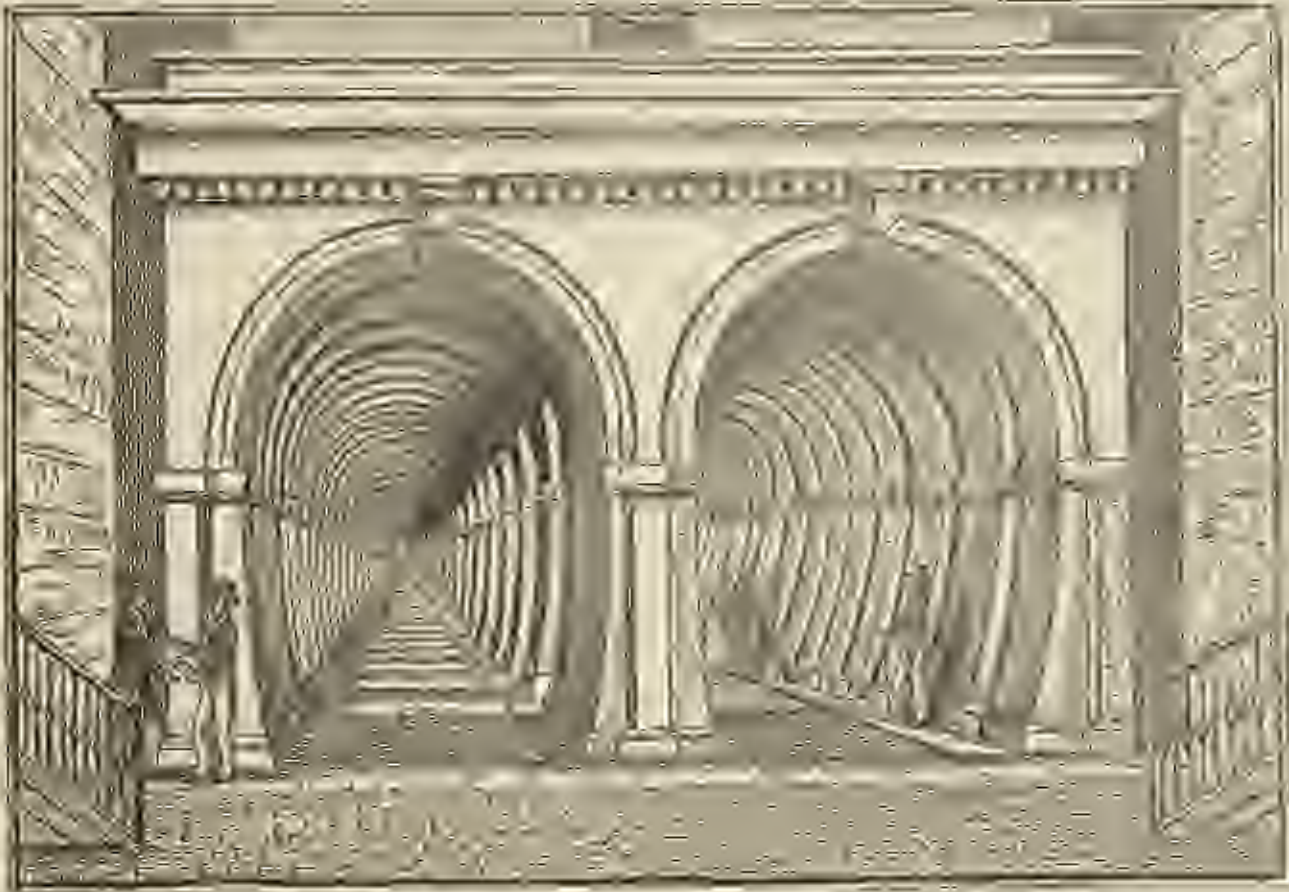


Thames Tunnel Paper,

PRINTED BY AUTHORITY, 76 FEET BELOW HIGH-WATER MARK,

To commemorate the day of opening the Tunnel as a Thoroughfare for Foot Passengers,
March 25, 1843.



An Account & Perspective View of the Two Archways FROM THE ENTRANCE OF THE THAMES TUNNEL.

In contemplating this great and important undertaking, we almost feel at a loss which most to admire—the steady, unflinching perseverance for nineteen years, of SIR ISAMBARD BRUNEL, in overcoming the vast difficulties he had to contend with—or the greatness of mind of those gentlemen who confided in his skill; and who, in spite of the ridicule of ignorance, did all in their power to facilitate and finish a work which must add honour to their names, and remain the pride and admiration of future ages.

SIR I. BRUNEL, in 1823, exhibited his plan for constructing a double and capacious road-way under the Thames—which was not only well received, but was liberally supported by many of rank and science, who were not discouraged by the extraordinary risks which an enterprise of such magnitude must present; and no one has given it more prominent and consistent support than the DUKE OF WELLINGTON. His Grace described it as “a work important in a commercial as well as in a military and political point of view; and that there was no undertaking upon which the public interest of foreign nations had been more excited, than upon the formation of this Tunnel.”

