

ROBERT STEELE AND COMPANY: SHIPBUILDERS OF GREENOCK

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There is a long tradition of shipbuilding on the west coast of Scotland. It began with the production of small fishing boats and coasters to satisfy the demand for vessels from people living in the region. The scale of production, however, was modest and might have remained so but for a number of changes taking place in the wider world.

Foremost among these was the expansion of Britain's colonial empire, especially the plantations founded in the West Indies and North America.¹ The efforts to establish and protect these colonies together with the trade they generated created a demand for new shipping that Scottish yards helped to satisfy. Other relevant factors were the frequent wars between 1750 and 1816 that helped keep ocean freight rates at high levels; the early stirrings of the industrial revolution; the influence of the Navigation Acts; and Britain's continuing naval dominance. The size of the United Kingdom's registered merchant fleet doubled between 1775 and 1790 following the American War of Independence, and by the conclusion of the Napoleonic wars had doubled again to 2,417,000 tons.² Of particular importance to Scotland was the 1707 Act of Union that enabled her to share fully in Britain's economic growth, and the completion of the Clyde-Forth canal in 1790 that linked western and eastern Scotland and gave Glasgow better access to the Baltic trade. Toward the end of the eighteenth century, Scotland entered a period of rapid economic growth that was soon matched by a rise in trade. Between 1750 and 1800, Scotland's overseas trade increased by three hundred percent compared with two hundred percent for England during the same period.³

Greenock shared in this growth because of its location at the waterway entrance to industrial Scotland. Large fully-laden sailing ships could not easily negotiate the upper Clyde and most chose to unload at Greenock, or nearby Port Glasgow, from where their cargoes could make the final stage of the journey to Glasgow by smaller boat or road. But as time went by Greenock became more than just an outpost for Glasgow. Trading houses and shipping fleets began to locate at Greenock so that the town became an important port and shipping centre in its own right. By 1783 it had a population of fifteen thousand and by 1800 there were 377 ships based in the port employing four thousand men.⁴ Although affected by the loss of the Virginia tobacco trade after the American Revolution, Greenock compensated for the setback

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by expanding into a number of other areas in which it was already established, including shipbuilding.⁵

Ships had been built at Greenock from at least 1711 by John Scott and Company. More yards followed and by the middle of the eighteenth century there were at least half a dozen other firms building ships in Greenock.⁶ Supplies of cheap timber from the Baltic (and later Canada), a large skilled workforce and a ready demand for their product from local owners led to rapid expansion of shipbuilding activities in and around the town. Greenock became a centre for shipbuilding and in the years that followed some of the finest vessels built in Britain were launched from yards on the lower Clyde, craft that helped to make "Clyde-built" a synonym for excellence the world over. A firm that helped shape this reputation for quality was Robert Steele and Company of Greenock.

Robert Steele was born to James Steele, a shipbuilder and Burgess of Ayr, and his wife Anne (nee Laurie) in 1745, the year of Scottish revolution.⁷ When he was old enough, Robert went to work as an apprentice shipwright in his father's small Saltcoats shipyard that specialised in fishing vessels and coasters. After his father's death, Robert continued at the yard for another ten years before deciding to go into partnership with John Carswell, who had a large shipbuilding yard at Greenock. The resulting firm, trading under the name Steele and Carswell, commenced operations to the west of Greenock in 1790. Its first vessel, the 145-ton brig *Clyde*, was launched the following April.⁸

The firm's yard sprawled on the shore of the Bay of Quick. Unusually for the time, it had its own vegetable garden and a freshwater spring in the southeastern corner near a large lime kiln where, legend has it, apprentice lads from the yard sometimes roasted potatoes filched from the garden over the embers in the kiln fire. The yard was well-located but suffered several drawbacks, chief of which was a gentle slope down to the water that made it necessary to have exceptionally long launching ways. Ship launchings were a popular spectacle in Greenock attended by most of the town, but while the sight of a finely-balanced vessel wobbling precariously down to the sea was a great crowd-pleaser, it was also a cause for concern to both builder and owner. The gently-shelved coast also meant the fitting-out dock had to be built well out into the Clyde, making it subject to regular storm damage. Nevertheless, the firm prospered. About thirty-five vessels were launched from the site during the twenty-year partnership, including the *Bengal*, the first East Indiaman built at Greenock.⁹

There were a number of reasons for Steele and Carswell's success. Robert Steele brought to the partnership many years experience as a skilled shipwright and yard administrator at Saltcoats, while John Carswell as an established shipbuilder at Greenock may have had a better range of contacts among prospective owners. Another factor was the Napoleonic wars, whose duration coincided almost exactly with the life of the firm. Apart from the Peninsula campaign, the conflict was fought mainly at sea, thus creating a strong demand for all types of shipping and maintaining ocean freight rates at a high level for an extended period. Many new ships were built in Britain during the war years and when peace came in 1815 the tonnage of the United Kingdom's merchant marine was twice that of its nearest rival, the United States.¹⁰

