



Friends of  
**Dinosaur  
Ridge**

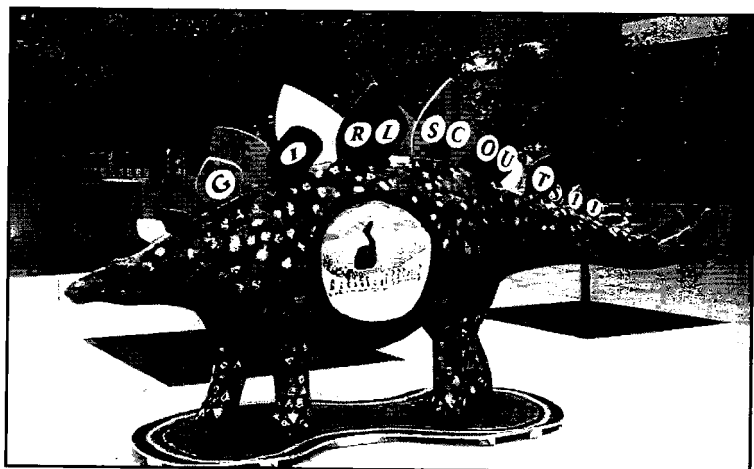
# 2003 Annual Report

## The Dinosaur Herd on Dinosaur Ridge



Feeling Groovey ▲

Bivi ▼



DinoCookie ▲

Shopasaurus ▼



# Friends of Dinosaur Ridge

## *2003 Annual Report*

Friends of Dinosaur Ridge  
16831 West Alameda Parkway  
Morrison, CO 80465  
303-697-DINO  
[www.dinoridge.org](http://www.dinoridge.org)

Editor: Ed Warren  
Design and Production: Ed Warren

### 2003 Major Contributors Scientific and Cultural Facilities District (SCFD) Jefferson County Conservation Trust Fund



The Friends of Dinosaur Ridge (FODR), a 501 C3 non-profit tax exempt organization, was established to protect the natural resources of the hogback west of Denver known as Dinosaur Ridge, and to educate visitors about the area's geologic, prehistoric and natural features.

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*Scientific & Cultural Facilities District (SCFD)*



*Jefferson County Open Space*

The Visitors Center is open daily from 9:00 a.m. to 4:00 p.m., except Sundays from Noon – 4:00 p.m. Tour and Guide Services are available, Inquiries may be made at the Visitors Center or by calling 303-697-DINO

## Friends of Dinosaur Ridge

### Officers

President	Andy Taylor	Metro State College
Vice-President	Chris Carroll	US Geological Survey
Secretary	Bob Raynolds	Consulting Geologist
Treasurer	Keith Meakins	Accountant

### Executive Committee Members

Norb Cygan	Geologist
Duff Kerr	Kerr & Associates
Kathleen McCoy	Lawyer
Pete Martin	U. S. Bureau of Reclamation
Betty Rall	Geologist
Ed Warren	Geological Engineer

### Board of Directors

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Kevin Black	Colorado Historical Society
Tim Connors	National Park Service
Harald Drewes	Geologist
DuWayne Ebertowski	Fed. Hwy Admin., Ret.
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Jan Jacobs	Technical Editor
John Kelly	Geologist
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Martin Lockley	University of Colorado, Denver
Marge MacLachlan	Geologist
Pete Modreski	United States Geological Survey
Beth Simmons	Metro State College
Jeff Stephenson	Denver Museum of Nature and Science

<b>Executive Director</b>	Joe Tempel
<b>Program Director</b>	Matt Carey
<b>Store Manager</b>	Roger Bennett

### Intergovernmental Consortium Representatives

Tim Sandsmark	Lookout Mountain Nature Center
Paul Bartos	CO School of Mines Geology Museum
Richard A. Scott	Morrison Natural History Museum
Elizabeth Nosek	Lakewood's Heritage Center

## PRESIDENT'S REPORT

by Andrew Taylor

The year of 2003 was another successful year for the **Friends of Dinosaur Ridge**. It was a busy year with a number of different activities underway. FODR continued to facilitate tours of school children over the ridge. This is quite possibly our most important activity. Other tours and educational activities also were conducted. **Matt Carey**, our program director, has performed excellently in orchestrating these activities.

Physical improvements continued to be made at the Ridge. These included the **Brontosaurus Bulge Ramp**, the **Dinosaur Dig Pit** and a gravel parking lot. The **Triceratops Trail** at Golden was created, which represents an expansion in FODR activities. Tours were successfully conducted, although we need to increase visitation by the public. A very successful gambit in advertising was the involvement of FODR in the

creation and display of the now famous herd of painted stegosaurus, which have had considerable exposure in the urban area. FODR will benefit in the near future from membership in the new **Lariat Loop Heritage Alliance**, a **Colorado Scenic and Historic Byway**, which will increase visitation.

