

MISSISSIPPI GEOLOGICAL SOCIETY

eBULLETIN

Volume 69

No. 9

May 2021

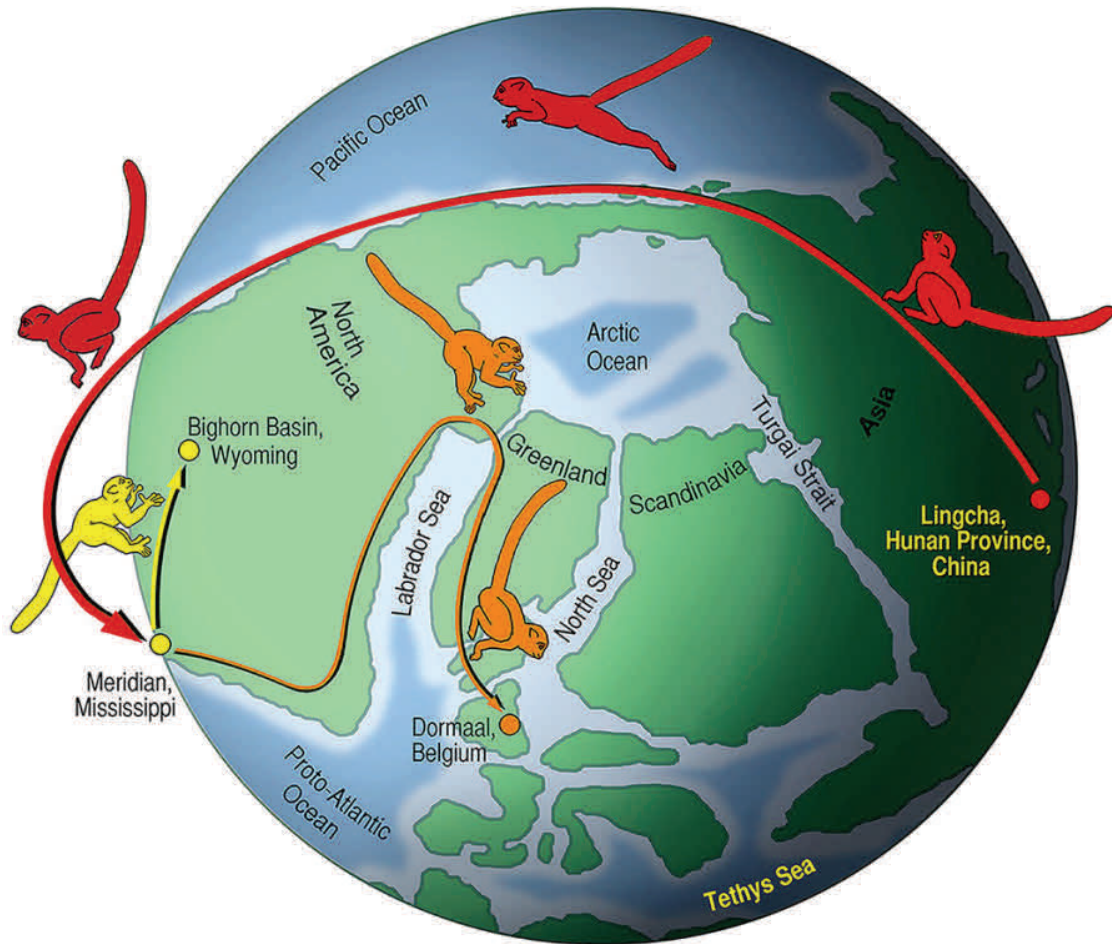


Illustration: Mark A. Klingler / Carnegie Museum of Natural History

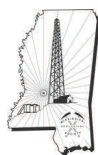
BOLAND & DUSTIN JOHNSON SCHOLARSHIP AWARD WINNERS

THE PALEOCENE-EOCENE BOUNDARY IN MISSISSIPPI

Dr. David T. Dockery, RPG, Office of Geology

OIL PATCH QUIZ

Steve Walkinshaw, Vision Exploration



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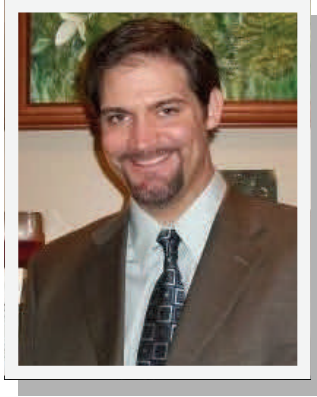
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PRESIDENT'S LETTER

David Snodgrass, MSOGB



Dear MGS Membership,

It is my honor to report the MGS has selected its Boland Scholarship winners and the allocations are being distributed as you read this communication. Individuals selected included students from the University of Mississippi, Mississippi State University, the University of Southern Mississippi and at Millsaps College. Congratulations to you all and continue the great work in your academic and future endeavors.

Although things are starting to get back to normal, we are still trying to get back on track with the monthly luncheons at the River Hills Club in Jackson, MS rather than the occasional Zoom meetings. I have been in contact with Bob Herr with the SPE, and we are working to get live speakers as soon as possible. We are shooting for August 11, 2021 followed by the annual fall BBQ in September. The MGS will reach out to its membership by email once that is organized. Please be patient.

