LAURENCE L. SLOSS AWARD

Presented to
J. Fred Read

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Virginia Tech (emeritus)

Citation by "John P. Grotzinger and Isabel P. Montanez"

Fred Read has made original and lasting contributions to the carbonate domain of sedimentary geology, building from his seminal PhD work on the modern carbonate platforms sediments of Shark Bay, Western Australia.

Throughout his career, Fred's meticulous field studies of Paleozoic and Mesozoic carbonate rocks in the Appalachians, Cordillera, and parts of Europe have collectively transformed our understanding of the evolution of continental margin carbonate platforms. Synthesis papers in AAPG Bulletin and the Decade of North American Geology set the pace in the 1980s for others to follow for the past three decades. With his students always by his side, his lab group was able to provide clear evidence for the separation of tectonic, eustatic, and climatic influences on patterns of carbonate facies distribution.

This work was done simultaneously with a complimentary focus on understanding patterns of diagenesis at the regional scale of carbonates platforms. Pioneering work that integrated petrographic, geochemical and fluid inclusion studies, provided the foundation for this definitive research on reconstructing fluid-flow regimes in regional paleo-aquifers and mapping dolomitization fronts at regional- to basin-scales.

During the late 1980s and 1990s, this work evolved into an attempt to elucidate the mechanisms of high-frequency cyclicity in carbonates. Research into ancient climates, the search for fossil fuels, diagenesis, chemostratigraphy, and sequence stratigraphy, all are based in the fundamentals of the carbonate cycle - a basic depositional unit recognized by Fred early in his career. Read's lab was the first to exploit numerical simulation as a tool to untangle the effects of tectonics versus sea level and climatic effects. These early studies showed clearly the effects of varying amplitude of eustatic drivers, leading to an objective basis to differentiate "greenhouse" from "icehouse", as well as transitional, states of ancient climate. Building on this body of work, the field of quantitative cyclostratigraphy exploded, field studies were refocused using explicit criteria and predictive searches for particular suites of sedimentary structures, stratal stacking patterns, and impacts of early diagenesis.

Anyone who worked in Fred's lab had the pleasure of working with a brilliant, fun-loving, and thoughtful advisor. And much of Fred's work in stratigraphy was inspired by Larry Sloss's own efforts. Larry was very familiar with Fred's early work and would have been impressed with Fred's accomplishments, and delighted to see Fred receive this award.

Response by J. F. Read

I would like to thank the Awards Committee for this honor, along with Isabel and John for nominating me. I would like to acknowledge all my former students, who made the Virginia Tech Carbonate Lab a great place to work and who subsequently have been remarkably successful. I would also like to acknowledge Pauline and my daughter Stephanie.

I am indebted to Brian Logan, University of Western Australia, who in 1967 took me into the marine program, studying the modern and Pleistocene carbonates, Shark Bay, following Graham Davies. Visits by Paul Hoffman and Eric Mountjoy made a lasting impression with their basin-wide approaches to carbonate facies. In 1970, Brian and West Australian Petroleum set up a post-doc for me on the classic Devonian back-reef of the Canning Basin. The many stacked cycles were an eye opener after the 3 carbonate cycles of Shark Bay.

Don Bloss and Bob Ginsburg were instrumental in getting me from Australia to Virginia Tech, which provided a superb situation for me, located on the very thick pile of Paleozoic carbonates. Lawrie Hardie (Johns Hopkins), Ken Walker (University of Tennessee) and their students provided a really stimulating environment during our joint field trips, which were well lubricated and not lacking in strong opinions. The Geosciences faculty at Virginia Tech, provided a top-class learning environment for me and my students. Sitting in on their graduate courses greatly broadened my perspective.

My students however provided me with the greatest education, herding me through the Paleozoic rocks of the U.S, the Early Proterozoic of Canada, the Cenozoic of the Carolina Coastal Plain, and the Mesozoic of Eastern Europe and the Middle East. A harsh review of one of our early papers coupled with an invitation (with Ken Eriksson) to the Paris IGC in the late 70's stimulated me to put together the paper on carbonate platform models for Tectonophysics and subsequently the AAPG Bulletin building on the work of Jim Wilson, Wayne Ahr and others. Our studies coincided with the blossoming of sequence stratigraphy, pioneered by Larry Sloss, Peter Vail and his co-workers, and this led to our high resolution studies of carbonate platforms. It also led to our attempts at modeling cyclic sequences. Rob Matthews text, which touched on the origin of Pleistocene cycles, got us thinking about how orbital forcing might have affected the carbonate record.

Early on, we also initiated studies on regional calcite cement patterns and then near-surface and burial dolomite diagenesis. In all of these, we took a regional approach, with geochemistry tied to detailed petrography and early attempts at understanding the basin-wide flow systems involved. Over the last few years we have been interested in applying high resolution studies and chemostratigraphy to subsurface carbonates, involving some of the giant fields of the Middle East.

The U.S. has been a marvelous place to work, the students have been exceptional, and I would like to acknowledge the great collegiality I have experienced here from everyone, even when we heatedly disagreed. Thank you all.