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“The influence of Geology on London’s Underground Railways”

by

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The nature of the varying ground conditions and groundwater regime beneath London presents a wide range of challenges to the formation of railway tunnels and the construction of underground stations.

This technical talk begins with an introduction to the geology of the London Basin and the key geological formations that are encountered beneath the ground surface.

After addressing the reasons why it became necessary to take the railway system underground in London, the significance of the Brunels’ tunnel beneath The Thames at Rotherhithe is underlined. Although not formed with the intention of carrying rail traffic, this tunnel was subsequently integrated into the underground railway system.

Initiated by Marc and Isambard Kingdom Brunel, the advances in the technology adopted to form tunnels and tackle the challenges presented by London’s geology are explained and illustrated. Such advances have been a major factor in the expansion of the network of underground railways in London.

The talk continues with a more-detailed description of different techniques to form underground space, including cut-and-cover (“green”) tunnels, mined tunnels using Sprayed Concrete Lining, and bored tunnels using Tunnel Boring Machines of varying types.

Based on the speaker’s involvement with both projects, the talk concludes by giving attention to Crossrail (now operating as the Elizabeth Line) and to the Northern Line Extension, between Kennington and Battersea Power Station.

There will be an opportunity to ask questions.