Fossil of the Month – Mosasaur skull parts

By J.P. Cavigelli, Tate Museum Prep Lab Manager

This summer's Tate Conference will be on marine paleontology, so I chose Oomtar's skull as the fossil of the month. Several years ago I featured some of Oomtar's bones in these pages. At that time we in the lab were working diligently on these bones. They were put aside to work on mammoth and dinosaur bones for a few years, but recently we got back onto this project. We hope to put more of Oomtar on display before the conference in June. The photo above shows Oomtar's premaxilla, or the tip of his snout, including four nicely preserved teeth (two left and two right).

Oomtar is a mosasaur of the genus Plioplatecarpus, which was donated to the museum in a big hard rock before I started working here. Mosasaurs are marine reptiles that are related to Komodo dragons. They became extinct at the end of the Cretaceous period, along with the dinosaurs and ammonites.

The longest mosasaurs were up to 60 feet long. We estimate Oomtar to have been about 20 or 25 feet long in life. We have about half the skeleton, which is mostly vertebrae; mosasaurs had over 120 vertebrae, most of which were in the tail.

We also have numerous bones from Oomtar's skull. Above right is a cast of a smaller mosasaur called Clidastes. I am using it to show where the Oomtar bones fit on the skull. The bone behind the skull is Oomtar's left quadrate. This is the bone that connects the skull to the lower jaw and forms the hinge there. It also holds the ear drum in many reptiles, including mosasaurs.

The quadrate in Clidastes is outlined in red at the back of the skull, showing how much larger Oomtar is. The premaxilla (teeth not included) is outlined in red at the snout end. The dotted line indicates that the premaxilla is hidden inside the skull in that area. The yellow outline shows the maxilla, again, teeth not included. The maxilla is the main tooth-bearing bone.

Shown at the bottom of this page are some other skull bones that I have been able to identify. In this photo, the Clidastes skull is viewed from the top. On the left is Oomtar's premaxilla, the same bone as above, but this time from a dorsal view. The corresponding bone on Clidastes is in red. The large triangular bone is the frontal bone which makes up much of the top of the skull, green on Clidastes. The next bone, shaped a bit like a check-mark, is the right postorbital, seen in blue.

The bone outlined in yellow is the occipital portion of the skull, which is made up of several bones. Oomtar's occipital is the bone on the far right. The toothy bone is part of Oomtar's right maxilla, whose relative placement is seen in the above photo outlined in yellow.

There are numerous other skull parts in our collection of Oomtar bones that need to be identified. This is an ongoing project, which includes learning more about mosasaur skull parts as well as thinking about how to display them.
March was a DEElightful month:
The official unveiling of “Dee” the mammoth, and the ensuing open house brought over 1300 visitors to the Tate Geological Museum in less than three days. The most common reaction upon seeing the display was either complete silence and a wide-open mouth or a loud “Wow!” As the mammoth can be seen through the windows leading from the lobby into the museum, I can sit in my office and hear the children gasping in delight and literally shouting “Look how big it is.” That doesn’t do much for my attention span, but it is so much fun. As we continued through the month of March, our attendance remained way above average and we finished with a grand total of 4,246 visitors for the month. The Tundra to Tate celebration was a huge success and we netted over $35,000. We are very thankful to everyone that attended and generously supported our fundraising efforts.

2010 Annual Tate Conference:
June 4, 5, 6, 2010 SAVE THESE DATES!!!
The theme of this year’s conference is “Beneath Wyoming Waves: Marine Paleontology.” Our keynote speaker is Dr. Judy Massare from the State University of New York, Brockport. Her topic is Jurassic Ichthyosaurs. The keynote address this year will be held at Fort Caspar Museum and participants will have an opportunity for a free tour of this historic site as part of the scheduled event.

We have had some changes in our list of speakers so here is the revised information:
• Anton Wroblewski: “Jurassic Gumbo: Invertebrate Trace Fossil Assemblages of the Sundance Formation at Glendo Reservoir”
• Josh Slattery: Ammonites

Summer Digs:
All digs will be on location in the Lusk, Wyo. area. The dates for the digs are July 5-9, July 19-23, Aug. 23-27 and Sept. 13-17. Registration will be through the museum and CEU credit will be available upon request. The fee this year is $800/person for a full five-day dig. The fee includes transportation, motel and meals.

