At last year’s Tate Conference, Ben Shoup talked about the habits of an Eocene carnivorous mammal called *Patriofelis*. This animal is known from some good skeletal material at the American Museum of Natural History in New York City. It was collected in southwestern Wyoming in late 1800’s and described by Jacob Wortman in 1894. Ben was inspired to speak about *Patriofelis* because he had found a set of jaws in the Haystacks south of I-80 while doing a paleontology survey on Bureau of Land Management (BLM) land. Ben found this *Patriofelis* site in the Washakie Formation in August of 2010, and reported this to me fairly soon thereafter. Unfortunately it wasn’t until this past summer that we went out to find the site and see if his discovery hadn’t completely weathered away.

On July 29 Helen Hoff, Dwaine Wagoner, Steve Pfaff, Judith Johnston, and I drove to the Haystacks to search for this site and see what else might be out there. With the help of Ben’s BLM report, a GPS and photos we found the site quickly. In the four years since he had found it, there was a wee bit of erosion. Alas, one tooth was lost based on Ben’s pictures. The specimen did not have too many teeth preserved, so the loss of one tooth is unfortunate. The jaw fragment shown above is 7 inches long, measured along the curved bottom edge. It is the fused left and right jaws. The animal’s chin would be to the left, the tooth row extends along the top edge and the jaw joint would be to the right.

*Patriofelis* was a carnivorous mammal, yet it was not a carnivore. ‘Carnivore’ can be a confusing term. It is used to mean animals that eat meat, but it is also used to denote the taxonomic group called Carnivora. In modern terms, Carnivora includes cats, dogs, weasels, bears, civets, seals, and sea lions and a few other more obscure critters. *Patriofelis*, despite having a cat-like name, is a carnivorous mammal, but not a true carnivore; it is a creodont. Creodonts and carnivores are close relatives; they share a common ancestor. Creodonts had much smaller brains, and it has been suggested that this may have been a factor in their losing out in the race for survival to the carnivores. In creodonts, the molars form the main meat-shearing tooth, whereas in carnivores it is the last premolar and first molar. Creodonts and carnivores were both present in the Eocene, but the creodonts were the dominant carnivorous mammals, both in numbers and in size.

(continued on page 6)
Hello all! A lot of folks think that life in a museum must be slow, but it seems that things are always changing around here. Our previous director, Deanna Schaff, retired at the first of the year, and I was made director of the Casper College museums shortly after that. All I can say is that I hope I can live up to the expectations. Deanna left some pretty big shoes to fill! I am optimistic about the future of the museum and look forward to learning the ropes and to all of the challenges in the coming years. As members, please feel free to come and talk to me. My door is always open.

**AMETHYST RAFFLE:**

We are going to raffle a beautiful 27 inch amethyst cathedral to help raise money for this year’s conference. Tickets go on sale March 1 and the drawing will be held during the keynote presentation at the conference. Tickets are one for $5 or five for $20. Call the Tate for more information.

**SAVE THE DATE:**

**From the Earth:** Join us on Friday, March 27 between 4 and 6 p.m. for our spring semester art show opening. The art show will feature ceramic art inspired by the Tate collections and created by students. The art will be nestled near the object that inspired it, so come and see if you can find them all. Refreshments will be served.

**Retirement Party!** The Tate Geological Museum is going to have a retirement party for Deanna! Please join us for cake and punch on Monday, March 23 from 4-6 p.m. to say “THANK YOU” to a fantastic director!

**2015 TATE CONFERENCE:**

Hooft it on over to the Tate for the 2015 Tate Conference this June.

The 2015 Tate Conference will be held here at Casper College on June 5-7. The theme this year is “Artiodactlys, Perissodactlys and Whales.” If you think there are some big words in there, the conference will be about ungulates (hoofed mammals), including whales. The taxonomy of these groups has been turned upside down in the past few decades and we thought it would make a fun and interesting topic for a conference. At this time we have 11 speakers lined up and a few maybes. One field trip will be to the White River Formation badlands near Douglas, Wyoming, where we have taken groups several times during the Tate Conference. The second field trip is a work in progress; we are working on a different White River site.

Registration information is included in this newsletter or call the museum at 307-268-2447 for details.

**SPRING LECTURE SERIES UPDATE:**

Our spring lecture series, “Caves of Wyoming and Beyond” is off to a fantastic start. Over 40 people came to our first talk on February 17. Kent Sundell, Ph.D. kicked us off with a talk entitled “Caves of Wyoming: Formation, Utilization and Preservation.” He introduced the basics of cave formation and the importance of cave preservation. He also treated us to some spectacular photos of the interesting and unique formations found in Wyoming’s caves. Join us on March 24 for the next lecture in the series!