In the early years of the peace this glut of new vessels plus the large number of craft released from naval service created a pool of vessels that pushed down freight rates and reduced the demand for new shipping. Trade was dull and profit margins low, resulting in the many bankruptcies and dissolutions of partnerships among Scottish shipbuilders. The partnership between Steele and Carswell was one of those that ended at this time. The

agreement between the two partners was formally dissolved in 1815 and a new company formed under the name Robert Steele and Company. The new firm was a partnership between Robert Steele and his two sons, James and Robert (II), and continued to operate from the same site.

The first vessel built by Robert Steele and Company appears to have been the single-decked, three-masted barque *Rebecca* (302 tons), built for Laurie and Company of Glasgow as a timber trader. Like many other trading vessels at this time, the *Rebecca* was exceptionally deep with a very high depth to width ratio for reasons that had more to do with economics than nautical practice. Apart from being able to carry more cargo, deep vessels were subject to fewer charges, as customs duties on vessels arriving in British ports were levied using a formula based on the vessel's length and width but which assumed a constant depth. By not taking ship depth into account these regulations encouraged the construction of ships of great depth in relation to their width. Such vessels were of commercial advantage in certain trades where full cargoes were the rule rather than the exception (i.e., carriers of bulk commodities such as timber or coal) but created problems for those who had to work them, as they tended to be difficult to handle and inclined to ground. These regulations for tonnage measurement, together with much other shipping-related legislation, were either swept away or radically amended in the late 1840s as part of British attempts to expunge those parts of the shipping regulations considered to be a hindrance to the efficient operation of the merchant marine. Before that time, however, there was a much stronger force at work for change in British shipping—the advent of steam power.

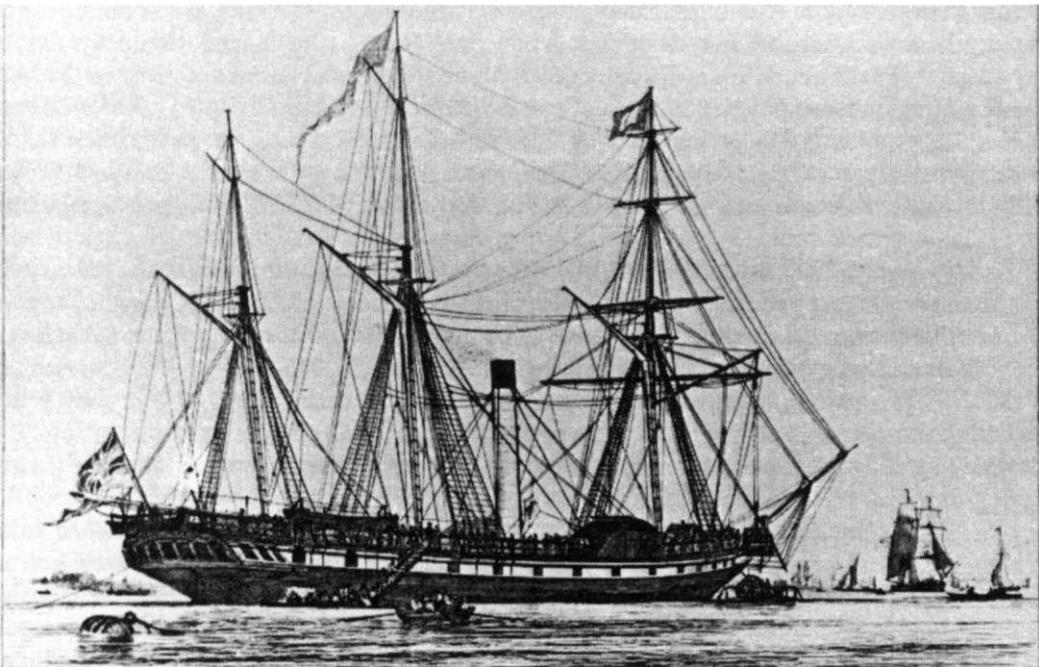


Figure 1: SS *United Kingdom*, 1829.

Source: National Maritime Museum, Greenwich, negative X781.



Figure 2: View of Greenock by I. Clark, 1824.

Source: National Maritime Museum, Greenwich, negative 4879.

