

Two Centuries of Shipbuilding by the Scotts at Greenock – Published 1906

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## TWO CENTURIES OF SHIPBUILDING BY THE SCOTTS AT GREENOCK

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"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 hand-work, defiance of brute elements, careless courage, careful patriotism, and calm expectation of the judgment of God, as can well be put into a space of 300 feet long by 80 feet broad."—RUSKIN.

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# Personalia



*William Scott*  
(1722 - 1769)



*John Scott*  
(1752 - 1837)



*William Scott*  
(born 1756)



*Charles C. Scott*  
(1794 - 1875)



*John Scott*  
(1830 - 1903)



*Sinclair Scott*  
(1843 - 1905)



*C.C. Scott*



*R.H. Scott*

JOHN SCOTT (I) founded the firm in 1711, and engaged in the building of herring busses and small craft. There is, unfortunately, no engraving of him extant.

WILLIAM SCOTT, his son, born 1722, died 1769, succeeded him, and, with his brother, extended the business alike as regards the extent of the works, and the types of vessels built. His first square-rigged ship—of 1765—was the first vessel built on the Clyde for owners out of Scotland.

JOHN SCOTT (II), born 1752, died 1837, son of William, greatly developed the works and built the dry dock and basin now included, with the original Yard, in the establishment of Messrs. Caird and Co., Limited. Under his regime many ocean-going sailing ships were constructed, ship-work for the Navy was undertaken, the manufacture of steam machinery commenced in 1825, and Admiralty orders undertaken for engines for dockyard—as well as Greenock-built frigates. He built the Custom House Quay in 1791, bought Halkhill, the family seat, in 1815, was a partner in the Greenock Bank, and otherwise promoted the industries of the town.

His brother, WILLIAM SCOTT (II), born 1756, migrated to Barnstaple, where he carried on an extensive shipbuilding industry, obtaining engines for the most of his steamships from the Greenock Works.

CHARLES CUNINGHAM SCOTT, born 1794, died 1875, son of John Scott (II), along with his elder brother, John Scott (III), born 1785, died 1874, carried on the business as “John Scott and Sons,” developing still further the progressive policy of his father, who had been responsible for the works for about half a century. The Cartsdyke Yard was commenced in 1850 by Charles Cuninghame Scott, and his son John, under the style of “Scott and Co.,” and this firm is the one which has maintained the continuity of the Scotts' association with shipbuilding,

JOHN SCOTT (IV), born 1830, died 1903, and ROBERT SINCLAIR SCOTT, born 1843, died 1905, sons of Charles Cuninghame Scott, were responsible for the progress for nearly forty years, and the former was created a Companion of the Bath (C.B.) in 1887. During their regime the firm took a large part in the introduction of the steamship for over-sea voyages; in the development of high steam pressures and of the multiple-expansion engine, which greatly improved the economy of the steam engine; and in naval work, with its incidental advancement. They completely reconstructed the Cartsdyke Works, and greatly improved what is now known as the Cartsburn Dockyard, modernising the equipment. The co-partnership was, for family reasons, registered in 1900 under the Limited Liability Company Law.

CHARLES CUNINGHAM SCOTT, son of John Scott, C.B., is now the head of the concern and Chairman of the Company (Scotts' Shipbuilding and Engineering Company, Limited), and with him on the directorate are his brother ROBERT LYONS SCOTT, C. Mumme, and James Brown.



# The Era of the Sailing Ship

The maintenance of an industry for two hundred years by one family, in the direct line of succession and in one locality, is almost unique in the history of western manufactures. Such a record proves that the successive generations have displayed diligence, prudence, and enterprise; otherwise it would not have been possible for them to have held continuously a foremost place in the face of incessant competition consequent upon the general advance in science, the introduction of superior constructional materials, and the invention of new machinery. It indicates also the maintenance of a much standard of workmanship as well as integrity and business capacity; because time is the most important factor in proving efficiency and in establishing credit for durability of work, without which no reputation can be retained for such a long period.

The Scotts began the building of ships in Greenock in 1711. To-day, their descendants of the sixth generation worthily maintain the high traditions which have accumulated during the intervening two hundred years. It is impossible to form an adequate conception of the service rendered by this one firm to the science of marine construction and to Britain, the leading maritime nation of the world.