Gift Shop:
We have added some mammoth jewelry made by local artists to our collection in the gift shop. If you are looking for a unique gift for someone special come see our selection.

Chris Navarro Sculptures:
The 10 1/2" X 14” Navarro sculptures of Dee the mammoth are a limited edition of 25. Between the silent auction at our 30th anniversary fundraiser and subsequent sales we have sold eight of these sculptures. We will continue to sell them in the gift shop for $1200 as long as they are available. The larger 24” X 31” sculpture sold at live auction for $9000. It was one of a limited edition of five and we have since sold one more. If you are interested in purchasing one of the remaining three sculptures, please contact me at 268-2077 for details.

Mike Kopriva Prints:
Now that we have the complete skeleton of Dee in our museum you might want to display a reminder of what it took to get him there. We have prints of Mike Kopriva’s paintings: Mammoth “Dee” dated December 2006, depicting a living Dee the mammoth in with the modern dig site in the foreground. “Paleo Rendezvous on the Platte” dated February 2008 shows many of the staff and volunteers from the Tate having a rendezvous with Casper Mountain in the background. Limited edition prints of both paintings are on display in our gift shop and are on sale for $150 each.

Adopt a Bone:
There are only five mammoth bones yet to be adopted:
• Lower Jaw $2,000
• Tooth (2) at $500 each
• Sternum $500
• Hindlimb sacrum $300

A memorial in honor of Ernest Stanley “Stan” Dietrich has been established for the Tate Geological Museum and his wife, Jeanne, has adopted three of Dee’s bones in his memory. Our thanks go out to his family and friends for this generous donation.

Membership Status:
I am working on updating membership status and plan to get letters out to you if you need to renew. In the meantime if you are not sure, please call me at 268-2077 and I will look up your anniversary date.

Facebook:
Did you know that Dee has his own Facebook page? Check it out and become a fan now!
Exhibits Updates

By Patti Wood Finkle, Museum Exhibits Specialist

The Pleistocene exhibit is slowly coming along as we finalize the concepts and begin the fun hands on work. The plans for the display cabinets have been submitted to the carpenters and their fabrication is in the works. We have a tentative finish date of mid-June, but that date is subject to change as we do not have a firm date on the cabinet installation as yet.

The exhibit will have several traditional display cases, multiple text panels, interactive stations and educational activities. The storyline is based on the three major themes which will tie the exhibit content together and create a natural flow. Dee’s Life, Dee’s Death and Dee’s Discovery and Excavation will comprise the major components and each will encompass several smaller themes. The exhibit will have a diorama style tundra landscape on the base, which will reflect what we think Dee’s environment looked like. We believe that Dee died in early spring so the tundra landscape will reflect that season.

In other exhibit news, the annual Tate Conference is fast approaching, and as many of you know, the theme of the conference is “Under the Wyoming Waves.” To go along with the conference theme, we are planning to rearrange and enhance the marine exhibits. However, as the creation of a new Mesozoic Marine exhibit is one of the next projects under the current five-year plan, we will prepare for the conference by giving the current cases a fresh coat of paint and consolidating the marine fossils into a more cohesive marine exhibit.

Two new mini-exhibits to look for this summer include “Curator’s Choice,” which will feature an interesting fossil from the collections (chosen by JP) that will be rotated seasonally, and “In the Works,” which will showcase and explain work that is currently going on in the prep lab, and will display finished portions of the current projects. There are lots of exciting things going on at the museum, so don’t forget to stop by and check on our progress!

Summer Paleontology Field Experiences

The Tate Geological Museum is once again offering summer paleontology field experiences. As in previous years we will be focusing on late Cretaceous dinosaurs in eastern Wyoming. Our trips meet in Casper and we head east for five days of digging. This year we will explore two different potential dinosaur skeletons in hard sandstone that were discovered several years ago. One shows a string of three or four vertebrae on the surface, the other shows only some ribs. These projects will be pure paleontological exploration...who knows what we might find! There are a few other sites we may explore as well, including microsites (locally rich accumulations of small fossils) and a bone bed site. Over the past few summers we have collected many isolated dinosaur bones and worked on several sites with Triceratops bones (including a partial skull) and a nice partial hadrosaur skeleton. If the target dinosaurs prove to be unexciting, we will return to one of the Triceratops sites. Fossils collected remain property of the Tate.

