



# The Players

## Sediment Mineralogy

A Short Course VU March, 2009

Peter Swart University of Miami

---

---

---

---

---

---

---

---

## Mineralogy

- **Hexagonal**
  - Low-Mg Calcite (LMC)
  - High-Mg Calcite (HMC)
  - Dolomite (diagenetic)
- **Orthorhombic**
  - Aragonite
- **Vaterite**

---

---

---

---

---

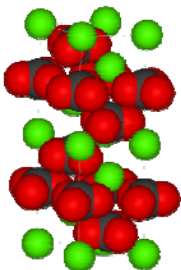
---

---

---

## Calcite

- Most Modern Pelagic Carbonates
- Contains approximately 1000 ppm Mg (so-called LMC)
  - Coccoliths
  - Foraminifera



---

---

---

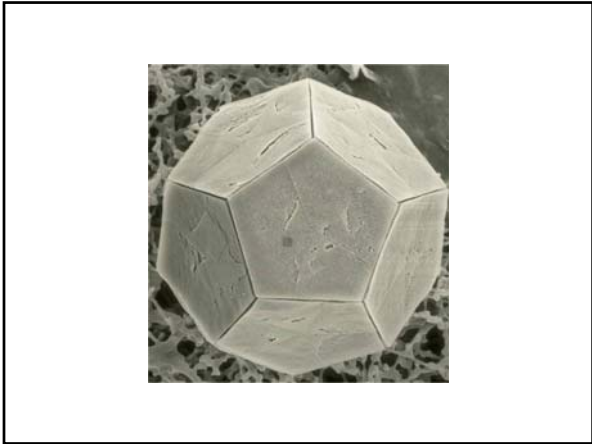
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

