

On the Rocks



A Newsletter of the Michigan Basin Geological Society
E-mail version

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April 2002

EVENTS

April 10, 2002: MBGS Meeting, the speaker is Dr. Jerry Lucia, AAPG Distinguished Lecturer, and his topic is "Dolomitization: A Porosity Destructive Process". This talk was originally scheduled for April of last year

April 22, 2002: Earth Day

April 27, 2002: MBGS Fieldtrip Detroit Salt Mine Tour

May 17-19, 2002: Karst fieldtrip, family style sponsored by the DEQ Geologic Outreach Committee. The trip is open to other professionals and their families and will be lead by Tyrone Black.

June 20, 2002: The Geology Outreach Committee is sponsoring a one day glacial geology field trip/training on for State geologists, at Berrien County. *Non-State geologists are also welcome.*

October 6-8, 2002: AAPG annual Eastern Section meeting, Champaign, Illinois.

October 22-25, 2002: 9th Annual INTERNATIONAL PETROLEUM ENVIRONMENTAL CONFERENCE, in Albuquerque, New Mexico.

AAPG Memoir

A new memoir containing papers from the celebrated Wallace Pratt Conference on Future Petroleum Provinces of the World that took place in 2000 has been released by the AAPG. The book sells for \$59.00 (plus shipping) at the AAPG bookstore, online at <http://bookstore.aapg.org> or by phone at 800-364-2274. Ask for Memoir 74 (catalog: 590-03).

Biography

F. Jerry Lucia

Bureau of Economic Geology | Austin, Texas

Education

1952 University of Minnesota, Minneapolis; BS Engineering (with distinction)

1954 University of Minnesota, Minneapolis; _MS Geology

Experience

1955-57 U.S. Army Corp of Engineers, Germany

1957-67 Shell Development Company, Bellaire Laboratory, Houston, Texas

1967-80 Geological Engineer, Shell Oil Company, Midland and Houston, Texas

1980-85 Geological Engineering Consultant, Head Office, Shell Oil Company, Houston, Texas

1985-Present Senior Research Fellow, Bureau of Economic Geology, The University of Texas at Austin

Professional Interests and Awards

Carbonate Geology, Sandstone Geology, Petrophysical Engineering, Computer Simulation and Modeling

West Texas Geologic Society Distinguished Service Award - 1993

Wallace E. Pratt Memorial Award for AAPG best paper award - 1996

Wallace E. Pratt Memorial Award for AAPG best paper award - 1997

Memberships

American Association of Petroleum Geologists

Society of Sedimentary Geology

Geological Society of America - Fellow

Society of Petroleum Engineers

Dolomitization: A Porosity-Destructive Process

By Jerry Lucia

Dolomitization is always a controversial subject and porous dolostone has always been at the heart of the controversy. Since Elie de Beaumont concluded in 1837 that dolomitization was a mole-for-mole replacement process because he measured 12.5 percent porosity in Tyrolian dolomites, dolomitization has been touted as a mechanism for creating porosity from dense limestone. However, in the past 50 years a large body of data has been collected demonstrating that dolomitization does not create but occludes porosity. It is time to nail the coffin shut on this myth.

To test the effect of dolomitization on porosity requires knowing the porosity of the precursor limestone. Limestones in lower Paleozoic carbonate reservoirs are typically dense, whereas porosity is commonly found in dolostones. The explanation for this fact has been that dolomitization creates porosity. However, this observation does not hold for young carbonates. Limited data indicate that Holocene dolomites have 50 to 60 percent porosity similar to adjacent lime sediments. Recently reported data from the Neogene of the Bahama Banks show dolostones with 35 percent porosity and adjacent limestones with 40 percent porosity. The study of a Plio-Pleistocene carbonate in Bonaire, N.A. demonstrated that the limestones are more porous than the adjacent dolostones. The limestones average 25 percent porosity, whereas the dolostones average 11 percent porosity. Porosity studies of the Jurassic Arab D formation show that dolostones are no more porous than associated grain-dominated limestones, and many dolostones are dense, suggesting porosity destruction through dolomitization.

