

"Avoiding Equally Extravagance and Parsimony"

The Moral Economy of the Ocean Steamship

**CROSBIE SMITH, IAN HIGGINSON, and
PHILLIP WOLSTENHOLME**

Take it all in all, a ship of the line is the most honourable thing that man, as a gregarious animal, has ever produced. . . . Into that he has put as much of his human patience, common sense, forethought, experimental philosophy, self control, habits of order and obedience, thoroughly wrought hard work, defiance of brute elements, careless courage, careful patriotism and calm expectation of the judgement of God, as can well be put into a space of 300 foot long by 80 foot broad.

—John Ruskin

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On Sunday 12 May 1889, in the Lake District of England, a little-recorded but revealing encounter took place between two seemingly contrasting representatives of Victorian society. John Ruskin, strident critic of all things utilitarian and especially industrial, drew the attention of his guests to the beauty of the view over Coniston Water.¹ Alfred Holt, former railway engineer and now the unpretentious owner of one of the largest and most prestigious ocean steamship fleets in existence, politely agreed but accidentally ignited the wrath of the famous art historian by alluding to the presence of scum on the surface of the lake. The immediate result was a heated outburst from Ruskin against the industrial works at Barrow in Furness, less than twenty miles distant and home to ironworks and steel shipbuilding.

As Holt recalled the episode in 1906, he had been frightened of meeting Ruskin, "having heard that he made very cutting remarks, amounting almost to rudeness, to anyone who had, what he thought, the stain of Utilitarianism, or Philistinism, about him, and as (1) shipowner and (2) one who speaks as he finds, I was libellable on both counts." But the encounter took an unexpected course when Ruskin enquired of Holt his occupation. "I told him . . . I was a shipowner," Holt recorded. "Where do your ships go?" "To China," I said, "and I think they carry . . . half the tea that comes to this country." "Well!" said he, "I forgive you for being a shipowner, on account of my liking for the article you carry."² Holt's sense of vulnerability evaporated and a discussion of the literature of Sir Walter Scott ensued. The creator of the long-distance ocean cargo liner and the antiphilistine art historian had come together in a shared gentlemanly culture of late Victorian Britain.

Alfred Holt was born in 1829, the third son of the prosperous merchant and cotton broker George Holt and his wife Emma, who some years earlier had won over her husband to Unitarian Christianity. Together with a younger brother, Philip Henry, Alfred founded the Ocean Steam Ship Company (widely known as the Blue Funnel Line) in 1865. His older brother George Jr. had already in 1845 formed a partnership with Liverpool shipowner William James Lamport to operate a fleet of sailing ships. Son of a Unitarian minister from Lancashire and brother of Charles, a shipbuilder in the Cumberland seaport of Workington, near the Lakes, William Lamport joined the Holts in worshipping in the Renshaw Street Unitarian Chapel in central Liverpool.³

In 1849 Lamport addressed the Liverpool Literary and Philosophical

1. The quotation from Ruskin that opens this article appears on the title page of *Two Centuries of Shipbuilding: Scotts of Greenock* (n.p., 1911).

2. Alfred Holt, "Interview with Mr. Ruskin," in *Miscellanea* (n.p., 1911), 3–5, Papers of Alfred Holt, 920 HOL 2/15, Liverpool Central Library.

3. On George Holt Sr. and family, see F. E. Hyde, with J. R. Harris, *Blue Funnel: A History of Alfred Holt and Company of Liverpool from 1865 to 1914* (Liverpool, 1957), 1–9. On Lamport, see P. M. Heaton, *Lamport and Holt* (Newport, Wales, 1986), 15.

Society on the subject of “The Education of the Mercantile Classes.” “More and more political and social power,” he told his gentlemanly audience, “falls, year after year, into the hands of the mercantile classes, whose position, therefore, in the race of mental progress should not be less advanced than that of any other influential or ruling class.” In answer to the “often agitated question of the relation of classical studies to the education of those destined for commercial pursuits,” Lampport challenged traditional distinctions between “the intellectual education of the mercantile classes and the intellectual education of the professional classes.” He appealed to his own mercantile class to pursue a course that would promote “as much zeal for the acquisition and diffusion of knowledge . . . among Traders as among Doctors and Clergymen.” As a result, “We would open our minds to the elevating and refining influences of Art; and would alternate the associations and delights of Learning and Science with our love for the talk of merchandize and the chink of gold.”⁴

Although at first sight merely an appeal for the cultural aggrandizement and adornment of the philistine mercantile classes, Lampport’s address was deeply imbued with a conviction that growing wealth and power did not by themselves guarantee moral improvement. His fundamental concern was with “the mental and moral condition of our principal Commercial Cities,” which seemed afflicted by the “moral evils” of “Gaudy Churches and empty pews; . . . Libraries undisturbed, and Lecture-rooms deserted; Museums of Science, and Galleries of Art—monuments, and only monuments, of a respect for knowledge existing without a love of knowledge; Intellectual circles, in which Mesmerism finds its most credulous believers, and Phrenology its least inquiring disciples; the means of demoralization which, with all but literal truth, may be said to stand at every corner.” Such “peculiar evils under which commercial communities labour, do certainly appear to be those which the intellectual culture of the upper classes would at least be likely to alleviate.”⁵

In this article we argue that the local culture within which the Holts founded and built the Ocean Steam Ship Company was above all characterized by its concern to transcend “the talk of merchandize and the chink of gold.” Fundamental to this effort to rise above merely utilitarian knowledge was a sociocultural network of Unitarian shipowners and merchants, centered on Renshaw Street Chapel. They frequently worshipped in the same chapel, formed alliances by marriage, met socially, invested in one another’s ventures, shared technical know-how, embarked on philanthropic (especially educational) schemes, and engaged fully in the politics of liberal reform. Taken together, the result was a moral economy that stood

4. William J. Lampport, “The Education of the Mercantile Classes,” *Proceedings of the Literary and Philosophical Society of Liverpool* 5 (1849): 72–75.

5. *Ibid.*, 74–75.

in contrast to both the spiritual economy of the evangelicals and the material or political economy of the utilitarians.⁶

The centrality of these moral concerns in Liverpool Unitarian culture is exemplified by a sermon delivered by the revered minister of Renshaw Street Chapel, John Hamilton Thom, on "The Doctrine of Waste." We argue that the Holts embedded a moral economy in the engineering and business arrangements of their Ocean Steam Ship Company. On the one hand, they focused on the causes of waste in their new high-pressure engines (boilers, cylinders, mechanisms, and propulsion), in their ships (bow and stern designs, sea-keeping qualities, and cargo arrangements), and in their business practices. But on the other hand, their concerns to minimize waste merged seamlessly with their philanthropic interests, including their efforts to secure the education of women as well as to reduce the waste they perceived as resulting from human ignorance, superstition, disease, and poverty. All of these forms of waste, then, acted as barriers to what their fellow Unitarian William Stanley Jevons (quoting from Francis Bacon) termed "imitations of God's own works" when addressing the nature and benefits of such human inventions as steam engines.⁷

We therefore aim to show that the Holts pursued complementary goals of material and moral perfection in their shipping venture, goals that were the common property of a strong Unitarian culture in Liverpool. In opposition to evangelical creeds of damnation for the many and salvation for the few, shipowning Unitarians challenged the inevitability of "losses," whether of souls or ships in an age characterized by daily disasters at sea. Abhorrence of waste in all its forms provides the crucial link between John Hamilton Thom and Alfred Holt within the Renshaw Street Chapel network. While such values (including a dislike of extravagance and ostentation) stem from a much broader nonconformist tradition, the distinctive cultural freight carried here by the idea of waste derives from much more localized denominational differences. "Waste," for Liverpool Unitarians, implied no

6. On early-nineteenth-century British evangelicals and their biblical values (in contrast to utilitarians and other materialists), see Boyd Hilton, *The Age of Atonement: The Influence of Evangelicalism on Social and Economic Thought, 1785–1865* (Oxford, 1991), esp. 115–62.

7. W. Stanley Jevons, *The Coal Question: An Inquiry Concerning the Progress of the Nation, and the Probable Exhaustion of Our Coal Mines*, 2d ed. (London, 1866), 374. The Liverpool Unitarians formed a tight-knit sociocultural network, with the ship-owning Rathbones and Holts often holding shares in the same vessels. One of the older Jevons brothers, Thomas, later worked for Rathbones, while William Stanley, writing from Liverpool's Queens College, claimed that their father was responsible for the first iron ship (*Mechanics' Magazine* 13 [1865]: 369). The Holts and Jevons took a strong interest in the Liverpool Institute (the former Mechanics' Institution). William Stanley was based at Queens College (the new "higher education" component of the institute) when *The Coal Question* was first published. See R. Collison Black and Rosamund Konekamp, eds., *Papers and Correspondence of William Stanley Jevons*, 7 vols. (London, 1972–81).

suggestion that Nature herself was wasteful and no admission of the utter helplessness of humanity in the face of a sin-saturated world. For the Unitarian, Nature (God's Creation) was perfect. Such perfection, however, did not mean that human beings lived in a benevolent world. Nature was powerful, but it was neither malevolent nor benevolent toward man.

