Maryland’s Prehistoric Elephants

By Stephen J. Godfrey, Ph.D.
CMM Curator of Paleontology

Just imagine — during Maryland’s prehistoric past at least three different kinds of elephants lived here. Beginning twenty-five million years ago, gomphotheres (Figure 1), then more recently mastodons (Figure 3), and mammoths (Figure 5) have at various times shared the land we call home. Can you picture herds of huge prehistoric pachyderms roaming through forests? It is a vision completely foreign to our everyday experience. The evidence for the presence of these indigenous proboscideans (the technical term for elephants and their prehistoric kin) comes mostly in the form of their teeth. Teeth are the hardest items animals make — more resistant to disintegration than bone because teeth have an enamel coating. If parts of a prehistoric vertebrate are to be found as fossils, they usually include teeth.

Gomphotheres

Gomphotheres are the oldest-known group of elephant-like creatures that inhabited the warm Miocene epoch forests that bordered the Atlantic Ocean. The Calvert Marine Museum possesses several excellent gomphothere teeth in the paleontology collection, one of which is truly spectacular (Figure 2). Because the overwhelming majority of the fossils from along Calvert Cliffs are of creatures that lived in the prehistoric ocean that flooded southern Maryland, the fossilized remains of terrestrial creatures are understandably exceedingly rare. How would a gomphothere tooth occur in sediments that were laid down on the bottom of the ocean? As far as we know, these elephants were not spending any time swimming in salt water. Although there are several possible explanations, one likely one is that the fossil gomphothere remains derive from individuals that died attempting to ford rivers. Riparian currents carried their carcasses out to sea, and as they decomposed or were scavenged, those bones and teeth that were not eaten by large hunter-scavengers sank to the ocean floor where some became buried in sediments and subsequently fossilized. Anyone who finds gomphothere remains has found the paleontological equivalent of a needle-in-a-haystack.

What predators were of concern to Miocene gomphotheres? For adults, probably not many, but baby and juvenile gomphotheres were likely highly prized by

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The museum recently received its third accreditation from the American Association of Museums’ (AAM) Accreditation Commission. Since 1981 the Calvert Marine Museum has been accredited by the national museum organization, the American Association of Museums. Accreditation is a widely recognized seal of approval that brings national recognition to American museums, regardless of their size or location. Since the first museums were accredited in 1971, the AAM Accreditation Program has recognized museums’ commitment to excellence, accountability, high professional standards, and continued institutional improvement.

Accreditation is a rigorous process that begins with an extensive one year self-study that looks at all aspects of a museum’s operation including governance, finances, planning, leadership and organization, collection stewardship, education and interpretation, and facilities and risk management.

A Visiting Committee of two museum directors reviewed these materials submitted by CMM and spent two days meeting with staff, board, and volunteers, and then wrote a report to the Accreditation Commission, an independent and autonomous body of museum professionals who review and evaluate the self-study and Visiting Committee report to determine whether a museum should receive accreditation. While the time to complete the process varies by museum, it generally takes three years. In their report, the Visiting Committee stated that “CMM’s performance meets the standards and best practices expected within the profession. CMM is a professional, well-operated museum with a competent and dedicated staff, a supportive board of trustees, and a loyal group of volunteers.”

Of the approximately 17,500 museums of all sizes in the U.S., only 783 museums nationwide have been accredited. All accredited museums must go through reaccreditation approximately every ten years. For the current roster of accredited museums, 149 (19 percent) have been accredited once, 229 (29 percent) twice, 311 (40 percent) three times, and 94 (12 percent) four times. The Calvert Marine Museum is part of the small elite of 300 plus museums who have gone through the process three times. We are one of only twelve museums in Maryland to be accredited.

