ran away, so that your Petitioners finding it impossible for them to manage their business and to bear with such treatment they were obliged to take their leave from Mr Cuthbert and remained at their own houses.[467]

Cuthbert responded that '...the men could not be controlled without punishments, and referred to the Captains who frequented the Beach house to confirm his view.'[468] Master

[464] Ahuja, 'Labour Unsettled: Mobility and Protest in the Madras Region, 1750-1800,' 402.
[465] 5 Oct. 1762, BL, IOR/P/240/20.
[466] 20 Aug. 1779, BL, IOR/P/240/48.
[467] 11 Nov. 1782, BL, IOR/P/240/55.
[468] Love, *Vestiges of Old Madras,* 3:79.

Attendant Thomson anxiously attempted to use corporal punishment to gain some semblance of control over the fleet in the early 1780s, but wrote to the Board of Trade that while he was empowered to punish boatmen for thefts committed afloat, he had no means to punish boat owners who failed to supply the necessary number of boats on a daily basis, greatly endangering function of the port and shipping in the roads.[469] In 1796, the then-deputy Master Attendant William Abbott's servant Appoo Moodelly was accused of

> having tied [several of the *tindals*] in a tree and flogged them severely…[he] also sent sepoys with their Firelocks, and with some peons together who entered your petitioners houses and ill used [them] very unlawfully and even brought your petitioners in the Guard as guilty and committed to confinement very closely at the Beach for two days without their Victuals…they unjustly without the meanest fault have tied to several of your petitioners crews and their wives in trees and flogged [them].[470]

Taswell, after his reappointment as Master Attendant in 1797, requested the power to punish boatmen on the beach for thefts without trial, to save captains of ships in the roads the trouble of staying for a trial. His request was granted in 1798, and in the early nineteenth century, Taswell was also appointed a rotating beach magistrate.[471] This meant he was paid to investigate, prosecute and rule on cases of theft, drunkenness, nonattendance, and other disorders on the beach. The practice of allowing the sitting Master Attendant to simultaneously hold the position of beach magistrate was ended by the Court of Directors in the mid-1820s, who argued that it was anathema to fair treatment.[472]

Corporal punishment was still part of the regulation of the beach in the mid-nineteenth century; the 1842 Boat Act included punishments for willful neglect and refusal to work when able which consisted of fines for owners and floggings on the beach for boatmen.[473]

[469] 6 June 1783, BL, IOR/P/240/56.
[470] 7 Dec. 1795, BL, IOR/F/4/2/626.
[471] 24 June 1797, BL, IOR/P/241/73; 'Madras Public Proceedings,' 29 Sept. 1797, BL, IOR/P/241/75; 28 Nov. 1820, BL, IOR/F/4/1188/30855.
[472] 'Public Consultations No. 171,' 8 March 1826, BL, IOR/E/4/932.
[473] Theobald, *The Acts of the Legislative Council of India, with a Glossary; an Analytical Abstract Prefixed to Each Act, and Copious Indexes.*, 526–43.

As late as 1881, the efficacy of corporal punishment on the beach was under debate as part of revisions to the Marine Police Bill. The Commander in Chief of Police felt that the current maximum punishment of sixty lashes for refusing to work when asked was too severe, and that corporal punishment was soon to be out of style. Gajaputti Rao suggested that lashes be replaced with fines, as flogging would 'inflict a sense of self-degradation on the victim,' while others argued that some offences could only be punished with flogging. In Britain, the use of corporal punishment had declined significantly over the course of the nineteenth century, and flogging had been abolished in both the Royal Navy and the British Army in 1879 and 1881 respectively.[474] Nettlebeck has argued, however, that corporal punishment continued in the colonies as a racialised punishment meant to reinforce colonial control; perhaps not surprisingly in a space defined by a struggle for control, the resolution to change the punishments failed to make it into the final revised bill.[475]

Recruitment, setting the rate of boat hire, offering prizes and support funds, and financial and corporal punishment were means by which the Madras government attempted to mitigate the issue of labour supply and retention. The environmental constraints under which the boatmen worked, however, affected the efficacy of these solutions. Recruitment from the surrounding areas still required new boatmen to already possess the requisite skill needed to pass through the surf. It also jeopardised the government's relationship with the boatmen already working in the port—if the existing community absconded, as often threatened, the port would again be left shorthanded. While setting a standard rate of boat hire was a more effective means of retaining the services of the boatmen, the Boat Department still struggled at times with crews using their boats to fish instead of work in

[474] Johnston, '"Arbitrary and Cruel Punishments:" Trends in Royal Navy Courts Martial, 1860-1869,' 536; Killingray, '"The 'Rod of Empire": The Debate over Corporal Punishment in the British African Colonial Forces, 1888-1946,' 203.
[475] Nettelbeck, 'Flogging as Judicial Violence: The Colonial Rationale of Corporal Violence,' 112; 'The Madras Legislative Council—The Marine Bill,' *Madras Weekly Mail* [Madras] no 3, (20 January 1881), 22-3 col c-a.

the port. The threat of punishment was also lessened by the physical nature of the surf zone; individual boatmen could not easily be seriously punished or transported because of their skill, and the community as a whole was at least partly impervious to punishment as a result of their documented willingness to abscond the settlement or strike. Environment, technology, and skill combined caused the Madras government's struggles with exerting control over the process of ship to shore movement through regulatory and legislative means.

Conclusion

Officials of the Madras Board of Trade and Marine Board perceived three main obstacles to the smooth operation of the port—the difficulty of maintaining an adequate number of boats, endemic theft in the process of transport, and the struggle to attract a sufficient labour force. Properly relating the demands of ships in the roads to the size of the masula fleet was a difficult proposition; uneven access to supplies from the Malabar Coast and Ceylon, alongside recalcitrant (or simply differently motivated) boat owners meant that repairs and rebuilding of boats often did not happen very quickly. The lack of consistent boat availability led native grain merchants to threaten not to return on multiple occasions and coincided with a decline in international shipping through Madras. Struggles with reducing theft, which was consistently and creatively attempted to no avail, also led officials to worry about the endurance of the port; in this case, the concern was that if rates of theft rose too significantly, business conducted through the port would dwindle. Keeping a knowledgeable labour force employed in the boats was a struggle because while imperative and dangerous, working in the port was not a particularly lucrative pastime for the boatmen, and on numerous occasions they made their displeasure with their working conditions known by absconding the settlement and going on strike. All these obstacles, however, are

a direct result of the unfavourability of the environmental conditions experienced at Madras for facilitating seaborne trade. The regulatory solutions aimed at overcoming them failed because their environmental underpinnings went unaddressed.

In addressing these obstacles via oft-revised sets of regulations, government officials situated the unusual measures required for crossing between ship and shore in a global and imperial context. They worried that the 'port'—which was really just a wide-open and undefined roadstead—would decline with international shipping interests in favour of other, better-appointed and safer Indian ports. This concern was not without foundation. Trade out of Madras peaked in the 1680s, and had been slowly declining over the course of the eighteenth century as trade interests turned away from finished goods and towards raw materials, resulting in the consolidation of international trade in Bombay and Calcutta.[476] By the nineteenth century, when both Bombay and Calcutta were continuing to grow in global importance, Madras's international trade had shrunk precipitously—in the late 1830s international shipping tonnage between Bombay and Britain was twice that of Madras, while Calcutta was servicing nearly five times the volume.[477] By the 1860s, Madras was still servicing less than half the international shipping as compared to Calcutta or Bombay.[478] The low volume of trade processed through Madras in the nineteenth century was directly attributed to the boat system by members of government and the public; for instance an 1860s report on declining international trade found the prime culprit to be the price, danger, and inconvenience of the masula fleet, noting that 'Notwithstanding the skill of the boatmen, the danger to goods from spray, and from shipping seas in crossing the

[476] Basu, 'Madras in 1800: Perceiving the City,' 222.
[477] 'Trade with India,' *The Asiatic Journal and Monthly Register* [London] vol xxvii, (September-December 1838) 68; in 1838, the total tonnage of ships from Madras to British ports was 6,291 tons, while the total tonnage from Bombay was 12,392 tons and from Calcutta was 34,397 tons.
[478] Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1866/67*; State, *Report on the Administration of the Bombay Presidency*, 350; Bengal Presidency, *Annual Report on the Administration of the Bengal Presidency*, xxxvii.

surf, is a very serious consideration.'[479] Even here, issues with the environmental context—in this case, damaging salt spray—was the root cause for concern.

Examining day-to-day regulations and administrative activities in the Madras littoral demonstrates its varied and contested history, shaped by an undercurrent of conflict between the Company and the boat people. The surf zone arises as a space in which the Company attempted to exert control administratively over a long period of time, but continuously failed to greatly diminish uncertainty, risk, and inefficiencies. The approaches to perceived technical and social obstacles deployed by a number of different administrators reflected shifting military concerns, economic policy, and attitudes towards local native labourers. But the proposal of broad social and economic solutions failed to dramatically alter the experience of moving between ship and shore because the environmental constraints of the passage were not effectively addressed. Attacking a techno-environmental problem with social and regulatory solutions proved insufficient for bringing the passage under the full control of the British government at Madras.

[479] Macgeorge, *Ways and Works in India*, 515.

Chapter 5: (Non) Construction in the surf zone

In his 2003 littoral history *The Indian Ocean,* Michael Pearson asserts that 'Turning Chennai into a viable port was one of the great achievements of British colonial engineering.'[480] He then acquiesces that it took a very long time and details a fifty-year struggle between the approval of a plan for an artificial harbour in 1872 and the completion of 'a decent port' in 1925. This thesis, however, has shown that the British struggle to turn an exposed beach into a viable port, consisting of social and regulatory attempts to shape littoral space, long predated Pearson's 1872 date. Concurrent with social and regulatory changes, however, was a growing effort to solve Madras' environmental conundrum through technological innovation. As a result, by the time harbour construction began in 1872, port administrators and utilisers had suggested, attempted, and discarded a century's worth of building proposals, half-finished projects, and smaller pieces of infrastructure. This chapter argues that histories of technology in colonial spaces ought to address both projects that were attempted or completed and include rejected proposals and failed initiatives. This shows decisions about what and when to build at Madras were dependent on not only engineering prowess and innovation, but also financial concerns and changing metropolitan attitudes towards the relative importance of local expertise.

This chapter draws on a social-constructivist framework for the history of technology in empire to analyse the century-long process of (non) construction of port infrastructure in the Madras surf zone. It places proposed and rejected plans on equal footing with projects that were approved and attempted. Attempted projects differed from rejected projects in terms of feasibility and circumstance—most of the proposals that were attempted benefitted from an increasingly centralised political decision-making process, a

[480] Pearson, *The Indian Ocean*, 215.

growing dependence on metropolitan engineering expertise in place of local and nautical expertise, and the diminishing effectiveness of the masula fleet, brought on by changes in the administration of the fleet and the volume and types of cargo moving through the port. As the process of selection became more centralised, the local considerations that would have helped adapt plans to the specific requirements at Madras played less and less of a role, ultimately resulting in the construction of a series of structures that were poorly suited to the surf zone.

This chapter begins with an overview of the existing historiography on the role of technology in British imperial contexts. It then examines the reasons for and against building port infrastructure at Madras, followed by an outline of a selection of the many proposals for improvement of the Madras surf zone set forth between the 1770s and 1890s. In the interest of space, I have chosen to primarily focus on proposals that were officially assessed by a body with the authority to either directly approve proposals or recommend them to one that did—for example, most plans that were described in pamphlets or engineering magazines but never formally submitted for review are not included here. Finally, the chapter argues that shifting local and imperial contexts impacted what types of infrastructure were built as well as if and how designs were adapted to Madras. As the British consolidated political power in India after 1859, the local and financial barriers to infrastructure projects lessened in relation to perceptions of theoretical metropolitan engineering expertise and cultural expectations of technological superiority.

The role of technology in empire

The importance of innovative European technology to nineteenth-century imperial expansion and the colonial state has been emphasised by a number of historians. Daniel Headrick has argued that new technologies, like steamships, railways, and quinine, facilitated European expansion and governance in Africa and Asia, leading to the growth

of imperial holdings and making communication between continents quicker and easier.[481] Michael Adas has further asserted that British technological advances eased the acquisition and governance of colonies, and as a result nineteenth-century Britons increasingly used technology as the metric by which they measured their 'superiority' over colonised populations.[482] That the British, and in particular the Victorians, saw themselves as superior on the basis of their technologies has become widely accepted and used as a starting point for new work on the role of British technology in empire.[483] But defining 'technology' in imperial settings as strictly things with a European origin means that the impact of any number of indigenous technologies on the daily experience of empire have not been included in this historiographical tradition. It also does not account for technological *failure* in imperial settings, due to new and different environmental, social, or political contexts.

Other historians of technology in empire highlight the many cases in which European innovations were unsuited to new physical, social, and political contexts. David Arnold argues that while India has been taken to exemplify the 'massive transfer of technology from the West to Africa and Asia,' the 'transfer of technology' argument is a 'one-dimensional idea, stressing the dynamism of the West but ignoring the context in which new technologies were employed.'[484] In examining the cultural construction of large-scale technologies of empire, Marsden and Smith further emphasise the issue of relative failure in imperial contexts. They argue that only with a 'deep understanding of colonial conditions' could technology be successfully and sustainably adapted to different colonial contexts. The fact that 'most British engineers regarded the technologies they were designing or adapting to be superior to native or indigenous technologies' was complicated

[481] Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century*, 11.
[482] Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*, 4.
[483] For example, Arnold, 'Technologies of the Steam Age,' 105; Kubicek, 'British Expansion, Empire and Technological Change,' 248; Schäfer, 'Technology and Innovation in Global History and in the History of the Global,' 149.
[484] Arnold, 'Technologies of the Steam Age,' 92.

by the demands of local environmental and market conditions.[485] Improvement in design or productivity did not equal commercial success if a new technology did not also match the conditions under which it was to be sold and used. As pointed out by Simon Werrett and Clive Dewey, any number of issues could arise with objects designed and manufactured in England and sent abroad, down to things as simple as a failure to account for seasonal changes in river depths and relative humidity.[486]

Broader arguments within the history of technology provide ways of thinking about the experience of failure or struggle in the application of Western technologies to colonial contexts in Asia and Africa. Historians engaged with failure have found that there is a disconnect between innovativeness, usefulness, and success. The theoretical innovativeness of an idea is only one marker of success; a technology deemed 'successful' in one physical, social, or political context does not necessarily translate seamlessly into any other context.[487] Instead, the specific times and places in which innovations arise have a significant impact on ideas, method, means of production, distribution, reception, and use. In other words, the success of any given technology is socially contextualised, or based on factors outside of the technology itself. Social constructivists argue that what the modern historian considers instances of success and failure should be examined on equal terms to unpack the influence of a variety of general social conditions.[488] Failure, therefore, is a necessary component to understanding technological development, application, and change, and helps highlight the importance of extra-technological influences on the process of both design and implementation. Fully uncovering the role of technology in the conquest

[485] Marsden and Smith, *Engineering Empires: A Cultural History of Technology in Nineteenth-Century Britain*, 1; 111.
[486] Werrett, 'Technology on the Spot,' 604; Dewey, *Steamboats on the Indus: The Limits of Western Technological Superiority in South Asia*, 4.
[487] Gooday, 'Rewriting the "Book of Blots": Critical Reflections on Histories of Technological "Failure,"' 276.
[488] Bauer, 'Failed Innovations--Five Decades of Failure?,' 35.

and administration of imperial spaces, requires a detailed consideration of the specific context in which a technology was applied. The effective application of technology in imperial spaces, be it something as small as a mechanical loom or as large as a railroad, required an in-depth accounting of the local physical, political, economic, social and temporal conditions, and without such an accounting the longevity and success of new technologies was not guaranteed. Locality mattered tremendously.

Building in the surf zone: the pros

Several practical imperial considerations spurred investment in the Madras surf zone. In the mid-nineteenth century there was an abrupt uptick in British infrastructure projects in India generally, most famously the railways and roads. The resultant increase in connectivity expanded the potential hinterlands of the major Indian ports and increased the speed at which materials consolidated at ports for reshipment.[489] Frank Broeze argues that the completion of the Suez Canal in 1869 led to a 'promethean First Wave of modern port construction' in answer to the needs of the larger and faster steam fleets that were arriving in India's major ports of Bombay, Calcutta and Madras.[490] Steam ship lines put greater and greater pressure on outports to provide modern facilities, demanding fast turnaround times and reducing the number of ports of call on their regular sailing schedules. To attract or maintain business, ports had to be kept ready to meet the demands of the ships themselves.

At Madras, the demand for efficiency posed by steam was a real concern, as unloading and loading of cargo through masulas could take up to a month to complete. Furthermore, the influx of prefabricated iron bridge and railway components arriving from Britain for installation in India posed significant difficulties for the masulas, which could carry a maximum of two-tons of deadweight, and could not easily transport large or

[489] Kidwai, 'Conceptual and Methodological Issues: Ports, Port Cities and Port-Hinterlands,"'22; 13 Feb. 1875, BL, IOR/C/138.
[490] Broeze, 'The Ports and Port-System of the Asian Seas: An Overview with Historical Perspective from c. 1750,' 84.

unusually-shaped cargoes.[491] Colonel Arthur Cotton, a proponent of Indian infrastructure projects, argued in 1858 that some sort of construction was needed in the Madras surf zone, writing that 'the port is now totally out of keeping with the whole of the present system of management of the country. To spend 3 millions on a railway…to end it in a massulah boat, is altogether preposterous.'[492] The delays and difficulty in unloading cargo, Madras officials feared, would chase away potential business.

