



Proposal to the Admiralty
Lady Franklin
£1000 (offered by her, as a reward to the
Masters of Whale Ships - to search
for Sir John Franklin) by the Admiralty, providing
with her Ladyship, the total sum required - viz
£4000
J. G. W.

(they will not undertake it for less)

Francis Baring.

I do not think we can go further than as here
already offered to do -

Discovery, Innovation, and the Victorian Admiralty: Paper Navigators

Erika Behrisch

...
Should they receive assistance from others, then, the
subject of reward or remuneration should be considered.
This appeal ought not to have been made to the
Board.

Capt. Lord John Hay.

I quite agree with Capt. Hay
in thinking that this matter ought
not to have been referred to the
Board.

Captain Miles.

I entirely concur in opinion with Capt
Miles.

Hon. Wm. Cooper.

after all that has been done by the
Board this must be refused.

Secretary.

Global Studies in Social and Cultural Maritime History

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This series seeks to reconnect the maritime sphere with broader social and cultural histories across the globe. It looks to an emergent area of historiography: how the maritime was a space of global social and cultural exchange. It offers a platform for the growing community of scholars working in ‘new maritime history,’ which looks beyond (but by no means ignores) the economic, political, and military history of the seas, to understand its wider connections to social, cultural, geographical, and imperial histories.

The editors welcome proposals on ‘the maritime’ in its widest sense, including projects framed in terms of coastal history or the paramaritime. Therefore, studies examining the ways that littoral societies or inland communities, spaces, and people connected to the sea are also welcome. So are studies of interstitial watery realms (straits and portages; reticulated systems of lakes, rivers, or inland seas; archipelagos or island clusters). The series considers proposals from across a long chronological period, from antiquity to the twenty-first century.

We are especially keen to publish work that offers insights into the important themes of sailors’ gendered sexual identities and sexual activities, including the perspectives of non-normative and proscribed sexual activity, and aiming to incorporate queer approaches and break free of heteronormative frameworks. Similarly, we actively encourage proposals which investigate the global south or incorporate race and ethnicity into their research scope, for example by addressing the experiences of non-European born sailors, or European and American sailors’ interactions with non-westerners.

Erika Behrisch

Discovery, Innovation, and the Victorian Admiralty

Paper Navigators

palgrave
macmillan

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and Communication
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For Martin and Felix, my brave young men

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CHAPTER 1

Introduction: Triangulating the New—Discovery, Innovation, Bureaucracy

This book is my response to a pun, the title of an article written by Thomas Huxley in the January 1854 edition of the *Westminster Review*. In his “Science at Sea,” a review of naturalist John MacGillivray’s account of HMS *Rattlesnake*’s 1846–1850 mapping of the Great Barrier Reef and New Guinea, Huxley condemned what he interpreted as the hypocrisy of the mid-century Admiralty Board: they gave false encouragement to naturalists, he claimed, and their apparent interest in scientific activities aboard Royal Navy ships was belied by their reluctance to help in the publication of those expeditions’ results. Huxley had been in a position to know: recently returned from the same four-year cruise as junior naturalist (under MacGillivray) and assistant surgeon, Huxley was frustrated by the Admiralty’s disinclination to reward him personally for his research on jellyfish done during the voyage. His book, *The Oceanic Hydrozoa*, was eventually published with a private grant by the Ray Society. Any declarations of scientific interest on the Admiralty’s part, Huxley complained, were merely a façade, “little better than an attempt to look well with the public upon false pretences.”¹

¹ Thomas Huxley, “Science at Sea.” *Westminster Review* January 1854: 98–119. 107.

Much scholarship on the growth of nineteenth-century science seems to contradict Huxley's opinion; it claims instead that there were collaborative and even "close relations between natural history and the Royal Navy" in the period.² This perplexing schism is perpetuated in both popular and scholarly texts; some, for instance, celebrate the "devoted if sometimes eccentric band of [civilian] scholars [who] ventured far from home" as guests aboard Her Majesty's ships, and cast the Royal Navy as passive host.³ Others say the opposite: in Randolph Cock's words, "[s]cience was being professionalised by the Navy in [the period], and largely at State expense."⁴ Some even do both: Simon Naylor notes that "ships that were part of voyages of exploration, along with those that performed more mundane surveying duties, were packed with scientific equipment," but that "there remained significant ambivalence about the place of science on ships at sea."⁵ This same contradiction can be found in the nineteenth century between the public and private documents related to discovery and innovation, between accounts in the press and the Admiralty's own records. What this suggests is that, in essence, the triangulation of the Admiralty, scientific and technological innovation, and public engagement in the period was as complicated as science itself.

