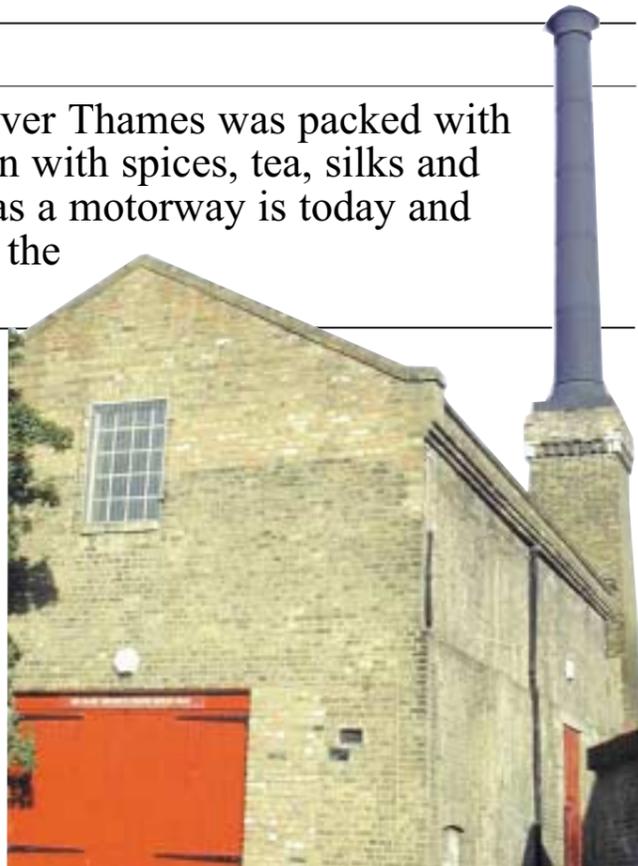


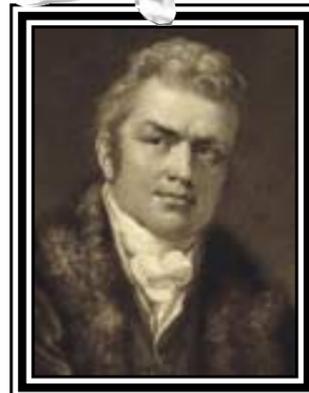
# History

In the late eighteenth century the River Thames was packed with tall ships from exotic countries laden with spices, tea, silks and cotton. The river was as congested as a motorway is today and transporting goods from one side to the other was a logistical nightmare.

# Brunels' Tunnel Vision!



**TEAM EFFORT...** Isambard Kingdom Brunel (pictured in top hat) took over the tunnelling project after his father Marc (below) suffered ill health. Both the Brunels were geniuses in the world of Victorian engineering with Marc being knighted for his work



The English have always had a bit of a thing about tunnelling - just think of all those soldiers that managed to break out under the noses of the Nazis in the Great Escape. Hollywood may have glamorised it by casting Steve McQueen, but the story is actually true. There were tunnels named Tom, Dick and Harry and they *did* dispose of the soil down their trouserlegs. It was a marvel of engineering in dire circumstances by some ingenious and brave men. Back in the nineteenth century the same could have been said of the Brunels, as they struggled to build a tunnel from Rotherhithe to Wapping. Despite floods, deaths and financial loss it turned out to be the first major underwater thoroughfare in the world, with the Brunels' tunnelling techniques still being practised by engineers today, writes Debra Gosling...

The 18th century River Thames was a bit like the M25 today. It was gridlocked with ships waiting to dock as others headed out of port whilst the watermen's small craft dodged in and out just like motor-bikes do now. It was claimed that you could walk from Rotherhithe to Wapping just by jumping from barge to barge it was so crowded. Fine if you didn't mind the risk of getting wet but what if you had a horse and cart to transport to the East End? There was urgent need for a new river crossing. Creaky old London Bridge wasn't equipped for heavy traffic and newly built Blackfriars was too far upstream to be of any use. Cost and lack of technology meant it would be almost a hundred years before Tower Bridge came into being, so if you couldn't go over you had to go under. It was decided the underwater tunnel would be built from Rotherhithe to Wapping as the distance between the two points was at its narrowest here and perfect for reaching the docks. Also, after the Napoleonic wars it was felt that a tunnel that could give Military access from south to east under the Thames would be an advantage. Celebrated Naval engineer, designer and inventor of the day, Marc Brunel was the obvious choice to build such a tunnel.

