

Scientists produce archaeological 'time machine'

February 11 2010



Professor Gerry McCormac and Dr Paula Reimer pictured in the 14 Chrono Centre at Queen's University Belfast. Staff at the Centre have been involved in the creation of a new calibration curve, which extends back 50,000 years. Credit: Queen's University Belfast

Researchers at Queen's University have helped produce a new archaeological tool which could answer key questions in human evolution.

The new calibration curve, which extends back 50,000 years is a major landmark in radiocarbon dating-- the method used by archaeologists and geoscientists to establish the age of carbon-based materials.

It could help research issues including the effect of climate change on human adaption and migrations.

The project was led by Queen's University Belfast through a National Environment Research Centre (NERC) funded research grant to Dr Paula Reimer and Professor Gerry McCormac from the Centre for Climate, the Environment and Chronology (14CHRONO) at Queen's and statisticians at the University of Sheffield.

Ron Reimer and Professor Emeritus Mike Baillie from Queen's School of Geography, Archaeology and Palaeoecology also contributed to the work.

The curve called INTCAL09, has just been published in the journal *Radiocarbon*. It not only extends radiocarbon calibration but also considerably improves earlier parts of the curve.

Dr Reimer said: "The new radiocarbon calibration curve will be used worldwide by archaeologists and earth scientists to convert radiocarbon ages into a meaningful time scale comparable to historical dates or other estimates of calendar age.

"It is significant because this agreed calibration curve now extends over the entire normal range of radiocarbon dating, up to 50,000 years before today. Comparisons of the new curve to ice-core or other climate archives will provide information about changes in solar activity and [ocean circulation](#)."

It has taken nearly 30 years for researchers to produce a calibration curve this far back in time.

Since the early 1980s, an international working group called INTCAL has been working on the project.

The principle of radiocarbon dating is that plants and animals absorb trace amounts of radioactive carbon-14 from carbon dioxide in the

atmosphere while they are alive but stop doing so when they die. The carbon-14 decays from archaeological and geological samples so the amount left in the sample gives an indication of how old the sample is.

As the amount of carbon -14 in the atmosphere is not constant, but varies with the strength of the earth's magnetic field, solar activity and ocean radiocarbon ages must be corrected with a calibration curve.

Most experts consider the technical limit of [radiocarbon dating](#) to be about 50,000 years, after which there is too little carbon-14 left to measure accurately with present day technology.

More information: Further information on the work of Queen's Chrono Centre can be found online at <http://chrono.qub.ac.uk/>

Provided by Queen's University Belfast

Citation: Scientists produce archaeological 'time machine' (2010, February 11) retrieved 3 May 2024 from <https://phys.org/news/2010-02-scientists-archaeological-machine.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--