Our digs in the Lance Formation continue to produce interesting fossils. Earlier this summer during a paleontology field class we spent a few days collecting hadrosaur bones at a site called Tendonitis. Kent Sundell found this site during our Tate Conference 2005 field trip. Initial exploration revealed many, many ossified tendons, some up to two feet (60 cm) long, and all about a quarter or three eights of an inch (7-9 mm) thick. The site also has a few ribs and a vertebra and some likely pelvic bones. These larger bones were mostly in harder sandstone, which we collected in large blocks. The tendons were primarily in softer shale and sandstone, and we were able to collect many of them individually. While removing rock from and around the tendons, which are all spread out like pick-up sticks, this piece of rock split in two revealing the telltale pattern of dinosaur skin.

The two rocks in the first photo are part and counterpart; they fit together face to face. The skin sample is not very big. We looked carefully in the area where this rock came from and found only one other smaller piece.

Is it real dinosaur skin? It is the impression of real dinosaur skin. There is no actual skin left. To create something like this a piece of skin of the poor dead beast has to become dried out and leathery. Then some sand or silt needs to bury it and conform to its leathery shape. This moist proto-rock would then dry out and the skin decompose leaving the impression of the skin in the sediments, which would eventually turn to stone through deep burial. It is not a simple nor a common process, so dinosaur skin is not often found, yet it is probably more common than previously believed. The second photo is a close-up of the left hand block showing the crenulations on the edges of some of the scales.

Dwaine Wagoner has been working on the blocks of rock from the Tendonitis site for a few weeks and has found that in addition to the ribs, there are also some patches of skin impression there as well. Very exciting. Those scales are much smaller than these. Other dinosaurs that preserve skin impressions (often called “mummies”) show that different scales were found on different parts of duckbills and ceratopsians. Our hadrosaur skeleton known as Dead Sheep 148 (which has been featured here once or twice over the years) also has a small patch of skin preserved but it is more ambiguous than this one. We look forward to seeing how much more skin is in the blocks we collected from Tendonitis. As we’ve done before we would like to express our thanks to Lee and Vicki Brown for allowing us to collect on their ranch in Niobrara County.
SAVE THE DATE: September 11, 2010
CELEBRATE THE TATE by attending a barbeque and concert by Pete Martinez at the True Barn. Information will be mailed to all of our supporters and members in the local area. Tickets will be available at the Tate Geological Museum during our regular hours beginning September 1. Prices: Adult – $50, children ages 7-14 – $25 and children under 6 free. There will be a limited number of tickets sold and NO tickets will be sold the evening of the event.

Coffee, Tea, and Dee:
We would like to encourage community members and especially Casper College faculty, students, and staff to visit the museum on a regular basis. So to facilitate that, we are going to have a social gathering once a month at the Tate and will furnish special coffee and tea blends from P. Hawks Coffee Roasters. At the Tate and will furnish special coffee and tea blends from P. Hawks Coffee Roasters. Tea and Dee on the second Tuesday of every month. The dates for the remainder of the month shall be Monday, October 11. For more information about the festival, please visit the website: www.equalitystatebookfest.com/index.php.

First Annual National Fossil Day:
The U.S. National Park Service and the American Geological Institute are partnering to host the first annual National Fossil Day on Wednesday, October 13, 2010, during Earth Science Week. The mission of National Fossil Day is to celebrate and promote public awareness and stewardship of fossils, as well as to foster a greater appreciation of their scientific and educational value. In honor of this new National Fossil Day, the museum is having an open house, which will provide many activities for children and adults alike. Since it is a school day we will spread the word to teachers and home school parents that these special events are available at the Tate. By then the rest of the “Dee” exhibit will be completed and ready for viewing. We will allow visitors to make and take a fossil cast, enter a coloring/art contest depending on their age, listen to a lecture regarding fossils and their scientific and educational value, and many other activities. We will also be having a prehistoric antique road show, which will allow patrons to bring rocks and fossils to the museum to be identified by an expert. We look forward to seeing you October 13.

Saturday Club topics for September and October, 2010:
Saturday Club meets on the first Saturday of each month unless otherwise advertised. The junior class is for children ages 5 to 7 and costs $5 per child. The advanced class is for those 8 years old and up and costs $10 per child.

Junior class: 10:30-11:30 a.m.
• September 4 – What is it Like to Prepare a Fossil for Display? Find out during this session when we remove and identify fossils, sharks teeth, shells, and other surprises from specially prepared dig kits.
• October 2 – Mammals! We will discover the important role snakes play in the ecosystem. The class will be able to make their own rattlesnake or cobra to bring home.

Advanced class: 10:30 a.m.-12:30 p.m.
• September 4 – Geology Field Trip: We will take a trip to a local outcrop to hunt for real minerals and fossils.
• October 2 – Mammal Evolution: Students will be shown how to plot a graph that shows rates of evolutionary change through time. Afterwards students will build animal skeletons out of pipe cleaners.

Event Calendar:
Tate Geological Museum
2010
• Sept. 4 Advanced Saturday Club, 10:30 p.m.-12:30 p.m.
• Sept. 11 Pete Martinez concert and barbeque, True Barn
• Sept. 13-17 Summer Dig – Lusk, Wyo.
• Sept. 21 First monthly “Coffee, Tea and Dee”
• Sept. 24-25 Equality State Book Festival
• Oct. 2 Advanced Saturday Club, 10:30 a.m.-12:30 p.m.
• Oct. 12 Coffee, Tea, and Dee
• Oct. 13 First Annual National Fossil Day – open house
• Dec. 4 Holiday open house
• Dec. 14 Coffee, Tea, and Dee

2011
• June 2-5 TerQua Conference in conjunction with the Annual Tate Conference.
**Q:** ‘Dee’ is so huge; it seems to me that he must have needed a couple hundred pounds of grass every day to survive. But his teeth look so tiny – how was he able to chew enough food to keep going?