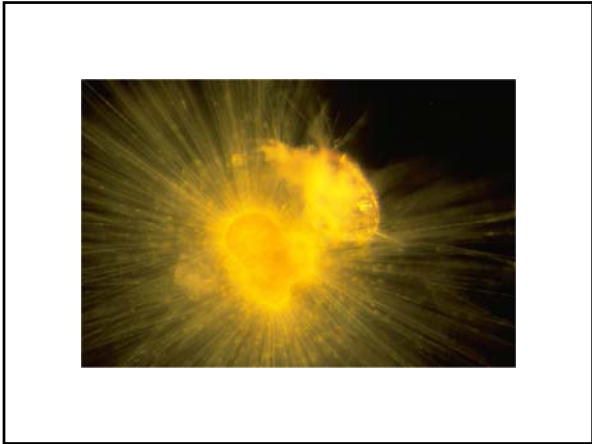
---

---

---

---

---



---

---

---

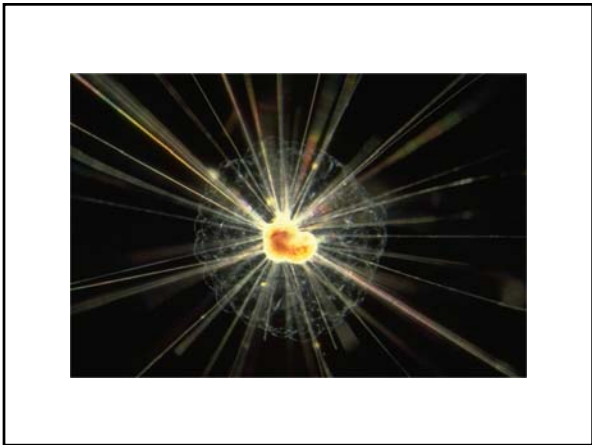
---

---

---

---

---



---

---

---

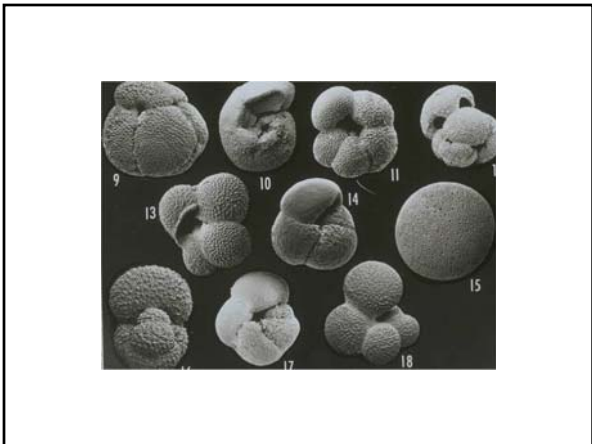
---

---

---

---

---



---

---

---

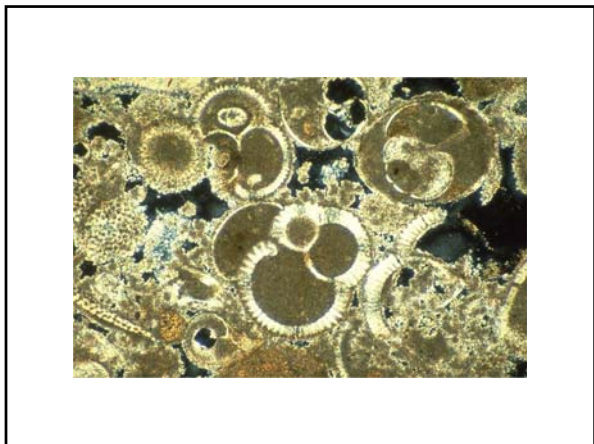
---

---

---

---

---



---

---

---

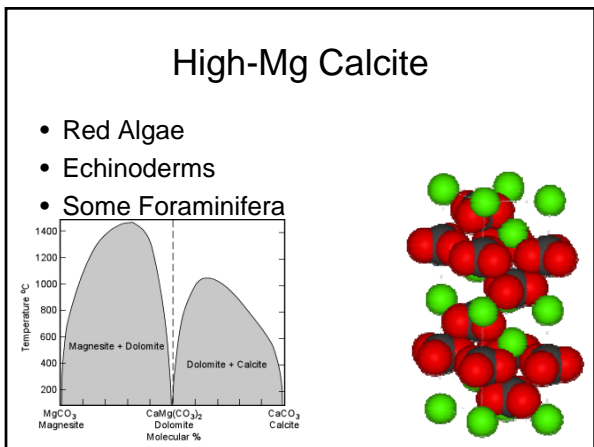
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

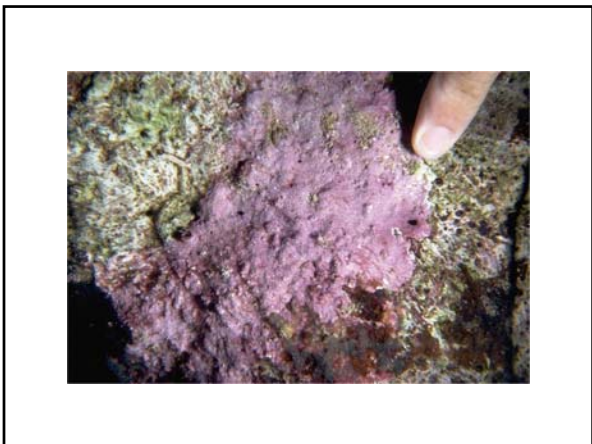
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