This honor reflects the hard work and dedication that all the staff and volunteers have put into making CMM an exceptional museum. (Doug Alves)

The Calvert County Commissioners have appointed two new members to the museum’s Board of Governors for 2010. Ms. Lynda J. Striegel of North Beach is a partner in the law firm Striegel and Buchheister and is president of the Beach Business Group and the Calvert Business Alliance. In 2006 she was elected to the North Beach Town Council in addition to being a member of the Maryland, District of Columbia, and Virginia bars. Her legal expertise in estate planning will be helpful in settling up gifts and charitable contribution programs. Ms. Nancy K. Wieck of Solomons is a financial program manager with the Department of the Navy, Navy Enterprise Resource Program. She holds memberships with several professional/civic organizations such as Women of the Moose, Military Comptrollers Society, National Board of Realtors, Southern Maryland Board of Realtors, and St. Clements 100. The museum will benefit from her experience in financial and strategic planning, team building, and program execution. These new members were welcomed at the annual board dinner on December 9, and two retiring board members were recognized for their service: Marvin E. Oursler, who served as chairman in 2009, and Robert S. Crum, who served as the board secretary.

Board members who will continue in 2010 are Anthony J. Benn (serving a second term), Pat G. Carpenter (second term), Robert S. Currie, Wanda W. DeBord, Karen Everett, Marianne Harms, Donald P. McDouggall, Mark A. MacDougall, James B. Perkins, Jeannie C. Stone (second term), and Frank E. Taylor. Ex officio members include County Commissioner Gerald “Jerry” Clark, CMM director C. Douglass Alves Jr., and Capt. Stephen A. Schmeiser, USN, executive officer at NAS, Patuxent River. The Board of Governors also serves as the Board of Directors of the Calvert Marine Museum Society, Inc., responsible for fundraising.
“SATISFACTION” – A ROLLING STONES EXPERIENCE

Celebrate the World’s Greatest Rock and Roll Band of all time at the Calvert Marine Museum on **Friday, January 15, 2010.** Honoring the Rolling Stones and their legacy, The Rolling Stones Experience will host two performances at **7:00 p.m. and 9:30 p.m.** Tickets for the shows are $30.00 (additional service fees apply) and are on sale now at www.calvertmarinemuseum.com.

“Satisfaction” is the international touring Rolling Stones tribute show dedicated to the “World’s Greatest Rock & Roll Band”. With authentic costuming featuring the likes of Mick Jagger and Keith Richards, this one-of-a-kind production showcases over 45 years of classic hits like, *I Can’t Get No Satisfaction*, *Beast of Burden*, and *Angie*. More than just the music, the show captures the magic of an actual concert experience. Seats for the shows are general admission and are not assigned. Doors will open at 6:00 p.m. for the 7:00 p.m. show and 8:45 p.m. for the 9:30 p.m. show. Beer, wine, soda, and water will be available throughout the evening.

Quality performances like “Satisfaction” are made possible by the generous support of the following sponsors: Cumberland & Erly, LLC, Prince Frederick Chrysler/Jeep/Dodge, Coors, Coors Light, Killians Red (Bozick Distributors), All American Harley-Davidson, The Greene Turtle Sports Bar & Grille, Quality Built Homes, Isaac’s Restaurant, The McNelis Group, DM Group, 102.9 WKIK, Southern Maryland Newspapers, Bay Weekly, Calvert Independent, Quick Connections, Comcast, The Lemondrop What-Not-Shop, Jay Worcht Electric, United Rentals, Roy Rogers-Solomons, and the Holiday Inn Select-Solomons.

For additional information and to purchase tickets, please visit the CMM website at www.calvertmarinemuseum.com. To reach a staff person, please call 410-326-2042, ext. 16, 17, or 18.

WINTER GALA COMING IN FEBRUARY

Experience the *Fire and Ice* theme at CMM’s new Winter Gala on February 27, 2010. An extraordinary evening of great food, live entertainment, unique decor and other surprises await attendees of this elegant event. The Honorable Steny H. Hoyer will serve as the Winter Gala’s honorary chair.