One of the first successful steamers to be launched was a vessel called the *Comet*, built on the Clyde by John Wood and Company in 1812. More soon followed, but while Greenock rapidly became a centre for steamship production, Robert Steele and Company did not immediately join the rush. Indeed, another forty-three steamers were built in yards on the lower Clyde before the company entered the field in 1821.¹¹ By that time Robert Steele Sr., was seventy-six years old, thus perhaps making the firm's delay in entering this radical new field of endeavour understandable. Yet once the decision was made to go ahead the company became fully-committed. A new yard was opened at Rue End and the works of Shaw's Water Foundry and Engineering Company acquired to allow for the construction of boilers and engines for its ships.¹² So involved did the company become that in 1826 Steele and Co. launched the *United Kingdom*, the largest paddle steamship in the world to that date and the first designed to cross the Atlantic (due to bankruptcy of the firm that commissioned her she never made a crossing).¹³ Robert Steele, Sr., retired from the firm soon after the launch of the *United Kingdom* and died in 1830. During his time in charge he had supervised the construction of over fifty vessels including six steamers, one of them the world's largest.¹⁴ Robert Steele the younger took over the running of firm following the retirement of his father, his brother James, the other partner, having died some years earlier.

The company's standing at this time can be measured by a book published in the United Kingdom in 1830. A treatise on marine architecture by the navel architect and shipbuilder, Peter Hedderwick, was one of the earliest to deal specifically with merchant ships and included in its pages the plans of a number of vessels the author considered to be models of their kind. Of the eight ship plans in the book that can now be identified, no less than four were built by Robert Steele and Company.¹⁵ Part of the firm's success at this time and throughout its history seems to have been a steadfast commitment to quality in design, materials and workmanship. Clyde-built vessels in general, and "Steele-built" ones in particular, seem to have been built to last. The company's success also probably owed something to a network of

contacts built up by Robert Steele, and maintained by his sons, with the owners and managers of shipping lines and with other larger shipbuilders for whom the company sometimes acted as sub-contractors. Many of these people, such as George Burns, the Napiers and Elder Denning were residents of Greenock or Glasgow and their friendship was no doubt a factor in the concern's success. A more general reason for the success of Scottish shipbuilders like Steele and Co. was the large number of Scottish merchants and immigrants living in Britain's overseas possessions.¹⁶ These expatriates preferred the products of their homeland, thus creating a ready market for her products, including ships.

Yet not all Greenock yards fared as well as Robert Steele and Company. As shipbuilding firms grew larger and more sophisticated their numbers started to decrease, so that by 1842 the Steele operation was one of only three yards still building ships at Greenock.¹⁷ Part of the problem was the recession of the early 1840s that held down freight rates and the demand for new shipping. As a result, a number of Greenock's shipyards closed down or moved elsewhere. Also important was the increasing use of iron in ship construction that caused a shift in shipbuilding activity away from Greenock and toward the upper Clyde and Glasgow in order to be closer to the source of materials from which these new vessels were built, and the owners who were buying them. Nevertheless, the Greenock shipbuilders who managed to survive the recession were well-placed to benefit when the economy recovered and new orders for ships started to come again.

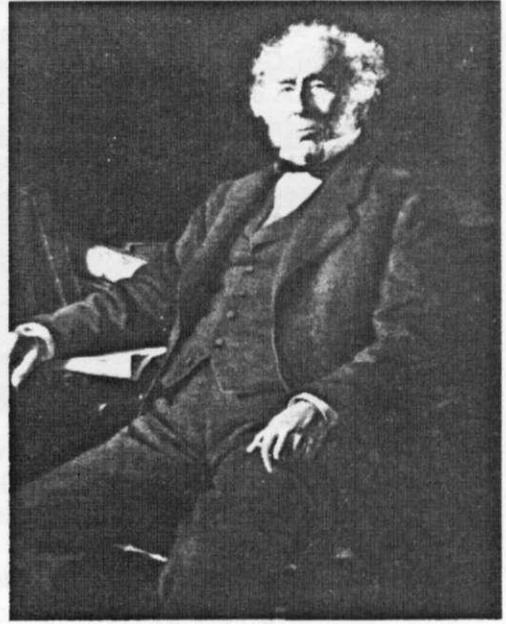
As the 1840s progressed, Robert Steele and Company became closely associated with the production of high-quality, wooden-hulled paddle steamers for use as packets on lucrative coastal runs between ports such as Glasgow and Liverpool and on short ocean crossings between Britain, Ireland and Europe. One of these, the 650-ton *Unicom*, was bought by the Canadian Samuel Cunard and became the first to make the Atlantic crossing flying his flag.¹⁸ Steele's connection with Cunard was further strengthened by an order for the hull of the *Columbia*, one of four steamer's commissioned to fulfil the lucrative mail contracts awarded to this enterprising Canadian.¹⁹ In 1838 the British Admiralty had sought tenders for the conveyance of sea-mail between Britain and North America by a regular steamship service. Two tenders were received, including one from Cunard's St. George Steam Packet Company. While it was rejected at first, Cunard attempted to demonstrate the seriousness of his commitment by entering into a contract with Wood and Napier of Glasgow for three wooden paddle steamers of 960 tons each (later increased to four vessels with amended specifications).