Unitarian shipowners sought to build and operate vessels whose design would aspire to, and whose characteristics of economy and reliability would reflect, the natural and moral perfections of Creation. The survival of Alfred's personal papers (and other family documents) has enabled us to follow this quest in the day-to-day practices, actions, and reflections of a leading shipowner who embodied a culture of "noble humanity" in his ships themselves—their very names, taken from human heroes of Homer's *Iliad* and *Odyssey*, testaments to the striving for what the New England Unitarian minister William Ellery Channing termed "the god-like in the human."⁸

Our goal is to demonstrate, through a detailed case study, that the technologies and commercial practices of ocean steamship communities from the mid-nineteenth century on were neither inevitable nor "natural" but rather highly contingent upon distinctive cultural values, both material and moral. The instabilities of iron steamship technologies, combined with a hostile marine environment, provided shipowners with cultural choices. If they took advantage of short-term commercial opportunities (for example, during periods of economic prosperity), steamship owners could quickly convert their wealth into country houses or art treasures and thus emulate the aristocracy.⁹ Not all chose this course. The Holts, as shipowners who eschewed rapid conversion of profits into the trappings of the landed aristocracy, sought to construct ocean fleets that were themselves the embodiments of moral as well as material power and authority. This process of maritime aggrandizement elevated the cargo steamer from barely credible cultural status into a position as one of the most conspicuous servants of empire.¹⁰

8. Quoted in J. L. Diman, "Religion in America, 1776–1876," *North American Review* 122 (January 1876): 1–47, on 44. See also William Henry Channing, ed., *The Perfect Life, in Twelve Discourses by William Ellery Channing, D.D.* (Boston, 1876), esp. xxi: "[T]he End of man's being is to be Perfect, as the Father in Heaven is Perfect."

9. Compare Martin Wiener, *English Culture and the Decline of the Industrial Spirit, 1850–1980* (Cambridge, 1981). Wiener's book discusses examples of attempts by industrial families in Britain to gentry themselves over time and in so doing to move away from their manufacturing roots toward academe and/or more aristocratic lives. Deployment of the thesis to explain Britain's industrial decline has been controversial. Aristocratic families such as the Devonshires and the Rayleighs, for example, have often been leaders in Victorian science and industry. See Simon Schaffer, "Physics Laboratories and the Victorian Country House," in *Making Space for Science: Territorial Themes in the Making of Knowledge*, ed. Crosbie Smith and Jon Agar (Basingstoke, 1998), 149–80; David Cannadine, *Aspects of Aristocracy* (Harmondsworth, 1995).

10. The standard history of Holt's shipping venture is Hyde (n. 3 above). Although

The Liverpool Unitarians

Like its Boston counterpart, Liverpool Unitarianism was not populist in character. But whereas Boston Unitarians saw themselves as an intellectual elite, Liverpool Unitarians prided themselves on their mercantile practicality and famously provided commercial and civic leadership. The luxury of almost complete religious freedom had been denied English Unitarians until the repeal of the Test and Corporation Acts in 1829, which permitted Nonconformists to hold public office. In July 1838, for example, Mayor William Rathbone, well-known Unitarian shipowner, reformer, and founding member of the Literary and Philosophical Society, laid the foundation stone of St. George's Hall, centerpiece of Liverpool's self-image as a modern Athens.¹¹

primarily an economic (business) history, it contains an important technical appendix (172–81) drafted in the 1950s by the company's naval architect, Harry Flett, who designed the classic Blue Funnel cargo liners of the mid-twentieth century. A more recent company history is Malcolm Falkus, *The Blue Funnel Legend: A History of the Ocean Steam Ship Company, 1865–1973* (Basingstoke, 1990), which emphasizes business management rather than engineering.

11. George Holt Sr. diary (with entries by Emma Holt and others), 23 January 1830–5 October 1844, Papers of the Durning and Holt Families, 920 DUR/1/1, Liverpool Central Library, 28 July 1838. George and Emma's American tour in 1851 took them to the very heart of New World Unitarianism in Boston. For almost two centuries, Congregational clergy, their "authority built on learning," had formed an "extremely aristocratic class" of "almost unrivalled authority and influence." From the time of American independence, however, Enlightenment values of reason and toleration had eroded the older forms of dogmatic theology. Unitarianism's chief representative had been William Ellery Channing, whose inspirational qualities "lay in his noble 'enthusiasm of humanity.'" With a "true and abiding influence [which] overruns the boundaries of sects" and which affected "the tone of every Christian communion," Channing had been "the foremost and most eloquent propagator of that humanitarian sentiment which pervades so widely our modern life." His vision of "the godlike in the human" was embodied in a decisive change in American Christianity, "the disposition to assign so much greater relative importance to practical well-doing, and to recognize the relations of the Gospel to the present life." By the second half of the century cultural authority in the United States was a far more fragmented feature of the social landscape. Unitarianism was but the diluted Christianity of a small intellectual elite, increasingly isolated from the mass of New England Christians. In contrast, the populist, emotional appeals of Methodists, Baptists, and other evangelicals flourished by offering a far stronger brew, one that appealed not to the intellect but to the soul; see Diman, 13–14, 44. The fragmentation extended to Unitarianism itself. George Holt noted in his journal that "Everything we learn leads us to conclude that political feelings run high amounting to strong animosity—respectable men of the same Unitarian faith differing even to quarrel & the direct cut of personal intercourse & this too among men of letters." It was, he concluded, "perhaps the most sad part of anything we have seen of American society." See George Holt, "Diary of a Journey to North America, 12 April to 16 July [1851]," Papers of the Durning and Holt Families, 920 DUR/2/32/11, Liverpool Central Library. The catalog date of 1857 is falsified by the loss in 1854 of the *Arctic* (the Collins Line ship that returned the Holts safely to Liverpool).

Practical concerns therefore tended to take precedence over divisive theological controversies. Mercantile families who worshipped in the Renshaw Street Chapel participated vigorously in promoting and managing the progressive and practical educational institutions of the city, most notably the Liverpool Mechanics' Institution (of which George Holt was president in 1842 and 1849), its classical (Ionic) architecture contrasting with the Tudor Gothic style of the later, Anglican, Liverpool Collegiate Institution. These were the different architectural embodiments of a divided Christianity. The Liverpool Unitarians expressed their "reasonable faith" through institutions standing for scientific, technical, and medical progress by the advancement of knowledge and learning. Man was not an inherently depraved creature but one capable, through faith in the power of the omnipotent God and following the example of Christ, of spiritual and material improvement in this life, not merely in the life to come.¹²

In one of their confrontations with evangelicals, Liverpool Unitarian clergy threw down the gauntlet of religious liberalism: "We believe, no less than you, in an infallible Revelation . . . ; you in a Revelation of an *unintelligible* Creed to the understanding; we in a Revelation of moral perfection; . . . you in a Redemption which saves the few, and leaves with Hell the triumph after all; we in a Redemption which shall restore *to all* at length the image and the immortality of God."¹³ In reply, their evangelical opponents asserted that Unitarians were destined to meet "the miseries of hell . . . [which] are indeed the vengeance of an angry God, who will never relent, and who can never spare."¹⁴

12. On the architectural embodiments of religious values in Liverpool's educational institutions of this period, see James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of "Vestiges of the Natural History of Creation"* (Chicago, 2000), 191–221, esp. 193–95.

13. Anne Holt, *Walking Together: A Study in Liverpool Nonconformity, 1688–1938* (London, 1938), 195, our italics. Anne Holt, historian of Liverpool Unitarianism, was a granddaughter of Alfred's brother Robert. Reverend Thom participated in the most intensive controversy, which took place in 1839. For example, his lecture "Christianity not the Property of Critics and Scholars; but the Gift of God to all Men" was the third in a series delivered weekly "in answer to a course of lectures against Unitarianism, in Christ Church, Liverpool, by thirteen clergymen of the Church of England." Liverpool Lectures, Unitarian Collection, 1839, Harris Manchester College Library, Oxford.