**CAVE TALKS:**

Mark Jenkins: March 24th, 7 p.m. in the Wheeler Concert Hall, “Vietnam Underground: Exploring the Biggest Cave on Earth” in conjunction with: the University of Wyoming Center for Global Studies, Global Area and Studies at UW, UW at Casper, Wyoming Humanities Council, and Casper College.

Julie Meachem: April 28, 7 p.m. in the Sharon Nichols Auditorium, “Reopening Natural Trap Cave: What We Can Learn About the End - Pleistocene Extinctions”

Bob Montgomery: May 12, 7 p.m. at the Tate, “Cave Surveying and Mapping”

**IT’S A MYSTERY!** Someone donated this mammoth to the Tate, but we aren’t sure who. If you have any clue please let us know!

By Patti Wood Finkle, Director of Museums
March 7 Saturday Club: “The Planets”

In this class we will discuss the geology of other planets, their past history and the possibility of extraterrestrial life. In the past, the sciences of astronomy, geology, and paleontology were almost completely separate. But as our robotic probes explore the solar system, we are learning that many of the other worlds have geological features similar to those of earth including volcanoes, stream channels, and glaciers. And with the discovery that many potentially earth-like worlds may exist outside of our own solar system, exobiologists – scientists who study the question of life on other worlds – turn to paleontologists for clues to how life forms on other worlds might have evolved to adapt to the conditions of their home planets.

A brief introduction to the constellations is also provided so that students can see the planets for themselves in the night sky. We’ll even go into the mythology of the constellations a bit – it’s a lot easier to find the constellations if you know the stories behind them.

April 4 Saturday Club: “Bronto-Bugs”

Was there ever a dragonfly as big as a hawk? Or a cockroach the size of your hand? Find out in the April session of the Saturday Club. We’ll be looking at the history of the most numerous and diverse group of animals that ever lived – the insects. We’ll learn about insect anatomy, and discover why insects were so successful. We’ll also see some of the gigantic – and sometimes horrifying – insects that lived during the Carboniferous Coal Age, and probe the mystery of how they got so much larger than the insects of today. We’ll conclude the class by making our own simulated insect fossils.

From the gift shop

Easter baskets, chocolate bunnies, egg hunts and more! Easter is on its way, which we cannot ignore. The Tate can help put together a basket for your grandchildren, cousins, daughters, or sons. Each basket will consist of merchandise from the gift shop and made with geological themes including: dinosaurs, fossils, and rock and mineral collecting. Pre-made baskets will be $20 to $25, while the build-your-own basket option will vary in price. The Easter Basket Sale will commence on March 2, and end the day before Easter.
Walk on the Wild Side:


“Walk on the Wild Side Wearable Art Show” is open to Casper College students, faculty, and staff as well as legal residents of Wyoming. Participants shall execute a piece of wearable art inspired by exhibits at the Werner Wildlife Museum. The resulting clothing will be modeled on stage before a live audience at Durham Auditorium located in Aley Hall on the Casper College campus. Judges will be drawn from professional fiber artists and sewists within the community. Winning garments will be exhibited at the Werner next to the display that inspired them.

For the purposes of this contest, wearable art is defined as clothing that is creative, artistic, handmade, and wearable. Accessories must be part of a complete handmade outfit and are not eligible on their own.

CATEGORIES
1. Preteen, 12 and under
2. Teen, 13-17
3. 18 and up
4. Professional (anyone who sews/knits/weaves/etc. or who teaches the same for profit)
5. People’s Choice

IMPORTANT DATES AND DEADLINES
- Entries forms/guidelines are available at Werner Wildlife Museum, at local fabric and yarn shops, or online from indiahayford@caspercollege.edu
- Deadline for entries: May 8, 2015 at 4:45 p.m.
- Runway show: May 19, 2015 7-9 p.m.
- Werner Open House with display of winners in each category: May 26, 2015

Displays will remain up until Friday, July 24, 2015

SPRING T-SHIRT SALE

The Tate Gift Shop is overflowing with t-shirts! We want you to get the shirt you’ve been eyeballing and starting April 6, 2015 we will have a special sale rack. There will be various sized shirts, accommodating all ages and both genders.

THANK YOU!