The construction of colonial port infrastructure also helped maintain commercial dominance among a network of regional ports. The poor facilities at Madras meant that despite being the capital of the Presidency, the port struggled to consolidate Coromandel Coast trade. Instead, the coastline was dotted by a series of smaller ports that diluted the shipping that could, if Madras was markedly safer or quicker to use, have been subsumed into its hinterland.[493] To consolidate trade and survive as a port, Madras needed to appear more attractive than other options for local and international shipping. Building infrastructure was seen as a way to draw potential shipping, and the lack of infrastructure as a primary reason for why trade volumes were low. The open roadstead was portrayed as one of the 'greatest objections' to the port and, in 1869, the *Annual report for the Administration of the Madras Presidency* stated that a plan was in development for a breakwater and expansion of facilities specifically with an eye to attracting new steam traffic. The report noted that the want for a 'special anchorage, for steamers, close in shore…is represented to be a cause of inconvenience to the mercantile community.'[494] In

[491] 'Legal Intelligence: Landing Charges at Madras,' *Madras Mail* [Madras] no. 113, (15 May 1877) 3 col d-f.
[492] *Madras Journal of Literature and Science*, 154. Despite this anti-masula comment, Cotton was more broadly a significant advocate for the use of indigenous technology and experience in constructing irrigation canals in the Godavari delta. David Arnold argues that Cotton consciously built on earlier irrigation technology and 'while having a modern vision of improving India by "English energy and understanding" still freely acknowledged his debt to the "old native engineers."' Arnold, 'Technologies of the Steam Age,' 116-17.
[493] Arasaratnam, *Maritime India in the Seventeenth Century*, 117.
[494] *Madras Journal of Literature and Science*, 145; Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 90.

the drive to attract more shipping some even went so far as to suggest moving Madras' port eighty kilometres north to Armegan, where a natural shoal provided some protection for shipping.[495] While this bold plan went unrealised, it demonstrates how desperate members of the mercantile class and government at Madras were to attract a larger share of international and Coromandel Coast trade. For Madras, the demands of steam and the inevitable consolidation of ports that was the result of the adoption of steam technology, made the construction of infrastructure imperative to its continued survival.

Port facilities were also expected to benefit the city financially. While construction projects required a major outlay in capital, local commentators were convinced that the cost could be recouped, and the port could be more profitable and attract more trade if it was seen as safer and faster to use. Captain William Lennon argued in 1798 that his plan for a pier would lead not only to savings on the landing of military stores and merchandize, but that the 'great increase in convenience' would quickly attract additional trade and make up for the cost of construction.[496] An 1835 committee determined that the construction of a breakwater would result in 'the furtherance of commercial prosperity at Madras as well as the public convenience.'[497] The expectation that construction would change the financial outlook of the city makes sense; insurance premiums on goods shipped to and from Madras were a quarter of a percent higher than they were at Bombay, and it was assumed that if some protection was offered, insurance rates would drop. [498]

Not only were insurance rates higher, but the actual cost of moving cargo in masulas was also higher than at ports where cargo was loaded and unloaded from piers and jetties. Cranes could not be placed close enough to the shore to be useful in loading and unloading

[495] Cotton, 'Memorandum on the Papers Connected with the Proposal for a Pier at Madras,' 157–58; Robertson, 'Report by Mr G Robertson on the Proposed Madras Harbour, 1871,' 35.
[496] 25 June 1798, BL, IOR/F/4/1580/64266.
[497] 23 Feb. 1835, BL, IOR/F/4/1580/64265.
[498] Carpendale et al., 'Report of the Committee for the Preparation of Plans and Estimates for the Proposed Break-Water,--Dated 16th January 1869,' 14.

cargo on the beach, so the system remained based on manual labour, which led to slower and costlier transport.[499] Prior to 1842, the cost per boat trip was predetermined, but the small amount of cargo carried in each boatload led some merchants to complain about the total cost of shipment.[500] After the passage of the 1842 Boat Act and the introduction of a competition based model of hiring boats, the cost of a boat trip became more variable. Rather than a set government rate, merchants were subjected to the individual, and sometimes astronomically high, rates of the different boat owners.[501] There was also often a shortage of boats after 1842, leading to long wait times, high prices and increasing animosity towards the boat people. John McCosh railed against the boat system in the 1850s, writing, 'who can look at the present barbarous mode of transit through the surf and not feel humiliated, that all our national skill at sea is superseded by native ingenuity; Britannia does not rule the wave at Madras!'[502] Others portrayed the boatmen as having the 'upper hand' in demanding boat hire, or called them a nuisance, aggravating, and extorters, pinpointing the boat system itself as the reason why harbour infrastructure was so key.[503] The *Ceylon Observer* hailed the approval of a breakwater scheme in 1868, noting that a breakwater would 'render the shipping operations of this port independent of the uncertain aid of surf-boats' and a *Madras Mail* editorialist threw his support behind the construction of a closed harbour in 1877 because he expected massive savings when the need for masulas was done away with.[504] If a closed harbour was built, he claimed, 'a good many rupees would go into my pocket, which are now absorbed by that primitive article called a masulah boat, and which so many people wish to preserve, but I wish at the bottom of the sea.'[505]

[499] 'The Madras Pier,' *Engineering: An Illustrated Weekly Journal* [London] (4 July 1866), 177.
[500] 24 Aug, 1836, BL, IOR/F/4/1806/74212.
[501] 'Miscellaneous,' *The Friend of India* [Calcutta] no 2176, (25 November 1876), 24 col a.
[502] McCosh, *Advice to Officers in India*, 305.
[503] 'The Madras Pier' (4 July 1866); 'A Floating Nuisance'; 'Landing Charges,' *Madras Mail* [Madras] no 104, (4 May 1877) 3 col c; Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 89
[504] 'Breakwater for Madras,' *Ceylon Observer* [Colombo] no 19, (19 September 1868) 4 col b.
[505] 'Correspondence: The Harbour Question.'

In 1868, it was estimated that together, the reduction in boat hire and insurance premiums that would follow if a breakwater was built would save the shipping of the port Rs. 507,500 (£50,750) per annum.[506] Building infrastructure, it was argued, would result in a commercial boom. The hope was that if the boatmen lost the power to demand high rates, if goods were less likely to be damaged from spray and pilferage during transport, and if loading and unloading delays stopped, Madras's status in the eyes of local and international shipping would rise.

But practical concerns were not the only drivers of construction projects in the Madras surf zone. As in imperial contexts more broadly, infrastructure was also a means to assert imperial power and control. Turbulent yet featureless littorals—at least to the European eye—were a distinctive aspect of the experience of India as an alien place. The term 'surf' itself, denoting the repeated pounding of waves upon a beach, was first used in English to describe the process of landing on foreign beaches; one of the earliest uses of the word was in a description of landing at Madras.[507] Passage through the surf was violent and disorienting, and the need for masulas served as a constant reminder of the precarity of Madras' existence as a port. In the latter half of the nineteenth century, construction of port infrastructure came to be seen as a necessary signal of dominance over nature and the local population.

Infrastructure was widely used to visually signal British control in colonial contexts. In the South African colonial port of Durban, for example, the struggle to remove a natural sandbar from the harbour entrance was portrayed by engineers and port officials as a 'war,' conjuring images of struggle and the potential for bodily harm.[508] Writing about the

[506] Carpendale et al., 'Report of the Committee for the Preparation of Plans and Estimates for the Proposed Break-Water,--Dated 16th January 1869,' 14.
[507] Arnold, *The Tropics and the Traveling Gaze: India, Landscape, and Science, 1800-1856*, 138–39.
[508] Hofmeyr, 'Imperialism Above and Below the Water Line: Making Space Up (and Down) in a Colonial Port City,' 1034.

construction of railroads, roads, and canals, Nitin Sinha argues that British infrastructure in India was primarily a mechanism of control, while Susan Lewandowski argues that the seemingly random placement of government buildings around Madras created a sense of colonial monumentality and power.[509] Atiya Kidwai describes colonial ports specifically as 'the symbols as well as the immediate instruments of the grand colonial design in Asia.'[510] The reshaping of colonial port space through construction, he noted, became a means to underscore the role of the port as the connector to the 'controlling powers of the metropolis.'[511] Furthermore Isaac Land argues that for rulers, the outward appearance of a port sent diplomatic signals, established prestige, and could even offer insight into a regime's stance towards the outside world. Harbours could serve as the backdrop for occasions of state and had to provide an appropriate setting for the arrival of dignitaries and emissaries.[512] The unbroken line of Madras surf, punctuated only by the ungainly boats and harsh yelling of the masula boatmen, was a constant reminder of the lack of tangible control.

A desire to control the space of the Madras port through infrastructure was explicitly expressed. Captain Lennon, who laid the first detailed plan for a pier before the Madras Government in 1798, urged them to imagine the 'glory arising from a work that would equally contribute to the utility and magnificence of the state.'[513] In 1860, during the construction of a screw pile pier, *The Homeward Mail* celebrated the achievement, writing that 'communication with the shipping without the assistance of Masulah boats, was already practicable.' Furthermore, the *Mail* observed, 'more than one gallant ship captain

[509] Sinha, 'Questioning "Railway-Centrism": Infrastructural Governance and Cultures of the Colonial Transport System in India,' 281; Lewandowski, 'Changing Form and Function in the Ceremonial and the Colonial Port City in India: An Historical Analysis of Madurai and Madras,' 205.
[510] Kidwai, 'Conceptual and Methodological Issues: Ports, Port Cities and Port-Hinterlands,' 7.
[511] Kidwai, 30.
[512] Land, 'Port Towns and the "Paramaritime,"' 5.
[513] 25 June 1798, BL, IOR/F/4/1580/64266.

had been seen landing at the pier from his own boat.'[514] To the *Mail,* the new pier promised freedom from the masula boatmen and signalled the taming of the surf. In the *Illustrated London News's* special coverage of the Prince of Wales's visit to India in 1876, the paper made sure to mention that Prince Edward had left Madras via the pier, rather than launched from the beach in a masula.[515] Specifically noting Edward's use of the pier suggests the importance placed on its existence. Passing over the pier allowed him to visually assert his authority over the Indian landscape, but the scene was doubly important from the perspective of the occupants of Madras. The passage signalled to a wider audience that the pier was again in use, having been substantially damaged multiple times in its first decade of operation.

More commonly, though, the desire for control was expressed when there was a breakdown in perceived power in the surf zone. When a new commander-in-chief, Lieutenant-General McCleverty, arrived in 1867, the *Madras Times* reported that very high surf meant that the 'gallant general had to be drawn up from the masulah boat by a crane, just like a bale of merchandise.' Despite the potential indignity of the situation, the article made note of the fact that McCleverty was 'no griffin in India, and will think none the worse of the inhospitable shores of Madras though having to make his first appearance…in this rather inglorious fashion.'[516] But this careful note of McCleverty's perceived disregard for the ridiculousness of his arrival also signalled the social risks of his mode of arrival for a person coming into a position of authority. The idea that an undignified arrival damaged the perception of authority was revisited by an editorialist in the *Madras Mail* the very next year. As support for his argument that Madras was on the verge of fading into commercial

[514] 'The Madras Pier.'
[515] 'Departure from Madras,' *Illustrated London News: Welcome Home Number: Prince of Wales in India* [London] (16 May 1876), 14.
[516] 'Arrival of the New Commander-in-Chief,' *The Homeward Mail* [London] no 490, (6 December 1867), 17-8 col b-a.

obscurity, the editorialist referred to the removal of the Madras naval base to Trincomalee in 1817, attributing the loss to the undignified circumstances of landing. An admiral, he wrote,

> whenever he landed, was obliged, at the back of the never ceasing surf, to quit his own proud barge at some hazard of his life, and to step into one of the most inconvenient conveyances possible, a masula boat; to be then swept with almost terrific velocity through the repeated surges, in considerable danger of being swamped; ultimately to be bumped on shore like an abandoned boat or wreck, and then scramble out on men's shoulders or otherwise at the watched moment of a retreating wave.[517]

In other words, the surf and the boats negatively impacted the European passengers' ability to arrive in such a way that signalled their assumed superiority.

A desire to attract and retain shipping, to increase the profitability of the port, and to convey imperial power and control over nearshore space are all well-trod explanations for why the imperial ports of the eighteenth- and nineteenth-century were built. Such rationales for construction were also all suggested as justification for the building of new port infrastructure at Madras; there was a real fear, through the 1890s, that the city's trade would be subsumed into Bombay's growing hinterland if changes were not made.[518] However, in comparing such motivations to the actual trajectory of port construction at Madras, the historiography of port studies appears overly focused on the reasons why ports were built, and not enough on why they were not. At Madras very few of the proposals reviewed by the government between 1772 and 1895 were approved. Equally important in the case of Madras are the various rationales given for why *not* to build a port.

Building in the surf zone: the cons

[517] 'Lord Napier and the Extinction of Madras,' *The Friend of India* [Calcutta] no 1759, (17 September 1868), 3 col b-c.
[518] 13 Feb. 1875, BL, IOR/C/138.

Despite the many practical and social impetuses for building harbour infrastructure, most plans proposed between 1772 and 1895 were rejected. As in the struggle to regulate the surf zone, other mitigating factors complicated the attractiveness of building projects. There were nearly as many reasons not to build as there were to build. First, the cost of building on an open and exposed coastline was expected to be very high. Many proposals optimistically assured the Madras government that infrastructure would invariably increase the value of the port. The various committees established to review proposals, however, often questioned whether construction costs were justified based on the *existing* traffic, rather than a projected increase in traffic.[519] Some reviewers even argued that a pier would lead to a reduction, rather than increase, in the value of the trade. In 1808 it was argued that the additional tax levied on imports and exports needed to fund the proposed project would be an 'insurmountable bar,' as it would cause the price of commodities to increase and the private trade to consequently decrease.[520] A second plan was rejected on similar grounds in 1842, when a reviewer found that 'the trade of the Port is not sufficiently extensive or valuable to justify the heavy outlay that would be unavoidably required.'[521] These early concerns were borne out by later merchant reactions to harbour-building plans. In the 1870s representatives from the British India Steam Navigation Line, the Peninsular and Oriental Line, and independent shipowners all reported that the construction of a harbour, and consequent higher dues, would make stopping at Madras prohibitively expensive. Just a small port of call on longer routes, the various companies threatened to cut Madras altogether if the harbour was built and higher dues enacted.[522]

[519] 'Fort St George Public Department: Madras Breakwater,' 28 June 1837, BL, IOR/E/4/949; Cotton et al., "Report of the Committee Appointed to Examine Messrs. Saunders and Mitchell's Project for Erecting an Iron Pile Pier at Madras," 142.
[520] 18 May 1808, BL, IOR/F/4/1580/64266.
[521] 'Respecting a project by Monsieur Piron, Ingineur Colonial du service des Pouts et Chaussies for a suspension pier over the surf at Madras,' 12 April 1842, BL, IOR/F/2000/8883.
[522] 14 Oct. 1874, BL, IOR/C/137.

Besides the initial outlay of funds, the risk of damage or destruction of structures in the surf was also a barrier to construction projects. A floating breakwater proposed in 1828 was rejected partly on the grounds that even a plan that appeared suitable theoretically could still be 'destroyed or for a considerable time rendered useless by one of the Hurricanes to which this Coast is liable.'[523] A partially-built breakwater begun in 1835 by 1839 was considered nothing more than a navigational hazard, while a plan for a pier from a decade later went unrealised because of the stipulation that if the pier was damaged or destroyed, the contractors would be held fully liable for removing all debris from the surf zone.[524] But local reviewers were not just skeptical of proposals on the basis of the impact of extreme weather. They also often expressed the opinion that proposals were ill-suited to the daily environmental conditions at Madras.

Concerns about the applicability of different styles of infrastructure to the surf at Madras are expressed in the replies to nearly all the proposals set forth in the eighteenth and nineteenth centuries. Designers were often accused of not spending sufficient time at Madras to understand the specific needs of the place; a reviewer derided a proposal from independent merchant SH Grieg in 1808 for supposing he understood the surf after only 'a short residence on the beach;' in the 1820s, Master Attendant Majoribanks replied to a proposal for a floating breakwater with several pages of minute detail about the direction and strength of the surf and prevailing winds at different points in the year to explain why the plan was unfeasible.[525] Nearly fifty years later Master Attendant Hew Dalrymple voiced his displeasure with a proposal for a closed harbour by noting that the author had only visited Madras for a few weeks during which the weather was exceptionally calm, and concluded that, 'I am of opinion that those who have been familiar with the place for a long

[523] 'Extract Public Letter from Fort St George,' 19 August 1831, BL, IOR/F/4/1332/52612.
[524] 'India Legislative Letter no. 612,' 9 Sept. 1846, BL, IOR/E/4/789.
[525] 'Letter from William Majoribanks, Esq., Master Attendant to T Daniel, Marine Board Secretary,' 9 Oct. 1828, BL, IOR/F/4/1332/52612; 18 May 1808, BL, IOR/F/4/1580/64266.

series of years may possibly be better qualified to judge the requirements of the port.'[526] Dalrymple himself had been employed by the Marine Department since the 1830s, and placed the highest value on extensive first-hand knowledge of the place.[527] Detailed knowledge of the environmental demands of the surf zone was seen as fundamental to the production of a plan worth funding, and most proposals were found wanting in this regard.