The MGS membership year is from June through May. Please remember to renew your membership on or before June 2021. You can find our application/renewal form online at <http://www.missgeo.com/join.htm>.

We are still looking to fill the leadership role of President of the MGS. For personal reasons I must step aside soon. To the extent possible I will continue to stay involved with the MGS. If you are a current member and would like to get involved and are interested in trying something new and fun while enhancing network contacts and your leadership skills please contact me to discuss at dsnodgrass@ogb.state.ms.us or by phone at 601-576-4930 or any of the MGS officers listed on our website <http://www.missgeo.com> to express your interest in volunteering your time to this great organization.

With kindest regards,

David H. Snodgrass, MGS President



MGS SCHOLARSHIP AWARDS

The Lawrence F. Boland Memorial Scholarship Fund Trust, Inc. is pleased to announce the 2021 winners of the Lawrence F. Boland Memorial Scholarships and the Dustin Johnson Memorial Scholarship.

The 2021 winners of the Lawrence F. Boland Memorial Scholarships are:

Lindsey C. Howard, Millsaps College

Linah Turner-Chism, Mississippi State University

Esther Gnaridia Goita, University of Southern Mississippi

Sarah Rose Simmons, University of Mississippi

The 2021 winner of the Dustin Johnson Memorial Scholarship is:

Madelyn Marie Barber, University of Mississippi

These winners were selected from among outstanding students nominated by their departments.

The Boland Scholarship is offered to one junior or senior geology student at each Mississippi college and university offering geology degrees. Candidates are nominated by their departments. Selection is based on academic excellence, geological curiosity, character, ability to communicate, and to a lesser extent, financial need. The Boland Scholarship has been presented since 1983.

The Dustin Johnson Award is usually offered to one junior or senior geology student from among Mississippi colleges and universities offering geology degrees. Candidates are nominated by their departments. The recipient is a student who has demonstrated character and determination, overcoming challenges while successfully pursuing a geological degree. Financial need is an important criterion.



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Crude Oil WTI (NYM \$/bbl) Front Month

[+ WATCHLIST](#)

☀️ OPEN

Last Updated: May 24, 2021 at 1:08 p.m. EDT - Delayed quote

\$ **65.89**

SETTLEMENT PRICE 05/21/2021

\$63.58

▲ 2.31 3.63%



Natural Gas Continuous Contract

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☀️ OPEN

Last Updated: May 24, 2021 at 1:08 p.m. EDT - Delayed quote

\$ **2.962**

SETTLEMENT PRICE 05/21/2021

\$2.977

▼ -0.015 -0.50%





MONTHLY POST

Dr. David T. Dockery III RPG

THE PALEOCENE-EOCENE BOUNDARY IN MISSISSIPPI

David T. Dockery III, RPG

Morgan F. Schaller and Megan K. Fung published an article on an extraterrestrial impact at the Paleocene-Eocene boundary in the October 13, 2018, issue of the *Philosophical Transactions of the Royal Society A* (Volume 376, Issue 2130) in which they attributed the onset of the P-E boundary hyperthermal event to the impact. Based on the chemistry of micro-spherules at the boundary in three wells in the North Atlantic Basin (Figure 1), they argued that a cometary impact vaporized CaCO₃ target rocks, which mixed with cometary carbon, to create the onset of the P-E Carbon Isotope Excursion (CIE). While such micro-spherules have not been found in Mississippi, the P-E CIE has been documented in two test holes in Lauderdale County in the Meridian area.

