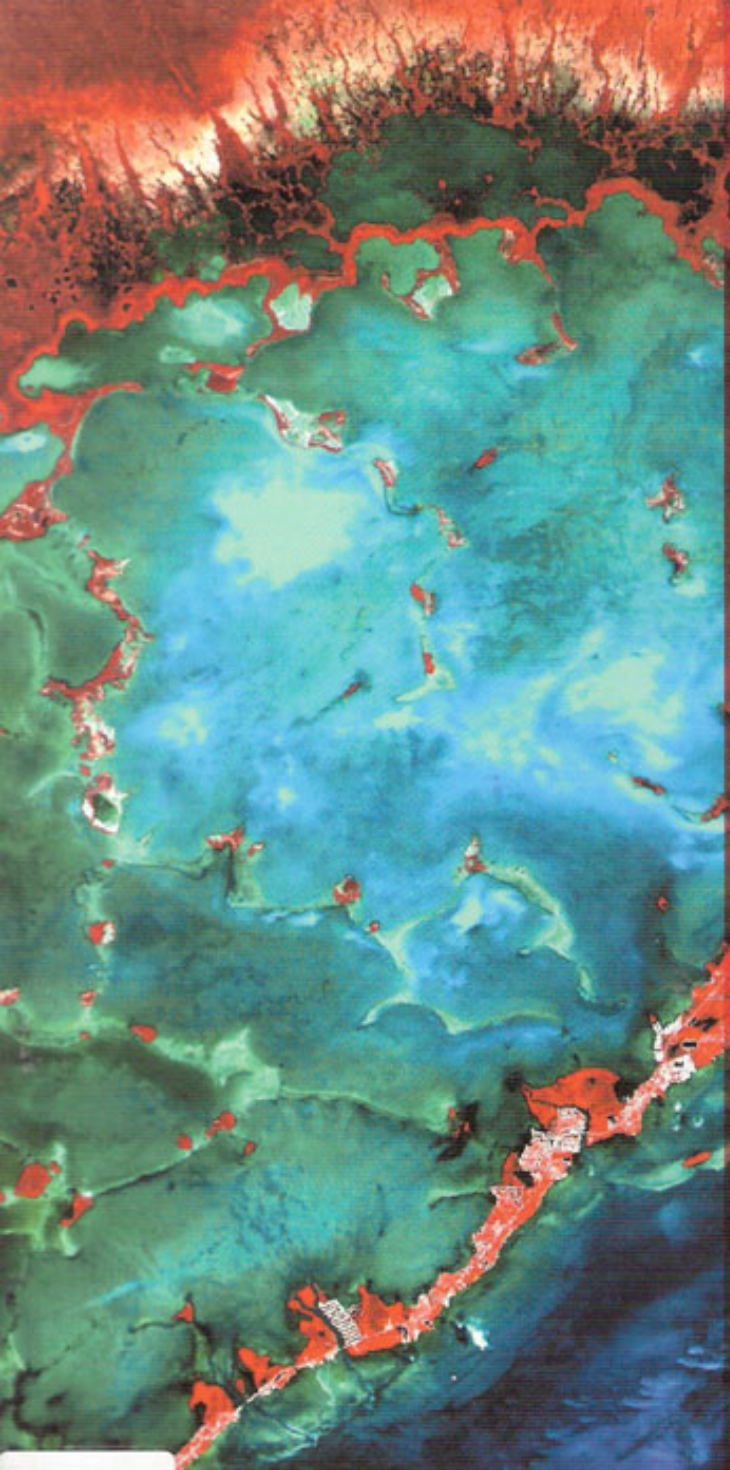

Perspectives in Carbonate Geology

A Tribute to the Career of Robert Nathan Ginsburg

Edited by
Peter K. Swart
Gregor P. Eberli
Judith A. McKenzie

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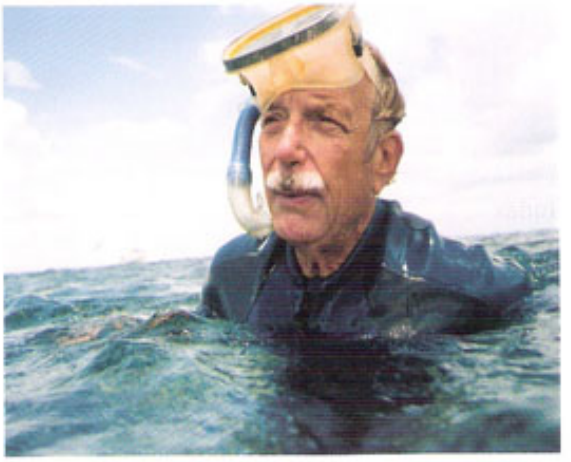


Robert Ginsburg in characteristic South Florida field gear.

