

## DVESScapades

*escapades: interesting, stimulating, exciting activities and adventures*



### Delaware Valley Earth Science Society Newsletter March 12, 2008



March 12 Program : METEORITES  
with Bob Summerfield

#### President's Message - by AnnLynne Benson

Things have been a bit confusing since we lost our long-time home at the Evergreen Ave. School in Woodbury, but there is stability and permanence about our club in many regards, here are just a couple: we still have an active and dedicated Executive Board, ever on the lookout for ways to make our club more interesting and exciting; we still have excellent speakers at our meetings; we still have Juniors who want to learn and adult members who are willing to teach them. The people who speak **your** language, who understand **why** you collect rocks, who share **your** excitement at a fossil find, still gather on the 2<sup>nd</sup> Wednesday of each month - somewhere; ample contact information is still provided in this newsletter. If you don't want to go to a meeting or show alone, **CALL SOMEONE**. We'll be glad to hear from you. We are still educational, still social, and still reaching out in new areas to increase the value of your membership dollar; DVESS dues are among the most reasonable in the Eastern Federation. ( Dues due now ) We still offer opportunities NO OTHER CLUB can offer you (like the Sterling dig) and we want what **you** have to offer as well. What is **your** skill? What do **you** think is fun? Let us know, and we'll make it happen for you and for the rest of us too. This club has something valuable to offer that has been, and is being, passed down from generation to generation - come out and find out what it is.

Thankfully, DVESS is open and welcoming to all - no age or gender restrictions, no cliques. Everyone's suggestions are valuable, all members are invited to attend Executive Board meetings. Whenever and wherever we get together, there's a seat waiting for **you!**

Many of us have come into this hobby through a parent; mine took me to the Franklin Institute and Academy of Natural Science in Philadelphia on a regular basis. My father took me, and two of my sisters, on vacation every year; we saw the grandeur of the Grand Canyon, the soaring Rockies and Tetons, thousands of dinosaur bones in Dinosaur National Monument in Utah, and just about every national park west of the Mississippi. These sights and experiences embedded in me a passion for minerals, fossils and geology.

Our club has a family also: our "parent" organization is the Eastern Federation of Mineralogical and Lapidary Societies, EFMLS; our "grandparent" organization is the American Federation of Mineralogical Societies, AFMS. <http://www.amfed.org>

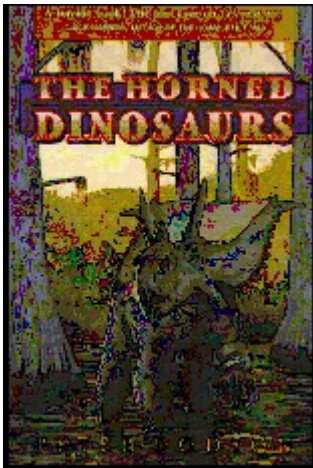
No matter where **you** fit in, we're glad you've chosen to be a member of the DVESS family.

**A CHANCE TO VOLUNTEER** The New Jersey State Museum in Trenton will hold its annual Super Science Weekend on Saturday and Sunday, May 17<sup>th</sup> & 18<sup>th</sup> from 11am to 4pm each day. If you are interested in participating for/with the DVESS we need to know by Mar 18<sup>th</sup>. Please contact our President AnnLynne Benson at [SeleniteQueen@comcast.net](mailto:SeleniteQueen@comcast.net) Or 856-783-0969 with your creative ideas. This would be a good place to make others aware of our club. Please consider helping, it is a good educational opportunity for all.

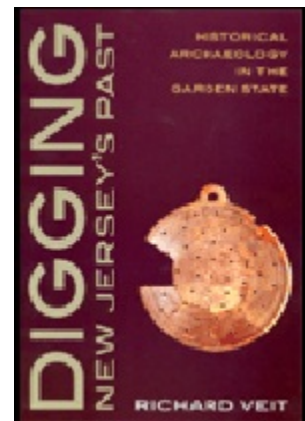
## UPCOMING SHOWS AND EVENTS

### NEW JERSEY STATE MUSEUM Sunday Science Lecture Series

The New Jersey State Museum is excited to offer the inaugural season of the Sunday Science Lecture Series, sponsored in part by the Friends of the New Jersey State Museum. Scholarly, yet family-friendly lectures will be presented in the Museum's Auditorium by some of the world's most distinguished and prominent researchers in the fields of paleontology, paleo-artistry, and archaeology.



Arrive early to tour the Fossil Mysteries exhibit in the Auditorium galleries and meet the Museum's paleontologists. Following each lecture, guests will have the opportunity to ask questions, share their own experiences and ideas, and meet the featured lecturer while enjoying light refreshments.



March 9 Dr. Peter Dodson Professor of Anatomy & Geology, University of Pennsylvania "Collecting Dinosaurs on Four Continents"

April 13 Dr. Richard Veit Professor of Anthropology, Monmouth University "Digging New Jersey's Past: An Archaeological View of Historic New Jersey"

May 4 Dr. Michael Stewart Professor of Anthropology, Temple University "Pottery and Ancient Native American Life in the Delaware Valley"



June 15 Dan Varner World-renowned paleoartist, Paleo-Illustration Space is limited. Reserve your seats early!