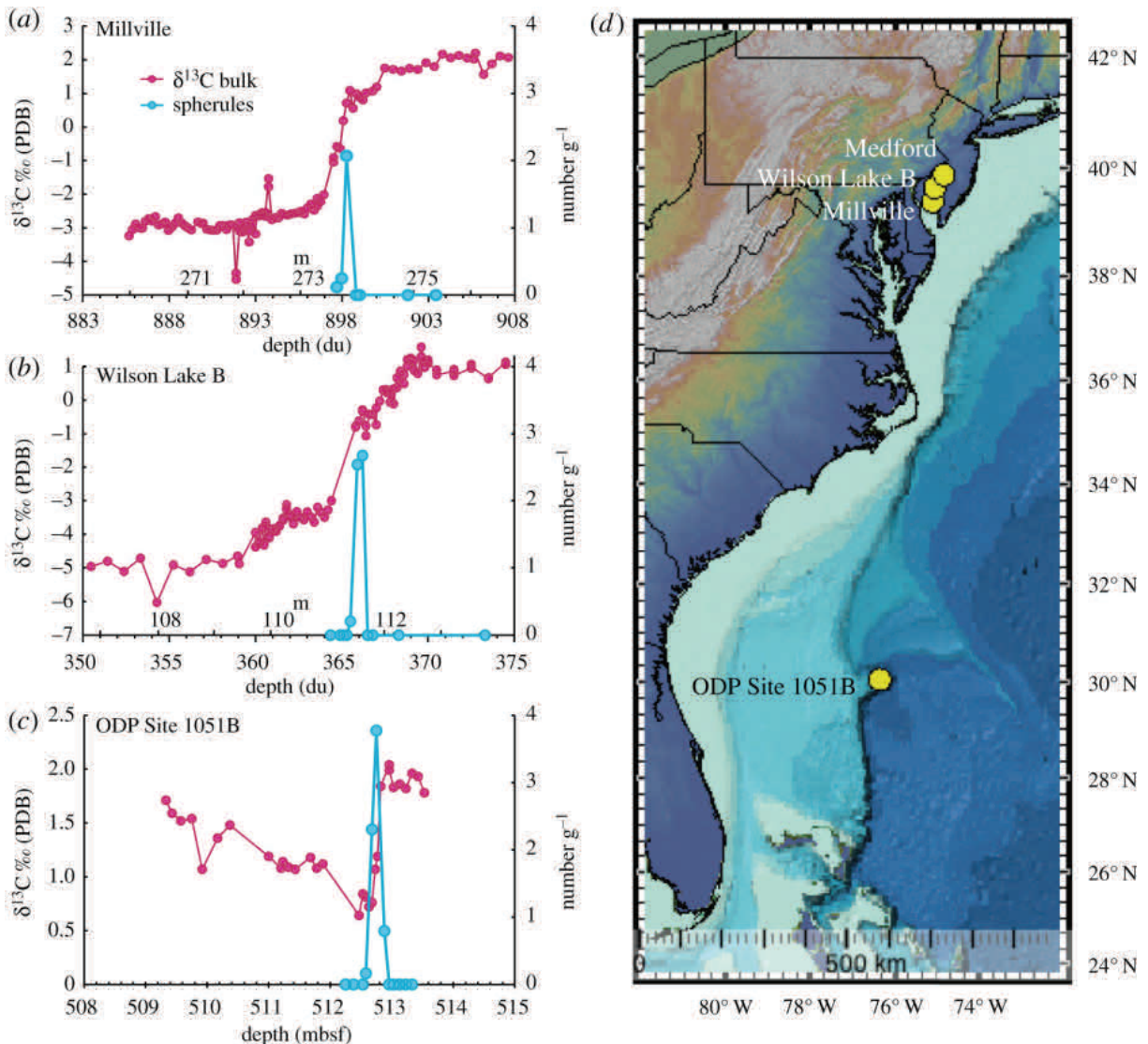


Figure 1. From Schaller and Fung, 2018 with coreholes identified at right and, at left, distribution of spherules by depth for the Millville, Wilson Lake B, and ODP Site 1051B boreholes in blue and the CIE in red.



MONTHLY POST

Dr. David T. Dockery III RPG

The T-4 Sand, a fossiliferous glauconitic sand in the Upper Tuscahoma Formation at the Red Hot Truck Stop locality (featured in the previous issue of the MGS Bulletin), contains the dinoflagellate *Apectodinium* Acme Zone, which marks a period of earth climate hypothermia that lasted some 200,000 years or less at the base of the Eocene Epoch. A similar glauconitic sand some ten feet below the Tuscahoma-Bashi Formation contact in the Harrell core, which was drilled six miles south-southwest of the Red Hot Truck Stop site, contained the CIE at its base. The Walmart core in Meridian contained an expanded section of glauconitic sand with the CIE within a glauconitic sand bed some 58 feet below the surface and some 30 feet below the T-4 Sand. Of interest here is how close is the occurrence of Mississippi's reportedly second oldest primate specimen of *Teilhardina magnoliana* to the base of the CIE, a measure of its geologic age.

Belgium also claims the second oldest primate fossil (perhaps a matter of national pride). Thus, Professor Appy Sluijs of Belgium sent his student Linda van Roij to study the Harrell core in the MDEQ Office of Geology Core and Sample Library. Figure 2 shows the analysis of Sluijs, Roij, and others, of that core with the CIE present at the base of a glauconitic sand containing the *Apectodinium* Acme Zone.

