During the last hour of the last Tate Geological Museum paleontology field session this summer, volunteer Steve Pfaff found this nice tooth of a *Tyrannosaurus rex*. We spent most of the week at a site called Promise Hill. Pfaff found the site a few years ago by noticing lots of bone pieces on the surface, many of which were identifiable and well preserved. Last summer we opened up a quarry there, which proved to be successful fairly quickly. Along with many bone pieces, a hadrosaur metatarsal showed up. It had been in the soil zone, and was pretty beaten up by the soil formation, but soon a nice turtle shell turned up, along with numerous other bones.

This year we decided to spend some time here and found quite a few more hadrosaur bones: about six caudal (tail) vertebrae, some ribs, and some foot bones. I have high hopes for this site; it may produce enough hadrosaur bones to give us a nice skeleton to mount in the museum. One area of the quarry also has a lot of smaller bones, from small dinosaur teeth to unidentifiable pieces, to a turtle plastron about five inches long. The *T. rex* tooth came from near this area, and was found between two hadrosaur vertebrae. Does this mean the animal was feeding on the hadrosaur? Well, not really. Firstly, we are not sure if the hadrosaur bones are all from one animal. To determine this, we would have to find more of them and determine that there are no bones being repeated, or only a small number of them being repeated. Secondly, since this quarry has bones of many other critters, (like turtles, crocodiles, and other dinos), we can assume that back in the Cretaceous this area accumulated a lot of bones from the immediate surroundings, (probably by river currents), so finding a *T. rex* tooth among these smaller bones and hadrosaur bones does not imply a killing scene. Of course, we can't rule that out either.

Anyway, here is the tooth, with a U.S. penny for scale. Notice that much of the enamel is worn off. The second picture shows a close-up of some of the serrations on the tooth, forming a line between the two red arrows. Notice that they are pretty well worn down.
Celebrate the Tate:
The weather was wonderful, the venue was fantastic and the company was even better. Pete Martinez provided the audience with a variety of excellent country songs. Thank you again to Patricia Clark for making the evening possible and to the True family for allowing us to use their barn.

Twenty-Fourth Annual Casper College/ARTCORE Literary Conference a.k.a. The Third Annual Equality State Book Festival:
The Equality State Book Festival was very successful and both the Illustrators Panel and the “Dig-it” Panel were well attended. Ray Troll was kind enough to give us marketing ideas for our gift shop and is even talking about returning to Casper to do a mural on the west wall. Wow!

Coffee, Tea, and Dee:
We have been pleased with the turnout for our social gatherings. October 12 P. Hawk Coffee Broker gave out 44 cups of coffee/tea and the comments have been very positive. Our next Coffee, Tea & Dee is scheduled for November 9 from 7:30-11:30 a.m.

First Annual National Fossil Day:
Approximately 154 people turned out on October 13 to celebrate National Fossil Day. Both Arnold Woods at the rock and fossil road show table, and Patti Wood Finkle at the fossil-making table were kept busy and did a great job. Jodi Youmans-Jones and her dance performance class brought a whole new dimension to the museum as they did their interpretive mammoth hunt. Throughout the day children of all ages showed their creative side by entering our coloring/drawing contests. The winners were:

- Ages 1-5: Addie Finkle
- Ages 6-8: River Muir
- Ages 9-12: Darla Tennant

Publication Award:
The Mountain-Plains Museum Association recognized the “Tate Geological Museum’s Geological Times” May-June 2010 newsletter with an award in their publication design competition. We received first place among museums in the under $250,000 budget category. The award was presented to the museum at the MPMA annual conference in Rapid City, S.D. September 13-17.

Tater Travels:
Patti Wood Finkle, I and Sue Easton attended the Mountain Plains-Museums Association Conference in Rapid City, S.D. September 13-17. The conference allowed us to interact with museum professionals from Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. We all found it educational and invigorating and enjoyed the friendships we built and the expanded network of experts that we were able to access through our participation. Below is a picture of the three of us with Dee Harris, from the National Archives at Kansas City, who purchased our “I Dig Dee” sweatshirt at the silent auction.

J.P. Cavigelli just returned from his visit to Pittsburg, Pa, for the Society of Vertebrate Paleontology Conference. SVP has members representing professionals, students, artists, preparators, and others interested in vertebrate paleontology. J.P. is on the Preparator’s Grant committee and has put together a 2011 calendar whose sales support the development of fossil preparation. The calendar is available for sale in our gift shop for $20 and features artistic photos of fossils.

Dee and the Mammoth
Available Soon
The children’s book written by Gene Gagliano and illustrated by Zachary Pullen is ready to go to the publishers. We anticipate the first edition of the book will be available in time for our holiday open house on December 4, 2010. Prepublication orders are being taken and you may order your copy by filling out the enclosed form and sending it with payment to the Tate Geological Museum at 125 College Dr., Casper WY, 82601. You may also place an order by calling the museum at 307-268-2447. If you wish to have the book mailed to you, please add the $5 shipping and handling fee as indicated on the form. You will receive a poster signed by both Gene and Zak when you preorder a copy of Dee and the Mammoth. The first edition will consist of 5,000 copies, which will be signed by both Gene and Zak. The book will include a documentary of the entire story of Dee the mammoth from discovery to display in DVD form, along with an audio version of the book. Can you think of a better Christmas present for anybody on your list no matter what his or her age?
So, if there were two different kinds of mammoth, which one was the ancestor of the modern elephant?

