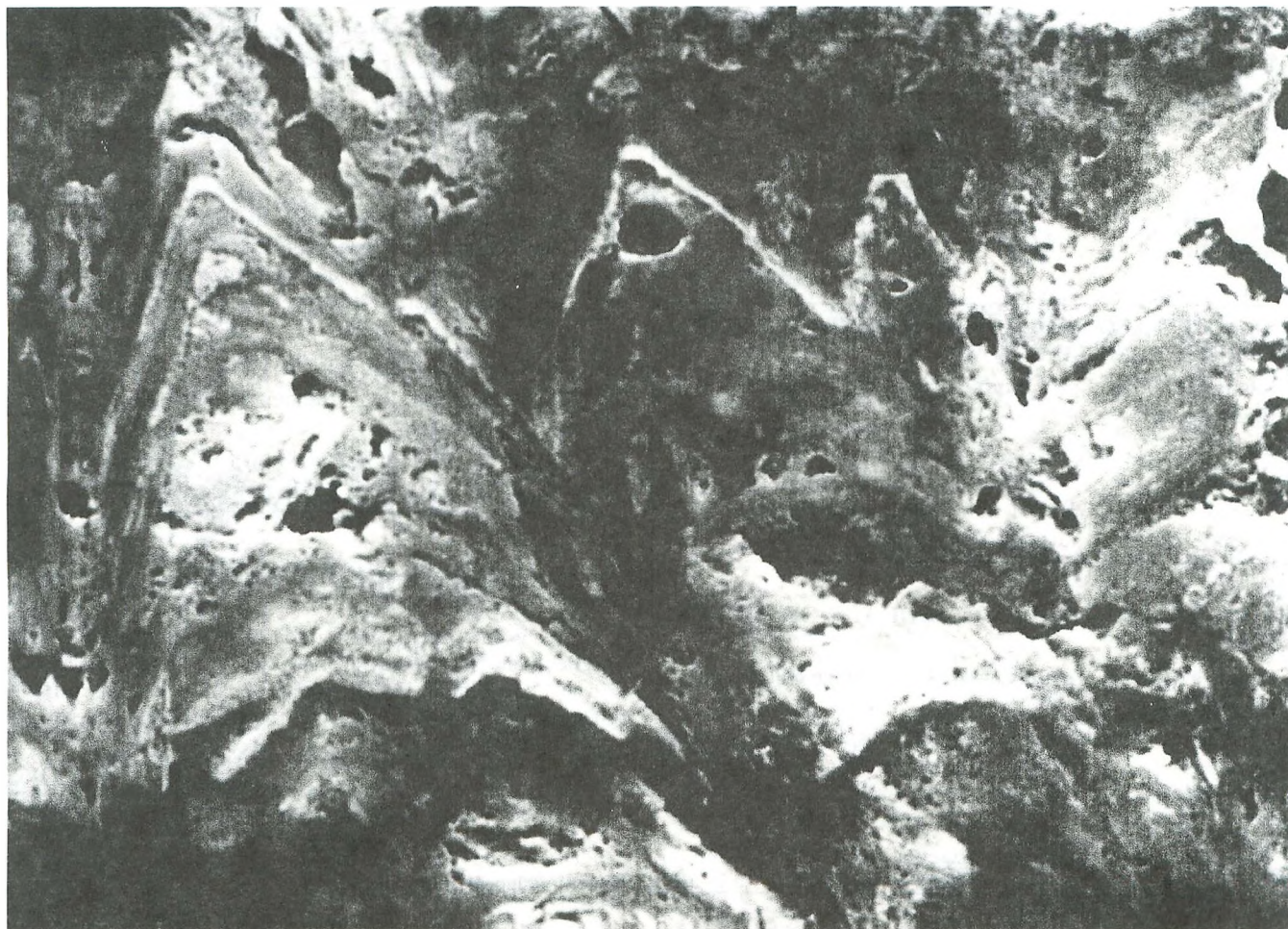


M.A.P.S. *Digest*

Official Publication of
Mid-America Paleontology Society

Volume 23, Nos 2&3
February-March 2000



MARK YOUR CALENDARS

Feb 26 ALL DAY FIELD TRIP TO AMERICAN MUSEUM OF NATURAL HISTORY

Paleontological Research Institution, 1259 Trumansburg Rd., Rte 96, Ithaca, NY

Guided tour by PRI paleontologist to newly renovated fossil halls, the world's tallest free-standing dinosaur, and the newly opened Hall of Planet Earth.

Chartered bus, admission to AMNH and guided tours included in package: Adults/Children: \$60/38 members., \$65/43 nonmembers. Register by February 19.

607-273-6623 www.englib.cornell.edu/pri

Feb 26-27 FOSSIL FAIR of Delaware Valley Paleontological Society Philadelphia Academy of Natural Sciences, 19th and Parkway, Philadelphia, PA

Fossil Exhibits, Sales, and Children's activities, including fossil sand pit. Free with Academy admission

Contact: Bill Stulpin 610-626-5243 or Ron Tillis 610-279-6241

Mar 10-12 39TH ANNUAL GREATER KANSAS CITY GEM & MINERAL SHOW (Includes fossils)

K.C. Market Center, 1775 Universal Ave., I-435 at Front St., Kansas City, MO

Fri. 9-8

Sat. 10-8

Sun. 10-5

Adults \$4.00, Under 18 \$2.00

Mar 18-19 BUFFALO GEOLOGICAL SOCIETY 32ND ANNUAL GEM, MINERAL, FOSSIL SHOW

Grange Building, Erie County Fairgrounds, South Park Ave., Hamburg, NY

Sat. 10-8

Sun. 10-6

Contact: Robert J. Hoffman, Show Chairperson

716-681-6875 <RJH52089@aol.com>

Apr 1 AMBER: THE GOLDEN GEM OF THE GEOLOGICAL PAST

Lizzadro Museum of Lapidary Art, 220 Cottage Hill, Elmhurst, IL

Doris Kemp presents theories on origin of amber and locations of major deposits. Learn different types of amber, etc. Special amber display. Bring your amber for discussion.

Slide/Lecture — Adult — 60 min. — 2:00

Free with Museum Admission Reservations: 630-833-1616

Apr 12, 13, 14, 15 CENTRAL ILLINOIS FOSSIL SHOW

DAYS INN, Hwy 67 in Macomb, IL, 1400 N. Lafayette St. Macomb, IL

Wed. and Thurs. Day and Evening

Fri. and Sat. After MAPS show hours or by appointment

For more information, contact:

Jim Wyatt, 1517 Greentree Lane, Garland, TX 75042 Tel: 972-494-3443

Apr 14, 15, & 16 MAPS NATIONAL FOSSIL EXPOSITION XXII—TEETH

Western Illinois University, Macomb, IL

Fri., Apr. 14 8 am - 5 pm

Sat., Apr. 15 8 am - 5 pm

Sun., Apr. 16 8 am - 3 pm

Friday's keynote program on shark teeth will be given by Bob Purdy from the Smithsonian, Museum of Natural History, in Washington, DC

Full information in December-January Digest. Request copies from Dale Stout. (Address on back page).