14. Anne Holt, 196. Not all evangelicals adopted such an uncompromising stance. The former whaling captain, William Scoresby, for instance, placed more emphasis on the redemptive powers of Christ and on the powers of Providence manifest to those who went down to the sea in ships. The iron shipbuilder, Tory M.P., and evangelical Christian John Laird, however, had no time for "democratic" tendencies at home or abroad and was eager to supply the Confederates with as many ships of war (including the infamous *Alabama*) as they could get away with during the American Civil War. Not surprisingly, the Holts never patronized the Laird family's Birkenhead yard (just opposite the Liverpool waterfront) in the nineteenth century. See Alison Winter, "'Compasses all awry': The Iron Ship and the Ambiguities of Cultural Authority in Victorian Britain," *Victorian Studies* 38 (1994): 69–98 (on Scoresby); David Hollett, *The "Alabama" Affair:*

JULY

2003

VOL. 44

A small number of highly articulate clergy comprised the leadership of Liverpool Unitarians. Most notable among them were John Hamilton Thom and James Martineau. Thom, in contrast to Martineau, consistently elicited favorable comments and admiring summaries from various members of the house of Holt. "The sermon from Mr Thom very good & improving—practically useful," wrote George Holt Sr., in a typical journal entry. "Behold how great a matter a little fire kindleth."¹⁵

Born in the Ulster canal port of Newry, Thom was raised in the "New Light" (later "nonsubscribing") Presbyterianism, which had distanced itself from the Calvinism of the Westminster Confession—indeed, from all sectarian creeds and dogmas—during the Enlightenment, and educated at the radically nonsectarian Belfast Academical Institution.¹⁶ Between 1831 and 1867, the period that encompassed the formative years of George and Emma Holt's children, he served the Renshaw Street Chapel (marrying William Rathbone's daughter early in 1838). As Anne Holt explained in her historical study of Liverpool nonconformity, Thom "saw in Christ the great example where was reflected the very image of God."¹⁷ Writing to his sister in the 1850s, Alfred Holt noted: "[We should] point out that though applause, enthusiasm, and overflowing congregational zeal are very exciting things . . . yet they are manifestations of feeling which we rather deprecate having in view *the philosophic truthful selfrelying [sic] nature of our creed*. . . . Up to the present time Mr Thom has been eminently my idea of what a minister should be."¹⁸

The British Shipyards Conspiracy in the American Civil War (Bebington, 1993), 14–16, 21–4.

15. George Holt Sr. diary (with entries by Emma Holt and others), 11 November 1844–31 December 1854, Papers of the Durning and Holt Families, 920 DUR/1/2, Liverpool Central Library, 23 November 1851. Martineau's abstract style did not endear him to the Holts. On his liking for doctrinal disquisitions, see Secord, 191–92.

16. Anne Holt, 187 (on Thom's Ulster education); I. R. McBride, *Scripture Politics: Ulster Presbyterians and Irish Radicalism in the Late Eighteenth Century* (Oxford, 1998), esp. 41–66 (on the "New Light" Presbyterians and their opposition to Calvinist doctrines); Crosbie Smith and M. Norton Wise, *Energy and Empire: A Biographical Study of Lord Kelvin* (Cambridge, 1989), 9–18 (on the Belfast Institution and its political contexts); R. K. Webb, "John Hamilton Thom: Intellect and Conscience in Liverpool," in *The View from the Pulpit: Victorian Ministers and Society*, ed. P. T. Phillips (Toronto, 1978), 211–43. During Thom's years as a student there in the 1820s, the staff of the Belfast Academical Institution included the mathematics professor James Thomson, father of William (later Lord Kelvin).

17. Anne Holt, 215; George Holt Sr. diary, 23 January 1830–5 October 1844 (n. 11 above), 2 January 1838 (on Thom's marriage). Thom left Renshaw Street between 1854 and 1857 for personal reasons and was replaced during that period by W. E. Channing's nephew, William Henry, who was a good friend of the American consul in Liverpool, the famous New England writer Nathaniel Hawthorne. See Anne Holt, 206.

18. Alfred to Anne Holt [c. 1853], Papers of Alfred Holt, 920 HOL/2, Liverpool Central Library, our italics. The letter is undated but makes reference to the steamer *Dumbarton Youth* (the first to have a blue funnel) running for Holt around May 1853 as

In May 1836 Reverend Thom delivered a discourse titled “The Doctrine of Waste” in Prince’s Street Chapel, Cork. Published as a pamphlet the same year, at the behest of that congregation, it was later included in a bound volume of Thom’s sermons; George Holt’s well-thumbed copy of that volume, inscribed “with the author’s kind respects,” survives in his papers. The discourse opened with the text from Matt. 26:7–11, in which a woman (Mary) poured upon the head of Christ a precious quantity of ointment while He sat at meat. Mary’s act called forth the indignation of the disciples, who asked: “To what purpose is this waste? For this ointment might have been sold for much, and given to the poor.” Jesus’ response, however, was very different: “[S]he hath wrought a good work upon me. For ye have the poor always with you, but me ye have not always.” Thom therefore began with the rhetorical question, directed against contemporary utilitarian doctrines that narrowly identified material happiness and profit with virtue: “Would the doctrine which makes utility the measure of virtue agree with Christ, that the ointment poured on his head, was no waste, but a good work?”¹⁹

Thom’s answer depended on a distinction between two kinds of utility. The first “deems nothing useful except it bears an exchangeable value; in its estimate of good [it] takes the material view, and suffers not its calculations to be modified by considerations from the regions of the affections and the soul.” This was the utility “based upon Political Economy,” a utility “to be held in profound and most sincere respect” but one “which provides for only *half* of our nature.” Taken by itself, then, it was “the narrow and unspiritual utility,” “the poor usurper,” which governed the disciples’ implicit condemnation of Mary’s “wasteful” action.²⁰ The second, “true,” utility “recognizes our moral and internal nature, and shapes itself with the view of making a full provision for the grace and strength of our thinking, feeling, spiritual being,” which is “our immortal being.” Only by deploying

evidenced by George Holt Sr. diary, 11 November 1844–31 December 1854 (n. 15 above), 27 May 1853. The “selfrelying” creed of Unitarianism emphasized the individual and his or her conscience in the pursuit of the highest states of moral and natural perfection, exemplified in Christ’s life and in God’s Creation. “Self-help” meant just that. In contrast, evangelicals differentiated the individual “sinner” acting independently of the Divine (and therefore sinfully) from the individual “saint” acting through and by the Holy Spirit. A shared moral earnestness therefore carried very different cultural freight.

19. John H. Thom, *The Doctrine of Waste: A Discourse Delivered in Prince’s Street Chapel, Cork, 8th May 1836* (Cork, 1836), 5. Thom’s dedication of the printed version of the sermon to the Cork congregation was dated Liverpool, June 1836. The ties to the Cork chapel were close: the father of Thom’s two predecessors in Renshaw Street (William and John Hincks) had been minister there before taking up a post as classics master at the Belfast Academical Institution. A copy of the pamphlet, bound together with other sermons, survives in the library of the Ullet Road Unitarian Chapel, successor to Renshaw Street Chapel. On Thom’s printed sermons and their power over readers, see Anne Holt, 207.

20. Thom, 5–9.

“utility” in “a sense wide enough to include these two departments of our nature,” the material and the spiritual unified in a “Rule of Right,” would it be “fairly qualified to become a measure of human duty.” Mary’s action therefore was not wasteful but a good work. It was a utility both moral and spiritual, productive not of material profit but of a “memorial of her” in the form of a beautiful, valuable, and enduring exemplar of moral economy.²¹

Building upon this foundation, Thom’s discourse developed a comprehensive “Moral Economy” that would transcend the “Political Economy” of the utilitarians.²² Thom’s idea of the moral economy was severely practical and addressed broadly to the northern mercantile classes, among whom the Unitarians found their most committed members. In contrast to Mary’s true “utility,” true “waste” was Thom’s Unitarian reinvention of the Puritan notion of sin. “Waste is an unproductive expenditure of the means of happiness,” Thom explained. “Whatever lessens human enjoyment, or produces it inadequately to the power expended, is waste.” True waste infected human affairs in a variety of guises: “to destroy the instruments of good, or to use them unprofitably,” was wasteful; likewise to “spend time and talents on objects and pursuits that do not give the *largest* returns of peace and unperishing good—when the same means, otherwise directed, could have made us at once happier and nobler beings.” This radical reformulation of the utilitarian principle would enable a judgment between “a wise appropriation” and “an unwise prodigality” in the human spheres of religious efforts, moral and social efforts, and ordinary material expenditure. Moreover, Thom deployed the conceptual language of the engineer as much as that of the political economist when he spoke of “duty,” “effort,” “waste,” and, above all, “power expended”—terms used to compare the results delivered by waterwheels and steam engines, and thus integral to Alfred’s own practice as a consulting engineer.²³

Overall, “The Doctrine of Waste” encapsulated many of the values that would find expression again and again in Thom’s sermons to his Liverpool congregation. Reinventing political economy as moral economy, Thom represented humankind neither as a fallen and deprived race nor as indi-

21. *Ibid.*, 6–8.

22. For an excellent study of the varieties of political economy in the period, see Maxine Berg, *The Machinery Question and the Making of Political Economy, 1815–1848* (Cambridge, 1980). Thom’s views bear comparison with Robert Vaughan, *The Age of Great Cities, or Modern Society Viewed in Relation to Intelligence, Morals and Religion* (London, 1843; reprint, Shannon, Ireland, 1971), but whereas Vaughan identified the moral deficiencies of modern cities in order to highlight the need for the saving power of the gospel, Thom was primarily concerned to implement a practical moral economy within human communities.