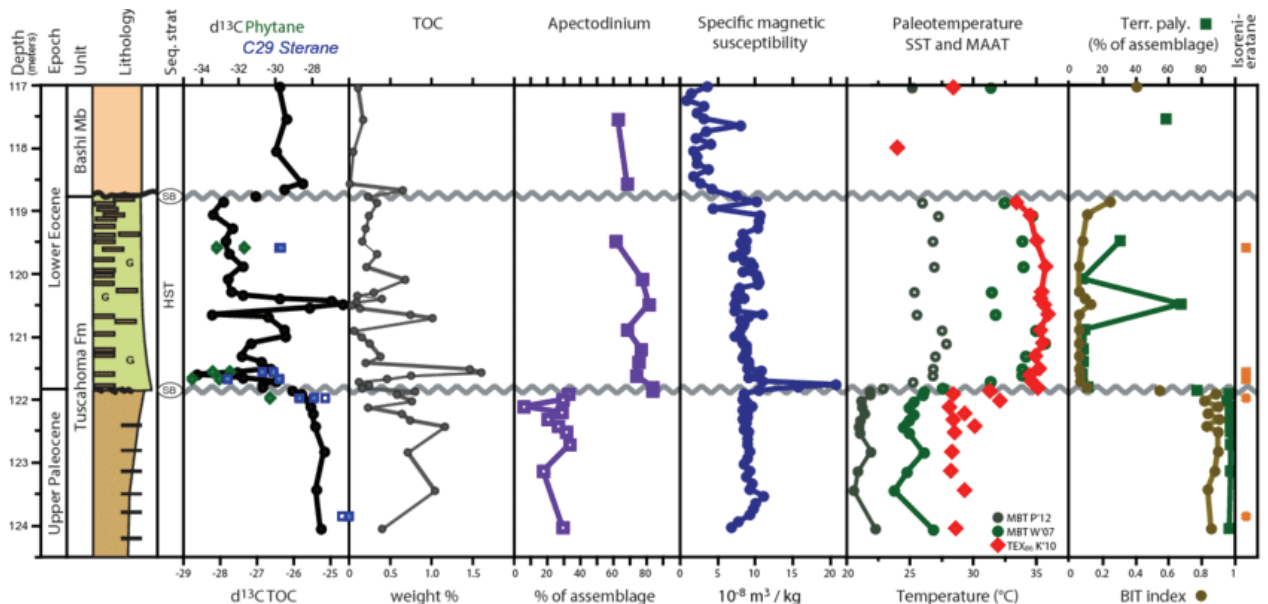


Figure 2. Figure from A. Sluijs, L. van Roij, G. J. Harrington, S. Schouten, J. A. Sessa, L. J. LeVay, G.-J. Reichart, and C. P. Slomp, 2014, Warming, euxinia and sea level rise during the Paleocene-Eocene Thermal Maximum on the Gulf Coastal Plain: implications for ocean oxygenation and nutrient cycling: *Climate of the Past*, v. 10, no. 4, p. 1421-1439, Figure 3.



MONTHLY POST

Dr. David T. Dockery III RPG

Figure 3 locates the Harrell core, marked by a star, with other complete Paleocene-Eocene boundary sections worldwide. According to the legend, the Harrell site shows a sea level rise, photic zone euxinia, and a temperature rise of 5-6 to 7-8 degrees centigrade.