I have no interest in resolving this scholarly and historical inconsistency. On the contrary, I exploit it as the foundation for the following chapters, each of which explores how the Admiralty were simultaneously engaged and ambivalent, committed and non-committal around the issues that so exercised Huxley: questions of science, technology, and funding. To effect this, I first reframe high-level Admiralty administrators as scientific workers, men whose bureaucratic and even political positions brought them into contact with and made them publicly responsive to large and

² Jane Camerini, "Remains of the Day: Early Victorians in the Field," in *Victorian Science in Context*. Ed. Bernard Lightman. Chicago UP, 1997. 354–77: 355.

³ Glyn Williams, *Naturalists at Sea: Scientific Travellers from Dampier to Darwin*. Yale UP, 2013. 4.

⁴ Randolph Cock, "Scientific Servicemen in the Royal Navy and the Professionalisation of Science, 1816–55," in *Science and Beliefs: From Natural Philosophy to Natural Science, 1700–1900*. Eds David Knight and Matthew Eddy. Ashgate, 2005: 95–112. 111.

⁵ Simon Naylor, "Log Books and the Law of Storms: Maritime Meteorology and the British Admiralty in the Nineteenth Century." *ISIS* 106.4 (2015): 771–797. 771–72, 772.

small-scale questions of scientific and technological research and development. Second, I look at the nineteenth-century Admiralty Board's interactions around these issues with three distinct groups, each of which brought unique expectations to its negotiations for support: Royal Navy employees, who did their duty, were not always happy about it, and hoped to receive greater compensation than the satisfaction of doing their job (Chapters 2–4); external scientific societies with whom the Admiralty both collaborated and competed for data (Chapter 4); and private technologists, inventors interested in cashing in on the Royal Navy's institutional affinity for innovation and new technology (Chapter 5). Using four different case studies, the following chapters analyse the Admiralty's awkward and contradictory efforts to engage their wider public and simultaneously retain control over the information and inventions they received as well as the budget they were responsible for managing; ultimately, this book is about the acquisition and treatment of knowledge and of the people who gather it, about the power of ideas to move, elide, and destroy bodies, and how discovery and innovation are monetized and commodified. These topics reverberate in our own time.

Much has been written about the crews of nineteenth-century Royal Navy surveying ships, the work that they did, and the data they brought back.⁶ Comparatively little critical space, however, has been dedicated to the nineteenth-century Admiralty Board administrators who filled out the paperwork to make such work happen, and whose jobs were thus also deeply intertwined with mapmaking, discovery, and technological research and development. Even in texts dedicated to naval science and exploration, the Admiralty as an institution has been characterized variously as anonymous, uninterested, or grudgingly cajoled into action through the vision of inspired and ambitious civilians. On the surface, this makes sense; cravat-wearing bureaucrats with “ink-stained fingers” don't cut quite the same dashing figures as uniformed heroes in the field; indeed, they look more like the explorers' enthusiastic audience—consumers, rather than producers.⁷ They are also pushed to the narrative

⁶ See, for instance, Randolph Cock, “Scientific Servicemen”; Michael Reidy, *Tides of History: Ocean Science and Her Majesty's Navy*. Chicago University Press, 2008; Jenny Bulstrode, “Cetacean Citations and the Covenant of Iron,” in *Notes and Records of the Royal Society* 73.2. Eds Simon Naylor and Simon Schaffer, June 2019: 167–185.