- Anonymous Museum Visitor

**A:** Neither one of them.

Both of the two modern elephants, the African elephant *Loxodonta africana* and the Asian elephant *Elephas maximus* have fossil records that extend back about half a million years. This means that for most of their history elephants were contemporaries of the mammoths, not successors. Only the fact that mammoths became extinct and elephants survived, creates the impression that the mammoths were older.

So what was the ancestor of modern elephants? Both genera have a good fossil record extending back about four million years. *E. maximus* seems to have been descended from the early Pleistocene flat-headed elephant *E. planifrons*, which in turn seems to be descended from the Pliocene *E. ekorensis*. *L. africana* is descended from the Pliocene dawn elephant *L. adaurora*.

**Adaurora.** Meanwhile, the Columbian mammoth *Mammuthus columbi* and the woolly mammoth *M. primigenius* share a common ancestor in the early Pleistocene *M. meridionalis*, which in turn was descended from the Pliocene *M. subplanifrons*.

In several important anatomical details Asian elephants are more like mammoths than they are like African elephants, so it seems that the genera *Mammuthus* and *Elephas* share a common ancestor that probably lived a little over five million years ago.

Just short of six million years ago we find a beast in the fossil record which seems to be the common ancestor of the Asian elephant, the mammoths, and the African elephant: the ancestral elephant *Primelephas gomphotheroides* from the Miocene of Africa. This primitive beast had a very small pair of tusks in the lower jaw, suggesting descent from the gomphothere *Stegotetrabelodon*. But that’s another story...

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**Geology Club Field Trip** by Emery Mahaffey

On Saturday September 18, six members of the Casper College Geology Club drove down to Denver to the annual gem and mineral show. The gem and mineral show was an outstanding event. There were many fine examples of many crystalline minerals such as barite, Ethiopian opals, tanzanite, tourmaline, gold, silver, and beryl, as well as many others not mentioned. There were approximately 300 vendors selling and showing their specimens, and the crowd came from as far away as Pakistan. The price range varied about as much as the various minerals. However, there were plenty of low-priced minerals so that kids as well as amateur collectors could bring home several nice examples of minerals.

There was also a fossil show. Many dealers were showing and selling a large variety of fossils from fish to full dinosaur skeletons. The prices were mostly out of the common man’s reach, although most dealers did have some small fossils that most could afford if interested in bringing home a souvenir.

There was so much to take in, I was hard pressed to see every display. It was a wonderful time and I recommend if you get a chance to go next year to do so, as it is a very enriching experience for young and old.

**Bear Stories and Glaciation** by Russell Sydow

On Friday September 17, 12 geology students, geology club members, and folks interested in our wonderful Wyoming crossed Togwotee Pass as Kent Sundell, Casper College geology instructor, finished another bear story. The weekend continued with visits to many sites of geologic activity including the Teton Fault, the Gros Ventre Slide, and many examples of ancient glaciations.

While the sights are always amazing on Sundell’s field trip classes the best part seems to always be the great company! I encourage people of all ages and abilities to sign up for one of these general education courses. Really, they are just a good time exploring the beautiful place Wyoming is!

**National Fossil Day** by Adam K. Johnson, vice president of Casper College Geology Club

National Fossil Day has come and gone, and it was an exciting day for the Tate Geological Museum. With casting labs and lectures, the staff at the Tate was kept very busy with the influx of people searching for a higher understanding of paleontology and getting a look at the mammoth, Dee. The Casper College Geology Club also had a busy day with the first big fundraiser of the year, a bake sale.

Weeks ago, when the fall semester started, the geology club’s seasoned students were amazed to see many new faces at the first meeting, and after establishing the officer positions, we started brainstorming ways to raise money for a spring trip. With so many people wanting to be involved, we knew we would need to get the ball rolling as soon as possible. The ideas started flowing, and the classic “bake sale” idea came up, as it always does. National Fossil Day was fast approaching, and the obvious action was to have the bake sale during the Tate’s Open House on National Fossil Day.

As the morning of October 13 came upon us, the club members were busy making a plethora of baked goods and crafts. We had everything from cookies and jelly to necklaces and bath salts. The club really came together and accomplished a lot. We are very happy to report we profited a little over $200 dollars, and are well on our way to taking the spring break trip of a lifetime.

Thank you so much to all the people who contributed to the geology club by purchasing something from us. We are so appreciative of the support. We will continue to hold bake sales during other Tate events, the next being the open house in December. Thank you again, by helping the Casper College Geology Club – you help the future geologists of Wyoming get their start!

