MWF News

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WEB SITE - www.amfed.org/mwf

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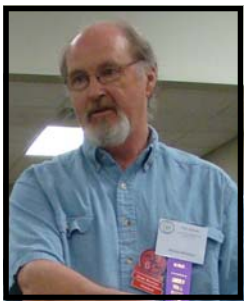
PRESIDENT'S MESSAGE

by Dennis Westman

For most clubs, we are at the transition of summer activities (field trips, picnics, etc.) and indoor meetings. It is time for your members to sit down and decide how to grow. One half of the clubs in the MWF are either losing or just maintaining membership. Do you remember at the show that young boy or girl who was thrilled with your rock or fossil? You explained it to him or her. They left thinking you were the smartest person they met all summer. When you joined the club, someone took the time to teach you about fossils or how to cut a cab. It is time to invite interested people to your club meeting. Rock clubs are not just a hobby, but a way of life. Pass on your experiences and skills to new people. Do you want to deny the fun you've had to these people interested in rocks? "But times have changed." Baloney! Kids still have rock collections and they see rock collecting as treasure hunting. How about a would-be rockhound holding a fossil and knowing it was a living creature, or turning an ugly rock into an exquisite piece of jewelry? All it takes is an invitation to your rock club. Do it! All of these new members, kids included, can be willing workers for your activities. New members seldom say no.

Speaking of a club meeting, what could we talk about that would interest potential members? The MWF has lots of programs listed in the directory. Each club has a directory. Here are a couple ideas for spur of the moment programs. What did I do on my summer vacation? Give everyone a chance to share a rock hounding adventure, a visit to a museum, the displays at a show, or a colorful character. Your program will have everyone laughing and having a great time. The potential members will leave the meeting exclaiming what a group of fun people are in your club. They would be right. The best part of a rock club is the people. I could go on a week's vacation with any of you and have a fun time. Knowing you first is not necessary. Here's the second idea. How did I become a rockhound and what is my most memorable find? You won't believe some of the stories you will hear. FYI, my memorable find was 30 years ago near Cuyuna, Minnesota. A huge boulder with some weathered out pockets lay next to the road. Having no luck, my wife told me to try that boulder. After 5 minute of protesting that it was a waste of time, I gave in to keep peace in the family. To get this waste of time out of the way, I pulled my 20# sledge out of the trunk. The boulder was filled with pockets of groutite crystals. Some were museum quality. It was so good I kept collecting way past



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UPCOMING EVENTS

SEPTEMBER

6-8: **TOLEDO, OH.** Toledo Gem & Rockhound Club's 42nd Annual Jewelry, Gem & Mineral Show; Stranahan Theatre Complex, 4645 Heatherdowns; Fri. 2-8, Sat. 10-6, Sun. 11-5; Contact: John Capuano, (419) 882-1733, jscapuano@yahoo.com.

6-8: **GREENFIELD, IN.** 500 Earth Sciences Club's Rock, Mineral, Gem Show; Hancock County 4-H Fairgrounds; Fri. 10-7, Sat. 9-7, Sun. 9-4; Contact: Cheryl Hamilton, 317.897.6639, hamiltoc2624@att.net, www.500earthsciencesclub.org.

13-15: **HOLLAND, MI.** Tulip City Gem & Mineral Club's Annual Show; Holland Civic Center, 150 W. 8th St.; Fri. 9-8, Sat. 9-7, Sun. 11-5; Contact: Dave Nienhuis, dpnienhu@sbcglobal.net, tulipcity.org.

14: **ROCKFORD, IL.** Rock River Valley Gem & Mineral Society's Rock & Mineral Swap Meet; Odd Fellows Hall, 6219 Forest Hills Rd.; Sat. 9:30-3; Contact: Bill Horschke, 815.544.2073, whorschke@yahoo.com.

20-22: **LINCOLN, MO.** Mozarkite Society of Lincoln, Inc.'s 54th Annual Gem, Mineral & Jewelry Show and Swap; Lincoln City Park; Fri.-Sun. 8-5; Contact: Ted Belich, 660.890.4983, mozarkite.com.

21-22: **CEDAR RAPIDS, IA.** Auction, Amana RV Park & Event Center Amana, Iowa Contact information @ 319-364-2868, Marv Houg or 319-551-3870, Tom Whitlatch or through the club's web site, www.cedarvalleyrockclub.org.

21-22: **HOWELL, MI.** Livingston Gem & Mineral Society's Gem, Mineral and Jewelry Show; Hartland Consolidated School, 9525 E. Highland Rd.; Sat. 10-6, Sun. 10-4; Contact: Chuck Amberger, 248.787.6586, livingstongemandmineralsociety.com.