Apr 29 FOSSIL COLLECTING FIELD TRIP

Lizzadro Museum of Lapidary Art, 220 Cottage Hill, Elmhurst, IL

Trip to Braidwood, IL, to collect Mazon Creek Fossils at pit 11. Led by Don Auler. Travel by motorcoach, take lunch, wear old clothes. Rain or shine. Ages 9 - Adult — 9:00 to 3:00

Members/\$15; Others/\$20

Reservations Required: 630-833-1616 (Call Early)

Nov 13-15 THIRD CONFERENCE on PARTNERSHIP OPPORTUNITIES for FEDERALLY ASSOCIATED COLLECTIONS

Austin, TX

Goals are to foster communication and cooperation among Federal and non-Federal managers of Federal collections, to create new and revive old partnerships, and to improve technical expertise related to managing Federally associated collections of all kinds.

Texas Association of Museums

3939 Bee Caves Road, Building A, Suite 1-B

Austin TX 78746

ph. 512-328-6812; fx. 512-327-9775; e-m. Tam@io.com

<<http://museums.doi.gov/fedcoll/fedcoll3/>>

990/02 and 990/03 DUES ARE DUE

Are your dues due? You can tell by checking your mailing label. It reflects dues received by February 25. The top line gives the expiration date in the form of year followed by month--990/03 means 2000/March. Dues cover the issue of the Digest for the month in which they expire.

We do not send notices but will let you know if you are overdue by highlighting your mailing label and stamping your Digest. We carry overdues for two months before dropping them from our mailing list.

Please include your due date and name exactly as it appears on your mailing label--or include a label.

Dues are \$20 per U.S./Canadian household per year. Overseas members may choose the \$20 fee to receive the Digest by surface mail or a \$30 fee to receive it by air mail. (Please send a check drawn on a United States bank in US funds; US currency; a money order; or a check drawn on an International bank in your currency.) Library/Institution fee is \$25.

Make check payable to MAPS and mail to:

Sharon Sonnleitner, Treas.

4800 Sunset Dr. SW

Cedar Rapids, IA 52404

PROCEEDINGS OF THE BOARD

Plans are set for EXPO. Carlos Bazan and Randy Faerber will run the Silent Auction during the show. Doug DeRosear reported the tables are sold out.

It was decided to change closing hours for Sunday in 2001 to 12:00 noon because so many people leave early on Sunday anyway.

We are considering setting up a Web page for MAPS, preferably one that is low-maintenance.

In response to an inquiry concerning a nominee's eligibility for MAPS's Richardson Award, it was decided the candidate better fit the description for Strimple Award since she is technically an amateur even though she has held many positions that could be considered professional.

We have been invited to send a representative to the Third Conference on Partnership Opportunities for Federally Associated Collections in Austin, Texas, and will ask a member from that area to represent us.

Allyn Adams reported that beginning in 2002, we could no longer get April dates for EXPO at the University because the school would be using the Union. He was asked to check first for the last weekend in March and then the first weekend in May.

ABOUT THE COVER

This month's cover photograph was sent by Bruce Stinchcomb. It is a cross-section of Conophyton stromatolites possibly from the Ste. Genevieve fault region, Missouri. (x3)

See accompanying story on page 9.

The next *Digest* will be the EXPO edition. Packets with the *Digest* and Directory are put together at the show and are given out or mailed from there. If you attend the show, be sure to pick yours up once the announcement has been made that they are ready.

The next regular *Digest* will go out in June.

FROM THE PALEO SOCIETY

Dear Sharon,

On behalf of the Paleontological Society thank you for the \$3,000 donation for the PS Student Scholarship Fund. Please express the Society's appreciation to the membership of MAPS. This is a substantial contribution that will have a significant impact on our ability to support deserving graduate student research in paleontology. Such donations help insure the future vitality of Paleontologic research.

Thank you also for sending the \$100 contribution from MAPS for the Strimple Award Fund. Each year we use money from this fund to pay the travel expenses for the recipient of the Strimple Award to our national meeting. This award is one way for the Paleontological Society to show its appreciation for the support amateur paleontologists give to the science of paleontology.

Sincerely, Tomas W. Kammer, Treasurer

Dear Sharon:

Once again, I have to write to you on behalf of The Paleontological Society to express our sincere thanks for the very generous donation of \$3,000 to The Paleontological Society Students Scholarship Fund. On behalf of all of us in The Paleontological Society I want to express our thanks to the membership of MAPS for their support of students in this way. Through this gift your members are making a very important contribution to the future of paleontological research.

Thank you also for sending \$100 for the Strimple Award fund which will enable The Paleontological Society to continue to show its sincere appreciation for the enormous support that amateur paleontologists give to our science.

We are so grateful to you and to the Mid American Paleontology Society for your extremely generous support. Please pass on our sincere thanks to the membership of MAPS.

With kind regards

Sincerely, Peter R. Crane FRS, Director (of Paleo. Soc.)

FROM PRI

Dear Sharon:

On behalf of all of us here at PRI (Paleontological Research Institution), thanks to you and everyone at MAPS for your extremely generous gift to the Institution. Your contribution has been applied to our unrestricted annual fund, which provides badly needed support for general operations. Your gift will support the care of our collections, our much-expanded educational programs, our world-class publications, and research by our staff and visiting scientists.

We very much enjoy our association with MAPS, and are so very grateful for all you have done for us. Again, thank you.

Sincerely,
Warren D. Allmon, Director

CONFERENCE ON FEDERAL COLLECTIONS

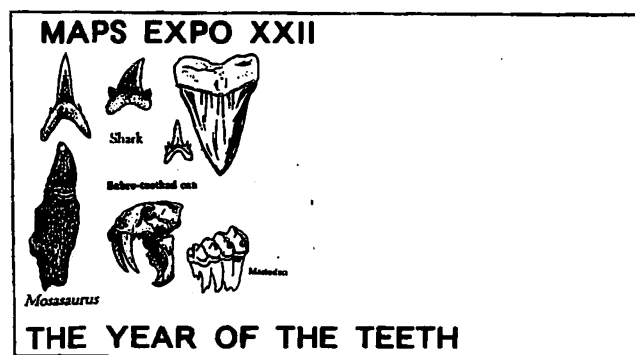
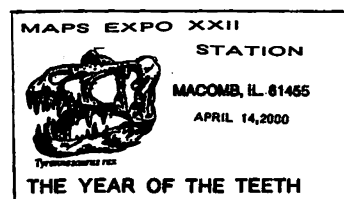
The Third Conference on Partnership Opportunities for Federally Associated Collections will be held November 13-15 in Austin, Texas. This training conference provides a forum for non-Federal and Federal participants to address issues related to the long-term management of these Federally associated collections.