Tate Geological Museum field expeditions run for five days. We generally meet on Sunday evening for dinner, head out into the field Monday morning and spend the week digging and collecting. We return to Casper on Friday afternoon. The cost includes hotel stays in Casper Sunday and Friday nights and in Lusk the other nights. The hotel in Lusk offers continental breakfast (and indoor pool and hot tub). We provide lunch and dinners during the trip. Trip costs also include all transport from Casper to Lusk and to the field site. All the tools needed and expert guidance will be provided by the Tate.

The goals of the Tate Geological Museum paleontology field trips are to offer fun educational experiences while building up the museum’s collections for display and/or research. The trips are run by the museum’s field trip organizer and prep lab manager, JP Cavigelli. JP has been working in paleontology for way too long. He has had the honor of participating in international expeditions to Niger, Mongolia, Tanzania and North Dakota. The minimum age for our trips is 16. Participants meet in Casper on the evening before the dig begins (on that Sunday). Details will be finalized upon registration.
Jennifer Anderson, Associates of Science in Geology

Jennifer Anderson will graduate from Casper College with an associate’s degree in geology. She is going to the University of Wyoming next fall to continue with a bachelor’s degree in geology. She is also planning on beginning work on a history/archeology degree while at UW. She’s has many hobbies, including kayaking, skiing, hiking, video games, art, history, and reading. She held an internship with the Rocky Mountain Oilfield Testing Center last summer, and is currently a resident assistant in McIntire Hall.

Whitney L. Carlton, Associates of Science in Geology

Whitney Carlton is the current vice president of the Casper College Geology Club. After she graduates from Casper College in May, she plans to complete her B.S. in geology at the University of Wyoming in Laramie, beginning in the fall of 2010. From an early age, Whitney has been drawn to the beauty of nature. That love of the outdoors led her to the field of geology, and she hasn’t looked back. Geology has been a great way for her to explore new places and possibilities.

Tim Fox, Associates of Science in Geology

Tim was born and raised in southern California, and found out about Casper College through the Tate Geological Museum when he came out here in 2006 on a dinosaur dig. He thought that getting into a community college in Wyoming couldn’t be all that difficult, and it would let him be close to an actual museum and fossils. He applied and was accepted, and took up a degree in geology. He has spent three years working at the Tate doing all manner of jobs. As of this writing, he has not yet heard back from all of the universities he has applied to, but will most likely be attending Northern Arizona University in the fall semester, where he will continue to study geology and fossils. Paleontology brought Tim to Wyoming, and he hopes one day to work in a museum full time.

Christy Gorzalka, Associates of Science in Geology

Christy moved from Sheridan to Casper in 2007 to attend Casper College. She moved into Bailey Hall, on campus, where college life started moving along quite quickly. After her first year at CC, Christy explored the array of classes offered to find EXACTLY what she was looking for: GEOLOGY!!!! The exciting field trips, the great people at the Tate Geological Museum, and obviously, THE ROCKS!! In the summer of 2009, Christy worked as a Geo Tech for Uranium One. She plans to further her education at the University of Wyoming in Laramie, to eventually become a professional geologist in this great state.

Tyrell Kipp, Associates of Science in Geology

Ty graduated from Natrona County High School in 2002, after which he worked in the oil field. It was during this employment that he discovered his love for the land, and decided it was time to get serious about his college education. Ty is planning to go to Mesa State University in Grand Junction, Colo. to earn his B.S. in geology. His mom, dad, sister and brother are all proud of him for his accomplishments.

Con Trumbull, Associates of Science in Geology

Con has been an active member of the Tate Geological Museum since he first started going to Casper College. Some of his accomplishments and activities include volunteering with many summer digs, including helping with “Dee” the Mammoth, and receiving an NSF EPSCoR undergraduate grant with Melissa Connelly to research trace fossils in the Mowry Shale. Con is also the current president of the Casper College Geology Club. Con plans to finish his B.S. degree in geology at Mesa State University in Grand Junction, Colo. Upon completion of his B.S. degree, he plans to return to Casper.
Q: One minor note of puzzlement to me is the fact that when I see the proper (alleged I must add) pronunciations of the dinosaurs in various books, they are sometimes different. How can that be? For example, how can Troodon be TROO-oh-don in one publication and TROH-uh-don in another? How can an animal be pronounced other than the right way?