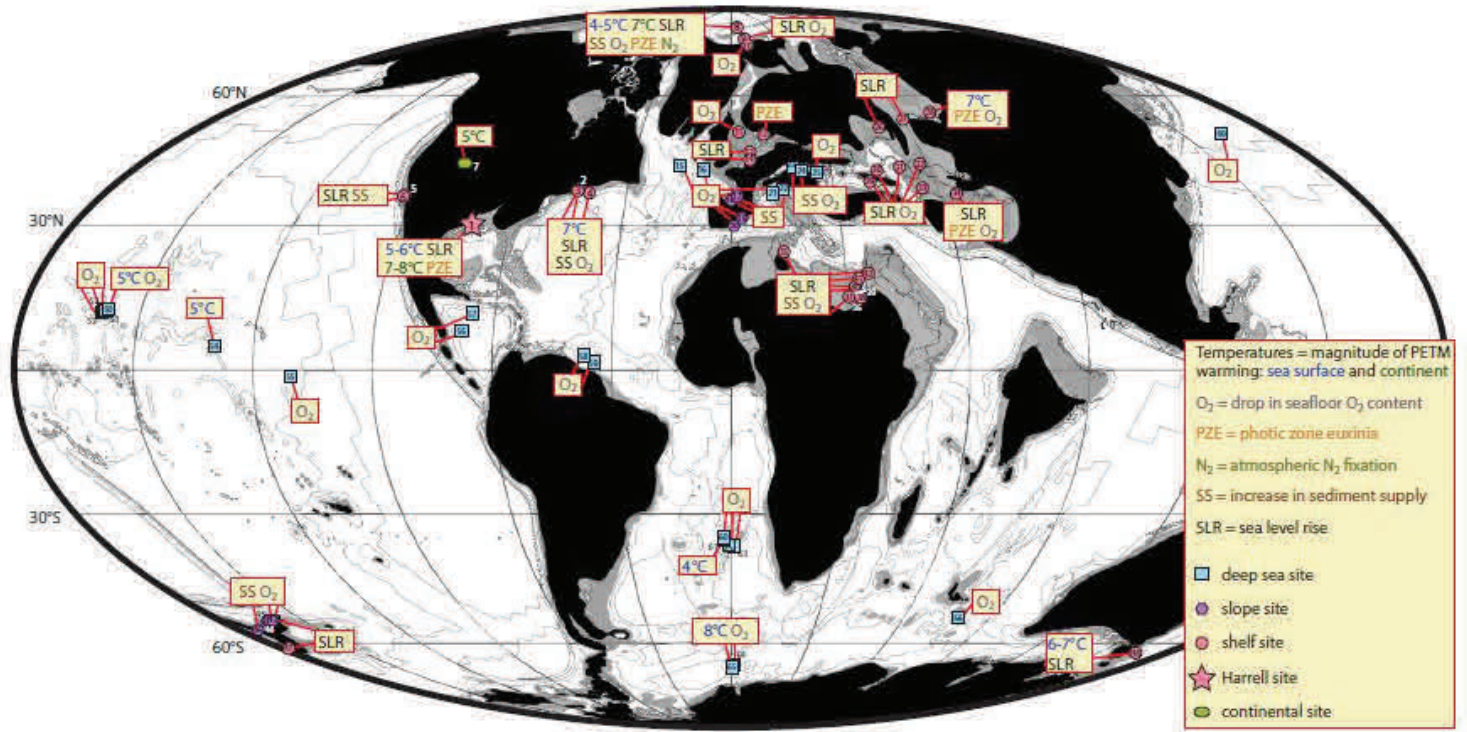


Figure 3. Preserved Paleocene-Eocene boundary sections worldwide. Star marks the Harrell core site, which according to the legend shows a sea level rise (SLR), and photic zone euxinia (PZE), and temperature rise of 5-6 to 7-8 degree centigrade (from A. Sluijs et al., 2014, Figure 6).



MONTHLY POST

Dr. David T. Dockery III RPG

Figure 4 shows Linda van Roij standing beside boulders from the Bashi Formation in front of the Mississippi Museum of Natural Science, boulders salvaged from the Meridian Walmart construction site.



Figure 4. Linda van Roij, a Dutch graduate student at Utrecht University studying the Paleocene-Eocene boundary in Mississippi and elsewhere, standing on the grounds of the Mississippi Museum of Natural Science among fossiliferous boulders from the Bashi Formation, which were transported to the museum from just above the Paleocene-Eocene boundary in Meridian, Mississippi. The picture (1112) was taken on November 14, 2008 (From *The Geology of Mississippi*, 2016, Figure 472)..



MONTHLY POST

Dr. David T. Dockery III RPG

Figure 5 shows Professor Guy Harrington of England and his student Phil Jardine, who were the first to study the Harrell core and who worked with Sluijs and Roij on its publication; they are standing in front of the core boxes.



Figure 5. Guy Harrington (left) and his Ph.D. student Phil Jardine (right) from the University of Birmingham at Birmingham, United Kingdom, at the Office of Geology core storage facility on North West Street in Jackson sampling the Harrell core for fossil pollen and carbon isotopes. Picture taken on May 13, 2008 (From *The Geology of Mississippi*. 2016. Figure 471).



MONTHLY POST

Dr. David T. Dockery III RPG

So, who has the second oldest primate? That is still hotly debated. Figure 6 shows the first proposed migration route from China to Belgium to Wyoming.