**Martin Lockley** continued his literary efforts with the publication of the outstanding guide "**Fossil Footprints of Dinosaur Ridge and Fossil Trace Areas**". Scientific studies and publications are an important part of the responsibilities of FODR. Under the able direction of our store manager, **Roger Bennet**, the gross sales in the retail store reached \$100,000. Approximately 60% of this sum was profit. It is my opinion that sales in the store will increase in the future, largely due to the expertise of **Roger**. **Joe Tempel** has continued to

weave his fund raising magic for FODR. Somehow, we are going to have to get him a salary! FODR initiated two new fund raising events in 2003, the **Morrison House Tour** and the **Rock Out For the Ridge** held at the new **Red Rocks Visitor Center**. These were successful and are planned to be repeated in 2004.

### Our future needs include:

- More tour guides.
- More money!
- Improvements to the barn.

It is obvious that we are not going to be moving to a new location any time soon. Therefore to accommodate our continued growth, we need to make better use of our existing facility. In the barn, we have four walls, a roof and two floors. We currently are using only about 60% of this space. We are making plans for improvements so that we may use all of the existing area.

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## Executive Director's Report

by Joe Tempel

### *Improvements at Dinosaur Ridge*

The **Brontosaurus Bulge Ramp** was the major project completed on Dinosaur Ridge in 2003. It provides a safe environment for people to view the brontosaurus tracks and also provides handicapped access to the tracks. The project cost approximately \$36,000 and the funds were provided by the following organizations: **Jefferson Conservation Trust Funds** (\$23,900); **SCFD** (\$6,900) and the **Denver Foundation** (\$5,000).

The **Dinosaur Dig Pit** was partially completed in 2003. A scout troop under the direction of **Derek Tweed** embedded twenty-eight **Edmontosaurus** bones in concrete and installed six posts to support a future canopy. A nest of eggs will be installed in 2004. This site will become a major interactive learning facility in 2004 to augment our tours of the Ridge. The **Greater Denver Area Gem and Mineral Council** (\$500) and **Holly Tempel** (\$1,000) provided funding. A gravel parking lot was installed west of the barn to accommodate additional cars during peak periods.



**Brontosaurus Bulge Ramp**

## Friends of Dinosaur Ridge Annual Report 2003

### **Improvements at Parfet Prehistoric Preserve**

The *Parfet Prehistoric Preserve* is located on property owned by **Chip Parfet** and the **City of Golden** is now known as the *Fossil Trace Golf Course*.

The **Triceratops Trail** was constructed in 2003 by the following scouts: **Colin Lamprecht, Chris Cumello, Dan Gifford, Rob Jurenko, Trevor Toms, and Taylor Weaver**. The trail was constructed by spreading 200 tons of gravel (donated by **LaFarge** and hauled by the **City of Golden**) over a quarter mile trail. Split-rail fencing was installed at critical points to control foot traffic and netting was erected to keep golf balls from hitting trail walkers. A set of steps was constructed from the golf cart path to the palm frond wall to provide golfers access to the palm frond wall.

A railroad-tie retaining wall and switchback trail were constructed at the **Hadrosaur Pit, Denver Mountain Parks** donated over 150 railroad ties for this project. Seven wooden sign bases were installed along the trail. Funding for the signs has been secured from the following people: **Friends of T Caneer, Friends of Susan Landon, Bob Weimer, CU Denver Dinosaur Trackers, Colorado Scientific Society and SCFD**.

Fifteen mini-signs were installed next to the fossil features primarily with funds donated by **T Caneer**. **Marci Miller** laid out the graphics for the signs and they will be installed during the spring of 2004. There were 3,000 copies of the *Fossil Footprints of Dinosaur Ridge* and *Fossil Trace Areas* published and are available to the public.

The **Friends of Dinosaur Ridge** would like to thank **Chip Parfet** for all his assistance in grading the trail, providing an area for parking during public tours and providing public access to the tracks and raindrops in the **Hadrosaur Pit**. The **Friends of Dinosaur Ridge** would like to thank **Martin Lockley** for conducting the original research on the site, writing the *Fossil Footprints Guide*, preparing the fossil exhibit in the **Fossil Trace** clubhouse and opening the door to public access to the site. The **Friends of Dinosaur Ridge** would like to thank **T Caneer** for insisting upon the preservation of the fossils and public access to view the fossils.

### **Painted Stegosaurus on Dinosaur Ridge**

A herd of five painted dinosaurs were created in 2003. These **stegosaurus** measure 6' high and 12' long and were sponsored and painted by the following organizations and individuals:

- ❑ **Star Spangled Stegosaurus** - funded by **Karin Bond** - painted by **Paul Koroshetz**.
- ❑ **Shopsaurus** - funded by **Wilson Thorn**, developers of the **Lakewood Commons Shopping Center** - painted by **Paul Koroshetz**.
- ❑ **Bivi** - funded by the **Denver Botanic Gardens** and **Alameda Gateway Community Association** - painted by the **Denver Botanic Gardens**.
- ❑ **DinoCookie** - funded by **Bruce Katchen** - painted by **Girl Scout Troop 1614**.
- ❑ **Feeling Groovy** - funded by **SCFD** - painted by **Patterson Elementary School** and **Alameda High School** students.