**\*\* WHAT YOU NEED TO KNOW!**

Free Admission Free Parking Museum Auditorium Doors open at 4pm. Each lecture begins at 5pm. Light refreshments will be served. For more information, or to make reservations, please call (609) 292-6740.

**Saturday, March 29<sup>th</sup> and Sunday, March 30<sup>th</sup>** The Delaware Valley Paleontological Society along with the Philadelphia Mineralogical Society present the 2008 Fossil Fair and Mineral Show at the Lulu Temple in Plymouth Meeting, PA. There will be many exhibits to see, fossils

and minerals to buy, and a children's "sandbox" with lots of fossils for kids to find and take home. Don't miss the Delaware Valley Paleontological Society's Sales Table with many fossils and related articles to buy. See the end of newsletter for poster.

**Saturday, April 26, 9 am - 11:00 pm a 14 Hour Event!!!!**

**The 2008 DIGGGGG IS ON** Come and enjoy a fluorescent mineral dig like no other in the USA. We will have a special blackout mine tour once again, along with an upper mill tour, and, as ore supplies permit, another chance to own a piece of Sterling history form the last remaining ore on the belt !!!

Last year we moved tons of rock, this year we're moving the mountain practically !!! Registration begins Jan. 15<sup>th</sup>, 2008 and is limited to 200 people on a first come, first served basis. Walk-ins are always welcome but, must wait to be processed, so please sign up early !!!! For further info: <http://www.uvworld.org> Here you will find up to date info regarding fees, schedules, hotels, photos, directions & maps. See article on following pages for more info on Franklin & Sterling Hill.

**Saturday, April 26, 9 am - 4:30 pm and Sunday, April 27, 10 am - 5 pm**

36<sup>th</sup> Annual New Jersey Earth Science Association Gem and Mineral Show, Franklin School, 50 Washington Ave., Franklin, New Jersey

**Saturday, May 3, 10 am - 5:00 pm and Sunday, May 4, 10:00 am - 4:00 pm** Treasures of the Earth, 5<sup>th</sup> annual show & sale, sponsored by the Mineralogical Society of Northeastern Pennsylvania 1880 Hwy 315, Pittston, Pa. 18640 ( Oblates of St. Joseph ) Contact George Walko 800-473-3602

**2008 National Gem, Jewelry, Mineral & Fossil Show**, Convention Sept 24-28, 2008 Show Sept 26-28, 2008, Humble Civic Center, 8233 Will Clayton Parkway, Humble, TX 77338 Contacts: (281) 446-4140 <http://www.amfed.org>

**UPCOMING DVESS MEETINGS**

WEDNESDAY, **April 9, 2008** - Due to the soon-to-be 150th anniversary of the hadrosaurus folki we will be enjoying "The Dinosaur in our backyard" a power point presentation by Amy Carpinelli. Amy is a teacher with a master's degree in Geology. We have Ed Loveland to thank for acquiring her.

WEDNESDAY, **May 5, 2008** - TBA                      WEDNESDAY, **June 6, 2008** - TBA  
**No meetings July and August**

DVPS Meets on the 4<sup>th</sup> Thursday of the month at 7:30 PM in THE ACADEMY OF NATURAL SCIENCES, Philadelphia, PA  
Website – [www.dvps.org](http://www.dvps.org)

**# \* # NOTE NEW MEETING PLACE # \* #**

**DVSS MEETING LOCATION** : In the 2<sup>nd</sup> floor of Wilson Hall at Rowan University, off Rt 322. There are 2 handicap parking spaces in front of the building at the rear of the building. Members and guests may park in the A lot and cross the bridge to the music bldg or go thru lot A to lot M-1 next to the buildings. Check our website for more info.

**Directions: From Rt 55**, In the 2<sup>nd</sup> floor of Wilson Hall at Rowan University, on Rt 322 cross the railroad, at the light turn right, pass the triad, over the railroad again take the first right into the parking lot. Use lot D or on into M-1. The building is the second one to the right ( the larger of the two - music bldg)

**Directions: From Delsea Drive, Rt 47**, go West on Rt 322 toward Mullica Hill. As you go through the college campus, notice the buildings on your right. Westby Hall is the last building on the right before the railroad tracks. Pass in front of Westby Hall then turn right into the parking lot. See above for entry directions.

#### "Code of Ethics" as re-printed from AFMS

I will respect both private and public property and will do no collecting on privately owned land without permission from the owner.

I will keep informed on all laws, regulations or rules governing collecting on public lands and will observe them.

I will, to the best of my ability, ascertain the boundary lines of property on which I plan to collect.

I will use no firearms or blasting material in collecting areas.

I will cause no willful damage to property of any kind such as fences, signs, buildings, etc.

I will leave all gates as found.

I will build fires only in designated or safe places and will be certain they are completely extinguished before leaving the area.

I will discard no burning material - matches, cigarettes, etc.

I will fill all excavation holes which may be dangerous to livestock.

I will not contaminate wells, creeks, or other water supplies.

I will cause no willful damage to collecting material and will take home only what I can reasonably use.

I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.

I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and will leave all collecting areas devoid of litter, regardless of how found.

I will cooperate with field-trip leaders and those in designated authority in all collecting areas.

I will report to my club or federation officers, Bureau of Land Management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.

I will appreciate and protect our heritage of natural resources.

I will observe the "Golden Rule", will use Good Outdoor Manners and will at all times conduct myself in a manner which will add to the stature and Public Image of Rockhounds everywhere.