- Anonymous Museum Visitor

**A:** He wasn’t. Let me explain: unlike humans, in which most of the cheek teeth erupt more or less simultaneously, a baby mammoth started out with just two teeth in each half of its lower jaw, the first and second premolars (this arrangement was mirrored in the upper jaw). Each tooth was made of several plate-like structures called lamellae, which were cemented together in stacks, one behind another. A good analogy is a row of fig Newton cookies held together with peanut butter. In this model, the chewy filling of the fig Newton represents the dentine, the outside crust represents the enamel, and the peanut butter represents the cementum. Each tooth material had a different hardness. As the mammoth chewed, the three different materials wore down at different rates, so the crown of the tooth always maintained a rough, corrugated grinding surface – perfect for chewing grass.

All well and good, except that grass is remarkably tough stuff. Its tissues are full of natural glass (silica) and it’s usually covered with dust and grit. The first premolar was completely worn away within a year or two, and the second was gone by the time the mammoth was 5 or 6. However, as the first two teeth wore down, they moved forward in the jaw, and the third premolar moved in from behind to replace them. This process was repeated, with the first molar replacing the third premolar and the second molar replacing the first molar, until finally the mammoth was left with just four teeth in its mouth – the third molars. Each tooth was larger than the tooth it replaced, so that by the time the mammoth was on its sixth set of teeth, each one was the size of a human head. This final monster molar could provide the mammoth with 30 years’ worth of chewing power, but once it was gone the mammoth was doomed. There would be no fourth molar.

Each of Dee’s teeth were worn down to the point where the grinding surface wasn’t much bigger than a Twinkie, and there was no sign of a replacement tooth waiting in the wings, so he was undoubtedly on his last set. We suspect that he was around 60 or even 70 years old when he died, and died the same way that elephants do if they live that long: starvation.

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**Exhibits Updates – August 2010**

By Patti Wood Finkle, Museum Exhibits Specialist

The Tate Geological Museum was a hive of activity in July and August. Visitor numbers were up and exhibits activity was too. I spent this part of the summer finalizing research for Dee’s exhibit text, testing the foam for the snow in the exhibit, and coordinating with our lighting and cabinetry contractors.

We have begun work on the “Pleistocene Wyoming” landscape under Dee. In the concept drawings, we planned that the front 1/3 would be covered in snow and the back 2/3rds would be covered with grasses, rocks and dirt. We have poured the snow and put the first coat of paint on. We need to adjust a few spots, prime them and apply the final coat.

The next step will be the grass and rocks. We went up on Casper Mountain to gather rocks for the exhibit. After consulting with Kent Sundell, about the size and variety of rocks that we would need to represent this area in the Pleistocene, Lisa Fujita, my husband Jason, my kids, and I spent a morning rock hunting and gathering. We focused on trying to gather as many different kinds of rocks as we could. One vanload was not enough it seems, so we have another trip planned to get more.

We have new ceiling lights in the front third of the museum to illuminate Dee, the Pleistocene exhibit, and our gift shop. These lights needed to be installed before the cabinets. (The cabinets were delivered on Aug. 24). To make room for the lighting contractor’s lift we moved the Dino Den, Russell’s extremely large desk, and all of the free standing shelving in the gift shop. The end result is fantastic and was well worth the effort.
The Gift Shop

By Sue Easton, Gift Shop Manager

The museum gift shop is carrying a larger selection of maps. Now available is an eight-sheet packet of Natrona County maps, including geology, water, uranium, water, and petroleum, from the Wyoming State Geological Survey. A CD of the geologic bedrock of Casper is for sale, also from WSGS. Booklets about the geology of different sections of the state are available, including Alcova, Sweetwater, and Carbon counties, and Sunlight Basin in Park County. Maps published by the United States Geologic Service include the geologic map of the U.S., and a geologic map of Crater Lake.

The time of the year for purchasing back to school supplies has arrived. The gift shop can provide Estwing picks, geological field books, 10X hand magnifiers, heavy plastic zippered cases, and protractors.

The entire gift shop looks different now with the newly installed overhead lighting. Spotlights highlight our t-shirts and the large selection of children’s books. One of our newest books is Dinosaurs In Your Backyard by Hugh Brewster. It offers an informative description of life on the North American continent millions of years before human life. The material is presented in an informative and easy to understand format with beautiful illustrations. Additionally, footprints, jawbones, skull, and skin are illustrated and explained. Also included is a glossary, pronunciation guide, recommended further reading, and a short list of dinosaur museums in the United States.

Additional new books include Woolly Mammoth by Helen Frost. This book is written for the younger child, specifically grade one. With easy to read text, the book explains the physical attributes of mammoths, as well as extinction. The next book, How Do Dinosaurs Count to Ten? is for even younger readers and four books from this series are carried in the gift shop. Finally, Raptor – the Life of a Young Deinonychus, by Michel Henry, talks about seven different dinosaurs, all raptors. The large book is also beautifully illustrated. Please stop by and browse through the books.

Remember to show your membership card to receive a 10 percent discount on all gift shop items.