

# The ECPHORA



The Newsletter of the Calvert Marine Museum Fossil Club

Volume 21 • Number 1 March 2006

## Features

- **Fossil Platanistid Skull From Calvert Cliffs**
- **Shark Teeth from Flag Ponds**
- **Blue Lake Rhino**

## Inside

- **Bizarre Vertebra**
- **Pathological Meg Tooth**

If you have not renewed your CMM Fossil Club Membership, this may be your last chance! Form in the December Issue!

Upcoming Lecture:  
**Dr. John Pojeta**  
(National Museum of Natural History, The Smithsonian)

Saturday, April 22,  
2006

**The Early Evolution of Mollusks**

## First Fossil Platanistid Dolphin Skull at CMM

Living platanistids comprise only two species of freshwater dolphins confined to the Indian subcontinent, the Indus River dolphin, and the Ganges River dolphin (Figure 1). During the Miocene Epoch (from 23.8-5.3 million years ago) however, platanistid dolphins were fully marine and nearly global in their geographic distribution. Most members of the Platanistidae, both fossil and extant, exhibit enlarged bosses or crests over the eyes. The two living species are extreme in the development of these large pneumatic or sinus-filled crests that curl up and over their face just in front of the blowhole. The ragged-edged crests nearly encircle the melon, the soft-tissue sound lens that they use to echolocate. Notice also how slender their fully-toothed snout is.



Figure 1. The Ganges River dolphin, *Platanista gangetica*, a National Museum of Natural History specimen in an oblique right lateral view. Access to the skull courtesy Dr. James Mead, Curator, Division of Mammals. Photo by S. Godfrey.



In 1868, well-known American paleontologist, **Edward Drinker Cope**, described the skull of a long-snouted platanistid dolphin from Calvert Cliffs and named it *Zarhachis flagellator* Cope, 1868. Until recently, the Calvert Marine Museum did not have a skull of *Z. flagellator* in its collection. I am delighted to report that



Figure 2. Skull of *Zarhachis flagellator*, CMM-V-2279, in an oblique right lateral view. Approximately 24" is missing from the front end of this dolphin's greatly elongate rostrum. CMM Paleo Research Intern, **Jennifer Gerholdt**, has her hand around part of the supraorbital crest. Photo by S. Godfrey.



Figure 3. *Zarhachis flagellator*, CMM-V-2279, showing the development of the supraorbital crest in this skull. The right supraorbital crest was depressed post-mortem. Photo by S. Godfrey.

that deficiency has now been rectified (Figure 2). Although the rostrum is not complete anteriorly, the skull and lower jaw of CMM-V-2279 are otherwise very well preserved. This is the skull that prep lab volunteer **John Nance** began to prepare several years ago and was reported on in *The Ecphora* (Godfrey, 2005). Work on the skull is now complete, including its archival cradle that holds this handsome addition to our permanent collection.

As in other platanistids, *Zarhachis* (Figures 2 & 3) exhibits a robust supraorbital crest over each eye. However, it is relatively small and not so nearly plate-like as compared to its development in the

Ganges River Dolphin. Furthermore, in its overall proportions, the skull of *Zarhachis* is much more like other primitive Miocene dolphins than it is like its highly derived living relative, *Platanista* (Fig. 1).

*Zarhachis* was not the only platanistid species to swim in the Miocene Atlantic when it covered southern Maryland. Work continues on other less well-known platanistids from Calvert Cliffs!

## References

- Cope, E. D. 1868. "Second contribution to the history of the Vertebrata of the Miocene period of the United States." *Proceedings of the Academy of Natural Sciences of Philadelphia*, 20:184- 194.
- Godfrey, S. J. 2005. "Well-preserved dolphin skull from the Calvert Formation." *The Ecphora*, 20(2):6.

## A 2005 Census of Miocene Shark Teeth From Flag Ponds, Maryland

Recently, **Scott Neiman** conducted a yearlong study of the diversity and abundance of fossil shark teeth found on the beach at Flag Ponds, Calvert County, Maryland (Table 1). 96 trips to Flag Ponds later, a total of 3,010 teeth had been collected.