His efforts were successful and in May 1839 he signed a seven-year contract for the conveyance of mails between Liverpool, Halifax and Boston, worth a total of £55,000 per annum.²⁰ He still needed additional help to finance the venture and again sought the assistance of Robert Napier to convince two Glasgow-based shipping magnates, David Melver and George Burns, to become partners in the enterprise. In this he was again successful and the British and North American Royal Mail Steam Packet Company came into existence in May 1840 with capital fixed at £270,000. Each partner assumed a specific task in the new company; George Burns remained in Glasgow to oversee the construction of four new ships, the *Britannia*, *Columbia*, *Acadia* and *Caledonia*, each of about 1,150 tons with accommodation for up to one hundred passengers; David Melver went to Liverpool to supervise the construction of a terminus, while Cunard returned to North America to prepare docking facilities at Halifax and Boston.

Figures 3-6



Robert Steele (I) 1745-1830



Robert Steele (II) 1791-1879



Robert Steele (III) 1821-1890



Robert Steele (IV) 1859-1913

Source: All portraits courtesy of Lt. Col. Robert Steele.

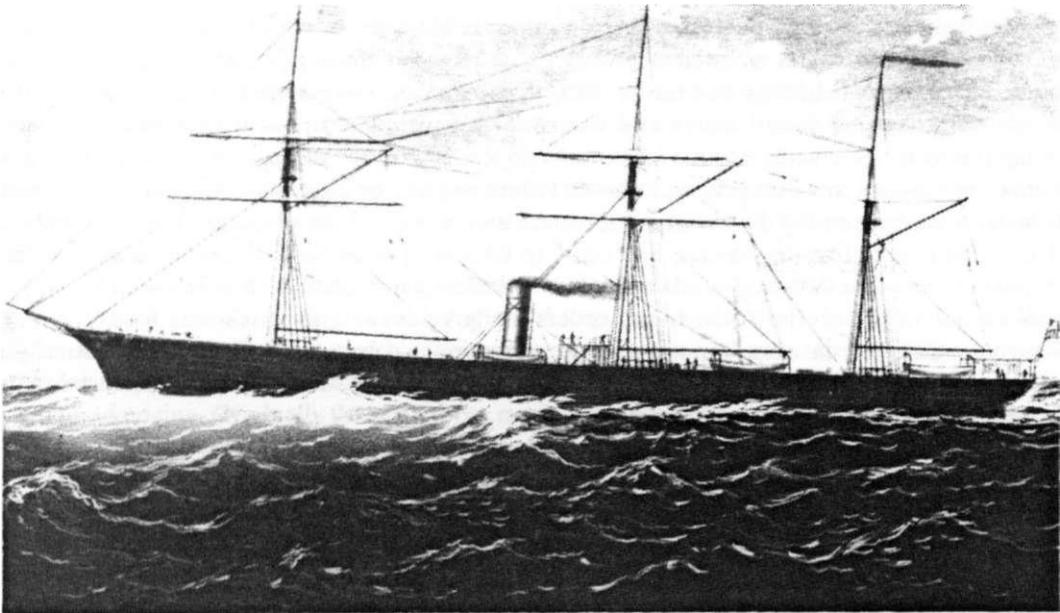


Figure 7: The SS *Columbia*, 1842.

Source: National Maritime Museum, Greenwich, negative 9377.

The work done by Robert Steele and Company on the hull of the *Columbia* must have been satisfactory, since the firm subsequently worked on all but four of the first thirteen Cunard steamers. These vessels established reputations for reliability and safety that were the foundation of Cunard's subsequent success. Yet although Cunard soon came to dominate steamship traffic on the Atlantic, the firm did not become known as an innovator in the rapidly-changing field of ship design. Above all, it needed reliable and safe vessels and tended to leave design innovation to others. Yet once the value of a change was proven it was readily adapted by Cunard - indeed it was a requirement of its mail contract that proven technical advances be absorbed in each new generation of vessels, provided they were consistent with established standards of safety and speed.

Unfortunately, the rapid pace of change in ship design also meant that Steele's prominence in the first generation of steamship construction was short-lived. Within a few years of being launched, wooden-hulled paddle steamships were made redundant by new iron-hulled vessels that were faster, less expensive to maintain and lasted longer. These in turn were soon made obsolete by vessels using screw propellers rather than paddles. Yet even when Steele's steamers were superseded, their construction was such that they continued to give many years of useful service, sometimes serving purely as sailing ships on the long Far East routes.