23. Thom, 8–19. For a study of the links between engineering and political economy, see M. Norton Wise (with the collaboration of Crosbie Smith), “Work and Waste: Political Economy and Natural Philosophy in Nineteenth Century Britain,” pts. 1–3, *History of Science* 27 (1989): 263–301, 391–449; 28 (1990): 221–61.

viduals defined by pursuit of mere material gain. Rather, Thom represented the human as a moral being with capacities and talents for useful work, the value of which in promoting the well-being of the world should be measured in its religious, moral and material totality rather than in physical terms alone. Adapted to the needs of a modern, capitalist culture, this version of Unitarian Christianity represented God not as an absolute monarch but as a perfect craftsman or engineer in whose Creation human beings worked to imitate Providence, through the use of implements and for the benefit of all humankind.

“The finest, the fastest, and the best sea-boats in the world”

From the vantage point of fashionable New Brighton, at the western entrance to the Mersey Estuary and the port of Liverpool, George Holt noted in August 1850 how he was “becoming interested with the vast number & variety of the craft going to & fro, more especially so the rivalry going on at this precise moment with the Cunard Line of Steamers to the U. States & the New American liners namely the Atlantic & Pacific.”²⁴ By that time Samuel Cunard’s British and North American Royal Mail Steam Packet Company had been running between Liverpool and the New World for a decade. But it seemed that Cunard had more than met his match in the newly launched New York and Liverpool United States’ Mail Steamship Company, popularly known as the Collins Line.²⁵

With its four new liners—the *Atlantic*, *Arctic*, *Baltic*, and *Pacific*—the Collins Line seemed set to achieve an enduring triumph for American maritime power on the North Atlantic. “These magnificent vessels,” as the *North American Review* (NAR) described them more than a decade later, in 1864, “at once took the first position upon the ocean; their models were superior in grace and proportion to anything that had been seen; they combined the sharpness and swiftness of our swift river steamers with the beauty and buoyancy of our world-renowned sailing-packets.”²⁶ Significantly, the New York builders of Collins’s ships were also the builders of a line of fast American sailing packets, characterized by finer lines than those of any British counterpart, that long reigned supreme on the transatlantic route. The Collins Line ships’ speed and opulence captivated the British and American

24. George Holt Sr. diary, 11 November 1844–31 December 1854 (n. 15 above), 27 August 1850.

25. N. R. P. Bonsor, *North Atlantic Seaway* (Newton Abbot and Jersey, 1975), 1:72–175 (on Cunard ships) and 1:201–8 (on Collins ships); Melvin Maddocks, *The Great Liners* (Amsterdam, 1978), 27–33. See also F. E. Hyde, *Cunard and the North Atlantic, 1840–1973* (London, 1975).

26. “Ocean Steam Navigation,” *North American Review* 99 (October 1864): 483–523. Proud of its “reasonableness” and balance, the NAR embodied Harvard Unitarian values.

JULY
2003
VOL. 44

publics. Expert testimony came from a Royal Navy officer, one Captain McKinnon, who made a passage in the *Baltic* in 1852. "I am only doing justice to these magnificent vessels in stating that they are, beyond any competition, the finest, the fastest, and the best sea-boats in the world," he wrote the following year in *The Resources and Settlement of America*. "Their extraordinary easiness in a sea cannot fail to excite the admiration of a sailor, and I never beheld anything like it." He concluded decisively: "From a considerable experience in all classes of steam-vessels . . . I advisedly assert that the *Baltic* is out and out, by long odds, the very best and easiest steamship I ever sailed in." A very different perspective issued from Congressman Edson Baldwin Olds of Ohio: "We have the fastest horses, the prettiest women, and the best shooting guns in the world, and we must also have the fastest steamers. The Collins steamers must beat the British steamers. Our people expected this of Mr Collins, and he has not disappointed them."²⁷ But even as it quoted these brave words the *NAR* invested them with heavy irony and offered its readers some reasons why the United States, after such a promising beginning, had failed to maintain a presence on the transatlantic mail run and why the Collins Line collapsed after less than eight years.

The *NAR* identified the extravagant use of limited capital as the first of two principal causes. Thus, the "inadequacy of capital at the outset was aggravated by the extravagant cost of the vessels, and the lavish expenditure continually made upon them. . . . The luxurious elegance of the saloons and cabins, which were compared by a Senator to Cleopatra's barge, was altogether unnecessary."²⁸ The *Illustrated London News* had also noted the high degree of luxury: "In the drawing room [of the *Atlantic*] the ornaments consist of costly mirrors, bronze-work, stained glass, paintings &c. Between the panels connecting with the staterooms are the arms of the different States of the Confederacy painted in the highest style of the art, and framed with bronze-work."²⁹ Expensive alterations had also been made to the engines during construction, and "novelties, which were supposed to be improvements, were introduced, which after trial had to be given up."³⁰

"These vessels, thus expensively built, were still more expensively sailed," the *NAR* continued. Identifying reckless management as the second principal cause of the line's failure, the *NAR* accepted that "the desire to surpass rivals, and to achieve distinction for this great representative line, proceeded largely from national and patriotic motives." But the managing owners seemed to have acted "upon the presumption that they had the national treasury to fall back upon, and that therefore prudence and economy were unnecessary. . . . Had the ships . . . been managed on strict commercial principles, the issue would perhaps have been altogether different."

27. *Ibid.*, 491, 494.

28. *Ibid.*, 493.

29. *Illustrated London News*, 25 May 1850, quoted in Bonsor, 1:202.

30. "Ocean Steam Navigation," 493.

Above all, recklessness was manifest in the imperative for speed: “The avowed object of Mr Collins, from the first, was to outsail the British steamers, if it were necessary to put all the capital at risk in order to do it.” The *NAR* placed the blame squarely on the shoulders of the people of the United States and their government. Moreover, “Mr Collins was urged on by the newspapers and by stump orators until he probably felt that the honor of the country depended upon his beating his competitors on every trip. . . . Mr Collins was ready to come before the country and declare that he was sacrificing \$436,000 annually for the sake of saving a few hours in the transit across the Atlantic, and the country encouraged him in his course.”³¹

Collins’s rivalry with Cunard therefore took place not “in respect of economy in sailing, perfection of discipline, solid comfort in cabin arrangements,” but in terms of speed. Moreover, this “expensive and reckless navigation was performed on an ocean perhaps the most dangerous on the globe, taking into account fog and ice, and the severity and frequency of its gales.” As a result, “this infatuation on the subject of speed was to lead to disasters to this favorite and boasted line from which it could not recover.”³² Thus, in late September 1854, seven days out from Liverpool and on course for a record-breaking passage, the *Arctic* collided in dense fog with a small French iron-hulled steamer and sank four or five hours later. Well over three hundred persons perished, including all the women and children—Collins’s wife, son, and daughter among them. Little over a year later, in January 1856, while engaged in a race with the new Cunarder *Persia*, the Collins steamer *Pacific* disappeared without trace en route from Liverpool to New York, presumed to have struck ice in the western Atlantic. Upward of 286 passengers and crew were lost. As George Holt noted tersely in March 1856: “No accounts of the steam ship ‘Pacific.’ It is now to be feared that all onboard are lost!” Two years later, the line suspended operations.³³

In contrast, Cunard’s British and North American Royal Mail Steam Packet Company was everything that the Collins Line was not. The *NAR* enthusiastically praised the qualities of the Cunard steamers: “Never in advance of the times, but never far behind them; never experimenting, but always ready to adopt any improvement thoroughly tested by others; avoiding equally extravagance and parsimony . . . the success of this Company, taking all things into the account, has never been equalled. . . . [T]he strength of the vessels, the discipline of the crews, and the seamanship of the commanders were made available promptly at the moment when everything was depending on them.”³⁴

31. *Ibid.*, 493–95.

32. *Ibid.*, 496.

33. *Ibid.*, 496–501; George Holt Sr. diary, 7 January 1855–6 January 1861, Papers of the Durning and Holt Families, 920 DUR/1/3, Liverpool Central Library, 12 March 1856.

34. “Ocean Steam Navigation” (n. 26 above), 505–7.