Shark Teeth Identification	# of teeth	% of total
<b>Cow - <i>Notorynchus primigenius</i></b>	<b>13</b>	<b>0.4%</b>
Giant White – <i>C. chubutensis</i>	1	0.03%
Giant White – <i>C. megalodon</i>	15	0.5%
<b>Gray - <i>Carcharhinus</i> spp.</b>	<b>1259</b>	<b>41.8%</b>
Hammerhead - <i>Sphyrna laevisissima</i>	10	0.3%
Lemon - <i>Negaprion eurybathrodon</i>	138	4.6%
<b>Mako - <i>Isurus</i> spp.</b>	<b>191</b>	<b>6.3%</b>
Sand - <i>Carcharias</i> spp.	40	1.3%
<b>Snaggletooth - <i>Hemipristis serra</i></b>	<b>784</b>	<b>26.0%</b>
Thresher - <i>Alopias latidens</i>	10	0.3%
<b>Tiger - <i>Galeocerdo</i> spp.</b>	<b>549</b>	<b>18.2%</b>
<b>Totals</b>	<b>3010</b>	<b>100.00%</b>

**Table 1.** A census of float-collected shark teeth from Flag Ponds, Calvert Cliffs, Calvert County, Maryland. Collected by **Scott Neiman**.

Keep in mind that in a study like this, collecting biases and human error are inadvertently introduced into a dataset as a result of, but not necessarily limited to: 1) Size filtering. Obviously, shark species with very small teeth are under-represented in the sample because their teeth are not so easily seen and therefore not collected. 2) Misidentification. Some water-worn teeth are difficult or impossible to correctly identify. 3) Bodies. The number of shark teeth in a dataset does not translate directly into the number of sharks that lived in that place during prehistoric time. That is because small-toothed sharks tend to produce more teeth in a lifetime than do large-toothed species. Here we are only comparing the relative abundance of shark teeth, not the number of individual sharks.

Visaggi and Godfrey (2001) reported on the results of a preliminary census conducted on fossil shark teeth collected as float from the beaches the length of Calvert Cliffs (Table 2). There is remarkable congruence between the two datasets (compare Tables 1 & 2). Notice that gray sharks dominate in both samples at about 41% and 46% respectively.

Shark Teeth Identification	# of teeth	% of total
Angel - <i>Squatina subserata</i>	9	0.04%
<b>Cow - <i>Notorynchus primigenius</i></b>	<b>171</b>	<b>0.70%</b>
Giant White – <i>C. chubutensis</i>	1	> 0.01%
Giant White – <i>C. megalodon</i>	172	0.70%
<b>Gray - <i>Carcharhinus</i> spp.</b>	<b>11326</b>	<b>46.40%</b>
Hammerhead - <i>Sphyrna laevisissima</i>	213	0.87%
Lemon - <i>Negaprion eurybathrodon</i>	132	0.54%
<b>Mako - <i>Isurus</i> spp.</b>	<b>1050</b>	<b>4.30%</b>
Sand - <i>Carcharias</i> spp.	1347	5.52%
Sawfishes - <i>Pristis</i> spp.	1	> 0.01%
Sharpnose - <i>Rhizoprionodon fischeuri</i>	5	0.02%
<b>Snaggletooth - <i>Hemipristis serra</i></b>	<b>3346</b>	<b>13.71%</b>
Thresher - <i>Alopias latidens</i>	79	0.32%
<b>Tiger - <i>Galeocerdo aduncus</i></b>	<b>2083</b>	<b>8.53%</b>
<b>Tiger - <i>Galeocerdo contortus</i></b>	<b>2622</b>	<b>10.74%</b>
Whale - <i>Rhincodon typus</i>	1	> 0.01%
White - <i>Carcharodon carcharias</i>	2	0.01%
<b>Other</b>		
Uncertain - Requiem vs. Lemon	176	0.72%
Uncertain - Sand vs. Mako	326	1.34%
Uncertain - Tiger Species	269	1.10%
Uncertain - Unknown	1079	4.42%
<b>Totals</b>	<b>24410</b>	<b>100.00%</b>

**Table 2.** A census of float-collected shark teeth from Calvert Cliffs, Calvert County, Maryland. Reproduced from Visaggi and Godfrey (2001).

One of the few significant differences between the two samples involves the proportions of snaggletooth shark teeth. In the total Calvert Cliffs sample, snaggletooth shark teeth make up about 14% whereas in the Flag Ponds sample, they nearly double their abundance at 26%.

Tiger shark teeth are spot on in both samples comprising about 18% and 19% respectively (Note: in Table 2, add the two tiger shark species together). Mako shark teeth were slightly more common at Flag Ponds, making up 6% as opposed to 4% of the total Calvert Cliffs sample. Sand tiger shark teeth were much more common in the larger sample, at about 5%, whereas at Flag Ponds, they constituted only about 1% of that sample. Lemon sharks showed the opposite trend. In the larger sample their teeth made up only about 0.5%, whereas at Flag Ponds they are ten times more likely to be found, comprising about 5% of the data set.

Of the remaining types of shark teeth collected at Flag Ponds (i.e., cow shark, giant white shark, hammerhead shark, and thresher shark), each constitutes less than 1% of their respective total data-set sample!