We would like to thank Jason Eggemeyer, drafting instructor in the Casper College School of Business and Industry for engraving and cutting out three new Dino Den activities. Thank you!
Werner Wildlife Museum:

By India Hayford, Museum Assistant

The Werner Wildlife Museum is making strides in its effort to no longer be the best-kept secret in Casper. Not only have the number of tour groups picked up in recent months but so has attendance at the monthly presentations of Animal House and Raptor Rap. January’s programs were particularly well attended with standing room only for “An Uneasy Peace: Human-Eagle Interactions” on January 15. The programs are drawing all ages and not just the children originally expected. The Raptor Rap program for February went for the ever popular “Ick Factor” with “Why Does a Turkey Vulture Have a Bald Head?” and other adaptations to environment. February’s Animal House program was “Badgers: Ferocious Not Mean.” March’s programs will concern moose and progeny raising challenges faced by eagle parents.

Both Raptor Rap and Animal House will have a new presenter in March. India and Viola have been joined by the Werner’s newest living mammal and museum assistant, Eileen Lemm. A native of Casper, Eileen comes to us with an art history background and experience in museum science at the Territorial Prison in Laramie, Wyoming. She has an excellent sense of humor and will no doubt excel at giving tours and presentations while keeping the museum’s Past Perfect Program in peachy pie order. Welcome, Eileen!

On February 7, the Werner joined with Casper Needle Guild to hold a rare Saturday open house to celebrate both the upcoming wearable art show and Hari-Kuyo: Festival of Broken Needles. The Shinto religion of Japan teaches that inanimate objects, like living things, have a soul and that it is disrespectful to simply discard a tool that has served you well. On Feb. 8, seamstresses, embroiderers, kimono-makers and tailors gathered at religious shrines to lay to rest their worn-out pins and needles in a cake of tofu or a soft fabric pad. Softness comforts the needles and pins as prayers, or sutras, are chanted to thank the tools for a year of straight stitches, repairs, and for any damage done to the tools.

Needle Guild President Ann Hudson recreated a traditional Japanese shrine for the Werner’s celebration. Attendees were encouraged to bring their handwork to the festival along with any broken, bent, or otherwise damaged needles that were honored and laid to rest that day. Visitors were welcome to stay a few minutes or all day to stitch with other needle workers and to take a rare weekend opportunity to visit the Werner’s collections. Attendance for the occasion came in at just under 70 people.

DVD Review - “Eyewitness: Dinosaur”:

By Russell J. Hawley, Tate Geological Museum Education Specialist

For decades Dorling-Kindersley’s Eyewitness series of books have brought us great nonfiction for children, lavishly illustrated with eye-popping photos and diagrams so sharp and detailed that they seem to leap right off the page. This DVD, “Eyewitness: Dinosaur” carries on that tradition in the video medium. The basics of dinosaur science are presented in an easy-to-understand format with lots of colorful visuals that are sure to keep the attention even of very young viewers.

For adult viewers – especially those of my generation – there’s an added bonus: many of the points made in the narrative are illustrated with clips from the classic dinosaur movies that we all knew and loved as kids. I recognized footage from Ray Harryhausen’s “One Million Years B.C.” (with stop-motion animated dinosaurs pursuing a leopard-skin clad Raquel Welch) Willis O’Brien’s classic 1925 version of “The Lost World,” “The Arctic Giant” (a beautifully animated cartoon from 1942 in which a frozen dinosaur comes to life and attacks the city, only to be defeated by Superman), and an obscure short film from 1917, “R. F. D. 10,000 B.C.,” in which an entrepreneurial caveman uses a pet brontosaurus to deliver the mail. I also saw many scenes from Christopher Reeve’s dinosaur special from 1985, Phil Tippet’s last great masterpiece of stop-motion animation before the special effects technology of “Jurassic Park” rendered the practice extinct.

Extinct? Well, not quite – “Eyewitness: Dinosaur” also has a ‘host’ of sorts – a friendly looking claymation dinosaur who serves as a guide, demonstrating many of the concepts presented in the program in a fun and entertaining way.

In all, I’d recommend “Eyewitness: Dinosaur” for any aspiring young paleontologist in your family, especially those in the 4-6 year-old age bracket. Come to the Tate Geological Museum gift shop and pick up your copy today!
Back to our specimen. Judith Johnston helped collect the jaws and prepared them back here in the lab. Even with only one premolar in the jaws, it is evident that this was a ferocious critter; the tooth suggests a carnivorous diet, and the jaws are massive. The one tooth has a carnassial notch, which is typical of carnivorous mammals. Additionally, the canine teeth are preserved only as cross-sections where they enter the jaw and they are impressively large.

Othniel Marsh originally described this beast as a ‘gigantic carnivore’ in 1872, based on isolated lower jaws. Russell J. Hawley and I compared these jaws with our cast of a Pleistocene short-faced bear, the largest Ice Age carnivore which may be bigger than modern polar and grizzly bears. We found Patriofelis comparable to the short-faced bear; a gigantic carnivore indeed. But Russell was quick to mention that creodonts are well known for having a large head and jaws compared with their body size. After more complete skeletons became available, Wortman compared Patriofelis to a large black bear, maybe not gigantic, but big nonetheless. It was probably the largest Eocene meat eating mammal in North America. (There were also big crocodiles and Diatryma, the six foot tall flightless bird, although its meat eating habits have been questioned lately).