We should require to review in detail the successive steps: firstly, in the perfection of the sailing ship, from the sloops and brigantines of the eighteenth century, to such beautiful clippers as Scotts' Lord of the Isles, which in 1856 made the record voyage from China, and did much to wrest from the Americans the "blue ribbon" of the ocean; and, secondly, in the development of the steamship from its inception early in the nineteenth century to the leviathans of to-day. In successive epochs in the history of naval architecture the Scotts have played a creditable part, and to some of the more important improvements initiated or advanced by the firm reference will be made in our brief survey of the work done during the past two centuries. Unfortunately, some years ago, most of the old-time records were destroyed by a fire at the shipyard, so that our review of the early work is largely from contemporary publications, and is unavoidably incomplete.



The Lord of the Isles

The beginnings were small, for Scotland had not yet attained to industrial importance, and had little oversea commerce. The first trans-Atlantic voyage made by a Clyde ship was in 1686, when a Greenock-built vessel was employed on a special mission to carry twenty-two persons transported to Carolina for attending conventicles and "being disaffected to Government." American ships were most numerous on the western seas, and the East India Company had a monopoly of the eastern seas, so far as Britain was concerned, and preferred to build their ships in India, although many were constructed on the south coast of England. This monopoly checked progress. There was little or no incentive to improvement in merchant ships, and the naval authorities were too busy fighting Continental nations to risk extensive experimental work. We have it on the authority of Sir Nathaniel Barnaby, K.C.B., that neither Government nor private builders made much progress in improving methods of construction. The first letters patent granted for improvements relating to ships bear the date January 17th, 1618, but the result

of a thorough investigation of all patents between 1618 and 1810 discloses no improvement worth recording, except in the manufacture of sheathing and the construction of pumps.

The Scotts, like a few other shipbuilders on the Clyde, were concerned for the greater part of the eighteenth century in the building of fishing and coasting boats. There belonged to Greenock, in 1728, as many as nine hundred of such fishing boats, locally built, each carrying from twenty to twenty-four nets and manned by a crew of four men. For many years the business of the firm consisted almost entirely in the building of herring busses and small craft employed in the fishing trade, the first establishment being at the mouth of the West Burn, on land leased from the Shaw family. The shipbuilding industry was carried on intermittently, and the Scotts were the first to give it stability and continuity. In 1752, the Greenland whale fisheries were engaged in, and this led to a development in the size of craft. The first square-rigged vessel built in the port was a brig, named Greenock, constructed in 1760, for the West Indian trade. In 1765, William Scott, who had succeeded the original founder—his father, John Scott— built a large square-rigged ship for some merchants of the town of Hull, the timber for which came from the Ducal woods at Hamilton. This ship is notable as being probably the first ship built on the Clyde for owners out of Scotland. To take a fairly representative year (1776), eighteen vessels, ranging up to 77 tons, and of a total of 1073 tons burden, were constructed in Greenock, and of the number six were built by the Scotts. Although the work could be more cheaply done on the Clyde than at London or Bristol, there was for a long time a strong prejudice against English owners ordering vessels from the north, and against Scotch vessels taking any part in the oversea trade.

The Jacobite risings had also affected the industry, but the War of Independence in America had far-reaching beneficial results. It is true that prior to this the rich fields of the English colonial possessions, as well as the English markets, had been opened to the commerce of Scotland, and that the merchants of Glasgow had developed extensive commercial operations with the West Indies and British North America; but, although there was thus a considerable oversea trade between the Clyde and the Western hemisphere, all the large vessels trading to the Clyde were built in America. The shipbuilding industry in the States was thus a very extensive one; and, in 1769, there were launched, in the North American Colonies, three hundred and eighty-nine vessels of 20,000 tons burden, which was far in excess of the annual British output. This was largely owing to the limitless supply of timber in America, and to the import duties on constructional material imposed in this country to suit the English growers of oak, the price of which advanced in the eighteenth century from £2 15s. to £7 7s. per load. The Brunswick, of 600 tons, carpenters' measurement, to carry 1000 tons real burden, built by the Scotts in 1791 for the Nova Scotia trade; and the Caledonia, of 650 tons, built by the Scotts in 1794, for the carriage of timber for the Navy yards— each the largest ship in Scotland of its respective year — signalled the beginning of a period of greater activity, especially in respect of large ocean ships. Some years before—1767—the Scotts had feued ground for a building yard on the shore east of the West Burn. They added a graving dock of considerable size, and the inaugural proceedings included a dinner held on the floor of the dock.

