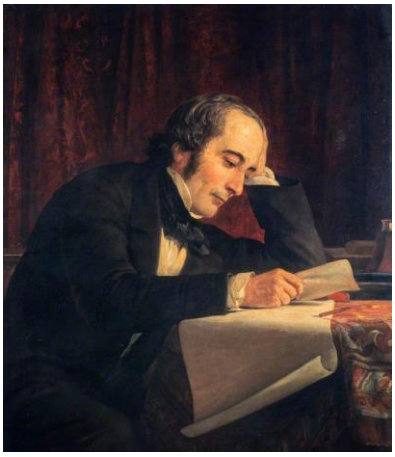
Sir John Scott Russell (1808-82)

Sir John Scott Russell (1808-82)

-BUILT THE GREAT EASTERN IN PARTNERSHIP WITH ISAMBARD KINGDOM BRUNEL-

-DISCOVERED THE WAVE LINE THEORY OF SHIP DESIGN-

-INFLUENCED THE DESIGN OF CAPTAIN NEMO'S NAUTILUS-



Sir John Scott Russell (1808 -1882) worked with Isambard Kingdom Brunel to design and build his greatest ship – the partly Birkenhead financed *Great Eastern*.

Sir John Scott Russell (1808-82).

The *Great Eastern* and submarine telegraphic cables are of course a recurring theme in the works of Jules Verne. In the novel *Mysterious Island* Captain 'Nemo's telegraphic cable runs directly to Dakkar's Grotto and to Nemo's submarine the *Nautilus*.

The SS *Great Eastern* was built at the Millwall Iron Works, London and was originally named '*The Leviathan*', at 22,500 tons and nearly 700 feet long, she was to hold the title of the world's largest ship for the next 40 years.

John Scott Russell (left), Isambard Kingdom Brunel (second right) and Prime Minister Lord Derby (right) at the launch of the SS *Great Eastern* in 1858.

John Scott Russell's work on the *Leviathan* bankrupted his shipyard in the year prior to launching and only the financial input of the engineer Thomas

Brassey of Birkenhead finally resulted in the ship's completion in 1858. The stress of building the *Great Eastern* took its toll on Isambard Kingdom Brunel who died just a matter of weeks after the ship's launch.

John Scott Russell had previously developed the 'wave-line theory' method of ship hull design, whereby the sinusoidal bow shape minimised wave resistance. The design became very popular with many 19th century clipper ships and racing yachts – most notably the world-famous yacht *America* in 1851.

America's outstanding performance in beating all comers at the Isle of Wight in 1851 gave rise to the modern yachting competition known today as The America's Cup.

The Racing Yacht *America*. (1851)

John Scott Russell also discovered the physical properties of waves known as the 'wave of translation' also known as 'solitary waves' or 'solitons'.

In 1855 the first outline of Sir John Scott Russell's wave line hull for the *Great Eastern* would have been taking shape at Millwall on the River Thames – the *Great Eastern* on the Thames would later be encountered by Jules Verne in his 1859 novel *Backwards to Britain*.

In his 2017 article in *Physics Today*, the naval architect and historian Larrie Ferreiro acknowledges Sir John Scott Russell's contribution to the design of both the *Great Eastern* and to Captain Nemo's *Nautilus*.

... one of Great Eastern's passengers, Jules Verne, was so impressed with the ship's wave-line hull that it inspired a passage in his novel Twenty Thousand Leagues Under the Seas.

The Great Eastern on its 'grid iron' at Birkenhead.