The close parallels in abundance and diversity between these two large samples would seem to indicate that these finds are reasonably accurate in terms of the proportions of shark teeth that one could expect to find in an entire sample comprising all the beaches along Calvert Cliffs and one restricted only to Flag Ponds. Visaggi and Godfrey (in prep) believe the differences between the total Calvert Cliffs sample and the one from Flag Ponds are real and reflect differences in depositional environments and the types of sharks that inhabited these domains at different times during the Miocene. As an aside, Visaggi and Godfrey continue to work with their initial census dataset as well as with another dataset comprising shark teeth that were collected *in situ* by CMM and the Smithsonian.

## References

Visaggi, C. C. and S. J. Godfrey. 2001. "A census of Miocene shark teeth from Calvert County beaches, Maryland, a preliminary report." *The Ecphora*, 17(3).

Scott Neiman and Stephen Godfrey ☀

## Pathological Meg Tooth From Calvert Cliffs



*This severely deformed C. megalodon tooth was collected recently from Calvert Cliffs by J.T. Marcum and currently resides in another individual's private collection. The isolated tooth, about two inches wide at its base, was disturbed early in its developmental history (ontogeny) for the crown to exhibit such an unusual shape. Scale bar is in centimeters. Scan by S. Godfrey. ☀*

## Jurassic "Beaver" Unearthed in China...

<http://www.cmn.com/2006/TECH/science/02/23/jurassic.beaver.ap/index.html>

Submitted by Bruce Hargreaves. ☀

## The Blue Lake Rhino

by: George F. Klein

Paul Murdoch's recent article on rhinoceroses (1) mentioned an extraordinary fossil located near Coulee City in Washington State. The fossil is a body mold of a primitive rhinoceros that was entrapped in a lava flow 15 – 16 Million Years Before Present (MYBP). Called "The Blue Lake Rhino" for a small town nearby, it was discovered by a group of hikers in 1935. The discoverers saw what they thought was a small opening on a cliff side. Thinking it might be a lava cave, they decided to explore it. Upon entering the "cave," they realized it was something more. The opening was actually the mold of one of the rhino's rear legs!

Starting during the Early Miocene, 15 – 16 million years ago, the Pacific Northwest was inundated by a series of huge lava flows. These flows eventually covered approximately one half of Washington State as well as portions of Oregon and Idaho. Over time, the lava hardened to form the igneous rock basalt. They are referred to as the Columbia River Basalt Flows (2) due to their proximity to the current Columbia River.

The timing of these lava flows overlaps two of the Land Mammal Ages of the Miocene, the Hemingfordian (19.0 – 15.9 MYBP) and Barstovian (15.9 – 11.5 MYBP). Members of the CMMFC will note that the Blue Lake Rhino was entrapped during the deposition of the Calvert Formation.

Apparently, the rhino had died and its body floated in a shallow lake. Paleontologists know that the rhino was in water because pillow lavas were formed that can only occur when the molten lava contacts water (3). These lavas were plastic enough to flow around the body and were cooled by the water so they became rigid quickly. Thus an external mold of the animal's body was formed (4).

After discovery of the Blue Lake Rhino, word got back to the University of California at Berkeley and two fairly famous paleontologists of the time, Don Savage and R. A. Stirton, visited the site. They entered the rhino cavity and recovered a jaw section and some other bone fragments. The

recovered bone looked as though it had been partially burned.

Later, Don Savage returned with a work crew and made an internal plaster cast of the rhino. It was made by coating the interior of the cavity with liquid soap to act as a release agent. Then the complete interior of the rhino was covered with strips of burlap dipped in plaster-of-Paris. The liquid soap prevented the plaster from sticking to the basalt rock. The crew waited for the plaster to harden. Then, while inside the rhino, in temperatures between hell and a blast furnace, they cut the cast into sections and removed them through the rear leg opening.

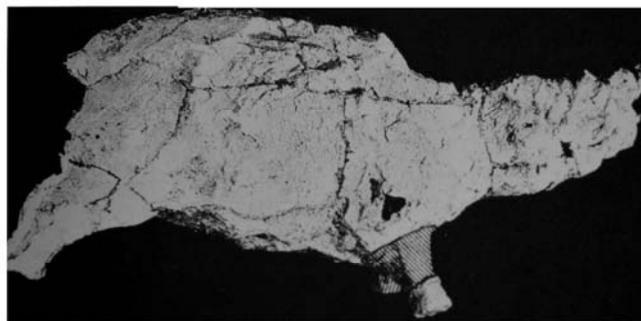


Figure 1. The re-assembled cast of the Blue Lake Rhino. Examination of it back at Berkeley confirmed that the animal was indeed dead prior to burial in the lava. The head was pulled upward, the upper lip was drawn back and the mouth was opened. It was also bloated and its legs splayed outward. All of the above are characteristics of an animal that was buried post-mortem.