Goals of the conference are to foster communication and cooperation among Federal and non-Federal managers of Federal collections, to create new and revive old partnerships, and to improve technical expertise related to managing Federally associated collections of all kinds. These collections include artifacts and specimens representing the disciplines of art, history, ethnography, archeology, documents, paleontology, geology, and biology.

Among those who are invited to attend are researchers, educators, and students of natural history. More information is available from the contacts listed in the Calendar.

POSTAL CANCEL AT EXPO

Tony Verdi has once again designed a postal cancel for MAPS EXPO. This year's cancel and cover envelope depict fossil teeth. The Post Office will set up part-time at the show. Listen for announcements. All *Digests* mailed from the show will carry the EXPO cancel.



MAPS BADGES AVAILABLE

MAPS name badges are available. To order:

- Request a MAPS name badge.
- Print your name exactly as you want it to appear.
- Include your city and state.
- Be sure to include your return address.
- Send the above information along with a check in the amount of \$6.36 to:

Designer Awards
207 Western Avenue
Davenport, IA 52801-1012
Ph. (319) 326-2222

The price includes postage, handling and tax. MAPS is not directly involved in the sale of the badges; however, please let us know if you have any problems

NEW WEB SITE LEARNING CENTER

by Dr. Judith Scotchmoor

excerpts from Association of Systematics Collections Newsletter, 12/99, V27, N6

The mission of the University of California Museum of Paleontology (UCMP) is to investigate and promote the understanding of the history of life and the diversity of the Earth's biota through research and education... (UCMP) is an active center of research, housing one of the nation's largest collections of fossils, as well as state-of-the-art facilities for the study of these fossils.

Without exhibit space, these collections have only been available to the scientific community — until the development of web technology. The World Wide Web has had a major impact on UCMP, enabling us to present paleontology and the process of science to a vast and varied audience... .

(T)he UCMP site was one of the first 25 sites on the World Wide Web and the first actual museum to display exhibits via the Internet... .As the first museum web site, we literally set the standard for thousands of other sites now in existence. We also set ourselves a goal: to fully use informational technology to facilitate communication among scientists *and with the public* in order to reverse the trend of isolating science from general audiences. . . .

Our user statistics show a huge increase in volume each September and a tapering off in June. This sends a clear message: Students and their teachers, at all grade levels and from all over the world, are using our site... .(But) (f)or the K-12 classroom user, the vastness of our web site has some disadvantages — primarily, getting lost.

Although already modularized for some purposes, we are now restructuring information into distinct learning modules appropriate for classroom and at-home learning. With support from Sun Microsystems, Pacific Bell, and a grant from the National Science Foundation, we are working on a new project entitled *Explorations Through Time*. These interactive web-based modules are designed to involve students and their teachers in the process of science and to provide content promoted by the National Standards for Science Education.

The project uses technology to offer teachers and students access to updated resources in order to enhance science teaching and conceptual inquiry-based

learning. All of the modules fit easily under the umbrella of biodiversity — past and present. This provides a contextual setting within which to integrate the teaching of evolution, adaptation, geologic time, plate tectonics, paleoclimates, etc. The modules are developed by a team of scientists (faculty, staff and students of UCMP) and teachers. The combination of science teachers working with a scientific institution strengthens the quality of the product developed — both in pedagogy and in scientific content. This collaboration also provides a much-needed link between educators, researchers, and the public.

Explorations through Time consists of two types of modules: informational **Tours** and inquiry-based **Research Labs**, both of which include extensive teacher resource and support materials.

Each tour provides information presented in a conceptual format, provides direct ties to the National Standards, and contains embedded hands-on activities to assess understanding.

Topics include: fossils, geologic time, plate tectonics, common ancestry, evolution, and phylogenetics. A prototype of one of the tours, entitled *Getting into the Fossil Record*, may be viewed at <http://www.ucmp.berkeley.edu/fossil/open.html>.

The Research Labs are the primary focus of the project. This is where the science is done. Students investigate, ask questions, access on-line resources, gather and analyze data, make inferences, propose multiple hypotheses, and communicate their findings for review. Students work on real research questions using actual data sets. The selected research topics effectively exemplify the scientific process, integrate multiple disciplines of science, and provide content promoted by the National Standards. They are based upon current research work in the labs of Faculty associated with UCMP.

Modules to be developed include: exploring the fauna at the Cretaceous/Tertiary boundary; the origins of flight; evolution of marine mammals; using microfossils to determine paleoclimates; and paleobotany. A prototype of one of these Research Labs entitled *Adventures at Dry Creek*, is currently being field-tested. It may be viewed at <http://www.ucmp.berkeley.edu/DC/opendc.html>.

AMAZING FOSSILS

Grant County Discovery Reveals Life from 3-6 Million Years Ago

by Steve Kash

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During the first 14 days of June 1998, paleobiologist Ron Richards and a crew of Indiana State Museum staff and volunteers worked diligently in chilly, rain-soaked weather to recover bones and plant material from piles of sediment that had been isolated by workers in a Grant County quarry.

The partial Jaw of an ancestral bear, tooth fragments of rhinoceros, shell fragments of giant tortoise and the abundant remains of turtles, frogs, snakes and small mammals saw light for the first time in millions of years.

The discovery of ancient bones of creatures that inhabited Indiana millions of years ago changed the geologic time scale that had been used for more than 130 years.

When Jason Greer and Dick Huffman set off for their job site with a dump truck and a backhoe on June 21, 1996, they thought they were headed for just another day of work at Irving Materials Inc.'s Pipe Creek Junior Quarry near Swayzee.

Their assignment was to prepare bedrock for eventual drilling and blasting by cleaning dirt-like sediment out of an unexpected 200-foot wide, 30-foot deep sinkhole that had been found in the bedrock 15 feet below the ground's surface.

Little did the two quarrymen realize that before the day was done their dump truck would be filled with perhaps the most priceless sediment ever scooped up from Indiana's landscape.

As excavation neared completion in the late afternoon, while backhoe operator Huffman was talking with his supervisor Ray Rich, he spotted something that caught his eye in the pile of loose debris he had been removing. Immediately he shouted on his radio to co-worker Greer, whom he knew to be an amateur fossil hunter and artifact hunter.

"Jason, I'm finding bones. Come down here and look."

"As soon as I heard Dick on the radio, I knew the bones would be old because they were so deep," Greer recalls. "I just didn't realize how old. I thought they might be 15,000 years old or so from back in the glacial ages."