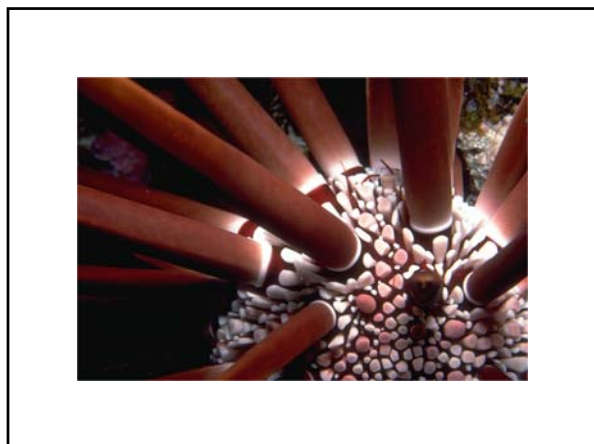
---

---

---

---

---



---

---

---

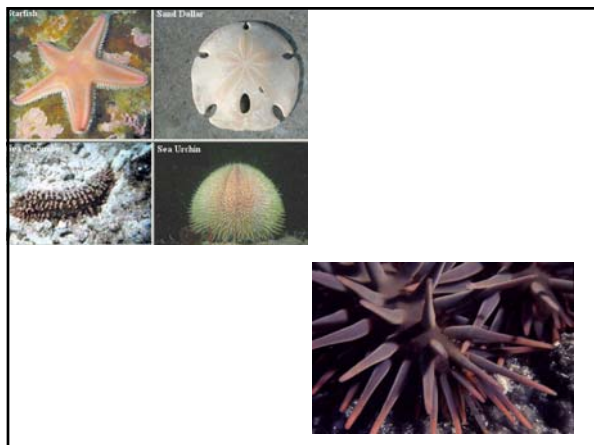
---

---

---

---

---



---

---

---

---

---

---

---

---

**Aragonite**

- Some Foramanifera
- Corals
- Green Algae
- Inorganic precipitates

---

---

---

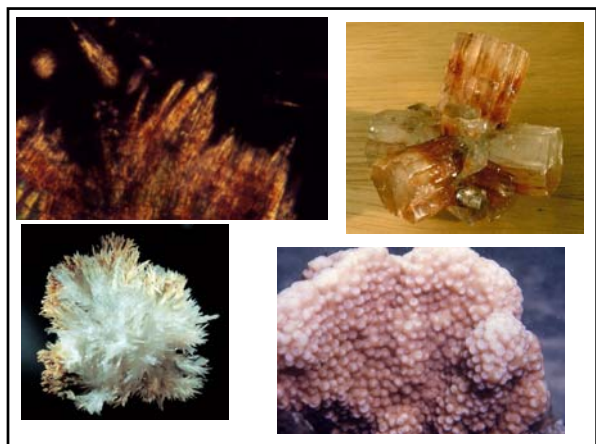
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

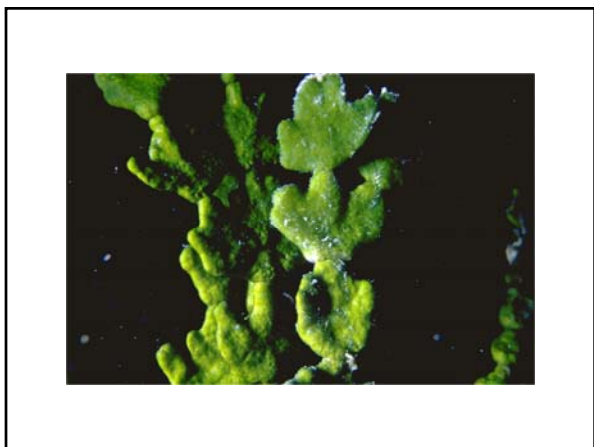
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---