Revised July 7, 1999 at the AFMS Annual Meeting

#### **ANOTHER AWESOME WEBSITE** by Betsy Oberheim, Jr. Activities

OK, I'm pushing another web site for education! I have an excellent poster about "Rocks and Minerals and How We Use Them". And just recently acquired, at a book sale; "Out of the Rock" ; a book the size of a telephone book devoted to educators and teachers, showing ways to share geology. I should have known both fantastic aids are from the same source: The National Energy Foundation! On the web; <[www.nef1.org](http://www.nef1.org)>

The information in each is so concise, simple, and easy to understand and the illustrations are so eye-catching and clever. The activities suggested are even scaled to a 40 minute class and can easily be simplified or expanded. The chapter on careers is so informative and could excite our incipient young geologists to consider other options in their field. This book alone

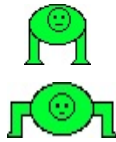


can give you ideas for hundreds of clever activities for your youth that are more educational than they will realize because they are having too much fun! I like the description of how core samples are used and you can demo with layers of clay and a straw. "Alloys" used different wire to experiment with and understand why mixing metals was such an important advancement to earlier man. The page entitled "Soapstone; a Tailors Type of Talc.", suggests they experiment with tailors's chalk (I never realized that was talc!) The book also contains flash cards and small versions of all the big posters they sell. I'm not really a saleswoman; just thrilled with a wonderful resource to help me and the youth better understand what I used to think was a very complicated subject.

## The Name "Dinosauria"

Sir Richard Owen (1804-1892) was a pioneering British comparative anatomist who coined the term dinosauria (from the Greek "deinos" meaning fearfully great, and "sauros" meaning lizard), recognizing them as a suborder of large, extinct reptiles in 1842. He had noticed that a group of fossils (which included remains of Megalosaurus, Iguanodon, and Hylaeosaurus) had certain characteristics in common, including: Column-like legs (instead of the sprawling legs that other reptiles February 24, 2008 have) Five fused vertebrae fused to the pelvic girdle. Owen presented dinosaurs as a separate taxonomic group in order to bolster his arguments against the newly proposed theory of evolution (although Darwin's "Origin of the Species" wasn't published until 1859, the basic ideas of evolution were known, but its mechanisms, including natural selection, were not). Ironically, his work actually helped support the evolutionists arguments.

This new taxonomic name, Dinosauria, and new group of reptiles was only the beginning of a great scientific exploration. Since Owen's time, about 330 dinosaur genera have been described. Every few months (sometimes every few weeks), a new species is unearthed (for recent finds, see Dino News). Paleontologists have varying estimates of how many dinosaur genera existed during the Mesozoic Era; estimates range from about 1,000 to over 10,000. Whatever this number really is, there are a lot of new dinosaurs left to discover!



## The First Nearly-Complete Dinosaur Skeleton and First American Dinosaur

The first dinosaur fossil found in the US was a thigh bone found by Dr. Caspar Wistar, in Gloucester County, New Jersey, in 1787 (it has since been lost, but more fossils were later found in the area).

### A Hadrosaur footprint.

In 1800 in Massachusetts, USA, Pliny Moody found a 1 foot long (31 cm) fossil-ized footprint at his farm. They were thought by Harvard and Yale scholars to be from "Noah's Raven." Many other dinosaur footprints were found in New England stone quarries in the early 1800's, but they were thought to be unimportant and were blown up in the quarrying process. Other fragmentary dinosaur bones and tracks were unearthed at this time in Connecticut Valley, Massachusetts.



The first nearly-complete dinosaur skeleton was discovered by William Parker Foulke. Foulke had heard of a discovery made by workmen in a [Cretaceous](#) marl (a crumbly type of soil) pit on the [John E. Hopkins farm in Haddonfield, New Jersey](#) beginning in 1838. Foulke heard of the discovery and recognized its importance in 1858. Unfortunately, some of the bones had already been removed by workmen. The skull-less dinosaur was excavated and named by [US anatomist](#) Joseph Leidy who named it [Hadrosaurus fouki](#) (meaning "Foulke's big lizard"). It was a [duck-billed](#)

[dinosaur](#) (but it is now a doubtful genus because there is so little fossil information about it). The "Haddon-field Hadrosaurus" is on display at the Philadelphia Academy of Natural Sciences.