Greer promptly told plant superintendent Ron Lewis about their find. After Lewis came down to the sinkhole site and saw the bones, Greer requested that they dump the bone-bearing debris on an isolated area so it could be properly studied.

Lewis agreed, and by doing so set in motion a series of events that gained the attention of geologists throughout the United States. The special sediment was to open a time window far into the past.

Within a few days Irving Materials' geologist Jon Havens and Dr. Jack Sunderman, a retired geology professor at Indiana-Purdue University in Fort Wayne, were on the scene doing a preliminary analysis of fossil materials that would come to include large and small animals as well as plant fossils.

Initially their findings included numerous frog, turtle and rodent bones, and a few tantalizing bones of bigger animals.

The remains of the larger animals turned out to be the toe of an 8-foot-tall camel, the foot bone of a pig-like animal called a peccary, and parts of a land tortoise similar to the kind found on the Galapagos Islands in the Pacific Ocean near the equator.

Preliminary investigation convinced the scientists that the ancient fossils were older than Ice Age deposits.

Sunderman quickly became intrigued by sinkhole sediments that were not part of the glacial drift swept down into Indiana from Canada. Striking masses of bright red clays suggested long weathering and warmer climate, but what most aroused Sunderman's curiosity was the presence throughout the sinkhole of numerous rounded and smoothed quartzite pebbles.

The quartzite would be a key clue to determining the relative age of the finds in the sinkhole. Sunderman knew there was no possible Indiana source for this quartzite. He reasoned that the distinctive pebbles had been transported to Indiana before the first Ice Age more than two million years ago during the late Tertiary period of geologic time. Sunderman believed the most likely source of the pebbles was along the western flank of the Blue Ridge Mountains.

A preglacial Tertiary Period river called the Teays that was at least the size of the modern-day Ohio could have transported the quartzite pebbles. The Teays crossed West Virginia, Ohio, Indiana and eastern Illinois before draining into a primitive Mississippi River. In some places the Teays eventually cut a 400-foot deep channel into the bedrock of northern Indiana.

To investigate his beliefs, Sunderman took a trip with geology student John Koryl to one of the few visible remains of the ancient Teays, a valley west of Huntington, West Virginia. There they managed to find the same type of distinctive quartzite pebbles found in the Pipe Creek sinkhole.

By late February, 1997 the scientific inquiry into the fossil discoveries at the Pipe Creek sinkhole was underway. Dr. James Farlow, a paleontologist from Indiana-Purdue University in Fort Wayne, came to head the investigation. Soon more unusual bones were found, including one bone that turned out to be a rhinoceros tooth (the Pipe Creek sinkhole is the first place in the northeastern United States that the remains of either a camel or a rhinoceros have been found).

Eventually, scientists would identify other animal fossils, including remains of a small, extinct bear species, as well as fossil material from a bone-crushing, dog-like carnivore. Another fossil was identified as the remain of a songbird.

Farlow's investigation led to bones being analyzed by scientists from around the world. By comparing the bones at the sinkhole with other bones of the same species at sites where positive dating is possible, Farlow has concluded that the sediment in the sinkhole was deposited sometime between three million and six million years ago.

Prior to discovery of the sinkhole, there was an enormous evidence gap in Indiana's fossil history. Although there were glacial era findings dating back more than 100,000 years, the next findings had come from coal deposits 300,000,000 years ago — which was before the time of dinosaurs.

Sunderman believes the sinkhole began as a small cave in the surrounding bedrock. As the cave grew larger, the ceiling became thinner and eventually collapsed to form a sinkhole which became habitat for amphibians and reptiles such as frogs, turtles, tortoises and snakes, and a drinking hole for larger mammals.

Sunderman reasons that the distinctive quartzite pebbles and possibly some of the larger mammal fossils were washed into the sinkhole by local streams after the Teays River began to cut its deep bedrock valley across northern Indiana.

Dating of the sinkhole has been a perplexing scientific puzzle. "We're finding animal remains at the sinkhole not normally located in the same time frame at the same site," Farlow says. "The small rodent remains are characteristic of the Early Blancan Age of three to four million years ago, and the large animal remains are normally associated with the late Hemphillian Age which took place five to six million years ago."

Farlow's challenges to dating are compounded because the sediment taken from the sinkhole appears to have formed during a relatively short period of years. He says that scientists don't know the exact time limits for these extinct species. He believes it is possible that the older species could have persisted longer in Indiana than in other places where they've been found, or that the younger species may have lived here earlier than they did elsewhere.

Curiously, the paleontologists have found few fish bones in the sinkhole debris, but they have found an abundance of pond turtles which suggest standing water was in the sinkhole most of the time. Farlow believes that fish bones being absent is a possible indication that on rare occasions the sinkhole dried up and could not support fish life.

According to Farlow, Indiana's climate was much warmer during the time the sinkhole was in existence

than it is now. Many of the life forms inhabiting Indiana such as the giant tortoise and rhinoceros could not have withstood prolonged cold. The area around the sinkhole was similar to savanna parkland with temperatures in the range of those in Florida today, but the weather would have been much drier than Florida's modern climate.

During the life of the sinkhole, the Rocky Mountains and Appalachians formed, and the Florida Peninsula was jutting out into the sea, but because the world was so warm, ocean levels were higher and North and South America were not yet connected. Meanwhile, in East Africa, the branch of primate which was to be the ancestor of modern humans was evolving into creature ever more similar to ourselves.

When the earth's climate chilled during the Ice Ages, the action of the retreating glaciers that blanketed northern Indiana acted as a sealant over the sinkhole, protecting the Tertiary Period sediment deposits from the erosion that would normally have destroyed them years before the IMI quarrymen made their discovery.

IMI designated the Indiana State Museum will be the ultimate repository for Pipe Creek Junior's ancient remains. In the past two decades, the state museum has grown into the largest and most comprehensive repository of ancient bones in Indiana.

Steve Kash is a freelance writer from Terre Haute, Ind.

MUSEUMS AND FOSSIL COLLECTIONS: WHAT DOES THE FUTURE HOLD?

by Alan Goldstein, Interpretive Naturalist, Falls of the Ohio State Park

The following comments were motivated by Bruce Stinchcomb's article "Paleontological Collections of the St. Louis Academy of Science and the St. Louis Science Center" in the Maps Digest vol. 22, no. 7-8, 1999.

Many natural history collections are suffering the same fate as those in the St. Louis Science Center. University museums are shrinking in numbers. University science department collections face crises regularly when faculty retire. Collections of fossils, minerals, taxidermy mounts, etc., are all in danger of being discarded from ignorance. Type species of fossils have been destroyed or sent to landfills from poor management. A local example: The Indiana University geology collections which were curated by the late Alan Horowitz. They included types kept in secure drawers and reference specimens used for display. Now, the fate of the collection is in limbo.

