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the fifth element of life came from meteors

by Mike Baldwin

Carbon, oxygen, hydrogen, nitrogen—these are the building blocks of life. These were abundant in the early days of Earth. But where did phosphorus (the fifth element of life) originate?



In August 2004 University of Arizona researchers proposed that Schreibersite, an iron-nickel phosphate found in iron meteorites, could have supplied an abundant of phosphorus. Life originated on Earth because of the vast amounts of water present. Carbonaceous meteorites impacting Earth in the early days contained amino acids, sugars and nucleobases, but do not contain phosphorus. Iron meteorites contained the phosphorus needed. Water provided the catalyst whereby the components could meet, mix together and react.

Researchers found this link by submerging meteorites rich in phosphorous in pure water, and studying the nuclear magnetic resonance of the complicated compounds of the phosphide, schreibersite. Phosphorus is central to life. It forms the backbone of DNA and RNA because it connects these molecules' genetic bases into long chains.

>>> see the fifth element on page eight >>>

january MAGS events

- 07 6:30p MAGS Board Meeting • Blue Plate Café, 5469 Poplar Ave.
- 08 8:30a DMC Field Trip to Aquadale, North Carolina [see page 6]
- 14 7:30p MAGS Membrship Meeting • Shady Grove Presbyterian Church
5535 Shady Grove Road • Bring refreshments and displays

Our January program will be presented by stone cutter, Steve Webb. Mr. Webb cuts stones from all around the world to produce everything from table tops to walls. He is also a natural history buff.

2005-2006

officers and board of directors

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president's corner

WC McDaniel

Have you paid your
2005 dues? Dues are the
club's primary source of
income and provide for building
rental, newsletter publication and
mailing, federation dues and special

events and activities. The club and show accounts are in good financial condition and we will report detailed information to you at the January meeting.

As we enter 2005, Ida Jean, Roger, Raynee, Sherida, Lou and David are busy planning programs and field trips. If you have an idea for a program for field trip, now is the time to speak up. Look for a couple of new additions to the membership meeting program during the first quarter of 2005.

I encourage all members to help get the new year off to a good start. Bring a display in January. Remember there was some nice prizes awarded at our Christmas party for our monthly winners.

The show committee will begin cranking up its meetings and planning as the April 23/24 dates move closer. Be sure to mark your calendars and plan on being an active volunteer and participate. We are also in need of gem dig material. If you went on some 2004 (or before) field trips and collected some extra material, now is the time to donate. We request that you clean the material if you can.

WC

remembering Diane McIlwain

by Mike Baldwin



On Wednesday, the 22nd of December, MAGS lost a dear friend. Diane McIlwain passed away during the night and she will be greatly missed. Diane was one of the kindest and gentlest people I have ever had the pleasure of meeting. Diane and David spent many hours exploring prospective new collecting sites for MAGS, and many more hours leading our club on rockcollecting adventures. Diane enjoyed her adventures, but not nearly as much as she enjoyed her grandchildren. Zachary and Taylor loved their grand-

mother and looked forward to their trips with Diane and David, whether it was scooping up geodes in middle Tennessee or searching for drusy quartz in Missouri. They will have wonderful memories of those excursions. I cannot recall many field trips that did not include Diane and David. She waded the creeks of Mississippi, screened for shark's teeth at Frankstown, picked up blastoids in Alabama and spread her happiness to each of us who collected beside her. Yes, those of us who remain will think of Diane each time we walk the gravel bars of

Richardson's Landing. We'll think of her each time we tromp through the sticky gray mud of Vulcan Quarry in search of crinoids, each time we hammer out a quartz crystal at Mount Ida. Diane was always so enthusiastic, always willing to help, always there to volunteer in any way she could at rock shows, field trips and club meetings. There will be fond memories of her and a void that cannot be filled. David, your friends in MAGS hurt with you as we mourn the loss of your wonderful wife and companion. We miss her too.

local news from the Commercial Appeal

December 18, 2004: **Memphis on the Web-Rocks for Jocks:** Mickie Anderson: Did you know that Memphis had an Archaeology and Geology Society? We didn't either. Check 'em out at memphisgeology.org.

