

# Connecting the Oceans: The Impact of Global Steam in the Nineteenth Century

A conference under the joint auspices of the SS Great Britain Trust and the Society for Nautical Research, to mark the fiftieth anniversary of the SNR co-ordinating her salvage in 1969, held at the Brunel Institute, Bristol.

## Friday, September 6, 2019

- 16:00 Conference registration  
17:30 Welcome and keynote, Admiral Sir Ken Eaton, SNR; Helen Doe, University of Exeter - *Making connections possible: The businesses that drove the global expansion of steam*  
18:30-20:00 Drinks reception on board the SS Great Britain

## Saturday, September 7, 2019

- 09:30 Welcome & coffee  
10:00 Opening lecture: Graeme Milne, University of Liverpool - *The steamship and the making of a globalised world*  
10:45 Panel 1: Moving under steam  
  
James Boyd, Brunel Institute – *Mechanising Migration: Transnational Relationships, Business Structure, and Diffusing Steam on the Atlantic*  
Jonathan Stafford, University of Nottingham – *Steamship Modern: Boredom and repetition in the temporal rhythms of colonial steamship travel*  
Tim Carter, Norwegian Centre for Maritime and Diving Medicine – *From sail to steam: changing health risks and requirements for seafarers*  
  
12:00 Panel 2: Port changes and technological adaptation  
  
Morten Tinning, Centre for Business History at Copenhagen Business School (CBS) and a curator at the Maritime Museum of Denmark in Elsinore – *Sail or Steam, that is the question*  
Tim Beattie, National Maritime Museum Cornwall – *The Struggle of a west country harbour to survive the transition from sail to steam in the late nineteenth century*  
Dimitra Kardakari, Institute for Mediterranean Studies (IMS-Forth), in Rethymno, Crete – *'The Invisible Entrepreneurs' Aspects of female entrepreneurship in Greek shipping of the early 20th century: the case of Marigo Kulukundis*  
  
13:15 Lunch  
14:00 Panel 3: Naval Transitions  
  
Benjamin Miertzschke, University of Potsdam – *Steam and the Resurgence of Germany as a Maritime and Naval Power 1871-1914*  
Alistair Roach, SSGB Trust – *Brunel's Crimean War 'stealth' gunboats*  
Zachary Kopin, University of Michigan – *From Sailors to Engineers: Steam and its Impact on the United States Naval Labor Supply*  
  
15:15 Coffee  
15:45 Closing lecture: Cpt. Peter King – *The advent of steam propulsion in the long-haul freight trades*  
16:30 Close

# Making connections possible: The businesses that drove the global expansion of steam

**Helen Doe**

In any discussion of nineteenth century steam companies, the usual suspects are mentioned such as Cunard, P&O and Royal Mail. These were the success stories and they were the survivors of a competitive race to win business. Examining the successful ones can make it look relatively simple but new technology needed new business models, new ways of thinking and plenty of investors prepared to take risks. Where did the engineers such as Brunel, Napier and Elder fit into this as they strove to develop new ideas to take steam around the world? What about the day to day management of the business? Success often comes after the lessons learned from failed ventures. An examination of some of the many failed schemes, particularly in the early days of ocean steam, provides evidence of the variety of factors that could make or break an enterprise. Investors, influencers, location, politics and opportunity all played their part in addition to the brilliance of their engineers.

*Dr Helen Doe is a maritime historian who has published extensively on nineteenth century sail and steam, including co-editing and contributing to the award winning Maritime History of Cornwall. Her previous book was The First Atlantic Liner: Brunel's Great Western Steamship. She has a PhD from the University of Exeter where she has been a lecturer for some years. She is a Fellow of the Royal Historical Society, Vice Chairman of the British Commission for Maritime History, a member of the UK Government's Council of Experts for National Historic Ships and trustee of the SS Great Britain.*

# The steamship and the making of a globalised world

**Graeme Milne**

Although the rise of the steamship in the nineteenth century has been widely researched, most attention has been paid to business and technological aspects. This paper considers some alternative questions about the impact of the steamship on seafarers. While the transition to steam in many ways drove clear improvements in the lives of seafarers, their families and communities, this was rarely straightforward, and there were losers as well as winners. It is also clear that steam carried with it major challenges to the culture and identity of work at sea, and what it meant to be a seafarer in an era of globalising change.