Fossil collections fall under the category of natural history collections. This is an issue taken up by the Society for the Preservation of Natural History Collections (S.P.N.H.C.) and the Association of Systematic Collections. Nationally, there are no easy solutions. On a state or local level, some institutions are addressing it better than others. Extreme examples include Alberta provincial laws that consider all indigenous fossils to be the property of the province (managed by the government.) How many aggregate and cement quarries have been fined for destroying fossils during the course of daily "collections?" Not many, I am sure.

Any of the following examples I cite from my current knowledge of what has been going on, but this can change direction and be obsolete quickly. In Louisville, there has been a museum in the community since about 1875. In 1984 the Louisville Museum of Natural History and Science dropped the "Natural" from the title as it changed direction under a new director. Slowly, collections-based exhibits were removed and hands-on science and history exhibits replaced them. A small contingent of natural history specimens remained on display, with the emphasis on minerals and fossils. Behind the scenes, a tremendous amount of collections storage vanished as the building was renovated. On the plus side, hundreds of lockable, enclosed cabinets were purchased replacing the open shelving and random placement of artifacts. On the down side the collections were moved from the environmentally stable second floor to the wild swings of the temp./humidity on the fourth floor. But exhibit space needed to be secured and the collections were best tucked out of the way.

In 1993, under a new director, the museum changed its name to the Louisville Science Center. Within a year, plans to change the exhibits on the second floor (the location of the remaining natural history collections)

were developed. Many of the geological specimens were put in storage, and though an effort has been maintained to display specimens, the numbers are decreasing steadily. At the present time, the natural history collections are in no danger of being deaccessioned (a formal method for getting rid of unwanted items in the permanent collections). At the same time, there is no interest in acquiring new specimens. In fact, Kentucky may be one of the few states without any natural history museum at all. Currently, fossils are acquired by the Kentucky Geological Survey/University of Kentucky Geology Department, but there is no museum, per se.

The Indiana State Museum is planning their new facility which will have increased storage space for collections - 200% to 300% more than now. At present, their fossils are not stored using the most ideal methods possible, but this will change. The number of Pleistocene vertebrate bones (like the mastodon jaw pictured recently) is impressive. The ISM actively acquires donations and occasionally funds to purchase exceptional specimens for their collections or display. The long term outlook for geology collections is good.

The Cincinnati Museum Center, in which the Museum of Natural History and Science is a prime component, is another institution which seems to be looking ahead in terms of collections management. They have a collections manager, and curators of both invertebrate and vertebrate paleontology. The Greier Research Center is the old museum (before the exhibits and most staff were moved to the Union Terminal facility) and contains copious amounts of storage space. The University of Cincinnati recently transferred their huge historical collection of Cincinnati (Upper Ordovician) fossils. Grants have been sought and received for proper storage of the collections. Other notable Ohio museums with good fossil collections include the Orton Geology Museum, part of the Ohio State University geology department and the well-known Cleveland Museum of Natural History.

The current issue of "Museum News" reports on the Science Museum of Minnesota. They have recently moved and doubled the size of their Paleontology Hall (renamed the Dinosaur and Fossils Gallery). They have put many new items on display. To make the gallery more interactive (presumably keeping with the rest of the museum) visitors can learn about dinosaur

digestion by walking through an 80 foot long 500-gallon tank designed to simulate the stomach of a *Diplodocus*!

The Falls of the Ohio State Park maintains a small collections room with several thousand fossil specimens. A number of identified fossils are on exhibit. Although it would be tempting to contact the Field Museum of Natural History or the St. Louis Science Center and ask for 19th century specimens to be deaccessioned and curated here at the park, the fact is, our storage here could never accommodate even a tiny fraction of material that is boxed away and forgotten in the bowels of these fine institutions. The research value of these specimens is questionable, because the vast bulk of the specimens used for research are in the collections at the Smithsonian, Yale, Harvard and the University of Michigan. There are new species to be identified at the Falls (I have found several species that do not match any published works), but the number of people doing taxonomic work with Devonian corals can be counted on one hand.

What about your neighborhood? Each member of MAPS probably has a favorite museum, even if not in their community. If the fossil displays, or more significantly, the collections are suffering from neglect, speak up! Talk to the museum director or chief curator. Find out what the plans are for the near and long term. Enlist support from local geology clubs. Volunteer and help curate specimens. Although this is a generalization, science centers - almost by definition - are more likely to focus a greater portion of their resources on technology exhibits and not natural history. There is hardly any reason for me to visit my old work place, because there is little to pique my curiosity.

In closing, there are many museums that have fossils and geology exhibits. The *Digest* would be an ideal place for members to report on their favorite museum (especially those that are small, local institutions.) How about it? MAPS members are all over the place! Can someone report on the fossil display at the Burpee Museum of Natural History? or the Denver Museum? your state geological survey? What did you like or dislike? Talk to a curator and find out what the future holds! We should be as concerned about the museums where our fossils repose almost as much as the regulations regarding the lands we collect from!

CONOPHYTON FROM THE CAMBRIAN OF MISSOURI

by Bruce L. Stinchcomb

An Eastern Missouri Society for Paleontology October field trip on the Meramec River from Fenton to Arnold Missouri netted some interesting fossils! Upstream from the I-55 bridge is a former gravel dredge site. In dredging gravel, large boulders and cobbles mixed with the gravel being mined, are separated from the gravel and dumped in piles along the river's bank. We scouted through piles of these boulders and found a mixed bag of rocks, including rhyolite, rhyolite porphyry and granite which came down the Big River, which is upstream from where we were. Boulders of quartzitic sandstone (Roubicoux Formation) containing ripple marks and brecciated chunks of Gasconade chert had probably come down the Meramec and the Bourbeause Rivers, some of these weighing in at 70-100 lbs. Such large chunks of rock must have been transported to the Arnold area during major floods on these rivers. Keep in mind that some of these boulders came from gravels 15-30 feet below the river's bed and may have been transported to their present location half a million years ago.

One small boulder caught my eye, a mass of chert with peculiar surface markings, peculiar surface markings associated with a peculiar type of stromatolite that I've seen in the Precambrian of Montana. These peculiar surface markings are associated with a stromatolite given the form genus of *Conophyton*. This peculiar stromatolite is particularly characteristic of the mesoproterozoic of the Proterozoic Era of the Precambrian. This puts *Conophyton* and the strata containing it, where it is abundant in Montana, back some 1.7 billion years in geologic time. *Conophyton* has been considered as a possible mid Precambrian guide fossil; however, it is found in rocks of other geologic ages as well, and modern *Conophyton*-like stromatolites are found growing in the hot springs of Yellowstone Park as well as elsewhere in present-day geothermal areas. It has been suggested that *Conophyton* might be a type of stromatolite produced by thermophillic bacteria. That is a group of bacteria which can not only withstand very hot water but can thrive in what would kill other types of life.