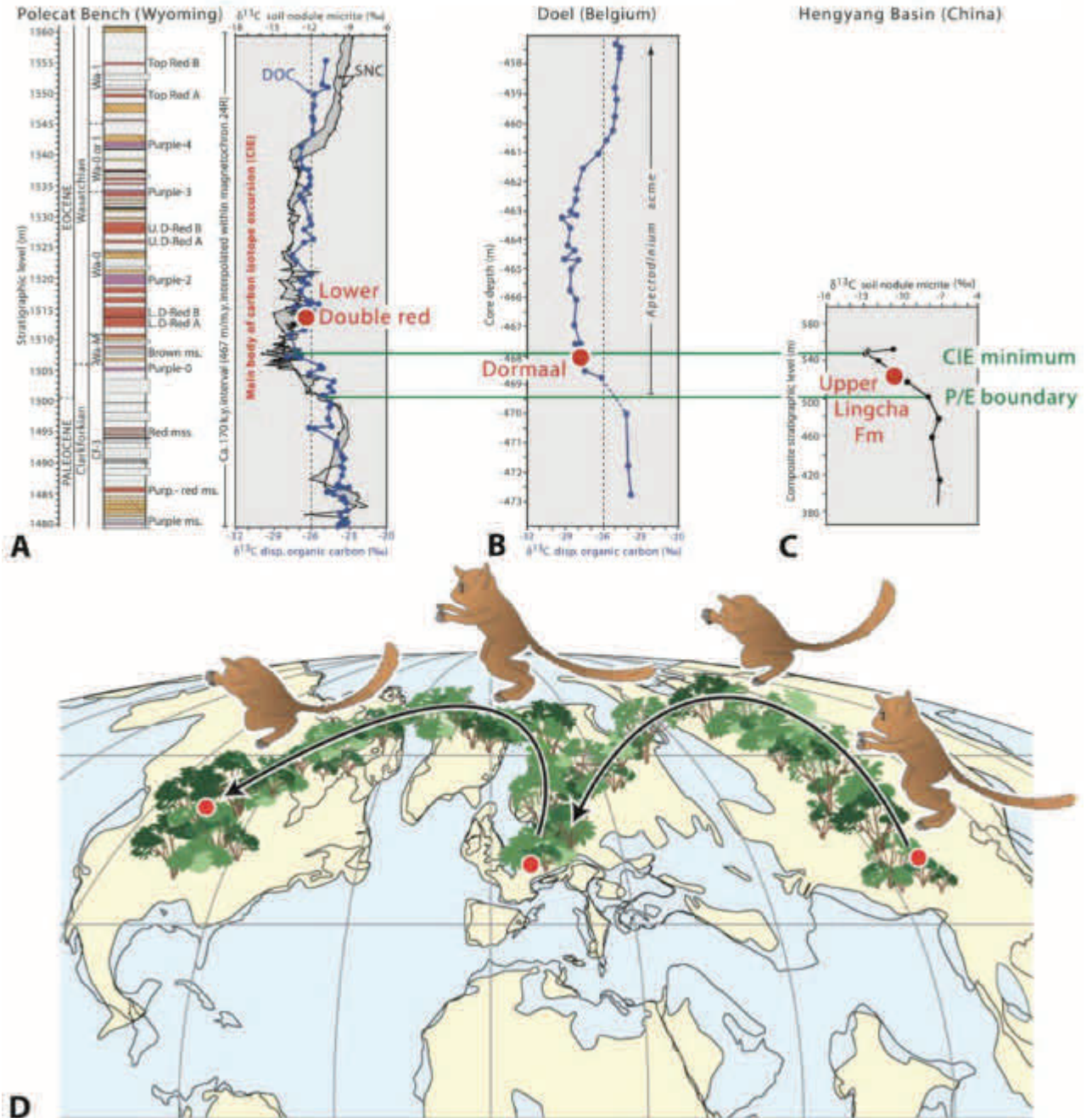


Figure 6. Before the publication of *Teilhardina magnoliana* from Meridian, this was the model of *Teilhardina* migration out of China--from China to Belgium and to Wyoming.



MONTHLY POST

Dr. David T. Dockery III RPG

Chris Beard, who named *Teilhardina magnoliana*, proposed the route in Figure 7, noting the primitive nature of the fossil teeth. This route is from China to Mississippi to Wyoming and to Belgium.

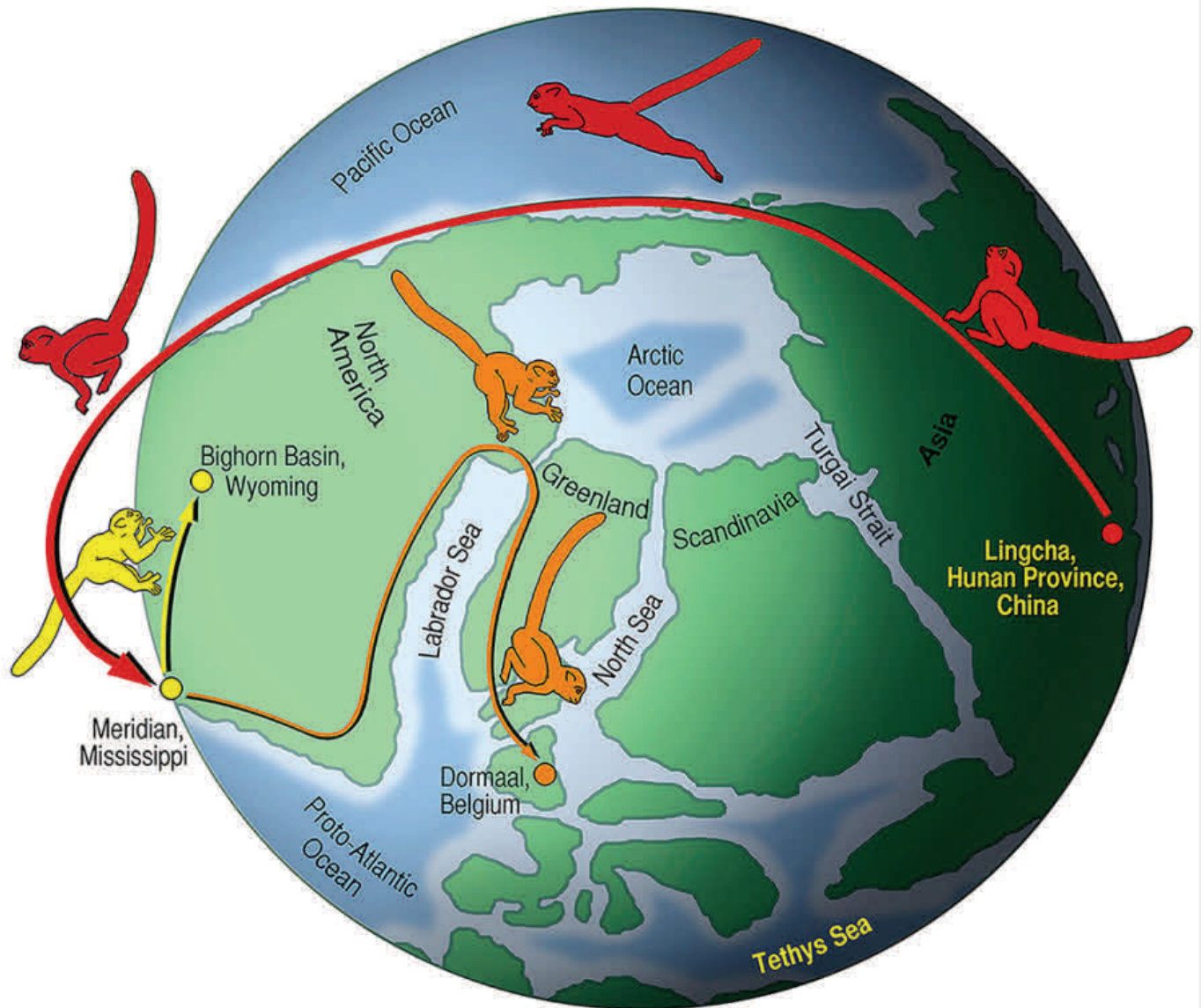


Illustration: Mark A. Klingler / Carnegie Museum of Natural History

Figure 7. Migration route of early primates 55 million years ago from China, around the eastern Pacific and northern Gulf of Mexico margin to Meridian, Mississippi, and then north to Wyoming and east to Belgium by way of the North American east coast and Greenland (according to Beard, 2008).