⁷ Reidy 13.

shadows by more powerful personalities in the civilian community, individuals characterized as almost larger than life, masters pulling strings on a global scale while uniformed puppets dance. Michael Reidy cites William Whewell as an especially persuasive scientific diplomat, working “assiduously in the halls of the Admiralty” to sustain his global network of data gatherers on the world’s tides.⁸ There is also evidence, certainly in the correspondent records of inventors and naturalists frustrated by the Admiralty’s silence, that they sometimes (often?) preferred to keep out of the public gaze. Nevertheless, the chapters that follow show Admiralty administrators as active participants in both these conversations and activities—they were not throwers of lines and recorders of data, but they were those enterprises’ budgetary decision-makers and conceptual drivers. This book, then, examines naval scientific endeavour from the other side of the desk; to analyse how the bureaucrats set the agendas, wrote the instructions, chose the technology, and sent the ships out is to understand how the lords and clerks of Whitehall managed scientific enterprise within the Navy, and supported the Admiralty’s contributions to science and innovation within the larger public sphere. In their administrative approach to scientific discovery and technological innovation in both their decision-making and handling of their practitioners and their returns, the Admiralty Board, too, were scientific workers. I combine this consideration of Admiralty bureaucrats as themselves directly engaged in questions of science and innovation with an analysis of how they made their decisions in specific cases: how they allocated their budgets, how they treated returned objects and charts, what technology they chose to adopt in the fleet, and whom they decided to reward for work well done. Their deep engagement with these questions is clear when the same signatures appear in a variety of conversations and contexts—for instance, the opinions of Sir Francis Beaufort, of the Hydrographic Office, and of legal counsel William Robson permeate each chapter of this book—revealing that for some at the highest levels of Admiralty bureaucracy, science, technology, and their various considerations were regular and even abiding priorities. Administrators whose offices used data returned from expeditions and who advocated for different instruments and even food on board

⁸ Reidy 155. Randolph Cock has pointed out, though, that “professional scientific specialists” grew from this very circumstance; in gathering data for others, the Royal Navy’s “class of research assistants” learned also how to gather and analyse for themselves (Cock 97).

acted as advocates within Whitehall for work at the edges of the known world, negotiating extra supplies for expeditions and, as Peter Kjærgaard argues for civilian scientific figures in the period, “promoting the scientific ideology in all aspects” of their profession.⁹ They were thus deeply embedded in all stages of the process.

Including bureaucrats within the Admiralty’s scientific workforce in the nineteenth century is consistent both with the Admiralty’s own intentions and with the broader definition of scientific work in the period; it also makes room for new examinations of how, when, and by whom such work was conducted, the effects it had on Royal Navy expeditions and their crews, and the way in which the public perceived the Admiralty’s support for it. Such men belong in this equation; they are participants in what Jenny Bulstrode terms the “fraught power relations” that “embodied [...] the work of [...] nineteenth-century survey science.”¹⁰ Yet, as Reidy notes, the finished maps that remain the most recognizable objects of their influence “hid much more than they revealed.”¹¹ Cock concurs: Admiralty workers—the bureaucrats as well as the men on the ships who followed their instructions—involved in such projects still remain largely “hidden from view.”¹² Megan Barford’s description of the map as an archival record of labour, in which officers were desperate “to show themselves through their own laborious practice,” might equally be said of the bureaucrats who handled the paperwork around their expeditions.¹³ This consideration brings the Admiralty—its explorer employees, but especially its high-level administrators—into the narrative foreground, analysing the Admiralty’s efforts as a bureaucracy to position themselves at the nexus of a vital network of public interest, private ambition, and government funding—but also reveals their bureaucratic, budgetary, and personality-driven vulnerabilities. A sustained study of this awkward and often unstable triangulation between individual explorers and innovators, the public, and the Admiralty Board is important because, first, it makes

⁹ Kjærgaard, Peter. “Competing Allies: Professionalism and the Hierarchy of Science in Victorian Britain.” *Centaurus* 44 (2002): 248–88. 249.

¹⁰ Bulstrode 168.

¹¹ Reidy 192.

¹² Cock 111.

