

OCEAN, EARTH & ATMOSPHERIC SCIENCES



OLD DOMINION UNIVERSITY

Department of Ocean, Earth and Atmospheric Sciences
2019 LUDWICK LECTURE

Thursday, April 4, 2019

3:00 pm, Room 200, Oceanography and Physics Building

Gideon Henderson
University of Oxford

***The Sweet Spot for Oceanic Metal-Isotope Tracers: Barium
Isotopes in Seawater, Sediments, Rivers and Plumes***

Abstract

Barium (Ba) is the most concentrated ion in seawater to show significant spatial variability. That variability encodes information about biological productivity and ocean circulation, and Ba has been used as a proxy for these processes, as well as for past riverine input. Natural stable-isotope variation of Ba in the ocean has only recently been measured, but has perhaps the most systematic variability of any metal in seawater. The apparent simplicity of the Ba-isotope system, and relative ease of measurement, gives it tremendous potential as a tracer in the modern ocean. Barium is also reliably captured in sedimentary and carbonate archives so this system has similar potential as a tracer for past processes. In this lecture I will overview knowledge of the modern marine Ba isotope system, including presenting the first assessment of the role of rivers and hydrothermal plumes in setting ocean Ba isotope compositions. I will describe how Ba isotopes can be applied in sediments to assess past productivity, and how its use in corals has potential to assess past ocean circulation and nutrient cycles.

After the seminar, please join us in OCNPS 404, the Zaneveld Conference Room, for coffee and cookies, and to meet with the seminar speaker.

Background Information

This year's Ludwick Lecturer is Professor Gideon Henderson from the University of Oxford, UK. Dr. Henderson is a geochemist whose research has focused on past changes in the Earth's climate, including the ocean's role in glacial-interglacial changes in atmospheric carbon dioxide, and on the development of geochemical proxies that provide information on past variations in processes such as ocean circulation, rainfall and weathering, and sea level. His most recent research includes collaboration with ocean modellers on the feasibility of geoengineering schemes as a means of storing carbon dioxide. Dr. Henderson has received the European Geosciences Union's Outstanding Young Scientist Award and the Philip Leverhulme Prize. He is a Fellow of the Royal Society, and past co-chair of the Scientific Steering Committee for GEOTRACES, an international research program for the study of trace elements and isotopes in the ocean.

Dr. John ("Jack") Ludwick loved seminars and, as legend has it, never missed one if he was in town, no matter the topic or discipline. Thus, it seemed a fitting retirement gift to him, beginning in 1988, to initiate a distinguished lecture series bearing his name. Each year the Department of Ocean, Earth and Atmospheric Sciences brings in a leader or innovator in oceanography or earth sciences to meet with faculty, students, and alumni, and deliver a public lecture to a general audience. Responsibility for selecting the Ludwick Lecturer is rotated among the department's academic sub-disciplines.