*Dr Graeme Milne is a Senior Lecturer in Modern History at the University of Liverpool. His recent publications include People, place and power on the nineteenth-century waterfront: Sailortown (Palgrave Macmillan, 2016); and 'Collecting the sea shanty: British maritime identity and Atlantic musical cultures in the early twentieth century', International Journal of Maritime History, 29, 2 (2017).*

# **Mechanising Migration: Transnational relationships, business structure, and diffusing steam on the Atlantic**

**James Boyd**

The diffusion of steam into the transatlantic migration system of the 19th century, one of the most important developments in the history of human demography, is often explained by the technical progress of ships, which made the carrying of migrants under steam profitable. Existing historiography posits that early, basic paddle steamers were sustainable only with government mail contracts, whilst later iron screw steamers allowed breakthrough, as an inevitable commodity in the emigrant trade. These conventions mask a number of consistent, historically significant factors that were critical to the viable use of steam, and its ultimate use in emigrant markets. Data on steam company formation, durability and accounting for the mid-19th century show that technical thresholds are not sufficient to explain the transfer to steam shipping of migrants. Determinative factors were inter-regional relationships at the nexus of engineering and demographic change, and, critically, the abandonment of capitalising novel steam lines – a strategy that could not support the technology. This paper demonstrates that beyond technical developments, steam became usable because of endogenous transfer within well-established sailing services, a pivotal strategy adopted by those connected to centres of both innovation and migration.

*James Boyd is Research Fellow in the Brunel Institute, a collaboration of the SS Great Britain Trust and University of Bristol. James' research considers the evolution of Atlantic transit, technological systems, and international migration. He was previously Research Associate at the University of Cambridge, and post-doctoral scholar at the German Historical Institute, Washington D.C.*

# **Steamship Modern: Boredom and repetition in the temporal rhythms of colonial steamship travel**

**Jonathan Stafford**

In the first decades of global steam navigation, the steamship's unprecedented speed was characterised as a break with tradition, a means of transportation which, like the steam train, embodied the nineteenth-century preoccupation with the revolutionary potentialities of technologies of mobility. A wealth of scholarship has explored the culture of acceleration which prevails as one of the dominant discourses of modernity, a category of experience largely rooted in the nineteenth-century revolution in mobilities. Such radical acceleration, the 'annihilation of space and time', can be witnessed in the steamship service between Britain and the colonial East which emerged as an expeditious alternative to the slow sailing route in the late 1830s. Yet the subjective experience of those at the cutting edge of this revolution – the colonial passengers who travelled on board these ships – remains under-explored. Accounts of steamship travel describe the experience of this unprecedented mobility as one of monotony, temporal discipline, and repetition, at odds with the more familiar discourse of speed and fragmentation. Applying insights from mobilities scholarship to the social history of maritime travel, this paper will examine the ship as both a means of transportation which revolutionised colonial mobility, and as a significant site for exploring emergent cultures of temporality in a global context. This will foreground the mobile subject of the steamship passenger as the key to understanding the nature of this change. The archive of colonial steamship travel narratives will be used to develop insights into steamship temporality and its broader significance for shaping conceptions of the modern world.

*Jonathan Stafford is an interdisciplinary scholar of the sea, with a particular focus on maritime mobilities, landscape and culture. His PhD (2015) was a cultural history of the entry of steam propulsion into colonial shipping in the mid-nineteenth century. He is a Postdoctoral Research Fellow in the Department of Culture, Media and Visual Studies at the University of Nottingham.*