27-29: **JOPLIN, MO.** Tri-State Gem & Mineral Society's Rock-a-Thon; Schifferdecker Park, 7th & Schifferdecker Ave.; Fri. & Sat. 9-6, Sun. 9-3; Contact: Chris Wiseman, jmc-cwiseman@sbcglobal.net.

28-29: **OSHKOSH, WI.** Oshkosh Earth Science Club's 42nd Annual Oshkosh Gem & Mineral Show; Sunnyview Expo Center, 500 E. County Road Y; Sat. 9-5, Sun. 10-4; Contact: Bob Fox, 920.235.4669, foxbooks@att.net, oesclub.org.

OCTOBER

5-6: **JACKSONVILLE, AR.** Central Arkansas Gem, Mineral, & Geology Society's 41st Annual Gem & Mineral Show; Jacksonville Community Center, 5 Municipal Dr.; Sat. & Sun. 9-5; Contact: Tom Sharp, (501) 379-8653, thom61847@yahoo.com.

5-6: **JEFFERSON, WI.** Rock River Valley Geological Society's Gem & Mineral Show; Jefferson County Fair Park, 503 N. Jackson; Sat. 10-5, Sun. 10-4; Contact: Steven Streich, (608) 655-1011.

5-6: **SPRINGFIELD, IL.** Lincoln Orbit Earth Science Society's Annual Gem & Mineral Show; Illinois Building, Illinois State Fairgrounds; Sat. 10-6, Sun. 10-5; Contact: John Washburn, (217) 498-7713, jrwashburn3@att.net.

8: **MOUNTAIN HOME, AR.** Ozark Earth Science Gem Mineral & Fossil Club's Annual Auction; Van Matre Senior Citizens Center, 1101 Spring Street; Tues. 7 p.m.; Contact: Sharon Waddell, 417.256.8948 (home), 417.274.8712 (cell), www.ozarkearthscience.org.

11-13: **WARREN, MI.** Michigan Mineralogical Society's Greater Detroit Gem, Mineral, Fossil & Jewelry Show; Macomb Sports & Expo Center, Building P, 14500 E. 12 Mile Rd.; Fri. 9-6, Sat. 9-7, Sun. 11-5; Contact: Stan Woollams, 734.994.3048, wwooll@comcast.net, www.michmin.org.

12-13: **MINNEAPOLIS, MN**. Anoka County Gem & Mineral Club's Gem & Mineral Show; HarMar Mall, 2100 Snelling Ave. North, Roseville, Minnesota; Sat. 10-6, Sun. 12-5; Contact: 763.421.8521.

19-20: **CLIO, MI.** Flint Rock & Gem Club's Earth's Natural Wonders, 10-5 both days Carter Middle School, Rogers Lane Dr. Contact: Ed Hearn, (810) 687-2339, edleo324@att.net.

19-20: **DES MOINES, IA.** Des Moines Lapidary Society's & the Central Iowa Mineral Society's, Annual Gem, Mineral & Fossil Show; Paul R. Knapp Animal Learning Center, Iowa State Fairgrounds, East University Ave. Gate; Sat. 10-5, Sun. 10-4; Contact: Steve Cunningham, 515-262-4578, steverv@mchsi.com.

25-27: **MASON, MI.** Central Michigan Lapidary and Mineral Society's 48th Annual Show; Ingham County Fairgrounds Main Arena; Fri. 6-9, Sat. 10-7, Sun. 11-5; Contact: Roger Laylin, 517.349.3249, l.r.laylin@gmail.com, michrocks.org.

ROCK HOUNDING IMPROVES FAMILY COMMUNICATION

By Charles "Wooly" Wooldridge, Nebraska State Director

Family rock collecting in Nebraska is an under-appreciated recreational activity and is more than just fun. Families who rock hound together experience better mental health and improved communication with each other.

All leisure activities contain elements which may be more or less helpful to families. Playing video games or watching television add little value to a family's communication. They are passive individualized interactions and can have negative results. A parent or parents taking their children to a ballgame is usually a more positive experience. In this situation the family members communicate and interact more, although as spectators, their level of activity is limited.

During family rock collecting, there are a number of positive factors that make it in my opinion one of the best shared recreational activities. Rock hounding offers an opportunity for family members to have a positive influence on each other, while offering a chance to be alone without being lonely. Finding a spot to hunt away from the other family members can provide a sense of separateness, while maintaining a sense of others being close by. The development of boundaries is an important element in our psycho social development. Rock collecting reinforces the establishment of personal boundaries. A person for example, should not cross another person's line of sight while searching for specimens. It is inappropriate in rock hounding to crowd into another person's spot.