Other developments contributed to the prosperity of the port of Greenock, the chief of the establishment being John Scott of the third generation, who was born in 1752, and died in 1837. His brother, William Scott, also the second of that name, migrated to Bristol, where he carried on an extensive trade as a shipbuilder. The latter was the father of James M. Scott, who is still remembered by some old inhabitants as the founder, about 1847, of penny banks in Greenock and of the Artisans' Club. John Scott, after his brother's departure, carried on the business under the name of John Scott and Sons, and did great service not only for the town, but also for the advancement of the business. In three successive years, 1787, 1788, and 1789, he bought three large plots from the ninth Lord Cathcart, for the extension of the works. These then extended almost from the West Quay to the West Burn. He also, in 1791, constructed the old steamboat or custom-house quay and played a large part in developing the banking facilities of the town. He bought, in 1815, Halkshill, near Largs, which has continued the residence of the family. In view of the association of the firm with the town, it may be worth interpolating here a statement of the growth of the population of Greenock, with the sources from which the figures have been taken.

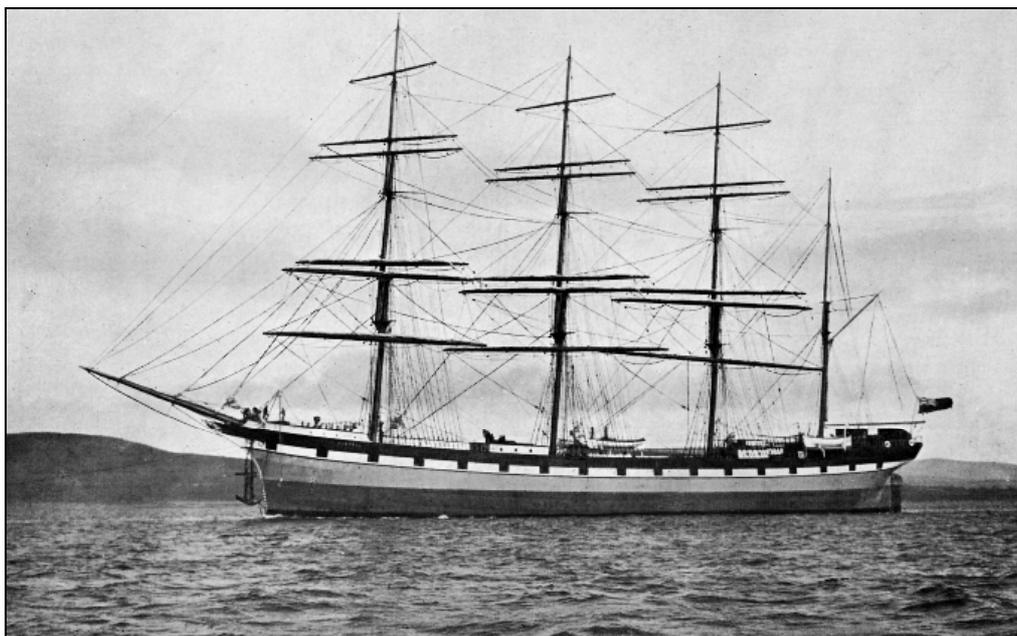
Year.	Population	Source.
1700	1,328	Campbell's History, page 23.
1801	17,458	Weir's History, page 120.
1901	68,142	Census Returns, vol i., page 212.

Shipbuilding work, however, was still in craft which to-day would be considered insignificant. The increase of the mercantile fleet of England throughout the eighteenth century was only fivefold in respect of numbers, and six fold in tonnage ; the average size shows an augmentation from 80 tons to only 100 tons, and there was no improvement in labour-economising appliances for the working of the ship, as the ratio of men to tonnage was at the beginning of the century practically one to every 10 tons, and at the close one to 13 tons.

In the nineteenth century, the tonnage increased eight fold, but in view of the adoption of steam the actual carrying capacity was augmented nearly thirtyfold; the average size of ship increased to 760 tons. Practically, every ship in the eighteenth century carried guns, the average being two per vessel. It was not until 1853 that there was omitted

from the mail contracts the clause which provided that each mail vessel must be built to carry guns of the largest calibre in use.