Originally from France, Marc Brunel fled to America during the French Revolution in a bid for safety. Clever and gifted, one of his first innovations was the design for a primitive form of photocopier! He built a device that held three quill pens which, as the person wrote, duplicated their writing onto three sheets of paper. Whilst working in Chatham Dockyard, he

was inspired for his tunnelling machine by watching a worm munching through some oak. It was this simple movement that Marc adopted for his Tunnelling Shield. And here's how it worked: the round shield was set up against the mud and each miner would work on a small section, which had a wooden compartment. They'd open the compartment and dig out the mud, close it and start on another one. Then, as each layer was dug out the shield was shunted forward and the whole process started over again. The river's soil type couldn't be relied on; sometimes the workers came up against crumbling gravel, which seeped water through the shield. But before the shield was even put in place, Marc was taken ill and had to turn his dream over to his son, Isambard Kingdom (parents can be so cruel...) Luckily, Isambard had inherited his Dad's brilliant brain and took to his new job like a duck to the Thames.

The area where the tunnel shaft now stands was once known as Cow Court (possibly because cow keeping was big in the area). Brick workshops and offices were built for the craftsmen and draughtsmen needed to make the project work. Houses around St Mary's church were done up for the engineers on the project and Brunel and his family moved to Rotherhithe for the duration, living somewhere around the shaft. Encouraging local employment, Rotherhithe men were taken on to do the mining work and a big bell was installed in Cow Court to summon them to their shift. In 1824 Brunel got the royal assent and digging started on the Thames Tunnel.

From the start there was much interest in the works and to satisfy local curiosity a full-scale bas-relief depiction of the Tunnelling Shield was created on one of the workshop walls. But the most impressive bit was yet to come. The shaft that would take the miners down to their work

had to be built and the problem of the marsh and quicksand that is the character of Rotherhithe overcome. A round brick tower appeared then promptly disappeared as it was sunk under its own weight into the soft soil. It took just seven weeks to get the shaft in place. It was topped by a powerful steam engine, which would whirr and chug as it pumped water out of the tunnel and brought up the buckets of sludge from below (anyone visiting the museum today will be delighted to find it's still in working order). The tunnel shield was then installed and work on digging commenced.

To Isambard's dismay the directors decided to charge the flocking crowds to go down and see the tunnel works. He watched horrified as the general public trooped about inside his tunnel, oblivious to the dangers of the water seeping in upon their inquisitive heads. And seep in it did.

Three years after work began, the Thames reclaimed the tunnel but by November it had been repaired and work restarted. To celebrate, a banquet was held in the dried-out tunnel, this being to restore confidence in the workers as well as the directors and the general public. The floor was swept and carpeted, red curtains hung on the walls and candelabras on the ceiling. Even the shield itself was given the once over with a feather duster as the Band of the Coldstream Guards played a selection of Victorian hits at its foot.

Forty directors, investors and generally well-off sorts sat in one tunnel and the brickies, chippies and the generally skint sat in the other. But all of them raised a glass of plonk when a toast was drunk to the then King, George the Fourth. The workmen then presented Isambard with his own pickaxe and shovel as they toasted their tools.



**ABOVE LEFT:** Artist's impression of how the Thames Tunnel should have looked upon completion. Unfortunately the money ran out before the ramps could be built to accommodate horse-drawn traffic. **ABOVE RIGHT:** Unable to be used for its original purpose the tunnel became a top London tourist attraction bringing in more visitors than the newly-built Crystal Palace.



But in 1828 work on the tunnel once again halted as the river burst through the bricks. This time six men went to a watery grave as they tried to escape the tidal wave.

Two of them were trapped by falling masonry while four more were washed away as they clambered up the shaft. Isambard Brunel himself was badly injured when his leg became trapped in the falling masonry. He was unable to work for three months as he also had internal injuries. Disaster had struck; in August that year the cash had run out for the work and the tunnel was bricked up.

Later help was at hand from the Duke of Wellington who, being a big fan of Brunel Senior, dug deep into the Government purse and loaned Junior the money he needed for a new shield. To replace the old one was a feat of engineering in itself, as Brunel had to get it down the shaft then dig a space to manoeuvre the old one out and the new one in. There was now only one more snag: there wasn't enough cash to build the slopes to accommodate horse and carts, the original reason for building the tunnel! Despite two more floods and one more death the Rotherhithe tunnel and the Wapping tunnel met up in 1841, a year after Marc Brunel had been knighted.