¹³ Megan Barford, “The Surveyor’s St. Lawrence: Route Science and Survey Work,” in *Soundings and Crossings: Doing Science at Sea, 1800–1970*. Eds Katharine Anders and Helen M. Rozwadowski. Science History Publications, 2016: 49–78. 50.

visible the historical contradictions between how the Admiralty Board behaved and how they were perceived, and, second, it explores why those contradictions—between their simultaneous rejection of and insistence upon civil-military collaboration around science and technology—existed. This analysis of how the Admiralty Board talked amongst themselves about science and technology provides a view not often seen: not just how the public saw them in relation to the work they were called upon to support, but how they saw themselves. This consideration in turn can help to clarify the Admiralty’s particular ambitions as an institution in relation to the growing—and increasingly professionalized—communities of scientific enthusiasts in the nineteenth century.

There were in fact multiple levels of bureaucracy with links to (and influence on) scientific endeavour in the Navy: the Admiralty Board, the highest office, adjudicated rewards and considered promotions; the Magnetic department, housed within the Ordnance Department at Woolwich and overseen by former polar explorer, artillery officer, and scientific adviser to the Admiralty Edward Sabine, supplied individualized instructions and instruments to explorers setting off around the world¹⁴; and the Hydrographic Office—run in the middle of the century by the influential Sir Francis Beaufort, himself a former explorer with a preternatural sense of national duty and information control—managed the maps and surveying instructions. The administrative levels on which the Admiralty engaged in scientific acquisition are also worth noting: archival evidence identifies everyone “from first lords down to lowly clerks” as offering opinions on where ships should go, what data should be gathered, and who would be best to do it.¹⁵ It also points to active conversations between Whitehall and civilian institutions, whose leaders frequently asked for (and even felt entitled to) financial and material aid.

Historians of science have noted that nineteenth-century explorers were often treated as “regulated instruments” in a fantasy quest for objective data, as neutral as a Mason’s Hygrometer, one of the instruments

¹⁴ See Matthew Goodman, “Follow the Data: Administering Science at Edward Sabine’s Magnetic Department, Woolwich, 1841–57.” *Notes and Records of the Royal Society* 73 (2019): 187–202.

¹⁵ Cock 103.

they were responsible for monitoring.¹⁶ This analogy, I think, can equally apply to Admiralty administrators: like the men in the boats, the men at the desks were expected to provide consistent responses in clockwork time. Indeed, reactions to Admiralty Board decisions that I explore in the following chapters indicate that many considered the Board as a type of machine, expected to pump out funding whenever a lever was pulled; many considered the Admiralty a “secure source of patronage.”¹⁷ As such, Board members were simply walking signatures darkening the shadowy hallways of Whitehall, their intelligence assumed to be as grey as the walls of the building in which they made their decisions. Like so many precision devices, however, the “regulated instruments” of the Board were quixotic and inconsistent; they just as “constantly broke, malfunctioned or were misread.”¹⁸ In their too-frequent refusals to finance experiments or approve payments for inventions, they weren’t very “reliable inscription devices” and, most relevant to our discussion here, they didn’t always feel the need to explain the reasons behind their decisions.¹⁹ As well, they, too, were “misread”: they were much less a cohesive group of “institutionalized men” than a “highly complex, evolving body” with multiple, sometimes contradictory concerns.²⁰ C.I. Hamilton efficiently deconstructs the instrument: “‘the Admiralty’, as shorthand for the Lords Commissioners of the Admiralty, ought to be a plural noun.”²¹ In other words, they were human.

This book accepts Hamilton’s treatment of “the Admiralty” as a plurality of personalities but, rather than provide biographies of the

¹⁶ Charles Withers, “Science, Scientific Instruments and Questions of Method in Nineteenth-century British Geography.” *Transactions of the Institute of British Geographers* 38.1 (2013): 167–79. 176.

¹⁷ Reidy 159.

¹⁸ Withers 176.

¹⁹ Withers 173.

²⁰ Katy Barrett, “‘Explaining’ Themselves: The Barrington Papers, the Board of Longitude, and the Fate of John Harrison.” *Notes and Records of the Royal Society of London* 65.2 (2011): 145–62. 145, 146. Katy Barrett’s description is of the Board of Longitude, but the Board’s organization as a governmental body designed to oversee discovery, technological research and development, and funding makes her study immediately applicable here.

