

CHAPTER 1

Reconsidering the Theory of the Open Polar Sea

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In 1845, British explorer Sir John Franklin and a party of 129 men vanished in the Arctic. The party's disappearance was a blow to the British Admiralty and its efforts to discover the Northwest Passage. Yet finding Franklin became the new object of Arctic exploration, a project that piqued popular interest in Great Britain and the United States, and launched dozens of rescue expeditions on both sides of the Atlantic. The search for Franklin also kindled new interest in an old idea, the theory of the open polar sea. Since the Renaissance, geographers had suggested that the high Arctic regions might be free of ice. As the mystery of the Franklin Party deepened, many seized upon the theory as a way of explaining where Franklin might have gone and, more importantly, why he might still be alive. The expedition had become trapped in the open polar sea, they argued, and now sailed its bountiful waters searching for a way out. This explanation came at an opportune moment for U.S. and British explorers, who used it to justify new Arctic expeditions for a decade after Franklin's departure.

Historians have not been kind to proponents of the open polar sea theory, viewing them as wishful thinkers at best and unscrupulous schemers at worst. "The myth of the open polar sea exerted an enormous influence on the Franklin search," argues L. Gillies Ross, "overriding the reasonable and correct conclusion that the ships had gone south." For Clive Holland, "the ability of otherwise rational men to delude themselves was remarkable." "That such a notion could withstand for a century all the evidence thrown

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against it," writes P. J. Capelotti, "elevates the open polar sea almost to the status of an El Dorado."¹

These views do not capture the strength of the theory's arguments or its range of influence. The open polar sea theory's appeal was multifaceted, sustained not only by wild-eyed optimists and enthusiasts of the Franklin search but also by serious scholars who felt that it offered the key to a hydrographic system of the world. In the United States, scientists defended the theory in the *American Journal of Arts and Sciences*, the *Smithsonian Contributions to Science*, and the *Journal of the American Geographical Society*. It gained the support of luminaries of American science such as Alexander Dallas Bache of the Coast Survey, Matthew Maury of the Naval Observatory, and Louis Agassiz of Harvard University, all of whom suspected that the Atlantic Gulf Stream passed into the Arctic basin, keeping the waters there warm and free of ice.

Tracing the story of the open polar sea, then, sheds light on the broader process by which Americans formed ideas about the geography of the globe. In particular, knowledge of the Arctic regions emerged from the consensus of many groups: scientists, explorers, and popular audiences. As much as scientists depended upon explorers for observational evidence of the open polar sea, explorers relied upon scientists to give credibility to their field reports. In turn, both scientists and explorers used the support of popular audiences to fund new Arctic expeditions. The fruits of their labor are found not only in scientific journals, but the varied texts—expedition narratives, newspaper articles, family atlases, and geography primers—which ordinary Americans used to learn about the world.

HISTORY OF THE OPEN POLAR SEA

The open polar sea is an idea with long roots. Three hundred years before ships sailed to find John Franklin, Renaissance scholars talked about an open polar sea described in the medieval text *Inventio Fortunata* (Fortunate Discovery). The *Fortunata* supposedly based its evidence on the 1360 voyage of Nicholas of Lynn, an Oxford priest and mathematician who saw the watery top of the world with his own eyes. Whether there was a 1360 voyage, whether it was commanded by the versatile Nicholas, and whether it reached the Arctic are issues clouded in fog.² The reports are not consistent and the *Inventio Fortunata* no longer exists. But if the voyage itself has the whiff of the

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fantastic about it, the *Fortunata* had real effects upon Renaissance geography. John Ruysch cites it on his 1507 world map which shows water coursing over the top of the world. The Lenox Globe of 1511, and the world maps of Gerard Mercator (1569), Abraham Ortelius (1570), and Petrus Plancius (1592) show the same, along with other details that derived from the mysterious text: a ring of islands circling the Arctic sea and four channels that connected the sea to the world's northern oceans.³

Yet we must be careful what we conclude from the appearance of these maps. If they gave attention to the open polar sea, it was a single feature in a much larger, changing portrait of the globe, the most noticeable (and mutable) part of which was the New World. That they include curious depictions of Arctic geography tells us little about the opinions of the people gazing at maps: who they were, what they saw, and (if they happened to glance at the polar sea) what they made of it. It is reasonable to think that they would have had doubts that the polar sea remained free of ice. The idea of a warm ocean at the top of the world conflicted with a very old, very basic axiom of global geography: that it gets cold as one moves away from the equator. On this basis, ancient geographers had divided the world into separate climatic zones. So it is not surprising that other sixteenth-century map makers were unaware, or unimpressed, with the travels of Nicholas of Lynn. Most saw fit to place the North Pole in the middle of a cold, featureless "Mare Glaciale."⁴