Watching someone, especially kids, playing video games, as well as many other leisure activities, I get concerned about the high level of competition. In rock collecting there can be healthy competition on the size, quality, number, or even smallest specimen found. As the atmosphere of competition focuses on doing the best you can, rather than beating someone else, valuable lessons are learned.

While people rock collect for a wide range of reasons, increased cooperation and communication can be developed during the hunt. When rock hounding, people, even strangers, tend to share information about locations where rocks are located and what techniques work to find them. Collecting encourages children to gain independence through building their own collections, choosing their own collecting spots, accepting or rejecting advice, and taking responsibility for their own equipment, displays and collections.

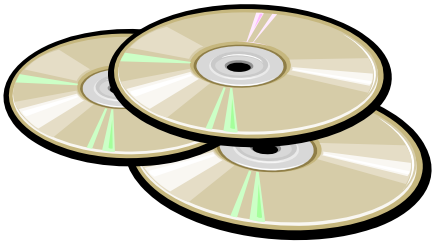
Most people find rock hounding to be relaxing. Locations in nature have been recognized through the ages as areas for reflection and tranquility. It is often a welcome relief to get away from the fast pace of urban life and the day to day problems that work, school, or even home life brings to us all.

This year make a plan to take your family rock hounding. You deserve it!

PROGRAM COMPETITION

Cindy Root, Program Chair

It is time to start creating new programs for the MWF library. I haven't received any yet, and I know the problem is that you're unsure of what an excellent job you'll do. With summer over and winter soon at our doors, it's the perfect time to starting thinking about topics that are important to you that you would want to turn into something new and exciting. (Yes, new and exciting—if it wasn't, all we would have would be boredom.) Start making those creative juices work for you and earnestly consider the possibility of preparing something for the MWF Program Competition.



WEBSITE COMPETITION

Cindy Root, Webmaster

The 2014 Website contest will be starting up in the very near future. I don't have the forms yet, but when I do, I will add them to the website. The deadline this year will be February 1, 2014. Remember that the top three entries from the Midwest will be forwarded to the American Federation. We didn't have anybody enter last year, so this is a really, really early reminder to make certain that you enter your club's website.

SCHOLARSHIP HONOREE—2014 NOMINATIONS

by Tony Kapta, MWF 1st Vice President

Is there someone that you or your club would like to honor for their contributions to the hobby? This is your chance. The Midwest Federation needs to present its selection of an honoree(s) to the American Federation which will then choose the recipients of the scholarship grants for 2014. This means:

- An individual or club needs to submit a nomination for a person to be considered as an honoree.
- Permission must be secured from the nominee, as it will take work on his/her part to select the scholarship grant recipients.
- The following information must be included with the nomination:
  1. Include services to rock clubs, students, and the community;
  2. Note accomplishments and/or contributions made to the earth sciences (geology, mineralogy, paleontology, archaeology, oceanography, etc., whichever may be his/ her specialty);
  3. List universities or colleges attended, degrees received, papers, pamphlets, or books written alone or in conjunction with someone else;
  4. List honorary and professional organizations, present or past positions held, and honors which have been received;
  5. Include personal information such as date and place of birth, marital status, number of children, home address, etc.; and
  6. If possible, include a black and white, wallet sized photo of the candidate.
- Consider the following individuals as possible nominees:
  1. Someone in a local club who stands out as worthy of such an honor due to his/her dedication and service;
  2. A Federation officer or committee chair who has served the organization faithfully and well over the years;
  3. An individual in the professional world, such as a professor at a university or college who has contributed to the hobby by helping a club with projects, or serving as a speaker for meetings and shows when called upon; or
  4. A museum curator or the staff of a geological survey who has likewise served the hobby.
- Send the nomination to: James Marburger, 334 Locust, Box 64, Hickman, Nebraska 68372, by November 15, 2013. James may be reached at 402.430.6703 or jm24122@windstream.net to answer any questions.
- Remember, if a person was nominated last year but was not selected, he/she may be considered again this year. Simply send a letter of nomination to Tony. He will have last year's files. Check with the nominee to be sure he/she is willing to be considered for next year.
- The Board of Selectors must rely on the information sent in, so include everything possible to support your nominee.

CANCELLED STAMPS

Club Name _____

Responsible Person _____

Address _____

_____

Do you want a thank you letter sent? (circle one)

Yes No

Send **cancelled postage stamps** for the Endowment Fund, along with the form above, to:

Lyle Kugler
612 S.E. 3rd St.
Aledo, IL 61231.

AFMS SCHOLARSHIP AWARDS

By Tony Kapta, MWF 1st Vice President

Every year, the AFMS gives scholarships to two graduate students from each of its member Federations. At the MWF, these students are selected by the Scholarship Honoree who is picked by the MWF at the end of each year from the nominations sent in by MWF clubs and their members. Please see the article, *Scholarship Honoree – 2014 Nominations*, on page 4 of this newsletter for more information.