The nineteenth century brought every incentive to the development of shipbuilding. Nelson taught the lesson, never to be forgotten, that sea-power is essential to the commercial expansion—even to the existence—of our island kingdom, with its corollary, that the merchant fleet is as necessary to this mastery of the sea as fighting squadrons. The sea became our home; there arose a renewed love of exploration, and an ambition for colonisation. Success brought the chastening influence of responsibility, with a higher appreciation of the advantage of a conciliatory policy towards foreign nations. Contemporaneously with the growth of this conception of empire there arose a war of retaliation in shipping with the newly-formed United States of America, which continued for half a century. Although not without its regrettable incidents, it stimulated a rivalry in the shipping and shipbuilding industries which was ultimately as beneficial as it had been pronounced. The monopoly of the East India Company in the Eastern shipping trade terminated, so far as India was concerned, in 1814, and as regards China in 1834. This removed an influence which had hitherto retarded enterprise in naval construction—especially on the Clyde—due to the Company's preference for building their ships in India, and in the south of England ports. Private owners, too, entered more vigorously into competition with American clippers which had first commenced trade with China in 1788.



The Archibald Russell

With the widening of the maritime interests and the intensification of competition there was awakened a general desire to increase the strength of ships. In this respect, as in others, there had been little advance either in the Navy or in the mercantile marine. It was exceptional for a ship of the eighteenth century to continue in service for more than twelve or fifteen years. This was due partly to defective constructional details, and partly to the ineffective methods of preserving timber.

Ships were then built up of a series of transverse ribs, connected together by the outside planking and by the ceiling. There was no filling between the ribs. The ship's structure thus suffered severely from hogging and sagging stresses. The French tried to improve this by introducing oblique iron riders across the ceiling, or by laying the ceiling and the outside planking diagonally, while in other instances the whole was strengthened with vertical or diagonal riders; but none of these systems gave complete satisfaction. The Sepping system was introduced about 1810, and was early adopted by the Scotts. The bottom of the ship was formed into a solid mass of timber. The beams were connected with the side of the ship by thick longitudinal timbers below the knees, and by other stiffening members. A trussed frame was laid on the inside of the transverse frame in the hold of the ship, and the decks were laid diagonally. These members bound the ship in all directions, so as to resist the stresses due to the ship working in a seaway.

The method of preserving the timber adopted at the beginning of the eighteenth century was to char the inner surface of the log, while the outer surface was kept wet; but this was superseded early in the century by the stoving system, which consisted in placing timber in wet sand, and subjecting it to the action of heat, for such time as was necessary to extract the residue of the sap and bring the timber to a condition of suppleness. This process continued until 1736, after which the timber itself was steamed. Copper sheathing was first employed on warships in 1761; prior to this lead had been used, but only occasionally.

American shipbuilders held an important position, even in the British trade, for some time after the Declaration of Independence; but there was then developed a pronounced spirit of emulation amongst the British firms, which had a marked effect on competition in western seas. At the beginning of the nineteenth century much of the oversea work done by the Scotts was for the West Indian trade. The vessels were not often of more than 600 tons, but the firm continued steadily to develop their business.

Between 1773 and 1829, the period of expansion under the second John Scott, to which we have already referred, the output was 16,800 tons. This output included a succession of fine ships for the West India trade, to the order of some of the old Glasgow companies, amongst the number being Stirling, Gordon and Company; J. Campbell and Company; James Young and Company; and Muir and Fairlie. We may mention as typical ships, the *Grenada*, of 650 tons burden, and the *John Campbell*, of 446 tons, built in 1806, the first ships launched on the Clyde with all rigging in position.

Thus early, too, the Scotts had entered upon the construction of that long series of yachts, sailing and steam, which has brought them considerable repute, and even more pleasure, since they were in successive generations noted yachtsmen. In 1803 they launched the 45.5 ton cutter for Colonel Campbell, of the Yorkshire Militia, which was pronounced one of the completest of the kind ever built in Scotland up to that time. It may be incidentally mentioned, that the Scotts also showed thus early their practical sympathy with the auxiliary forces of the Crown by being at the head of the volunteer Sea Fencibles formed on the Clyde in the stormy years of the Napoleonic wars.

As soon as the monopoly of the East India Company was removed in 1814, private ship owners entered the lists, and the Scotts were early occupied in the construction of Indo-China clippers. In 1818 they built the *Christian*, and in 1820 the *Bellfield*, the latter, of 478 tons register, for the London and Calcutta trade. She was one of the first of a long series. The *Kirkman Finlay*, of 430 tons, built in 1834, suggests the name of a firm long and honourably associated with the development of trade in our great Eastern dependency. The effect of competition was a reduction in the average rate of freight per ton from India to Britain from £32 10s. about 1773 to £10 in 1830.