In preparing the jaws, Judith found the end of a tibia tucked away inside the lower jaws. The tibia is likely from the same animal.

Ben’s name has appeared in these pages a few times recently. His job is to do paleontology surveys for those who need one done ... usually oil or uranium companies. He has found a few good sites that we have followed up on. Thanks to Ben for letting me know about his work in the haystacks, and thanks to the BLM for granting us a surface collecting permit, permit Number PA10-WY-191, and thanks to Russell J. Hawley for discussions about big carnivores.
Q: What would a turtle look like if it came completely out of its shell?

A: The short answer: Not pretty.

A turtle isn’t like a hermit crab, which can crawl in or out of its shell whenever it likes. The shell of a turtle is an integral part of its body, and it can no more crawl out of its own shell than you could crawl out of your own ribcage.

Actually, that’s pretty much what it would amount to. The ribs of a turtle are very flat and broad, and form the innermost layer of the shell. The ribs are fused to a second layer of bone plates, and then there’s a third layer of plates – this time made of keratin – covering them, making up the outer surface of the shell. Each keratin plate straddles the boundary between two of the underlying bone plates, which makes the shell a lot stronger.

In the diagram below, I’ve drawn a red-eared slider (Trachemys scripta)* with the upper shell, or carapace, removed. The two lines of ovals running down its back on either side of its spine are the necks of its ribs – each rib has been shown as if cut to free the upper shell. If you were to pull the shell off without cutting the ribs you’d rip the turtle’s spine out. (By the way, please don’t do any of these things to a living turtle. I like turtles.) With the shell removed, you’d be able to see the organs in the turtle’s back, right under the shell – the lungs and kidneys on top, and then various squishy guts and muscles lying underneath.

Many thanks to J.P. Cavigelli for explaining turtle ribs to me.

* The genus name of this turtle has changed three times since I was a kid! First it was Chrysemys, then Pseudemys, and now it’s Trachemys.

Below: Red-eared slider turtle (Trachemys scripta) with carapace removed to show dorsal internal organs.
Tate Museum Event Calendar

MARCH
7  Sat. Club – "The Planets"
11  Coffee, Tea and Dee 7:30-11:30 a.m.
12  Werner – Animal House: "If you give a Moose a Muffin He Might Give You a Stompin’" 4 p.m.
19  Werner – Raptor Rap: “Eagle Nesting Instinct” 4 p.m.
23  Retirement Party for Deanna! 4-6 p.m.
27  Tate Art Show Opening: “From the Earth” 4-6 p.m.
30  Museum Consortium spring break “drop in” activity at the Tate 1-3 p.m.

APRIL
3  Museum Consortium spring break “drop in” activity at the Werner 1-3 p.m.
4  Sat. Club – "Bronto-Bugs: Discovering Fossil Insects"
9  Werner – Animal House: "Puma, Cougar, Panther: A Mountain Lion by any Other Name Would be as Fierce" 4 p.m.
15  Coffee, Tea and Dee 7:30-11:30 a.m.
16  Werner – Raptor Rap: “Boils, Casts, Parliaments and Convocations: Raptors in Communities” 4 p.m.
28  Lecture Series – Julie Meachem 7-8 p.m.

MAY
2  Sat. Club – "Volcanoes of Our Solar System"
6  Last Coffee, Tea and Dee of the season 7:30-11:30 a.m.
12  Lecture Series – Bob Montgomery 7-8 p.m.
14  Werner – Animal House: “Coyote: Chief Mischief Maker” 4 p.m.
16  Adult's Members Only Dig – location TBA
19  Werner Wearable Art Show Runway Walk 7-9 p.m., Durham Auditorium, Aley Hall
21  Werner – Raptor Rap: “Bald Eagle Migration: Deciding on Alaska or Wyoming for Summer Vacation” 4 p.m.
26  Werner Wearable Art Show Open House
20-22  GSA Conference (Geological Society of America)

JUNE
(No Saturday Club during the summer months)
5-7  Tate Conference
11  Werner – Animal House: “Mountain Sheep Don’t Live on Farms” 4 p.m.
18  Werner – Raptor Rap: “Kestrels, Osprey and other Less Familiar Raptors” 4 p.m.
20  Kids Only Member’s Expedition – location TBA
22-26  Tate Museum Dinosaur Dig – Lance Formation