In responses to several of the plans proposed before 1842, rejections also referred to the importance of the masula boatmen and the negative impact an attempt at harbour infrastructure would have on the port's relationship with key workers. It was argued in 1808 that a pier would render communication with the shipping more dangerous in rough weather and 'deprive the port of the service of the boatmen.' The reviewer did not think it likely that the boatmen would 'risk their lives in crossing the surf in tempestuous weather, when no employment would be given them at the periods the Pier or wharf could be made use of.'[528] Master Attendant Majoribanks objected to the floating breakwater proposed in 1828 by arguing that if the project led to the dispersal of the highly trained boatmen and then failed, it would be difficult to recall enough men to operate the port and result in 'the greatest imaginable inconvenience.' Majoribanks fully acknowledged that the present boat system could be seen as 'defective' in some regards but cautioned against pouring money into an unproven change in the status quo.[529]

Despite the repeated urges of caution and negative reactions to many proposals, structures did eventually rise out of the Madras surf. But rather than ignoring the numerous plans that were rejected prior to 1859, putting construction and non-construction on the

[526] Dalrymple, 'Letter from HDE Dalrymple, Esq., Master Attendant, to Chief Secretary to the Government of Madras, Marine Dept. Communicating Remarks on the Nautical Bearing of the Proposed New Harbour at Madras--No.7489, Dated 20th December 1873,' 44.
[527] 'Fort St George Gazette for 1839,' 5 April 1839, BL, IOR/V/11/1593. Dalrymple was appointed interim Master Attendant 3 April, 1839, and served until Christopher Biden arrived in 1840. Remaining in the Marine Department, Dalrymple retook the post of Master Attendant on Biden's death in 1859 and remained in the post until 1876.
[528] 18 April 1808, BL, IOR/F/4/1580/64266.
[529] 9 Oct. 1828, BL, IOR/F/4/1332/52612.

same footing highlights the tension between the context of centralised metropolitan authority and that of local expertise and place-based knowledge. The treatment of imperial versus local concerns in the littoral shifted over the course of the nineteenth century, as evidenced by the type of expertise sought out to validate the effectiveness of different proposals, the diminishing importance placed on local environmental experience in favour of metropolitan engineering expertise, and the abrupt about-face on the perceived role of the masula boatmen in arguments for or against building projects. The completion of an enclosed harbour in the 1890s suggests the eventual dominance of the global imperial structure over local initiative and knowledge, but even here the victory of metropolitan expertise was tainted by constant and yet predictable damage.

Proposals and Projects, 1772-1895

Dozens of plans for improving communication between the shore and shipping in the roads were proposed to the Madras government between 1772 and 1895, and likely many more were passed around in less official settings. They encompass projects ranging from minimally invasive piers and jetties to larger and more complex breakwaters and enclosed harbours. Of the plans that underwent official review, only five were ever attempted, and only two were begun before 1859. The nature of the different proposals is also indicative of the changing motivations for improving communication over time and can be split into three main periods. The first, from 1772-1808, is marked by plans that are primarily concerned with issues of shortening loading and unloading times and improving watering capabilities; in the second, from 1808-1843, plans most often are framed as a means to reduce the impact of the surf on ship to shore transport; and in the third, from 1845-1894, concern shifted towards neutralising the impact of the surf on both ships and boats for the more efficient movement of cargo. Continuities and changes between these three periods

demonstrate the impact of metropolitan ideas about expertise and conceptions of social and technological superiority on the surf zone, but also show the persistence of local place-based knowledge. Despite the best imperial intentions of Madras government officials, independent merchants, and engineers, infrastructure in the surf zone had to be moulded to the exact specifications of the place.

1772-1808: Reprovisioning and streamlining

Rumblings about the need for some sort of infrastructure in the surf zone to improve the experience of trade date at the very least to the early 1770s. In 1772, Warren Hastings wrote to his brother-in-law and attorney John Woodman asking him to investigate the feasibility of carrying a 'causeway or pier into the sea beyond the surf,' and to consult with experts in Britain. Hastings complained about the conditions of the littoral, writing that 'the surf rises so high continually upon this Shore as to make the Landing always troublesome and often dangerous,' before comparing the Madras surf to that at Margate, where a masonry pier had recently been completed.[530] While Woodman responded with suggestions for a masonry pier, when Hastings took up the governorship of Calcutta later the same year the plan was dropped and no official proposal was made to the wider Madras Government. In the early 1770s Madras Boat Department officials were struggling with manning and shortages of supplies for repairing boats, and Hastings' personal investigation, concurrent with regulatory attempts to keep the fleet afloat, suggests that ideas about technological solutions to the port's problems were already beginning to circulate.

The first plan for a pier that was seriously considered by the Madras Government was proposed by Captain William Caulfield Lennon, an engineer in the Madras Public

[530] Love, *Vestiges of Old Madras,* 3:9-10.

Works Department, in 1798. Lennon proposed a multistep construction effort tailored to the financial resources available. First, he proposed a 450-yard-long (411 metre) solid masonry pier that would extend out to fourteen feet (four metre) depth, or outside the normal extent of the surf zone. He was not concerned about the effects of siltation on the pier, as he expected the current to carry the sand around its outer end. He also did not think monsoonal conditions would damage his design; his pier was to stand eighteen feet (5.5 metres) above the high-water mark with a nine-foot (approximately 3-metre) parapet, and he calculated that the masonry could withstand an impact exceeding the maximum force exerted by the surf. Lennon then suggested that the pier could be further improved by building an enclosed harbour to provide protection to shipping, also made of solid masonry. But he cautioned that a harbour would be far more expensive to build, estimating that the pier would cost £120,000, and the harbour an additional £450,000.[531]

Lennon argued that the lack of port infrastructure was hazardous. He wrote that the delays in watering and revictualling naval fleets 'can hardly be conceived but by those who have experienced it,' and blamed the loss of Trincomalee to the French in 1782 on the fact that the fleet was detained so long at Madras. He also pointed out that the delay in unloading cargo occasionally led to loss of cargo and life when vessels were forced to remain in the roads during monsoon season. That Madras relied on imported grain and rice also made a pier necessary in Lennon's eyes; it would help to stave off famine during stormy or turbulent periods and lower the price of foodstuffs. A pier that stretched beyond the surf, he argued, would allow ship's boats to rewater, load, and unload cargo without having to rely exclusively on the masula fleet.[532] The Madras Government was impressed with Lennon's carefully and thoroughly laid-out proposal, but was restricted from acting on

[531] 25 June 1798, BL, IOR/F/4/1580/64266.
[532] 25 June 1798, BL, IOR/F/4/1580/64266.

major infrastructure projects without the approval of the London-based Board of Control. The Board of Control, though interested, ultimately rejected the proposal based on cost and an uncertainty that Madras was a valuable enough port to warrant the investment.[533]

Other plans were rejected more summarily than that of Lennon, like the 1808 proposal by Sebastian Greig, an independent merchant operating out of Madras. Greig wrote to the Governor in Council, Sir George Barlow, requesting permission to build an experimental pier at his own expense, built on wooden piles rather than out of solid masonry. Pile piers offer less resistance to surf, tides and storm surges than solid masonry piers and are therefore less likely to be severely damaged during extreme weather, while also requiring fewer financial and material resources to complete. If his proposed pier proved effective for loading and unloading goods using ship's boats rather than masulas, Greig wanted to open it for general use—for a fee, of course.[534] Skeptical of the engineering merits of Greig's vague plan—he did not specify the dimensions, materials, or anticipated cost— Barlow's secretary forwarded the proposal to the Marine and the Military Boards. Officers of both Boards rejected Greig's proposal outright on the grounds that it suggested neither engineering nor environmental knowledge, and for the risk it posed to the Boat Department's current relationship with the boat people. The Marine Board responded, in reference to their anticipated negative reaction from the boat owners, that they 'consider it inadvisable to take any measure likely to disturb a mode of management which has completely answered the expectations formed on its adoption.'[535] Colonel Trapand, a member of the Chief Engineer's office tasked with responding to the plan on the behalf of the Military board, strongly concurred, responding that Greig's suggestions did not

[533] 31 Oct. 1799, BL, IOR/F/4/1580/64265.
[534] 17 Feb. 1808, BL, IOR/F/4/1580/64266.
[535] 18 April 1808, BL, IOR/F/4/1580/64266.

demonstrate that he had the 'practical knowledge which is necessary for so great and important an undertaking.'[536]

The proposals considered for improving communication between ship and shore in the period between 1772 and 1808 emphasise the writer's familiarity with the local environment and the specific hurdles it created for trade. Hastings, for example, solicited a pier plan after observing the way trade was conducted through the surf as Governor in Council, while Lennon couched his proposals in a detailed evaluation of the direction, height, and force of the surf at different times of year. Greig also tried to highlight his local credentials, stating that he developed his plan for a pier after living on the beach and observing the surf 'for some time.'[537] These proposals also made reference to past tragedies in an appeal to local memory of the shortcomings of the boat system, such as ships going without water, cargo loss, shipwreck, and even famine. Conversely, lack of familiarity with the local environment was also used as a criticism.

The process of reviewing proposals also demonstrates the importance placed on local and engineering knowledge combined. Proposals were submitted directly to the Madras Government, rather than to the Board of Control or Court of Directors, and reviewed by engineers stationed within the Presidency. These decisions were then run by the London-based boards, but they appear to have valued the opinions of local authorities. While Lennon's pier had a favourable evaluation from experts based in Madras, review still resulted in a rejection from London-based authorities. Correspondence from the process of reviewing Lennon's proposal, however, makes clear that rather than any real concern with the engineering merits of the plan itself or its local reviewers, it was instead rejected purely on financial grounds. Greig's proposal was also rejected partly on financial grounds;

[536] 18 May 1808, BL, IOR/F/4/1580/64266.
[537] 25 June 1798, BL, IOR/F/4/1580/64266.

Colonel Trapand argued the experimental pier was more likely to slow down the process of loading and unloading and end up chasing away trade rather than attracting it. The need for the continued cooperation of the boatmen is also mentioned as a reason not to build any sort of infrastructure; rather than trying to build something to replace and undermine the boat system, it is cited as a status quo that needs to be protected. Without the boat people, and possibly without a working alternative, Trapand predicted that Madras would suffer grave consequences.[538] The contributions of the boat people were still seen as an invaluable resource, rather than a hindrance. Despite the innovativeness of Lennon's ambitious plan, or the experimental nature of Greig's pier, it was not the engineering merits of their work that led to their rejection, but rather the local and imperial extra-technological contexts. Rejection was instead based on a reluctance to take financial risks, environmental uncertainties, and the power of the boat people.

1808-1845: Taming the surf

Reference to environmental constraints and local expertise continued into the second period of improvement proposals, but solutions broadened to include various forms of breakwaters that would reduce the impact of the surf zone on the transport of goods between ship and shore. The purpose of a breakwater is in its name; they 'break' the momentum of offshore swell to create a calm stretch of water close to shore. Some breakwaters are natural, such as sandbars, shoals, and thick beds of reeds. In places where none of these exist, like Madras, artificial alternatives can be built, which usually consist of piles of rubble, rubble bases with a cut stone upper level, or stacks of caissons laid directly on or sunk into the seabed. Many of the breakwater proposals from the first half of the nineteenth century included creative approaches to the difficulties expected in building in an active surf zone.

[538] 18 May 1808, BL, IOR/F/4/1580/64266.

Peter Lindeman proposed an unusual breakwater for Madras in 1828. Lindeman's design was for a floating breakwater made up of reeds secured in place by anchors across the back of the surf. He argued that a thick line of reeds would be enough to disrupt the surf and create a calm nearshore zone that could be crossed by lighters and ship's boats as well as masulas, with the bonus of being a mere 'trifling expense.' Lindeman introduced himself in his letter to the Governor in Council as having lived in India since 1796, working as a builder and architect.[539] He did not suggest that he was a resident of Madras specifically, and his unfamiliarity with the place was, in the Marine Board's opinion, obvious in the unsuitability of his plan. They believed it betrayed a lack of familiarity with the daily and monthly shifts in weather conditions, and again risked negatively impacting the government's relationship with the boat people.[540] Master Attendant Majoribanks wrote that the plan suggested Lindeman had never carefully watched the space of the anchorage, if he had not observed how 'Country Craft lying close to the point where the swell of the surf commences has no effect in checking it and that it falls in that direction as heavy if not heavier than in any other part of the beach.' Lindeman's breakwater, Majoribanks concluded, was too 'obviously deficient in the essentials of strength and durability to afford any hope of success.'[541] When the proposal and its rejection was transmitted to the Board of Control, they not only voiced their assent, but cautioned the Madras Government 'against holding out encouragement to other schemes of the kind.'[542]

The rejection of Lindeman's breakwater and discouragement of further proposals, however, did not erase the idea of building some sort of structure to block the surf. In the 1830s, frustration with the cost and delays associated with transporting cargo in masula

[539] 22 May 1828, BL, IOR/F/4/1332/52612.
[540] 'Letter from T Daniel, Secretary to the Marine Board to Daniel Hill, Chief Secretary,' 23 Oct. 1828, BL, IOR/F/4/1332/52612.
[541] 9 Oct. 1828, BL, IOR/F/4/1332/52612.
[542] 20 Feb. 1833, BL, IOR/F/4/1580/64265.

boats led a group of independent merchants to establish a Breakwater Committee, which tasked itself with funding and constructing a breakwater at the back of the surf. The goal was not to protect shipping in the roads, but rather to smooth the water between the breakwater and the beach to speed up masula trips and potentially allow for the use of ship's boats to load and unload cargo.[543] With the permission of the Madras Government, the Breakwater Committee began to solicit proposals and subscribers pledging to pay for the completion of the breakwater in March 1835.[544] The committee settled on a plan proposed by Arthur Cotton for a 200-yard (183-metre) stone breakwater, rising five feet (1.5 metres) above the high water mark, 350 yards (960 metres) offshore in front of the Custom House.[545] Then a captain in the Corps of Engineers assigned to the Tank department, Cotton had begun his career in India as an assistant to the chief engineer at Madras, so was likely at least somewhat familiar with the coastline.[546] The committee budgeted Rs. 60,000 (£6,000) for Cotton's project and expected the government to eventually contribute just over half that amount. The Breakwater Committee moved quickly, and by August 1835 had secured convict labour for quarrying granite from the nearby Adyar river region.[547] But the granite blocks proved harder to quarry and transport to the coast than the committee had expected, and bringing the blocks through the surf on catamarans and aligning them properly moved incredibly slowly. The *Naval and Military Gazette* reported in 1836 that the hardness of the rock had been underestimated, and, adding in the cost of extra gunpowder, the estimated budget ballooned to Rs. 350,000 (£35,000.)[548] After two years of laborious, over-budget construction, the breakwater was only seventy-six feet in length,

[543] 23 Feb. 1835, 27 Feb. 1835, BL IOR/F/4/1580/64265.
[544] 'Fort St George Gazette for 1835,' 18 July 1835, BL, IOR/V/11/1589.
[545] Cotton, "Report by Captain Cotton on the Proposed Breakwater at Madras," 7.
[546] Hope, *General Sir Arthur Cotton: His Life and Work*, 16.
[547] 'Madras,' *Bombay Gazette* [Bombay] no 2521, (23 September 1835), 6 col b; 29 July 1835, BL, IOR/V/11/1589.
[548] 'East India Intelligence,' *Naval and Military Gazette and Weekly Chronicle of the United Service* [London] no. 163 (12 March 1836), 4 col a-b.

fifty-five feet wide, and rose to a maximum depth of twelve feet below the surface (approximately 23 metres long, 16 metres wide, and 4 metres below the surface).[549] The disastrous project was brought to an abrupt halt in 1837 when the Court of Directors accused the Madras Government of sanctioning an expensive infrastructure project without their permission and demanded construction be stopped.[550] The half-built breakwater ended up as yet-another hazard in the surf zone, and had to be marked out by buoys on its northern and southern ends to prevent ships from grounding on it.[551]

Despite the unfortunate end of the first breakwater project, it was followed by a flurry of proposals in the early 1840s. In 1842, Pondicherry-based engineer P. Duval Piron submitted a plan for a suspension pier, which he claimed to have discussed in-depth with French engineers in Paris before submitting to the Madras Government. The plan was passed to the Marine Board, which requested Lieutenant Colonel D. Sim, in charge of the Chief Engineer's office, review the plan.[552] Sim responded that similar plans had been rejected in the past due to their cost, and that while suspension piers were generally easy to design, he feared

> from local causes, among which may be instanced the unsettled state of the sea on this coast, the heavy surf and swell which almost always prevail, and the severe hurricanes with which Madras is periodically visited, the execution of such a work would be attended with obstacles which would greatly increase its difficulty and cost.[553]

Sim proposed the contents of the plan be kept secret until it was approved to allow Piron the chance to maintain control of his intellectual property, but the secretive nature of the

[549] *The Madras Almanac and Compendium of Intelligence for 1843.*, 493–94.
[550] 28 June 1837, BL, IOR/E/4/949; 'The Gazette,' *Bombay Gazette* [Bombay] no 2730, (2 October 1837), 3 col c.
[551] 'Madras Roads,' *Bombay Gazette* [Bombay] no 3015, (10 June 1839) 4 col b.
[552] 12 April 1842, BL, IOR/F/2000/8883.
[553] 4 May 1842, BL, IOR/F/2000/8883.

proposal was ultimately its downfall. The Court of Directors refused to entertain a plan that they could not circulate among experts for an opinion, and the plan was shelved.[554]

A second proposal considered alongside Piron's was submitted by Captain Archibald Chisholm. Chisholm's plan was for a pier built in sections on longitudinal piles, but this also was rejected based on the advice of a committee of Engineer Officers, who argued 'with respect to these peculiarities they are doubtful whether any advantage would be derived from them.'[555] A third proposal by Master Attendant Christopher Biden for a 'portable pier or gangway' costing only Rs. 450 (£45) to construct was considered in 1843. Unlike the others, Biden's cheaper and more modest design was sanctioned by the Court of Directors, who thought it seemed 'likely to prove very useful.' The pier was subsequently built, but proved a failure.[556] In 1845, the Court of Directors responded to the government report on the pier's disuse, writing they 'regret that the portable pier erected by Captain Biden has not been productive of advantage to the extent anticipated by the Marine Board; and that it has not been made use of either by the mercantile community of Madras or by the Boat owners attached to the port.'[557]

The proposals, approvals and rejections written in the period leading up to 1845 continued to exhibit a concern for local environmental expertise in deciding which plans were viable and which were not. Lindeman, despite highlighting his thirty-two-year career as a builder and architect in India, was still dismissed for not understanding the specific local conditions at Madras. But local environmental knowledge was not the only source of authority. Where the opinions of metropolitan experts did not play a notable role in the decision to accept or reject the plans submitted in the earlier period, metropolitan, alongside

[554] 2 Aug. 1843, BL, IOR/E/4/960.
[555] 21 June 1843, BL, IOR/E/4/961; 'Respecting Captain Chisholm's project for a section pier across the surf at Madras,' 21 May 1844, BL, IOR/F/4/2038/92564.
[556] 21 June 1843, BL, IOR/E/4/960.
[557] 13 Feb. 1843, BL, IOR/E/4/963.

local, expressions of authority appear in the mid-nineteenth century. For example, the importance of metropolitan power and opinion is apparent in the Court of Directors' reaction to the construction of a breakwater in the 1830s. The Directors shut down construction on the grounds that the project had not been reviewed and approved by them and that the plan itself had not been vetted by experts in Britain.[558] Issues with the collection of subscriptions had also arisen when some subscribers felt that a local review process for the planned work, proposed by an engineer not currently based at Madras, was needed before they would make good on their pledge.[559] Local and metropolitan concerns together complicated and ultimately ended the project.