Tickets for the Winter Gala are $150 per person. Attendance is limited to 250 guests. Sponsorship opportunities ranging from $250 to $10,000 are also available. Tax-deductible donations in any amount are also welcome.

Please contact Vanessa Gill at 410-326-2042 x 18 or gillvl@co.cal.md.us to request an invitation or sponsorship information. All proceeds raised for the Winter Gala will be dedicated to the completion of Cove Point Lighthouse renovations.

CMM NOW OFFERS PREPAID GIFT PASSES

As gifts for family or friends, the museum now offers prepaid gift admission passes with an appropriate design. The passes are the regular admission prices of $7.00 each for a pass for adults; $6.00 each for seniors; $2.00 each for a child 5 to 12. Also available on a prepaid basis are tickets for the May to October cruises on the *Wm. B. Tennison*, at $7.00 each for adults, and $4.00 for children 5 to 12. All prepaid passes/tickets are sold at the admissions desk in the exhibition building, or they may be ordered by calling 410-326-2042, extension 12 or 21, with a credit card (VISA or MC).
The Patuxent River Appreciation Days (PRAD) activities were the highlight of the early fall at CMM. With an attendance of 7,500, the museum grounds were alive with visitors on both Saturday and Sunday, October 10 and 11.

Activities at the boat basin included canoe rides, Drum Point Lighthouse tours, the John Smith shallop, and short cruises on the Wm. B. Tennison (out cruising) and the Nathan of Dorchester (just returning).

Breana and Tara McKenna worked on model boats, a popular activity at many museum events.

A new feature of PRAD in 2009 was the use of the Corbin Nature Pavilion in the museum’s south field, here displaying the “Bounty of the Patuxent.”

One of many environmental displays was that of the Southern Maryland Audubon Society, with Bev and Warren Walker (both are also CMM volunteers).
Other Fall Events

“Song Buccaneer” Ray Owen was impressed with the museum’s megalodon reconstruction during his performance at the First Free Friday, November 6.

CMM photo by Bob Hall

An interactive event for families at the museum on November 11 was Pirate Day. Lori Cole (right) led a group of “pirates” on a parade through the museum.

CMM photo by Bob Hall

The annual Members’ Yule Party on December 6 was as popular as ever.

CMM photo by Bob Hall

LOSS OF MUSEUM FOUNDER

Daniel Barrett, one of the founders of the Calvert Marine Museum, died on December 11. He supervised the construction of the first museum building on Solomons Island, contributing many hours of volunteer service. In 1987 he wrote about the beginnings of the museum in an article in the journal of the Calvert County Historical Society, The Calvert Historian. He, along with the other museum founders, will be recognized in a permanent plaque placed in the museum lobby.

CMM photo by Bob Hall

To honor both Veterans Day and the many men who were trained at the Naval Amphibious Training Base in Solomons, a wreath was placed at the “On Watch” statue at the site of the former base on the Dowell Peninsula. With the color guard from the Naval Air Station, Patuxent River, Capt. Andrew T. Macyko placed the wreath, flanked by Calvert County veterans Vernon Garner (left) and Bernie Fowler.

CMM photo by Bob Hall
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robust-skulled predators known as amphycyonids (a.k.a. the bear-dogs) and packs of smaller hyena-like Miocene dogs known as Tomarctus (which literally means “cutting bear”).

**Mastodons**

More recently during the Pliocene epoch (approximately five to two million years ago), gomphotheres became extinct in Maryland and were replaced by another family of elephants, the mastodons. Mastodons (Figure 3) were heavily cloaked in long insulating hair, an asset as the global climate cooled during the Pliocene to usher in the great Pleistocene epoch Ice Age. Although they superficially resemble gomphotheres, there are many features that distinguish these two families of extinct elephants. The Calvert Marine Museum counts two mastodon teeth in its collection. One was dredged from the Chesapeake Bay off the Nuclear Power Plant and the other found by girls playing in a stream in Anne Arundel County (Figure 4).