JULY
2003
VOL. 44

Much depended on the quality of the steam engines manufactured by Robert Napier of Glasgow, whose marine engineering (and later shipbuilding) skills were in the same period making Glasgow and the River Clyde into the most famous nineteenth-century site for the construction of iron steamers: "In the machinery especially, the best material, the most skilful mechanism, and the most approved designs are made use of; the engines are always put together and thoroughly tested in motion before going into the vessel." In service too, everything was "kept in the best repair. . . . A visitor at one of the company's works near Glasgow saw several boilers lying about which had been condemned simply because of their age. . . . The company do not wait until a boiler explodes before deciding whether it is defective."³⁵

As a consequence of its "long-proved [record of] reliability and safety," the Cunard Line had grown from its original four vessels in 1840 to nearly forty vessels in the mid-1860s, and it continued to attract the support of the British government in the form of mail contracts. The company was a model of consistency. Thus, in 1876, W. S. Lindsay (former shipowner, member of Parliament, and early client of Alfred Holt) could write that over a period of more than thirty-five years "*neither life nor letter entrusted to their care has been lost through shipwreck, collision, fire, or any of the too frequent causes of disaster, during the numerous voyages made by the Cunard steamers across the Atlantic.*"³⁶

The space left by the demise of the Collins Line was quickly filled by newcomers to the North Atlantic, such as William Inman of Liverpool. Since the early 1850s, the *NAR* noted, "the shipbuilders of Great Britain were bringing to perfection a new class of steamers" considerably in advance of the traditional wooden-hulled paddle steamers of Cunard and Collins. These iron-hulled, screw-propelled steamers, "for which the yards and shops on the Clyde especially have become so famous," had "solved the long-perplexing problem of self-sustaining ocean steam navigation." Capable of operating successfully against subsidized rivals such as Cunard, these British-built and British-owned vessels had been "far more fatal to our [U.S.] commercial interests than the hesitation of the Federal government to grant subsidies." And despite the loss of several major vessels in the early 1850s, the new steamers of the Inman Line had demonstrated the practicality of operating such vessels without subsidy on the competitive North Atlantic.³⁷

The *NAR* had thus provided an account both of the causes of failure of the Collins Line (reckless extravagance) and of the success of Cunard

35. *Ibid.*, 507.

36. W. S. Lindsay, *History of Merchant Shipping and Ancient Commerce* (London, 1876), 4:239.

37. "Ocean Steam Navigation," 509–11; Bonsor (n. 25 above), 1:218–45 (Inman steamers).

(“avoiding equally extravagance and parsimony”). Moreover, the review held out hope for progress, most notably through the screw-propelled steamers of Inman.³⁸ As we shall now see, such values permeated the plans of an English Unitarian just emerging from a five-year engineering apprenticeship on the celebrated Liverpool and Manchester Railway.

Unitarian Shipowner

“Every steamer now has a straight stem,” recalled Alfred Holt toward the end of his life. “It was not always so.” Consistent with his Unitarian values, Alfred lived for the practical, the scientific, and the Protestant: useful work and simple economy became the values embodied in his creations. The “straight stem” would become a hallmark of the plain, unadorned style of Holt steamers, though with a slight forward rake that set it apart from the later, almost universal fashion for vertical stems. Well into the 1850s, Holt claimed, almost without exception steamers had “the orthodox cutwater, bowsprit, name boards and figurehead.” Then in 1855 came “the first English steamer to be built without these useless appendages,” the *Saladin*, built by Cato, Miller of Liverpool as the first ship in a small fleet of West India steamers owned by Alfred Holt. Modestly, however, Holt confessed that he “got the idea from the Collins (USA) Line.”³⁹

Following their appearance in 1850, Collins’s ships had immediately won the approval of British observers, who quickly identified superior features in these extraordinary steamers. The London *Times* reporter “spoke with admiration of the appearance of the *Arctic* as she steamed up the Mersey, opening the water before her so smoothly that there was hardly a ripple under her bows.” McKinnon’s authoritative verdict, quoted above, rested on his assessment of the design of the bow in particular—“long and gently graduated”—and of the forepart of the vessel in general—light and buoyant “when relieved of the bowsprit.”⁴⁰

Small wonder, then, that Alfred Holt, armed with such judgments from his fellow countrymen, who might have been expected to rally to the defense of their own designs, contracted for the *Saladin* soon after. Holt adopted the “Collins Line” bows for his own West India steamers of the

38. We stress here the primacy of the *NAR*’s *perception* of the Collins Line disasters; the writer clearly rated extravagance (especially in relation to speed) a more important factor than bad luck. While the loss of two out of four ships must have seemed more like carelessness than misfortune (as Oscar Wilde might have said), the “true causes” are not our concern.

39. Alfred Holt, “Interview with Mr. Ruskin” (n. 2 above), 20. The stem is the upright timber or iron frame at the fore end of a ship (the ship’s bow). It is the first part to cut through the water, hence the alternative name of “cutwater.” On many other ships of the time the stem was curved and adorned with a figurehead.

40. “Ocean Steam Navigation,” 490 (paraphrasing the *Times* report), 491.

1850s, and then did likewise with the vessels he designed for his brother's firm of Lamport and Holt in the 1860s (probably beginning with the *Memnon*, from Scotts of Greenock, in 1861, and certainly evident in the 1864 *Galileo*).⁴¹

When, therefore, Alfred Holt sold off his West India steamers, ended his formal connections with Lamport and Holt, and began planning the construction of his China steamers, he had not only firsthand experience of steamship operation but also the knowledge that there existed a number of choices. He would eschew the traditionalism of Cunard designs, the ostentation and recklessness of Collins, and the example of the "odious Inman ship" *City of New York*, in which he had returned from New York in 1862. Precisely why Holt regarded the *City of New York* so unfavorably can only be surmised, but poor seamanship seems to have been part of the problem. "Such a Captain, such a ship," he wrote later. "Fortunately the water was smooth."⁴² And indeed, the *City of New York* was wrecked near Cork just over two years later. She had not seen three years service.⁴³ Holt instead chose to combine the sea-keeping excellence of Collins's bows with the modernity and economy of the iron hull and screw propeller of Inman steamers and the thorough, disciplined management of Cunard's liners. For Holt, however, such best-practice choices were governed by his own deeply held convictions concerning humankind's place in the natural and moral economy under God.

When John Hamilton Thom began his ministry at Renshaw Street in the early 1830s, evangelical Christianity was soaring to new heights of spiritual rhetoric. A favorite technique among preachers was to point to the "fact" of death at an indeterminate moment for every human being, implying that to die without salvation was to guarantee eternal damnation for lost souls. The Presbyterian Thomas Chalmers, a "moderate" evangelical minister, delivered a series of uncompromising sermons sounding that theme in the period 1815–40. A few quotations are illustrative: "[F]or the smile and the verdure and the gracefulness of nature in her happier moods, tell also of her angry tempests, of her *wasteful* volcanoes, of her sweeping hurricanes and floods." And again: "[N]ature contains within itself the rudiments of decay . . . unless renewed by the hand of the Almighty, the earth

41. Heaton (n. 3 above), 24, 108 (*Memnon*), and fig. 4, facing 48 (illustration of the first *Galileo*). Significantly, Lamport and Holt's *Memnon* was also the first Holt vessel to carry a Greek name, after "the god-like Memnon," handsome son of the Dawn (*Odyssey*, bk. 1). Five years later Alfred Holt invested in the first of three Greek heroes for the China trade, all with raked stems devoid of "useless appendages."

42. *Fragmentary Autobiography of Alfred Holt* (n.p., 1911), 38, 42. He incorrectly refers there to his voyage aboard the *City of London* (only completed in the following year), but his sister Anne's diary makes clear that it was the *City of New York*. See "Extracts from Miss Anne Holt's Diary Relating to Alfred Holt," Papers of Alfred Holt, 920 HOL 2/40, Liverpool Central Library, 15 May 1862.

43. For Inman Line ships and their short lives, see Bonsor (n. 25 above), 1:240–41.

must disappear in the mighty roll of ages and of centuries. . . . Every thing around us should impress the mutability of human affairs. . . . For death is at work upon all ages . . . A gust of wind may overturn the vessel, and lay the unwary passenger in a watery grave.”⁴⁴

Nature is wasteful, embodying the universal consequences of man’s Fall, which reduced both human beings and the natural order from a state of perfection to one of sin. Another, more strident, contemporary defender of biblical orthodoxy also wrote of these consequences: “[N]ature in whole . . . appears fearfully fallen throughout ALL her domains,” and the “previously magnificent world was fearfully convulsed and shattered, physically as well as morally.” Waste in nature, as well as by man, for the evangelicals therefore became a starting point for, or pointer to, the road to salvation. For more “extreme” evangelicals, God manifested His wrath by continuing direct intervention, punishing individuals and nations for their sins of disobedience to the Divine agenda. Not surprisingly, such perspectives retained their popularity in a society where life, especially life at sea, was frequently nasty, brutish, and very short.⁴⁵

With respect to the biblical literalism of evangelicals, James Secord has shown that in Liverpool around 1845 the Bible was seen by some as a guide to optimum steamship design—vessels were being designed by some shipbuilders on Merseyside to the ratios of Noah’s Ark. Indeed, the same kinds of comparisons filtered into the 1854 Liverpool meeting of the British Association for the Advancement of Science when a Captain Andrew Henderson evaluated the prospects for the success of Brunel’s *Great Eastern* (around twice the size of the ark), then under construction on the Thames. Unsurprisingly, Henderson’s verdict was not encouraging: such deviation from the blueprints in Genesis implied infidelity and invited divine chastisement.⁴⁶

Such evangelical perspectives were anathema to the Holts’ Unitarian vision. Natural and moral histories of disaster and death, of “lost souls” and “lost ships,” were not to be read in terms of washing away the sins of the world in Christ’s atonement and accepting the gift of spiritual grace in

44. Thomas Chalmers, *The Works of Thomas Chalmers*, 25 vols. (Glasgow, 1836–42), 2:371–72; 7:266–67, 272–73. Our italics.