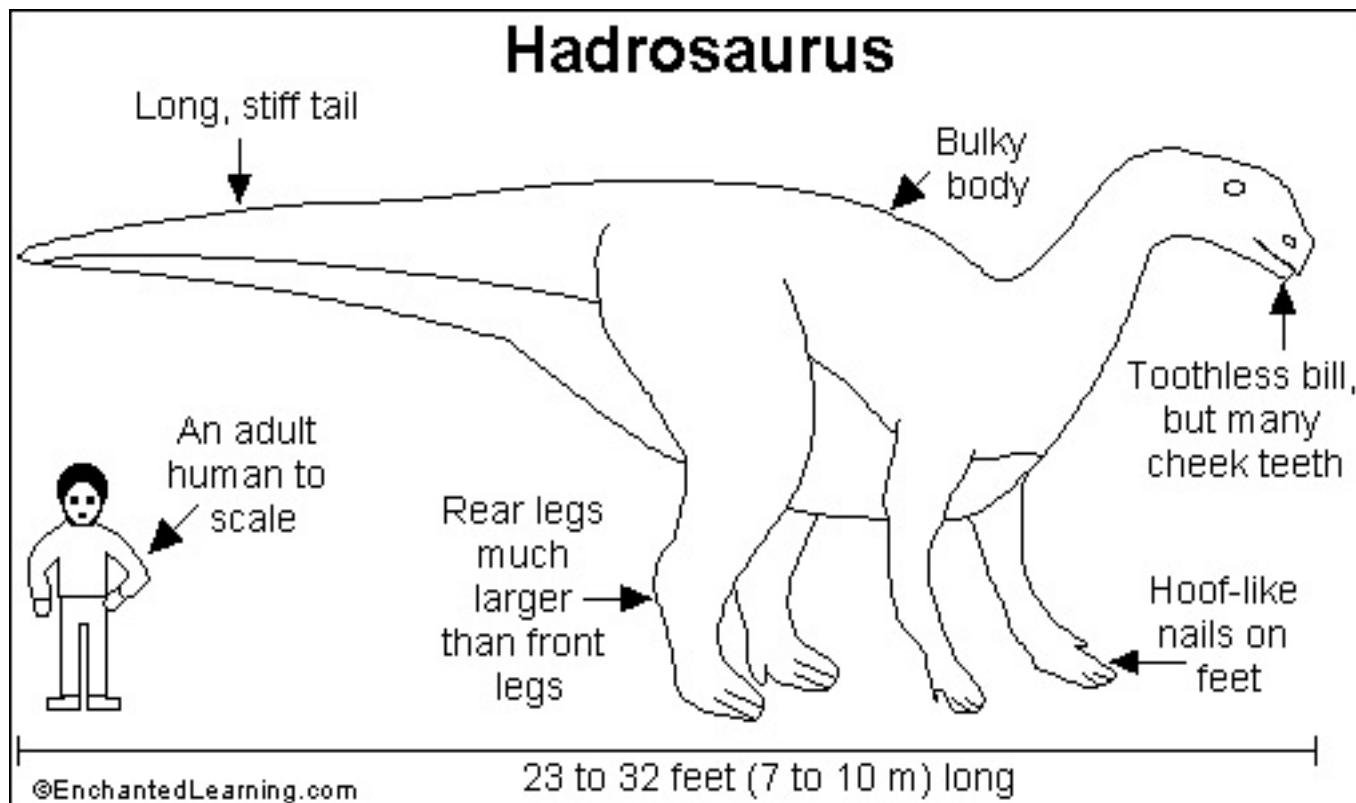
Leidy's analysis of this Hadrosaur skeleton was thorough; from its anatomy, he wrote imaginatively about the dinosaur's way of life and its death. Leidy wrote, "Hadrosaurus was most probably amphibious; and though its remains were obtained from a marine deposit, the rarity of them in the latter leads us to suppose that those in our possession had been carried down the current of a river, upon whose banks the animals lived." (Quoted from J. Leidy, Account of the

Remains of a Fossil Reptile Recently Discovered at Haddonfield, New Jersey. Proceedings Academy of Natural Sciences, Philadelphia, Dec. 14, 1858 pp.1-16.)

This study influenced the popular image of dinosaurs and dinosaur science for years. This beautiful skeleton made dinosaurs come to life in peoples' imaginations and spurred generations of paleontologists. Copyright ©1998-2008

[EnchantedLearning.com](http://www.EnchantedLearning.com) Col, Jeananda. Enchanted Learning.

<http://www.EnchantedLearning.com> 1996 Col, Jeananda. Zoom Dinosaurs. <http://www.ZoomDinosaurs.com> 1996



**The mines of Franklin and the Sterling Hill Mine at Ogdensburg, Sussex County in northwestern New Jersey** are world famous and deservedly so. No other site can boast the same assortment of rare and interesting minerals. Over three hundred different minerals were found at these mines and most are listed in "The Minerals of Franklin and Sterling Hill Table". Over 60 new minerals to science were also described from samples taken from these mines, thus claiming these mines as their type locality (these minerals are shown in bold in the table). While other great localities can have similarities with other sites, there simply are no real good parallels with the mineral assortments of Franklin and Sterling Hill, New Jersey.

The geological reasons for this diversity of minerals is somewhat complex. It involves zinc, manganese and iron rich sediments on a pre-Cambrian sea floor being swept up into a regional orogenic event that created a mountain chain in the approximate position of the current Appalachian Mountains. This event however occurred more than a billion years ago. The origin of the zinc, manganese and iron sediments is theorized to have been manganese nodules and/or sulfide producing "black smokers" that we see along mid-oceanic ridges today. Whatever the case, the manganese and zinc is what drives almost all of the unique and exotic mineral species that are found here. Later contact and regional metamorphism, hydrothermal alterations and weathering produced unusual results and thus a whole "mess" of rare zinc and manganese minerals.

The minerals that were found here are unlike those found anywhere else. Unusual manganese and zinc oxides and silicates as well as a few arsenates, are the hallmark of this locality. The primary ore minerals are the franklinite (an iron, zinc and manganese oxide) and willemite (a zinc silicate) and to a lesser extent zincite (a red colored zinc oxide) and hemimorphite (a zinc silicate). Iron is the primary product, in terms of weight, while zinc and manganese are rather significant.