Measurements of the teeth and lower jaw section, though not particularly diagnostic, show that the Blue Lake Rhino could be a small *Diceratherium*, a *Menoceras* or a small *Peraceras*, such as *P. profectum*. Don Prothero, author of the book *The Evolution of North American Rhinoceroses* believes it to be the latter, as *Diceratherium* and *Menoceras* became extinct by the Barstovian.

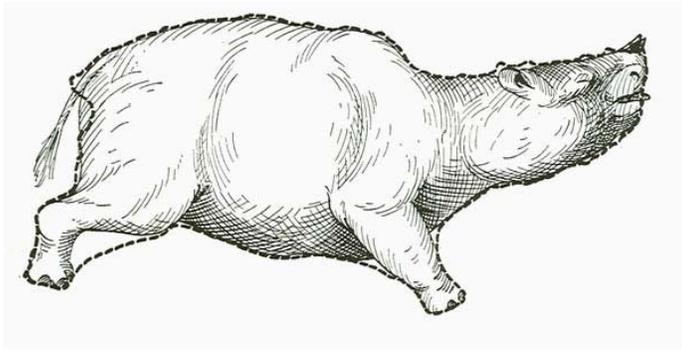


Figure 2. A restoration of the Blue Lake Rhino in its death pose. The dashed outline indicates the outside dimensions of the cast made by the Berkeley field crew. The overall length of the cast is approximately 7'-10".

Note: Much of the above comes from posts made by **Wann Langston Jr.** and **Don Prothero** to SVP's vertpaleo server. **Wann Langston** was involved in the restoration of the Blue Lake Rhino while at Berkeley. There was a story about the Blue Lake Rhino in *The Fossil News* (5), stating that the rhino was a *Diceratherium* and alive prior to burial in the lava. However, according to the above, this may not be correct.

## References

- 1) Murdoch, Paul "A Rhinoceros Tooth Fossil from the Calvert Cliffs of Maryland." *The Ecphora*, July 2004
- 2) [http://volcano.und.nodak.edu/vwdocs/volc\\_images/north\\_america/crb.html](http://volcano.und.nodak.edu/vwdocs/volc_images/north_america/crb.html)
- 3) <http://volcanoes.usgs.gov/Products/Pglossary/PillowLava.html>
- 4) Rich, P. V. et al. *The Fossil Book, A Record of Prehistoric Life*. Dover Publications Inc, Mineola, NY (1996)
- 5) [www.fossilnews.com/1999/rhino.html](http://www.fossilnews.com/1999/rhino.html)



## Two-Legged Fossil Crocodile Found in the Basement of the American Museum of Natural History

<http://www.cnn.com/2006/TECH/science/01/26/fossil.archosaur.reut/index.html>

Submitted by **Bruce Hargreaves**. ☀

## Myliobatid Spine



The individual barbs and tip of this stingray tail spine from the St. Marys Formation are superbly well preserved. Scale bar is in centimeters. Collected and prepared by **Bill Counterman**. Scan by **S. Godfrey**. ☀

## *Stegodon* (a Miocene Elephant) Remains Found in a Thai Rice Bed

[http://news.nationalgeographic.com/news/2006/01/0103\\_060103\\_thai\\_fossils.html](http://news.nationalgeographic.com/news/2006/01/0103_060103_thai_fossils.html)

Submitted by **Bruce Hargreaves**. ☀

## Interested in the origin of Cats...

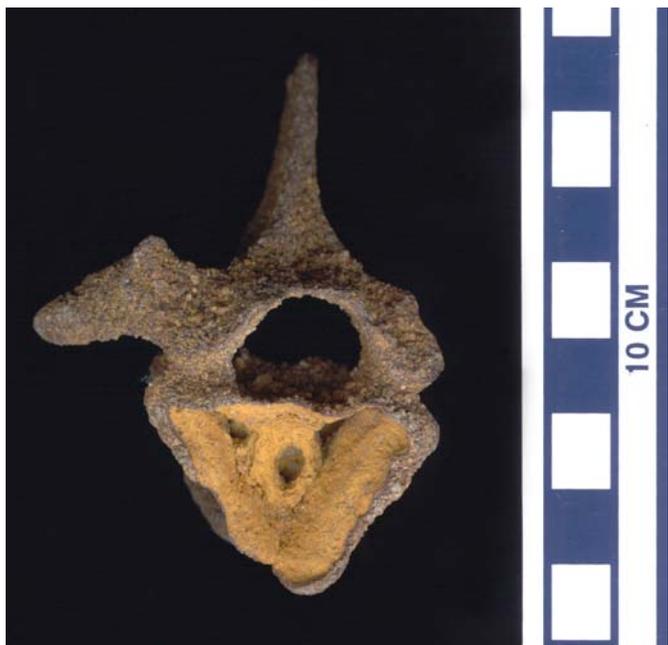
Then check out this link submitted by **Bruce Hargreaves**.