GEOLOGY POST

ARTICLES, PAPERS or NEWS?

ATTENTION!!!!!! Industry, Professors and Students:

I am adding a dedicated section that includes more content from the industry and our schools.

Submissions can include anything from professional papers, thesis abstracts, job opportunities to pictures. Anything!!!!

If you have any information or news you would like to share with the Society **PLEASE** email them to the MGS Editor at:

mcaton13@yahoo.com

Thanks & Regards,

Matt Caton
Editor



MONTHLY QUIZ

Steve Walkinshaw

OIL PATCH QUIZ

Oil patch quiz time. Oil was first discovered around 80 years ago in this country, which stands at the crossroads between significant geological and geopolitical events.

Several large fields dominate production here; one, a large onshore field, is shown. In this field, oil was discovered not in the primary target, but an older reservoir.

The principal reservoir of the largest field complex is one of the most heterogeneous carbonate reservoirs in the world, with 5 distinct carbonate/evaporite depositional cycles.

Questions...

Part 1: What country am I referring to?

Part 2: What onshore field am I referring to?

Part 3: What's the (a) name and (b) age of its primary reservoir?

Part 4: What's the largest gas field in this country?

Part 5: What company discovered it?

Part 6: What's its principal reservoir ("C")?

Part 7: What diagenetic process created "D"?

Part 8: What are the organosedimentary structures ("O") shown in core tomograph "E" called?

Part 9: What type of carbonate porosity is labeled "Q"?

Part 10: What accounts for the white color labeled "T" in "N"?

Part 11: What mineral is labeled "R" ("J", "L" and "M")?

Part 12: What's labeled "S"?

Bonus:

Part 13: What mineral is shown in "H"?

Part 14: What caused the linear black features within the crystal?

Part 15: What is "F"?

Answers at end of Bulletin



MONTHLY QUIZ

Steve Walkinshaw

RESIDUAL GRAVITY - LARGE FIELD **EAST - WEST 3D LINE ACROSS LARGE FIELD** **OUTCROP OF PROLIFIC RESERVOIR IN NEIGHBORING COUNTRY**

A **B** **C**

LARGE SURFACE FEATURE - THIS COUNTRY

D

CORE TOMOGRAPH **FOUND ON BEACHES HERE** **FLATTENED 2D LINE MONTAGE CROSSING SOUTH SIDE OF ARCH - THIS COUNTRY**

E **F** **G**

CRYSTAL OF CERTAIN MINERAL **CARBONATE FACIES - PRINCIPAL RESERVOIR**

H **I**

THIN SECTION / SEM IMAGES **SHALLOW MARINE SETTING - THIS COUNTRY'S COASTLINE**

J **K** **L** **M** **N**

T

5 km

5 cm

Full credit for the source of these images to be provided once the quiz has been solved.

GEO LINK POST

USGS TAPESTRY OF TIME AND TERRAIN <http://tapestry.usgs.gov> The CCGS is donating to all of the 5th and 6th grade schools in the Coastal Bend. Check it out—it is a spectacular map. You might want a framed one for your own office. The one in my office has glass and a metal frame, and it cost \$400 and it does not look as good as the ones we are giving to the schools. Call Owen 510-6224 if you want one for your office for \$150. Duncan, Mike, Chris, Dave, Bob Randy, Seb., Kevin, Ken, Craig, Patrick, Robert.

FREE TEXAS TOPO'S <http://www.tnris.state.tx.us/digital.htm> these are TIFF files from your state government that can be downloaded and printed. You can add them to SMT by converting them first in Globalmapper. Other digital data as well.

FREE NATIONAL TOPO'S [http://store.usgs.gov/b2c_usgs/b2c/start/\(xcm=r3standardpitrex_prd\)/.do](http://store.usgs.gov/b2c_usgs/b2c/start/(xcm=r3standardpitrex_prd)/.do) go to this webpage and look on the extreme right side to the box titled TOPO MAPS DOWNLOAD TOPO MAPS FREE.

<http://www.geographynetwork.com/> Go here and try their top 5 map services. My favorite is 'USGS Elevation Date.' Zoom in on your favorite places and see great shaded relief images. One of my favorites is the Great Sand Dunes National Park in south central Colorado. Nice Dunes.

<http://antwrp.gsfc.nasa.gov/apod/astropix.html> Astronomy picture of the day — awesome. I click this page everyday.

<http://www.spacimaging.com/gallery/ioweek/iow.htm> Amazing satellite images. Check out the gallery.

<http://www.ngdc.noaa.gov/seg/topo/globegal.shtml> More great maps to share with kids and students.

www.geo.org Don't forget we have our own web page.