When first exploited, it was thought that the ore minerals were magnetite (an iron oxide) and cuprite (a red colored copper oxide), but the ore behaved differently than other magnetite ores in the smelting process and the "cuprite" yielded no copper. Of course most of the "magnetite" turned out to be a new mineral to science, franklinite and the "cuprite" turned out to be zincite, one of the first new minerals identified in the *New World* and one of many to come from this locality. As the mining continued, more uses and better techniques for the exploitation of zinc and manganese were found and the mine became a boom for the area. The steel, paint and coal industries (needed to smelt the ore) were all positively affected by these mines. The iron/manganese alloys strengthened steel; while the zinc was used in a variety of paints and in certain alloys.

Fluorescence is a very special trait to many of the minerals here. In fact the city of Franklin calls itself "**The Fluorescent Mineral Capital of the World**"! Not all the minerals fluoresce, but many do, especially willemite and calcite. It is hard to imagine a single fluorescent mineral display that exists without at least a specimen from Franklin or Sterling Hill. The most ordinary and even dull looking specimens from these localities can literally light up with beautiful reds (calcite) and greens (willemite) under short-wave and long-wave ultraviolet light. These specimens are made even more interesting with a sprinkling of nonfluorescent black franklinite peppering the fluorescent display with opaque black dots. Other fluorescent minerals from here include esporite (bright yellow-green), clinohedrite (orange-yellow), hardystonite (violet-blue), barite (white), manganaxinite (an intense red) and over 70 others.

Manganese is the typical activator, either as a trace element or as a primary element in the fluorescent mineral's chemistry. The ore body at Franklin and Sterling Hill is surrounded by a marble made up of mostly calcite similar in appearance to the calcite of fluorescent fame. Only a few meters from the ore body however, the calcite is non-fluorescent. It lacks the manganese as an activator. This tells geologist how far the manganese permeated into the surrounding rocks.

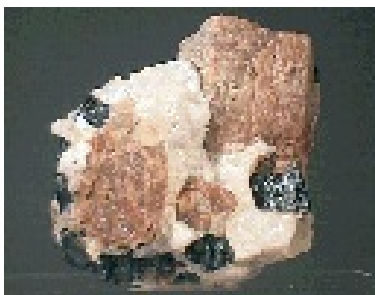
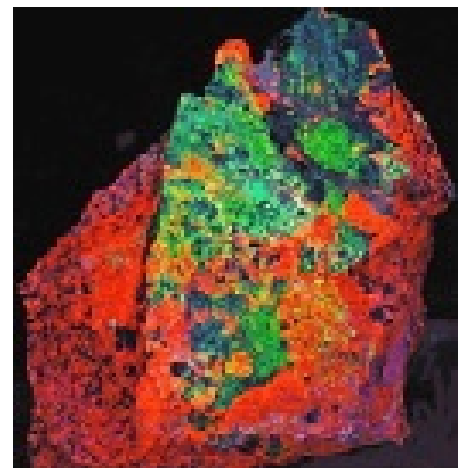
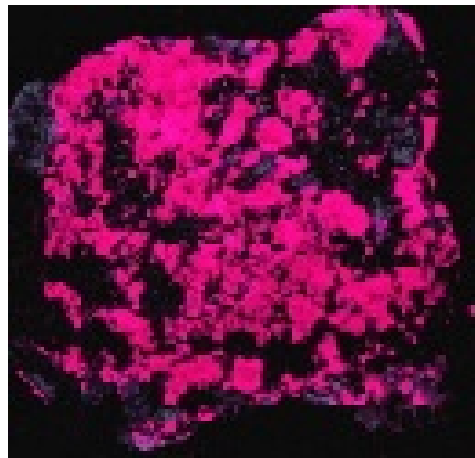
Several minerals from this site have been cut as **gemstones**. Many rank as the largest gemstones of their kind in the United States and the world. Although most are not nor have ever been significant on the gemstone markets, they were cut by and for gemstone collectors

who seek unusual gemstones. Willemite, zincite, rutile, hodgkinsonite and friedelite are a few of the rare gemstone minerals that have been cut for collectors and museums from here.

Sadly, the mines are now closed and filled with water and rock. Only a few mine dumps remain to provide any new material. Two museums are present to educate the public about these remarkable mines and one allows tours into some of the actual mine shafts and both provide mine dump collecting opportunities. It is easy to see that these mines are truly one of the best mineral localities to ever be discovered and specimens from them should be treasured.

For a nearly complete list of minerals found at this locality see **The Minerals of Franklin and Sterling Hill**. Much information for this page was provided by Franklin and Sterling Hill website.

Some samples below, check out their web sites or google ultraviolet minerals.



Willemite, franklinite and calcite  
seen on the left in daylight, on  
the right under UV light.

**LET'S GO ROCK SURFING:** You can surf the worldwide Rockhounding community at <http://groups.yahoo.com/group/rockhounds/>

**WEB-A-RAMA:** Some other websites you may find interesting and exciting:  
<http://epod.usra.edu/>

<http://www.weatherscapes.com/index.php>

<http://www.amfed.org/AACA2007Application.pdf>

Bob: I lost my pet dinosaur . Anthony: Why don't you put an ad in the newspaper ?

Bob: What good would that do, she can't read!