<http://news.bbc.co.uk/2/hi/science/nature/4585766.stm>

## Mystery Vertebra From Calvert Cliffs

When bones fossilize, most or all of the original bone-forming minerals are preserved. What is usually added to the original bone to make it a fossil are rock-forming minerals that either partially or completely infill its porous interior.

Under exceptional circumstances, however, bone can be replaced so that no part of the original bone remains. Bone is often replaced by the clay-forming mineral kaolin in the Paleozoic (Pennsylvanian) iron carbonate nodules found at Mazon Creek, Illinois (Godfrey, 1997).



This recently collected vertebra, shown here in anterior view, is another example of a replacement fossil. This fossilized vertebra was entirely replaced by an ironstone precipitate. **William Douglass** collected it from along Calvert Cliffs. Scan by S. Godfrey. ☀

Godfrey, S. J. 1997. "Amphibians and Reptiles." Chapter 19. In: *Richardson's Guide to the Fossil Fauna of Mazon Creek, Illinois*. Edited by Shabica, C.W., Sroka, S.D., Kurty, S., and Baird, G.C.

## New Paleo Research Intern at CMM

**Jennifer Gerholdt** is CMM's newest paleontology research intern. She is working with **Stephen Godfrey** to describe a series of Miocene fossil dolphin partial rostra from Calvert Cliffs that display interesting paleo-pathologies. The swollen dolphin snouts from the collections of the Smithsonian and the CMM have been CT-scanned to reveal, among other things, how the prehistoric infection and resulting osteological abnormality affected the original shape of the rostrum. Look for an article on these pathologies in an upcoming issue of the *Bugeye Times*. S. Godfrey ☀

## Judge Rules Against 'Intelligent Design'

<http://www.washingtonpost.com/wp-dyn/content/article/2005/12/20/AR2005122000532.html?referrer=emailarticle>

Submitted by **Doug Alves**. ☀

## Dodo Mass Grave Found on Mauritius

<http://news.bbc.co.uk/2/hi/science/nature/4556928.stm>

Submitted by **Bruce Hargreaves**. ☀

## 6,000 Year-Old Oak Tree in Pristine Condition Unearthed in Indiana

[http://www.usatoday.com/tech/science/discoveries/2006-02-17-ancient-tree\\_x.htm](http://www.usatoday.com/tech/science/discoveries/2006-02-17-ancient-tree_x.htm)

Submitted by **Bruce Hargreaves**. ☀

## UPCOMING FIELD TRIPS AND EVENTS

---

Please remember to call (or e-mail, if requested below) for yourself and family members, or for another club member, on the dates and times indicated. Current memberships in both the fossil club and the Calvert Marine Museum are needed to go on the trips. Information on directions, lodging, meeting times and meeting places will be provided at the call-in, or via e-mail if requested below.

---

**April 1, 2006: Saturday Morning. Purse State Park (Nanjemoy Point).** A Late Paleocene site on the Potomac River in Charles County, MD. Well known for abundant crocodile, ray, *Otodus* sp., and *Striatolamia* sp. teeth, and the gastropod *Turritella* sp.. Rare *Paraorthacodus* sp. and *Palaeocarcharodon* sp. teeth have turned up with persistence. Access to the site requires a moderate hike through the woods, and sometimes rather strenuous hiking and climbing over trees along the water's edge. Collecting is by beachcombing along the riverbanks and screening. Call in to Bruce at 301-843-1844, Monday evening, March 27, 7:00-9:00. Or, e-mail to Bruce at [mooseman65@verizon.net](mailto:mooseman65@verizon.net).

**April 22, 2006: Saturday. Fossil Club Meeting** at 1:00 pm, to be held in the 3rd floor lounge in the Exhibits Building. **Public Lecture** at 2:30 p.m.: **Dr. John Pojeta Smithsonian Institution will lecture on the early evolution of mollusks.**

**April 29, 2006: Saturday. Plum Point. Upper Calvert and Lower Choptank Formations (Miocene).** Martin Meyer has kindly allowed our group to visit this site on the Chesapeake Bay, approximately 32 miles north of the Calvert Marine Museum. Shark, marine mammal, and land mammal (including horse teeth) have been collected here. Limit 15. Call-in to Kathy at 410-549-4701, Sunday evening April 23, 5:00-7:00 (if no answer keep trying; after 7:00 leave message). Or e-mail to Kathy from April 19-April 23 at [k.a.y@erols.com](mailto:k.a.y@erols.com).