Piron also appealed to local and European authority in his 1842 proposal for a suspension pier. Piron, the Chief Engineer at nearby French Pondicherry, not only described how he had observed the surf and how dangerous landing through it could be, but also explained how he first discussed his ideas with scientific men in Paris.[560] The rejection of Piron's plan by the Court of Directors further demonstrates the perception that both local and domestic expert opinion mattered. The Court of Directors wrote they could not 'avoid expressing our surprise that a scheme involving so many local and technical considerations be submitted to us, unaccompanied by any intimation of the…persons in your service best qualified to decide on its practicability and expediency;' and continued that 'your request that the plans should be kept secret, prevents our obtaining the advice of competent judges in this country [and] we must decline to entertain M. Piron's project.'[561] Their response suggests the perceived importance of both a locally-produced assessment of the adaptability of Piron's ideas to the specific demands of the Madras surf and weather, and a review of its theoretical engineering merits by a domestic expert. The change in the

[558] 28 June 1837, BL, IOR/E/4/949.
[559] 1 Aug. 1835, BL, IOR/V/11/1589.
[560] 19 Aug. 1843, BL, IOR/F/2000/8883.
[561] 2 Aug. 1843, BL, IOR/E/4/960.

governing structure of British India following the 1833 Charter Act and the move to tie colonies closer to Britain politically may account for the slight shift in emphasis towards metropolitan expertise, while Sim's suggestion of a need for secrecy is reflective of ongoing domestic British debates over patent reform and the need for better intellectual property protections for patent filers.[562]

Besides changes in how authority was demonstrated and whose expertise mattered, concern for the reaction of the boatmen to a new way of crossing the surf also began to fade in this period. In 1828 Master Attendant Majoribanks was still warning of the potential disaster that could occur if the boatmen were to leave and an alternative was then to fail, but from the 1830s the boat system and its merits was absent from responses. This reflects major changes in the relationship between the boat people and the Marine department in this period; the slow rate of transport and the Boat Pay Office's perceived oppression of merchant interests was fostering increasing animosity towards the boatmen and the surf zone from the early 1830s onwards. And from 1842, variability in cost and transport times only increased, a result of the uncertainty created by the elimination of the Boat Pay Office and predictable employment and income for the boat people. Despite slight changes in the reasoning behind rejecting proposals, the sources of ideas, reviews, and rejections continued to reflect considerations beyond the technical merits of a proposal, once again demonstrating that the successful application of technology is as much determined by physical, social, and political contexts as the objective effectiveness of the technology itself.

1845-1895: Eliminating risk, shortening port call times

[562] Bell, 'Dissolving Distance: Technology, Space, and Empire in British Political Thought, 1770-1900,' 527–28; Batzel, 'Legal Monopoly in Liberal England: The Patent Controversy in the Mid-Nineteenth Century,' 191.

The Madras Government took a markedly different approach to infrastructure projects in the surf zone in the period between 1845 and 1895. Rather than simply reviewing plans put forward by members of the public, the Madras Government made several concerted efforts to solicit plans from knowledgeable engineers in India and in Britain, and to engage contractors. The stated purposes of the proposals submitted during these calls for designs were also different than earlier examples. Instead of focusing on improvements like smoothing the surf zone for boat transport, new proposals argued for building out beyond the normal extent of the surf to provide protection for ships alongside circumventing the masula system entirely. There was also a wider variety of styles in the proposed construction plans in this period, which included piers, boat- and ship-breakwaters, and, most significantly, enclosed harbours for protecting boat and ship traffic. Enclosed harbour designs require more extensive construction and pose greater engineering challenges in turbid environments than the less-obstructive pile pier or standalone breakwater. They consist of solid masonry breakwaters running perpendicular to the shore which meet to create one or two protected entrances; the goal of an enclosed harbour is to create calm water within which ships and boats can load and unload cargo more efficiently and safely, and to provide protection during storms. Fully artificial enclosed harbour designs were the most extensive type of intervention considered in altering the natural conditions for trade at Madras.

Plans of this period were also put through a more rigorous review process than earlier proposals, including in-depth analyses of the engineering merits, financial outputs, likelihood of profit, and overall feasibility. Who conducted this in-depth research also changed. While earlier reviews were mostly conducted locally by the Marine Board and Public Works department, the opinions of engineering experts working elsewhere in India and in Europe were increasingly garnered and favoured, and after 1858, serious proposals

were subject to Parliamentary review.[563] Why plans were approved or rejected also changed, away from a concern for local environmental conditions as observed by government officials working on the beach, and towards an emphasis on engineering merits. In deciding to build or not to build, the local context and local expertise diminished in importance relative to metropolitan engineering expertise.

There are several reasons why so many procedural changes occurred in this period and why major projects were finally approved and attempted. Locally, disputes with the boat people over the cost and rate of transporting goods between ships and shore continued to grow in the post-1842 Boat Act surf zone. In the new competition-based, free market model, the boat people were less financially secure. This led their participation in trade to fluctuate, and boat owners, knowing that there was a dearth of boats and qualified crews, began demanding prices double and triple the sanctioned rate. At any given moment, the fleet was either too large or too small for the needs of the port, giving rise to renewed government efforts to lessen the impact of the size and cost of the masula fleet on trade, this time through calls for proposals and funding for infrastructure projects. On a broader Indian scale, the number of infrastructure projects had been growing since the 1840s with advancements in canal irrigation, telegraphy, road and railway building.[564] The 1857 rebellion in northern India further increased the British emphasis on infrastructure projects across the subcontinent because, as David Arnold argues, the rebellion had made 'more direct forms of intervention in Indian society dangerously impolitic.'[565] Instead, expansive public works were key to justifying the British presence in India; Alfred Deakin wrote in 1893, for example, that 'if the British in India had achieved nothing less, the public works

[563] *Parliamentary Papers* (1860), xv, Reports from Committees: Leith Harbour and Docks Bill; Breakwaters and Harbours; Piers and Harbours Bill, 263.
[564] See Stone, *Canal Irrigation in British India;* Choudhury, *Telegraphic Imperialism;* Kerr, *Building the Railways of the Raj, 1850-1900.*
[565] Arnold, 'Technologies of the Steam Age,' 121.

policy of the past twenty-five years would fully justify their supremacy.'[566] Across the empire and domestically in Britain, innovations in harbour and port infrastructure were also occurring in this period. Alexander Mitchell began experimenting with screw piles and screw pile structures in the 1830s, a development Alan Lutenegger has called 'the most important Civil Engineering technological foundation development of the mid to late nineteenth century' in that it allowed for 'extensive economic expansion' in oceanfront areas.[567] Reforms to the British patent system were also passed in 1852, which better protected inventors and lessened the risks of patents being deemed invalid. The improved patent system encouraged the publication and circulation of patent drawings and explanations; this new wave of communication itself then spurred more design, tweaking, and application of ideas in new places.[568] Finally, innovations in steam technology, the rise of schedule-bound steam shipping lines, and changes in the types of cargo being shipped through Madras, placed demands on the port that could no longer be answered by the masula fleet, even if it had been restored to its early-nineteenth century height of functionality.

The impact of these local, Indian, and imperial changes over the course of the second half of the nineteenth century are evident in the processes of proposing, assessing, and building port infrastructure. After the failure of Biden's moveable pier, the Madras Government approved a measure to investigate the cost of building a permanent pier in 1845. A local committee was assembled, and the government awarded them Rs. 1000 (£100) to construct an experimental platform on wooden piles at the back of surf, which demonstrated the feasibility of a pile-style pier in the surf zone.[569] The successful pilot

[566] Deakin, *Irrigated India, an Australian View of India and Ceylon: Their Irrigation and Agriculture*, 143.
[567] Lutenegger, 'Historical Application of Screw-Piles and Screw-Cylinder Foundations for 19th Century Ocean Piers,' 3.
[568] Batzel, 'Legal Monopoly in Liberal England: The Patent Controversy in the Mid-Nineteenth Century,' 196–97.
[569] 13 Feb. 1845, BL, IOR/E/4/963.

project led to the creation of an 'Association for the Construction of a Pier,' or Pier Company, made up of local merchants and members of the maritime community. From amongst several submissions, the Pier Company chose a plan for a wooden pier on iron piles designed by Colonels Underwood and Montgomery, and in September 1846, the Court of Directors communicated their conditional approval of the Company's charter and their adopted plan. While the Directors agreed that Madras needed some sort of infrastructure in the surf zone, they were concerned about the estimated Rs. 400,000 (£40,000) cost of the project. The large price tag and likelihood that the project exceeded that amount ultimately sank it; the Court of Directors demanded that the large financial risk be guaranteed by the Pier Company. They had to provide security 'that in the event of its not being completed, or of its failure after completion, no part of it shall be left to be an obstruction on the beach, but the whole shall be removed at the expense of the Pier Company.'[570] This demand was too great of an impediment, and the company was dissolved in 1851 without sinking a single pile.[571]

Efforts to build something in the surf zone persisted, however, and in 1856 two plans were reviewed by a committee of made up of Christopher Biden, still serving as the Master Attendant; Lieutenant Colonel Frederick Cotton, who had worked as the supervising engineer on the 1835 breakwater; Assistant Civil Engineer R Kennedy; J Goolden, representative from the Madras Chamber of Commerce; and William Burton Wright, Locomotive Superintendent of the Railway. [572] The reviews resulted in the publication of two detailed reports in the *Madras Journal of Literature and Science*. Who the designers were and how the review committee reacted to their plans illustrate a shift in

[570] 9 Sept. 1846, BL, IOR/E/4/789.
[571] 'India Legislative Letter No. 9,' 2 July 1851, BL, IOR/E/4/810.
[572] 25 Aug. 1835, BL, IOR/F/4/1580/64265; Taylor, *Plan for a Suspension Pier or Jetty at Madras*; Cotton, Biden, and Kennedy, 'Report upon Captain Taylor's Proposed Jetty Thrown over the Surf at Madras'; Cotton et al., 'Report of the Committee Appointed to Examine Messrs. Saunders and Mitchell's Project for Erecting an Iron Pile Pier at Madras.'

the perceived importance of engineering, as opposed to local, expertise. The first was a pile jetty suggested by John Taylor, a captain in the East India Company fleet who highlighted his nautical expertise in advocating for his proposal. Taylor's plan was different than a standard pile jetty in that it would derive its lateral strength from moorings which were pushed deeper into the sand by wave action, rather than the standard method of driving piles straight into the seabed.[573] He emphasised the cost effectiveness of his plan, which he estimated would only cost £5,980 to build.[574] Despite the novelty of his proposal, the review committee felt that it was written 'under a wrong impression as to the difficulties to be contended with in piling across the surf.'[575] Furthermore, the committee was concerned that the plan, though an ingenious temporary solution, would not serve as a permanent solution. Instead, they felt it would 'be a constant source of anxiety and expense.'[576]

The second pier plan examined in 1856 was proposed by George Saunders and Alexander Mitchell.[577] The proposal outlined a pier one thousand feet long, forty feet wide, and fifteen feet above high water (approximately 305 metres long, 12 metres wide, and 4.5 metres above high water) resting on 109 rows of four piles each. The pier was to end in a 'T' head one hundred and sixty feet in length by forty feet in width (149 by 18 metres.) The iron piles would be covered by a decking of creosoted timber, and four rail lines would run from the pier head to the Custom House. Finally, a cast iron pipe would run below the decking so that fresh water could be transported across the surf for rewatering without the use of masulas. The plan was far more expensive than Taylor's, with estimates totaling

[573] Taylor, *Plan for a Suspension Pier or Jetty at Madras*, 9–10.
[574] Taylor, 22.
[575] Cotton, Biden, and Kennedy, 'Report upon Captain Taylor's Proposed Jetty Thrown over the Surf at Madras,' 135.
[576] Cotton, Biden, and Kennedy, 135.
[577] Cotton et al., 'Report of the Committee Appointed to Examine Messrs. Saunders and Mitchell's Project for Erecting an Iron Pile Pier at Madras,' 135–46.

between £70,000 and £100,000.[578] The additional output for a more permanent solution, however, made the plan attractive despite the cost.

Alexander Mitchell held the patent for wrought iron screw pile technology, and its efficacy had been demonstrated in various places like Margate, Wexford, Ireland, and in Kingston, Jamaica, but no screw pile piers had yet been built in India.[579] Drawn to the novelty of the project, and flattered to have attracted the attention of experts in nearshore engineering, the review committee was delighted with the Saunders and Mitchell plan, suggesting only a few slight alterations in projected cost, length, and height of the decking above the water. Construction should begin immediately, the review committee argued, as the pier would mitigate many of the 'evils' of Madras as a port. The committee felt sure that after the screw pile pier was completed, 'the injury done at the time of arriving at and departing from the shore would be altogether removed, all extra expense avoided, and a facility of transit secured to every description of traffic, which is altogether impracticable under the current system.'[580]

Construction on the screw pile pier commenced in 1859 but was slowed by multiple hiccups. All of the ironwork, creosoted timber, and Titan cranes for the project were imported from England, and over the course of construction three different vessels carrying the ironwork for five hundred of the thousand feet of pier were lost in transit.[581] Partway through construction, it was found that a number of piles were not embedded deep enough in the sand and had to be removed and redone.[582] And finally, the Titan cranes which were meant to assist in construction and be used for unloading and loading cargo from the pier

[578] Cotton et al., 141.
[579] Lutenegger, 'Historical Application of Screw-Piles and Screw-Cylinder Foundations for 19th Century Ocean Piers,' 4; Great Britain. Parliament. House of Commons, *Parliamentary Papers: Reports from Committees: Leith Harbour and Docks Bill; Breakwaters and Harbours; Piers and Harbours Bill*, 15:263.
[580] Cotton et al., 'Report of the Committee Appointed to Examine Messrs. Saunders and Mitchell's Project for Erecting an Iron Pile Pier at Madras,' 142–43.
[581] 'The Madras Pier' (4 July 1866); *East India (Progress and Condition). Statement Exhibiting the Moral and Material Progress and Condition of India, during the Year 1860-1861*, 261.
[582] 'The Madras Pier' (4 July 1866).

head after it was completed were poor quality, and a replacement set had to be ordered from Manchester.[583] The various setbacks meant that the project was finished over the maximum budget estimate at £107,948.[584] The pier opened to foot traffic, passengers, and mail boats in December 1861, but was not opened to goods traffic until 1863.[585]

The screw pile pier was not the success with merchants that the Madras Government expected. In the years following the pier's completion, most cargo was still moved through masulas; the 1869 Administration Report for the Madras Presidency noted that in the six months between October 1869 and March 1870, 8,336 tons of cargo had passed over the pier—and 75,000 tons through masula boats. 'It will thus be apparent,' the report continued bitterly, 'that the mercantile community do not avail themselves fully of the advantages afforded by the Pier, which was constructed for their especial benefit.'[586] There were several reasons why the pier was so unpopular with the merchants. First, even after the delivery of working cranes, the swell at the pier head made it very difficult to load and unload cargo and people into boats, and on rough wind or surf days using the pier was impossible.[587] Second, the pier was in a near constant state of disrepair. *The Homeward Mail* called it 'useless at present' in 1864, and reported that the ironwork was showing signs of oxidation; in a November 1865 gale, the pier end was damaged and parts of the superstructure swept away; and worst of all, in June 1868, the French barque *St Bernard* separated from its moorings, plowed directly through the middle of the pier and created a two hundred and fifty foot gap full of broken piles and pieces of ship. The *St Bernard*

[583] Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1862-1863*, 119; 'The Madras Pier' (4 July 1866).
[584] 'The Madras Pier' (4 July 1866).
[585] 'Fort St George Gazette for 1861,' 18 Nov. 1861, BL, IOR/V/11/1622; *East India (Progress and Condition). Statement Exhibiting the Moral and Material Progress and Condition of India, during the Year 1861-1862*, 416.
[586] Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*, 94.
[587] 'The Pier,' *Madras Mail* [Madras] no 238 (30 September 1869) 2 col g; 'Arrival of the New Commander-in-Chief.'

accident halted the use of the pier for over a year and complicated the process of repair and placement of new piles.[588]

The wreck of the *St Bernard* was the final straw for the Madras Government. Following the destruction of the pier, Lord Napier, Governor of Madras, appointed a new committee of local experts, including members of the Public Works department, the Master Attendant, an agent of the Madras railway, and a member of the Chamber of Commerce, to evaluate and formulate a plan for a breakwater, this time one that would protect both boat traffic and the shipping in the roads.[589] The committee evaluated eight plans for breakwaters, enclosed harbours, and boat harbours, and settled on a plan proposed by Mr DeClosets and Colonel Orr of the Royal Engineers. DeClosets and Orr suggested a 2,000-yard (1,829 metre) rubble breakwater with a granite superstructure 1,200 yards (1,100 metres) offshore in seven fathoms of water.[590] The amount of stone required to build the breakwater so far from shore meant it came with an estimated price tag of over Rs. 10.6 million (£1.06 million.)[591] But despite the committee's enthusiasm for the plan and conviction that an open breakwater-style design was the most likely to protect shipping without risking accumulation of sediment, time-consuming bureaucratic procedure stalled the commencement of works.