Although the vast majority of the sediments along Calvert Cliff were laid down during the Miocene epoch, a thin veneer of Ice Age debris tops the cliffs. These sediments seem to be devoid of fossils, but several finds indicate that Ice Age fossils come from those layers. Although Earth, in its 4.6 billion-year history, has experienced many ice ages, “the Ice Age” commonly refers to the most recent cold snap that characterized the Pleistocene epoch (the Pleistocene lasted from 2.588 million (±5,000 years) to 11,550 years ago). During an ice age, cooler global temperatures can result in over one-mile-thick accumulations of continental snow and ice. Only 20,000 years ago massive ice sheets lay over large parts of the North American and Eurasian continents. Living along the southern margin of this continental ice sheet were Ice Age mega fauna (large-bodied mammals), most of which are extinct today. The American mastodon, *Mammut americanum*, roamed widely over North America for roughly 3.5 million years before it finally became extinct about 10,000 years ago. Although the chances are slim, the possibility

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**Figure 3.** Life restoration of a Pleistocene mastodon, one of the elephant-like creatures that lived here in southern Maryland up until about ten thousand years ago. Facts: American mastodon; name pronounced mas-tuh-DON; common name means “American nipple-tooth”; scientific name Mammut americanum; name means “American earth burrower” (“Mammut” traces back to the Middle Ages when Russian farmers found the gigantic bones of mammoths and mastodons in their fields and mistakenly believed that they belonged to gigantic burrowing animals); family — Mammutidae; lived during Pliocene to Pleistocene epochs (about five million to ten thousand years ago); size — about ten feet tall at shoulder, weighed five tons; diet — plants (herbivore).

**Figure 4.** A single mastodon molar (CMM-V-3976). The front of the tooth is to the left. Here, the originally cream-colored enamel crown was stained a dark brown. As the high-crowned cusps are worn, the very hard enamel forms narrow and elongate figure-eight-shaped, plant-crushing surfaces. Notice how different the worn-enamel pattern is between gomphothere and mastodon teeth. As in gomphothere teeth, worn enamel reveals softer internal dentine. Below the crown are the fused roots that anchored the tooth to the jaw.
exists that prehistoric Paleo-Americans of the Clovis culture saw and hunted the very individuals from which the teeth in our collection derive!

Like gomphotheres, mastodon teeth possess high cone-shaped cusps (Figure 4). In some exceptional finds in other states (Michigan, for example, boasts over 250 mastodon finds), mastodon skeletons have been found to include within their rib cage the remnants of their last meals. Analyses of these plant remains show that mastodons were browsers (like deer), feeding primarily on evergreen boughs and other herbaceous plants (grazers on the other hand, like horses and cows, feed primarily on grasses).

Mastodon tusks were much longer than those of gomphotheres and probably came in handy fending off Ice Age predators that included the American lion, American “cheetahs,” saber-toothed cats, scimitar cats, and dire wolves (the Miocene bear-dogs and Tomarctus had long since become extinct).

**Mammoths**

Although we don’t yet have any fossil remains of mammoths in our collection, they are known to have co-inhabited Ice Age Maryland with the American mastodons. Like contemporary mastodons, mammoths too were covered in a thick coat of heat-retaining hair (Figure 5). Imagine, Paleo-Americans would have had the choice of hunting either or both kinds of elephants; I wonder if they had a preference? The massive molars of these true elephants have been found in Maryland, and they are very easy to distinguish from those of gomphotheres or mastodons. Unlike the more primitive pachyderms, in which their molars have high-crown cusps, mammoths, like living elephants, have molars with an essentially flat crushing surface. This surface is characterized by many closely spaced, parallel, enamel ridges (Figure 6). When upper and lower teeth grind past each other, plants are very effectively pulverized.