Fabric studies show that large dolomite crystals replace not only CaCO_3 but also microporosity. Replacement dolomite crystals are therefore part replacement and part pore filling. The pore-filling carbonate is mostly from the dissolution of CaCO_3 between the dolomite crystals and a small amount from the dolomitizing water. As dissolution progresses, porosity is increased in the intercrystalline volume and decreased in the crystal volume. However, more volume is added to the crystals than pore space occluded, resulting in an overall loss of porosity through dolomitization.

These studies suggest that the porosity in dolostone is inherited from the precursor limestone and not created by a mole-for-mole replacement mechanism. Indeed, Dr. Robert L. Folk has reported on a dense dolomite found replacing a marbled Pleistocene limestone in Italy; dolomitization did not create porosity. Dense lower Paleozoic limestones were most likely porous and permeable at the time of dolomitization. Limestones lost porosity through compaction and cementation, whereas dolostones resisted compaction and retained much of their porosity. These studies suggest that instead of creating porosity, dolomitization reduces porosity and preserves porosity from being destroyed by compaction.

Check out article on the AAPG's online journal, Search and Discovery, at: www.searchanddiscovery.net.

MBGS-SPE Meeting

April 10, 2002

Location: Mountain Jacks
5800 W. Saginaw Highway, Lansing, Michigan

Schedule: 4:30-5:30 PM Executive Committee Meeting
5:30-6:15 PM Cash Bar
6:15-7:15 PM Dinner
Presentation after Dinner

Cost \$25.00/member \$10.00 Student (includes dinner)

Topic: "Dolomitization: A Porosity Destructive Process".

Dr. Jerry Lucia, AAPG Distinguished Lecturer

MBGS Dinner Meeting Reservation

Name _____

Number attending _____ Society _____

Enclosed Registration Fee _____

Please make your check out to the MBGS by April 5, 2002 and send to:

Bruce Arndt
508 W. Michigan Ave.
P. O. Box 763
Jackson, Michigan 49204
Ph: 517-782-8206 Fax: 517-782-8205

NEW MICHIGAN BASIN GEOLOGICAL SOCIETY PUBLICATIONS

Historical CD #1: Nine out-of-print publications from 1949 through 1965 and 1998, Devonian to Silurian Rock Fieldtrips to MI, WI, IL and Ontario, 2000, \$15

Historical CD #2: Four out-of-print publications from 1947, 1959, 1983 and 1991 , Northern Devonian and UP Fieldtrips in MI, 2001, \$10

Historical CD #3: Six out-of-print publications from 1947. 1959, 1983 and 1991, Northern Devonian and UP Fieldtrips in MI, 2001, \$12

Special Price - Historical CD #1, #2 & #3, \$30

Stratigraphic Lexicon for Michigan, 2001, prepared by MBGS and published by DEQ, 56 pp., chart, \$2.65 picked up or \$4 mailed, Can be ordered from MBGS or Geological Survey Div. of the DEQ

Price Includes postage, handling and any applicable sales tax. Orders for publications should be prepaid in U.S. Funds and addressed to:

MBGS - Publications
c/o Dept. of Geological Sciences
206 Natural Sciences Building
Michigan State University
East Lansing, Michigan 48824-1115

INTERNATIONAL PETROLEUM ENVIRONMENTAL CONFERENCE

You are invited to submit an abstract for the 9th Annual INTERNATIONAL PETROLEUM ENVIRONMENTAL CONFERENCE, October 22-25, 2002, in Albuquerque, New Mexico.