The long process of reviewing the breakwater proposal was brought to an abrupt halt by yet-another extreme weather event. A cyclone hit Madras in May 1872, wrecking twenty-nine vessels in the roads, killing nineteen and sending almost 5,000 tons of cargo

[588] 'Madras Local News'; 'Account of the Injury done to the Madras Pier,' *The Pioneer* [Allahabad] no 149, (13 December 1865) 3 col b; 'The Wreck of the "St Bernard,"' *Allen's Indian Mail* [London] no. 823, (23 July 1868), 726 col b; Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 89.
[589] 'Lord Napier and the Extinction of Madras'; Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 89.
[590] Carpendale, 'Minute by Colonel J Carpendale, RE, President of the Committee--Dated 15th January 1867,' 21.
[591] Carpendale et al., 'Report of the Committee for the Preparation of Plans and Estimates for the Proposed Break-Water,--Dated 16th January 1869,' 13.

to the bottom.[592] Furthermore, two native vessels were pushed through the pier in the same location the *St Bernard* had damaged four years earlier, again rendering it unusable.[593] In response to the damage caused by the cyclone, William Parkes submitted a proposal for an enclosed harbour in lieu of a breakwater. Parkes had recently served as consulting engineer on the construction of the harbour at Karachi, and felt the experience gave him the authority to design a harbour for Madras despite admitting that he had never visited the city.[594] His design consisted of two breakwaters of packed concrete blocks running out from shore to 1200 yards 1000 yards apart (1,097 metres 914 metres apart), enclosing a 170-acre area with space for multiple piers and jetties and moorings for thirteen ships.[595] The plan included a 150-yard (137-metre) entrance on the eastern face of the harbour for ease of access from the sea, and Parkes estimated expenditure would be a fraction of the cost to build the breakwater at £565,000. To demonstrate the merits of his plan and assuage local concerns about siltation, Parkes compared Madras to other port projects he argued were built in similar environments, like Great Yarmouth, Bayonne, Point Said and Karachi, where siltation was a nonissue.[596]

[592] *East India (Progress and Condition). Statement Exhibiting the Moral and Material Progress and Condition of India, during the Year 1871-72*, 74.
[593] *The Asylum Press Almanac and Compendium of Intelligence for 1874*, 488.
[594] Parkes, 'Note by William Parkes, Esq., MICE, on the Formation of a Harbour at Madras, 1872,' 35.
[595] Mackenzie, *Official Papers Concerning the Construction of the Madras Harbour*, 7–8.
[596] Parkes, 'Report by W Parkes, Esq., on the Formation of a Harbour at Madras, Dated Madras, 4th November 1873,' 50.

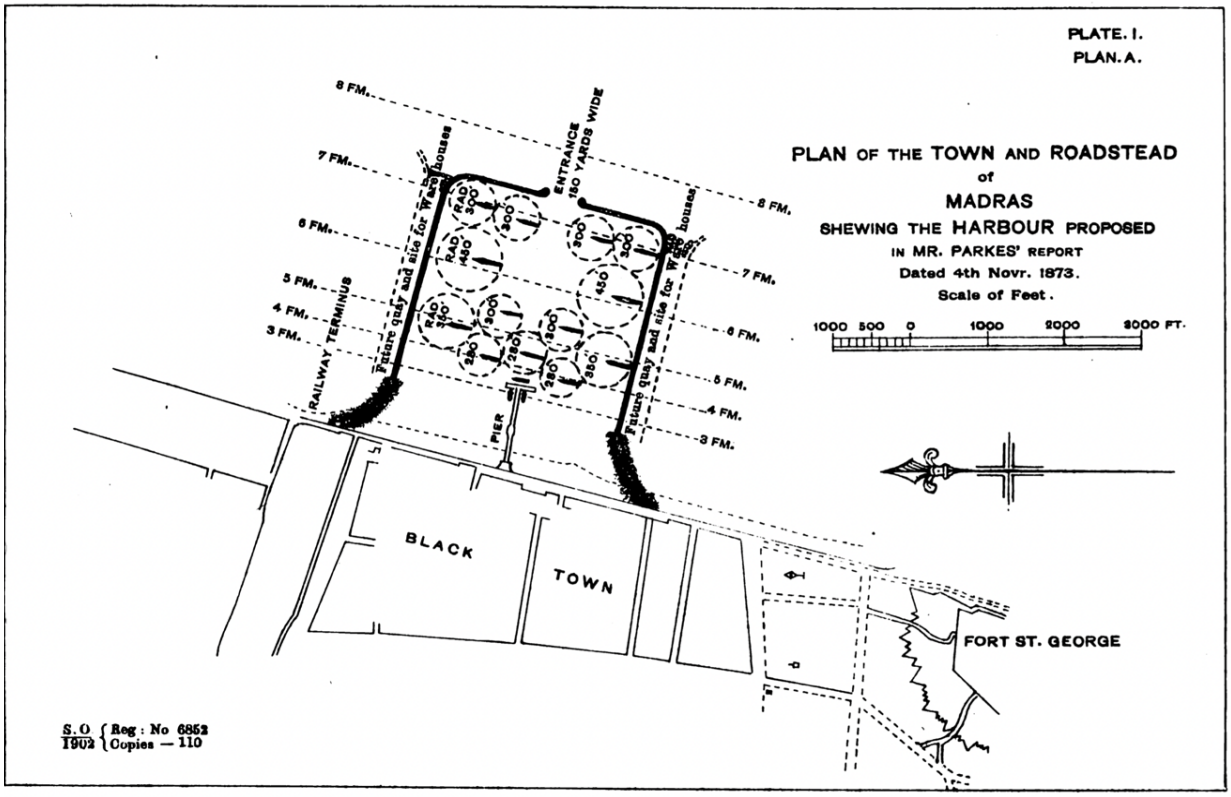

Figure 7: Parkes's original harbour plan, showing the existing pier and room for thirteen ships to swing at anchor. McKenzie, Official Papers Concerning the Construction of the Madras Harbour, Plate 1.

Parkes's plan divided local and metropolitan engineering and nautical experts. Officials stationed at Madras were almost invariably against the plan, often on the grounds that the enclosed harbour design was poorly suited to the site and demonstrated Parkes's lack of knowledge about Madras. 'It is very desirable that any Harbour Engineer who may be consulted as to the design and execution of a harbour at Madras,' wrote Colonel GW Walker, Chief Engineer with the Madras Public Works Department, 'should reside there throughout a season to watch the effects of the changes of the monsoon currents, as well as to obtain information as to the cost of materials, carriage and labour.'[597] Master Attendant Hew Dalrymple also disliked the enclosed harbour proposal, which he felt was not structurally sound enough for monsoonal conditions. Following Parkes's first visit to

[597] Walker, 'Memo by Colonel GW Walker, RE, Chief Engineer, P.W. Dept., Govt. of Madras, on Mr Parkes' Proposal for a Harbour at Madras, 1873,' 41.

Madras in 1872, after which he doubled down on his original design, Dalrymple wrote to the Madras Government that he felt bound 'to warn the government against being committed to any incomplete scheme,' and observed that while

> no one can have appreciated more highly the projector's abilities and achievements…[Parkes's] stay in Madras was only during a few weeks of most exceptional and unprecedented weather for the season of the year, during which time…he had only one opportunity of seeing an average monsoon surf.[598]

Parkes strongly disagreed with Walker and Dalrymple and compiled a list of nautical men in Britain who were all in favour of the closed harbour design. The relatively small cost as compared to the breakwater scheme also attracted the support of the Madras Chamber of Commerce and the Government of India, who passed the correspondence surrounding the project on to the Secretary of State for India, Lord Salisbury, strongly suggesting he place it as-is before Parliament. Salisbury had the plan reviewed by JF Bateman, a civil engineer based in London, and then passed it on for Parliamentary approval alongside his own ringing endorsement of the scheme in February 1875.[599] The plan was approved, and construction began in 1877.

Just like with the screw pile pier, the harbour plan hit road bumps. Construction began with a north arm running perpendicular to the beach but was slowed when the concrete used to hold the granite blocks together set more slowly than expected. Parkes had used the same concrete while building the harbour at Karachi but had failed to account for the impact of the constant movement of the water at Madras on the setting process. [600] As construction on the north arm progressed, sand immediately began accreting on its southern

[598] Dalrymple, 'Letter from HDE Dalrymple, Esq., Master Attendant, to Chief Secretary to the Government of Madras, Marine Dept. Communicating Remarks on the Nautical Bearing of the Proposed New Harbour at Madras--No.7489, Dated 20th December 1873,' 43.
[599] 13 Feb. 1875, BL, IOR/C/138.
[600] Parkes, 'Report by W Parkes, Esq., M. Inst. C. E., Chief Engineer, Madras Harbour Works, on the Progress of the Madras Harbour Works, for the Quarter Ending 30th June 1878,--Dated 27th August 1878,' 67.

side inside what was ultimately going to become the harbour basin. Weather also impacted the rate of construction. A cyclone struck soon after construction began, once again rendering the original pier unusable and damaging the new breakwater arms.[601] The structure was still not complete when, in 1881, the coast was hit by another cyclone, sweeping away all of the newly-imported harbour lighters, two steam hopper barges, undermining the rubble foundations and knocking large sections of the granite upper layer of the north and south arms into the harbour basin.[602]

The cyclone damage prompted a minute reexamination of the original plan and stalled construction until 1885.[603] The wave action was so severe that scouring undermined the foundation at twenty-two feet (6.7 metres) below low water, which shocked British experts, who had previously assumed that a depth of fifteen feet (4.5 metres) below low water was safe from the worst waves.[604] Even more concerning was debate over whether the cyclone was even a particularly bad one; a poll of masula *tindals* suggested that the cyclone was less severe than other earlier storms they had experienced.[605] Resultant estimates for repairing and completing the harbour on the original design were high, ranging from £430,000 to £480,000.[606] The tension between the assumptions of the British harbour engineers, extrapolating from personal experience to a foreign environment and weather patterns, and the life-long intimate familiarity of the boat people, demonstrates the importance of adapting technology to the specific contexts in which it is being applied, and the crucial role of practical local, rather than theoretical engineering, expertise.

[601] *The Asylum Press Almanac and Compendium of Intelligence for 1878*, 611.
[602] 'Papers regarding the restoration of the Madras Harbour Works,' 3 March 1882, BL, IOR/V/27/750/25.
[603] Mackenzie, *Official Papers Concerning the Construction of the Madras Harbour*, 49.
[604] Macgeorge, *Ways and Works in India*, 518.
[605] 'Statement of Yagapan, Antony, Veeragaven and Palliathan, Boat Tindals,' 31 March 1882, BL, IOR/V/27/750/25.
[606] Mackenzie, *Official Papers Concerning the Construction of the Madras Harbour*, 38.

However, the shock of the scouring data did not lead to a new deference to local environmental and nautical expertise. During the course of recording the damage and assessing the causes of the masonry's failure, local and nautical experts like the new Master Attendant John Taylor, members of the Public Works department, and commanders who stopped at Madras frequently, began arguing that the entrance to the harbour needed to be moved from the eastern to the northeastern side. The eastern entrance, they believed, allowed the surf to directly enter the harbour basin, intensify as it reverberated off the inner walls, and create a dangerous, rather than protected, space for ships to shelter during stormy weather.[607] The estimated cost of blocking off the existing entrance and removing debris from the northeast corner amounted to Rs. 5,142,636 (£386,664.)[608] The local, northeast entrance-proponents saw the higher cost as worth it to create the accessible still-water basin that had been the original object of the enclosed design.

Parkes, Secretary of State for India Lord Kimberley, and engineering experts from outside Madras disagreed with the north-east contingent that moving the harbour entrance was necessary on financial and nautical grounds. Lieutenant Stiffe, the Port Officer of Calcutta, visited Madras in the wake of the 1881 cyclone but did not agree that the entrance should be moved, appealing to a metropolitan authority when he remarked to the Government of India that 'Mr T Stevenson, the eminent harbour engineer, lays down as an axiom that the entrance should always be fixed seaward of any other point. All harbours on the English coast that I am acquainted with are so constructed…' Secretary of State Lord Kimberley also sought the input of domestic engineers, and in 1883 solicited a report on the northeast entrance proposal from Sir John Hawkshaw, Sir John Coode, and Professor GI Stokes. The committee disagreed with the call to move the entrance, writing 'this would

[607] Mackenzie, 39.
[608] Mackenzie, 41.

involve a very large additional expenditure, and we cannot recommend it, more especially as we do not think it would be an improvement.'[609] They felt the ease of access through an eastern entrance outweighed the risk of surf entering the basin. Kimberley agreed, and argued to the Government of India that to change the plan so late in the process would be a costly and unnecessary alteration.[610]

In prioritising the opinions of domestic engineers who had never worked at or visited Madras, Kimberley ignored the report from Master Attendant John Taylor that 'all commanders of vessels who have been consulted, and that includes nearly all that have visited Madras since the accident, approve entirely of the alteration from every point of nautical convenience.' Taylor further emphasised their opinions

> Represent the views of experienced men, commanding the largest steamers visiting the port; men who have known this coast and these seas for years, and who have watched the progress of the harbour works from the beginning. If there be any more competent nautical authority, thoroughly conversant with the somewhat complicated local conditions and with the nature of cyclonic storms, I am to state that His Excellency in Council earnestly requests that the question at issue may be referred to such authority before it is irrevocably decided.[611]

Taylor pushed repeatedly for government officials in Calcutta and London to defer to local expertise on wind, waves, and monsoons, and eventually the new Secretary of State Viscount Cross agreed to form another committee, made up of Admirals Salmon and Nares and Sir John Coode, for reevaluating the two options while works continued to the original specifications. In 1887 the committee reported that a northeastern entrance would be preferable, but despite an 'unswerving local preference for a northerly entrance,' Cross refused to sanction the change and construction continued with the eastern-facing design.[612]

Parkes, a stubborn advocate for his original design to the very end, died in 1889. His successor as consulting engineer, A Rendel, completed the harbour with Parkes's

[609] Mackenzie, 47.
[610] Mackenzie, 45.
[611] Mackenzie, 46–47.
[612] Mackenzie, 46; 50.

original east-facing entrance in 1895.[613] But even before the harbour was completed, it was obvious that the eastern entrance was a mistake. By 1895, the eastern entrance had already shoaled two and a half feet (.75 metres), and the high-water mark south of the southern arm was advancing seaward at a rate of seventy feet (21 metres) per year. Accretion was noticeable up to eight kilometres south of the harbour, and the beach to the north of the harbour was scouring away. A marine survey completed in 1897 found that between 1876 and 1897 the depth between the pier heads had decreased by three feet (approximately 1 metre), the corners of the harbour had shoaled by three to four feet, and to the south of the harbour the foreshore had advanced almost 1,800 feet (550 metres). Attempts at dredging inside the harbour and its entrance were fruitless.[614] Not only was shoaling a problem, but so was heavy swell inside the harbour, as predicted by local experts. AT Mackenzie, the local consulting engineer for the Madras Harbour Trust at the turn of the twentieth century, was still advocating for moving the entrance in 1902. He noted 'the waves inside, caused by swell coming in the east entrance, frequently cause trouble, expense, and delay in landing and shipping operations, and necessitate the retention of the masulah boats which it was one of the first objects of the harbour to do away with.'[615] Between 1904 and 1906 the eastern entrance was closed and the harbour was redesigned with a north-east entrance, which was completed in 1912.[616] The Chief Engineer for the project in 1912, Francis Spring, estimated that in total over £1.6 million had ultimately been spent completing the project, nearly triple Parkes' original estimate.

[613] Mackenzie, 65.
[614] Mackenzie, 66.
[615] Mackenzie, 66, 71.
[616] Spring, 'The Remodelling and Equipment of Madras Harbour,' 115.

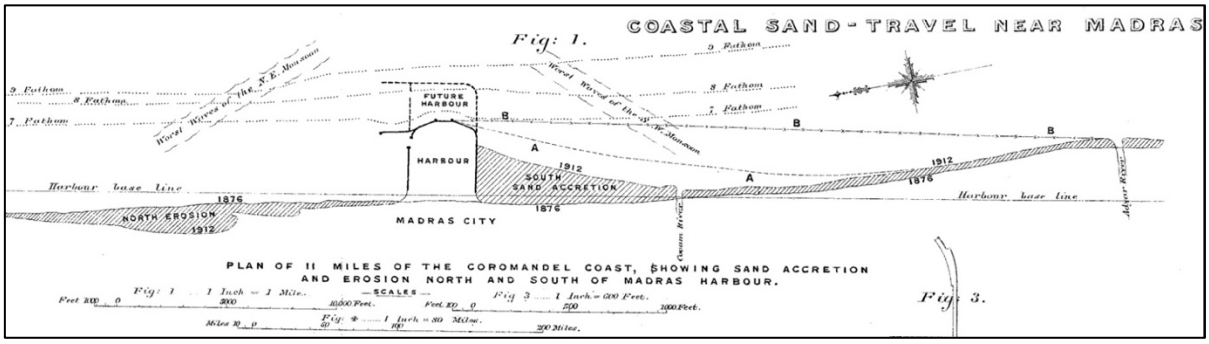

Figure 8: Plan of coastal sand travel around the Madras Harbour, 1876-1912. Spring, 'Coastal Sand Travel near Madras Harbour,' 1913. Note the closed eastern entrance and newer north-east entrance with protecting breakwater arm.

