

Awards Ceremony Speech

Citation for presentation of 2008 Nicholas J. Shackleton award to R. Lawrence Edwards

Nick Shackleton is widely recognized for his major discoveries connecting the isotopic record preserved in foraminifera (Fig. 1) that grew in the oceans and the mass of ice stored in ice sheets during periods of continental glaciations. He was awarded the Crafoord Prize of the Royal Swedish Academy for his pioneering discoveries on glaciations & climate change (Fig. 2). In addition to his scientific accomplishments, Nick was an excellent musician and collected old instruments that are both played and greatly valued by musicians. Remarkably, the musical community knew him as a musician and had no idea of his scientific activities (Fig. 3).

Larry Edwards, of the University of Minnesota, has made fundamental contributions to our understanding of climate change, growing out of his ability to measure ages of speleothem calcite and other carbonates with unprecedented precision and accuracy using the uranium decay series isotopes. This has opened up the field to important new ventures that are not dependent on changes in cosmic ray production and dilution with “dead carbon”. It thus provides an “absolute time scale”. The brilliant demonstration

that the speleothems in many parts of the world record the same climatic template as seen in the Greenland ice, and the much greater accuracy of Larry’s dates, recommend his time scale.

Dr. Edwards follows the example set by Sir Nick Shackleton to improve both the resolution of the chemical traces of the climate system and the ability to place paleo-climate patterns into a firm temporal context. His investigation of speleothem records from China and northeastern Brazil has mapped out the behavior of the tropical hydrology over various time scales. It demonstrates the variability of the monsoon patterns during the Holocene and reveals that glacial terminations have two phases characterized by millennial-scale events. His research establishes a link between insolation forcing of climate change and its persistence from South America to Asia via the atmospheric circulation belts. These insights about the behavior of the tropical circulation force new thinking which was not possible with just the marine and ice core records.

A fundamental challenge in paleo-climate studies is that the further back in time any investigation goes, the poorer is the temporal resolution. Dr. Edwards is overturning that

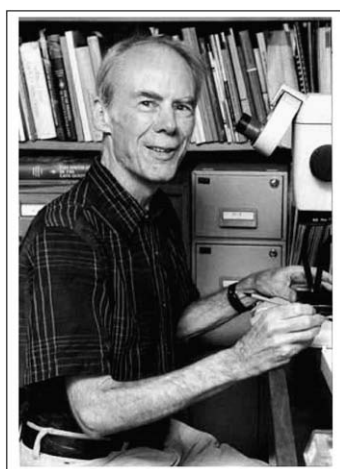


Fig. 1. Nick Shackleton picking forams in Cambridge – his favorite sport.

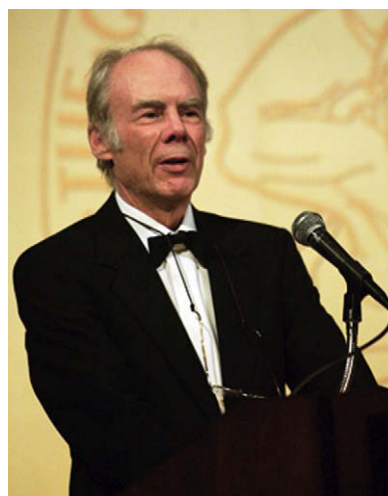


Fig. 2. Shackleton receiving the Crafoord Prize in 2005.

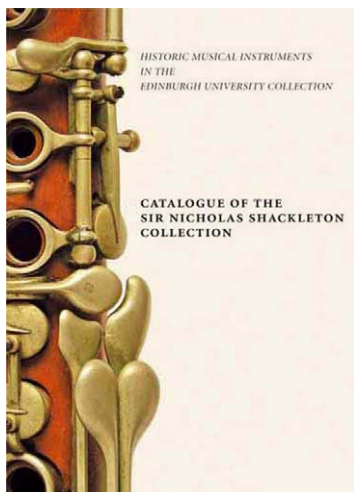


Fig. 3. Shackleton's instruments.

roadblock and has given us the ability, over the last two glacial cycles, to track events now approaching a resolution better than 100 years at 150,000 years. Such dating resolu-

tion is being broadly applied to fields such as hominid evolution and seismic events recorded in corals. He has extended the climate record in cave deposits back to 500,000 years, again with remarkable precision.

He has generated well-dated atmospheric records from the tropics which when compared with deep sea and ice cores records enable a large step toward the resolution of the long-enigmatic question as to the patterns of glacial cycles first pointed out by Nick Shackleton. These contributions will force re-thinking about the interactions between the oceans and atmosphere in the climate system, the geographic pattern of rapid climate changes and the nature of glacial terminations. Larry Edwards is a very worthy, and appropriate, recipient of the first Shackleton Medal.

G.J. Wasserburg
*Charles Arms Laboratory, Division of Geological Sciences,
California Institute of Technology,
Pasadena, CA 91125, USA
E-mail address: gjw@gps.caltech.edu*

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Acceptance of the 2008 Nicholas J. Shackleton Award



Thank you Jerry, for your kind words. This is a tremendous honor, even more so because of the link to Nick.

Because of this tie, I would like to talk a little about mentors. Throughout my career I have pored over Nick's classic papers, committing the key strategies and interpretations to memory, to employ or challenge later on. I have followed and continue to follow along with him, the interpretations pushed to the limits of the data, but not beyond, and, in the process, learn lessons that continue to guide me. Nick was and still is a wonderful mentor by example. Eric Essene, my Master's advisor, has gifts of tremendous enthusiasm and support, which launched me on my research career, and today guide me in my own mentoring. Jerry Wasserburg, from whom you have just heard, instilled in me a real sense of what science is all about, teaching me to "write . . . about something I knew nothing about. . ." (Wasserburg G.J., (2009) *Eos Trans. AGU*. 90(1), doi:10.1029/2009EO010007) and conveying the continuing excitement and challenge of studying problems in new ways. Jim Chen shared secrets and a sense of what it truly takes to get a measurement right and where that hard-nosed dedication can lead. Finally, Wally Broecker serves today as a magnificent informal mentor, as he has to many others in the field, a positive light and a great source of guidance to many of us young and old.

I have also had the good fortune of having the support of my faculty colleagues at the University of Minnesota, which provides a very positive environment in which young and not so young scientists can prosper; student and post-doctoral advisees have helped and continue to help me along in many, many ways, during and after their time at Minnesota. Hai Cheng runs the lab beautifully, develops new techniques, and coordinates major projects, facilitating research that takes me back to my mother's Chinese roots, introducing me to wonderful Chinese colleagues, such as Wang Yongjin, An Zhisheng, and Yuan Daoxian. Finally, my wife Missy McDonald has been a source of tremendous support daily over decades, and my daughters Louise and Eliza remind me constantly of the joys of learning and discovery. Thank you all. It's a truly a pleasure to have the opportunity to work on exciting and rewarding problems and strive to contribute to and repay, in a small way, such a vibrant community.

R. Lawrence Edwards
*Department of Geology and Geophysics,
University of Minnesota, Minneapolis, MN 55455, USA
E-mail address: edwar001@umn.edu*