²¹ C.I. Hamilton, *The Making of the Modern Admiralty: British Naval Policy-Making, 1805-1927*. Cambridge UP, 2011. 5. Throughout this book, I follow Hamilton’s recommendation and refer to “the Admiralty” and “the Board” in the plural.

Board's individual members in order to explain their quirks, it concentrates on their professional responses to particular queries and how they responded to each other and the problem at hand. Certainly, strong personalities were frequently in play, and individuals with political clout came into conflict with those with military experience; Don Leggett notes that, "like in many government departments, there was a tension between those individuals who were authorities on technical matters, derived from experience and reputation, and the administrators and representatives of government who had the authority to make decisions."²² Civilian inventors eager for compensation and naval officers interested in promotion were sometimes caught between these opposing authorities. Leggett laments the absence of "human actors" in much research on science and technological changes in the nineteenth-century navy, seeing instead a surfeit of research that presumes "technological evolution and determinism" and removes the human from the decision-making process.²³ While this study hopes to call attention to the plurality of voices and opinions that were expressed in conversations, it sees these voices firmly in the context of the workplace. In the case studies that follow, then, it is less a matter of personality than one of profession; the Board's collective behaviour is the product of bureaucratic circumstance, as are the archival records of their decisions. Names are attached to opinions, but it is the discussion itself that reigns.

The other aspect of Admiralty and Royal Navy business I choose not to consider are the innovations, discoveries, and research done overtly for the purposes of military might. Leggett has amply explored the ways in which decisions surrounding naval military technology were taken and implemented, most specifically around ship design for the purposes of naval dominance. Christine MacLeod, too, makes the important observation that the works of inventors and engineers were always "at risk of co-option by the military state"; even if "indirect and unintended," any invention or discovery was potentially an instrument of war.²⁴ This remains true for the discoveries and innovations discussed here: maps

²² Don Leggett, *Shaping the Royal Navy: Technology, Authority and Naval Architecture, c.1830–1906*. Manchester University Press, 2015. 15–16.

²³ Leggett 5, 6.

²⁴ Christine MacLeod, *Heroes of Invention: Technology, Liberalism and British Identity, 1750–1914*. Cambridge UP, 2007. See, especially, Chapter 8, "Heroes of the Pax Britannica" (212–248). 220.

allowed British warships in and out of harbours; a discovery of coal on a remote island could identify a mid-voyage refuge; a stronger anchor kept warships safe as much as they did pleasure yachts and mail packets. The discussions between the Admiralty Board and Royal Navy officers, civilian scientific workers, inventors, and engineers that I have chosen here, however, have no overt or direct military bearing: maps were made, ostensibly, for commerce; an iron ship was designed to reduce loss of civilian life. The Admiralty's understandably martial culture and those same administrative procedures were applied to questions of science and technology not overtly geared towards force, at least in the minds of the people producing them. Using Leggett's encouragement to see "the Admiralty as an agent in the changing relationship between craft and science" and considering the Board's decision-making process in a different context contributes, I hope, to Leggett's call for a more "nuanced history of authority."²⁵ Showcasing the Admiralty Board's support for discoveries and innovations not immediately applicable to war also supports MacLeod's opinion of the nineteenth century, that it was a period in which the inventor was recognized as a possible "alternative hero to the warrior"—even in the halls of the most powerful military institution in the world, and even if those same innovations would eventually be adopted by that military.²⁶

Some historians tell us that the nineteenth-century "British Admiralty was at the forefront of technological and scientific advance."²⁷ Like Reidy, Leggett contends that it is easy to recognize "the Navy as a site of science in the first half of the nineteenth century."²⁸ Technology and engineering were equally a part of this equation; in public approbation, mid-century "inventors and engineers [were] portrayed on equal terms with the elite of British science."²⁹ Two major bodies of texts convincingly attest to the Admiralty's centrality in these twin endeavours: the published accounts of explorers' adventures and the maps Royal Navy explorers produced. Both types of texts were significant points of interaction between the

²⁵ Leggett 8, 23.

²⁶ MacLeod 212.

²⁷ Reidy 156.

²⁸ Leggett 12.