This final stretch of nineteenth-century infrastructure proposals and building projects in the surf zone differed significantly from the approach of the eighteenth and earlier nineteenth century. Changes occurred in relative government authority to review and pass judgement on various proposals, the importance placed on local versus metropolitan expertise reversed, and construction contributed to the deterioration of the relationship between Madras' commercial class and the boat people. The changing governing structure of India meant that the Supreme Government in Calcutta and British Parliament contributed to the review and building processes to an ever-greater extent. Particularly after 1859 and the official subsuming of Indian governance under the purview of the British crown, the decision-making process about what and how to build prioritised the expertise of engineers and nautical men outside of Madras. The construction of the Saunders and Mitchell screw pile pier was a result of the success of the method elsewhere and the popularity of the screw pile design. It was still subjected to a full parliamentary review before it was sanctioned in 1859, but this review was not led by anyone with direct experience at Madras.[617] Designers also began couching their expertise in general engineering terms, rather than in terms of their local experience. Alexander Mitchell had

[617] *Parl. Pap.* (1860), xv, 263.

never visited Madras when his screw pile design was approved on the basis that it had proved effective in 'similar' environments in Britain and Ireland. William Parkes, the consulting engineer for the enclosed harbour project, openly admitted to never having visited Madras when he designed the harbour, and even during construction was only occasionally present.[618]

The movement of the decision-making process out of the hands of local actors and into those based in Calcutta and London led to prolonged arguments between local environmental and nautical experts with distant engineers about the relative importance of engineering knowledge versus environmental knowledge. Local committees and officials continued to stress the importance of observing over time how the surf fluctuated, the sand moved, and the winds shifted. They collected the opinions of nautical men who regularly called at the port, and elderly boatmen, whose knowledge of the surf zone was still viewed locally as unparalleled. But their insistence that environmental considerations should come first increasingly fell on deaf ears as the century waned. The extended debate over the location of the harbour entrance is a prime example of the struggle between an idealised vision of the surf and British technological and nautical advancement, and the realities of local conditions. Prioritising theoretical engineering knowledge and experience gained in Britain and elsewhere in the empire over the local environmental knowledge of officials stationed at Madras for decades, boat people, and captains who frequented the port, led the central government to saddle Madras with a dangerous and largely ineffective harbour that was repeatedly damaged during and after construction. Even as British designs progressed in complexity, extra-technological contexts continued to dictate their success and failure when applied to Madras.

[618] Parkes, 'Note by William Parkes, Esq., MICE, on the Formation of a Harbour at Madras, 1872,' 35.

The growing divide between metropolitan and local authorities in the decision-making process is visible in the perception of the structures themselves. The screw pile pier was lauded in the British press as a shining example of British ingenuity at the same time that newspapers published in Madras and India more widely were criticising its failures. Zerah Colburn wrote in *Engineering: An Illustrated Weekly Journal* in 1866 that the pier was a 'great boon…conferred on shipping,' and a book published in 1867 by George Wells, the consulting engineer on the screw pile project, called the pier 'convincing proof of the great advantages of screw-pile structures over any other.'[619] But this perception of the pier did not align with local experience or local reporting. The pier was unpopular with merchants, and most cargo continued to move through masulas. Merchants objected to the danger of the pier—it could not be approached when there was any significant swell—and the cost of using it. As late as 1877 an importer named William Maylor sued for reimbursement of landing charges, arguing the cost was higher than it should have been for his 162-ton cargo of cast iron bridge components. The cargo had been landed using eighty-two masulas and nine pier boats; a witness for Maylor insisted that the entire cargo should have been landed in more-economical masulas.[620]

The Indian press was also less impressed by the pier than the British press. By the time Wells' celebration of the pier was published in 1867 Indian publications had been vilifying the structure for years. In 1864 the *Homeward Mail* reported the *Madras Athenaeum* had called it a 'melancholy looking, deserted structure,' 'practically a monument to skill and money thrown away,' and concluded that 'generally speaking, everything has gone wrong with it, to the great disgust of Government.'[621] A year later, the *Madras Standard* noted that a cyclone had washed away much of the timber decking of the

[619] 'The Madras Pier' (4 July 1866); Wells and Johnson, *Mitchell's Screw Piles and Moorings, with Johnson's Patented Improvements, and Their Applications*, 10.
[620] 'Legal Intelligence: Landing Charges at Madras.'
[621] 'Madras Local News.'

pier end and caused the left arm of the T to sag, and in 1868, the *Friend of India* reported that the 'expensive pier was little used and now seems to be a wreck,' while the *Ceylon Observer* called it 'a comparative failure…used chiefly as a promenade.'[622]

Despite annoyance at the cost of using the pier and preference for masulas, the act of construction, in combination with the changes wrought by the 1842 Boat Act, profoundly changed the relationship between the Madras authorities, commercial public, and the boat people. The Boat Act had stripped the boatmen of a central boat pay office through which all trips were managed, turning the roads into a competitive free-for-all that was worsened by the additional competition of harbour lighters made possible by the pier and enclosed harbour. Competition from the pier before it was damaged had two conflicting results for the boatmen. First, it led to a decline in interest in working in the port, and second, it made the work more dangerous, as it encouraged boats to approach ships under way, a risky decision that led to masulas being smashed by moving ships, injury, and even death.[623] When the pier was out of commission, merchant competition for access to masulas increased and prices rose, but when the pier reopened prices fell again. The precarity of their income led the boatmen to attempt to strike a final time in 1872 in protest of the reopening of the pier and subsequent reduction in their earnings, but the existence of an alternative had weakened their bargaining position and they were forced back to work after a day.[624]

The problems with the construction process and repeated destruction of the pier and harbour installations further intensified commercial resentment towards the boat people, who became an uncomfortable symbol of the shortcomings of European innovation. The

[622] 'Account of the Injury Done to the Madras Pier'; 'Lord Napier and the Extinction of Madras'; 'Breakwater for Madras.'
[623] Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 89.
[624] Madras Presidency, *Annual Report on the Administration of the Madras Presidency During the Years 1869-70*, 124.

boat system was framed in the press, proposals, and reviews as the great 'evil' of Madras as a port, and every time the pier or harbour was damaged frustration with the existing system grew. In the review of Saunders and Mitchell's screw pile pier the committee remarked that the 'risk of damage and inconvenience' of the passage through the surf was compounded by 'the insufficiency of the boat accommodation for the increasing traffic of the port… the difficulty of getting the boatmen to work with regularity and order [and] the constant pilfering that takes place and which is facilitated by the length and often unavoidable deviousness of the transit between shore and the shipping.'[625] The destruction of that pier in 1868 led the government to determine that the port 'should no longer labour under the serious disadvantages of heavy surf, a rough roadstead, an unsafe anchorage, and a boat monopoly.'[626] A *Madras Mail* editorialist, writing in 1877, was convinced that the harbour would reduce landing charges by seventy-five percent as compared to the boat system, arguing that Madras 'would be benighted if she refused a Harbour.'[627] George Macgeorge remarked in 1894

> the very skill of the boatmen is one of the difficulties of the port… the much higher rates which the mercantile community pay on demand, rather than incur the inconvenience and odium of prosecuting the boatmen, enhances the cost so much as to become a formidable addition to the charges of a port otherwise regarded as a cheap one.[628]

By the late nineteenth century, despite new piers, jetties, and a 'modern' harbour, the Madras surf zone had become a site of unresolved technical, commercial, and cultural frustration.

[625] Cotton et al., 'Report of the Committee Appointed to Examine Messrs. Saunders and Mitchell's Project for Erecting an Iron Pile Pier at Madras,' 142.
[626] Madras Presidency, *Annual Report on the Administration of the Madras Presidency, during the Year 1868-69*, 90.
[627] 'Correspondence: The Harbour Question.'
[628] Macgeorge, *Ways and Works in India*, 514–15.

Conclusion

Historians of technology argue that the success or failure of a new idea, or application of an existing idea to a new place, is determined not only by technical merit, but also by the social, political, and physical context. A technique or technology that proves useful and is adopted widely in one place does not automatically transfer to any other place, but rather must be adapted to local demands. The century-and-a-half-long process of constructing port infrastructure at Madras bears out this argument; the changing context of trade, governance, and British attitudes towards their own technology and that of local native practitioners, dictated when and what type of interventions were rejected or attempted. The difficulties and setbacks experienced in the second half of the nineteenth century, rather than the result of objective faults with the design process, were instead a result of the change in Victorian attitude towards technology and improvement. The Victorian conviction that new advancements in steam power, wrought iron, and construction made them technologically and objectively superior led decision-making bodies to prioritise domestic engineering experts over local nautical and environmental experience. This prioritisation, which did not leave space for adequate adaptation to the specific requirements of Madras, hindered the construction process and the usefulness of the enclosed harbour.

The trajectory of proposed and realised construction projects, and the nature of the response to them from the Madras Government, the commercial public, and the boatmen underscores British dependency on the boat people prior to the turn of the twentieth century. The shift from not-building to building happened during a series of imperial and local changes that made the existing system of dependence appear untenable. The rise of steam ships led to tighter schedules, and the delays in loading and unloading at Madras were an impediment to timely voyages. As the explosion in rail and road construction projects in India led to the importation of heavy and awkward prefabricated iron works, masulas

became less suited to carry the cargo moving through the port. The construction of the railways also threatened Madras' 'trade-shed' in favour of Bombay, so harbour infrastructure was seen as a way to maintain and expand the Madras market.[629] This was particularly important because the value of the trade with India as a whole was growing exponentially, and Madras risked being shut out by Bombay and Calcutta if it did not make itself more attractive as a port of call. Additionally, changes in the governmental structure of India after 1858 altered the decision-making process about harbour design and construction. In the second half of the nineteenth century the voices of cautious local and nautical experts were increasingly drowned out by international interests. Newly developed engineering and construction techniques further contributed to the decision to finally build; it was expected that innovative design would answer to the demands of the Madras littoral environment.

The decision to finally start building in the Madras surf zone was not just the result of practical considerations, but cultural expectations as well. Over the course of Britain's industrial revolution, it became less tenable to rely on the expertise of 'culturally inferior' people armed with seemingly 'simple' technologies, a sentiment that is expressed repeatedly in the discussion around the reliance on masulas. Not only was the practicality of using masulas to transport cargo changing as the types of imports shifted, but the perception of dependency was as well. Michael Adas has argued that in the nineteenth century technology became the metric by which Europeans assessed their own cultural and racial superiority, and as a result, dependence on native technology in a place like Madras became increasingly unpalatable.[630]

[629] 13 Feb. 1875, BL, IOR/C/138.
[630] Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*, 7.

The experience of building port infrastructure at Madras further emphasises the importance of tailoring technology and design to local environmental constraints, and the need to listen to local experts in making design decisions. The enclosed harbour cost nearly three times the original budget and took twenty years to complete, then a further ten years to fix and turn into something more usable. This was partly because Parliament and the Government of India prioritised the theoretical opinions of metropolitan engineers over practically-minded, locally-experienced administrators and nautical authorities. Without accounting for the impact of the specific environment, especially in a place like Madras where the coastline was exposed and the water turbid, projects were never going to go to plan or adhere to the rules of thumb developed in other contexts. As Chief Engineer Francis Spring mused in 1919, after yet-more cyclone damage,

> The chief lesson to be learnt…is that, under such conditions as prevail on the Coromandel Coast of the Indian peninsula, or on similar coasts, a certain class of structure is apt to prove inadequate, and that in future, in like circumstances, a design must be adopted differing from that of the structure which failed at Madras.[631]

[631] Spring, 'Restoration of a Cyclone-Damaged Breakwater-End, in Madras Harbour,' 2.

Chapter 6: Conclusion

Ship to Shore in the 20th century

While the closure of the eastern harbour entrance and construction of a protected northeastern entrance was completed in 1912, this was not the end of the troubles faced in the Madras Harbour. Port structures were again damaged in September 1914 when the German SMS *Emden* blew up oil storage tanks and several ships anchored within the harbour.[632] In 1916, yet another cyclone hit the coast, scouring sand around the harbour to a depth in excess of thirty-five feet (10.6 metres) and damaging the breakwater protecting the entrance.[633] Repair efforts were delayed by supply shortages resulting from World War I, and a semi-permanent head for the breakwater was installed using supplies already available in Madras, referred to by Chief Engineer Francis Spring as a 'roadside repair.'[634] In 1918 Spring promised the Institute of Civil Engineers that he would provide an update on the steps taken to repair the damage, but 'only [if] the next three months' monsoon would refrain from wrecking them.'[635] Issues with siltation persisted as well, and the beach continued to creep seaward to the south of the harbour and along the edge of the outer breakwater. Spring ascribed the worrying accumulation of sediment to

> the fact that some of those consulted, and whose opinion carried weight with authorities, failed to realise that, close to the shore on the Coromandel Coast, the trend of the waves does not conform to the direction of the wind in the same way as the open sea,

[632] Frenz, 'Of Expectations and Aspirations: South Asian Perspectives on World War I, the World, and the Subcontinent, 1918-2018,' 118.
[633] Spring, 'The West Quay of Madras Harbour,' 4.
[634] Spring, 'Restoration of a Cyclone-Damaged Breakwater-End, in Madras Harbour,' 2.
[635] Various, 'Correspondence on the West Quay of Madras Harbour,' 79.

while it led another correspondent of the Institute to label the uncontrolled siltation 'depressing' and a 'world-wide lesson.'[636] Though a tireless chief engineer for the harbour project, Spring retired in 1919, six years before construction was completed.

The years of slow and laboured construction, however, did not mean that the reliance on masulas and catamarans continued. By the early twentieth century, masulas and catamarans were no longer employed by the harbour administration. A 1919 travel guide referred to catamarans 'crude craft' in which 'fisher folk continue to breast the surf with a skill tantamount to instinct, and which is a legacy from remote antiquity.'[637] The guide neglected to mention masulas at all, instead focusing on the 'modern well-found lighters' that moved cargo around the harbour's five quays.[638] According to James Hornell, a foremost British expert on Indian Ocean traditional boat building and head of the Madras fisheries department, masulas had fallen completely out of use as cargo boats outside of the Presidency's small outports by the mid 1920s.[639] Centuries of masula transport at Madras had finally come to an end.

After employment in the port ceased, the boat people pivoted back to subsistence fishing, as evidenced by the living communities studied by ethnographers BA Blake and Eric Kentley in the 1960s and 1980s respectively.[640] Blake and Kentley found that what they thought of as masulas were being used for seine fishing, which continued to take advantage of the boats' maneuverability moving through the surf, while catamarans were used for longer off-shore fishing trips.[641] Some similarities remained; for example, Blake observed an ownership structure within the fleet analogous to that of the colonial period.

[636] Spring, 'The Remodelling and Equipment of Madras Harbour,' 115; Brenan et al., 'Correspondence on Madras Harbour,' 38.
[637] Newell, *Madras: The Birthplace of British India. An Illustrated Guide with Map*, 6.
[638] Newell, 70.
[639] Hornell, 'Edye's Account of Indian and Ceylon Vessels in 1833,' 58; McGrail, 'Hornell, Hasslöf and Boatbuilding Sequences,' 382.
[640] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State'; Kentley, 'Some Aspects of the Masula Surf Boat.'
[641] Blake, 'Technological Change among the Coastal Marine Fishermen of Madras State,' 59.

He found that boats were owned by a small number of wealthier members of the community, who then employed boatmen, rather than an owner-operator run fleet.[642] But cultural and environmental changes were exerting pressure on the boat community. By the 1980s, Kentley found that the number of masula and catamaran fishermen had declined significantly, and it is unclear how many of these communities survive today on the Coromandel Coast.[643] The 2004 Indian Ocean tsunami led to the destruction of coastal settlements and traditional watercraft along India's eastern seaboard, destroying the beach and fishing facilities at Chennai.[644] Longer term changes have also damaged the viability of coastal subsistence fisheries; offshore trawling by large commercial fishing vessels has proven catastrophic, wiping out fish stock and damaging deep water habitats and breeding grounds. Climate change, rising ocean temperatures, and rising sea levels threaten traditional ways of life in littoral environments generally, and likely have also had an impact on descendant communities of the Madras boat people.

It was in their renewed capacity as fishing vessels that masulas and catamarans eventually made their exit from British popular memory. In 1924, Hornell sent a full-size catamaran and models of other Coromandel Coast boats, likely including a masula model, to the British Empire Exhibition held at Wembley stadium. The boats and models were displayed alongside other fishing tools and products as part of the fishery department's exhibit of what they called 'traditional practices.'[645] Referred to as one of the last 'imperial spectacles,' the British Empire Exhibition was concocted as an empire-centric celebration of commercial prowess in the tradition of the 1851 Crystal Palace Industrial Exhibition.[646]

[642] Blake, 58.
[643] Kentley, 'Some Aspects of the Masula Surf Boat,' 303.
[644] Bose, *A Hundred Horizons*, 1–3; Gopinath et al., 'Impact of the 2004 Indian Ocean Tsunami along the Tamil Nadu Coastline: Field Survey Review and Numerical Simulations.'
[645] Commissioner for India for the British Empire Exhibition, *India: Catalogue: British Empire Exhibition, 1924*, 120.
[646] Hughes, 'Kenya, India, and the British Empire Exhibition of 1924,' 66.

While initially conceived of as a tool for educating Britons about the Empire, in the postwar environment it became instead about restoring national and imperial confidence, advertising the economic importance of the empire, and showing off advances in environmental management, technology and manufacturing that were the result of imperial rule.[647] It was also aimed at further popularising 'empire migration,' or the movement of Britons to the dominion states, proclaiming an agenda of 'racial unity' in the empire, and introducing new ways of thinking about race relations and industrial progress.[648]

For Indians, the goals of the British Empire Exhibition were suspect, and India's participation in the exhibition was challenged repeatedly. This was in part because British approaches to industrialisation in India were explicitly aimed at keeping capital and manufacturing in Britain. Daniel Headrick has argued that the British actively worked to place limits on Indian industry, importing railway and bridge components, discouraging Indian manufacturing, and restricting Indians to unskilled, low paying jobs on the railways.[649] Policy in India was to preserve a market for British industry, not encourage local industrialisation. Growing political unrest also led Indians to question the goals of the exhibition. Nationalist, anti-colonial attitudes had been growing since the 1890s, and the Indian experience of World War I and the postwar period made the British Empire deeply unpopular. In response to the service of over a million Indians during World War I and increasing agitation for Home Rule, the Montagu-Chelmsford reforms were introduced in 1919, aimed at soothing those clamouring for self-rule.[650] The reforms were meant as a show of good faith through the introduction of concrete steps towards self-governance. Montagu's dyarchy, or 'training period' for Indian politicians, was accepted by some nationalists but not all, and the near-simultaneous passage of the Rowlett Bill in March

[647] Mackenzie, 'The Popular Culture of Empire in Britain,' 213.
[648] Stephen, '"Brothers of the Empire?": India and the British Empire Exhibition of 1924-25,' 176.
[649] Headrick, 'British Technology in India and Latin America: Domination and Dependence,' 676.
[650] Ghosh, 'Whither India? 1919 and the Aftermath of the First World War,' 390–91.