45. Crosbie Smith, *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain* (Chicago, 1998), 118–19; Hilton (n. 6 above), esp. 10; Winter (n. 14 above), 69–98.

46. Secord (n. 12 above), 216, 220. The *Liverpool Journal* (18 January 1845) reported an address by the evangelical Anglican, Tory, and biblical literalist Rev. Hugh McNeile in which he claimed that Merseyside shipbuilder Thomas Wilson “took his Bible to his workshop” so that the P&O steamer *Oriental* (1840) followed “the exact proportions of the ark.” Although the *Oriental* had the same length-to-beam ratio as the ark (6:1), the liberal *Liverpool Mercury* (31 January 1845) denied that McNeile’s claim had any foundation in practice. Andrew Henderson, “On Ocean Steamers and Clipper Ships,” *Report of the British Association for the Advancement of Science* 24 (1854): 152–56.

JULY
2003
VOL. 44

readiness for life in an unchanging eternity for the few. The journals of Alfred and his father illustrate not only the Holts' deep sense of the fragility of human life at sea but above all their very different (nonevangelical) responses to it. "Very disastrous *accounts* received this morning," George wrote of the great gale of early January 1839; "16 vessels stranded between this Port & Formby [some ten miles north near the entrance to the Mersey]." ⁴⁷ But there was no evangelical gloss on the gale, no suggestion that Nature herself was wasteful, and no admission of the utter helplessness of humanity in the face of a sinful world.

Not surprisingly, sailing ships suffered the overwhelming majority of wrecks and sinkings. George Holt's assessments of the new transatlantic steamships appearing in the Mersey from the late 1830s is therefore especially revealing. Although not himself a shipowner, still less an engineer, George regarded calculation and miscalculation as the key to steamship performance. In 1838, for example, he noted that the new Mersey-built transatlantic steamship *Liverpool* had been "obliged to put into Cork, owing to a *miscalculation* of the expenditure of her fuel & the wind continuing so violent as to prevent making more than 4 knots per hour." In the end the *Liverpool* took a total of thirty-four days to reach New York on that voyage, and made only seven round-trip voyages before being sold. By August 1840, however, Holt recorded the "arrival of the steam ship the [first Cunard steamer] *Britannia* from Halifax N.S. having performed the voyage in 9 days." ⁴⁸

On the other hand, the Holts' journals offer no affirmation of a faith in inevitable progress. Invited in 1840 to view the new SS *President*, "the largest steam ship yet built," while receiving her engines in Liverpool, George expressed his confidence that "her form [is] better calculated for safety in a storm" than some of her rivals'. Twelve months later, he recorded tersely: "Still no tidings of the *President* steam ship which sailed from America in March [1841]." The big steamer, upon which so many hopes had rested, had gone missing, presumed lost in a Western Atlantic storm. ⁴⁹

Alfred's journal (begun in 1865 when his Ocean Steam Ship Company was founded) is even less confident as to the inevitable triumph of steam at sea, full of gloomy entries on the losses of both human beings and ships. In contrast to the seemingly unbounded faith of many Boston Unitarians in the inevitability of natural and human progress, Liverpool Unitarianism retained enough of its Presbyterian (Calvinist) legacy to reflect as much on the painful imperfections of humankind and its artifacts as on its triumphs. ⁵⁰

47. George Holt Sr. diary, 23 January 1830–5 October 1844 (n. 11 above), 6 January 1839.

48. *Ibid.*, 26 September 1838 and 14 August 1840. See also Bonsor, 1:67–68 (*Liverpool*), 74 (*Britannia*).

49. George Holt Sr. diary, 23 January 1830–5 October 1844, 6 April 1840 and 12 April 1841. See Bonsor, 1:57–59.

50. On the optimism of Boston Unitarians, see Crosbie Smith and Ian Higginson,

“Very stormy weather since the beginning of the year,” he wrote in January 1866. “[On the] 15th heard of loss of the ‘London’ steamer London to Australia in Bay of Biscay with about 270 souls on board, also of ‘Amalia’ Liverpool to Constantinople worth about £200,000, the people saved.” In April he reflected pessimistically on the loss of two more steamers and concluded that “A most unaccountable fatality seems to have attended steamers of late.” But in the first two cases (the *London* and the *Amalia*) at least, the fatality was all too attributable to the hand of man rather than God, Satan, or material nature. “Both vessels,” he concluded, “were lost through water getting into [the] engine-room, showing clearly what I have often thought, that every opening through a steamers deck should be capable of being battened down like a hatchway.” With this philosophical conclusion, Holt identified the losses with the imperfections in man’s knowledge of a powerful but not malevolent universe. It was a perspective that was to set the Holt standard for a century to come—in the course of which the company would be able to make the exceptional and proud boast that never did it lose a ship through stress of weather.⁵¹

Accountability therefore provides the key to understanding the Holts’ (and especially Alfred’s) moral economy. Accountability in its material sense related most obviously to one’s immediate financial activities. But even here the term carried moral as well as material connotations: every penny had to be accounted for in a morally reputable household or family business. More significantly, monetary capital that a family or family member had accumulated, or been entrusted with, was convertible into “natural” commodities, such as coal or cotton, or into material artifacts, such as steam engines. In all of these cases, capital, in whatever form, could be deployed for the benefit of humankind or for wasteful and extravagant ends. From the perspective of a Christian moral economy, therefore, the parable of the talents (Matt. 25:14–30; Luke 19:12–27) treated capital as a gift to individuals, to be used wisely or simply wasted through lack of use. Sooner or later, however, the individual would have to account for his actions, morally as well as

“‘Improved Europeans’: Science and Reform in the *North American Review* 1865–1880,” in *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals*, ed. Geoffrey Cantor and Sally Shuttleworth (Cambridge, Mass., forthcoming).

51. Alfred Holt diary, bk. A, Papers of Alfred Holt, 920 HOI./2/52, Liverpool Central Library, 16 January and 30 April 1866 (our italics); H. M. Le Fleming, *Ships of the Blue Funnel Line* (Southampton, 1961), 2. “[I] read in the mornings newspaper an account of the destruction of the steamer ‘European’ at Colon, making the fifth the W[est]. I[ndia]. & P[acific]. S.S. Co have lost in 15 months,” ran the journal entry for 30 April 1866. “. . . It occurred thro’ the explosion of some ‘glonoin’ [nitroglycerin] oil which was shipped as merchandise without any notice, and which is more explosive than gunpowder. The loss is very serious, a fine steamer with cargo utterly destroyed, also the jetty & cargo shed, total estimated at £200,000 besides between 40 & 50 lives, including Capt’n Cole who I knew.” In the same paragraph he also recorded “lost on the shoal off Cape Trafalgar Mr Moss’ fine new steamer ‘Nile’ [and] Captain Horsfall on April 25th.”

materially, leaving, as Thom had long preached, true waste (manifest as either reckless extravagance or as unwise parsimony) as the ultimate sin of humankind. Even the Holts' journals represent accounts of their (and others') lives from the perspective of a moral economy in practice.

Extravagance, then, would let costly instruments of good perish unprofitably—and for Unitarians close to railway and steamship cultures, locomotives and steamers were indubitably instruments of good in the hands of human beings. Henry Booth, secretary of the Liverpool and Manchester Railway and Alfred Holt's mentor, told the Liverpool Polytechnic Society in 1844 that a "vessel is an *implement* with which to accomplish an object, and the efficiency of the *power* depends on the *form* of the implement more than on the *size*." With the *Great Britain* (1845) in his sights, Booth expressed concern about the "enormous *expense* of the huge steam-ships . . . year after year . . . increasing in size and in costliness." Without government aid, it seemed, few companies could derive a fair return on capital invested. Only by treating the question mechanically, he believed, could "we treat it economically." He therefore called for the discovery of "some new element of economy" resulting from mechanical inquiry rather than from mere increase in size and cost. Booth's entreaties went largely unheeded in the wider world of steamship companies. Thus the *Great Eastern* (1860) could be read as marking a dramatic progression to ever greater size and ever greater waste of capital and coal, while the Collins Line story looked like a sorry tale of extravagant speed and luxury culminating in the waste of ships and of lives in the unrelenting North Atlantic. In 1877, for example, Alfred Holt sardonically told an audience of marine engineers and shipowners: "Considering Mr. Brunel's genius and the flow of capital his designs attracted, his [Holt's] only wonder was that she [*Great Eastern*] was so small."⁵²

"Some new element[s] of economy" resulted from the introduction of the marine compound engine by the Glasgow engineer John Elder to the ships of the Pacific Steam Navigation Company operating on the Pacific seaboard of South America.⁵³ But there were few, if any, compound-

52. Henry Booth, "On the Prospects of Steam Navigation, &c," *Transactions of the Liverpool Polytechnic Society* 2 (1844–46): 24–31, on 30–31. Booth had taken the lead in securing Thom as minister of Renshaw Street in 1831; see Anne Holt (n. 13 above), 188–89. Alfred Holt, "Review of the Progress of Steam Shipping During the Last Quarter of a Century," *Minutes of the Proceedings of the Institution of Civil Engineers* 51 (1877–78): 2–135, on 71.