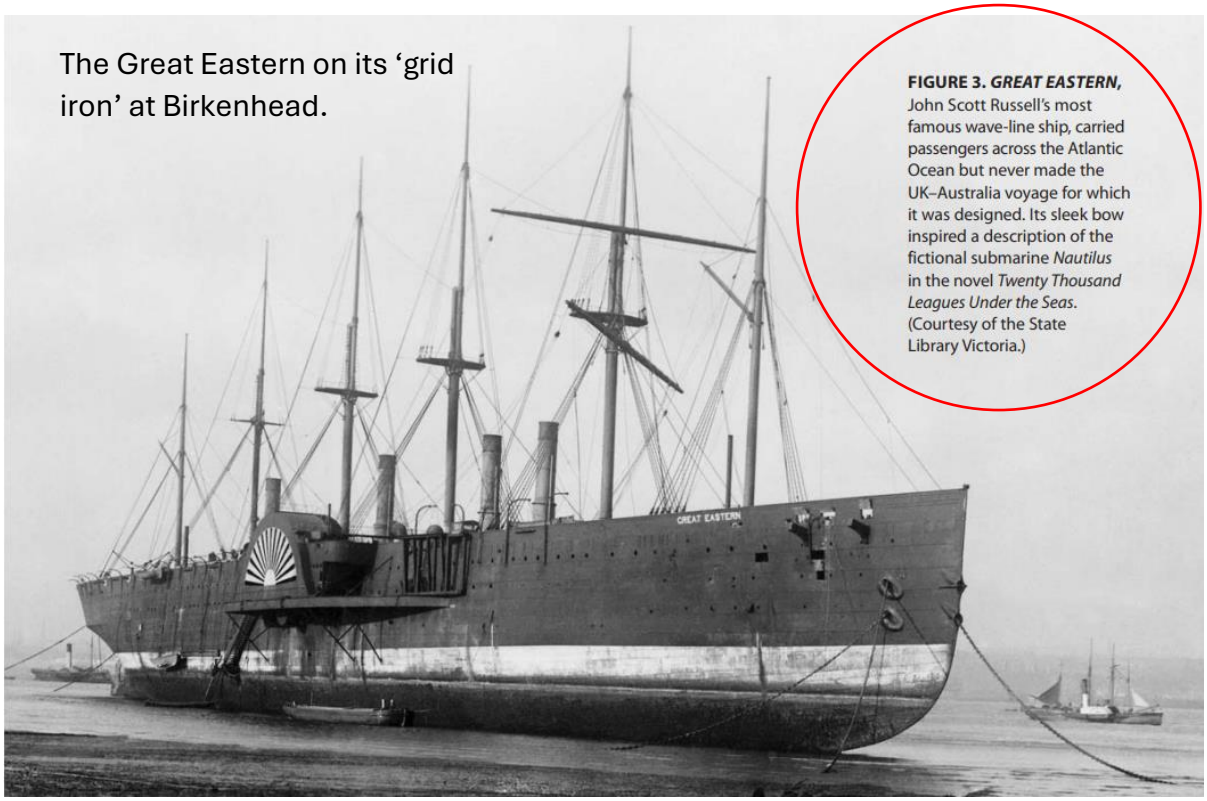
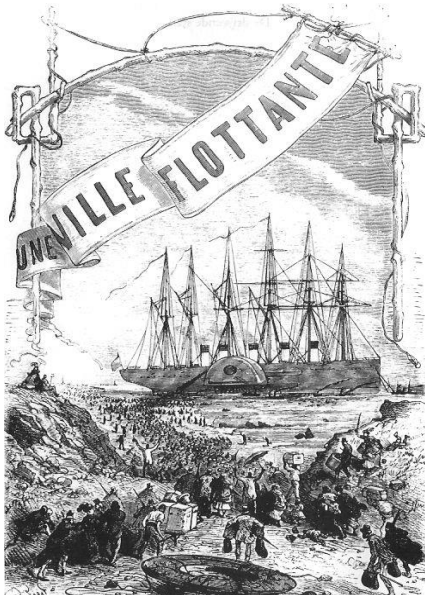


FIGURE 3. *GREAT EASTERN,* John Scott Russell's most famous wave-line ship, carried passengers across the Atlantic Ocean but never made the UK–Australia voyage for which it was designed. Its sleek bow inspired a description of the fictional submarine *Nautilus* in the novel *Twenty Thousand Leagues Under the Seas*. (Courtesy of the State Library Victoria.)

He describes his fictional submarine Nautilus as having "lines . . . sufficiently long and its run extensive enough for the displaced water to escape easily and to provide no obstacle to headway."

Clippers, yachts, and the false promise of the wave line.
Larrie Ferreiro and Alexander Pollara. *Physics Today* (July 2017)

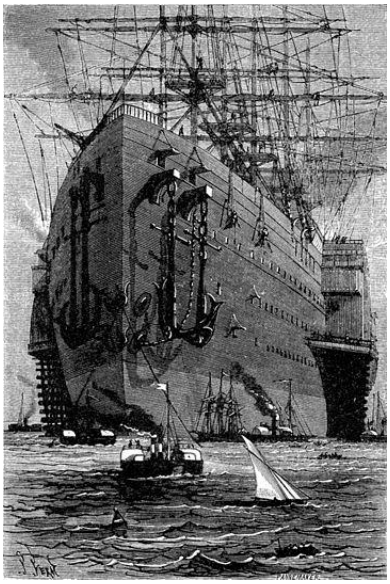


After serving first as a passenger ship and then as a cable layer, the *Great Eastern* had been converted back to a passenger liner at New Ferry, Birkenhead for the Paris Exposition of 1867.