Yet the idea of an open polar sea continued to intrigue, especially in the British Isles. As Britain sought to find its own sea route to Asia, an open sea in the Arctic carried the promise of commerce. In 1527, merchants Robert Thorne and Roger Barlow urged Henry VIII to send ships to find a northern passage to the Spice Islands, a route that would cut time and distance from the long voyage around Africa. The crown took its time but eventually put their plan into effect. At the end of the sixteenth century, Britain fielded a number of expeditions to find a northern passage under the commands of Martin Frobisher, John Davis, Henry Hudson and others. These voyages did not depend upon evidence of an open polar sea because they primarily sought routes northwest along the uncharted coasts of North America. Still, the open polar sea theory smoldered among groups of scholars and geographers. It interested the polymath John Dee, expedition writer Richard Hakluyt, as well as a small circle of Continental geographers. Later it attracted the attention of Joseph Moxon, hydrographer of Charles II, who came to the idea through less orthodox channels, drinking beer with Dutch sailors who claimed to have sailed over the North Pole. Moxon left his new friends convinced that they spoke

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the truth, later recalling the episode for the Royal Society in his essay *A Brief Discourse of a Passage by the North-Pole to Japan, China, etc* in 1674. The paper gained little notice. A century later, Daines Barrington revived the topic in a Royal Society lecture, but it too failed to arouse interest.⁵

There matters stood until the early nineteenth century, when the British Admiralty—idled by the peace that followed war with Napoleon—dusted off its fitful search for a Northwest Passage. Few still hoped to reap the benefits of the Northwest Passage, since earlier voyages had all but confirmed that the passage, if it existed and could be found, would be far too perilous to be used as a commercial sea route. This did not stop John Barrow, second secretary of the Admiralty, from seizing upon Arctic exploration for other ends. In public he spoke of the benefits of polar exploration “for the advancement of geography, navigation, and commerce.” Behind the scenes, Barrow conceived of the Arctic as a new theater of war, one in which his ships battled icebergs and pack ice rather than French ships-of-the-line. In the Arctic, he observed, British officers could risk their lives for higher, more civilized ends than they did on the fields of Europe. When whalers returned from the Arctic in 1816 and 1817 reporting that normally ice-choked bays were open, he used the news to launch a series of expeditions the following year. Thus began a thirty-year period of naval and overland exploration that would send thousands of Britons into the Arctic.⁶

The Franklin Expedition of 1845, the jewel of Barrow’s polar enterprise, set in motion a series of events that revived the theory of an open polar sea. After centuries of searching for the Northwest Passage, the Admiralty had high hopes for Sir John Franklin. He was already a tough veteran of three Arctic expeditions. An overland expedition to the polar sea had brought Franklin to the edge of starvation and fame back in England as “The Man Who Ate His Own Boots.” He sailed from England with detailed maps of the Arctic regions, identifying promising routes over the American continent. His ships, *Erebus* and *Terror*, with reinforced hulls and steam-powered propellers, had also proven themselves in the polar regions. Thus it was surprising when Franklin did not return from the Arctic in 1846 or 1847. In 1848, with still no word, the Admiralty sent a series of expeditions to look for him, focusing on the northern coast of America and islands off its shores. They found no sign of the expedition. Lack of news deepened the mystery surrounding the lost expedition and fueled public interest. By 1849, the British press had become fixated on the Franklin search, and it had prompted wide coverage in American newspapers and magazines as well.⁷

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At the urging of Franklin's wife and with the backing of wealthy U.S. merchant Henry Grinnell, the United States joined the Franklin search in 1850, sending two ships, *Rescue* and *Advance*, into Lancaster Sound under the command of Edwin De Haven. There it found British ships already looking for Franklin. While all the vessels lay together at the mouth of Wellington Channel, a sailor from one of the British ships found three graves on Beechey Island. The dead men had been members of the Franklin party. Nearby lay the detritus of an extensive camp: foundation stones for huts, a forge, and a carpenter shop, meat tins, even a pair of cashmere gloves laid on a rock to dry. Unable to find a written record, the explorers could only make guesses about the camp, the graves, and Franklin's course. Before De Haven could exploit the discovery, pack ice locked them in. They drifted with it north up Wellington Channel then south into Lancaster Sound. There *Rescue* and *Advance* slowly drifted east, reaching Baffin Bay by the beginning of 1851 and once free of the ice, reached New York in October.⁸

