



Churchill College
Storey's Way
Cambridge
CB3 0DS

Earthquake Science and Vulnerability in Asia

Professor James Jackson

Professor of Active Tectonics, University of Cambridge

7.30pm, Monday 30 November, 2015

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

This Lecture will be dedicated to the memory of Professor Sir Sam Edwards, Past President of CSAR, and will be preceded by a 5 minute presentation by CSAR Award Student, Evan Miles, entitled 'Supraglacial Ponds: Vectors of Atmospheric Energy for Debris-Covered Glaciers'.

The Lecture:

Professor James Jackson writes:

Since 2000 AD, more than 600,000 people have died in earthquakes, and reconstruction costs in industrialized nations have exceeded \$300 billion. But the experiences and consequences of earthquakes around the world are very varied. Four of the ten largest earthquakes since 1900 have happened in the last decade; but these are not the earthquakes responsible for killing the most people (excluding the effects of tsunamis). Many more people die in moderate-sized earthquakes in the interior of continents, particularly in Asia, than in the largest earthquakes, which occur on the margins of the oceans. The reasons for this are partly geological: earthquakes on ocean margins are localized on well-defined faults that move relatively frequently, whereas earthquakes on continents are widely distributed on thousands of faults that move rarely and are often unknown before they move. Consequently, much larger areas are vulnerable on the continents, often with dense urban populations concentrated in dangerous locations (usually chosen because of favourable geological circumstances, such as the control of water supply or access to trade routes) that have been destroyed by forgotten earthquakes in the past. But it is falling buildings that kill people, not the earthquakes themselves, and variations in building quality are mostly responsible for the contrast between relatively resilient places like Japan, New Zealand, Chile and California and the more vulnerable countries like India, Pakistan, Iran and China.

What can be done to improve the situation in vulnerable countries in Asia? It is important to recognize that this is not a problem that can be 'solved' by scientists. Earthquake prediction is not possible on a useful timescale, and it is not the reason fewer people die in developed nations. Resilient nations are those where scientists can provide a realistic assessment of earthquake hazard, which is then understood by politicians, engineers, and planners who work with the scientists to educate the public. This requires everyone to take responsibility, to collaborate and, especially, it requires a vigorous and healthy activity in modern earthquake science. Realistic earthquake hazard assessment needs work by geologists and seismologists: to identify and characterize earthquake-generating faults and their historical activity and to understand their effect

on the landscape. A recent example of the role of modern earthquake science in hazard assessment is the 2015 Gorkha (Nepal) earthquake, where within a few days of the event it was clear from the scientific analysis that the earthquake had not done what was anticipated, and that a substantial hazard remains both south and west of Kathmandu, where great earthquakes have ruptured in the past and will do so again in the future.

There is an urgent need to keep the public alert and prepared.

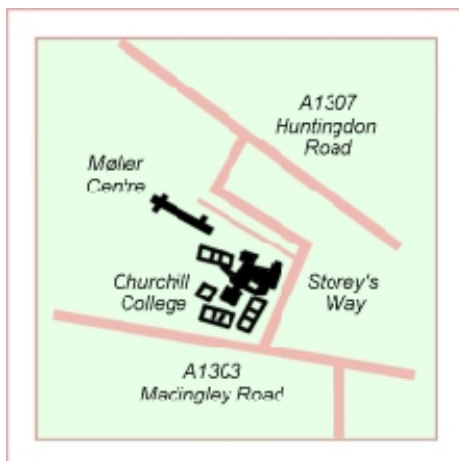
About the Speaker:

James Jackson is Professor of Active Tectonics and Head of the Department of Earth Sciences in the University of Cambridge. He was born and raised in India, which established his interest in all aspects of Asia, where much of his research has been concentrated.

After a first degree in Geology, he obtained a Ph.D. in Geophysics (both at Cambridge), using earthquakes to study the processes that produce the major surface features of the continents, such as mountain belts and basins. In addition to seismology, his current research uses the powerful range of satellite-based techniques now available, combined with observations of the landscape in the field, to study how the continents develop and deform on all scales, from the movement that occurs in individual earthquakes to the evolution of mountain belts. His field work has taken him to many parts of Asia, the Mediterranean, Africa, New Zealand and North America. He is increasingly involved in how to use the insights obtained by geologists to reduce the appalling risk from earthquakes to populations in developing countries.

In 1995 he delivered the Royal Institution/BBC Christmas Lectures on 'Planet Earth: an Explorer's Guide'. He has been elected a Fellow of the Royal Society and the American Geophysical Union, and is also a Fellow of Queens' College, Cambridge. In 2015 he was awarded a CBE and also the Wollaston Medal of the Geological Society of London.

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

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