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Tilted Out of Ice Ages | [Watch videos from Discovery News](#)

Aug. 14, 2009 -- Regular wobbles in the Earth's tilt were responsible for the [global warming](#) episodes that interspersed [prehistoric ice ages](#), according to new evidence.

The finding is the result of research led by Russell Drysdale of the University of Newcastle that has been able to accurately date the end of the penultimate ice age for the first time.

The new dates, which appear in the today's edition of *Science*, show the end of the second last ice age occurring 141,000 years ago, thousands of years earlier than previously thought.

Using information gathered from a trio of Italian stalagmites, the research has punched a hole in the prevailing theory that interglacial periods are related to changes in the intensity of the northern hemisphere summer.

Drysdale and colleagues suggest that the Earth emerges from ice ages due in large part to changes in the tilt of the planet in relation to the sun, otherwise known as its obliquity. This affects the total amount of sunlight each hemisphere receives in its respective summer, rather than the peak intensity of the solar radiation during the northern summer.

Sediment on the sea floor contains accurate a record of what happened to the Earth's climate prior to the last ice age. But up until now dating the sediment and the evident climatic changes has not been possible.

Drysdale and colleagues overcome this difficulty by comparing the changes in the sea floor to similar material on the surface that can be accurately dated.

John Hellstrom of the University of Melbourne used a very sensitive mass spectrometer to measure the amount of uranium and thorium contained in samples taken from the three stalagmites in the Italian Antro del Corchia cave to date the material.



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They were then able to relate variations in the chemical composition of the stalagmites, to changes in the North Atlantic sea floor, thereby dating the changes.

"When it's cold in the ocean, there is less evaporation and less rainfall above the cave. When it's warm in the ocean, there's a lot more water evaporated and a lot more rain," said Hellstrom.

This technique for dating the comings and goings of prehistoric ice sheets has the potential for tracking climate changes much further back than ever before.

The result is that the new date for the end of the second last [ice age](#) is thousands of years too early to be related to any increase in the intensity of the northern hemisphere summer as predicted by the Milankovitch Theory.

Instead, the researchers found that, in the past million years global warming events have occurred every second or third cycle of the Earth's changing obliquity, which occurs every 41,000 years.

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Hellstrom said that the new knowledge may assist in calibrating the effectiveness of current climate modelling technology.

"Any improvement we can have in understanding how the Earth's orbital parameters affect our coming in and out of ice ages can certainly affect the models used now too."

The team are now using their measurements to investigate the provocative idea that the glacial melting periods actually began in the Southern Hemisphere.

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