---

---

---

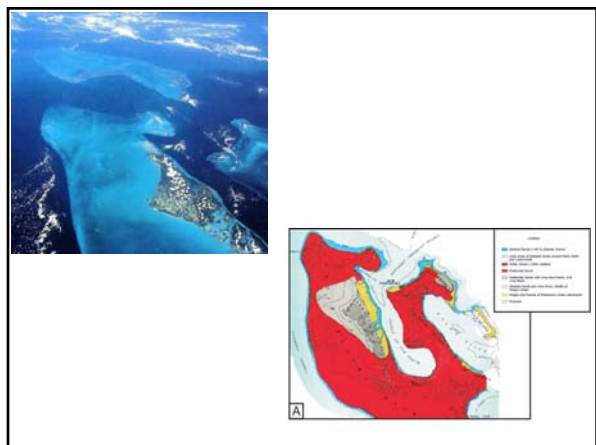
---

---

---

---

---



---

---

---

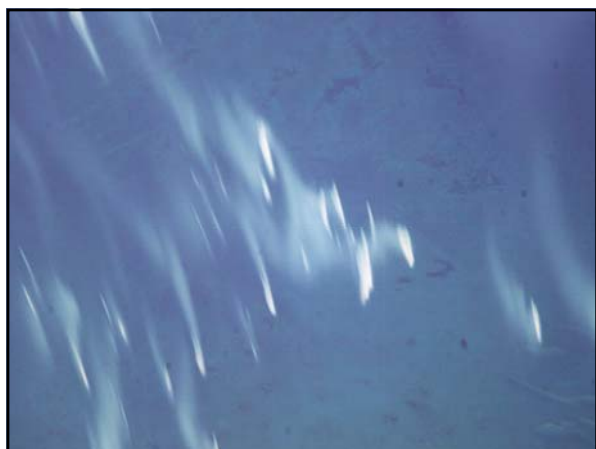
---

---

---

---

---



---

---

---

---

---

---

---

---

**Calcium Carbonate Precipitation on the Bahama Banks<sup>1</sup>**  
WALLACE S. BRUCKER  
*Laurens Geological Observatory, Columbia University  
Palisades, New York*

THOMAS SASAKAWA  
*Geology Department, University of Rochester  
Rochester, New York*

ELLEN HILL AND HARRISON HARRIS  
*IN THE SHIRT OF ARAGONITE: A REPLY  
TO 'A FIGURE IS WORTH A THOUSAND WORDS'*

JOURNAL OF GEOLOGICAL RESEARCH, VOL. 67, NO. 13, PAGES 2029-2034, MAY 20, 1974

**THE CARBONATE CHEMISTRY OF KARST AROUND KARST WEEDS:  
AFTER J. REED BOYD'S 1968**  
JOHN W. MORSE  
Department of Oceanography, Texas A&M University  
Frank J. Millard, Valeria Thurmond, Bruce West, and H.G. Orlund  
Rosenstam School of Marine and Atmospheric Science, University of Miami

**CaCO<sub>3</sub> precipitation kinetics in waters from the Great Bahama Bank: Implications for the relationship between Bank hydrochemistry and whittings**  
JOHN W. MORSE<sup>1</sup>, DEBORAH FELLE,<sup>2</sup> RANDOLPH P. STEINBY,<sup>3</sup> and FRANK J. MILLARD<sup>1</sup>  
<sup>1</sup>Department of Oceanography, Texas A&M University, MS 3146, College Station, TX 77843, USA  
<sup>2</sup>Rosenstam School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, FL 33149, USA

---

---

---

---

---

---

---

---

---

---

---

**PERSPECTIVES:  
WHITINGS, A SEDIMENTOLOGIC DILEMMA?**  
KYLE A. SMITH<sup>1</sup>, R. ANDREW P. STERNBY,<sup>2</sup> BARBARA B. JENSEN, and PETER A. SWARTZ  
<sup>1</sup>U.S. Geological Survey, Fisher Island Station, Miami Beach, Florida 33156  
Department of Geology, University of Connecticut, Storrs, Connecticut 06269  
<sup>2</sup>Marine Geology and Geophysics, Rosenstam School of Marine and Atmospheric Science, University of Miami

**COMMENT ON THE ORIGIN OF ARAGONITE NEEDLE MUD:  
A PICTURE IS WORTH A THOUSAND WORDS**  
JAN O. JOHNSON  
Department of Paleontology  
Natural Museum of Natural History  
Kronprincesstrasse  
1060 Wien, Austria