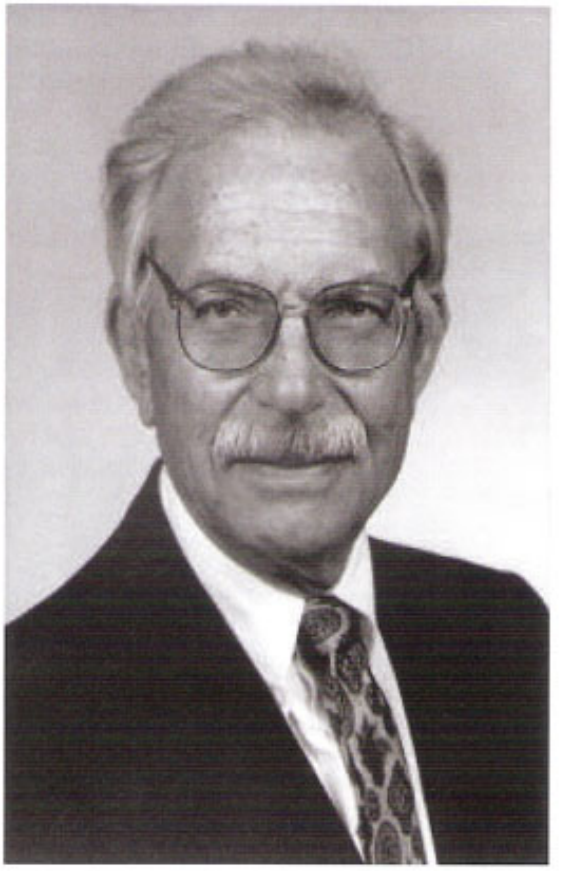
Robert Nathan Ginsburg's career in carbonate sedimentology began in 1950 when he left the University of Chicago to become a research assistant at the University of Miami's Marine Laboratory, the precursor of the present Rosenstiel School of Marine and Atmospheric Science. Subsequently he moved, first to establish and lead a research and training programme on Quaternary carbonates for the Shell Development Company (1954–60), then to become Professor of Geology and Oceanography at The Johns Hopkins University (1960–65). In 1970 he was persuaded by Cesare Emiliani to come back to the University of Miami as Professor of Sedimentology. At that time he organized the T. Wayland Vaughan Laboratory for Comparative Sedimentology headquartered on ocean-facing Fisher Island at the entrance to the Port of Miami.

His first published paper appeared soon after his initial arrival in Miami, 'Intertidal Erosion on the Florida Keys' (1953). It was a harbinger of his future career as it questioned the prevailing chemical explanation for shoreline erosion by offering a biological alternative. In the following half century, with his associates, post-doctoral fellows and students he has authored or co-authored a series of seminal papers, books and reports on the links between contemporary and Holocene processes and products of carbonate deposition and their fossil counterparts. These publications have been on subjects ranging from the formation of dolomite (Shinn *et al.*, 1965), precipitation of cements in reefs (Ginsburg & James, 1976; James *et al.*, 1976), health of coral reefs (Ginsburg, 1997; Ginsburg *et al.*, 2001), sedimentation patterns on carbonate platforms (Beach & Ginsburg, 1980; Ginsburg, 2005), stromatolites (Logan *et al.*, 1964) and the history and development of carbonate platforms (Eberli & Ginsburg, 1987a,b; Ginsburg, 2001; Ginsburg *et al.*, 1991; Schlager & Ginsburg, 1981). Within this corpus of contributions are an editorial exhortation, 'So What', to develop the wider implications of our specific findings (Ginsburg, 1982), a paper emphasizing the feedback of sediments on their deposition 'Disobedient Sediments' (Ginsburg, 2005) and what is termed the Ginsburg Model of autocyclic accumulation of shoaling-upward successions (Ginsburg, 1971).