This is not the first time stromatolites suggestive of *Conophyton* have turned up in Missouri. They have

turned up near Womack, Mo., associated with cherts of the Uppermost Cambrian. The Womack area is on the Ste. Genevieve fault system and invertebrate fossils such as monoplacophorans and plated mollusks are sometimes somewhat different here, different than they are in other parts of the Ozarks. The *Conophyton* chert boulder found on the Meramec, looked quite similar to the *Conophyton* that I've seen around Womack, although larger. There is a good chance that this boulder came down Big River and was originally from the Ste. Genevieve faulted complex, which includes a sizeable portion of the Big River watershed. It looks very much like some of the chert occurring in the Big River watershed and of course contains *Conophyton*, and *Conophyton* is associated with hot spring activity.

Conophyton being indicative of geothermal activity and occurring in Missouri! Could these occurrences be fossil evidence for ancient Cambrian hot spring activity? You bet! Associated with the Ste. Genevieve fault system and some of its "offshoots" are intrusions of high temperature igneous rocks. These intrusions (called diatremes) are particularly abundant in the Womack area as well as occurring along other areas of the large faults of the eastern Ozarks such as at Dent Branch on Big River. These faults represent major conduits or fissures along which ultramafic magma from the mantle was conveyed during various parts of the Paleozoic Era. These fissures very logically could also have conducted hot fluids to produce localized hot springs. Such hot springs would represent an environment which could have been exploited by heat-loving organisms such as the thermophillic bacteria. Such a localized ecosystem would also support animals which might otherwise not be present, animals like some of the peculiar fossil mollusks collected in the Womack area.

Geothermal activity of Paleozoic age has not been recognized in the Ozarks, and data that are presented here are arguably scientifically weak. However, awareness of a possibility is always a good thing as "luck follows a prepared mind" and somewhere in the Ozark Cambrian or younger rocks may be stronger evidence for such geothermal activity, and only "luck" and a prepared mind may discover it.

FINDING MIOCENE FOSSILS IN OREGON

by Guy DiTorrice

(for FOSSIL NEWS Magazine - Oct. 1997)

It's a breezy afternoon. Your pace begins matching the staccato surf pounding the sand beneath your feet. You pick up a dark rock to skip across the long stretch of wet beach, arching your arm back for the power pitch of the day.

Something white catches your eye and you slowly bring your arm back to take a closer look. Say "hello" to *Macoma albaria* on the back side of your rock. Before the afternoon walk is over, your pockets fill with dozens of whole and partial fossilized marine specimens.

Welcome to Lincoln County and Oregon's Central Coast. The sandy beaches here are well known for their agates and jasper. Marine and mammal bone fossils make this part of the paleontology world a great place for beginners.

Oregon coastal headlands are a mix of sandy shores, dark volcanic basalt and thousands of winter storms pounding hard rock into sand. The shifting sands mix rock and fossil, producing a variety of rough-polished agates and matrix-free fossils.

Oregon's 384 miles of Pacific Ocean beaches also share one common trait — they belong to everyone. 1997 represents the 30th anniversary of Oregon's Public Beach Law, declaring public ownership of the coastal inter-tidal zone, often right up to the right-of-way for Pacific Highway 101.



The fossil bug bit me more than 30 years ago amongst the suburban home construction boom to hit Rockford, Illinois. Piles of snail-laden sandstone dug with basement foundations drove my parents crazy, although they preferred the collection over idle time.

Time leap to 1996 and walk along with a group of Newport Volunteer Firefighters heading down to the Beverly Beach area to "rescue" a downed glider. It was a tricky walk over basketball-size basalt boulders and hand-sized sandstone concretions. The high cliffs

above the beach provided great breezes for kite-flying, gliding and exposing Miocene fossils to the whims of erosion.

Two pockets of clam and snail fossils later, we finally get to the former glider's owner. His only injury to his pride, the "rescue" group offered to haul the remaining pieces of his glider back up the hill to Highway 101.

At home, the fossils received hand cleaning with generic tooth paste (tartar control) and old brushes. Hand-dried and set on a box cover, they looked more like steamers ready for eating than 16-17 myo fossils of old.

A trip to FACETS GEM & MINERAL GALLERY, Newport's only, brought the new "collection" into the hands of Richard Petrovic, co-owner, and his wife, Kay. Patience is Richard's middle name, excitement is Kay's. He hand-checks each and every specimen, making positive IDs and recommending preparation approaches, she scours shelves for the "just-right" display stand.

Tourists and locals of all ages walk into the store daily with the findings of their beach-combings, asking for identifications and other assistance. (After all, what do you do with a 17-pound agate???) The store happily provides information, seven days a week, along with tips on cleaning, polishing and preserving. Those not so lucky on the beach can always help themselves to a wide selection of precious gems and jewelry as well as agates and fossils.

Ellen Moore, a former paleontologist with USGS and an Oregon State University research association, authored the definitive journals of authority for local fossils. Producing "Miocene Marine Mollusks from the Astoria Formation in Oregon" for the USGS, she also authored the more public-oriented booklet, "Fossils Shells from Oregon Beach Cliffs". The former published in 1963 is out of print and hard to find; mine was a gift from a Spokane, Washington,

Internet fossil trader. the latter sold since 1994 by many rock shops in the Pacific Northwest. My copy was provided by FACETS, complete with author's autograph.



Lincoln County sets square in the middle of the Astoria Formation, 15 myo sandstone layers mixed with compressed volcanic ash, and Nye mudstone up to 20 myo. While Astoria sandstone is softer and easily eroded, the harder Nye mudstone provides a sloping geology to help with water flows and mixing the collecting media. The Astoria Formation is compacted sand and silt, uplifted from the Pacific Ocean floor from geo-plate movement. Nye mudstone is mostly shale in the same layers doing the upward creep with the rest of the West Coast's geology.

The 15-20 myo layers expose themselves above sandy beaches cut between the basaltic headlands, forming the larger, more permanent hills along the Oregon coast. The combination of eroding basalt, mud and sandstones produce a combination of eroding basalt, mud and sandstones produce a combination of rocks and fossils mixing on the beaches with the seasonal sands. Moore's writings detail dozens of species of fossilized marine life — ranging from microscopic algae to the hand-sized *Panopea abrupta* (cousin to today's Geoduck clam) and the 8-inch diameter Patino- and Vertipectins (you know them as scallops).

During the winter months, Oregon coastal storms erode headlands into sand that's moved offshore into large bars. Come the calmer summer months and the Pacific coastal currents gently deposit tons of sand back on the beach. It make for interesting beach-combing 12 months a year, best enjoyed in Winter and early Spring.