The introduction of iron-hulled vessels marked the end of Steele's association with Cunard, as the company found itself again faced with dramatic changes in shipbuilding technology. Robert Steele Jr. proved equal to the challenge and in 1854 a bigger yard was opened at Cartside West to produce iron-hulled screw steamers.²¹ The first of these was S.S. *Beaver*, launched later that same year.²² Orders were slow at first and for a time the yard had to rely on fitting-out and maintenance work on small steamers such as the *Pearl*, a naval gunboat used by David Livingstone on his 1858 expedition up the Zambezi river.²³ But the firm persisted in seeking larger orders and was rewarded with a new era of prosperity. This was inaugurated in 1857 with a commission to build a 1,500-ton passenger liner for the Glasgow firm of Handyside and Henderson, followed two years later by the contract for a two thousand-ton screw steamer called the *Canadian* for the J. and A. Allan Line of Glasgow and Montreal.²⁴ The Allan family, like the Steeles, had come to Greenock from Saltcoats. They started a fleet of packets between Greenock and the St. Lawrence, relying on Robert Steele and Company to build many of them. The Allan Line's orders for large ocean-going steamers for the United Kingdom-Canada run were important to the company and became its "bread and butter" for many years. With these and other orders, Steele and Company was again in the mainstream of British shipbuilding.

We generally tend to think of our own century as characterized by rapid technological change, yet in shipbuilding the most fundamental transformations occurred during the nineteenth century. When it began vessels were relatively small, made of wood and driven by wind, as they had been for 3000 years or more; by the time it closed ships were many times larger, built of steel and powered by new and complex machinery. By the 1840s, the industrial revolution was in full swing and shipbuilding was quickly identified as an area in which the new technology could be readily applied.

From this temporal distance there is sometimes an impression that the changes occurred fairly rapidly. But in reality the transition was spread over a period of fifty years and included almost as many setbacks as advances. The early steam engines were tentative in design and fabricated from as yet imperfectly developed materials. Boilers could not be made strong enough to contain the high steam pressures required for the efficient conversion of coal into power, while the proper marrying of hull, engines and paddles took longer to achieve than expected. The high construction and running costs of the early steamers, together with their limited carrying capacity, made them economic only for the carriage of high-value items, such as mail and passengers, or for service as tugs. They were unable to compete with sail in the carriage of bulk commodities such as timber, coal, ore, grain, cotton and wool over long distances.²⁵ Another barrier was a public prejudice against the new methods of ship construction and propulsion. Apart from the very real danger of boiler explosions, it was widely believed that extensive use of iron would taint cargoes and render the compass useless. Many passengers, as well as some builders and owners, also believed that ships constructed from a substance that itself would not float was somehow contrary to nature and hence doomed to failure. Nonetheless, the advantages of the new ships soon became too evident to ignore. An average reduction in the weight of vessels of similar size by ten percent, coupled with increases in strength, durability, cargo capacity and speed, made steam power and the continuing use of iron or steel in ship hull construction commercial requirements.

Another important stimulus to the conversion of the United Kingdom fleet from sail to steam was the repeal of the greater part of the Navigation Acts in the second half of the

1840s. Although criticised by contemporaries for swamping British and colonial ports with cheap American-built sailing vessels, the situation forced British shipowners and builders to reconsider their attitude to ship design.²⁶ Other political and legislative changes that hastened the new era in British shipping included the repeal of the East India Company monopoly in the Far East trade; the Merchant Seaman's Act of 1854; changes in the system of tonnage measurement; and the Passenger Act of 1855, which provided minimum safety standards on British vessels. The latter was initially seen by shipowners as an unnecessary restraint on trade since it gave foreign competitors unaffected by its requirements an unfair advantage. In the long-run, however, it helped to raise the standard of British shipbuilding and ensure that the United Kingdom remained a force in world shipping to the end of the century and beyond. But as the pace of change in ship design continued, it became increasingly difficult for established yards to keep up with each new wave of advances.

The iron-hulled *Sardinian* launched in 1874 was the last big steamer to be built by Robert Steele and Company.²⁷ Technological change had again overtaken the yard as steel replaced iron in hull construction. Steamship construction in general had become more complex, with innovations such as bilge keels to reduce rolling and the introduction of the compound engine. Gradually the skill of the marine engineer became more important than that of the shipbuilder - and Robert Steele and Company was essentially a shipbuilder.

