‘The Arrival of the Mammoth Steamship “Great Eastern” at New York’

(1860)

This anonymous article in *Scientific American* (still published today), like the 1822 article on Charles Babbage in *Minerva* (included in the print anthology), indicates the lively interest and rapid transmission of scientific developments and writing across the Atlantic, especially between Britain and the US. More particularly, the article underscores the interdependence of transatlanticism and technology in the nineteenth century. Enhanced steam propulsion quickened ships across the Atlantic and thus the transatlantic book trade and authors’ manuscripts moving east and west (as well as north and south). An account of the *Great Eastern* steamship is especially appropriate in this section as the last project of pathbreaking civil engineer Isambard Brunel (1806-59), whose role in designing the ship is discussed in the article. Moreover, when the first enduring Atlantic cable was laid between Britain and North America, enabling almost instantaneous news transmissions, the procedure was carried out from on board the *Great Eastern*.

‘The Arrival of the Mammoth Steamship’

This “leviathan”[1] steamship arrived at this port on the 28th of June, and her appearance in our waters has created a much greater national excitement than the *pow-wow* got up for the

[1] Huge, adapted from the biblical term for an enormous sea creature.

recent reception of "John Japan" and his boy "Tommy."[2] To this steamer we may well apply the old saying, "Long-looked-for has come at last," for assuredly no enterprise, excepting, it may be, the laying of the Atlantic cable,[3] has upheaved the public mind on both sides of the Atlantic with so many hopes and fears during the past four years. But after many disappointments, the *Great Eastern* has at last safely and slowly breasted the billows of the Atlantic and is now moored in Manhattan waters. We will therefore give a succinct history of her construction, previous adventures and late voyage.

There are three leading features connected with the *Great Eastern* which naturally excite attention. There are first, her great magnitude – she being 692 feet in extreme length, 83 feet beam, and of 27,000 tons actual capacity; second, her peculiarity of construction – being of iron, and double cased to about three feet above the water line, and built on the cellular principle;

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[2] A cross-reference to the article 'A Continental Railroad—The Japan and China Trade' in the same issue (7 July 1860, 21); it alludes to the Japanese delegation to Washington D.C. on 16 May 1860, which attracted huge crowds ('The Japanese in Washington', *New York Times*, 17 May 1860, 8). 'John Japan' is a proverbial name for the Japanese after Captain John Saris, who arrived in 1613, dubbed his interpreter John. 'Tommy': the press nickname for a young Japanese interpreter accompanying the delegation ('The Japanese Embassy', *New York Tribune*, 17 May 1860, 6).

[3] The telegraph cable linking Britain and the US first attempted in 1858 but not successfully completed until 1866.

third, she is propelled by the combination of paddle-wheels at the sides and a screw[4] at the stern. With regard to her magnitude, some contend that this exceeds Noah's ark; but be that as it may, we know that the clipper ship *Great Republic*, the frigate *Niagara*, and the steamer *Adriatic* – all fully loaded – would make about a fair cargo if taken within her capacious sides. She can carry 4,800 passengers, with good and full accommodations; or an army of 10,000 men, in a superior manner to any troop ship.

This great ship was planned by the late distinguished engineer, Mr. I. K. Brunel, upon the most rational grounds of success. In the great and increasing trade between England and Australia, it was found that common steamships were incapable of carrying cargo or competing with sailing vessels, owing to the great amount of coal required for such a long voyage. Brunel calculated that a large ship could be built to carry sufficient coal for the entire round trip and at the same time make quick passages, take a great number of passengers, and a good paying cargo besides. He therefore designed the *Great Eastern* (about 1853) with these objects in view; and a company of wealthy merchants in London was formed to furnish the capital to complete the project. To J. Scott Russell[5] was given the contract for building the hull; in 1855, the first plate was laid at his works in Millwall, London; and in November, 1857, she was ready to be launched. Great mortification was experienced on Nov. 2, when – mid crowd of princes,

[4] 'A device for propelling a ship or boat, consisting of a helical surface or blade winding around a shaft that is turned by a piston; (in later use) a propeller consisting of multiple blades set at an angle' (*OED*).

[5] John Scott Russell (1808-82), Scottish engineer and naval architect.

potentates, *savans*,[6] and a great array of wealth and fashion that had assembled to witness the mighty even of the "leviathan" ship rushing like a mountain from its fastenings into the obedient waters of the Thames – the iron mammoth, like a baulky horse, refused to obey the reins of the driver; and it cost no less than $400,000, and constant labor from that day till Jan. 31st in the subsequent year, before she was floated in the river. When launched, her entire cost was $3,831,520, which exceeded the original estimate by $1,500,000, and yet she was then totally unfit for sea.