²⁹ MacLeod 227.

Admiralty and its public. Tackling the first of these rich oeuvres, Innes Keighren, Charles Withers, and Bill Bell (2015) analyse the experience of explorers publishing with John Murray (the Admiralty's official printers), and their work focusses on completed expeditions and the movement of these narratives through the Admiralty and into the public market.³⁰ Even beyond the Murray imprint, one can hardly open a nineteenth-century volume of exploration without meeting some form of dedication to the Lords of the Admiralty—though naturalist John MacGillivray (whose book was published by T. & W. Boone, and with which this Introduction began) dedicated his narrative to the mother of the expedition's late captain, Owen Stanley. Nevertheless, in his Preface, MacGillivray acknowledged that the Lords Commissioners' benevolence made his book possible: "in addition to sanctioning the publication of [his] account of the Voyage," MacGillivray noted that they also opened their archives, directing "that every facility should be afforded to [him] in consulting the manuscript charts and other hydrographical results at their disposal."³¹ Once they were received, approved, and standardized by the Admiralty's Hydrographic Office, maps were likewise in the public domain and a sign of the Admiralty's direct involvement in knowledge acquisition. A third locus of engagement was the much-publicized contests the Admiralty hosted for encouraging technological research and development that might be useful to the Royal Navy; these were closely followed in the press.³² A fourth category exists, equally important but less explored: the private conversations that occurred between and amongst administrators, officers, and applicants before or during an expedition or after the results of a contest. In contrast to the beautiful books, tidy maps, and controlled contests, these were messy negotiations that could last for years as the

³⁰ Innes Keighren, Charles Withers, and Bill Bell, *Travels into Print: Exploration, Writing, and Publishing with John Murray*. University of Chicago Press, 2015. Keighren, Withers, and Bell remind us that, included in the instructions for an expedition even as it set out, was the rule that "Admiralty-backed explorers' journals became the Admiralty's property on [that] expedition's return: this requirement of journal writing extended not simply to its being undertaken but to its safe keeping as well and from a concern over what its content might reveal about how the exploration had been conducted and by whom" (43).

³¹ John MacGillivray, *Narrative of the Voyage of HMS Rattlesnake*. 2 vols. London: T & W Boone, 1852. "Preface."

³² See Don Leggett, *Shaping the Royal Navy* for examples of the Victorian press's wider and sustained engagement in questions of naval architecture and design.

value of an innovation or discovery was negotiated; in their entirety, these never made it even close to official publication. These spats form the core of the chapters that follow.

1 “THE USUAL PRACTICE”: DECISION-MAKING IN THE ARCHIVES

These unpublished conversations—the focus of this study—comprise the Admiralty Board’s collective thinking around questions of discovery and innovation, and the support for such endeavours. They mostly exist as archival traces. If a letter or account made it to the press (and many frustrated inventors threatened the Board with such exposure), it represented only a fraction of the conversation. Most went altogether unseen outside of Whitehall. Even in the archives, these conversations can be difficult to trace; the archives are substantial and messy, their cataloguing as eclectic as the correspondents and topics themselves. Randolph Cock and N.A.M. Rodger’s *A Guide to the Naval Records in the National Archives* (2008), at nearly 400 pages still considered a “highly compressed guide,” is both a navigation tool and an apologia for the fond.³³ Cock and Rodger explain the state of the collection: “the vicissitudes of time, archival mismanagement, and governmental reorganisation have [...] severely disrupted the natural archival structure of the public records.”³⁴ I argue, however, that the disrupted nature of the Admiralty archives tells an interesting story in itself; as Cock and Rodger note, the order of an archives reflects the “organization of the administrations which created them,” and so the complexity of the Admiralty’s archives tells us something important about their office culture even while it obscures clear narrative paths.³⁵ Organized in turns by topic, date, or alphabet, these folders, boxes, and collections of sewn-together paper show ideas passing through multiple

³³ Randolph Cock and N.A.M. Rodger, *A Guide to the Naval Records in the National Archives of the UK*. Institute of Historical Research, 2006. 14.

³⁴ Cock and Rodger 13.

³⁵ Cock and Rodger 13.