<http://micro.magneet.fsu.edu/primer/java/scienceoptiscu/owersof10/>

<http://asterweb.jpl.nasa.gov/gallery/default.htm> Great satellite images of volcanoes

<http://terra.nasa.gov/gallery/> More here

www.ermapper.com They have a great free downloadable viewer for TIFF and other graphic files called ER Viewer.

www.drillinginfo.com This is an incredible (subscription) well and completion data service for independents. Can be demo'ed for free.

<http://terrasrver.com/> Go here to download free aerial photo images that can be plotted under your digital land and well data. Images down to 1 meter resolution, searchable by Lat Long coordinate. Useful for resolving well location questions.

<http://www.fs.fed.us/gpnf/volcanocams/msh/> This is a live cam of Mt. St. Helens refreshed every 5 minutes. At the bottom are old videos of past eruptions in this cycle. It is worth a watch especially now.



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2020-2021

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(Note: Please contact Steve Walkinshaw at (601) 607-3227 or mail@visionexploration.com for details concerning placing your ad on the MGS web site.)

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1979-1980	Philip R. Reeves		



MONTHLY QUIZ

Steve Walkinshaw

ANSWERS

Alright! This quiz took a brief look at an intriguing country and its impressive geology. We even had a peek at a radiation-damaged apatite crystal. Here's the quiz recap:

Part 1: What country am I referring to? Qatar

Part 2: What onshore field am I referring to? Dukhan

Part 3: What's the (a) name and (b) age of its primary reservoir? (a) Arab / Zekrit, (b) Upper Jurassic

Part 4: What's the largest gas field in this country? North Dome

Part 5: What company discovered it? Shell

Part 6: What's its principal reservoir ("C")? Khuff

Part 7: What diagenetic process created "D"? karsting

Part 8: What are the organosedimentary structures ("O") shown in core tomograph "E" called? rhizoliths

Part 9: What type of carbonate porosity is labeled "Q"? interparticle

Part 10: What accounts for the white color labeled "T" in "N"? precipitated halite, from evaporated seawater

Part 11: What mineral is labeled "R" ("J", "L" and "M")? gypsum

Part 12: What's labeled "S"? microbial (thrombolitic) filaments

Part 13: What mineral is shown in "H"? apatite

Part 14: What caused the linear black features within the crystal? they are tracks formed by radiation damage following the fission of individual uranium atoms; track analysis (and chlorine content) used in an age-dating technique known as AFTA (apatite fission track analysis)

Part 15: What is "F"? a whale shark egg (whale sharks frequent the waters in the North Field area)



MONTHLY QUIZ

Steve Walkinshaw

CREDITS

Image "A": "Near Surface Velocity Model of the Dukhan Field from Microgravity and Resistivity to Enhance PSDM Seismic Imaging" (K. Setiyono, S. Gallo, C. Boulanger, F. Bruere, F. Moreau and B. Rondeleux), European Association of Geoscientists & Engineers, Conference Proceedings, 76th EAGE Conference and Exhibition 2014, June 2014, Volume 2014, p. 1 – 5

Image "B": "Processing and Preliminary Interpretation of the Ultra High-Density Full-Azimuth 3D Seismic Survey, Dukhan Field, Qatar" (S. Seeni, K. Setiyono, H. Zaky, J. Snow and L. J. Weber), European Association of Geoscientists & Engineers, Conference Proceedings, IPTC 2014: International Petroleum Technology Conference, January 2014, cp-395-00261

Images "C" and "I": "Khuff: A Major Reservoir" (Alireza Bashari, Research Institute of Petroleum Industry, Tehran; (Image "C" photo credit: Christopher Toland, Oolithica Geoscience Ltd.)), GEOExPro, Volume 6, No. 4 – 2016

Image "D": "Near-Surface Characterization for Seismic Exploration Based on Gravity and Resistivity Data" (Jan Mrlina), Search and Discovery Article #41892 (2016)

Image "E": "Discovery of an Eolianite in the Upper Dalan Member, Khuff Formation, South Pars Field, Iran" (Gregory Frébourg, Claude-Alain Hasler, Eric Davaud, Jérémie Gaillot, Aurélien Virgone, and Mohammad Kamali), Search and Discovery Article #40493 (2010)

Image "F": <https://line.17qq.com/articles/hgdmlhlov.html> (whale sharks are known to frequent the North Dome / South Pars Field area of the Persian Gulf, seasonally aggregating around the platforms)

Image "G": "The Middle and Late Jurassic Intraself Basin of the Eastern Arabian Peninsula: Chapter 2, Structural development of the Arabian Intraself Basin region" (Edited by A. O. Wilson, Independent Consultant, London, UK), Geological Society, London, Memoirs Volume 53, 2020

Image "H": "World Leaders in Thermal History", Jane Whaley, GEOExPro, Volume 7, No. 1, 2010

Images, "J", "K", "L", "M" and "N": "Gypsum Stromatolites From Sawda Nathil: A Geological Relict From Salinas Along the Fourth Coastline of Qatar" (Christian J. Strohmenger and Jeremy Jameson), Search and Discovery Article #51389 (2017)