The conference is sponsored by:

IPEC (Integrated Petroleum Environmental Consortium)
The University of Tulsa, Cont. Engineering & Science Education
WERC, a Consortium for Environmental Education and Technology Development
U.S. DOE, National Petroleum Technology Office
U.S. EPA, Office of Research and Development

Papers and posters are solicited that address solutions to environmental problems and regulatory issues in the petroleum industry in both exploration and production (E&P) and refining.

Go to the website to download a PDF file of the Call for Papers:

<http://ipec.ens.utulsa.edu>

A 150-word abstract should be submitted by email to the conference chair by April 15, 2002. His email is: kerry-sublette@utulsa.edu

MBGS Ballot 2002-2003

Vote for not more than one person per office.

Mark this ballot - Mail your choices to:

Tom Hoane, MBGS Treasurer at: 1748 Danby Lane, SE Grand Rapids, MI 49506

or e-mail an attachment to: hoanet@state.mi.us

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FIELD TRIP: Karst of NE Lower Michigan

When: Friday – Sunday MAY 17 - 19, 2002

Where: Fletcher Motel (& Grove Restaurant), Alpena

Trip Leader: Tyrone Black

RSVP to Tyrone Black at (blackt@michigan.gov) AND Chris Christensen at (christec@michigan.gov).

The DEQ Geologist Outreach program will offer a field trip on the Karst geology of the Alpena area on May 17, 18, & 19. This trip will be a joint trip, also extended to members of the MBGS, and AIPG. This trip is intended to be on your own time and expense. Family members and friends are welcome.

Agenda:

Friday 5/17/02 Meet at Fletcher Motel at 7:00 PM to 9:00 PM group orientation meeting, handouts and presentation by Tyrone Black
There will be a CASH bar

Saturday 5/18/02

9:00 AM - Form up (car pool) and depart from Jesse Besser Museum and Planetarium parking lot (The Museum is about 1/3 mile from the motel)

(Details of stops will be given out on Friday evening)
return by 6:00 PM

Sunday 5/19/02

8:00 AM - Form up (NO car pool necessary) and depart from Fletcher Motel parking lot
Continue with Karst sites
Rockport Quarry – fossil collecting
Depart for home

LODGING

**Fletcher Motel (& Grove Restaurant), 1001 US 23 N., Alpena •354-4191
•1-800-334-5920**

A block of 30 rooms have been reserved at the Fletcher Motel (\$48 ea) for people attending the field trip. People need to make their own reservations and state they are attending the Geologic Outreach Karst Fieldtrip. The hotel needs reservations by **May 3rd** or they must release the unreserved rooms.

Alpena Karst field trip information sources:

(MBGS has seven 1995 Guidebooks left, but the 1983 and 1995 guidebooks and other guidebooks are available on MBGS CD #'s 2 and 3. They have a sale of all three CD's for \$30. For copies contact: Tom Hoane, DNR - Forest, Mineral and Fire Management Division, Ph: 517-241-3769 Fax: 517-335-3264, hoanet@state.mi.us)

Some words from Ty:

"The trip will have a gathering Friday night with a short talk and images, an all day field trip on Saturday, returning by 6 PM. All sites will be standard field hazards, the most dangerous will be at the sinkhole preserve. With "family style" I will visit fewer sites, those that are safest to negotiate with a crowd (but it will include the sinkhole preserve in Alpena County). We will spend a longer time looking at more variety of features at fewer stops than on the MBGS trips I have done in the past."

Other things to do in the area:

The Jesse Besser Museum and Planetarium will be open during the field trip.

Museum: \$3.00 for adults, \$2.00 seniors and children 5-17, under 5 free. Hours; Fridays 10-5, Saturdays 10-5 and Sundays noon-4. The weekend of the field trip they will have all of the permanent displays open, Lumbering Gallery, Avenue of Shops, Historic Alpena (an outdoor exhibit), Alpena 1920's-1940's plus a special exhibit called Bustles to Bloomers featuring 1870's-1920's clothing.