December 19, 2004: **Path to link Fayette, river:** Lela Garlington: Good news for all you MAGSters who love to collect on the gravel bars and along the banks of Nonconnah Creek. Money has been earmarked and construction should begin next summer on a 12-foot-wide paved greenbelt trail for bikers and hikers along Nonconnah Creek, all the way from Fayette County to the Mississippi River. The first section to be completed will be a 2-mile loop from Hacks Cross Road to Forest Hill-Irene. The second phase will be Forest Hill-Irene to the Collierville town limits near Houston Levee. The town of Collierville has agreed to finish another section from Schilling Farms Middle School to Houston Levee Road. I can hardly wait to check it out!

sunshine report

by Cornelia McDaniel

We are greatly saddened with the news of the passing of Diane McIlwain on December 22. She was a very active member of our MAGS family and will be greatly missed. Our thoughts are with David, Zach, Taylor and the other members of Diane's family during this time of mourning.

Here's hoping that everyone had a safe and healthy holiday season and will start off the new year in positive spirits. If you know of anyone in need of CHEER, please contact Melba Cole. It has been a pleasure having served as Membership Coordinator over these past four years as I now pass this baton to Melba.

website stats

by Mike Baldwin

A brief look at www.memphisgeology.org (our website) from 01.21.02 through 12.29.04:

Visits [every time someone comes to the site]..... 111,642

Hits [every page viewed on the site]492,791

Average visits/day this past month 293

Top pages in the past 30 days:

home page 569 hits

argon2003.pdf 544 hits

Explorer0203.pdf 507 hits

rocknews0602.pdf 393 hits

Explorer0403.pdf 324 hits

rocknews1204.pdf 301 hits

2005 dates to remember

	Board Meeting	Membership Meeting	Due Date for Newsletter Articles
Jan	6	14	--
Feb	3	11	January 23
Mar	3	11	February 20
Apr	Mar 31	8	March 20
May	5	13	April 24
Jun	2	10	May 22
Jul	Jun 30	10	June 19
Aug	4	12	July 24
Sep	1	9	August 21
Oct	6	14	September 25
Nov	3	11	October 23
Dec	1	9	November 20



january birthdays

Birthstone = Garnet

- 1 - Patrick Long
- 4 - Veronica Swink
- 5 - Floyd Lenz
- 6 - Lauren Holliday
- 7 - Rosie Crawford
- 7 - Michael Long
- 12 - Sam Norris
- 14 - Aimee Hackett-Whitley
- 21 - Richard Gunter
- 25 - Michael Cates
- 27 - Max Whitley
- 29 - Herbert Horowitz
- 30 - Bill Smith
- 31 - Johnny Holliday
- 31 - Teresa Noyes

mags roadcut

by WC McDaniel

MAGS Roadcut brings you little tidbits and useful information each month. This month, Roadcut will focus on websites where you can obtain information about rocks, minerals and fossils as you plan your trips and set your calendar for 2005.

american federation of mineralogical societies

<http://www.amfed.org/sfms/index.html>

rock collecting

<http://www.42explore.com/rocks2.htm>

paleontology and geology

<http://geology.er.usgs.gov/paleo/>

petrified wood

<http://www.intersurf.com/~chalcedony/Petwood.html>

<http://www.mashell.com/~estrauss/pwoodfx.html>

gravel

<http://www.intersurf.com/~chalcedony/gravel1.html>

Parsons wood

<http://www.nashvillefossils.com/fieldtrips/parsons-fieldtrip/parsons.html>

mineral data base

<http://www.mindat.org/index.php>

agates

<http://csd.unl.edu/agates/agatelexicon.asp>

general links

<http://ndgeosociety.tripod.com/links.htm>

<http://memphisgeology.org>

crater of diamonds

by Mike Baldwin

Until diamond mining began along the Wyoming-Colorado border recently, the Crater of Diamonds, Murfreesboro, Arkansas, was the United States' only diamond producing area. Although diamond-mining companies have failed many times at Crater of Diamonds, more fine diamonds have been found by individuals on or near the surface at Crater of Diamonds than at many of the world's best commercial

diamond mines. More than 100,000 diamonds have been found there.