# From Sail to Steam: Changing health risks and requirements for seafarers

**Tim Carter**

The voyage patterns of shipping and the tasks performed on board differed markedly between commercial sailing vessels and steamships, with an intervening period when ships such as S.S. Great Britain used both forms of propulsion. In the era of exclusively wind propulsion there was a largely fatalistic approach about the risks to the health of merchant seafarers. The move to steam, and the contemporaneous adoption of iron or steel hulls changed the risks greatly. There was less open deck work and falls and drowning became less prevalent. The heaviest physical work and the most adverse working conditions moved from sail handling to fuelling the boilers and a new group of workers, the stokers, often with different ethnic and social backgrounds joined the crew. Falls gave way to stoker's cramps from prolonged hot work. Many deck tasks such as raising anchors and mooring no longer relied on muscle as they were aided by steam donkey engines. Living conditions changed: the heating of crew quarters improved and fresh water could be obtained by distillation. However leaky timbers gave way to cold metal covered in condensation and damp persisted. Job demands changed – the marine engineer joined the crew and new conventions such as the use of red and green navigation lights made colour vision essential for navigating officers. Shorter passage times led to speedier access to medical care, but also meant that voyages often took less time than the incubation period of an infection, thus increasing the scope for international epidemic transmission.

*Tim Carter is a professor at the Institute of epidemiology and preventive medicine at the University of Bergen, with his working place at the Norwegian Centre for Maritime Medicine.*

## To steam, or to sail, that is the question

**Morten Tinning**

In February 1899 a local newspaper in the Danish maritime town of Svendborg printed a letter to the editor entitled 'Shipping in Svendborg and its surrounding region'. The author was the then 62-year-old sea captain and local shipowner, Peter Maersk Moller (1836-1927) - later co-founder of the Danish shipping company Maersk. In the letter P. M. Moller forcefully asserts his belief in the rising importance of steamships and the imminent demise of the sailing ship and articulates an urgent need for the establishment of a local steamship company and the need for local shipyards to gain experience with the building of iron hulled steamships. The response he got from the local maritime community was not at all what he expected and the public debate that followed soon became heated as several prominent members of the local maritime community put forward their own predictions and visions of the future; including views on maritime economy, geography, communications, technology, education, tradition and culture, safety at sea and not least the role of the Danish maritime industry in society. By analysing this debate in detail, this paper will examine some of the competing narratives, mindsets and visions of the future present in Danish maritime industry at the threshold of the 20th century.

*Morten Tinning is a Ph.D. fellow at the Centre for Business History at Copenhagen Business School (CBS) and a curator at the Maritime Museum of Denmark in Elsinore. Current research interests include the transition from sail to steam, maritime ethnology and maritime business history.*

# **Weathering the Storm: The struggle of a West Country harbour to survive the transition from sail to steam in the late nineteenth century**

**Tim Beattie**

In the early nineteenth century Falmouth was a confident, prosperous medium-sized port. It was, according to John Wilson Croker, Secretary to the Navy and MP for Bodmin, one of the world's largest natural harbours. It offered a 'first and last' haven on the busy waters of the western approaches and it was home port for the celebrated Post Office Packet Service to South America and Lisbon. Many ships arriving in the Channel from the Atlantic were instructed to call at 'Falmouth for orders' and would make use of the docks services to repair the ravages inflicted by their long sea voyages. By 1850, however, the sailing packet ships had been withdrawn and replaced by Samuel Cunard's Liverpool-based Steam Packet. At the same time the advantage of being able to offer provisioning, repair and dock facilities at the entrance to the English Channel all but evaporated with the advent of steam and Falmouth's land communications, which were notoriously poor even after the arrival of a railway line in 1865, provided little incentive for ships to offload there if the cargo's final destination was London or the home counties.

*Tim Beattie gained a Ph.D from Exeter University in 2013, and has subsequently published two articles in Mariner's Mirror and a book: British Privateering Voyages of the Early Eighteenth Century (Boydell, 2015). Since then he has been working as a volunteer at the Bartlett Maritime Research Centre and Library at the National Maritime Museum, Cornwall where he has been researching the history of Falmouth Harbour. Tim is a retired lecturer and part-time farmer.*

# **The "Invisible" Entrepreneurs: Aspects of female entrepreneurship in Greek shipping of the early 20th century. The case of Marigo Kulukundis Dimitra Kardakaris**