**April 28, 2006: Friday. Martin Marietta Rocky Point Quarry, New Hanover Co., NC. Castle Hayne Formation (Eocene).** The most common fossils at this site are echinoids, including the sea urchins (e.g., *Echinolampas appendiculata*, *Eurhodia rugosa*) and sand dollars. Crab claws, nautiloids, sharks teeth (*Carcharocles auriculatis*) and rarely archaeocete whale material (*Zygorhiza kochii*) have also been found here. We will need to bring our own hardhats and wear sturdy boots. This site often requires walking over difficult terrain, including steep hills and muddy areas. The travel time from the Washington, DC, area is approximately 8 hours. Call-in to Bruce at 301-843-1844, Monday evening, April 17, 7:00-9:00. Or, e-mail to Bruce at [mooseman65@verizon.net](mailto:mooseman65@verizon.net).

**April 29, 2006: Saturday. PCS Phosphate Mine in Aurora, NC. Yorktown Formation and Pungo River Formation.** A diversity of Miocene and Pliocene vertebrate and invertebrate material with abundant shark, whale, porpoise, turtle, fish, and mollusk specimens can be found. The giant and highly prized *Carcharocles megalodon* shark teeth, and relatively rare bramble (*Echinorhinus blakei*), whale (*Rhincodon* sp.) and false mako (*Parotodus benedeni*) teeth, and seal, walrus, *Squalodon*, and sea cow material have turned up on rare occasions. Hard hats, ankle-covering steel-toe boots, sleeved shirts, long pants, and photo ID are required. Call-in to Bruce at 301-843-1844, Monday evening, April 17, 7:00-9:00. Or, e-mail to Bruce at [mooseman65@verizon.net](mailto:mooseman65@verizon.net).

**May 13, 2006: Saturday. Scientists' Cliffs. Calvert Formation (Miocene)** site on the Chesapeake Bay. Invertebrate (*Anadara*, *Mercenaria*, *Nuculana*, *Ecphora*, *Crepidula*) and vertebrate material including *C. megalodon* teeth, crocodile teeth, and crab claws have been found here. In past trips, several specimens of the rare Miocene brachiopod, *Discinisca lugubris*, were found. Distance from the Calvert Marine Museum is approximately 20 miles. Limit 20. Call-in to Pam at 410-586-8750, Tuesday evening, May 9, 7:00-9:00 p.m.

**May 20, 2006: Saturday. Ramanessian Brook/Big Brook, Monmouth Co., NJ.** This is a late **Cretaceous** marine vertebrate site in Monmouth County, NJ, with an approximate age of 75 million years. The brook exposes the **Wenonah/Mt. Laurel formations**. Teeth from the Crow (*Squalicorax* sp.), Porbeagle, and the Goblin (*Scapanorhynchus* sp.) sharks, fish teeth (e.g., *Enchodus* sp., *Edaphodon* sp., *Anomaeodus* sp.), ray teeth and scutes, sawfish (*Ischyrrhiza* sp.) teeth, Chimera jaw pieces, and rarely, Mosasaur and Plesiosaur fossils can be found here. Bring a ¼-inch screen and a shovel, and wear waders or sneakers into the stream. Long pants are also recommended. The distance from Calvert Marine Museum is approximately 250 miles. Call-in to Pam at 410-586-8750, Tuesday evening, May 16, 7:00-9:00 p.m.

**June 17-18, 2006: Saturday and Sunday. Red Hill and Swope's Pit. Devonian Catskill and Mahantango Formations.** Devonian vertebrate site in the mountains of North-Central Pennsylvania. Work as volunteers for the Academy for the day. Collecting will require rather strenuous digging and splitting of rock. The fauna includes paleoniscids, placoderms (armored fish), primitive chondrichthyans, acanthodians (spiny sharks), actinopterygians, and sarcopterygians. We will be allowed to keep many of the collected specimens (such as scales, spines, and teeth), and unusual finds will be collected for study at the Academy.

On the way home on Sunday, we will stop at a Mahantango Formation site, known for producing well-preserved and abundant trilobites (*Phacops rana*) and several species of cephalopods. Lodging information will be available during the call-in. Distance from Calvert Marine Museum: approximately 244 miles (Swope's Pit) and 305 miles (Red Hill). Call-in to Grenda at 240-725-0689 on June 10-11, Saturday-Sunday evenings, 5:00-9:00 p.m. Or email to Grenda at [grenda.dennis@gmail.com](mailto:grenda.dennis@gmail.com).

**July 8, 2006: Saturday. SharkFest! at the Calvert Marine Museum.** Volunteers are needed to help with the Paleo Department and Fossil club exhibits.