The largest diamond, the Uncle Sam, weighed in at 40.25 carats. Colors of the Arkansas diamonds vary from white to pale



pink, brown and yellow. The Smithsonian includes two of the Crater diamonds in its gem collection in Washington, DC.

If you decide to try your hand at diamond hunting at the Crater of Diamond State Park, consider yourself fortunate if you find one. Although diamonds are scarce, there are many other minerals to be found at the park, including many varieties of quartz (chalcedony, carnelian, amethyst, agate, lace agate and jasper), satin spar, alabaster and trachyte (in black and green).

Reference: June Culp Zeitner; *A Thorough and Accurate History of Genuine Diamonds in Arkansas*; Lapidary Journal, March 2004; PriMedia Company, Devon, PA.

southeast federation news



DMC program of the SFMS field trip committee an official field trip of the High Point Gem and Mineral Club saturday, january 8, 2005 • 8:30 a.m. • aquadale, nc

Where: James Bowers Limonite Prospect, Aquadale (Norwood), NC

When: Saturday, January 8th, 2005 • 8:30 am. until dark. Meet at James Harold Bower's brick house (just past the school) at (8:30 a.m.) and find out where to park.

Owner: James Bowers • 24024 Old Aquadale Road, Albermarle, NC • Phone: 704-982-7351. For any information or directions please do not call Mr. Bowers. Contact the HPGMC. We do not need to unnecessarily disturb Mr. Bowers. This information is for emergencies only!

Tools and Conditions: This is a fee-based prospect and collectors are asked to pay \$5.00 each. Bring the usual quarry supplies: drinking water, food, eye protection, rock pick, chisels, pry bars, crack hammer, wrapping paper, containers, gloves, sturdy boots, and snacks. There are no stores nearby. Cubes may be found on low, muddy water flooded holes and requires picks or mattocks to break into the saprolitic, but hard, matrix rock. The best clusters, with cubes up to 2 1/2" on an edge, are found by digging. Similarly cubes and clusters are plentiful on the surface. A screen or sieve may be helpful.

Directions: From Archdale take I-85 South and exit onto highway 109 South at Thomasville. Drive south on 109. Pass through the town of Denton and take a right at the bridge onto 49 west. In Richfield where 49 and 52 intersect, turn left (south) onto highway 52 and take highway 52 South through Albermarle. Continue south on highway 52 approximately 10 miles to state road SR 1918. Turn right on to SR 1918 at sign for South Stanley High School. Keep left at fork shortly thereafter. Cross the railroad tracks and pass South Stanley High School on left and continue to Bower's brick house immediately on left. We will meet here, pay fee, and find out where to park.

Greg Hall, President • High Point Gem and Mineral Club • 3300 Hillside Drive, High Point, North Carolina 27265 • Home 336-887-1667 • Office 336-883-3168 • Cell 336-906-4343 • email hughall@yahoo.com

Field trips are open to all members of associated clubs of the DMC program of the SFMS Field Trip Committee and to all members of SFMS member clubs who have provided their membership with SFMS liability insurance. Because of insurance requirements, members of the GENERAL PUBLIC are NOT invited on this or any DMC program field trips!

january SFMS shows and other events

JANUARY 28-30, 2005 • Largo, FL • Pinellas Geological Society • 29th Annual Gem, Jewelry and Mineral Show and Sale, Largo Cultural Center, Parkside Room, 105 Central Park Drive. Hours: 28-29, 10am-6pm; 30, noon-5pm. Contact Hugh Sheffield at 727-894-2440.

FEBRUARY 18-20, 2005 • Vero Beach, FL • The Treasure Coast Rock and Gem Society • Gem and Jewelry Show, Vero Beach Community Center, 14th Avenue and 23rd Street. Hours: 18, noon-5pm; 19, 10am-5pm; 20, 10am-4pm. Contact Pedro Aroz, 608 Arcacia Road, Vero Beach, FL 32963 or 772-231-0005.