Exceptional winds and rain the last two Winters clear massive gravel bars for the early months of the year through late Spring. While agate-hunters dominate beach-combing in Oregon (especially in March & Summer months). Fossil collectors also get the benefits of easy year-round access and trouble free harvesting.

Bi-valves (e.g. clams) have shells divided on a left-right axis (unlike brachiopods and their dorsal-ventral articulation) and are generally hinged

together thanks to their single abductor muscle.

Bi-valve shell microstructure is split into its organic cover material, the usually calcite prismatic layer and the mother-of-pearl lamella layer. With no pedicle for attachment, most bi-valves either dwell near or burrow under the sea floor.

The most common bi-valve species on Oregon's Central coast include:

- *Anadara devincta* - the area's most common marine fossil
- *Katerinella angustri* - the other most common, often agatized
- *Acila conradi* - very small, distinctive chevron-shell pattern
- *Macoma arctata* - thin, flat, often presenting with a hole drilled by snails who eat them
- *Chione ensifera* - cousin to our "steamers ordered with butter"
- *Panopea arupta* - the "big one", measuring up to 105 mm across
- Pectins - find them whole in concreted sand- and mudstone, sometimes split by nature, often held in seawalls

(A quick word about "seawalls". While Oregon's beaches are public, this is not always the case with the seawalls above them where people's homes and public highways reside. While harvesting fossils on Oregon's beaches, DO NOT use your pick to remove a specimen from a wall. You're breaking the law, eroding the hill and denying the fossil a natural trip to the beach in a couple dozen years. Citizens are restricted annually to 50 cubic yards of mineral removal off Oregon's beaches -- sand, agates & fossils. Leave the seawalls alone. Use your pick for matrix removal).

While clams are the larger and more populous of the Miocene fossils here, gastropods (e.g. snails) are generously represented, especially in concretions. The artistic attraction of gastropods is usually the 180°-twist the body takes during its growth, called "torsion". This growth gymnastic puts the snail's gills and anus on the anterior position above their head.

Most gastropods - herbivores & carnivores - use an armored tongue ("radula") as a rasp to carve into its

dinners. Poor Macoma... For some reason, the clam most commonly found here with the perfectly round drilling hole right through its shell!

Other common Miocene gastropods making Oregon's Central Coast their home include:

- *Brucarkia oregonensis* - squatty shape, delicate whorls
- *Nassarius arnoldi* - short & slender, artistic ribs
- *Musashia indurata* - up to 145mm long, hard to find whole
- *Ficus modesta* - a well-rounded shape, mostly in Nye mudstone
- *Turritella oregonensis* - high spires, often found in groups
- *Crepidula praerupta* - extinct androgynous snail, great shell
- *Chlorostoma pacificum* - shorter, rounder, well-defined whorl
- *Calicantharus carlsoni* - often coated with Membranipora
- *Dentalium schencki* - look for "white drinking straws" running through either brown or gray rock, seldom found whole

In addition to the abundant marine fossils, Oregon's central Coast offers a variety of petrified woods. As ocean currents work their favor on this part of the coast, species from other regions find themselves deposited on-shore. Two forms are found on Lincoln County's beaches.

1. Look for brown to black, shoe-size (and larger) rocks, usually rounded at the ends with a Swiss-cheese look to them. The "cheese" pattern is caused by the fossilized casings from the Teredo marine clam eating its way through chunks of wood. Nickname "Teredo Wood", the small clams never crossed each-other's drilling, making each piece found unique.
2. Other petrified woods range in color from light tan to black, ranging in size from 1-2 inches to 1-2 feet across. Look for a dull sheen on rocks when wet, with parallel grain patterns.

While sandstone may have the patterns, the woods show them throughout and on any ends. Wood species include pines, alder and myrtle. An occasional

(although rare) leaf adds to the collecting.

Additionally, petrified wood pieces are often found in rounded pieces of Nye mudstone or gray volcanic ashballs. Sometimes halved by mother nature, the center dark piece is usually burned or fossilized wood (often pine) that was once carried downstream from the nearby Cascade Coast Range.

Sometimes the gray, concreted balls (when split) often display arthropod parts (e.g. claws and legs) as well as whole crabs. These are great specimens to practice your geologic pick or hammer skills. Protect your eyes and don't hit too hard. Nothing more humiliating than splitting into 50 pieces scattered throughout Lincoln County along the sandy beaches. . .but, I wouldn't know how they ever got there.)

Finally, while much has been written about fossilized mollusks and petrified wood, another collector's genre finds itself washed up on Oregon's Central Coast -- mammal bone. Usually deposited in the browner Astoria sandstone, bone frags are as abundant as Teredo wood and Anadara shells. Look for round, light brown rocks with a darker edge or center. The darker material is usually bone, often unidentifiable, clean and polish into a displayable specimen.

Look for larger, shoe-size pieces of brown and gray stone with one or two darker spots protruding out the edges. Careful matrix removal generally exposes either easily-identifiable fossilized bone structure or just more sandstone. Personal trophy pieces include numerous whale, dolphin and seal vertebrae (4-8 inches), rib bones, joints and skull. (Many thanks to fossil preparer, Marc Behrendt, for making rocks into display-quality specimens.)



Fossil-collecting on Oregon's Central Coast is excellent for beginners, teachers and families with kids. Bring your plastic bucket, pail or basket. Most specimens will be sited at low tide on the sandy beaches, in creek washes and below the rockier headlands in high-tide rock piles.

Keep your eyes open for "sneaker" waves - they'll drench you or take you out to sea on the calmest of sunny days. Also, the ocean is usually a moist

environment. Rock piles can be slippery due to water, algae and a host of other animals too small to see. Pack a jacket and a kite for afternoon marine breezes (you can set your clock to them).

Getting to Oregon's Central Oregon Coast is easy. U.S. Highway 20 literally deadends in Newport on Pacific Highway 101. Turn right, traveling north 10-15 minutes for Moolack, Agate, Otter Rock, Beverly and Depoe Bay's beaches. Turn left, traveling south 15-20 minutes for Lost Creek, Thiel Creek, One, Seal Rock, Bay shore and Yachats' Smelt Sands beaches. Remember we want to keep Oregon's beaches open for the public -- treat them as your own!