1919, which allowed for the detainment of political dissidents without a specific charge, insulted proponents of self-rule and was seen as foreshadowing further repression rather than liberation.[651] The Amritsar massacre orchestrated by General Reginald Dyer only a month after the passage of the repressive Rowlett Bill further worsened attitudes towards continued British rule. Beyond being stripped of his command, Dyer was never punished and was even lauded for his actions as the 'hero of Amritsar' in Britain.[652] This and similar incidents of unprompted violence against Indians was a turning point in public opinion against British rule, even for more moderate nationalists. The early years of the 1920s were marked by boycotts, strikes, disturbances and general unrest with continued imperial rule.

The Indian exhibit at the British Empire Exhibition was planned in this worsening political climate. Proponents of the exhibition argued that it was good for Indian industrial and commercial advancement—it would open new markets and provide the opportunity to advertise Indian products to a wider audience. But detractors cited British behaviour in India and the dominions as reason to doubt the exhibition's professed purposes of advancing industry and racial unity. The decision to send exhibits was relegated to individual provinces, and not all decided to send material. Even after the provinces voted to send exhibits participation was almost derailed by the publication of the Devonshire White Paper in July 1923, which for Indians provided further evidence of the British disregard for Indians as equals in the empire. [653]

Produced under pressure from white settlers in Kenya, the Devonshire White Paper stripped many of the rights of the longstanding Indian migrant community in Kenya to the benefit of a much smaller white settler community. The paper further strained the already tense relationship between the British Government and the Indian National Legislature.

[651] Ghosh, 391; Keay, *India: A History*, 474.
[652] Keay, *India: A History*, 475.
[653] Hughes, 'Kenya, India, and the British Empire Exhibition of 1924,' 67.

The paper's clear prioritisation of white settler experience sparked a threat of boycott of the British Empire Exhibition by India. While a total boycott did not come to pass, the exhibits in the Indian Pavilion for the 1924 season were underfunded and haphazardly run, and none of the Indian exhibitors chose to reopen for the 1925 season. Indians who visited the exhibit in 1924 criticised the ways in which their country was portrayed to the British public, finding the display of traditional technology 'primitivizing,' rather than emphasising Indian innovation and advancement.[654] Daniel Stephen further argues that persistently Victorian Orientalist ideas about India as exotic, timeless, and primitive were reinforced by the Exhibition, and reaffirmed the belief of Indians that their country was still seen as nothing more than a source of raw material and cheap labour, and not an equal 'brother of the empire.'[655]

It was in this miasma of dissatisfaction that the exhibition's catamaran, along with several other objects displayed by the Madras fisheries department, were donated to the Pitt Rivers Museum, an anthropological museum at the University of Oxford. James Hornell, likely compiler of the fisheries exhibit, was also likely responsible for the donation. An Oxford alumnus and previous donor to the museum, Hornell was an enthusiastic proponent of its ethnographic mission and interest in illustrating the different 'stages' of human development through objects produced by contemporary societies around the world.[656] Between 1920 and his death in 1949, Hornell published over fifty articles and books on the development of watercraft in the Indian Ocean and Africa, and crafted a global boat building chronology, attempting to demonstrate a steady increase in sophistication from 'primitive' dugout canoes to the modern ocean liner.[657] The catamaran, a watercraft Hornell

[654] Stephen, '"Brothers of the Empire?": India and the British Empire Exhibition of 1924-25,' 183.
[655] Stephen, 188.
[656] Hornell, *Water Transport: Origins and Early Evolutions*; Pitt Rivers Museum, "People Database, 'H' Names."
[657] McGrail, 'Hornell, Hasslöf and Boatbuilding Sequences,' 382–83.

referred to as 'weird' and utterly foreign to English eyes, was likely seen by him as an important addition to the museum's collection of indigenous boats.[658] The catamaran is still on display in the Pitt Rivers today, where it is suspended from the first-floor balcony of the museum, silent, static, and little more than part of the scenery. Unmoored in history and space, it betrays nothing of the several centuries across which boats of the same type played a crucial and dynamic role in safely conducting goods and people between ship and shore at a major colonial port. Removed from its watery element, it is displayed as abstract, ancient, and ahistorical.

Barringer and Flynn argue that nineteenth and early twentieth-century ethnographic museums and exhibitions in Britain were designed to promote and present a specific version of the colonial project. Displays of the material culture of colonised people were explicitly deployed as a means to cement an oversimplified version of the powerful, civilised coloniser/weak, savage colonised dichotomy in the popular imagination.[659] Emphasising the use of the catamaran as a primitive fishing craft for a British audience, as Hornell likely meant to do both at the British Empire Exhibition and by donating it to the Pitt Rivers Museum, places specific limitations on the ways in which contemporary viewers engage with the colonial past. If this image of 'catamaran' represents the watercraft of Southeast India—crude, unchanging, subsistence-driven—it should be no surprise that their presence in the history of the development of the port of Madras has been overlooked. By contrast, an examination of their linchpin role demonstrates that small watercraft and their skilled operators were both dynamic actors in the development of the British Empire.

The Madras littoral as evidence of British technological dependency

[658] Hornell, 'The Origins and Ethnological Significance of Indian Boat Designs,' 169.
[659] Barringer and Flynn, *Colonialism and the Object: Empire, Material Culture, and the Museum*, 5.

The history of Madras boats as suggested by their display and donation in the 1920s is in no way indicative of how masulas and catamarans were used and experienced in the colonial period. Instead, the British at Madras were dependent on this local technology, as well as their skilled operators. This becomes apparent when the political and cultural history of the port city are viewed alongside the physical and technological context of the port's littoral space. The city's commercial decline and concurrent rise in political importance in the eighteenth century are intimately tied to the environmental constraints of the nearshore anchorage and the boats used to traverse the space between ship and shore. Fears over the continued existence of the port in the second half of the nineteenth century were spurred not only by the continued growth of Bombay and Calcutta and the demands of steam-powered shipping, but also by the constraints to the volume and nature of its trade that were the result of reliance on the masula fleet. Recognising the ways in which politics and trade are tied to environment and technology shows that the traditional treatment of indigenous technology and knowledge in the history of empire does not capture the ways in which they were relied upon to facilitate daily life.

Madras's dependency on masulas and catamarans had far-reaching consequences. It stagnated the growth and development of the port, limited the value of trade and damaged the port's international reputation. The need for service with limited means to compel the boatmen to work forced British authorities to negotiate with them over treatment and pay. The timing and types of infrastructure erected were partly predicated on concerns over how the boatmen would react, and later, aimed specifically at diminishing their position within the port. The reliance on masulas and catamarans also determined the first impression of the city—and in many cases India—for generations of British travellers, soldiers, administrators, and missionaries, many of whom recorded and published their recollections of the crossing. Travel writers relied on stereotypes about the working classes, mariners,

and native people in describing the boats and boatmen of Madras. However, placing these reports in longer and broader contexts shows that rather than an anachronistic space, the littoral was as much shaped by shifts in the larger political, social, and commercial concerns of the British Empire as it shaped how empire was experienced within it.

Travel writers' tropes and categories for presenting the surf zone to a domestic audience bely the complexity and precarity of the system and skilled practitioners of the littoral. The impressions of nineteenth-century travel writers—that masulas were safe, reliable, and indigenous—should be read as a reflection of their transient passage and European frame of reference for evaluating the performance of masulas. Drawing on a wider range of source material produced at Madras or based on extensive contact with the surf zone, shows how perspective shaped an understanding of technical efficacy. Sources that resulted from sustained contact, like local newspaper articles and editorials, internal Madras government correspondence and correspondence between Madras and Company officials in London, suggest that long-term experience taught that the boats were not safe, *per se,* only safer than the European alternative; not perfectly built, only better suited to the conditions; not purely local, but dependent on regional trade networks and resource availability. The roles and experiences of the boatmen were also oversimplified by travel accounts, which drew on stereotypes of both native people in tropical climates and maritime labour to paint a picture of the 'Madras Boatman' for their domestic audience. While newspapers and Company correspondence made use of similar stereotypes about the boatmen as littoral native labourers, they also illustrate a fluctuating relationship between administrators and boatmen that was determined by a combination of local circumstances, global changes in the imperial governing structure, and British cultural expectations.

The Madras Government's struggle for administrative control of the surf zone was also influenced by fluctuating local and imperial circumstances. The system of boat

management and hiring was constantly revised and negotiated between the Madras Government and the boat people in attempts to balance the needs of ships in the roads and the desires of the boatmen for fair pay and treatment. That the boatmen remained in ultimate control of the only mechanism of movement of people and goods from the mid-seventeenth century to the last quarter of the nineteenth century complicated government efforts to control the space. Madras administrators envisioned three major obstacles to the effective management of the surf zone, including the size of the fleet, the size of the workforce, and endemic theft, but all these issues were all caused by the nature of the environment in which the boatmen worked. Unable to change the environment, introduce new and cheaper labour into the boats, or build and man more boats, the government could not fully control movement without recognising the position and desires of the boat people. While masulas remained the only option for ship to shore communication, officials repeatedly cautioned against angering the boat people with religious discrimination, low pay, or the construction of port facilities out of fear that they would abscond or go on strike. The petitions, complaints, and forced stoppages recorded in Company documents suggest that the boatmen did leverage their position as holders of key technologies and skill to attempt to better their working conditions and pay. The passage of the 1842 Boat Act and the construction of a pier in the mid nineteenth century, however, altered the nature of the relationship between imperial administrators and the boatmen. The Boat Act, which eliminated the Boat Pay Office and equal distribution of trips amongst all licensed masulas, was influenced by a merchant demand for faster service and the increasingly free market leanings of powerful British officials in India, including Madras's governor-in-council Lord Elphinstone.

Rather than a cheap and efficient free market system based on supply and demand, however, the 1842 Boat Act instead led to fierce competition amongst the boatmen, who

could no longer rely on a centralised office for pay or the equal distribution of work. The scramble to service shipping and earn a wage led to violence and dangerous maneuvers—the fleet was referred to as 'that floating nuisance,' and more than one masula was crushed tying up to a ship still under way.[660] The fraught situation was made worse by the rise of a new de facto monopoly of *Dubash*-owned boats, which outcompeted smaller and less affluent owners who could not offer the same low rates.[661]

The masula system also struggled under a shift in demand from the 1850s onward, when British road and railway building efforts exploded. Construction sparked the large-scale importation of prefabricated cast iron components, which were too heavy and too awkwardly shaped to be transported safely via masula. The growing demand for steam ship facilities and predictable port call times that arose from the successful design of oceangoing steam ships and the completion of the Suez Canal also reduced the boat people's hold on the surf zone. An unprotected roadstead and boat-based system of moving cargo was not safe or fast enough to service steam, and Madras officials feared the port would cease to exist if major changes were not made.

Cultural insecurities in Britain and locally over non-European technologies further sank the fortunes of the fleet—the boats were not only inefficient, but an embarrassment to the imperial project. John McCosh expressed his opinion of the fleet particularly violently in 1856, calling it a humiliating and 'barbarous mode of transit.'[662] In the face of competition, changing needs and imperial expectations, the boatmen's ability to enact change by withholding their labour diminished. When the boatmen went on strike for a final time in 1873, seeking higher wages and more equitable conditions, their effort was

[660] 'A Floating Nuisance;' 'A Boat Accident' (30 October 1871); 'Boat Owners in Trouble.'
[661] Madras Presidency, *Report on the Administration of the Madras Presidency During the Year 1870-71*, 124.
[662] McCosh, *Advice to Officers in India*, 305.

crushed in less than two days, and they were forced to return to work having secured no concessions.[663]

The shifting expectations and requirements for the continued existence of the port finally spurred the construction of infrastructure to replace the masulas and catamarans in the roads after 1857. While proposals from at least the 1770s onwards exist in Company records, suggestions for port infrastructure dating from the eighteenth and early nineteenth centuries were rejected for multiple reasons. These included a lack of familiarity with local conditions, the likelihood of structural failure, concerns over the boat people's reaction to competition, and high financial outlay. By the 1850s, however, decision makers began prioritising metropolitan technology and engineering expertise over the advice of local environmental and nautical experts. The struggles to construct infrastructure, which stretch nearly nonstop from 1858 to 1925, demonstrate that, regardless of the shift in attitude towards the masulas, advancement in engineering knowledge, experience across the empire, and change in the needs of vessels calling at the port, the local context still dictated the experience of building at and trading through Madras. Technological innovation and prowess could not fully subsume local environmental expertise, but rather had to be deployed in tandem to provide something effective. The performance of masulas, their persistent use, and the rocky transition to a Western-style harbour, demonstrates that the types of technology that 'succeeded' or were useful were not always Western or innovative, but rather those which were calibrated to local conditions and needs.

This thesis contributes to the scholarship on the history of ports by emphasizing the influence of local conditions. Many port histories emphasise the global position of ports as connecting nodes or imperial 'bridgeheads.' But focusing on the particulars of the British experience of the Madras surf zone between 1755 and 1895, rather than broad comparisons,

[663] 'Boatmen's Strike,' *The Homeward Mail* [London] no. 790, (15 September 1873), 7 col a.

suggests several key points about the development of Madras and the experience of technology in empire. First, diving into the minutiae of ship to shore movement demonstrates that imperial success was predicated on dependency on local technology and adaptability to an endless variety of physical contexts. Second, imperial expansion and administration was facilitated by local expertise. Third, viewing local physical, social, cultural, political, and technological contexts in tandem is key to understanding the applicability and 'usefulness' of technology, and struggle with the process of construction, use or maintenance can be the result of a failure or unwillingness to adapt to new boundaries. Finally, it demonstrates that using a littoral framework allows historians to trace British adaptability, dependency on local actors, and ways of incorporating (or not) local expertise in design and deployment of new technology through defined and comparable spaces.

'The littoral' helps to highlight the role of indigenous technology in the British Empire. Littorals are small spaces, easily bounded but not universally defined; they provide a tangible area for analysis while still illustrating methods of connectivity. A littoral framework can be used to focus in on the experiences of people for whom their port was always a 'here' and never a 'there,' and yet still played active roles in facilitating connectivity. It shows how watery edges are not only ephemeral spaces through which travellers pass, but concrete places that are experienced daily. As a result, littoral histories can supplement global survey histories focused on maritime connectivity on a massive scale that cannot practically account for the impact of local littoral passages. A littoral perspective can be used in tandem with larger-scale studies to enrich historians' understanding of how oceanic connectivity occurred and was maintained. Large scale connectivity only works if a mechanism exists for crossing between deep water and shore.

For Madras in particular, a littoral lens can be used to bolster its place in the broader history of British ports in India. Its technological and environmental situation can be held accountable for its limited consideration in survey histories; however, the experience of trading through Madras, when examined more in depth, can answer some of the questions posed of ports in survey histories. John Darwin, for example, argues that Madras, Bombay and Calcutta 'were the bases from which [the British] extended their rule,' and suggested that the ways in which India's port cities developed 'may reveal something of the terms on which steam globalisation had arrived and the local conditions to which it was forced to adapt.'[664] But while Darwin went on to write at length about the development of Bombay and Calcutta, he chose not to engage further with Madras beyond to note that it 'trailed far behind' and was rendered a commercial backwater *by* Bombay and Calcutta by the 1860s.[665] Likewise Michael Pearson, in his broad survey of the Indian Ocean, mentions Madras only in passing and to stress its relative danger, poor facilities, and laboured harbour works.[666] Examining Madras through a littoral lens demonstrates that its trajectory, too, has something important to say about 'the terms on which steam globalisation had arrived and the local conditions to which it was forced to adapt.' Perhaps not as obvious from a broad political or commercial perspective, focusing on the littoral over a long period of time shows that the advent of steam had a profound effect on Madras. It was partly responsible for worsening local attitudes to littoral labourers and technology—masulas and masula boatmen were too inefficient to comply with strict steam schedules, leading to frustration amongst merchants. Steam also altered the protocol for accepting or rejecting harbour construction plans; the Madras Government and Chamber of Commerce were so driven to improve conditions in the eyes of steamship lines that they began soliciting

[664] Darwin, *Unlocking the World: Port Cities and Globalization in the Age of Steam, 1830-1930*, 215, 218.
[665] Darwin, 249, 350.
[666] Pearson, Michael, *The Indian Ocean*, 191, 212, 215.

proposals and moved away from designs that protected boat transport and towards those that created protected calm water for ships as well. Rather than dismissing the site as dangerous, focusing on how locals worked around the littoral conditions shows the ways in which local and imperial drivers combined to change how the port functioned over time.