The spot between Rotherhithe and Wapping, selected for the purpose, was, perhaps, the only one situate between London Bridge and Greenwich, where such a road-way could be attempted without interfering essentially with some of the great mercantile establishments on both sides of the river; it is about two miles below London Bridge, in a very populous and highly commercial neighbourhood, and where a facility of land communication between the two shores is very desirable, and will prove to be of great advantage, not only to the immediate vicinity, but to the surrounding counties.

While the necessary steps were taking to obtain an Act of Parliament, and to raise money to carry the plan into effect, the Committee of Subscribers employed competent persons, unconnected with the Engineer, to make borings across the river, in the direction of the future works, in three parallel lines. On April 4, 1824, they reported most favourably, and SIR I. BRUNEL enlarged the dimensions of his original plan. The Act of Parliament having been obtained on June 24, 1824, and SIR I. BRUNEL appointed engineer to the undertaking, he began by making preparations for a shaft of 50 feet in diameter, which he commenced at 150 feet from the river, on the Rotherhithe side. This he effected by erecting a substantial cylinder of brick-work of that diameter, 42 ft. high, and 3 feet in thickness, which was sunken EN MASSE into the ground.

Upon the top of the cylinder was placed a steam-engine for pumping out the water, and raising the excavated earth. By this means the cylinder was successfully forced through a bed of gravel and sand 26 feet deep, full of land-water, constituting, in fact, a quick-sand. While this operation was in progress, the Engineer received an intimation from eminent geologists, apprising him of the existence of a bed of sand at a greater depth, with advice to go as little as possible below the bed of the river. This information corresponded with previous accounts respecting a quicksand at that depth.

The shaft having been sunk to the depth of 65 feet, a smaller shaft, 25 feet in diameter, intended as a reservoir for the drainage of water, was also sunk from this lower level; but at a depth of about 80 feet, the ground suddenly gave way, and sunk several feet at once, sand and water blowing up at the same time. Thus the previous account

was confirmed, of the existence and nature of this bed of sand, and this governed the Engineer in the level which he took for his horizontal structure.

The shaft and reservoir having been completed, the excavation for the body of the Tunnel was commenced at a depth of 63 feet; and in order to have sufficient thickness of ground to pass safely under the deep part of the river, the excavation was carried on at a declivity of 2 ft. 3 in. per hundred feet.

The extensive excavation which has been made for the Thames Tunnel is 38 ft. wide, and 22 ft. 6 in. high, presenting a sectional area of 850 ft. The base of this excavation, in the deepest part of the river, is 76 ft. below high-water mark, which was effected by means of a powerful apparatus of iron, designated a ‘Shield.’ This Shield consisted of twelve great frames, lying close to each other: each frame 22 ft. high, and about 3 ft. wide, and each frame had three divisions; thus presenting thirty-six chambers, or cells, for the workmen—namely, the miners, by whom the earth had to be cut down and secured in front, and the bricklayers, by whom the structure was simultaneously formed.

Powerful and efficient as this apparatus proved to be in accomplishing the work of the Tunnel, the influence of the tide upon some portion of the strata beneath the bed of the river, greatly contributed to increase the labour, to multiply the difficulties, and to add to the danger attending the excavation.

The Shield was placed in its first position at the bottom of the shaft by the 1st of January, 1826, and the structure of the double archway of the Tunnel was commenced under a bed of clay; but on the 25th of the same month, the stratum of clay was discovered to break off abruptly, leaving the Shield for upwards of six weeks open to a considerable influx of land-water, that flowed copiously from a bed of sand and gravel, which was saturated anew at each rise of the tide: the progress of the work was consequently much impeded.

On the 11th of March, this break in the clay being passed, and the Shield once more under a bed of clay, the work proceeded; and on June 30, 1826, advanced under the bed of the river, and increased daily. By the 30th of April, 1827, the Tunnel had advanced 400 ft. under the river—these 400 ft. were excavated, and the double archways substantially completed with brick-work, in ten months and a half. On May 18, 1827, and again in January, 1828, the River broke in, and filled the Tunnel, thereby causing the apprehension that this unprecedented undertaking would be abandoned. However, after filling the chasms in the bed of the river with bags of clay, and clearing the Tunnel of water, upon re-entering it, the structure was found to be in a perfectly sound and satisfactory state.

The Works from that time remained suspended during an interval of seven years, when they were re-commenced, and continued steadily, till the whole were completed, and opened to the Public as a thoroughfare for foot-passengers, on March, 25, 1843.

The carriage-way descents are now alone wanting to complete the Work. They will, no doubt, be contracted for in the ordinary way, so soon as the Directors can turn their attention to this portion of the Work. This wonderful Undertaking has already cost about £446,000. The actual Tunnel of 1200 ft. was executed in eight years.