Discovery of Franklin's campsite on Beechey Island led to a flurry of speculation about Franklin's whereabouts. In the United States, it gave life to a new campaign to send American expeditions into the Arctic. The campaign, led by Elisha Kane (medical officer of the De Haven Expedition) and Grinnell, combined the Beechey Island artifacts and the theory of the open polar sea to reconstruct Franklin's route through the Arctic. In a letter published in the *New York Tribune*, Kane laid out his arguments. The graves at Beechey Island made clear that Franklin had camped there in 1846. Valuable articles left at the camp, such as the cashmere gloves, suggested that his party had left the camp in haste. Perhaps the ice in Wellington Channel had broken up suddenly, Kane ventured, and Franklin had abandoned his camp in order to take advantage of the open passage north. Sledge tracks north of the camp indicated that the party had moved north up Wellington Channel. Observations from De Haven's drift up Wellington Channel in 1850 suggested that open water lay at the channel's northern mouth. Franklin's ships may have reached it and passed into the open polar sea. Once they had entered it, Wellington Channel may have once again filled with ice, preventing their means of escape. Although the Franklin party must have already exhausted their stores, they may have been able to survive on the marine life of this sea. The warmer climate and abundant wildlife observed by De Haven and others near the top of the channel suggested that food was plentiful. Kane's theory spread quickly in the popular press. Soon after it ran in the *Tribune*, the *New-York Daily Times* reprinted it. A few weeks later *Harper's New Monthly Magazine*

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brought Kane's arguments to an even larger readership. "It is the opinion of Dr. Kane that, on the breaking up of the ice, in the spring, Sir John passed northward with his ships through Wellington Channel, into the great polar basin."⁹

As Kane campaigned for a new search expedition, the open polar sea theory helped him appeal to different audiences. For individuals disposed to the heroic and patriotic aims of exploration, the open polar sea offered a plausible way to explain Franklin's whereabouts and continued survival. In this sense, the open polar sea argument served the aims of a second rescue expedition. For scholarly audiences, the polar sea theory itself, and the mission to confirm it, touched at the heart of current scientific research. Kane's discussion of the open polar sea particularly interested Matthew Fontaine Maury of the Naval Observatory and Alexander Dallas Bache of the Coast Survey. Both men had conducted research on ocean currents. They believed that the Atlantic Gulf Stream carried tropical waters far north of Europe. If Kane could confirm the existence of an open polar sea, it would corroborate their claims by suggesting that the Gulf Stream passed into the Arctic basin itself, keeping the waters there warm and free of ice. At stake was more than a confirmation of their theories about the Gulf Stream. Naturalists knew that the tropics received more energy from the sun than the other parts of the globe, yet the tropics did not get warmer over time. If the waters of the open polar sea really came from the tropics, it suggested a way by which oceans maintained their relatively stable temperatures. The poles and tropics must be tied together by a complex circulation system much like that of a living organism. For Maury and Bache, both of whom were philosophically committed to viewing nature as a system of global, lawful, and interconnected phenomena, proof of the open polar sea confirmed their basic beliefs about the world.¹⁰

Kane's Greenland expedition of 1853–55 did not find Franklin, but it did bring home eyewitness accounts of an open sea. "Coming as it did, a mysterious fluidity in the midst of vast plains of solid ice," Kane reported in his 1857 bestseller *Arctic Explorations*, "it was well calculated to arouse emotions of the highest order; and I do not believe there was a man among us who did not long for the means of embarking upon its bright and lonely waters." Kane even gave his readers a view of the open sea, an engraving of a lone explorer on the rocks of a craggy shore, arms outstretched before an ocean that stretches to the horizon. Kane was highly esteemed by popular and scientific audiences and his reports of open water at the top of Smith Sound were widely believed. Other explorers soon confirmed Kane's discovery. In 1860, Amer-

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ican explorer Isaac Hayes followed in Kane's footsteps up Smith Sound, reaching a point where the pack ice disintegrated and open channels "expanded as the delta of some mighty river discharging into the ocean." Hayes's account, titled (in case anyone remained unclear of his position) *The Open Polar Sea*, also came with illustrations. The narrative failed to excite American readers as had Kane's, but it helped cement the open polar sea as a legitimate geographical theory.¹¹