FEBRUARY 26-27, 2005 • Jackson MS—Mississippi Gem and Mineral Society • 46th Annual Gem, Mineral, Fossil and Jewelry Show. A&I Buildings, State Fairgrounds at High Street. Hours: 26, 9am-6pm; 27, 10am-5pm. Contact Ashley Redden, 601-925-8272 or asredden@netzero.com.

november 04 in review

november 2004 board meeting notes

Raynee Randolph

The MAGS board of directors met November 04, 2004 at The Blue Plae Café, 5469 Poplar Avenue. The following wer present: Mike Baldwin, James Butchko, Nancy Folden, Idajean Jordan, Cornelia and WC McDaniel, Terri and Park Noyes, Raynee Randolph, Bill Scheffer, Roger Van Cleef and Lou White.

The following reports were given: **[01] Treasurer's Report;** **[02] 1st VP Report**—Thanks to Lou and Park for guiding the Richardson's Landing trip. November 20 will be the trip to Black Rock Quarry. Hard hats, steel-toed shoes and safety goggles are required for entrance into the mine. This is a working mine and we must adhere to the safety regulations; **[03] Program Report**—Guy Weaver will be presenting our program of "Hematite to Pig Iron"; **[04] Library Report**—Two new tapes and a book have been added to the library. There will be no library open in December due to the Christmas party. Items taken out can be returned in January without an overdue fee; **[05] Youth Report**—We will have a review of what has been covered over the past year and we will have a dinosaur mug drawing; **[06] Membership Report**—Sympathy to Lucy Wallace. A reminder to board members to furnish drinks for the membership meetings. "Rock Starz Shine" this month will be Lou White and Park Noyes. An application for membership has been accepted from the Behm family; **[07] Show Report**—The show committee met November 11 at 6:30; **[08] Old Business**—Rock swap and fish fry at Alan Parks will be November 13. Admission will be a box of rocks for the gem dig or for grab bags. Accommodation and attraction information will be sent to Eileen Price for the SFMS board meeting in April MAGS will provide the mornign snack for the meeting. Thoughts of Lake Superior Agate to be given as momentos from Memphis; **[09] New Business**—TEST is applying for a grant to make and distribute "Rock Boxes". MAGS will provide funding for the boxes. Christmas party details as follows: board members will provide drinks. The club will supply the ham, turkey, tablecloths, cutlery and plates. Membes will provide all other food accompaniments. We will eliminate the tree and the poinsettias. Pictures will be taken in front of our "fireplace". Adjourned at 7:35pm.

november 2004 membership meeting notes

Raynee Randolph

The MAGS November membership meeting was held at Shady Grove Presbyterian Church on November 12, 2004, presided by President WC McDaniel. There were 42 membes present and one visitor. The visotr was Elaina Gordan.

Up-Coming Events: November 13—Rock swap and fish fry at Alishia and Alan Park's Admission will be one box of rocks. November 20—Field trip to Black Rock quarry. Steel-toed shoes mandatory. Brng heavy tools to dig and pry with. You must sign a waiver before entering the mine. A copy of the waiver and the sign-up sheet will be here to fill out. December 10—Annual Christmas party. Members are asked to bring a dish to share, a dessert, or both. The club will provide everything else. If you wish to participate in the gift exchange then you **MUST** bring a wrapped, club-related gift, with an approximate value of \$10.00. If you bring a guest with you, then bring a gift for that guest to exchange. The library will be closed the month of December so keep your library items until January without an overdue fee. Ther will be a silent auction thoroughout the evening, so bid high and bid often.

Program: Guy Weaver will be speaking about the "Wayne Furnace site".

New Business: The nominating committee has selected a slate of officers for 2005-2006. Nominations will be accepted from the floor. Nominations were closed and the slate of officers were elected by acclimation.