-- Bill Sparks
Green Bay, Wisconsin (via e-mail)

A: Dinosaur books vary greatly in the amount and quality of research that goes into them. Some are written by scientifically trained people who wish to educate the general public about paleontology, while others are written by popular writers who just want to jump on the dinosaur bandwagon and who often don’t know enough Latin to spell Habeas corpus.

Anyway, in answer to your query: the second book had it right. The name Troödon is derived from the Greek trogein (Τρογειν) which means ‘To gnaw,’ and odontos (Οδοντος) also Greek, which means ‘tooth.’

In Greek, whenever you see the double ‘o,’ you pronounce each ‘o’ separately. (A good way to spot first-year geology students is that they keep trying to pronounce oolite ‘OO-lite’ rather than the proper ‘Oh-Oh-lite.’ The word oolite is derived from the Greek oon (Οον), meaning ‘egg,’ and lithos (Λιθος) meaning ‘stone.’

Some other rules about ancient Greek are helpful to keep in mind as you read those dinosaur books. The letters ‘Ch’ are a transliteration of the Greek letter chi (Χ) which is pronounced like a ‘k.’ So, for example, Chasmosaurus is pronounced ‘KAZ-mo-saurus.’ If a Greek word starts with ‘Pt,’ the ‘P’ is silent. So pterodactyl is pronounced ‘Ter-o-dac-tyl.’

‘Ph’ is a transliteration of the Greek letter phi (φ) pronounced as an ‘F.’ In words that start with ‘Ps’ you only pronounce the ‘s.’

Many scientific words include the letters ‘ae’ (written ‘æ’ in older books) – this is a Latin diphthong and is pronounced like the ‘i’ in the word ‘kite.’ (I’m still trying to break the habit of pronouncing it like a long ‘A!’)

Sadly, paleontology books written for adults rather than children seem to assume that we all took Latin in high school (an increasingly unlikely prospect in today’s world…) and they almost never tell you how the names should be pronounced. So it’s quite easy to find out how to say the various dinosaur names, but if you need to know the pronunciation of the names of ancient mammals or invertebrates you’re usually out of luck.

When I went to my first paleontology conference I was mortified to discover that I’d been pronouncing almost all of the names of ancient mammals with the accent on the wrong syllable. After a couple of paleontologists ridiculed me for pronouncing Phenacodus ‘fen-a-CODE-us’ rather than ‘fen-ACK-o-dus,’ and pronouncing Merycodus ‘merry-CODE-us’ rather than ‘me-RICK-o-dus,’ I decided to spend the rest of the convention doing more listening and less talking.

There don’t seem to be hard and fast rules for accent placement in scientific names, but I did notice some general trends.

If a name ends in a two-syllable suffix, the emphasis is usually (but not always!) placed on the last syllable that precedes that suffix. This is particularly noticeable in ammonite names, which almost always end with – ceras, meaning ‘horn.’ So the pancake ammonite’s genus name is pronounced ‘Placen-TISS-er-us’ -- not ‘Placenta-SERR-as!’

Russell J. Hawley,
Tate Geological Museum
Education Specialist
The field trips for the 2010 Tate Conference will focus on marine deposits in the area.

On the Friday field trip we will visit a handful of sites in the Casper area primarily in search of ammonites. The details are still being worked out, but options include Frontier Formation (ammonites), Cody Shale (ammonites), Sundance Formation (belemnites), and Gypsum Springs Formation (crinoid stems). The Cody and Sundance sites may also produce marine reptiles.

The Sunday field trip will be to a ranch near the town of Medicine Bow, Wyo., into the Flat Top Anticline. This anticline exposes rocks from the Pennsylvanian to the Cretaceous.

We will collect in two or three Cretaceous units. The Frontier Formation is exposed in ridges here that have several species of ammonite (small *Scaphites* warren, and larger *Prionocyclus*). The Steele shale has baculites and some small scaphitid ammonites. Some of these are beautifully preserved with calcite infillings. This area has also produced at least one small mosasaur and several fishes in concretions.

A third site we may visit if there is time will be in the Mowry shale, which features flattened ammonite impressions.