



Cambridge Society for the Application of Research

Churchill College
Storeys Way
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Tunnelling Under Cities

Advances in Research and Practice

Professor Robert Mair CBE FREng FRS
Head of Civil Engineering, University of Cambridge

7.30pm, Monday 5th May, 2014

Wolfson Hall Lecture Theatre, Churchill College, Storey's Way, Cambridge

The Lecture:

Professor Mair writes:

Urban congestion is a serious problem in many cities, so the creation of underground space, and in particular the development of underground transport, is environmentally essential for our future megacities.

How can tunnels be built in ground sometimes as soft as toothpaste? What can go wrong? Will buildings above be affected by subsidence? What else is underground already that might get in the way or be adversely affected?

Geotechnical engineering - the application of the science of soil mechanics and engineering geology - plays a key role in answering these questions.

The talk will highlight the critical importance of geology, and the development and application of the latest underground construction techniques. Examples of projects from around the world will demonstrate the size, technical challenges and complexity of modern underground construction. Some research advances and innovations at Cambridge will be described.

Protection from subsidence is critical and new ways to evaluate how buildings may be affected by tunnelling and deep excavations will be explained; innovative protective techniques will also be described.

Novel techniques for monitoring construction using fibre optic technology and wireless sensor networks will be presented, illustrated by some recent case histories.

About the Speaker:

Professor Robert Mair is the Sir Kirby Laing Professor of Civil Engineering, and Head of Civil Engineering at the University of Cambridge. Professor Mair was Master of Jesus College for the period 2001-2011, and Senior Vice-President of the Royal Academy of Engineering 2009-2011. He is a founding director of the Geotechnical Consulting Group (GCG) based in London, which was founded in 1983.

After graduating from Clare College in 1971 Robert Mair's early career was spent working for Scott Wilson Kirkpatrick, including three years in Hong Kong. Specialising in geotechnical engineering, he worked in industry for 27 years until 1998, when he was appointed to a Professorship at Cambridge.

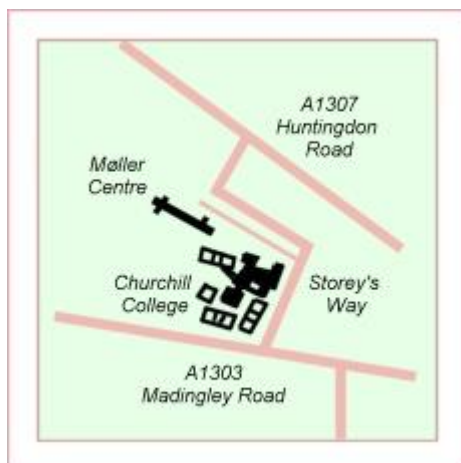
He leads a substantial research group collaborating closely with industry, focusing on the geotechnics of underground construction and innovative field monitoring techniques. He is also an active consultant on civil, geotechnical and tunnelling projects worldwide, and Chief Engineering Adviser to the Laing O'Rourke Group.

Professor Mair was Chairman of the Royal Society/Royal Academy of Engineering Report to the UK Government on Shale Gas and Hydraulic Fracturing, published in 2012. He has recently been appointed Chairman of the Science Advisory Council of the Department for Transport.

The Organising Secretary adds:

See the FT article for more background on Professor Mair's life and works: <http://www.ft.com/cms/s/2/cb797a80-b086-11e1-a79b-00144feabdc0.html#axzz2zn7I5uSa>

Practical Matters



Those attending the CSAR lecture may park in the Senior Car Park on Churchill Road, which is off Storey's Way. More parking is available further along Churchill Road, and in the Möller Centre at the far end.

CSAR lectures are open to all; CSAR members are admitted free. Pupils and students may register for free membership at the lecture reception desk.

Non-members are asked to make a nominal contribution of £3.00.

Coffee and biscuits are available in the Wolfson Foyer from around 7pm. For further directions, see: www.chu.cam.ac.uk/about/visitors/directions.php