**GREAT BAHAMA BANK ARAGONITE MUDS: MOSTLY  
INDOGENEALLY PRECIPITATED, MOSTLY EXPORTED**  
JOHN L. MILLARD<sup>1</sup>, DEBORAH FELLE,<sup>2</sup> RANDOLPH P. STEINBY,<sup>3</sup> and R. JUDIE WILSON<sup>1</sup>  
<sup>1</sup>Earth and Oceanographic Institute, Woods Hole, MA 01960-1325  
<sup>2</sup>Department of Geology, Boston University, Boston, MA 02215-1583  
<sup>3</sup>Department of Geology and Geophysics, University of Connecticut, Storrs, CT 06269-3043 USA  
<sup>4</sup>US Geological Survey, Woods Hole, MA 01960-1324

**Biochemical and ultrastructural evidence for the origin  
of whittings: A biologically induced calcium carbonate  
precipitation mechanism**  
L. L. Riddins  
Department of Geology, University of South Florida, Tampa, Florida 33620  
P. L. Stockwood  
Marine Geology and Geophysics, Rosenstam School of Marine and Atmospheric Science, 4600 Rickenbacker Causeway  
Miami, Florida 33149

---

---

---

---

---

---

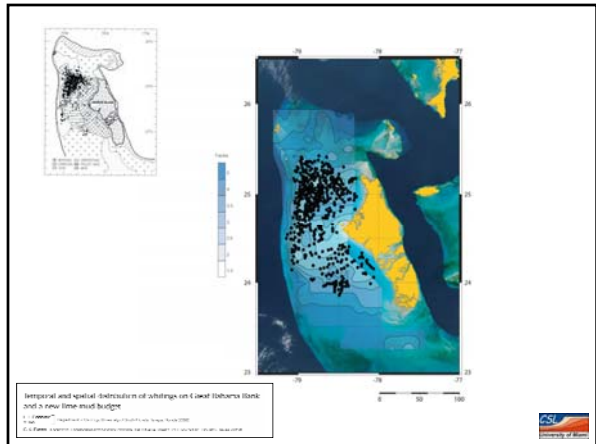
---

---

---

---

---



---

---

---

---

---

---

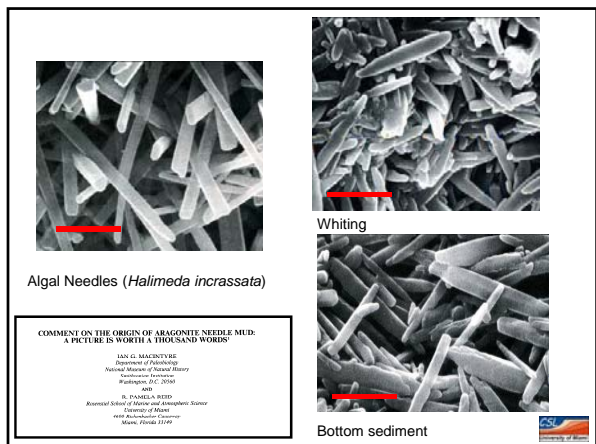
---

---

---

---

---



---

---

---

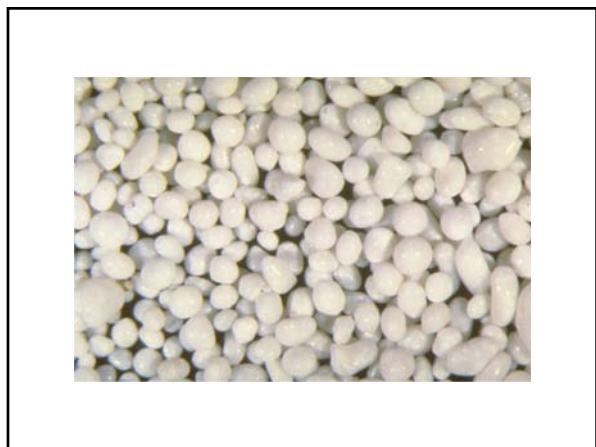
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