Planetarium: \$1.00/person and they have a show scheduled for 2:00 pm on Sunday, May 19th. It will be either the spring or summer sky (doesn't know exactly when it changes from spring to summer but was thinking that it would most likely be spring since summer isn't technically until June).

There is an opportunity to take a ferry-boat trip to view off-shore karst. Let Ty & Chris know if you're interested in this (\$10-15 per person). IF there are enough people for a load (15 person per trip), then maybe we can arrange for 1-2 trips.

Visit the Alpena webpage for more local information.

REMEMBER to RSVP to Ty & Chris and make your room reservations by May 3rd.

FIELD TRIP: Glacial Geology of Berrien County

When: Thursday June 20, 2002

Start Time: 9:30 a.m.

Non-State geologists are also welcome.

This trip is unusual in that it is being scheduled to be held during work hours. The trip content will reflect the value of understanding and properly describing glacial geology in the conduct of our various job duties. Please discuss this activity with your supervisors to obtain permission to attend on work time and expense, if possible.

The Geology Outreach Committee will sponsor a one day glacial geology field trip/training on Thursday June 20, 2002 for State geologists, at Berrien County. On this trip we plan to **evaluate complex glacial successions and discuss the best ways to describe the glacial sediments.** The trip will be run by Kevin Kincare, GSD and organized by Larry Bean, WMD.

We will decide on a meeting place in Berrien County at a later date.

We will start at 9:30, which will require Lansing staff to leave at 7:30.

Car pooling is a MUST. People should car pool from the Lansing and district offices. We will provide a list of attendees closer to the training date so that you can coordinate a ride. People should pack their own lunches, because there are 5 stops that we want to hit and not much time.

Lodging: For people who want to stay over the night before, the Benton Harbor Days Inn (right off I-94 at US-31 south) has been charging the GSD field crew around \$45/night which includes a free breakfast at the restaurant next door.

We will send out an itinerary at a later date for those people who sign up to attend. To sign up or to ask questions please contact Larry Bean, WMD Livonia, at: beanl@michigan.gov or 734-953-1469.

Lawrence Bean
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Michigan Department of Environmental Quality
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Douglas L. Daniels
Senior Geologist
(616) 567-3621
Fax (616-567-9440)

**MICHIGAN BASIN GEOLOGY SOCIETY FIELD
TRIP
DETROIT SALT COMPANY MINE TOUR
April 27th, 2002**

WHERE: Detroit Salt Company, 12841 Sanders Street, Detroit, MI 48217
313-841-5144

WHEN: Saturday, 27 Apr 02, two tours @ 830am & 11am As of this date the 11:00 am slot for the mine trip is full so we are only taking subs for that list. The 8:30 am slot has six thus far.

COST: None unless there is expense printing up a guidebook for the geology

DRESS: The mine is 59°F so a light coat, jeans, and boots are required.

EQUIPMENT: Bring a sample bag along for salt specimens. Hard hats, a mine belt, and a mine light will be provided by the Detroit Salt Company.

PHOTOGRAPHY: Still cameras only. No video cameras please.

AGE LIMIT: Thirteen and above ok.

PARTICIPANT LIMIT: Fifteen for each tour. First come, first served.

REGISTRATION DEADLINE: Wednesday 24 Apr 02

LUNCH: After the last tour we will all descend on some suitable eatery recommended by our tour leader, Emanuel Z. Manos.

DETROIT SALT COMPANY MINE TOUR	
NAME: _____	
ADDRESS: _____	
E-MAIL ADDRESS: _____	
Ph#: _____	FAX#: _____
REGISTRATION FEE ENCLOSED (if we ask for one): _____	
PLEASE MAIL, FAX, OR E-MAIL THIS FORM (and registration fee if we ask for one)	
TO: Leonard Espinosa, Forest, Mineral, and Fire Management, PO Box 30452, Lansing, MI 48909-7952; Fax# 517-373-2443, Ph# 517-335-3248, espinosl@michigan.gov	