## MEMBERSHIP INFORMATION

Regular members are entitled to participate in all DVESS activities. Sponsoring members are entitled to the same plus a specially chosen mineral specimen. Dues are renewable each year in January. Membership rates for the Society:

### **Regular Membership:**

\$15.00 for the 1<sup>st</sup> family member + \$5.00 for each additional family member

\$10.00 for the 1<sup>st</sup> Senior ( 65+ ) member + \$5.00 for each additional family member

\$10.00 for Rowan University Students with College ID

### **Sponsoring Memberships ( each additional family member - \$5.00 ):**

*“Silver”* \$50.00 for 1<sup>st</sup> family member - receive a Geode Specimen

*“Gold”* \$75.00 for 1<sup>st</sup> family member - receive a Native Gold Specimen

*“Platinum”* \$100 for 1<sup>st</sup> family member - receive a Premium Specimen

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## **SOCIETY INFORMATION**

The **Delaware Valley Earth Science Society, Inc.**, ( DVESS ), a non-profit organization, was founded in 1956 and incorporated in the state of New Jersey in 1957. The Society:

- \* promotes interest , knowledge and the development of skills in the “earth sciences”. These interests include mineralogy, paleontology, lapidary arts, archeology and local preservation.
- \* supports the conservation of natural resources, advocates the availability of collecting sites and maintains close contact with those in the academic field.
- \* is a member club of the Eastern Federation of Mineralogical and Lapidary Societies ( <http://www.AmFed.org/EFMLS> )

## **MEETINGS**

The Society meets the 2<sup>nd</sup> Wednesday of each month from September through June, at Rowan University, Wilson Hall, Glassboro, New Jersey. At 7:30 PM members meet to socialize, view displays, sign the registry and receive a door-prize ticket, toward a specially chosen specimen. Meetings start promptly at 8:00 PM and include the evening’s program followed by the monthly business meeting, concluding around 10:00 PM. Meetings are open to the general public.

Privilege to enter Rowan University facilities is limited to the night of the meeting between the hours of 7PM & 10PM under the direction of the University staff. Permission from the University staff is required to enter the school at any other time.

PUZZLES:

<b>Soon Soon</b> <b>Tell Tell</b>	<b>BA NK</b>	Barbershop Barbershop Barbershop Barbershop
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What sweet treat was invented on Feb 23 1896 ?

What was first introduced on our meeting date in 1862 ?

What famous physicist, who did much of his work at Princeton, New Jersey was born on March 14<sup>th</sup> ?

**Fact :** There will be 527,040 minutes during this 2008 leap year so the world can catch up.

Answers at the meeting, See you there.

Editor's Notes: Editor is not responsible for authenticity of information in any articles submitted for publication. Nor are the opinions expressed in the "DVESScapades" necessarily those of the officers of the Delaware Valley Earth Science Society, Inc., and/or the editor.

To submit an article for publication in the DVESScapades contact the Newsletter Editor. [decuzzic@comcast.net](mailto:decuzzic@comcast.net), or Delaware Valley Earth Science Society Inc., DVESS, P O Box 372 Maple Shade, New Jersey 08052 or DVESS Website: <http://www.dvess.org>

After this Newsletter we will attempt to send future newsletters via e-mail, this will save the club printing and postage costs. Please advise either [decuzzic@comcast.net](mailto:decuzzic@comcast.net) or DVESS Website: <http://www.dvess.org> if email is not available to you and you wish to stay on the mailing list. Thank you Carol

Q: Why did the dinosaur cross the road ? A: It was the chicken's day off!!

Thanks to Courtney T., Age 10, Port Moody, B.C., Canada

Q: Where do dinosaurs get their mail ? A: At the dead-letter office!

Q: What's as big as a dinosaur but weighs nothing? A: Her shadow! ( BADA BUM )

**WE ARE IN NEED OF A TEMPORARY OR PERMANENT FIELD TRIP PLANNER PLEASE !  
E-MAIL OR CALL AN OFFICER THANKS**

## DIG THIS! \_\_\_\_\_

Oldest Horse Crabs USC Press Release,  
Jan 28,2008

Nearly a half a billion years ago, tiny horseshoe crabs crept along the shorelines much like today's larger versions do, new fossil evidence suggests. Two nearly complete fossil specimens discovered in Canada reveal a new genus of horseshoe crab, pushing their origins back at least 100 million years earlier than previously thought. Dubbed *Lunataspis aurora*, the ancient horseshoe crab is estimated to have been just 1.5 inches (4 centimeters) from head to tail-tip. That's much smaller than its modern-day relatives that can span nearly 20 inches (50 centimeters).

"We do not know if the fossils were small because they were simply young animals or because *Lunataspis* just didn't grow any bigger," said researcher David Rudkin of the Royal Ontario Museum in Canada.

Rudkin and his colleagues, including Graham Young of the Manitoba Museum, spotted the fossils buried in 445 - million-year-old rocks from the Ordovician period in central and northern Manitoba. They describe the discovery in the January issue of the journal *Paleontology*.