These works, combined with the several issues of two informal periodicals he founded and edited (*Sedimenta* and *Geological Milestones*), together with countless field trips he has led and lecture tours in North America, Europe, North Africa and Australia, have had a most significant influence world-wide on research, teaching and the petroleum geology of carbonate deposits. A measure of this impact is the award of Fellowship in the American Association for the Advancement of Science and the Geological Society of America, the Twenhofel Medal of the Society for Sedimentary Geology, the Sorby Medal of the International Association of Sedimentology and honorary membership in four professional societies.

The 22 papers in this volume *Perspectives in Carbonate Geology: a Tribute to the Career of Robert Nathan Ginsburg* were mainly presented at a special symposium at the 2005 meeting of the Geological Society of America meeting at Salt Lake City to mark Robert's 80th birthday. Of the 60 authors on the 22 papers, 20 are either former or current associates, students, postdoctoral associates, or students of former students and associates.

A young Robert Ginsburg (centre) at the Shell Research Laboratory in Coral Gables.



Robert Ginsburg at the time of his selection as AAPG distinguished lecturer, circa 1987.

The fact that the majority of the papers in this publication are connected with modern carbonate sediments is appropriate as Robert pioneered the concept of comparative sedimentology, that is using the modern to compare to and relate to and understand the ancient. These studies are concerned with Robert's areas of passion, coral reefs and sea-level (Hubbard), submarine cementation and formation of beach rock (Shinn), surface sediments on Great Bahama Bank and other platforms (James, Gischler, Swart and Reijmer), origin of ooids (Kindler), coastal sediments (Vlaswinkel), formation of stromatolites (Andres), impact of storms on sediments (Reeder), and the formation of dolomite (Mónica Sánchez-Román). Two of these studies in particular draw on some of Robert's and his colleagues seminal papers. For example, Mónica Sánchez-Román demonstrates the formation of dolomite under the influence of aerobic bacteria, a mode of formation which could explain the dolomite forming on the tidal flats of Andros Island, Bahamas described in the classic 1965 paper (Shinn *et al.*, 1965). The second set of papers (John Reijmer and Peter Swart) follows up work carried out by the Shell group in the mid-1950s and not published until over a decade later on the distribution of sedimentary facies on Great Bahama Bank (Traverse & Ginsburg, 1966). In two papers in this volume the issue of the sediment distribution and their isotopic and mineralogical compositions are revisited, making use of navigational and computer methods not available to the workers in the mid-1950s. It is also gratifying to see that many of Robert's early colleagues (Shinn, James, Gischler and Kindler) have contributed papers in this section. Gene Shinn, a research technician with Robert at Shell Development Laboratory in Coral Gables in the early 1960s, revisits one of Robert's favourite subjects, syndepositional cementation, in his tale of Beach Rock formation and a subject discussed in Robert's earlier papers. Noel James, a former postdoctoral research assistant at the Fisher Island Station in the early 1970s, discusses epiphyte production of carbonate sediment in cool-water carbonates, once again an area Robert has extensively investigated in subtropical carbonates (Nelsen & Ginsburg, 1986). Finally in this section there are papers by

the 'grandchildren' of Robert Ginsburg, Miriam Andres and Brigitte Vlaswinkel. Miriam, who recently completed a postdoctoral position with Pam Reid at the University of Miami, describes modern stromatolites from the Bahamas, while Brigitte, a recent graduate student from Miami, presents a paper on the effect of sea-level rise and sedimentation on the coast of the Everglades. These are all areas that were pioneered in studies by Robert.