Although it was best known at this time for large steamship commissions, the company had continued throughout to accept orders for commercial sailing ships, yachts and barges.²⁸ Between 1864 and 1869, Steele built forty-five sailing ships but not one steam-powered vessel.²⁹ What allowed this return to sail was the expansion of the long Australian and Far East trade routes where wind power could still compete with steam. Also important were reductions in the cost of constructing and operating sailing ships. At the same time that the builders of steamers were grappling with a whole new array of design and fabrication difficulties, the many yards still building sail were able to adapt a number of technical advances from the industrial revolution to produce craft that were larger, stronger, faster and cheaper. Moreover, new labor-saving devices allowed substantial reductions in manning levels. The net result was that the cost of building and operating sailing ships fell significantly, allowing them on certain routes to successfully compete with steamers.³⁰

Among Robert Steele and Company's finest achievements during this period were about twenty clippers built for the China tea trade, the first of which was the *Kate Carne*, launched in 1855.³¹ Constructed like racing yachts, many of these beautiful vessels, such as the *Serica*, *Falcon*, *Ariel*, *Taeping* and the *Sir Lancelot*, became famous for winning the China Tea race year after year. No expense was spared to help land the first tea of the season at London and the superior design and construction of the Steele-built tea clippers saw them become the standard by which others were judged. While the early clippers were made of wood, it was not long before composite construction—wood planking on a iron frame—became standard. Composite construction improved a sailing ship's cargo-capacity, strength and durability; in addition, it was widely-believed that the continued use of timber was essential for the carriage of certain types of cargo, such as tea. Many people connected with sail—including those at Robert Steele and Company—hoped that wind-powered vessels might be able to hold their own on at least a few long distance trade routes, such as the Australian wool trade. This, however, was not to be and the evolution in steamship construction continued apace until steamers were able to compete on these routes also.

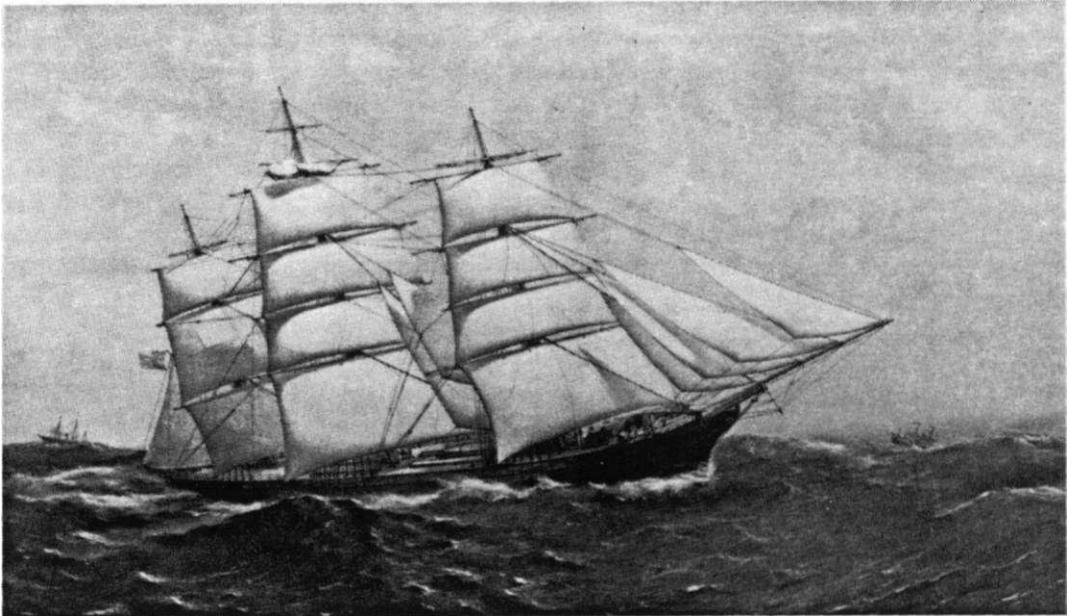


Figure 8: *Sir Lancelot* (886 tons), 1865.

Source: National Maritime Museum, Greenwich, negative B3670.