SUPPORTERS AND THEIR ARGUMENTS

For almost thirty years, from 1850 to 1880, the open polar sea theory found wide support. When explorer Elisha Kane wrote the Maryland Institute for help in selecting topics for his upcoming lecture, the lecture organizer wrote back. "I unhesitatingly answer on the probable existence of an open polar sea. If you will select that title, in my announcement by advertisement and editorial, [you will receive] a high degree of public interest and attention." The public showed its interest in many ways. The open polar sea quickly became an established geographical feature in U.S. textbooks, family atlases, and geography primers, many of which labeled the top of Smith Sound "Kane's Open Sea." Newspapers wrote extensively about Kane's discovery and readers took the time to write letters offering their own theories about the strange hydrography of the North Pole. That Franklin might still sail the waters of the polar sea fired the imagination of amateur poets, who wrote gothic poems about the polar sea in the pages of *Scribners Monthly* and *Littell's Living Age*. Perhaps the best evidence that the theory had become broadly known to Americans was its presence in texts that had nothing to do with Arctic exploration. It appeared in the novels of Mark Twain and Wilkie Collins as well as lesser-known works: senate speeches, books on Western settlement and travel by train, and anthologies of poems for children. For some, it was a benchmark of Anglo-Saxon spirit. For others, it symbolized the remote and the fantastic. For all, it was a concept well established in the American vernacular.¹²

Yet the open polar sea was more than a faddish idea for essayists and novelists. It had a vibrant life among scientists who debated its merits seriously and vigorously. In the United States, Bache and Maury were the theory's most visible and vocal proponents, joined by a number of elites including: Harvard zoologist Louis Agassiz, Columbia anthropologist Franz Boas, and Yale geologist James Dana. In Europe, the open polar sea attracted the attention of Roderick Murchison, president of the Royal Geographical Society,

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and the German geographer August Petermann. The prevailing theory, articulated by Maury, was that the Gulf Stream warmed the waters of the high Arctic. Petermann offered a variant of the Gulf Stream theory, arguing that the open polar sea was also fed by the warm Pacific Kuro-Siwa current that passed through the Bering Strait, an idea that caught on with some members of the American scientific community and helped to launch the U.S. *Jeannette* Expedition in 1879. In conference papers and published articles, scientists proposed a variety of other mechanisms too: solar radiation, geothermal activity, tropical winds, and the centripetal force of the earth's rotation. It is a sign of the theory's strength that the most active debates considered how, not if, the polar sea remained free of ice.¹³

Enthusiasm for the existence of the open polar sea rested upon a broad foundation of evidence, not merely the sightings of Kane and others. Russian mariners had long reported the existence of "polynias," vast areas of open water, around the Bering Strait and the northern shores of Siberia. Sailors observed strange behavior among Arctic wildlife, such as birds and game migrating *north* in the winter months, as if the high Arctic offered food and sanctuary from the bitter cold. They also witnessed whales in the North Atlantic carrying harpoons from Pacific whalers. Since many species of whales were thought to be unable to travel through the equatorial regions, their presence in the North Atlantic suggested that they had migrated from the Pacific through an open passage across the Arctic. At the same time, new geographical methods had challenged the system of fixed climatic zones that corresponded closely with latitude. Isothermal mapping, for example, had shown large variations in climate across a single line of latitude. The British Isles were far warmer than their latitudinal counterparts in America, a phenomenon largely attributed to the effects of the Atlantic Gulf Stream. It did not seem unreasonable to suggest, then, that this same current might have effects upon the climate farther north.¹⁴

Ultimately, the theory collapsed under the weight of new evidence. When new expeditions reached the polar sea in the 1880s, they found vast regions of pack ice, not open water, and serious discussion of an open polar sea came to an end. The point was made plainly, and tragically, by the *Jeannette* Expedition which sailed into the Bering Strait hoping to find the open channel—predicted by August Petermann—that led to the North Pole. Instead, the *Jeannette* became trapped in ice fields, drifted across the polar sea for over a year, and was crushed by pack ice far off the Siberian coast. Meanwhile, the U.S. Coast Survey found that southern currents did not provide the Arctic regions with a large influx of warm water. This evidence, combined with re-

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ports of the *Jeannette* survivors' long polar drift, was enough to cool enthusiasm for the theory, even among its most ardent scientific supporters.