The *Great Eastern*, was to travel from Birkenhead to New York on a publicity drive and bring back rich Americans to the Exposition. There would also be one star attraction on board – the famous French author Jules Verne!

***Une Ville Flottante* (1871) by Jules Verne. The *Great Eastern* off New Ferry Birkenhead.**

Jules Verne's journey on the *Great Eastern* features in the 1871 novel *Une Ville Flottante* (*A Floating City*) with Verne telling the story of his March 1867 journey from Birkenhead to New York.

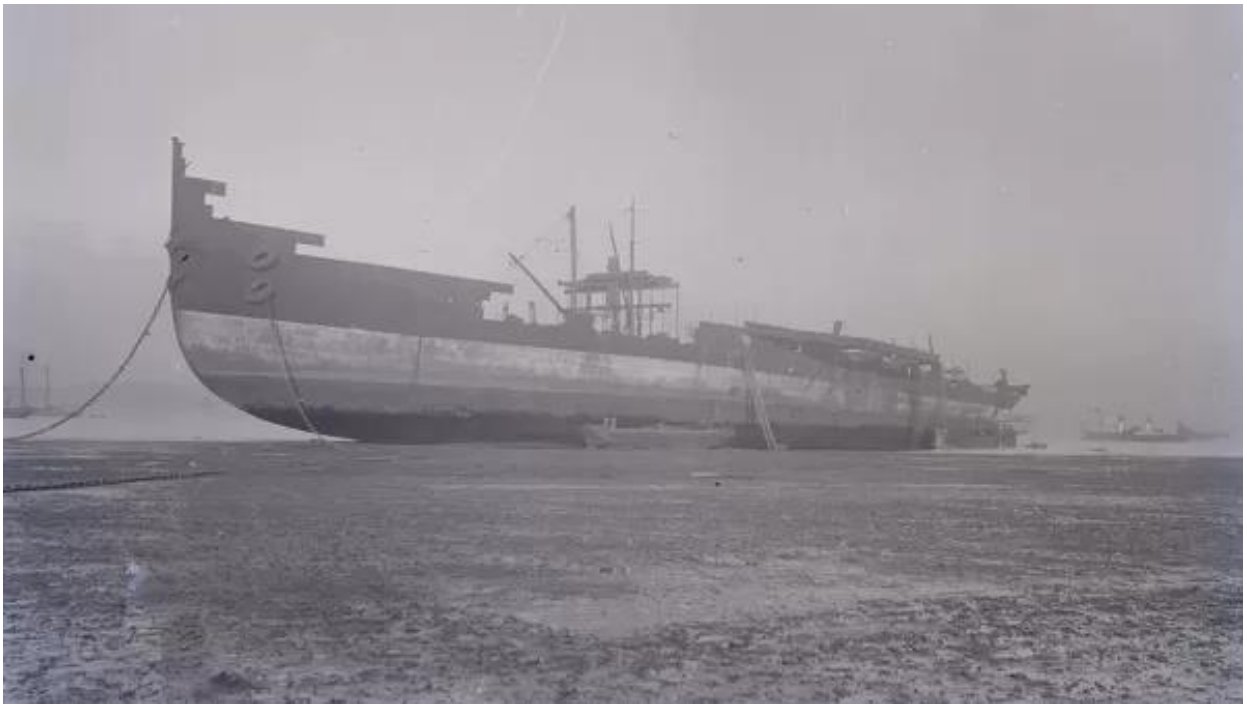


…. A quarter past one sounded from the Birkenhead clock towers, the moment of departure could not be deferred, if it was intended to make use of the tide.

…. There were thousands of spectators on both the Liverpool and Birkenhead sides, and boats laden with sightseers swarmed on the Mersey….

….. Our last salutation reached as from the platform of the lighthouse and the walls of the Bastion……

The *Great Eastern* and the Birkenhead Ferry Boats from Jules Verne's '*A Floating City*' (1871)



In 1889 the *Great Eastern* was scrapped on the shores of the River Mersey at New Ferry, Birkenhead.

To this day the last remnants of John Scott Russell's wave line hull lie preserved in the Birkenhead mud.

The end of the *Great Eastern*, New Ferry, Birkenhead 1889.