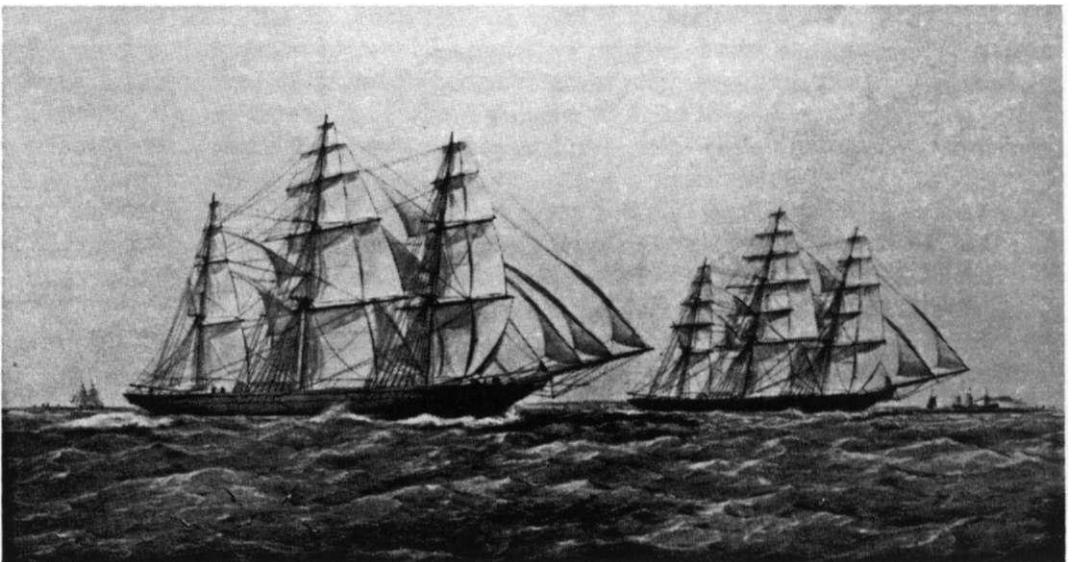


Figure 9: Clipper ships *Taeping* and *Ariel*, 1866.

Source: National Maritime Museum, Greenwich, negative A7187.

One of the fastest commercial sailing vessels of the nineteenth century was the *Ariel*, which recorded a best time of seventy-nine days on the Hong Kong-London run.³² Yet in 1867 a steamer called the *Ajax* went from Shanghai to London with a load of tea and silk and landed her cargo in good order after a voyage of just sixty-eight days.³³ Even faster voyages followed, finally bringing to an end the age of sail. The last clipper launched by the Steele yard was the *Wylo*, built in 1865 for Killick, Martin and Company of London.³⁴ Robert Steele and Company continued to build sailing vessels, notably large passenger vessels for the Australian run, and many immigrants first saw the shores of their new homeland from the deck of a Steele-built vessel, such as the *Aurora*, *Harbinger* or the *Hesperus*.

In the long-run, Greenock had cause to regret the coming of steam.³⁵ The town owed its prominence to the advantages its location gave it in the days of wind-powered shipping. Greenock and nearby Port Glasgow were the funnel through which most of industrial Scotland's trade flowed. But with the introduction of steam and the completion of extensive harbour and river improvements along the upper Clyde during the nineteenth century, Greenock lost much of this advantage. Large steam-powered trading vessels could now continue much further upriver by themselves, thus removing the need to transship at Greenock. The decline of certain trades with which the town was associated also played a part. Many important shipping companies were based at Greenock, including Carmichael's "Golden Fleece" line specialising in the Australian wool trade and John Kerr and Company's "Diamond K" line. When lines like these began to close or move away, the whole town felt the effect. Shipbuilders also began to close or move upriver to be closer to Glasgow's industrial centre. Although shipbuilding continued as an important activity, the relative importance of the town declined with the passing of sail, taking with it some shipbuilders who relied heavily on orders from local shipowners. There is perhaps a strange irony that a town brought to prominence by sailing vessels should experience a decline caused by an invention of its most famous son, James Watt.

Robert Steele and Company became a casualty of these changing times and circumstances. A downturn in the general economic climate in the early 1880s combined with some unsuccessful investments by Robert Steele (II) in fields unconnected with shipbuilding brought about the closure.³⁶ In a broader sense it could be argued that the company had backed a losing cause by maintaining its faith in the sailing ship for too long. It had acquired an enviable reputation in the production of sailing ships and eventually turned back to this established ability rather than tackling the expensive and increasingly complex problems posed by modern shipbuilding. The firm also appears to have remained privately-owned throughout and it is possible that the decision not to float an issue on the stock exchange may have denied it the capital that was needed to grow and compete.

Robert Steele and Company went into liquidation in 1883. In November of that year the yard was sold for £40,000 to Greenock's oldest shipbuilding firm, Scott and Company.³⁷ Robert Steele and Company had built thirty-four vessels at the Bay of Quick and 273 at the Cartsburn yard (formerly called Cartsydyke West); among these were nearly one hundred steamers, including eleven for Cunard and ten for Allan line. Between 1816 and 1882 this output totalled about 197,000 tons. Members of the Steele family had remained prominent in the firm throughout its history, providing a living connection with the company founder. Robert Steele's great-grandson, Robert Steele (IV), joined the company as an apprentice and managed to achieve the rank of assistant manager shortly before the firm closed. It is perhaps fitting that

a yard that began as a builder of wind-powered vessels should end the same way-the last commission was for a sailing vessel called the *Inveruglas*, launched in September 1883.