53. W. J. M. Rankine, *A Memoir of John Elder* (Edinburgh, 1871), 27–51. For an account of the new science of thermodynamics constructed by Rankine and William and James Thomson, especially in the contexts of Glasgow and liberal Presbyterianism, see Smith, *The Science of Energy* (n. 45 above), 150–69; Ben Marsden, "Engineering Science in Glasgow: Economy, Efficiency and Measurement as Prime Movers in the Differentiation of an Academic Discipline," *British Journal for the History of Science* 25 (1992): 319–46. "Waste" contrasted with "useful work" to provide measures of engine efficiencies (and inefficiencies). The relatively easy crossover from liberal Presbyterianism to Unitarianism was exemplified by James Thomson's move to Unitarianism in Belfast around 1850.

engined steamships on ocean routes. In the Unitarian spirit of improving man's imperfect knowledge, Alfred Holt replaced the simple steam engine originally fitted to his small steamer *Cleator* with a compound engine in December 1864. The engine, designed by Holt himself, and involving two cylinders driving a single crank, was to operate at the relatively high pressure of 60 pounds per square inch. "The experiment," he concluded, "left nothing to be desired. The engine worked perfectly, the vessels speed was improved and the coals burnt reduced so that 5 tons did the work for which 8 tons was previously required." The results were made more credible by Holt's claim that the *Cleator's* "old-type engines I [Holt] had designed, and actually drawn, myself, whose speed and coal consumption and performances generally, I knew with absolute accuracy." It was, he wrote, "On the strength of this experiment that we built the 'Agamemnon,' 'Ajax' & 'Achilles.'"⁵⁴

In February 1866 Alfred and his brother George paid a weekend visit to the Tyneside shipbuilder—and Shetland-born Presbyterian—Andrew Leslie, who was heavily involved in Lamport and Holt's building program. On the Saturday they "sent the [Lamport and Holt] 'Humboldt' to sea"

54. *Fragmentary Autobiography of Alfred Holt* (n. 42 above), 46–48. Holt's attention to detail in *Cleator's* original specification was striking. No part of the ship was left out of the document. Most revealing was the constant reference to strength and safety in every respect. Hull plating was to be over half an inch in thickness throughout, with considerable quantities of double riveting. The vessel would carry three masts, schooner-rigged, to complement the 50-horsepower engine. Bunkers would hold 40 tons of coal, with watertight coal traps on deck. There would be four ship's boats. With respect to woodwork, it was to be understood by the builders that "The trade for which the vessel is intended will subject her to the roughest treatment that any vessel can undergo. . . . everything of the very simplest and strongest and all metal fittings such as locks, bolts, hinges, &c to be double-extra strong." Carving would be minimal: "The whole of the ship to be very plain and the little carving that will be required to be of the very simplest kind." Likewise, the first cabin was to be "of a plain but neat description, and of strong hardwood so as not to be easily injured." The winches had "to be of an approved pattern of extreme substantiality." Overall, the "whole to be of the best workmanship and materials and to be finished and completed in every respect to the entire satisfaction of Mr Alfred Holt." See Alfred Holt, "Specification of an iron screw steamer for the coasting trade", Papers of Alfred Holt, 920 HOL/2/10, Liverpool Central Library. His proposal for the re-engining can be found in Alfred Holt, circular regarding *Cleator's* new engine, Papers of Alfred Holt, 920 HOL/2/10, Liverpool Central Library. He there explained that the "steam boat engine as at present used is an exceedingly wasteful machine." This had "long been evident to engineers, and many attempts have been made to improve it, some with very considerable success, but the margin of saving still left by the best engines is probably 50% of their actual consumption." He then asserted that as a general rule he "dislikes experiments, and has abstained from trying any in his late fleet, not wishing to risk the accident to which a novelty is necessarily liable." Moreover, he stated his wish that the new ships for the China trade would not be fitted with "engines which experience had not warranted him in believing that men of ordinary ability could work successfully on a long voyage." Either way, "Commercial failure would be the inevitable result of accident especially at the beginning of a new enterprise."

JULY
2003
VOL. 44

from the yard with another of Alfred's compound engines (fig. 1) on a trial trip. On Sunday morning Alfred recorded that they "took a walk about the Wallsend neighbourhood." First they viewed "the works which are being erected for the purpose of reopening the celebrated Wallsend collieries, the working of which was given up years ago, owing to the easily worked seams being exhausted, and the then price of coals not paying for going deeper where it is supposed that immense beds are lying untouched." Now it was expected that it would pay to reach these beds, but to do so required works "of great magnitude." Confessing to "economy of fuel" as his "constant crotchet," Alfred expressed surprise at "an immense waste of heat owing to a constant flow of melted slag" at some local blast furnaces, "the heat in which I am sure might have been turned to some useful purpose; but I suppose it is cheaper and easier to use fresh fuel, tho' the result cannot be other than the unnecessary diminution of our stock of coal."⁵⁵

Taken together, Holt's remarks on the trend toward deeper, more capital-intensive mines and the distinction between cheapness and economy of fuel suggest a connection to W. Stanley Jevons's then recently published book *The Coal Question*. Jevons, whose older brothers had attended school in Knutsford with Alfred Holt, had recently received an appointment at Queens College Liverpool, where he lectured on political economy and renewed his Liverpool connections. His father had interests in the iron trade, and had constructed some of the earliest iron ships on Merseyside. The family had strong Unitarian principles and frequently worshipped in Renshaw Street Chapel.⁵⁶

Jevons's arguments in *The Coal Question* centered on "the long series of changes in our [Britain's] industrial condition which must result from the gradual deepening of our coal mines and the increased price of fuel." He began with the observation "that where fuel is cheap it is wasted, and where it is dear it is economised. The finest engines are those in Cornwall, or in steam-vessels plying distant parts of the ocean."⁵⁷ His arguments concerning waste, however, had not only material but profoundly moral implications. On the one hand, "we ought not to think of interfering with the free use of the material wealth which Providence has placed at our disposal." On the other hand, "our duties wholly consist in the earnest and wise application of it." To spend that wealth "in increased luxury and ostentation and corruption" was to invite the blame of future generations. Or, in Thom's words, avarice led the human soul "to love wealth better than the end which the wealth should serve." But to spend it "in raising the social and moral

55. Alfred Holt diary, c. 16 February 1866. J. F. Clarke, *Power on Land and Sea: 160 Years of Industrial Experience on Tyneside—A History of Hawthorn Leslie and Company Ltd., Engineers and Shipbuilders* (Newcastle, 1979).

56. Black and Konekamp (n. 7 above).

57. Jevons (n. 7 above), x–xi.

JULY
2003
VOL. 44

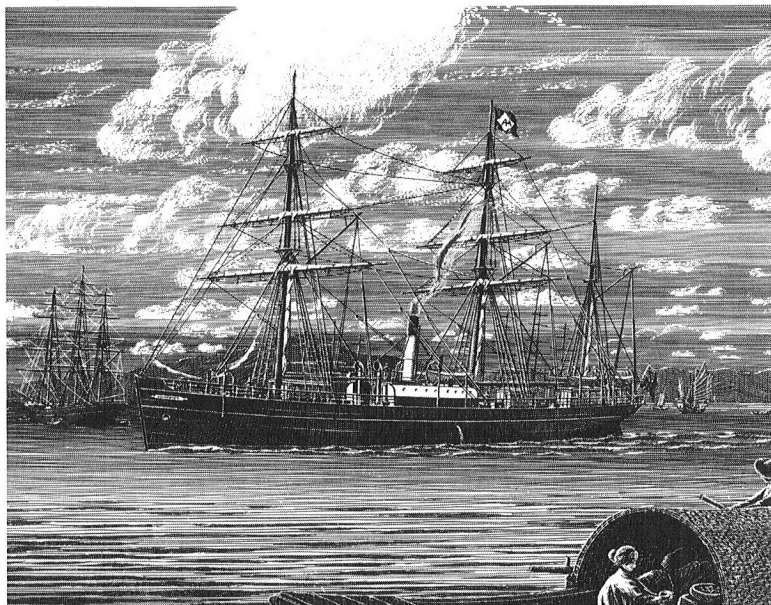


FIG. 2 The Blue Funnel Line's *Agamemnon*. (G. F. Campbell, *China Tea Clippers* [London, 1974].)

condition of the people, and in reducing the burdens of future generations” was, Jevons argued, to avoid placing an unimaginable “premium upon improvidence and future wretchedness.”⁵⁸

On the Monday following his Sunday reflections on waste Alfred Holt was on his way again to Greenock to see the *Agamemnon* (fig. 2), the embodiment of the highest stage yet reached in human engineering economy, then in the final phases of fitting out at the shipbuilding yard of another Presbyterian, John Scott. He returned toward the end of March to “see the engine of the ‘*Agamemnon*’ tried on the 24th the trial came off and was satisfactory.” Questions of fuel economy permeated Holt’s diary entry recording a further engine trial on 31 March: “We found her consumption by very accurate experiment to be 6½ tons in 7 hours & 40 mins = 20.6.3.23 [tons.hundredweights.quarters.lbs] in 24 hours, and this result as far as I know is not approached by any vessel afloat.”⁵⁹

58. *Ibid.*, xxii–xxv.