Investigating female entrepreneurship in early twentieth century Greece, this paper examines Marigo Kulukundi, one of the few such cases on which sufficient sources exist. I also intend to show that the history of women's participation in the shipping business and within the framework of Local Island and Greek economy is a continuation long-standing established, practices than a gradual introduction of new ones. As one would expect in this male dominated era, the managing of these companies and their local and overseas offices was at the hands of each male head of the family and his closer male relatives (brothers, cousins, sons etc). However, a persistent phenomenon, appearing in virtually every one such family was that all female relatives (sisters, wives, aunts and especially widows) appear as shareholders in ships and even in managing positions, at times influencing the general business policy of their families' to an important degree. One such woman was Marigo Kulukundis of Kasos. This is a tiny island in the South East Aegean, from which, originated Marigo's clan, the Kulukundis family, one of the most prominent Greek shipping families of the 20th century. Coming from humble origins, as owners of a several sailing ships, they became a great international conglomerate managing hundreds of ships, with offices in Syros, Piraeus, London, New York, Brazil, and Australia. Marigo and other women like her steadily played their important but always "invisible" part for the success of the family business.

*Dimitra Kardakaris is a graduate of the Department of History at the Ionian University. Her diploma thesis titled "The rise of the Greekowned shipping in the Eastern Mediterranean and the Black Sea in the 18th century. The action of Greek privateers under the Russian flag. The case of Ioannis Varvakis" won the Kaftatzoglio Award from the Academy of Athens in February 2013.*

# Steam and the resurgence of Germany as a maritime and naval power 1871-1914

**Benjamin Miertzschke**

After centuries of decline, the age of steam witnessed Germany's resurgence as a maritime and naval power. Still during the 1870s, both the German navy and merchant fleet had been quantities négligeables in international comparison, with most of their vessels still dependent upon sail or equipped with auxiliary engines at best. By the decade preceding the First World War, however, Germany's navy and merchant fleet had each become the world's second, surpassed in size, though by a considerable margin, still only by their British counterparts. They also ranked among the most modern ones, with more than 90 per cent of German shipping tonnage propelled by steam. From the turn of the century onwards, German passenger liners started to contest with British ones in terms of speed and luxury, while German commerce shipping enjoyed a growing share in trade with nations and regions all over the world. Notwithstanding this remarkable development, even by 1914 roughly half of Germany's overseas trade was still carried on foreign, especially British ships. In this sense, the presentation will take a critical view on the build-up of the German High Seas Fleet under the aegis of Alfred von Tirpitz. Inspired by a zero-sum concept of international trade, the infamous Admiral responded to an ever growing degree of international exchange and global interdependence with a national, monodirectional armaments scheme, that directly targeted Germany's main trading partner Britain. (Acknowledgement: B. M. is the recipient of a travel bursary from World Ship Society).

*Benjamin Miertzschke was born in 1987 in Lutherstadt Wittenberg (Germany). After completing his A levels and serving in the German military, he studied History and British Studies (2008-2012) and Contemporary History (2012-2015) at the University of Potsdam. In 2013 he did an internship at the German Historical Institute London. He currently works on his PhD thesis on the German naval policy during the First World War at the University of Potsdam, where he also is a teaching assistant.*

## Brunel's Crimean War 'stealth' gunboats

**Alistair Roach**

The only major European war in the nineteenth century was the Crimean, considered one of the first modern wars because of the tactical use of novel technology. It also showed that pure wooden sailing ships were vulnerable to accurate fire from modern shore based artillery and that there was the need for armour and manoeuvrability in shallow waters. As a result, the steam gunboat became one of the first purpose built warship designs to create a small, shallow draught vessel that could operate effectively close inshore. I.K. Brunel keenly followed discussions, both in Parliament and the national press. He noted that there was the need for gunboats in the Baltic theatre of war that could effectively attack Russian forts. This paper will focus on drawings of Brunel's gun boats, now held at the Brunel Institute (SS Great Britain Trust), in conjunction with Admiralty correspondence. Although innovative, none of his designs came to fruition as the Crimean war ended and he then continued to concentrate on building the *Great Eastern* until his death three years later. Some of his ideas could be deemed as 'cutting edge technology' and many have been adapted in later years by other people. Some examples include – armour plating without the use of rivets, water jet propulsion (albeit by steam), semi-submersible hulls, waterproof compartments, use of a camouflage colour scheme and even a 'parent ship' with opening bow doors!