Above all else, a littoral approach is valuable for its comparability.[667] It presents an opportunity to reinsert local skilled knowledge holders and technologies into the history of empire on a broad scale. Use of local littoral technology appears widely across the Empire once you begin looking for it; the use of masulas is an example of an overarching pattern, not a unique circumstance. Numerous boats around south and southeast Asia were utilised by the British. Like at Madras, the Master Attendant at Fort Marlboro in Sumatra was tasked with hiring his own boats for loading and unloading cargo.[668] James Forbes recorded being carried ashore at Anjengo in a toney, a type of dugout canoe, in which he was 'thrown on shore' by the fury of a violent surf.[669] Pattemars, from the Hindi for 'courier,' were used by the Company's Bombay Marine to carry despatches and for convoy duties in the early nineteenth century.[670] Writing about the Burmese war of the 1820s, David Charney has argued that 'Myanma's river-networks were impenetrable to European colonial expansion or belligerent activity, except in cases where Europeans forsook their new ocean-going vessels for traditional Mediterranean galleys…or used indigenous vessels.'[671] On the Pearl River approach to Canton (Guangzhou) in the eighteenth and early nineteenth centuries *sampans,* or long, low, decked boats propelled by one or two long sculling oars in the stern

[667] Pearson, 'Littoral Society: The Concept and the Problems,' 353.
[668] 'Fort Marlbro Public Proceedings,' 5 Jan. 1805, BL, IOR/G/35/106.
[669] Forbes, *Oriental Memoirs: A Narrative of Seventeen Years Residence in India, Volume 1*, 213.
[670] Bulley, *The Bombay Country Ships 1790-1833*, 41–44.
[671] Charney, 'Shallow-Draft Boats, Guns, and the Aye-Ra-Wa-Ti: Continuity and Change in Ship Structure and River Warfare in Precolonial Myanma,' 21.

and steered with a third oar towards the bow were used for navigation, towing merchant ships, and as markers on the river's shifting sandbars.[672]

In Africa, too, local boats played important roles in facilitating a British presence. During Napoleon's Egyptian Campaign (1798-1802), both the British and French armies were maintained by *djermes,* or undecked sailing cargo boats of the Nile, which were commandeered to carry troops, ammunition, victuals and water.[673] Krumen, equipped with small, light dugout canoes were employed by the Royal Navy to maintain communication between ships and shore on the West African Coast after the passage of the Slave Trade Act in 1807. So essential were the Krumen to the suppression of the slave trade that on board ship they were subject to their own rules and headman only, not punishable by the ship's captain or officers.[674]

In the Americas, local boats were used for exploration, daily trade, and warfare. Birchbark canoes of varying descriptions were used in the seventeenth and early eighteenth centuries in coastal New England, and by fur traders in the Hudson Bay region, and Caribbean pirates used *Tainō* dugout canoas at the turn of the eighteenth century, which proved to be 'key to European imperial contests in the region, proving itself as a light, fast, and versatile craft.'[675] In the 1779 siege of Savannah, communication between British ships blockading the harbour was maintained by enslaved people in their own craft.[676] When ice conditions at Point Barrow (Nuvuk) proved too severe in the 1848 search for the Franklin expedition, larger boats were sent back and the search continued in 'two 27-foot gig whale boats and an umiak.' Umiaks, a long, low double ended craft of sealskin stretched over a

[672] Ruschenberger, *Narrative of a Voyage Round the World, during the Years 1835, 36, and 37; Including a Narrative of an Embassy to the Sultan of Muscat and the King of Siam*, 2:213.
[673] Breene, 'Outfitting the Country Boats as Gunboats: Indigenous Vessels and the Egyptian Campaign, 1798–1802.'
[674] Bridge, *Journal of an African Cruiser*, 50, 86; Chappell, "Kru and Kanaka: Participation by African and Pacific Islander Sailors in Euroamerican Maritime Frontiers," 102.
[675] Lipman, *The Saltwater Frontier: Indians and the Contest for the American Coast*, 6; Walmsley, 'Robinson Crusoe's Canoes,' 9–10.
[676] 'Captain's log for the HMS Vigilant, 1779,' 19 Sept. 1779, TNA, ADM/51/107.

bone frame are the ancestor of today's pleasure kayaks.[677] Fifty years later, umiaks were used by explorers in the Canadian Arctic again—they were found to be 'decidedly better than a wooden boat.'[678] Even Horatio Nelson relied on local craft when serving on Cape Gracias a Dios in South America in 1781. In a bid to capture Fort San Juan Nelson's fleet 'proceeded…along the Mosquito shore, to collect their Indian allies, who were to furnish proper boats for the river…two hundred, therefore, were embarked on the Mosquito shore craft…' The currents and rapids of the river, a later biographer noted, 'would have been insurmountable, had it not been for the skill of the Indians in such difficulties.'[679]

This list of examples is far from exhaustive, but it illustrates the breadth and variety of watercraft utilised by the British in passing through littorals the world over, and does not even begin to touch on the equally numerous riverine craft that were utilised around the empire.[680] This analysis of the use of masulas and catamarans serves only as the initial application of a new framework for examining technology in empire and the ways in which local quotidian experience of colonial spaces was tied to, but distinct from, the metropolitan and global conception of empire. Local boats and littoral spaces offer ample opportunities for rethinking how empire was experienced by both the British and littoral peoples on a global scale.

British technological dependency on local people helps to better explain the nature of empire itself. Traditional narratives of the British imperial experience tell stories about technical and cultural superiority, the descent of a dominant and civilised people on the unsuspecting and uncivilised native masses. Post-colonial historians have worked to

[677] Pullen, 'W.J.S Pullen (1818-1887),' 444.
[678] Martin, 'Indigenous Tales of the Beaufort Sea: Arctic Exploration and the Circulation of Geographical Knowledge,' 30.
[679] Southey, *The Life of Horatio, Lord Nelson*, 19–21.
[680] Sinha, 'Contract, Work, and Resistance: Boatmen in Early Colonial Eastern India, 1760s-1850s'; Dewey, *Steamboats on the Indus: The Limits of Western Technological Superiority in South Asia*. For example, Dewey notes the British used dundas, kishti, zoruk, chappu, beri, tarak, dagga and bazai on the Indus alone starting in the 1830s.

challenge these assumptions, but the role of technology in empire is still widely confined to the application of Western technologies to facilitate imperial expansion and maintain colonial control. Analysing empire from the perspective of indigenous technology suggests that empire was also a messy, undignified, and negotiated undertaking. This is because the reliance on local technology to facilitate imperial expansion and governance required of its agents flexibility and adaptation, not an unbending notion of superiority.[681] The use of local technology demonstrates that this was the case even in the late nineteenth century, well-illustrated by the experience of Lieutenant-General McCleverty, arriving in a new position of command at Madras in 1867. No stranger to India, McCleverty refused to be flustered by the indignity of carriage in masula and the need to be craned from the boat like a bale of cotton.[682] This was the norm, not the exception. To be angered by the indignity of dependency was to show your inexperience and ignorance of the nature of empire.

[681] For a wider discussion of technological survivors and adaptations, see Arnold, 'Technologies of the Steam Age,' 92.
[682] 'Arrival of the new Commander-in-Chief.'

Appendix A: Weather events, wrecks and infrastructure damage at Madras, 1684-1886

The following table is derived from:

‘Account of the Injury done to the Madras Pier,’ The Pioneer [Allahabad] no 149, (13 December 1865), p. 3 col b, South Asian Newspapers (20 January 2023).

‘List of Ships lost at or near Madras between October 1842 and March 1853 owing to the insecurity of the anchorage,’ March 1853, Cambridge Centre for South Asian Studies (CCSAS), Microfilm no. 42.

London, BL, IOR/F/4/1189/30857: ‘Investigation into maladministration and corrupt practices in the Master Attendant's Department at Madras, vol 3 of 3,’ 1829.

London, BL, IOR/P/240/55: ‘MPP,’ August-December 1782.

London, BL, IOR/P/240/56: ‘MPP,’ January-December 1783.

London, TNA, ADM 1/3441: ‘Letter from Peter Puget, Naval Commissioner at Madras, to the Chief Secretary to the Supreme Government, Fort William,’ 3 May 1811.

London, BL, IOR/V/11/1614: ‘Fort St George Gazette,’ 18 May 1858.

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London, BL, IOR/V/27/750/25: ‘Papers regarding the restoration of the Madras Harbour Works, 1882-84,’ 1884.

Love, Henry Davidson. *Vestiges of Old Madras, 1640-1800.* Vol. 1. 4 vols. London: J. Murray, 1913.

‘Notes and remarks on a hurricane experienced by the screw steamer “Lady Jocelyn,” in the Indian Ocean on March 5th and 6th, 1854,’ The Nautical Magazine and Naval Chronicle [London] (July 1854), p. 358-64, Cambridge Core EBA (18 September 2022).

Public Works Department. ‘Papers connected with the construction of the Madras Harbour,’ Calcutta: Superintendent of Government Printing, 1885.

‘Rough Weather at Madras, The Homeward Mail [London] no 859, (11 January 1875), p. 8 col a-b, British Newspaper Archive (4 November 2020).

‘The Cyclone at Madras,’ Madras Mail [Madras] no. 125, (29 May 1886), p. 3 col b, South Asian Newspaper Archive (21 April 2020).

‘The Late Cyclone,’ Allen’s Indian Mail [London] no. 1024 (27 May 1872), 505-6, Google Books (1 May 2022).

‘The Madras Pier,’ The Homeward Mail [London] no 160, (6 December 1860), p. 9 col a, British Newspaper Archive (4 November 2020).

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Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
3 November 1684	Madras	Violent tempest from the NW as prognosticated by the boatmen	Love Vol 1 p. 479-80	Unknown	14 masulas dashed to pieces, fragments lost	Love Vol 1 p. 479-80	N/A	
4 October 1687	Madras	Loss of valuable gifts for the King of England	Love Vol 1 p. 481	*Loyall Adventure*	Found cast ashore near the southern end of the Mucquaw Town (Chepauk)	Love Vol 1 p. 481	N/A	
November 1695	Madras	Very big wind	Love Vol 1 p. 482	Unknown	5 masulas blown away and others broken by the violence of the wind	Love Vol 1 p. 482	N/A	
28 November 1730	Madras	Violent storm	Walsh p. 1039	None recorded			N/A	
14 October 1746	Madras	Violent storm	Walsh p. 1039	Unknown	3-4 French ships and a Dutch ship stranded or sunk near Madras. Many dead bodies on the beach	Walsh p. 1039	N/A	
1 November 1752	Madras, Palicut, Sadras	Violent storm with N winds and rain, thunder and lightning, before shift to	Walsh p. 1039	None recorded			N/A	

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
		stronger S winds overnight						
1761	Madras	No description	Papers connected to the construction of the Madras Harbour (hereafter 'Papers'), p. 19	Unknown	British squadron wrecked--8 sail of the line, 2 frigates, and 2 other ships suffered severely--3 came on shore and 3 others lost with crews, ~1100 men	Papers p. 19	N/A	
30 October 1768	Madras	Terrible storm, wind began as NE, but shifted to E and strengthened. At midnight turned to SE and was at its most furious.	Walsh p. 1039	None recorded			N/A	
21 October 1773	Madras	No description	Papers p. 19	Unknown	All vessels at anchor lost, 100+ country vessels beached	Papers p. 19	N/A	
Spring 1782	Madras	Gale	IOR/P/240/55	Unknown	~40 masulas possibly lost	IOR/P/240/55	N/A	
15 October 1782	Madras	Storm	Walsh p. 1040	Unknown	150 native grain ships lost and 59 masulas destroyed	IOR/P/240/55	N/A	

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
Spring 1783	N/A			*Duke of Atholl*	Blew up in the roads awaiting service	IOR/P/240/56	N/A	
17-21 May 1787	Tranquebar, Madras, Vizagapattinam, Masulipattinam, and Kackinara	Madras: storm commenced 17 May. Sea rose 14ft leading to massive coastal inundation	Walsh p. 1040	None recorded			N/A	
11 November 1787	Centre north of Madras	No description	Papers p. 57	None recorded			N/A	
7 May 1788	Centre north of Madras	No description	Papers p. 57	None recorded			N/A	
26 December 1789	Tranquebar, Madras, Jaffanipattinam, Palicut	Stormy NE wind	Walsh p. 1040	Unknown	English ship with 12000 sacks of grain sank with crew off Madras	Walsh p. 1040	N/A	
27 October 1797	Centre at Madras	No description	Papers p. 57	None recorded			N/A	
4 December 1803	Madras	No description	Papers p. 20	None recorded			N/A	
10 December 1807	Centre south of Madras	Surf broke over the ramparts of Fort St George, destroyed works in front of Custom House	Papers p. 57; Voice of Enterprise p. 23	None recorded			N/A	

Appendix A: Weather events, wrecks and infrastructure damage at Madras, 1684-1886

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
2 May 1811	Probably centre at Madras	Gale, surf breaking a mile offshore	Papers p. 57	HMS *Dover*, HMS *Chichester*, 50-90 merchant ships	Dover and Chichester wrecked on the beach, every vessel in the Roads foundered at anchor	ADM/1/3441	N/A	
24 October 1818	Centre at Madras	No description	Papers p. 57	None recorded			N/A	
30 March 1820	Centre north of Madras	No description	Papers p. 57	None recorded			N/A	
9 May 1820	Centre north of Madras	No description	Papers p. 58	None recorded			N/A	
9 October 1820	Madras	No description	Papers p. 20	None recorded			N/A	
7-9 May 1827	Centre north of Madras	Disastrous storm	Papers p. 58	*Hope*	Wrecked on the beach	IOR/F/4/1189/30857	N/A	
2 December 1830	Centre south of Madras	No description	Papers p. 58	None recorded			N/A	
30 October 1836	Centre at Madras	No description	Papers p. 58	*Earl Clive* and others	Author experienced in hurricanes, including 'off Madras in 1836, when the *Earl Clive* and others suffered'	Nautical Magazine for 1854 p. 361	N/A	
16 May 1841	Centre north of Madras	No description	Papers p. 58	None recorded			N/A	

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
October 1842	Madras	Heavy gale but not a hurricane	Papers p. 20	Ship *Francis Smith*	Put to sea and wrecked off the Seven Pagodas	CCSAS microfilm no. 42	N/A	
				B. *Highlander*	Put to sea and wrecked off the Seven Pagodas		N/A	
				B. *Ganges*	Put to sea and wrecked off Covelong		N/A	
				B. *Arethusa*	Put to sea and wrecked off Covelong		N/A	
				B. *Ruby*	Put to sea and wrecked South of Sadras		N/A	
				B. *Emerald*	Dismasted in the Roads and Condemned		N/A	
				B. *Tern*	Put to sea and wrecked off Covelong		N/A	
22 May 1843	Centre north of Madras	No description	CCSAS microfilm no. 42	S *General Hyd*	Put to sea disabled and condemned at Calcutta	CCSAS microfilm no. 42	N/A	
				B. *Braemar*	Put to sea and wrecked off Narsapour point		N/A	
				B. *Amelia Thomson*	Put to sea and foundered		N/A	
December 1844	Madras	No description	CCSAS microfilm no. 42	B. *Lord Eldon*	Wrecked off Ice House	CCSAS microfilm no. 42	N/A	

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
				Brig *Gipsey*	Wrecked off Ice House		N/A	
20 October 1846	Centre north of Madras	No description	CCSAS microfilm no. 42	None recorded			N/A	
25 November 1846	Centre north of Madras	No description	Papers p. 58	S. *Augusta*	Put to sea and abandoned	CCSAS microfilm no. 42	N/A	
February 1847	Madras	No description	CCSAS microfilm no. 42	Barque *Marie*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
13 October 1847	Madras	Pure northerly gale, not cyclonic	Papers p. 58	None recorded			N/A	
1 November 1848	Light centre south of Madras	No description	Papers p. 58	None recorded			N/A	
November 1849	Madras	No description	CCSAS microfilm no. 42	Brig *Sir Thomas Metcalfe*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
24 May 1850	Centre south of Madras	No description	Papers p. 58	S. *Sulimany*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
				Barque *Gunga*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
4 May 1851	Centre north of Madras	No description	Papers p. 58	S. *Sophia*	Put to sea and never heard of again	CCSAS microfilm no. 42	N/A	
November 1851	Madras	No description	CCSAS microfilm no. 42	Barque *Union*	Wrecked off Ice House	CCSAS microfilm no. 42	N/A	
October 1852	Madras	No description	CCSAS microfilm no. 42	Barque *Successor*	Wrecked on the Madras Beach carrying camp followers and government	CCSAS microfilm no. 42	N/A	

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
					stores for Burmah			
				Brig *Poppy*	Wrecked off Ice House		N/A	
				Sch *Struggle*	Put to sea and wrecked off Covelong		N/A	
March 1853	Madras	No description	CCSAS microfilm no. 42	Barque *Latchnie*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
				Barque *Aboukir*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
				Ship *Serainpore*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
				Brig *NSD Mageta*	Wrecked on the Madras Beach	CCSAS microfilm no. 42	N/A	
20 November 1856	Centre north of Madras	No description	Papers p. 58	None recorded			N/A	
May 1858	Madras	No description	Papers p. 20	Unknown	No damage to European vessels, but some native craft parted	Fort St George Gazette, 18 May 1858	N/A	
18 November 1864	Light centre south of Madras	No description	Papers p. 58	None recorded			N/A	
26 November 1865	Centre south of Madras	No description	Papers p. 58	None recorded			‘Cosmetic' damage to the pier--damage to pier head, watering pipe, some	‘Account of the Injury Done to the Madras Pier’

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
							planking gone	
6 June 1868	Madras	Fresh breeze and strong current	Manual of the Madras Presidency for 1869	*St Bernard*	Lost anchors and rudders, smashed into pier and was stuck. Lost cargo worth Rs. 21,993	Manual of the Madras Presidency for 1869, Appendix V.	250' hole smashed through pier by the St Bernard. Out of service for over a year.	Manual of the Madras Presidency for 1869, Appendix V.
1 May 1872	Centre south of Madras	Cyclone	'The Late Cyclone,' 27 May 1872.	9 foreign ships, 9 Indian barges, 3 Indian brigs, 1 Indian schooner, 6 Indian dhows, 1 Indian sloop.	4,883 tons and 19 lives lost. Multiple wrecked vessels acted as groynes, causing accretion and erosion. 3 dismasted native vessels, 2 wrecked dhonies on the pier.	Papers p. 41; Voice of Enterprise p. 46	Pier was damaged by native vessel in the same location at the St Bernard	'The Madras Pier,' Madras Almanac for 1874, Voice of Enterprise p. 46
17-21 December 1875	Madras	Bad Weather	'Rough Weather at Madras'	Unknown	Several masula drownings but no shipwrecks	'Rough Weather at Madras'	None recorded	
1877	Madras	Cyclone, max wave height 10'	Papers p. 75	None recorded			Pier listed as damaged and unusable, breakwater	Madras Almanac for 1878, p. 611

Weather event				Wrecks			Infrastructure Damage	
Date	**Location**	**Description**	**Source**	**Name**	**Description**	**Source**	**Description**	**Source**
							arm damaged	
12 November 1881	Madras	Significant cyclone	IOR/V/27/750/25	Unknown	All imported lighters and two hopper barges wrecked	IOR/V/27/750/25	Significant damage to breakwater arms	IOR/V/27/750/25
May 1886	Madras	Cyclone	'The Cyclone at Madras'	Barque *Nonpareil*, other unknown	Two wrecks outside of the port	'The Cyclone at Madras'	None recorded	

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