Call Stephen @ 410 326-2042, ext. 28, or e-mail Stephen at [godfresj@co.cal.md.us](mailto:godfresj@co.cal.md.us).

**July 15, 2006: Saturday. Blue Circle Quarry, South Carolina.** Eocene site, known to produce exceptionally nice specimens including sharks teeth (*Carcharocles auriculatis*) and archaeocete whale material (*Zygorhiza kochii*). Information on the call-in will be announced in the June 2006 issue of *The Ecphora*.

**September 9, 2006; Saturday. Fossil Club Meeting** at 1:00 p.m., to be held in the 3rd floor lounge in the Exhibits Building.

**October 7-8, 2006: Saturday and Sunday. 10:00 am – 5:00 p.m. Patuxent River Appreciation Days at CMM.** Please contact Stephen Godfrey at [Godfresj@co.cal.md.us](mailto:Godfresj@co.cal.md.us) or by calling 410-326-2042, ext. 28, if you will be able to lend assistance for the event or wish to display some of your collection on one or both days.

**November 11, 2006: Saturday. Calvert Marine Museum's 25<sup>th</sup> Anniversary Celebration and Miocene Symposium! Save the Date...**

**Also, coming up in Fall of 2006:** Planning is in progress for a joint trip with the American Fossil Federation through the Virginia Museum of Natural History research field trip program, to the Martin-Marietta Carmel Church Quarry, a Calvert Formation vertebrate fossil site in VA. Additionally, we hope to visit the Inversand Mine, a Cretaceous-Tertiary boundary site in Sewell, NJ.

**Happy hunting! Kathy Young ☀**

“Fossilized” Soft Tissue Remains

[http://news.nationalgeographic.com/news/2006/02/0221\\_060221\\_dino\\_tissue.html](http://news.nationalgeographic.com/news/2006/02/0221_060221_dino_tissue.html)

Submitted by **Bruce Hargreaves**. ☀

## Non-Club Field Trips

Join VMNH staff on our paleontological field trips and learn about the fascinating geological history of the Middle Atlantic States. These trips cover a wide variety of ages and environments representative of the last 450 million years.

All trips are filled on a first-come, first-served basis. Some trips have limits on the number of participants. Fees are used to support research at VMNH. Requested donations for each trip do not include accommodations, meals, transportation, or park entry fees.

To make a reservation, send a message to [bdooley@vmnh.net](mailto:bdooley@vmnh.net) with the subject "Field Trip." Tell which trip you are interested in, and how many adults and children will be attending, or call 276-666-8603. Then mail a check payable to Virginia Museum of Natural History to:

**Virginia Museum of Natural History**  
**Attn: Research Field Trips**  
**1001 Douglas Ave.**  
**Martinsville, VA 24112**

Trips will be cancelled unless 10 people have pre-paid at least one week prior to the trip, and after that point no refunds will be offered unless the trip is cancelled.

Schedules and itineraries are tentative. Trips may be cancelled due to inclement weather or lack of enrollment. Scientifically significant specimens may be retained by curators for the VMNH collection. Details on the costs, fossils found, and time frames can be found at the VMNH website: <http://www.vmnh.net/index.cfm?pg=285>

**April 14-16, 2006**  
*Maysville, KY*

This trip explores the Ordovician sediments exposed in various road cuts in the vicinity of Maysville, Kentucky. Collect crinoids, brachiopods, bryozoans, and trilobites from deposits that predate the Appalachian Mountains.

**April 29, 2006**  
**Martin-Marietta Carmel Church Quarry**

Visit one of the most significant fossil deposits on the Virginia Coastal Plain. The Carmel Church Quarry is one of the richest vertebrate fossil sites east of the Mississippi. The 14-million-year-old Calvert Formation deposits at Carmel Church contain at least five species of whales and two-dozen shark species, as well as manatees, crocodiles, turtles, birds, and bony fish.

**May 20, 2006**  
**Chippokes Plantation State Park/Chuckatuck Quarry**

Over 200 species of well-preserved fossil marine shells, 3 million years old, can be collected there, including snails, clams, sand dollars, and bryozoans. These deposits include the last occurrences of the scallop *Chesapecten* and the snail *Ecphora* before their extinction.

**June 10, 2006 & September 9, 2006**  
**Stratford Cliffs/Westmoreland State Park**

Take a trip along the spectacular cliffs along the Potomac River, in an area rich in paleontology, ecology, and history. The 140-foot-igh cliffs expose sediment ranging for 3.5 million to 14 million years old, and have produced fossils of whales, seals, crocodiles, sharks, and numerous seashells. These cliffs have been studied by naturalists for nearly 200 years.