**J.P. Cavigelli Contributes to Article in National Publication**

Last year the Tate Geological Museum’s J.P. Cavigelli had his name on his first scientific publication in the Journal of Vertebrate Paleontology. The article was written by F. Robin O’Keefe, Hallie P. Street, Jean-Pierre Cavigelli, John J. Socha, and R. Dennis O’Keefe and is titled “A Plesiosaur Containing an Ichthyosaur Embryo as Stomach Contents From the Sundance Formation of the Bighorn Basin, Wyoming.” It is in the Journal of Vertebrate Paleontology, Dec. 2009, Vol. 29 Issue 4, pages 1306-1310. This is the first report of Jurassic embryonic ichthyosaur bones from North America. They were found in the partial skeleton of a plesiosaur that Cavigelli helped collect near Greybull, Wyo.

Cavigelli prepared the specimen and was surprised to find a series of small rings of bone, which Robin O’Keefe identified as the remains of the plesiosaur’s last meal. O’Keefe also identified a small piece of the ichthyosaur’s jaw and a scapula in there. These remains were all found in association with a handful of gastroliths, suggesting that they were all part of the stomach’s content.
October 13 was the First Annual National Fossil Day and to celebrate, we aimed at completing our Pleistocene exhibit featuring Dee the Mammoth. We were able to finish the tundra landscape, which includes a portion of an ice-wedge polygon, created with rocks and gravels that eroded down from Casper Mountain. While the text panels were not complete, (they will be soon), the exhibit cases are full of interesting items, including several of Dee’s original bones that were too fragile to mount. Two of the most interesting objects on display are Dee’s maxillary (upper) teeth, which are less than a quarter of the size that they would have been when they erupted! A special 'guest' featured on the exhibit and text panels is Harmony the Harvest Mouse. Harmony is based on the harvest mouse skeleton found with Dee, which is now on display in the exhibit. Harmony will act as a guide for the exhibit’s youngest visitors, explaining interesting facts and indicating which drawers have interactive activities.

I would like to say thank you to all of the volunteers and staff that helped me to complete this exhibit. It was a long and sometimes tiring process, but we finished and in the end it will be a lasting and educational exhibit. Thank you!!

Exhibits Updates

By Patti Wood Finkle, Museum Exhibits Specialist

Washakie Museum and Cultural Center:
A 25-foot-tall mammoth sculpture by Chris Navarro was recently installed outside the Washakie Museum and Cultural Center in Worland, Wyo.

The maquettes of Dee the mammoth that were sold during our 30th anniversary fundraiser were patterned after this sculpture. Of course, ours has a broken tusk and a name. We want to congratulate the museum in Worland on their new attraction and thank them again for allowing us to share Chris Navarro’s mammoth sculpture. Reminder: We still have “Dee” maquettes by Chris Navarro available in the museum gift shop.

Saturday Club Topics for November and December, 2010:
Saturday Club meets on the first Saturday of each month unless otherwise advertised. The Junior Club is for children ages 5-7 and costs $5 per child. The Senior Club is for those 8 years old and up and costs $10 per child.

Junior Club: 10:30-11:30 a.m.
- November 6, 2010 – Dino Decorations!
  The club will decorate dinosaurs to hang on the Tate Geological Museum Christmas Tree.
- December 4, 2010 – No Junior Saturday Club due to the holiday open house.

Senior Club: 10:30 a.m.-12:30 p.m.
- November 6, 2010 – Overview of fossils:
  The club will discuss the process of fossil formation and participants will make their own fossil casts using plasticene and molding plaster. Afterwards members will calculate the hind limb index of several dinosaur species to find out which one could run the fastest.
- December 4, 2010 – Free Saturday Club during our holiday open house.
  Participants will make their own dinosaur ornaments to liven up the holiday season!

TATE MUSEUM EVENT CALENDAR:

2010
Nov. 9
Coffee, Tea & Dee
Dec. 4
Holiday Open House
Dec. 14
Coffee, Tea & Dee

2011
June 2-5
TerQua Conference in conjunction with the Annual Tate Conference
In the spotlight are our new custom Tate Geological Museum postcards, two of which feature Dee the Mammoth. One shows the bone bed as it was discovered at the Allemand Ranch, and the other shows Dee mounted in his new home in the museum. Other postcards show several museum displays, including the pterosaur model built by Jim Copen, and a soft-shelled turtle carapace, *Aspideretoides beecheri*. Two beautifully photographed postcards include the official state fossil of Wyoming, the small herring *Knightia*, and nonsilicate minerals on display at the Tate. For Tate members living out of town, I will gladly mail postcard selections to you.

A very popular Scholastic book for young readers 7 and older is back on our bookshelves: *Dino Poop* by Jane Hammerslou, which comes with an attached coprolite—a fancy name for dino poop. You’ll be amazed to find out what is buried deep in the earth around you. *Dino Poop* has a durable plastic cover and heavy paper pages. The price is $9.99, and I promise it will not disappoint.

The Prehistoric Times magazine, which sells for $6.95, is an excellent quarterly publication for older readers and is available in the gift shop.