59. Alfred Holt diary (n. 51 above), 31 March 1866.

“These Are My Ships”

The Ocean Steam Ship Company quickly became highly profitable; in less than fifteen years it expanded to a fleet of over twenty oceangoing vessels.⁶⁰ The Holts consistently saw to it that each ship of the Blue Funnel Line embodied the values of a moral economy, avoiding equally extravagance and parsimony. Disturbed by what he saw as their outdated business practice, the merchant John Swire (whose firm acted as principal agents for the company in China) again and again attempted to drive home to his Liverpool friends the message that, especially after the opening of the Suez Canal in 1869, coal consumption was a secondary matter to competition from faster steamers. Alfred Holt’s response was entirely characteristic. “I know what it means if we build quick vessels,” he told Swire in December 1880; “say we beat ‘Glen-coe,’ a couple of years after McG[regor] will try to beat us, then our turn will come, and the infernal system of European armaments will be repeated. The fact . . . is we are making more money as we are.”⁶¹

The issue, however, was far from simply a question of profit and loss. Not only did increased speeds, with the attendant increase in fuel consumption, link directly to the moral considerations posed by Jevons’s *Coal Question*, but Alfred Holt himself had not forgotten the consequences of earlier races for supremacy on the North Atlantic and elsewhere. “We are all getting a little intoxicated with prosperity just at the present,” he told Swire with Unitarian earnestness in the same letter. “The pendulum will swing the other way again, recollect the Pacific Steam Navigation Co.” The reference was to what Alfred called in his journal “the unfortunate mania for

60. A table of earnings per voyage (freight and passage money out and home) at the back of Alfred Holt’s diary shows the *Ajax* taking £5,491 on her first voyage; *Achilles* £8,943; *Agamemnon* £10,637 on her second; *Ajax* £11,714; *Achilles* £8,042; and *Ajax* £12,584 on her third. Although the earnings fell back to the £5,000 to £10,000 range (seldom below that level), the results were such that by the close of 1880 the Ocean Steam Ship Company had taken delivery of some twenty-six ships, all from Scotts of Greenock (twelve) and Hawthorn Leslie and Company (fourteen). Three were replacements for vessels lost by collision or stranding. In a letter dated 11 October 1888, Holt’s Far East agent, John Swire, wrote that “Ocean Steam Ship Co has been in existence 22 years [and] has declared annual dividends averaging nearly 15% per annum for the whole time”; Swire Papers, JSSI 1/9, School of Oriental and African Studies (SOAS) Archives, University of London. This compared with 10 percent per annum from two of Swire’s very profitable companies operating in China and Hong Kong, China Navigation Company and Taikoo Sugar Refining Company.

61. Alfred Holt to John Swire, 4 December 1880, Swire Papers, JSSI 1/1, SOAS Archives. MacGregor, Gow and Company’s Glen Line entered the China tea trade with steamers in 1870. Ten years later they had twelve steamers in service, most of them larger and faster than Holt’s. The threat of cutthroat competition prompted Swire to invent the “conference system,” in which all participating “conference” lines to the Far East agreed to charge the same freight rates. See Hyde, *Blue Funnel* (n. 3 above), 56–79. See also Duncan Haws, *Merchant Fleets: Glen and Shire Lines* (Hereford, 1991).

JULY

2003

VOL. 44

extension” that had seized Pacific Steam in the late 1860s, with compound-engined ships from Elder designed for direct mail links from Europe to link up with its original coastal trades along the Western seaboard of South America. What Holt identified as “an extravagant fleet extravagantly managed” was forced to lay up half its fleet of twenty-one ocean steamers in 1874 until profitable employment could be found on the Australian trade.⁶²

Alfred Holt saw his ships as more than simply a means to a profitable end. Upon learning of the sale of his West Indies fleet in 1863, for instance, his sister recorded in her diary that he had “raised” the fleet “little by little, each small vessel succeeded by a larger, by his own personal exertions, each having been planned for and built under his own closest thought and care in such a way as almost to raise them out of mere material properties into objects of affection—and now he has parted with them all. . . . He and we all feel that there is a something melancholy in the change—a something like selling your own flesh and blood.”⁶³ With the same moral sentiments, Alfred recorded the sinking of his former West Indies steamer *Plantagenet* in 1869: “[W]hen I think of the pains I took in building her, visiting Greenwich I believe between 25 and 30 times, the manner in which I designed every detail, the pleasure with which I saw her performances equal my expectation, and the success which attended my West India line from the day she joined it, I feel almost love for the old ship, and a fine wholesome strong ship she was. . . . What pleasure my father and all the family had in her success.”⁶⁴ Only in 1875 did Holt lose a China steamer, the *Hector*, by grounding, but his reaction was the same: “The long expected and feared event has come at last, we have lost a ship, one of our family as I may fairly term them. . . . I awake every morning as if some one was dead.”⁶⁵

These deeply felt expressions of grief testify to the manner in which the Holts transcended the “talk of merchandize and the chink of gold.” Alfred in particular made clear in his journal that the moral worth of shipowning lay for him in its being “more a return for work done [rather] than a speculation on the price of a commodity.” In contrast, he pondered ironically the prospect of Manchester banker John Heywood’s rumored elevation to the peerage: “[W]hat on earth has he done to deserve it (unless indeed standing still and letting money heap itself up round him be worthy service).”⁶⁶ The merchant might well be guided by moral values in his trading, but the shipowner and engineer went further: the ships themselves embod-

62. Alfred Holt diary, 17 March 1869; N. R. P. Bonsor, *South Atlantic Seaway: An Illustrated History of the Passenger Lines and Liners from Europe to Brazil, Uruguay and Argentina* (Jersey, Channel Islands, 1983), 149.

63. “Extracts from Miss Anne Holt’s Diary Relating to Alfred Holt” (n. 42 above), 20 December 1863.

64. Alfred Holt diary (n. 51 above), 7 October 1869.

65. *Ibid.*, 10 October 1875.

66. *Ibid.*, 18 October 1867, 25 April 1869.

ied the values of a moral economy. Those values were centered on the minimization of waste and the maximization of useful work in the natural and moral economy. The minimization of waste prioritized not profit and competition but wider concerns—such as the design and operation of strong, reliable, safe, and simple ships, which, in Ruskin’s words as appropriated by Scotts of Greenock, would be “the most honourable thing that man, as a gregarious animal, has ever produced.”

“No mourning coaches, no plumes to the hearse, no pall over his coffin, but all plain and avoiding show, I admire it much. . . . I would prefer to say ‘may my life be like his,’” Alfred Holt wrote in his journal about the February 1868 funeral of William Rathbone, Unitarian, shipowner, former mayor, and ardent reformer.⁶⁷ Holt indeed went further, and permitted no memorial to himself, even within the walls of the new Ullet Road Unitarian Chapel, which succeeded Renshaw Street at the turn of the century. Many years before, John Hamilton Thom had preached on Mary’s use of ointment as an exemplary act that appeared wasteful but in truth expressed a utility at once spiritual, moral, and material, a deed “embalmed in the memory of an act.” Alfred Holt himself made clear what he considered his memorial to be. Shortly before his own death in 1911, he is supposed to have confessed that he would be able to say to his Maker: “These are my ships.”⁶⁸

67. *Ibid.*, 5 February 1868.

68. Le Fleming (n. 51 above), 2. The Holt family also labored long and hard to ensure that their personal diaries and company records would endure as accurate histories of these acts, long after the ships themselves had gone. Historians are therefore doubly fortunate with respect to such Victorian merchant adventurers and shipowners. For not only have they inherited a veritable treasure trove of primary materials crafted by historical actors, but they also have the opportunity to analyze that material in the light of recent historiographical insights into the cultural shaping of technology.