The specimens included patches of the animals' outer covering and even evidence of their compound eyes. Horseshoe crabs are not true crabs and are instead more closely related to spiders and scorpions. And like their eight-legged relatives, horseshoe crabs sport a flexible exoskeleton made of chitin rather than the

hard-shell armoring worn by crabs. Chitin degrades over time. For that reason, ancient specimens of horseshoe crabs have been sparse. Until now, the oldest fossils dated back 350 million years ago, from the Carboniferous period. Fossils have also been found in rocks from the Jurassic Period, suggesting the animals were crawling around beneath dinosaurs. Both the Carboniferous and the Jurassic fossil discoveries indicate the ancient horseshoe crabs greatly resembled their modern-day counterparts. Analysis of the recent finds also indicates the ocean creatures haven't changed much over the eons. "We wouldn't necessarily have expected horseshoe crabs to look very much like the modern ones, but that's exactly what they look like," Rudkin said.

"This body plan that they've invented, they've stayed with it for almost a half a billion years. It's a good plan," Rudkin told LiveScience. "They've survived almost unchanged up until the present day, whereas lots of other animals haven't." And whereas major extinction events have wiped even the mightiest, non-avian dinosaurs from our planet, this primitive-looking organism has come out unscathed.

"The horseshoe crab, the lowly little animal that crawls out of the sea every once in a while to mate, it's survived for at least 445 million years in more or less the same form," Rudkin said. He added that understanding how horseshoe crabs adapted to their ecological niche so early and then weathered natural crises will give scientists broader insights about how ocean ecosystems changed over time.

## Platypus Lived with Dinosaurs

Proceedings of the National Academy of Sciences January 22, 2008

Australia's duck-billed platypus has been around much longer than previously thought, according to a new fossil study that found the egg-laying mammal's origin traces back to the dinosaur days. Platypuses and their closest evolutionary relatives, the four echidna species, were thought to have split from a common ancestor sometime in the past 17 million to 65 million years. But remains of what was believed to be a distant forebear of both the platypus and the echidna—the fossil species *Teinolophos*—actually belong to an early platypus, according to scientists who performed an x-ray analysis of a *Teinolophos* jawbone.

The finding means the two animals must have separated sometime earlier than the age of the fossil—at least 112 million years ago. The international team, led by Timothy Rowe, of the University of Texas in Austin, used a specially modified CT scanner to capture high-resolution images of the internal structure of a 112.5- to 122-million-year-old *Teinolophos* jawbone found in southeastern Australia. The scientists found that the *Teinolophos* had already developed features thought to be unique to modern platypuses, including an electro-sensitive "bill" for finding aquatic prey. "This pushes the platypus back across the K-T boundary," Rowe said, referring to the mass extinction event that wiped out the dinosaurs about 65 million years ago. "Now it looks like [platypuses] crossed the boundary without any problem."

The study appears in today's edition of the journal *Proceedings of the National*

*Academy of Sciences*. Platypus bills are complex sensory organs loaded with electrical receptors. In murky waters the animals hunt by tracking the weak electrical fields generated by muscle activity in fish and other prey. *Teinolophos* had an electro-sensitive bill, the scientists concluded after imaging revealed a broad canal running through the bone of the lower jaw.

All mammals have some type of canal that conducts nerve fibers to the teeth, Rowe noted. But in the platypus, this canal is greatly enlarged to accommodate a massive network of fibers that carry sensory information from the bill. The claim that *Teinolophos* is a very ancient platypus rests largely on this feature. "Nothing but the platypus has this huge canal," Rowe said.

But Matt Phillips, of the Australian National University in Canberra, said more evidence may be needed. The research "does not confirm that the platypuses and echidnas diverged more than 112 million years ago," Phillips said. Phillips offered an alternative explanation for the new findings—that an early platypus-echidna ancestor had wide jaw canals, and this feature was retained by platypuses but reduced during subsequent echidna evolution. In such a scenario, the split of the two species could still have been relatively recent, Phillips said. Lead author Rowe counters that evidence for a more recent divergence is weak. He says it makes more sense to assume the wide canals are a unique feature of the platypus lineage. Because platypus and echidna fossils are rare, Rowe noted, most previous estimates of the strange animals' antiquity were based on molecular rather than fossil evidence. The gradual accumulation of

changes in the DNA of closely related species provides a kind of "molecular clock" that biologists can use to estimate when the species branched apart from one another. DNA changes, however, don't occur at the same rate in different kinds of animals. The clock must be calibrated using other evidence, such as fossils. Studies suggesting a more recent platypus origin have used a molecular clock calibrated with fossil information from marsupials and other mammals, not platypuses and echidnas, Rowe said.

The newfound early days of the

platypus suggest that molecular evolution in platypuses and echidnas has proceeded at a far slower pace than in other mammal groups, the researchers say. "None [of the molecular studies] predicted we'd find a platypus this old," Rowe said. "The picture now emerging is that the monotremes are 'slow' in many respects," he continued. Platypuses and echidnas are the only extant "monotremes," or mammals that lay eggs. "Their metabolic and respiration rates are slower, their body temperature is lower, and it's possible that the monotreme lineage evolved at really slow rates," he said.

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## Fossil sea monster big enough to "bite a car"

By Alister Doyle, Environment Correspondent, Reuters Wed Feb 27, 12:09 PM EST

The fossil of a 15 meter (50 ft) long "sea monster" found in Arctic Norway was the biggest of its kind known to science with dagger-like teeth in a mouth large enough to bite a small car, researchers said on Wednesday.

The 150-million year old dinosaur-era pliosaur, a fierce marine reptile, was about five meters (16 ft 5 in) longer than the previous pliosaur record holder found in Australia.