This is an important honor, so if there is someone who you believe should be recognized for their contributions, please send in a nomination.

This year's Honoree was Robert Swanson of Lincoln, Nebraska. As the Honorary Award Winner, Robert selected a school and two of its graduate students majoring in one of the earth sciences, to receive the AFMS Scholarship grants of $4,000 each.

Please meet Robert Swanson, Rebecca Puta, and Jason Alexander.

Robert Swanson is the Director of the United States Geological Survey (USGS) Nebraska Water Science Center (NEWSC). The NEWSC has about 45 dedicated water science professionals located in Lincoln, Mitchell, and North Platte, Nebraska, and Coventry, Rhode Island and a budget of about $6.2 million. He joined the USGS after graduating from college as a hydrologic technician working for the Lincoln Subdistrict Office in 1978. Robert gained a wide range of experience in the Data Section as a hydrologic technician and hydrologist in the Cambridge, Ord, and North Platte (Nebraska) Field Offices. He served as field hydrologist for the National Water Quality Assessment Program's Central Nebraska River (CNBR) Basins Study Unit research team and later as CNBR Study Unit Chief. Robert moved on to the USGS Wyoming Water Science Center as the Chief of Hydrologic Surveillance in 1999 and returned to Nebraska as Director in 2004.

Robert is responsible for developing and overseeing USGS hydrologic investigations and data collection for ground-water, surface-water and water-quality programs in Nebraska, a center of excellence for hydrogeophysical investigations, hydrographic surveying, and groundwater modeling. The NEWSC's science program is managed through three sections; the Hydrologic Surveillance Section, the Hydrologic Investigations Section, and the Watershed and Riverine Integrated Studies Team. The NEWSC operates over 130 streamgaging stations, about 70 continuous groundwater recorders, and compiles ground-water levels for over 5,000 wells in Nebraska. It has international collaborative relationships with Thailand, Vietnam, Cambodia, Denmark, and Australia.

Robert is a native Nebraskan. He grew up on a farming and ranching operation in southwestern Nebraska among Ogallala outcrops. He graduated from Doane College with a major in biology and minors in geology and environmental studies. He has had the privilege to both train and study with some of the finest water scientists in the world for 33 years. He is married and has two children.

Robert is a member of the Groundwater Foundation and a board member of the Groundwater Guardian Council, the National Groundwater Association, the American Water Resources Association, and the Nebraska Water Resources Association. He is the recipient of the U.S. Geological Survey's Public Service Recognition Award and the Department of the Interior's Superior Service Award.

Rebecca Puta is a Doctoral candidate in the School of Natural Resources at the University of Nebraska – Lincoln. Rebecca earned a Bachelor's Degree in Geography at the University of Wisconsin – Platteville. She earned a Master's Degree in Natural Resource Sciences from the University of Nebraska – Lincoln, defending her thesis on "Late Holocene History of Dune Activity Along the Elkhorn River in Northeastern Nebraska." She is pursuing a Doctorate in the School of Natural Resources at the University of Nebraska – Lincoln with a concentration in natural resources, specifically soil science. Her current research work revolves around determining the phosphorus loading potential of agricultural soils in the United States to identify which areas pose the greatest risk to increased phosphorus contamination of water bodies.

Jason Alexander has worked as a hydrologist with the USGS in Nebraska since 2007. He obtained a double B.S. in Geology and Watershed Sciences from Colorado State University (2000), and an M.S. in Watershed Sciences, specializing in Fluvial Geomorphology, from Utah State University (2007). Jason uses field topographic and bathymetric surveys, mapping, stratigraphy and sedimentology, dendrogeomorphology, sediment transport measurements, geographic information system tools and analysis, hydraulic modeling, and data mining to investigate erosional and depositional dynamics of river channels and floodplains. These investigations have ranged in temporal scale from events to several decades, and over spatial scales of single channel reaches to entire river basins, and are often done as part of a multi-disciplinary effort to understand interactions between physical and biological processes. Jason is also the NAWQA-CNBR Groundwater Status and Trends leader, and the interim leader of the CNBR Surface Water Status and Trends Ecology project. As part of the NAWQA team, he also regularly participates in surface water quality sampling. Prior to coming to the USGS, Jason spent four years as a professional water resources engineering consultant.

METEORITE HUNTING IN A WISCONSIN GRAVEL PIT

by Bill Cordua

As a geology professor in Wisconsin, I am often called upon to identify rocks and minerals for the general public. Most often what they want to know if what they found is a meteorite. Most often I have to tell them, "meteorwrong." One youngster asked me, "Why can't you sometimes find meteorites in Wisconsin gravel pits?" After all, the glaciers and rivers depositing the gravels certainly came across and transported meteorites on occasion, so why not look for them in gravel pits? He's right – you should be able to, but the problem is how to recognize them.