The East India Company about the year 1813 paid £40 per ton for their ships, as against about £25 per ton by other traders; the latter sum was about the same as that paid in America. The East Indiaman had a crew in the ratio of one to 10 or 12 tons, while one to 25 tons sufficed for the West Indiaman. The speed of the western ship was greater, largely by reason of the difference in proportions and lines. The clipper built on the Clyde and in America had a length equal to five or six times the beam, against four times the beam in the case of the East India Company's ships. In the design of these clippers the Scotts took an important part, Charles Cuninghame Scott was then at the head of the concern. An ingenious method of making model experiments in the graving dock at the works was evolved in the 'forties, whereby the firm were able to arrive at the most satisfactory form of hull to give the minimum of resistance, and at the same time a large capacity for cargo per registered ton. In this latter respect they were more successful than the designers of the East Indiamen, notwithstanding the bluff form of the latter.

As rapidity in answering the helm was a most important element in tacking, and therefore in speed, the firm about this time prepared full-rigged models, about 5 ft. long, for experimental trials as to the ship's form and rudder, on Loch Thorn, on the hill above Greenock, in an exposed place where the conditions of wind were analogous to those at sea. The results proved satisfactory. In fact, in these years, when the *Minerva*, *Acbar*, and other noted clippers were built, the care used in design and construction was almost as great as that now devoted in the case of racing yachts.

The Scotts, in the first half of the nineteenth century, continued to produce a long series of successful sailing ships, while at the same time taking a creditable part in the evolution of the steamship. Steam, however, was not possible in long-distance voyages until pressures had been increased, and coal consumption reduced to moderate limits; and thus it came that, although the steam engine was used in the early years of the nineteenth century in river, and later in coasting, craft, the sailing ship continued supreme almost until the middle of the century. We do not propose, however, to refer to all of the later sailing ships built by the Scotts, but it may be interesting to give some details of the construction.

American rock elm was largely used. The frames were in three sections with scarfed joints, bolted together, the scantlings being reduced towards the top, so as to lower the centre of gravity. Inside the frames there were at various heights longitudinal timbers, to add to the fore-and-aft strength. The top sides were of greenheart, the beams of oak or greenheart, with wrought-iron knees; the height between the beams was made to admit of two hogsheads of sugar being placed in the hold. There were side-stringers, sometimes 10 in. thick, between the floor and the beams, which were half-checked into the stringers. On the top of the beams there were deck-stringers. There was a most effective transverse and longitudinal binding, brass bolts being extended right through the knee, stringer, frame, and skin of the ship. The decks were of yellow or Dantzic white pine. An 800 or 1000-ton West Indiaman occupied about nine months in construction. The last wooden ship built in Greenock was the *Canadian*, completed by the Scotts in 1859.

The highest conception of the iron sailing ship, as built by the firm, was probably embodied in the Lord of the Isles, completed in 1856. She had a length between perpendiculars of 185 ft., a breadth of 29 ft.—the proportion being thus 6.4 of length to 1 of beam—with a depth of hold of 18 ft. Her registered tonnage was 691 tons, and her builders' measurement 770 tons. Although a fine-ended ship she carried a large cargo on board, and made her first trip to Sydney in seventy days, which had not then been surpassed. She made the passage from Shanghai to London in eighty-seven days, with 1030 tons of tea on board. In one trip she averaged 320 nautical miles for five consecutive days. When engaged in the celebrated race for the delivery of the season's teas from Foo-chow-foo to London, in 1856, the Lord of the Isles beat two of the fastest American clippers, of almost twice her tonnage. She “delivered her cargo without one spot of damage, and thus British ships regained their ascendancy in the trade which their American rivals had far too long monopolised.”

From that time the British sailing ships gradually gained a complete superiority over the American vessels, and carried all before them, until they in turn were supplanted by the British steamship. From time to time an occasional sailing ship was constructed of steel; the latest, the Archibald Russell, is illustrated. Built for Messrs. John Hardie and Company, this vessel has a length, between perpendiculars, of 278 ft., a beam of 43 ft., and a depth, moulded, of 26 ft., and carries 3930 tons of deadweight cargo on a draught of 21 ft. 7.5 in. But less than 1 per cent, of ships now constructed depend upon the unbought but uncertain winds, and then only for special trades. On regular routes the steamer is now almost paramount, and it was, therefore, appropriate in the highest degree that the first vessels to steam regularly to China, via the Cape, should, like the Lord of the Isles, be built by the Scotts; but that belongs to another story.