Displays: Adult—Steve Hadju [Richardson's Landing finds]; Allen and Jean Helt [sharks' teeth, wire wrapped items and bolas]. Display winners were Allen and Jean Helt. There were two door prizes awarded and the meeting adjourned for refreshments at 9:10pm.

the fifth element of life came from meteors

<<< from page one <<<

Phosphorus is vital to metabolism because it is linked with life's fundamental fuel, adenosine triphosphate (ATP), the energy that powers growth and movement. And phosphorus is part of living architecture. It is in the phospholipids that make up cell walls and in the bones of vertebrates.

In terms of mass, phosphorus is the fifth most important biologic element, after carbon, hydrogen, oxygen, and nitrogen. Phosphorus is much more rare in nature than are hydrogen, oxygen, carbon, and nitrogen. There is approximately one phosphorus atom for every 2.8 million hydrogen atoms in the universe, one for every 49 million hydrogen atoms in the ocean, and one for every 203 hydrogen atoms in bacteria.

The most common terrestrial form of the element phosphorus is a mineral called apatite. When mixed with water, apatite releases only very small amounts of phosphate.

Scientists have tried heating apatite to high temperatures, combining it with various strange, super-energetic compounds, even experimenting with phosphorous compounds unknown on Earth. This research has not explained where life's phosphorus comes from.

Thus began the work of University of Arizona (UA) researchers and the idea that meteorites are the source of living Earth's phosphorus. Earlier experiments had shown that phosphorus became concentrated at metal surfaces that corroded in the early solar system.

Meteorites have several different minerals that contain phosphorus. The most important one is iron-nickel phosphide, known as schreibersite. Schreibersite is a metallic compound which is extremely rare on Earth. But it is plentiful in meteorites, especially iron meteorites, which are peppered with schreibersite grains or slivered with pinkish-colored schreibersite veins.

During the schreibersite/pure water experiments at UA, researchers observed a variety of different phosphorus compounds being formed. One of the most interesting ones was P2-O7 (two phosphorus atoms with seven oxygen atoms), one of the more biochemically useful forms of phosphate, similar to what's found in ATP. Previous experiments had formed P2-O7, but at high temperature or under other extreme conditions, not by simply dissolving a mineral in room-temperature water.

Iron meteorites have from about 10 to 100 times as much schreibersite as do other meteorites. UA conclusions are that meteorites were critical for the development of life because of some of the minerals, especially the P2-O7 compound, which is used in ATP, in photosynthesis, in forming new phosphate bonds with organics (carbon-containing compounds), and in a variety of other biochemical processes.

*Reference 01: Anne Sasso; **Life's Fifth Element Came From Meteors**; Discover; Buena Vista Magazines; New York, New York; January 2005.*

*Reference 02: Lori Stiles; **Meteorites Supplied Earth Life With Phosphorus**; <http://www.spacedaily.com/news/early-earth-04l.html>; 25 August 2004.*

Photo Credit on page one: Mike Baldwin

congratulations to Rhena South: 2004 junior of the year

by Mike Baldwin

For the fourth year in a row, the honor of SFMS Junior of the Year goes to a MAGS youth member. The 2004 award was announced in December at the SFMS Annual Meeting in Suwanee, Georgia. Congratulations to Rhena South for winning this year. Rhena is an extremely active MAGS member. She is a frequent contributor of articles to the **MAGS Rockhound News**. She also had an article published in **Lodestar** in 2004. Rhena keeps a journal of all her MAGS activities, family adventures, and Girl Scout activities. Rhena has shared her love of rocks, minerals and fossils with MAGS on several occasions by presenting displays at membership meetings.

Rhena will be presented with a very nice fossil specimen and a plaque for her accomplishments. Keep up the good work Rhena.

I encourage all of our youth members to make plans now to enter the SFMS Junior of the Year contest for 2005.

rocks tell the story of earth

by Rachel M. Barker; USGS

The Earth is made of rock, from the tallest mountains to the floor of the deepest ocean. Thousands of different types of rocks and minerals have been found on Earth. Most rocks at the Earth's surface are formed from only eight elements (oxygen, silicon, aluminum, iron, magnesium, calcium, potassium and sodium), but these elements are combined in a number of ways to make rocks that are very different.