Meteorites can be spotted in environments where few other rocks are accumulating, or where they look substantially different from what is ordinarily there. In the Sahara, for example, where there are miles and miles of light-colored sand, a black meteorite cobble will stand out. So will an odd rock perched by itself on top of an Antarctic glacier.

But Wisconsin gravel pits are tough environments for finding meteorites. The rocks are deposited dominantly by river and ice, where millions of rocks from many different environments are jumbled together. Only the hardiest of rocks will survive the mechanical grinding of centuries in the ice and fast-moving rivers. Plus meteorites, especially stony ones, weather fast, and won't stand up to the harsh earth environment very long. In addition, Wisconsin gravel pits contain many earth rocks that are magnetic - primarily banded iron ores from local iron ranges and gabbroic rocks with significant magnetic ilmenite and magnetite. These are often mistaken for meteorites. So there is a lot of what you might call "noise" to "signal" in seeking out the few magnetic extraterrestrial visitors that survived.

Still, every once in a while, there ought to be a glacially transported meteorite in a gravel pit. After all, float copper nuggets turn up from time to time. Of course they weather a nice green color, so are easy to spot. I decided to see what it would take to find a meteorite in the challenging environment of a gravel pit.

I was invited to visit a gravel pit in St. Croix County, Wisconsin in early summer, 2013. This is not far from where a documented 53-pound iron meteorite, the Hammond meteorite, was found in a farmer's field in 1884. I came armed with ToolShop magnetic pickup – a strong magnet on a four-foot long wooden handle, which I got it on sale at the local Home Depot. I wrapped a cloth cover on the magnet so that magnetic minerals would be easier to remove. I tested my tool against both iron-nickel and stony meteorites, and found both stuck well to it.

In the pit I focused on washed piles of pebble-sized materials, thinking my chances were better with smaller objects. Sure enough, I picked up quite a few pieces that stuck to the magnet. I carefully put these into a small sample bag to wash and examine at home. Once cleaned it was easy to see that many were banded iron ore and others were magnetic pieces of gabbro (figure 1). I did a have small set of pieces that were not clearly so easy to identify. I chipped off the ends, and found these were all massive magnetite – no iron-nickel metal.

Figure 1 - Meteor-wrongs from a Wisconsin gravel pit. These are mostly magnetite-bearing gabbros likely form the Duluth gabbro complex or related rock. Earth rocks!

Had I failed in my search? Not so fast! Meteoritic iron (the iron-nickel minerals taenite and kammacite) does alter to magnetite in fusion crusts that form as coatings on meteorites as they partly melt coming through the earth's atmosphere. Also iron-nickel metal can weather to magnetite when exposed to earth conditions. There was still a chance one or more of my little nondescript chunks were weathered meteorite. The key was determining if any of them had significant nickel in them.

Terrestrial magnetite commonly includes only trace amounts of nickel. Iron minerals in meteorites usually contains from 5% to over 7% nickel. I reasoned that, even after conversion to magnetite, weathered meteoritic material should have higher than trace amounts of nickel still there.

To test my remaining unknowns, I bought a little meteorite test kit from a company called Meteorites Plus. This allowed me to make a quick qualitative wet chemical test for nickel using the chemical dimethylglyoxime. Note 1: this test requires using concentrate ammonia and hydrochloric (or muriatic) acid and is not for children or for

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METEORITE—CONT'D

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those disposed to ignore printed instructions and MSD sheets! Following the instructions I mixed the appropriate solutions and tested them on the powders of a few meteorites – one from my collection and one sent as part of the kit. (Note 2: grinding up meteorites to test makes me cry, but fortunately you don't need much sample). Then I tested my unknowns in the solutions.

The two known meteorites I tried did stain the solution a lovely purplish-pink, as they should with significant nickel. Sad to say most of my gravel pit suspects tested negative for significant nickel. Apparently they were massive magnetite of earth origin, weathered free of matrix so their source wasn't obvious upon examination. BUT one of my samples (figure 2) tested positive for nickel. This piece seems otherwise indistinguishable from similar pieces showing a negative nickel test.

Figure 2 Nickel-bearing magnetite sample from a Wisconsin gravel. Meteorite? Scale is in millimeters.

Is this a weathered meteorite fragment? I did prove it was a nickel-bearing magnetite. Some library research on magnetite geochemistry revealed that nickel in terrestrial magnetite is low, only in rare cases approaching 1%. The ID as a meteorite fragment remains the best theory. So, I think it is possible, with determination, to find a meteorite fragment in a local gravel pit. All my collecting buddies got that day in the pit were a few measly Lake Superior agates!