**July 8, 2006**  
**Matoaka Cottages**  
Examine the Calvert, Choptank, and St. Marys Formations on the Calvert Cliffs. This trip, based at Matoaka Cottages near Calvert Beach, MD, will visit sections below Chesapeake beach, at Scientists' Cliffs, and at Matoaka Cottages.

**August 12, 2006**  
**James River Boat Trip**  
Explore the James River and collect fossils that range in age from 7 to 3.5 million years old. These ancient marine beds contain abundant vertebrate and invertebrate fossils that are accessible only by boat. Five different strata all provide different fossils peculiar to those ages.

## Calvert Marine Museum Fossil Club Minutes

From the February 11<sup>th</sup> meeting:

President **Bruce Hargreaves** called the meeting to order at 1:20 p.m. He asked for any additions or corrections to the minutes from the last meeting. None were offered, so the minutes were approved. There was no old business.

**Pam Platt** noted that our next club meeting will be held on Saturday April 22, beginning at 1 p.m. **Bruce** asked that the club's officers convene at 11 a.m. to discuss the 25<sup>th</sup> anniversary celebration and related business.

**Pam** said that only 41 club members have renewed their dues for 2006. Last year at this time nearly 85 members had paid. She reminded attendees that club members must pay dues in order to receive *The Ecphora* and that they must also renew their membership with the Calvert Marine Museum.

**Bruce** welcomed two guests who attended the meeting: **Gary Keller** and **Christa Conant**. Both applied for membership.

Next, the club's advisor, **Dr. Stephen Godfrey**, introduced **Dr. Alton Dooley**, assistant curator of the Virginia Museum of Natural History. **Dr. Dooley** talked about his areas of interest and later lectured in the auditorium on his research on extinct baleen whales in Peru.

**Stephen** announced that the Calvert Marine Museum is seeking financial support so that the museum can remodel the fossil displays and construct a new fossil preparation lab.

**Grenda Dennis** next gave the treasurer's report and noted that we have \$4,463.38 in the bank as of Jan. 1, 2006.

**Dave Bohaska**, Department of Paleobiology, Smithsonian Institution, reported that the fourth book on Lee Creek is almost ready for printing. The book will focus on mammal fossils found in Lee Creek. **Dave** is the junior author of the chapter on toothed whale flipper bones. He said that because of financial cutbacks within the Smithsonian, printing costs will not be fully subsidized and the final price of the book will likely be passed on to those who wish to purchase it.

Club website: <http://www.calvertmarinemuseum.com/cmmfc/index.html>

**Paul Murdoch** announced that the club has been invited by the Plum Point Citizens Association to display fossil collections and serve food at its annual community day on Sunday, June 25 from 9 a.m. until 4 p.m. The attendees motioned to accept the offer. All members are urged to support this event. If you would like to participate in the event, please contact **Paul** for details.

**Bruce** adjourned the meeting at 2:15 p.m.

Minutes submitted by **Flo Streat**

## Giant Frog Invades Calvert Marine Museum



Ok, so it's not paleo... **Bill Counterman** holds this healthy bullfrog found by **Skip Edwards** on the grounds of the Calvert Marine Museum (I think the frog was heading for the Exhibits Building). This handsome male was released unharmed after having left quite an impression on at least one unsuspecting female employee. Photo by S. Godfrey. ☀

Club email: [CMMFossilclub@hotmail.com](mailto:CMMFossilclub@hotmail.com)

**CMMFC**  
**P.O. Box 97**  
**Solomons, MD 20688**

2005 Elected Officers & Volunteers*	Names	Email
President	Bruce Hargreaves	mooseman65@earthlink.net
Vice-President	Kathy Young	k.a.y@erols.com
Treasurer	Grenda Dennis	venusdolni@earthlink.net
Secretary	Flo Streaan	N/A
Membership Chairperson	Pam Platt	platt@umbc.edu
Editor*	Stephen Godfrey	Godfresj@co.cal.md.us
Fall Trip Leader*	Robert Ertman	Robert.Ertman@usda.gov
Spring Trip Leader*	Kathy Young	k.a.y@erols.com

*The Ecphora* is published four times a year and is the official newsletter of the Calvert Marine Museum Fossil Club. All opinions expressed in the newsletter are strictly those of the authors and do not reflect the views of the club or the museum as a whole. **Copyright** on items or articles published in *The Ecphora* is held by originating authors and may only be reproduced with the written permission of the editor or of the author(s) of any article contained within.

The editor would like to acknowledge **Paul Murdoch's** ongoing contribution towards the production of *The Ecphora*.

Editor's Address:  
 Stephen Godfrey, Ph.D.  
 Curator of Paleontology  
 Calvert Marine Museum  
 P.O. Box 97  
 Solomons, MD 20688  
 Godfresj@co.cal.md.us