CONCLUSION

The rise and fall of the open polar sea theory follows an arc guided by reasonable evidence and arguments. Why, then, have historians been so quick to dismiss it as delusional thinking? Perhaps because they have associated it with other fantastical ideas about the polar regions. By the nineteenth century, the Arctic remained one of the worlds' last and largest *terrae incognitae*, and, as a result, it spawned a discourse rich in geographical speculation. While scientists and explorers investigated the open polar sea, others proposed the idea of a massive Arctic continent based upon tidal observations and Inuit legends. Still others adopted the "hollow earth" hypothesis of American John Cleves Symmes, who claimed that large openings at the North and South Poles led to a series of cavities inside the earth. Few people took his ideas seriously, but they generated considerable interest in the press, inspired authors such as Edgar Allan Poe, and prompted the polar research of the U.S. Exploring Expedition of 1838–42. While the open polar sea was the only idea to elicit broad, sustained, and critical attention, historians have frequently lumped it together with its more fanciful counterparts.¹⁵

More damaging for the open polar sea theory was its allure to groups that had little credibility among scientists and mainstream readers. After 1850, a number of spiritualists joined the search for Franklin, some of whom found him sailing the waters of the warm polar sea. American spiritualist Francis H. Smith confirmed the existence of an open polar sea by spiritual communications with John Franklin in 1856–57. Should anyone have had doubts about the credibility of Franklin's channeled testimony, Smith also pointed to communications with Elisha Kane and Humphery Davy, who joined Franklin at Smith's séance and traveled with him as afterworld companions. The open polar sea also became a favorite topic among religious groups and occultists, appealing in books such as William Warren's *Paradise Found* (which placed the Garden of Eden at the North Pole), Edmund Sears' *The Fourth Gospel, the Heart of Christ*, and the writings of H. P. Blavatsky, founder of the Theosophical Society. The growing skepticism of scientists in an open polar sea did not faze Blavatsky, who wrote in her 1888 book *The Secret Doctrine*, "Even in our day, science suspects beyond the Polar seas, at the very circle of the Arctic Pole, the existence of a sea which never freezes

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and a continent which is ever green." Nor did the theory's mainstream decline stop pulp novelists from using the warm polar sea as a stage for adventure stories such as Thomas Knox's *The Adventures of Two Youths on the Open Polar Sea*, Fred Whittaker's *The Lost Captain; Skipper Jabez Coffin's Cruise to the Open Polar Sea*, and John Hill's *The Polar Zone*.¹⁶

At a time when Arctic exploration was under fire for being too much about adventure and too little about science, proponents of polar exploration distanced themselves from the theory of the open polar sea. While the theory lived on among fringe groups and fantasy writers, scientists cut their ties to the theory and its serious history. Only a few years after the disaster of the *Jeannette* Expedition, Gardener Hubbard inaugurated the new *National Geographic Magazine* by labeling the open polar sea as "the ignis fatuus of explorers," a delusion of mind rather than the product of evidence and observation. Explorers themselves were equally critical. Fridtjof Nansen, writing about his own drift across the polar sea in 1895, explained away the idea of the open polar sea as "the attraction of mankind towards the most fantastic ideas." U.S. explorer Adolphus Greely offered a similar assessment of the theory in his *Handbook of Arctic Discoveries* in 1896, even though he had supported the idea earlier in his career.¹⁷

Yet how do we explain the Whiggish reaction of twentieth-century historians towards the theory? Those who have written about the open polar sea rarely talk about its appeal to novelists and occultists. It is doubtful that this knowledge, coming a century later, would prejudice their assessment of the theory. The answer, I believe, comes from the challenges presented by a theory that is, by modern standards, both wrong *and* counter-intuitive. Perhaps our most important task as historians is to forget what we know, to ignore our beliefs in modern geography, and in this particular case, to put aside our confidence that the polar sea is covered with ice. Were the situation different, were we, in absence of any data, confident to expect open water at the North Pole, perhaps historians would judge the open polar sea theory and its supporters more kindly. No one faults Aristotle, after all, for placing the earth, motionless, in the center of the universe. It does not seem silly for him to have imagined a theory that conformed with his experience. The earth was solid and still beneath his feet, a colossus so stable and imperturbable that it framed all other motions in the universe, even the whirling stars and planets. But the open polar sea offers no such logical extrapolation from experience. Long before mariners and explorers plied the Arctic, ancient geographers knew that higher latitudes were generally colder than lower ones. They predicted that the polar regions would be frigid. Most people agreed with them and they have

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been proven right. Looking backward, it is hard not to make judgments: the old, eminently logical idea of an icy Arctic has carried the day, marred only by a brief thirty-year period in the nineteenth century when explorers, poets, and scientists collectively lost their minds.