Rocks are continually changing. Wind and water wear them down and carry bits of rock away; the tiny par-

ticles accumulate in a lake or ocean and harden into rock again. The oldest rock that has ever been found is more than 4.4 billion years old. The Earth itself is at least 4.5 billion years old, but rocks from the beginning of Earth's history have changed so much from their original form that they have become new kinds of rocks. By studying how rocks form and change, scientists have built a solid understanding of the Earth we live on and its long history.

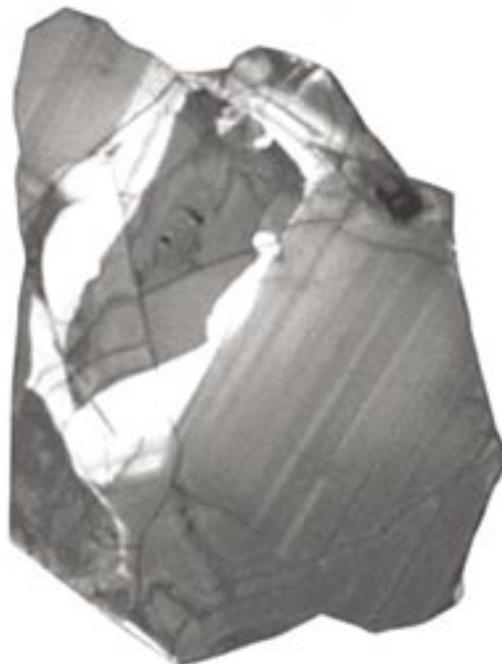
Reference: Rachel Barker; Collecting Rocks; US Geological Survey Information Services; Denver, CO.

The Oldest Rock on Earth

A rock found in the Australian desert nearly 20 years ago has provided scientists with the oldest-known zircon crystal on the earth, offering new ideas about the state of our planet 4.4 billion years ago. The zircon's most likely parent rock is a granite, formed from magma contaminated by melted continental crust sediments.

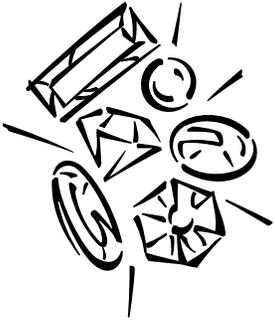
Reference: Naomi Lubick; The Oldest Rock on Earth; ScientificAmerican.com; <http://www.sciam.com/article>; 11 Jan 2001.

Photo reference: Spaceflight Now; National Science Foundation; 14 Jan 2001.



january's rock starz shine

Cornelia McDaniel



In this column, each month we recognize the volunteer efforts of MAGS members who continue to make contributions to the overall success of our club.

As we kick off this new year, I once again congratulate all the honorees from this past year and again thank you for all your valuable contributions. As the club continues its future growth, your continued services will still be of great importance to our success.

If you wish to nominate a MAGS member for volunteer recognition, please feel welcome and encouraged to contact me.

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The main purpose of Memphis Archaeological and Geological Society is to promote and advance the knowledge of the Lapidary Sciences in the mining, collecting, and identification of gemstones.



AFMS NEWSLETTER AWARDS: New Editor 7th-95 • Junior Article 3rd-98; 8th-03 • Special Pub 4th-03

DUES:

Family-\$20.00

Single-\$16.00

Junior-\$8.00



SFMS NEWSLETTER AWARDS: New Editor 1st-86; 2nd-88, 97 • New Editor (Explorer) 4th-03

Certificate of Excellence-89, 90, 91, 92, 93 • Large Bulletin 1st-87

Small Bulletin 4th-03 • Special Publication 2nd-03 • Art 77, 80, 81, 82, 86 • Junior Article 1st-03

Adult Article 2nd- 89, 90; 3rd-92; 4th-85; 5th-91, 03; 6th-87; Honorable Mention-03

MAGS Rockhound News
367 North Main Street
Collierville, TN 38017

MARK YOUR CALENDAR

Board Meeting
January 06

DMC Field Trip
January 07

Membership Meeting
January 14

No Fossil Section
Meeting in January

No MAGS Field
Trip in January