References:

Fisher, Davenport, 1887, "Description of an Iron Meteorite from St. Croix County, Wisconsin", American Journal of Science, series 3, vol. 34 #3, p. 380-383.

Nadoll, P., et. al., 2012, "Geochemistry of magnetite from hydrothermal ore deposits and host rocks of the Mesoproterozoic Belt Group, United States", Economic Geology, vol. 107, p. 1275-1292.

Norton, O. Richard, 2002, The Cambridge Encyclopedia of Meteorites, Cambridge University Press, 354 p.

Razjigaeva, N.G. and Naumova, V.V. ,1992, "Trace Element Compositon of Detrietal Magnetite from Coastal Sediments in the NW Japan Sea for Provenance Studies" Journal of Sedimentary Petrology, vol. 62, p. 802-809.

Read, W.F., 1962, "Wisconsin Meteorite Investigations": Wisconsin Academy Review, p. 152-153.

ELECTION 2014

By Donna Moore & Cindy Root

The ballots for the election of MWF Officers and Nominating Committee Members were mailed in early August. Each member of the Executive Committee and each member club current in its dues should receive a ballot.

Please take some time to discuss with your club which members of the nominating committee to vote for. These are the people who will be selecting the people to go through the chairs and serve on the board of directors. This is the leadership of the Federation. For those who say the federation isn't relevant, this is the place your club can have some influence.

Only ballots postmarked by the September 30 deadline will be counted.

Officers:
President - Tony Kapta
1st Vice President - James A. Marburger
2nd Vice President - David Rich
Secretary - Donna Moore
Treasurer - Sandy Fuller

Nomination committee (two to be elected)
Sharon Marburger
Regina Kapta
Barbara Sky
J.C. Moore

WALKING WITH DINOSAURS

by Brian Poelker, Eastern Illinois University

I can't believe I am standing on a dinosaur nest. A long time ago I read John Horner's book, "Digging Dinosaurs." The book recounts the discovery of nests and baby dinosaurs near the northwestern town of Choteau, Montana. Now there are tiny scraps of dinosaur eggshell at my feet. A whole dinosaur egg is partially exposed. There are at least three nests at this site. The nests probably belonged to a hadrosaur, either *Hypracrosaurus stebinergi*, or *Prosaurolophus maximus*. There is no way to tell until baby dinosaur bones are discovered at the site. Excavation will have to wait, both for Mother Nature to do her work in uncovering more material and the BLM granting permission to dig. Until then, the Two Medicine Dinosaur Center, which leases the land for field trips will bring eager groups of rockhounds to view the site. This was just one of the stops I made on my two-day exploration with Timescale Adventures of the Two Medicine Dinosaur Center.

The Two Medicine Dinosaur Center, in Bynum, Montana, offers programs that last from one-half day to three days for participants. Five- and ten-day programs can be taken for course credit. For cost information, see the website in the resources at the end of the article. he Two Medicine Dinosaur Center focuses on research. They don't buy and sell fossils. Fine specimens of fossils and minerals are for sale at the nearby Trex Rock Shop.

When I was there, eighteen members of the Livingston, Montana Rock Club were finishing up the last of their three-day field study. While most of the staff was working with them, Dave Trexler, the Center's director, provided me with an excellent day-one field trip.

The area stratigraphy indicates multiple transgressions and regressions of the inland Cretaceous Bear Paw Sea into the Two Medicine strata. The Bear Paw Shale was deposited on the seafloor at the same time that the Two Medicine formation was being deposited on land. The generalized geologic column is shown below.

St. Mary Formation
Horse Thief Sandstone

Two Medicine Formation (land) Bear Paw Shale (sea)

Virgelle Sandstone
Telegraph Creek Shale
Marais Shale

Dinosaur bones have been found in the St. Mary Formation and the Two Medicine Formation. Dinosaur tracks have been found in the Virgelle Sandstone. I got a first hand view of all on the field study.

The Two Medicine Formation is a very thick deposit that ranges in age from 81 to 70 million years old. It shows three separate fauna deposits. The Lower Two Medicine contains few named species. There is a duckbill, *Acristavus*, an unnamed tyrannosaurid, and a protoceratopsid. The Middle layer contains the famous Maiasaura layer. *Maiasaura peeblesorum* is the only duckbill in that section of stratum. The tyrannosaurid, *Gorgosaurus*, is present along with the deinoychosaurs, *Troodon* and *Bambiraptor*. Most of our field study focused on The Upper Two Medicine Formation. This layer shows the greatest diversity of dinosaur species. It includes the hadrosaurs from the first paragraph of the article; the tyrannosaurids *Daspletosaurus* and *Gorgosaurus*, ceratopsians include *Prenoceratops*, *Einiosaurus* and *Achelousaurus*.