Yet to deny the open polar sea credibility as a serious idea closes the door on an important story. As myth, the open polar sea has been given separate status as a geographical idea, one that emerged from “wishful thinking,” and dubious observations. Thus defined it sits alone, having little connection to the broader enterprise of geographical inquiry that mushroomed in the nineteenth century. In truth, the open polar sea theory is more representative of its age: of the people and institutions that shaped geography, their activities, and processes by which they came to understand the hard-to-reach places of the globe. Knowledge about the polar regions did not trickle down to the public from the press reports of the British Admiralty or the U.S. Hydrographic Office. It developed, like so many geographical projects, out of the clumsy back-and-forth between elite scientists, trusted explorers, popular writers, and geographical publishers. It is in this regard that the theory proves most valuable to the historian, not merely because it is representative, but because it was so extensively and exhaustively discussed by different nineteenth-century groups. We should not be surprised or displeased, then, that the open polar sea is an idea that reflects the influence of its culture as well as the phenomena of nature. It is this feature that gives it entry, not denies it access, to the rich canon of geographical thought.

NOTES

1. Quotations are from Clive Holland, *Farthest North: The Quest for the North Pole* (New York: Carroll and Graf, 1994), 29; Gilles Ross, “Nineteenth-Century Exploration of the Arctic,” in *A Continent Comprehended*, ed. J. L. Allen (Lincoln: University of Nebraska Press, 1997), 298; P.J. Capelotti, *By Airship to the North Pole: an archaeology of human exploration* (New Brunswick NJ: Rutgers University Press, 1999), 8. John Wright gives the most extensive treatment of the open polar sea. While he faults proponents of the theory for “defective reasoning,” he cautions historians not to judge them “in the light of facts and methods that were not known to them.” *Human Nature in Geography* (Cambridge, MA: Harvard University Press, 1966), 117. Preston James follows Wright’s lead, but feels the need to account for the theory’s erroneous conclusions. “On the Origin and Persistence of Error in Geography.” *Annals of the Association of American Geographers* (March 1967): 1–24. Even eminent geographer Yi-Fu Tuan, whose

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analysis of geographical issues are historically sensitive and sophisticated, concludes that the open polar sea theory resulted from “wishful geographical thinking.” “Desert and Ice: ambivalent aesthetics,” in *Landscape, Natural Beauty, and the Arts*. Eds. Salim Kemal, Ivan Gaskell (Cambridge: Cambridge University Press, 1995), 142.

2. Kristen Seaver suggests that the author of the lost *Inventio Fortunata* was the Norwegian priest Ivar Bardarson. “The Vinland Map and the Tartar Relation (review),” *Speculum* 73 (July 1998) 896–99.
3. On the mysterious *Inventio Fortunata*, see: David B. Quinn, “John Day and Columbus,” *Geographical Journal* 133 (June 1967): 205–209; George Sarton, “Notes and Correspondence,” *Isis* 29 (July 1938): 98–99; Aubrey Diller, *Isis* 30 (May 1939): 277–278; B. F. DeCosta, “Arctic Exploration,” *Journal of the American Geographical Society of New York* 12 (1880): 178–181. For a good survey of important sixteenth and seventeenth century maps, see Rodney W. Shirley, *The Mapping of the World: Early Printed World Maps, 1472–1700* (London: Holland Press, 1983). My thanks to Dr. Harold Osher of the Osher Map Library at the University of Southern Maine for information about Renaissance maps.
4. For an early example, see the famous world map of Martin Waldseemüller (1507) *Universalis cosmographia secundum Ptholomaei traditionem et Americi Vesupucii alioru que lustrationes*. For a later example, see Abbe Prevost’s *Carte reduite des decouvertes des Russes, entre l’Asie et l’Amerique* (1747).
5. On Robert Thorne, see: John L. Allen, “From Cabot to Cartier: The Early Exploration of North America, 1497–1543,” *Annals of the Association of American Geographers* 82 (September 1992): 512; David Gwyn, “Richard Eden, Cosmographer and Alchemist,” *Sixteenth Century Journal* 15 (Spring 1984): 22; W. Nelson Francis, “Hakluyt’s Voyages: An Epic of Discovery,” *William and Mary Quarterly* 12 (July 1955): 449. Joseph Moxon, *A Brief Discourse of a Passage by the North-Pole to Japan, China, etc.* (London, 1674), 1–2; Daines Barrington, *Instances of Navigators Who Have Reached High Northern Latitudes: Read at a Meeting of the Royal Society, May 19, 1774* (London: B. White, 1774).
6. Ann Savours, *The Search for the North West Passage* (New York: St. Martin’s Press, 1999), 23–38; Barrow is quoted by Fergus Fleming, *Barrow’s Boys* (New York: Atlantic Monthly Press, 2000), 11.
7. Literature on the Franklin search is vast. For some good examples, see Trevor H. Levere, *Science and the Canadian Arctic: A Century of Exploration, 1818–1918* (Cambridge: University of Cambridge Press, 1993); John Edwards Caswell, *Arctic Frontiers: United States Explorations in the Far North* (Norman: University of Oklahoma Press, 1956); Ross, “Exploration of the Arctic,” 244–331; Leslie H. Neatby, *The Search for Franklin* (London: Barker Press, 1970).
8. Elisha Kent Kane, *The United States Grinnell Expedition in Search of Sir John Franklin: A Personal Narrative* (New York: Harper and Brothers, 1857), 151–160; “Sir John Franklin and the Arctic Regions,” *North American Review*