Oregon State University Hatfield Marine Science Center (in Newport) and the Oregon Museum of Science & Industry (in Portland) provide whale-size, hands-on exhibits of marine fossils discovered on these

same beaches. The Oregon Coast Aquarium also recently hosted its own "Fossils, Fins & Fangs" paleontology exhibit. You can always check out FACETS, located next to the Yaquina Bay Bridge in Newport. -----

Guy DiTorrice is the Executive Director of the Central Oregon Association — a visitor information service and tourism promotions group. As an amateur fossil collector, he's donated hundreds of collected specimens to OMSI, the Oregon Coast Aquarium and to any teacher who asks. Guy's wife, Chris, tolerates his expanding Internet trading (for anything but Miocene marine fossils). Guy also conducts guided field trips to various geologic sites along Oregon's coastline. For information, contact him at:

eMail: guy@newportnet.com; webpage: <http://www.angelfire.com/or/fossilguy/index.html>
Snail Mail: PO Box 256 Newport OR 97365

NIGHT OF THE GIANT AMMONITES

by Kirk R. Johnson

Art by Ray Troll

Natural History, Jul/Aug 1999, pg 14-17

Reviewed by Les Adler, *Alberta Paleontological Society Bulletin*, 9/99; via *Dinny's Doin's* 2/00

Ray Troll has drawn the scene on a moonlit night near the present-day town of Kremmling, Colorado, 73 million years ago. Four mosasaurs attack swarms of invertebrates including *Baculites*, jellyfish, sixty-two *Placenticerias meeki* specimens and two *Anaklinoceras gordiale* specimens.

There is evidence of mass death of giant ammonites on a sagebrush slope about 21 kilometers north of Kremmling, northeast of Denver. Visitors to the site are not permitted to remove the fossils, which include crabs, lobsters, nautiloids, clams and snails. Rocks left from fossil digs are the empty halves of concretions that once enclosed fossilized ammonites. In the ancient seaway thousands of ammonites met their end and drifted to the bottom, where scavengers fed on the unexpected bounty. The site was close enough to the shoreline that

mud from nearby river mouths sifted over the shells and rapidly buried them. A chemical reaction precipitated calcium carbonate in the mud around the shells, forming the rock-hard concretions, while the surrounding mud was flattened into soft shale and the ammonites were fossilized.

A group from Denver led by paleontologist Emmett Evanoff prospected the area in August, 1998. They found many of the huge female ammonites. Kirk Johnson surmises that this was the site of a mass spawning and that after the males had fulfilled their role they left the scene; and like living squid, the females reproduced just once, producing planktonic embryonic ammonites and then perished en masse.

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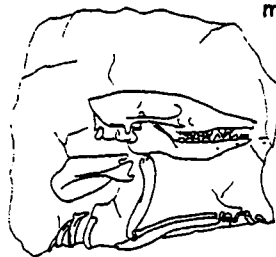
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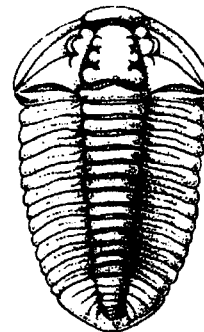
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others who are interested.

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HUMOR

from *Bulletin Board*. Uncompahgre Plateau Paleontological Society 3/99

Bruce Wahle spotted this item on "Backyard Paleontology" on the Internet:

Paleoanthropology Division
Smithsonian Institute
207 Pennsylvania Avenue
Washington, DC 20078

Dear Sir:

Thank you for your latest submission to the Institute, labeled "211-D, layer seven, next to the clothesline pots. Hominid skull." We have given this specimen a careful and detailed examination, and regret to inform you that we disagree with your theory that it represents "conclusive proof of the presence of Early Man i in Charleston County two million years ago." Rather, it appears that what you have found is the head of a Barbie doll, of the variety one of our staff, who has small children believes to be the "Malibu

Barbie.” It is evident that you have given a great deal of thought to the analysis of this specimen, and you may be quite certain that those of us who are familiar with your prior work in the field were loathe to come to contradiction with your findings. However, we do feel that there are a number of physical attributes of the specimen which might have tipped you off to its modern origin:

1. The material is molded plastic. Ancient hominid remains are typically fossilized bone.
2. The cranial capacity of the specimen is approximately 9 cubic centimeters, well below the threshold of even the earliest identified proto-hominids.
3. The dentition pattern evident on the “skull” is more consistent with the common domesticated dog than it is with the “ravenous man-eating Pliocene clams” you speculate roamed the wetlands during that time.

This latter finding is certainly one of the most intriguing hypotheses you have submitted in your history with this institution, but the evidence seems to weigh rather heavily against it. Without going into too much detail, let us say that:

- A. The specimen looks like the head of a Barbie doll that a dog has chewed on.
- B. Clams don’t have teeth.

It is with feelings tinged with melancholy that we must deny your request to have the specimen carbon dated. This is partially due to the heavy load our lab must bear in its normal operation, and partly due to carbon dating’s notorious inaccuracy in fossils of recent geologic record. To the best of our knowledge, no Barbie dolls were produced prior to 1956 AD, and carbon dating is likely to produce wildly inaccurate results. Sadly, we must also deny your request that we approach the National Science Foundation’s Phylogeny Department with the concept of assigning your specimen the scientific name “*Australopithecus Spiffarino*.” Speaking personally, I, for one, fought tenaciously for the acceptance of your proposed taxonomy, but was ultimately voted down because the species name you selected was hyphenated, and didn’t really sound like it might be Latin.

However, we gladly accept your generous donation of this fascinating specimen to the museum. While it is undoubtedly not a hominid fossil, it is, nonetheless, yet another riveting example of the great body of work you seem to accumulate here so effortlessly. You should know that our Director has reserved a special shelf in his own office for the display of the specimens you have previously submitted to the Institution, and the entire staff speculates daily on what you will happen upon next in your digs at the site you have discovered in your back yard. We eagerly anticipate your trip to our nation’s capital that you proposed in your last letter, and several of us are pressing the Director to pay for it. We are particularly interested in hearing you expand on your theories surrounding the “trans-positating fillifitation of ferrous ions in a structural matrix” that makes the excellent juvenile *Tyrannosaurus rex* femur you recently discovered take on the deceptive appearance of a rusty 9-mm Sears Craftsman automotive crescent wrench.

Yours in Science, Harvey Rowe, Curator, Antiquities

The Mid-America Paleontology Society (MAPS) was formed to promote popular interest in the subject of paleontology; to encourage the proper collecting, study, preparation, and display of fossil material; and to assist other individuals, groups, and institutions interested in the various aspects of paleontology. It is a non-profit society incorporated under the laws of the State of Iowa.

Membership in MAPS is open to anyone, anywhere who is sincerely interested in fossils and the aims of the Society.

Membership fee: One year from month of payment is \$20.00 per household. Institution or Library fee is \$25.00. Overseas fee is \$20.00 with Surface Mailing of DIGESTS OR \$30.00 with Air Mailing of DIGESTS. (Payments other than those stated will be pro-rated.)

MAPS meetings are held on the 2nd Saturday of October, November, January, and March and at EXPO in April. A picnic is held during the summer. October through March meetings are scheduled for 1 p.m. in Trowbridge Hall, University of Iowa, Iowa City, Iowa. One annual International Fossil Exposition is held in April.

MAPS official publication, MAPS DIGEST, is published 9 months of the year—October through April, May/June, July/August/September.

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