By now George the Fourth's reign was over and it was Queen Victoria who turned up in the royal barge to do the honours in opening the tunnel to pedestrian traffic. It was a woeful day for the watermen; the tunnel meant less trade for them and in



protest, they flew black flags from their craft. Aside from their whinges, the tunnel was an immediate success and within twenty-four hours of its opening fifty thousand people had passed through it. During the coming months the Thames Tunnel was a major tourist attraction, and continued to be so for the next fifteen years. It was brightly lit and filled with music as well as being full of stalls, side-shows, exhibitions and performers - a sort of latter-day Covent Garden. The stalls

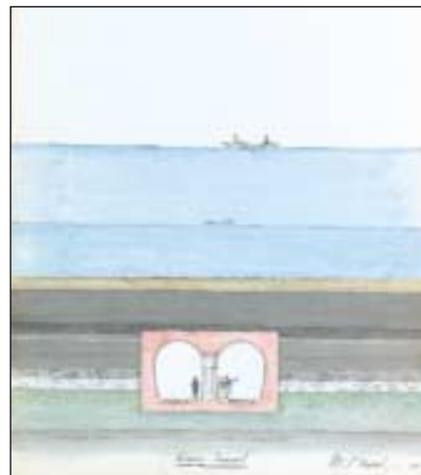
were nestled in the sixty-three open arches that ran along the length of the tunnel and sold souvenirs as well as costume jewellery and refreshments such as ginger beer, tea, coffee and cakes. There were displays of engineering and glassblowing and even a photographic studio and a printing press. People could buy a souvenir newspaper that had actually been printed underneath the river. It was extremely popular, even when Crystal Palace opened the numbers turning up for the tunnel didn't drop.

Each spring a fair was held in the tunnel, which lasted four days. It was a cross between a market and a carnival and traders from abroad, already very familiar with the area, set up stalls selling exotic perfumes, incense and jewellery from far off climes. There were tightrope walkers, puppet shows, magicians and Indian and Chinese performers - all very exotic and all beneath Old Father Thames' watery cloak.

However, unsurprisingly the tunnel was never profitable. The planned spiral road-way approaches for horse and carts were never built so the tunnel was only used for pedestrians, not the carriage of goods as intended. As the novelty eventually wore off the tunnel deteriorated and became home to thieves and prostitutes who made good use of the recessed arches. By night it was a dangerous place to be and swiftly got a bad reputation. The amazing tunnel was now seen as a waste of money which did nothing to attract investors and so in 1865 the tunnel was closed and sold at a loss, a

Victorian white elephant echoed by the Dome. But all was not lost. The tunnel was put to good use by the East London Line and four years after the purchase steam engines were rumbling through it. In 1913 the line was electrified and still carries people under the water from New Cross to the East End. And it wasn't until the Second World War that the Thames Tunnel finally got to be used for its original Military purpose. Enormous amounts of ammunition, guns and troops made use of it on their way to the bloody beaches of Normandy

Today, the original shaft at Rotherhithe is sealed up but the tunnel remains one of the most important civil engineering landmarks and many other roads, railways and sewers were built on the Brunels' principles. In 1995 English Heritage recognised its importance and awarded it Grade Two listing. At the same time London Underground undertook some major restructuring works as Brunel's original was finally showing its age. The arches were sympathetically restored to their former glory and will hopefully see another hundred year's service. If you take a stroll down Rotherhithe Street you can still see the top of Brunel's shaft next to the Engine House Museum. The Engine House is a designated ancient monument and listed building and contains a fascinating exhibition about the construction of the tunnel. So, before you make the great escape into the nearest pub, why not pop in and take a look around?



**LEFT:** A watercolour painted by Marc Brunel in 1835 when both his family and business affairs were thriving. A limited edition print of the painting together with a certificate of authentication is now on sale at the Engine House, priced £35 plus £4.00 p&p. Alternatively, the original can be viewed at the Engine House along with a number of new additions to its permanent collection.

## Volunteers Wanted!

The Engine House is a small independent museum, provisionally registered with the LMA. We are always looking for volunteers to help run the Museum and the Museum shop as well as welcoming visitors, helping with school groups and working on various education projects such as the Summer Holiday Playscheme this July.

We also need volunteers to help look after the growing art collection and the steam engine. If you have website design or computer skills, could help with marketing or any of the above please contact us on:

020 7231 3840

curator@brunelenginehouse.org.uk or write to:  
Brunel Engine House Museum  
Railway Avenue  
Rotherhithe, SE16 4LF