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- 71 (July 1850): 180; "The Grinnell Franklin Exploring Expedition," *New York Herald*, 22 May 1850, 4; "Sailing of the Grinnell Arctic Expedition," *New York Herald*, 24 May 1850, 4; "Mr. Grinnell's Arctic Expedition," *Boston Daily Evening Transcript*, 23 May 1850, 2.
9. Elisha Kent Kane, "Sir John Franklin: His Probable Course," *New-York Daily Times*, 9 October 1851; "The American Arctic Expedition," *Harper's New Monthly Magazine* 4 (December 1851): 11–22. Kane's conclusions found support in the reports of British Arctic commanders who also suggested that Franklin had traveled north into the open polar sea: *New-York Daily Times*, 26 May 1852, 2; "The Search for Sir John Franklin," *New-York Daily Times*, 25 November 1852; "Second American Expedition in Search of Sir John Franklin," *Littell's Living Age* 37 (April 1853): 35–36; "Sir Edward Parry's Opinion on Sir John Franklin's Fate," *New-York Daily Times*, 17 November 1853, 7.
 10. Maury had become interested in the open polar sea theory in the 1840s. He laid out his arguments in *The Physical Geography of the Sea, and its Meteorology* (New York: Harper and Brothers, 1855), 146–9. On Kane, see "New-York Geographical Society," *New-York Daily Times*, 15 December 1852, 4. On Bache's support for Kane's efforts, see Alexander Dallas Bache, "On Dr. Rink's Remarks Respecting the Supposed Discovery by Dr. Kane of the North Coast of Greenland and an Open Polar Sea," *Proceedings of the Royal Geographical Society of London* 2 (1857): 359–362. On Bache's beliefs and intellectual commitments, see Hugh Richard Slotten, *Patronage, Practice, and the Culture of American Science: Alexander Dallas Bache and the U.S. Coast Survey* (Cambridge: Cambridge University Press, 1994).
 11. Elisha Kent Kane, *Arctic Explorations: The Second and Last Grinnell Expedition in Search of Sir John Franklin* (Hartford: American Publishing Company, 1881), 312; Isaac Israel Hayes, *The Open Polar Sea: A Narrative of a Voyage of Discovery towards the North Pole, in the schooner "United States"* (New York: Hurd and Houghton, 1867), 378–379.
 12. Joshua Fausard to E. K. Kane, January 1852, Elisha Kent Kane Papers, American Philosophical Society, Philadelphia, PA; J. T. O'Neil, "Arctic Temperature," *New-York Daily Times*, 17 October 1855, 4; N., "The Open Polar Sea About the Pole," *New-York Daily Times*, 30 October 1855, 2; Elizabeth Doten, "A Song of the North," *Littell's Living Age* 40 (28 January 1854): 193–194; W. C. Wilkinson, "My Open Polar Sea," *Scribner's Monthly* 10 (1875): 194; D. M. Warren, *A System of Physical Geography; containing a description of the natural features of the land and water, the phenomena of the atmosphere, and the distribution of vegetable and animal life* (Philadelphia, PA: H. Cowperthwait and Co., 1856), 37; Mark Twain, "An Esquimau Maiden's Romance," *Cosmopolitan* (November 1893); Wilkie Collins, *Poor Miss Finch* (Oxford: Oxford University Press, 2000), 423 (Originally published in 1872); Anna Ella Carroll, *The Star of the West* (New York: Miller, Orton, and Co., 1857), 139; Gail Hamilton,