"It's a new species and the biggest proven pliosaur," Joern Hurum, a paleontologist at the Natural History Museum in Oslo who led the expedition to dig up the fossil on the archipelago of Svalbard 1,300 km (800 miles) from the North Pole.

"A small car could fit inside its mouth," he told Reuters, adding the lower jaw was about three meters (10 ft) long. "Something like a Morris Minor (European compact car) would fit perfectly."

The Museum said that pliosaurs were the top marine predators of the

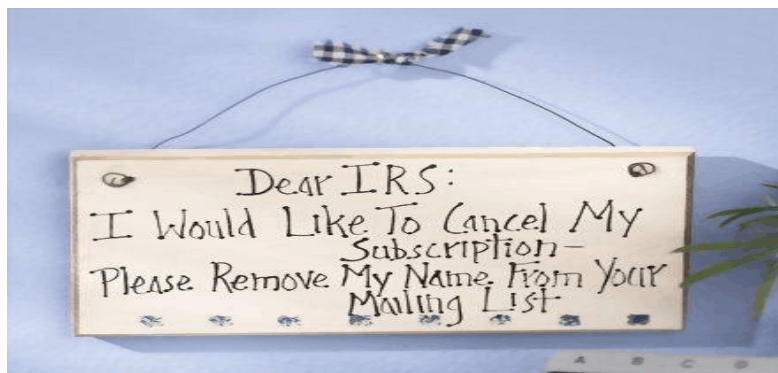
Jurassic era, preying upon squid-like animals, fish, and other marine reptiles. Another type of fossil marine reptile, the ichthyosaur, was bigger at up to 23 meters (75 ft). "The pliosaur is not the biggest sea monster but it's probably the most fierce," Hurum said, adding the fossil has jagged teeth the size of cucumbers.

"The front flipper of our pliosaur alone is three meters long. We've laid it out downstairs in the basement," he said. Earlier estimates had been that the Norwegian pliosaur, popularly dubbed "The Monster," was about 12 meters (40 ft) long, roughly as long as Australia's kronosaurus.

The Arctic find "demonstrates that these gigantic animals inhabited the northern seas of our planet during the age of dinosaurs," said Patrick Druckenmiller of the University of Alaska Museum who was on the expedition that found the fossil. The Norwegian museum said that it was planning to return in mid-2008 to excavate a skull and skeleton of another gigantic pliosaur recently found near "The Monster."

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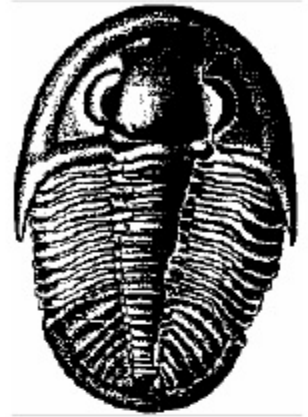
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# Philadelphia Mineral



## Treasures And Fossil Fair 28<sup>th</sup> Annual Show and Sale 2008



**Saturday, March 29<sup>th</sup> 10:00 AM – 5:00 PM**  
**Sunday, March 30<sup>th</sup> 10:00 AM – 4:00 PM**

Sponsored by the **Delaware Valley Paleontological Society**  
and the **Philadelphia Mineralogical Society**

**Admission - Adults \$5.00 – Kids under 12 \$1.00 - Uniformed Scouts Free.**

**Fossils, Minerals, Gems, and Jewelry for sale.**

**Fossil and Mineral Exhibits and Demonstrations.**

**Learning activities including a free Fossil Dig for children and a kids corner with free  
Mineral Specimens and Scouting Merit Badge Information.**

**Food, Beverages, and Door Prizes!**

### **Directions**

**From the PA Turnpike (I-276):** Take Norristown exit 333. After tollbooth follow signs for Plymouth Rd. Turn right at bottom of ramp onto Plymouth Rd. Continue to “T” intersection at traffic light. Turn left onto Butler Pike. Go one mile bearing left at the “Y” intersection with Militia Hill Rd. Lu Lu Shriners Temple is on the right.

**From the Blue Route (I476):** Take exit 20. Follow signs for Plymouth Rd, bearing left. At the bottom of the ramp turn right onto Plymouth Rd. Continue to “T” intersection at traffic light. Turn left onto Butler Pike. Go one mile bearing left at the “Y” intersection with Militia Hill Rd. Lu Lu Shriners Temple is on the right.

08/19

W O R D # D V E S S P U Z Z L E L o v e l a n d

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DATOLITE	FERBERITE
DENDRITES	FLINT
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DUMORTIERITE	HORNEBLENDE
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ENSTATITE	ILMENITE
EPIDOTE	JADE
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EUDIALYTE	
EUXENITE	
FELDSPAR	

## Rocks & Minerals

E	T	I	H	P	A	R	G	S	H	A	L	I	T	E
M	M	I	C	A	V	A	L	S	L	A	T	E	T	T
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I	Y	T	G	W	A	C	K	E	P	S	N	J	P	C
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AGATE	GABBERO	MICA
ALUM	GALENA	OLIVINE
BASALT	GARNET	OOLITE
BIOTITE	GNEISS	PYRITE
BORON	GRANITE	QUARTZ
CALCITE	GRAPHITE	RUBY
CHERT	GYPSUM	RUTILE
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