Application of the study of modern environments to ancient sediments is the theme of six papers which study rocks ranging in age from the Pleistocene to the Proterozoic. The first of these by Albert Hine draws on work published by Ginsburg, that showed the presence of siliciclastic sediments derived from the north as underpinning the Pleistocene of South Florida (Chung & Ginsburg, 1985; Warzeski *et al.*, 1996). Several papers in this section (Strasser, Forkner and Pope) draw on the lessons learned in the Bahamas (Ginsburg *et al.*, 1977) and use what is apparently one of the most cited abstracts in geology (Ginsburg, 1971) describing the landward movement of mud on carbonate platforms. These include the paper by André Strasser and Stéphanie Védrine dealing with the Jurassic, that by Robert Forkner, Linda Hinnov, Robert Goldhammer and Laurie Hardie with the Triassic, and by Mike Pope, Steve Holland and Mark Patkowsky with the Ordovician. The contribution by Mike Grammer (a former Ginsburg student) and Audrey Ritter describes phylloid algae similar to that in a previous Ginsburg collaborative study (James *et al.*, 1988) and the paper by Linda Kah, Julie Bartley and Alice Stagner deals with Proterozoic stromatolites. All these papers take the lessons learned from the modern and apply them to the ancient; comparative sedimentology in action and application.

Finally there are five papers dealing with processes common to all time periods. The first of these, by Harold Wanless, deals with layering, a subject often discussed in Robert's writings (Ginsburg *et al.*, 1977). Wolfgang Schlager, a colleague of Robert's at the University of Miami in the 1970s and 1980s, together with Georg Warrlich deals with changing sedimentation during sea-level oscillations, a topic previously investigated by Robert in the Bahamas (Ginsburg, 2001). The third paper by a former student (Don McNeill) and postdoctoral associate (Gregor Eberli), addresses fracturing in carbonate rocks collected during the Bahamas Drilling Project, an ambitious drilling operation conceived and organized by Robert in the late 1980s (Ginsburg, 2001). In this expedition two deep holes were drilled from a jack-up barge on the western margin of the Bahamas. The last two papers in this section, one by Bernard Riegl and Sam Purkis and one by Carl Drummond and Liliah Marlow, present modelling aspects of the development of facies on carbonate platforms supporting some of Robert Ginsburg's original work (Ginsburg, 1971, 1974; Shinn *et al.*, 1969).

So that is our (Swart, Eberli and McKenzie) and the authors of this volume tribute to Robert Nathan Ginsburg on his 80th birthday. I am sure that the countless students, young and old, who have been influenced by Robert will share in the following sentiments. Robert's enthusiasm has shaped our lives and we hope that this compilation in some way pays tribute to his career, although that would be a difficult task.

The editors would like to thank all those who participated in the completion of this volume including the reviewers listed below in alphabetical order: Tom Aigner, Miriam Andres, Christian Betzler, Steve Boss, Stephen Burns, Carl Drummond, Christophe Dupraz, Paul Enos, Elrick Ettensohn, Eberhardt Gischler, Kate Gilis, Mike Grammer, Laura Guertin, Mitch Harris, Paul Hearty, Stephen Hesselbo, Al Hine, Linda Hinnov, Hans Hoffman, Adrian Immenhauser, Xavier Janssen, Chris Kendall, Pascal Kindler, David Mallinson, Mitch Malone, Don McNeill, Florian Mauser, Lucian Montaggione, Hank Mullins, David Osleger, William Patterson, Werner Piller, John Reijmer, Harry Roberts, Eugene Rankey, Robert Riding, Bernard Riegl, Elias Samankassou, Art Saller, Diethard Sanders, Wolfgang Schlager, Toni Simo, Taury Smith, George Stanley, André Strasser and Ralf Weger.

In particular we would like to thank Greta Mackenzie, Tom Stevens, Ian Jarvis and Stella Bignold who dealt with the final copy editing issues.

Peter K. Swart, Gregor Eberli, and Judith McKenzie
December 2007

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This special publication *Perspectives in Carbonate Geology* is a collection of papers most of which were presented at a symposium to honor the 80th birthday of Robert Nathan Ginsburg at the meeting of Geological Society of America in Salt Lake City in 2005. The majority of the papers in this publication are connected with the study of modern carbonate sediments. Robert pioneered the concept of comparative sedimentology – that is using the modern to compare to and relate to and understand the ancient. These studies are concerned with Robert's areas of passion: coral reefs and sea-level; submarine cementation and formation of beach rock; surface sediments on Great Bahama Bank and other platforms; origin of ooids; coastal sediments; formation of stromatolites; impact of storms on sediments; and the formation of dolomite. The remainder of the papers apply the study of modern environments and sedimentary processes to ancient sediments.

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