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- Wool-Gathering* (Boston: Ticknor and Fields, 1867); Justin S. Morrill, *Annexation of Santo Domingo. Speech of Hon. Justin S. Morrill, of Vermont, delivered in the Senate of the United States, April 7, 1871* (Washington: F. J. Reves and Geo. A. Bailey, 1871), 6; Benjamin Franklin Taylor, *The World on Wheels and Other Sketches* (Chicago: S. C. Griggs and Co. Thaxter, 1874), 45; Celia Thaxter, *Poems For Children* (Boston and New York: Houghton Mifflin and Co., 1884), 42.
13. Louis Agassiz to LeConte, 6 December 1860, LeConte Papers, American Philosophical Society; Franz Boas, "Letters," *Science* 1884(?); James Dana, "Arctic Explorations, by Elisha Kent Kane, U. S. N." *American Journal of Arts and Sciences* 24 (1857): 235–251. On the various theories explaining why the polar sea remained free of ice, see: L. W. Meech, "On the Relative Intensity of the Heat and Light of the Sun upon different latitudes of the earth," *Smithsonian Contributions to Knowledge* 9 (Washington, 1857): 1–58; W. W. Weildon, "Remarks on the supposed Open Sea in the Arctic Regions," *Proceedings of the American Association for the Advancement of Science* 14(1860): 166–174; Aurora, "The Open Polar Sea About the Pole," *New-York Daily Times*, 24 October 1855, 2. On Petermann's theory, see Petermann, "On the Geography of the Arctic Regions," *Littell's Living Age* 48 (26 January 1856): 205–207. The open polar sea theory also had its critics. Charles Daly used his annual addresses before the American Geographical Society to regularly discredit the open polar sea theory. C. A. Schott, mathematician for the Coast Survey, also had doubts. William Healey Dall, who wrote about exploration for the *Nation*, felt that evidence for the theory was lacking. In Britain, opposition was led by Arctic whaling captain William Scoresby Jr. who wrote actively about the subject for scientific and popular audiences, and later by Clements Markham.
 14. On Russian polynias, see A. Kolchak, "The Arctic Pack," *Problems of Polar Research* (New York: American Geographical Society, 1928), 138. For isothermal and biogeographical arguments, see Maury, *Physical Geography*, 146–149; Kane, *Lecture on the Access to an Open Polar Sea in connection with the Search after Sir John Franklin and his Companions, read before the American Geographical and Statistical Society at its regular monthly meeting, by Dr. Kane, December 14, 1852* (Philadelphia: Childs and Peterson, 1857), 544–548.
 15. "Symmes Theory," *Cincinnati Literary Gazette*, 18 September 1824, 90–91; "Captain Symmes Theory," *Niles Weekly Register*, 25 February 1826, 427–428; Edgar Allan Poe, *Narrative of Arthur Gordon Pym* (London: J. Cunningham, 1841); Captain Adam Seaborne, *Symzonia: A Voyage of Discovery* (New York: J. Seymour, 1820).
 16. For more on ideas connected to polar geography, see Joscelyn Godwin, *Arktos: The Polar Myth in Science, Symbolism, and Nazi Survival* (London: Thames and Hudson, 1993); Francis Smith, *My Experience or Footprints of a Presbyterian to Spiritualism* (Baltimore, 1860); 158–164. British and American mediums fre-

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- quently reported visions of Franklin. See, for example, "Sir John Franklin," *Boston Daily Evening Transcript*, 18 May 1850, 1. On the broader issue of Franklin and the supernatural, see W. Gillies Ross, "Clairvoyants and Mediums Search for Franklin," *Polar Record* 39 (2003): 1–18; William Warren, *Paradise Found: The Cradle of the Human Race at the North Pole; a Study of the Prehistoric World* (Boston: Houghton, Mifflin, and Co., 1885); Edwin Sears, *The Fourth gospel, the heart of Christ* (Boston: Noyes, Holmes, and Co., 1872), 177; H.P. Blavatsky, *The Secret Doctrine* (Pasadena, CA: Theosophical University Press, 1977), 12; Thomas Wallace Knox, *Adventures of Two Youths on the Open Polar Sea. The Voyage of the "Vivian" to the North Pole and Beyond* (New York: Harper and Brothers, 1885); Fred Whittaker, *The Lost Captain; or Skipper Jabez Coffin's Cruise to the Open Polar Sea* (New York: Beadle and Adams, 1880); John A. Hill, "The Polar Zone," *McClure's Magazine* 11(May 1898): 1–16.
17. Gardiner G. Hubbard, "Introductory Address," *National Geographic Magazine* 1(1888): 3–10. Fridtjof Nansen, *Farthest North* (New York: Modern Library, 1999), 6; Adolphus Greely, *Handbook of Arctic Discoveries* (Boston: Roberts Brothers, 1896).