*Alistair Roach holds an MA in Heritage & Archaeology and an MPhil, his research thesis being on 'Model Boats in the Context of Maritime History and Archaeology: An Investigation into their Usage between the 9th and 19th Centuries AD in North West Europe'. He is an Associate of the Chartered Institute for Archaeologists and a Fellow of both the Royal Historical Society and the Royal Society of Arts. He is the Hon. Secretary of the Society for Nautical Research, an independent researcher and assists at the Brunel Institute.*

# From Sailors to Engineers: Steam and its impact on the United States naval labor supply

**Zachary Kopin**

From 1796-1860, the United States Navy relied upon a steady stream of African American sailors to fill their ranks. The navy paid less and punished more than the merchant marine. The United States Navy (USN) was more brutal than even the French or British navies. As a result, the USN found itself constantly short of the able-bodied white sailors it wanted to employ. The USN employed well-trained sailors of color, many of whom grew up in ports and working on ships, to fill that shortage instead. These sailors made up to 20% of the navy's enlistments. The presence of people of color in the service, however, became an issue of national debate. However, even when a controversy over black sailors' testimony influenced the outcome of the election of 1840, black sailors continued to serve in deck roles. It was not until steam and steel became the predominate form of naval locomotion and ship construction that African Americans moved from mostly deck roles, working guns and manning sail, to service ones, such as cooks and stewards. This paper will use records in the National Archives and Records Administration in Washington, DC. It will show how the USN's progressive revolution created space into which the change in the types of skills required to man a ship led to a switch in the people employed on a ship. I argue that, without the need for specialized skills like managing rigging, the USN could expand its labor supply without failing to meet its strategic goals.

*Zachary Kopin is a PhD Candidate at the University of Michigan. His work focuses on race and law in the Atlantic World. He holds two 2014 university honors bachelor of arts degrees from the American University in Washington, DC: one in music and the other in history. He earned a masters in history from the same institution in 2015. While attending university in DC, Zach interned at Naval History and Heritage Command, the Woodrow Wilson Center, and the National Archives and Records Administration. He spends his summers working with the Constitution Hill Museum in Johannesburg, South Africa.*

## The advent of steam propulsion in the long-haul freight trades

**Cpt. Peter H. King**

Steam propulsion delivered in one form or another was a developing feature of ocean transport over the course of the 19th Century. Initially inhibited by wooden hull construction and paddle wheel propulsion - iron, later steel, hull construction, screw propulsion and the development of the compound steam engine had enabled steam to become the dominant means of propulsion on short and medium-haul routes, but the inefficient use of steam as a propulsion medium had debarred its economic use on the long-haul trades for all but heavily subsidised mail and passenger services, where dead weight carrying capacity was a secondary consideration. Meanwhile, the need to move coal cargoes out to bunkering stations and the growth of dead weight return cargoes from afar, had led to a latter-day burgeoning of sail on the long-haul freight trades. The opening of the Suez Canal in 1868 did not at first lead to an economic solution. The principle of triple expansion engines using higher steam pressures was well understood when the distinguished engineer, Alexander Kirk, designed the first meaningful unit in 1874, but it was not until 1882 that the first truly effective high pressure triple expansion propulsion package embracing engine, boiler, furnace and condenser was brought together in the steamer Aberdeen, enabling at a stroke the economic application of steam on the long-haul freight trades, sounding thereby the eventual death knell of sail. Ironically, the successful introduction of triple expansion steam was pioneered by one of the leading sailing ship operators of its time, the deeply conservative Aberdeen Line.

*A Master Mariner with over 62 years continuous service in the merchant shipping industry embracing a wide range of sub-disciplines, King's abiding passion is maritime historical research. A Fellow of the Nautical Institute and a Liveryman of the Honourable Company of Master Mariners, King's published researches have included a definitive history of George Thompson's Aberdeen Line; he has lectured broadly on merchant maritime historical subjects.*