NOTES

- Mark Howard has an interest in maritime, economic and local history and lives in Melbourne, Australia. He would like to thank Lt-Col. Robert Steele for permission to reproduce portraits of the Steele family, and the National Maritime Museum in Greenwich for allowing the other illustrations to appear. He also thanks Dr. Graydon Henning of the University of New England and Professor Lewis Fischer of Memorial University of Newfoundland for drawing his attention to some useful sources. a.T.M. Devine, "An Eighteenth Century Business Elite: Glasgow-West India Merchants, c. 1750-1815," *Scottish Historical Review*, LVII (1978), 40-68.
- 1. John Bach, *A Maritime History of Australia* (Melbourne, 1976), 57.
- 2. David S. MacMillan, "The New Men in Action: Scottish Mercantile and Shipping Operations in the North American Colonies, 1760-1825," 45, in David S. MacMillan (ed.), *Canadian Business History: Selected Studies, 1497-1971* (Toronto, 1972).
- 3. *Ibid.*, 50.
- 4. Barbara Crispin, "Clyde Shipping and the American War," *Scottish Historical Review*, XL1 (1962), 124.
- 5. John Shields, *Clyde Built: A History of Shipbuilding on the River Clyde* (Glasgow, 1949), 16.
- 6. *Greenock Telegraph and Clyde Shipping Gazette*, 14 May 1914; "Pedigree of Steele," a genealogical chart showing the Steele family tree (in the possession of Lt-Col. Robert Steele).
- 1. *Greenock Telegraph (GT)*, 14 February 1956.
- 8. Fred W. Walker, *The Song of the Clyde : A History of Clyde Shipbuilding* (Cambridge, 1984), 227; David R. MacGregor, *Merchant Sailing Ships, 1775-1815: Their Design and Construction* (Watford, 1980), 125 and 133.
- 9. A.W. Kirkaldy, *British Shipping: Its History, Organisation and Importance* (London, 1914), 25.
- 10. *GT*, 14 February 1956.
- 11. *Greenock Telegraph and Clyde Shipping Gazette*, 14 March 1914.
- 12. *GT*, 21 February 1956.
- 13. *Ibid.*
- 14. David R. MacGregor, *Merchant Sailing Ships, 1815-1850: Supremacy of Sail* (London, 1984), 17.
- 15. MacMillan, *The New Men in Action*.
- 16. MacGregor, *Merchant Sailing Ships, 1815-1850*, 122.
- 17. *GT*, 28 February 1956.
- 18. Shields, *Clyde Built*, 121.
- 19. Francis E. Hyde, *Cunard and the North Atlantic 1840-1873: A History of Shipping and Financial Management* (London, 1975), 8. The subsidy was later increased to £81,000 when a fourth vessel became necessary.
- 20. *GT*, 29 March 1956.
- 21. David R. MacGregor, *Merchant Sailing Ships, 1850-1875: Heyday of Sail* (London, 1984), 29.
- 22. *GT*, 29 March 1956.
- 23. *Ibid.*
- 24. David R. MacGregor, *The China Bird: The History of Captain Killick and One Hundred Years of Sail and Steam* (London, 1961), 62.
- 25. S. Pollard and P. Robertson, *The British Shipbuilding Industry 1870-1914* (Cambridge, MA, 1979), 10-11.
- 26. I.E.O., *Steele-Built: The Story of a Greenock Shipyard and Its Ships* (Greenock, 1963), 19.

27. For a full list of vessels built by Robert Steele and Company during these years see MacGregor, *Merchant Sailing Ships, 1850-1875*, Appendix II.
28. *GT*, 5 April 1956.
29. Gerald S. Graham, "The Ascendancy of the Sailing Ship 1850-85," *Economic History Review*, IX (1956), 80.
30. I.E.O., *Steele-Built*, 20; David R. MacGregor, *The Tea Clippers: An Account of the China Tea Trade and Some of the British Sailing Ships Engaged in It from 1849 to 1869* (Whitstable, 1972), 76.
31. Shields, *Clyde Built*, 122.
32. *GT*, 13 April 1956.
33. I.E.O., *Steele-Built*, 18.
34. Andrew Porter, *Victorian Shipping, Business and Imperial Policy* (Woodbridge, 1986), 19-20.
35. Robert Steele (II) was a prominent promoter and shareholder in a range of industrial projects such as the Greenock Cotton Spinning Company and the Glasgow, Paisley and Greenock Railway, of which he was a director. Some of these projects drained the company of cash and left debts that continued to be a problem after his sons took over the firm's management. *GT*, 14 March 1914.
36. Porter, *Victorian Shipping*, 20.