

# MEMORIES

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## Brunel's city visit to test tunnel vision



Isambard Kingdom Brunel, pictured by Robert Howlett in 1857

On September 15, 1859, the world lost one of its greatest engineers, Isambard Kingdom Brunel. Aspects of his legacy originated in Canterbury with a safety experiment in the tunnel at Tyler Hill, on the first railway to use a steam locomotive to haul timetabled passenger trains for part of the journey, the Canterbury and Whitstable Railway, now known as the Crab & Winkle Line.

Four of the great nineteenth century figures in engineering were involved with the design and construction of the Canterbury and Whitstable Railway: proposer and first surveyor William James; railway and locomotive builders George and Robert Stephenson; and Thomas Telford who designed and built Whitstable harbour. In addition, in 1835 Brunel and five colleagues travelled down to inspect the Canterbury and Whitstable Railway and demonstrate that it was safe to travel on a railway line with a one in fifty-six gradient through the world's first railway tunnel at Tyler Hill.

When Brunel applied for an Act of Parliament to build the Great Western Railway,

One of the greatest engineers of all time came to Canterbury to prove his ambitious plans could be realised, as Richard West of the Chaucer Education Project explains...



The Box Hill Tunnel in Wiltshire

there was fierce opposition to the proposal to construct the Box Hill Tunnel in Wiltshire, between Chippenham and Bath, with a gradient of one in one-hundred through the tunnel.

One objector put forward the argument that there would be wholesale destruction of human life. Another tried to prove a train with brake failure would leave the tunnel at 120mph, with the unfortunate passengers quite unable to breath.

To prove the objectors were wrong, Brunel and his team of five boarded a carriage outside the northern tunnel portal on the Whitstable side. The carriage was pushed to start it moving into the Tyler Hill Tunnel and was not attached to the stationary winding engine rope.

The carriage accelerated through the tunnel under its own momentum, increasingly gaining speed. As soon as the carriage exited from southern portal in St Stephens, after having travelled through the 828-yard length of the tunnel,

Brunel applied the handbrake and brought the carriage to a halt within 60 yards. The experiment was repeated several times, with similar results obtained.

The Tyler Hill Tunnel became the prototype for railway tunnel design, especially Brunel's design for Box Hill Tunnel, on the Great Western Railway mainline running from Paddington in London to Temple Meads in Bristol and on to the South West of England and Wales.

Construction of the Canterbury and Whitstable Railway began on October 31, 1825, when the chairman of the Canterbury and Whitstable Railway Company, John Brent, lifted the inaugural shovelful of earth at the foot of Tyler Hill into a barrow.

It was calculated that 2.4 million bricks would be required to build Tyler Hill Tunnel; 1,000 bricks for each foot of tunnel. Six feet of tunnel brickwork was normally completed each day, whilst during the night, a second team of men excavated sufficient

earth, using picks and shovels under pungent smelling tallow candle lighting, to enable the next day's construction to take place.

The completed tunnel was opened with great ceremony on July 9, 1827, with a band playing as the company directors proceeded from their office in Canterbury to the tunnel.

Following the opening ceremony, a dinner was provided for all the workers who built the tunnel, by order of the Board of Works.

By 1836 there was still only 100 miles of railway line laid in the country. The dawn of the railway age had begun but it was still in its infancy.

Box Hill Tunnel was opened on June 30, 1841, becoming the world's longest railway tunnel at 1.83 miles and still continues in daily use on the Great Western Railway main line. The main contractor for the tunnel was George Burge of Herne Bay, responsible for constructing three-quarters of the tunnel commencing from the western end.



Restored northern portal of the Tyler Hill Tunnel on the University of Kent campus

Photo: Katie Scoggins

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