# What's Happening in Geography

SUMMER TERM

# SUMMER 2011

***This newsletter focuses on one of the key research areas for Lancaster staff and postgraduate students – extracting climate records from cave stalagmites.***

## *The Extraction of Climate Records from Cave Stalagmites*

Stalagmites grow through the deposition of carbonate minerals which are delivered by drip waters entering caves. Ultimately, these drip waters were sourced from rainfall which has moved through the soil and bedrock before emerging in the cave system. As the rainwater moves through these different environments, it picks up a chemical signal, forming a 'fingerprint' of environmental conditions. This fingerprint then becomes preserved in the stalagmite. Stalagmites grow in annual layers, like trees, so they can be dated and the chemical content of each annual layer used to build a picture of climate change. Below are some examples of the projects which are currently being undertaken.

The stalagmite opposite is from Australia and contains a band of very dark coloured material. This dark colouration was added to the stalagmite at the time of the megafaunal extinctions almost 80,000 years ago. By looking at the chemical content of this material, we can detect high levels of climatic instability which may have contributed to the demise of the Australian megafauna.

Oxygen and Carbon isotopes contained within stalagmites give us an accurate picture of how regional climate systems have changed through time. Lancaster Geography is working in cave sites in the Cantabrian Mountains of Northern Spain. This is one of the most sensitive areas of the World in which to detect changes in the North Atlantic weather systems.

We also use the sulphur content of stalagmites to trace the presence of atmospheric pollution and look for volcanic events in the climate record. Stalagmites from all over the World are being used to build an accurate picture of industrial pollution dynamics and to understand how the impact of explosive volcanic events have been transported around the Planet. All of these records can be compared to other archives of climate change such as ice cores and tree rings to help produce a comprehensive picture of how our climate is changing.

*Speleothems in N. Iberia*

*Australian stalagmite*


*Richly decorated cave chamber in Austria*

*Photos courtesy of A. Smith (top) and P. Wynn*

Geography

The Lancaster Environment Centre

**For more details about the reports above or about Geography courses on offer at Lancaster University please contact the Geography Admissions Staff, Lancaster Environment Centre, Lancaster University, LA1 4YQ, UK.**

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