Our first site was on BLM land, which was leased to the Dinosaur Center for field trips. No collecting is permitted. I was expecting badlands, like Badlands National Park. I was surprised at how green the land was. There were many flowers of all colors but hardly a tree in sight. We walked up a low hill and Dave Trexler pointed out a hadrosaur vertebrae just lying on the ground. A few steps up the slope was another vertebrae, and then another. A bit farther up the slope there was a shattered leg. Then the fossils abruptly stopped. The rest of the dinosaur is still in the hill! Dave will hopefully get permission to excavate the dinosaur in the future.

Hadrosaur vertebrae exposed on the ground.

We walked to another location nearby and I got to stand on a dinosaur's nest. Dave is waiting for erosion to expose baby bones. Then he will apply for a permit to work the site.

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WALKING WITH DINOSAURS - CONT'D

(Continued from page 8)

The concentrations of fragments of eggshell indicate the location of a dinosaur egg in the Two Medicine formation west of Choteau, MT.

Geologist Sherman Lundy and Two Medicine Dinosaur Center Director Dave Trexler stand on concentrations of eggshell indicating nest locations. A third nest is to the left of Sherman.

The Two Medicine Formation sprang into prominence in 1978 when Marion Branvold, the founder of the Trex Agate Rock Shop in Bynum, discovered baby dinosaur fossils. These were brought to the attention of paleontologist Jack Horner, then of Princeton University. Marion took Horner to the Peebles Ranch where she found the babies. He received permission to excavate the site and found twenty-seven dinosaur nests. This was a new hadrosaur. He named it *Maiasaura peeblesorum*.

Its name is very interesting and appropriate. *Maiasaura* means "Good Mother Lizard." The species name, *peeblesorum*, is for the Peebles family who owned the land on which the nests were found. The fossils of the babies were about three feet long. Some had died while in the nest because of flooding. The fossilization showed that the bones were cartilaginous. That means that the babies were atricial and couldn't move around very well. We see the same thing in baby birds. Birds have dinosaurs in their immediate ancestry, so that makes sense. The food had to be brought to them. Who served them the leaves and berries? Good Mother Lizard, maybe father lizard, too; we don't know for sure. The *Maiasaura* site is off limits to all as it was purchased buy the Nature Conservancy for preservation. Egg Mountain, where nests of the dinosaur, *Troodon*, were found is in the same horizon as *Maiasaura*. It is also off limits but it is near a gravel road and easily viewable.

Our next stop was a visit to the Virgelle Sandstone. This layer underlies the Two Medicine Formation and is a beach/streambed deposit. It shows evidence of cross bedding interspersed with channel lag deposits. There are also layers of volcanic ash embedded in the layers. These ash deposits are used to date the strata using Ar40-Ar39radiometric dating. The section of Virgelle we encountered was deposited 81.4 million years ago. The contact between the Virgelle and the Two Medicine is a black sand stratum derived from volcanic ash. It contains a high percentage of magnetite and titanium.

At our next stop, we moved up section to the St. Mary Formation. This was deposited about 67 million years ago. A leg of a hadrosaur had already been removed and we worked on pedestalling part of the body that had been jacketed.

Jacketed dinosaur bones

(Continued on page 10)

WALKING WITH DINOSAURS - CONT'D

(Continued from page 9)

When the pedestal is completed, the jacket will be flipped, encased in plaster and transported by to the Two Medicine Dinosaur Center for reconstruction. During the process, a small therapod dinosaur was discovered under the jacket. Care must be taken to preserve it as well.

The next morning we visited the Bynum Reservoir to look at dinosaur tracks in the Virgelle. The water level was down so a lot of sandstone exposed. The tracks were huge. All show signs of weathering. The many loose, large chunks of stone made finding the tracks difficult, but it was worth the hunt. Most of the tracks are large herbivores, but one toe stood out in particular.

Compare my size 8.5 shoe next to the toe of this meat-eater!

After a morning at the Reservoir and lunch, we returned work at the Dinosaur Center. The Center offers a nice variety of displays, including a full-size dinosaur skeleton. My favorite display is that of the nearly complete baby Maiasaur found by Marion Branvold. Rather than work on the bones brought in by the staff, I opted to work on a bone I purchased from the Trex Rock Shop next door. Dave Trexler guided me through the steps of preparing the bone for either display or scientific study. Cleaning the matrix off the bone, especially the broken sections that need to be glued, is tedious but very rewarding when you see the finished product.

Hadrosaur rib (above) and fibula (below). The straw hat is used for scale.