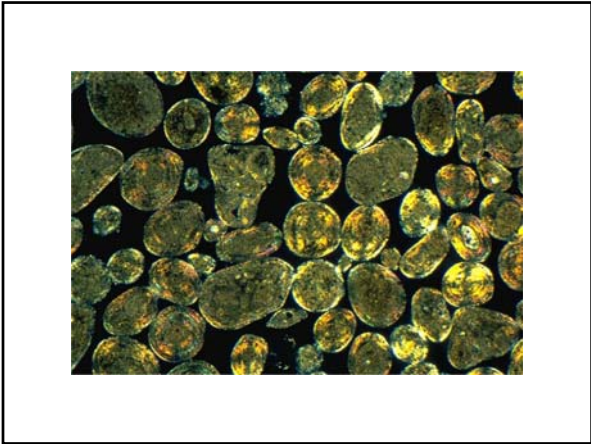
---

---

---

---

---



---

---

---

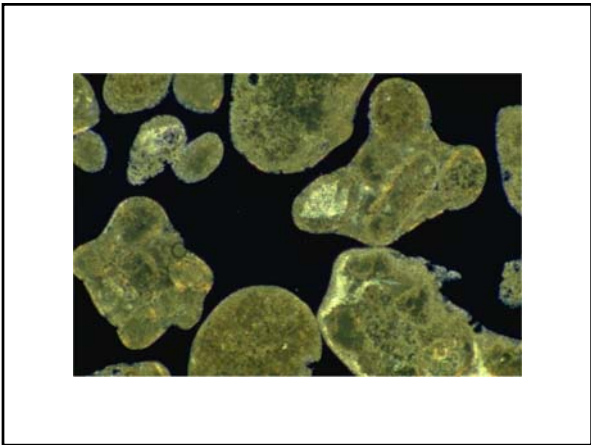
---

---

---

---

---



---

---

---

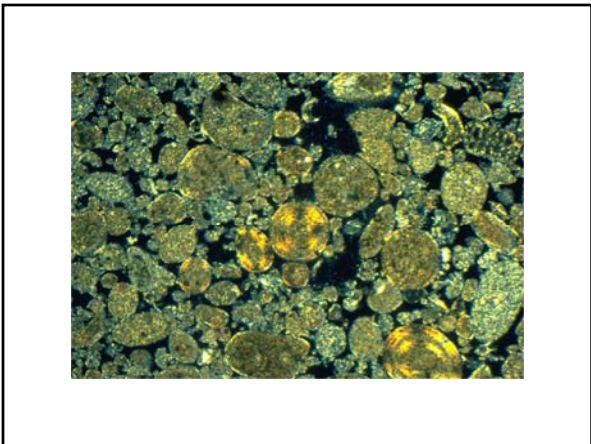
---

---

---

---

---



---

---

---

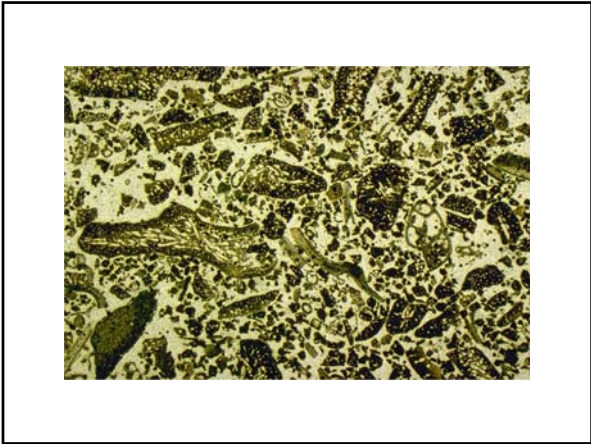
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

NEXT:

**Coral Fractionation**

---

---

---

---

---

---

---

---