Mammoths are closely related to living elephants and both belong to the same family, the Elephantidae. Mammoths had the largest tusks of any known proboscideans — living or extinct — and they were likely used in dominance/mating-related tussles and to keep the many Ice Age predators at bay.

**Extinction**

Why did these North American proboscideans become extinct? The answer is almost certainly the same as the answer to the more general question: Why does any species become extinct? In most instances, it is impossible to be specific as to why a species becomes extinct. That is because there may be many contributing factors like global or local catastrophes, climactic change, loss of habitat, predation, disease, and competition to which a species cannot adapt. Perhaps unexpectedly, a species can become extinct if over time it completely evolves into one or more new species. One or all of these factors likely contributed to the demise at different times of Maryland’s prehistoric pachyderms.

**Acknowledgments:** These rare finds would likely have been lost or destroyed through erosion had it not been for the collecting efforts of David S. Cammack, David Rae, Jessica Coffee-Johnson, and Charlotte and Constance Yonker; many thanks. Tim Scheirer is deserving of praise for drawing the life restorations of Maryland’s extinct elephants with his usual expertise. Hand models, Maureen Baughman and Lea Ann Smiley, are thanked for gently cradling these fossils while they (the proboscidean teeth) were being photographed by the author. Comments by Yasemin Tulu and Paul Berry improved this article.
**VOLUNTEER SPOTLIGHT**

*By Sherry Reid, Volunteer/Event Coordinator*

Believe it or not, we have another year in the books! I just don’t know where the time goes, but it sure seems to fly by. As in the past, the CMM volunteer family has made a huge impact on the programs and services the museum is able to offer our visitors. The volunteer family logged in 23,792 hours at the museum during fiscal year 2009, which is equivalent to $481,788 of in-kind service. Our volunteers do everything from answer phones to help set up websites and everything in between. It is because of their generosity of time and their willingness to work hand in hand with the staff that our visitors reap the benefits of a job well done. Thank you for yet another successful year at the museum — we could not have done it without each and every one of our volunteers! 🎉

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**GRANTS AND PROGRAM SUPPORT AWARDED IN 2009**

Considering the state of our current economy and budget cuts everywhere, the museum was pleased to receive financial support in 2009 from a number of different agencies to assist with our exhibits and programs. M&T Bank funded cruises aboard the Wm. B. Tennison at First Free Fridays in June through September 2009. The Maryland State Arts Council’s Arts in Communities grant, the Community Bank of Tri-County, and the Boeing Company supported musical performances at our First Free Friday events. The Boeing Company is also matching a mini-grant from the Southern Maryland Heritage Area Consortium and the Maryland Heritage Areas Authority to fund a lecture series on the “Local Challenges of Sea Level Rise and Climate Change.” This series is a follow-up to the PRAD State of the River Summit held in October.

The hiring of a part-time intern in early January 2010 to assist with collections care management is being made possible by a Museum Enhancement grant from the Maryland Historical Trust. The expansion of our maritime history hall, with the inclusion of an “African Americans in Southern Maryland” exhibit, scheduled to open next summer, is possible with the help of the Southern Maryland Heritage Area Consortium and the Maryland Heritage Areas Authority. Northrop Grumman has sponsored the “On Watch” memorial service for a number of years in honor of Military Month in November at the museum.

Thanks to Dominion and the 2009 Dominion Educational Partnership grant, we’re extending our education programs across the country. The museum’s distance learning programs give teachers world-wide the ability to bring real-time educational experiences into their classrooms by using point-to-point video conferencing via the internet.

Grants, donations, and program support have helped to make the Calvert Marine Museum an exceptional facility. Visitation was our best ever last year, with over 70,000 guests enjoying our site; educational programs reach over 20,000 children each year. We’re proud that for nearly forty years we’ve provided history, education, and culture to all of Southern Maryland with the help of granting agencies and generous private corporations. (Traci Cimini) 🎉