Above is an almost complete left rib from a hadrosaur. Because of its shorter length, it is near the sacrum of the animal; probably rib #14 or 15. Below is a partial right fibula of a hadrosaur. The rock shop purchased these bones from dealers from the nearby Indian Reservation for resale.

Not only did I come home with a great overview of land the dinosaurs walked on. I came home with a couple of nice pieces to share with my students as well!

Resources:

Notes from Dave Trexler Two Medicine Dinosaur Center Field Study
Two Medicine Dinosaur Center http://www.timescale.org/
Horner, John R. Digging Dinosaurs. Harper Row Publishers. New York. 1988.
ISBN 6-06-097314-5
http://en.wikipedia.org/wiki/Two_Medicine_Formation
http://en.wikipedia.org/wiki/Maiasaura
http://www.ucmp.berkeley.edu/science/eggshell/eggshell_case1.php

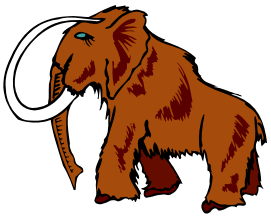
MWF Fall Meeting
October 19, 2013
Ft. Wayne, Indiana

Midwest Federation 2014 Convention in Des Moines, Iowa

by Karen Leibold

Join us in Iowa in October next year!

Where did the last glacier to "visit" Iowa terminate? Hint: It is named The Des Moines Lobe. Iowa's state capitol building sits atop the glacier's terminal moraine. The capitol building is an architectural gem that was completed in 1886. Its golden dome is covered with 23K gold, which has been replaced four times since it was built. Twenty-nine different types of marble were used in the interior. A sight and a site to see!



Recent geological discoveries in Iowa include a second impact crater under Decorah, the first being the Manson Crater. Actually, the first was second, geologically speaking. Another recent discovery is the wooly mammoth that is being unearthed by a diverse group of paleontologists, conservationists, students and others in Mahaska County.

Parts of Iowa have experienced devastating 100 year and 500 year floods in the past decade. As a result, massive amounts of water flowed over the spillways of several reservoirs, creating large gorge areas. A positive result of this is the revelation of layers of fossil rich soil and rock. The Devonian Fossil Gorge, located at the spillway of the Coralville Reservoir North of Iowa City, can be toured and features 20 discovery points. The gorge at Saylorville Lake is 15 miles North of downtown Des Moines. The Saylorville Lake Visitors Center was recently remodeled and rangers and volunteers offer a wide variety of free educational events.

The Annual Iowa Lapidary Society Gem, Mineral & Fossil Show will be held in conjunction with the MWF convention. Information about field trips, programs, exhibits, lodging, etc. will be provided this fall.

Come see us in Des Moines!

Shared Photos

Boneta Hensley, 2013 Chairman of the Missouri Mines Historic Site Rock Swap in Park Hills Missouri, which took place on June 14-16, shared these pictures of the event. It looks like something to watch for next year! Watch the "Upcoming Events" for many shows and swaps in the Midwest!

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PRESIDENT'S MESSAGE—CONT'D

(Continued from page 1)

exhaustion. Trimming out a pocket with my 4# Estwing, it glanced off the chisel and broke my thumb. Now I couldn't let my wife know or she'd make me quit. What a day! Your club is filled with stories. Potential members comment again, "What a group of fun people."

New members, kids included (with kids come parents), don't add more work, they add fun. Fellow Club Members, you probably forgot more than most people know about rocks. Don't just talk about rocks among yourselves, pass that knowledge along.

CORRECTION

by Barbara Sky

I would like to clarify a part of Martin Dougherty's article, "We Love a Road Trip," published in the June *MWF News*. Martin stated, "Fortunately for us, Barbara was able to judge ours, and she found another man to help with clerking." This is incorrect. It takes two judges to judge a Federation case. I'd like to take this opportunity to thank David Root for his assistance in judging the case.

Thanks to Martin, also, for an otherwise fine article.

SUBMISSION OF ARTICLES

Material may be e-mailed to Sharon Marburger at mwf.editor@windstream.net, or submitted via the U.S. Mail (see address on page 1). Acceptable e-mail formats include MS Word (.DOC & DOCX), Adobe (.PDF), rich text format (.RTF), or plain text (.TXT). Pictures must be in png, jpg, tiff, or gif format. If e-mailing an article, it may be included within the body of the e-mail message or sent as an attachment. Thank you for your submissions!

DUE DATE	FOR
December 1	January Issue
January 1	February Issue
February 1	March Issue
March 1	April Issue
April 1	May Issue
May 1	June Issue
August 1	September Issue
September 1	October Issue
October 1	November Issue
November 1	December Issue