The *Great Eastern* is now fitted with eight engines for propulsion, namely, four for the paddle-wheels, and the same number for the screw. Their united nominal power is about 4,000 horses. The cylinders of the paddle engines are each 74 inches in diameter, and the stroke is 14 feet. These were illustrated on page 264, Vol. XII. (old series), of the SCIENTIFIC AMERICAN.[7] The screw engines have cylinders of 84 inches bore and 4 feet stroke. The former were built by J. Scott Russell; the latter by J. Watt & Co., of Soho. The workmanship is excellent, but they are not up to the latest improvements. It takes about 250 tons of coal per diem to supply them, and if this great ship were to be built over again, totally different engines and boilers would be put in. With all her machinery, her weight is 12,000 tons – 8,000 being the weight of the 30,000 plates of iron and rivets in the hull.

On August 8, 1859, the *Great Eastern* was pronounced completed for her trial trip, and on that day a grand banquet was given on board by the directors of the company. She did not, however, finally depart until the 7th of September last, when she made a very successful coasting

[6] Variant of 'savants' or learned scholars and intellectuals.

[7] 'The Steamship Great Eastern', *Scientific American*, 25 April 1857, 264.

trip of two days, but she met with the unfortunate accident of having her water-feed jacket[8] burst, whereby five firemen were killed and several others severely wounded. This event was the result of blundering carelessness, and caused considerable damage to the boilers and main saloon, besides the deaths of the workmen. Just about this period her great designer, Brunel, was also breathing his last in London, and despondency seemed to settle down upon the public mind. Disagreements now arose among the directors; and Scott Russell was charged with improper workmanship in fulfilling his contract. The directors, however, were men of great capacity; their motto was "never say fail;" so they raised more money, and on went the alterations and repairs, with a tenacity of purpose and determination of will which does infinite credit to Uncle John Bull.

And now, since the *Great Eastern* has actually arrived, she represents a snug little capital of about $4,000,000, which has been expended upon her; and if any person ever expects her to be a "paying institution," we say, with the Moslem, "Great is thy faith, O son of the wilderness!" Her present commander is Capt. J. Vine Hall; her former commander – the esteemed Captain Harrison – having been drowned on the 21st of January last, at Southampton.[9]

Although we cannot but regard the *Great Eastern* as a failure in *payability*, yet she is not so in a scientific sense. She is a grand experiment; and the knowledge which has been acquired in her construction, we do not doubt, would enable Scott Russell now to build a superior vessel

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[8] 'A covering or casing of any kind; *spec.* one placed round a pipe, boiler, etc., for insulation' (*OED*)

[9] Captain John Vine Hall (1813-92) and Captain William Harrison (1812-60), the first appointed commander of the *Great Eastern*.

of like dimensions at nearly one-half the cost. Some persons have said that she would be the last big ship that would be built, and that vessels of from two to three thousand tons are the most suitable – all things considered. We entertain, however, different opinions. The *Great Eastern* is worth going a long journey to see. Her promenade deck is nearly one-eighth of a mile in length, and her other great dimensions are not appreciated until a spectator stands at the stern and looks forward over the vast expanse covered by this floating steam city.

[…]

The model of the *Great Eastern* is exceedingly beautiful. No more graceful hull ever floated on American waters. She has the hollow bow on the "wave line" principle, explained on page 354 of our last volume, and her stern is of the round clipper pattern, which we have copied from that once maritime people, the Hollanders. Her lines are so fine, and proportions so harmonious, that she has been justly admired by all, and for these features J. Scott Russell deserves the entire praise. She has six masts, a stack of funnels, and a vertical bow without a *sprit*[10] upon it – a wise arrangement copied from the Collins' steamers.

There is one particular point of interest to us connected with the steering of this vessel, which has been overlooked by most persons, namely, the local magnetic action of such a mass of metal in the hull, engines, and boilers, upon the compasses. There is a great discrepancy between the travel of the engines, and the actual distance across the ocean, which is only 3,190 miles to Southampton. She was stopped at one period to adjust the compasses, and it is well known that unless they operate correctly, she cannot be safe to navigate. That she has come safely is proof

[10] 'A large spar or boom running out from a ship's bow, to which the forestays are fastened' (*OED*).

positive that the compasses are peculiar; for the common kind, we believe, could not be trusted. We understand that the compasses used are an American invention, which has been patented both in the United States and in England, and they have been applied without the consent of the patentees. This involves an interesting and knotty novel feature in international law connected with patents, and no doubt it will take considerable legal acumen to unravel.

The saloons of this great vessel are spacious and splendid; and, as a whole, she is the greatest wonder of nautical architecture in this or any other age.

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