Not only did *Star Spangled Stegosaurus* and *Feeling Groovy* win **Best of Parade at Lakewood on Parade** two years in a row, but they joined **DinoCookie** at the **Dino Expo** in downtown Denver where over 200,000 people saw them at the entrance to the big tent housing the exhibit of 100 dinosaurs.

### **Long Range Planning for our Visitors Center**

Because it does not appear that the Friends will be able to acquire the new site for a Visitors Center west of Rooney Road anytime soon, the Friends have decided to make a more modest investment in renovating the existing barn for exhibits and office space. The downstairs would be devoted to interactive hands-on exhibits, a track casting room, an area to view our video, an interactive computer station and a volunteer check-in/scheduling area.

The upstairs would be devoted to a board room/classroom, volunteer office space, offices for the Program Director and Executive Director. A \$30,000 grant application has already been submitted to the **National Park Service** and applications to public and private foundations will follow in 2004 to raise another \$40,000-\$60,000 for the renovation.

### **Innovative Fundraising Activities for Dinosaur Ridge**

Following on the heels of the successful pancake breakfasts held in 2002, the Friends embarked on more aggressive fundraising activities in 2003. The first was the **Morrison House Tour** on June 21st. It was done in collaboration with the **Morrison Natural History Museum**, the **Denver Mountain Parks**, the **Horton House Bed and Breakfast**, the **Cliff House Inn**, the **Emanuel Martinez Studio** and **Holly/Joe Tempel House**. Even though the tour was a modest success because it raised only \$400, we hope to make this an annual event.

The much more successful **Rock Out for the Ridge** fundraiser was held at the new **Red Rocks Visitor Center** on November 7th. Approximately 130 people attended and almost \$11,000 was raised through the dinner and silent auction. We enjoyed music by the **Blues Brethren** and the newly installed **Geological Niche** that was done in consultation with the **RMAG's Popular Geology Committee** and **Martin Lockley**. Mark your calendar for November 5th in 2004 for the second **Rock Out for the Ridge** fundraiser.

### **Lariat Loop Activities**

The **Friends of Dinosaur Ridge** are members of the **Lariat Loop Heritage Alliance**. **Lariat Loop** is Colorado's newest **Scenic and Historic Byway**; traversing from Golden, up Lookout Mountain, over to Evergreen, down to Morrison along Bear Creek and back up to Golden past Dinosaur Ridge. The **Scenic Byway** signs (44) were installed by **CDOT**, 10,000 place-mats were produced with funding from **SCFD** and funding for 50,000 color brochures was secured from the **State Historic Fund** and the **Golden Civic Foundation**.

## Program Director's Report by Matt Carey

Since its formation in 1989, the Friends of Dinosaur Ridge has grown thanks to the support of the numerous volunteers and members that make up the Friends. In 2003, volunteers gave nearly 3,700 hours of their time to FODR for tasks such as leading tours and programs, making casts of footprints, soliciting program sponsors, and attending meetings. Without the support of the volunteers, the Friends of Dinosaur Ridge would not exist. Thank you!

In 2003, 39,297 visitors went through the **Dinosaur Ridge Visitors Center**. Another 6,166 people came out to Dinosaur Ridge for a guided tour and another 2,603 attended various programs offered by the **Friends of Dinosaur Ridge** in 2003. While attendance in the Visitors Center again increased from previous years, tour attendance declined and program attendance was down slightly compared with 2002. While there are numerous explanations for the decline in guided tours and programs, the Friends have resolved to meet this challenge in 2004.

The Friends expect to see a favorable response from teachers to an expanded tour program with educational tours specifically designed for varying age levels that address the **Colorado State Standards for Education**. The *Denver Foundations* has also graciously granted the Friends \$5,000 to offer tours to lower income schools in 2004. *Wal-Mart* and the *Scientific and Cultural Facilities District* also supported the guided tours of the Ridge by funding an introductory video for teachers and students visiting the Ridge.

In response to the increase in self-guided visitation, and thanks to funding from the *El Pomar Youth in Community Service* program and the *Greater Denver Area Gem & Mineral Council*, the Friends have also been working on several projects promoting a higher quality self-guided experience of the Ridge and the **Parfet Prehistoric Preserve** in Golden. These projects include **Family Backpacks**, an updated audio tour, and a self-guided tour brochure for the *Parfet Prehistoric Preserve*. Another area where the Friends have devoted some effort is with strengthening our relations with the **Town of Morrison** and the **Morrison Natural History Museum**. While still remaining separate

institutions, we have strengthened relations by drafting the **Memorandum of Understanding (MOU)**, developing tours that complement the information gleaned from tours of each other's sites, and by forming the **Preservation Committee**.

### Preservation Committee

In the latter part of 2003, the **Friends of Dinosaur Ridge** and the **Morrison Natural History Museum** joined to create the **Preservation Committee**, the first mutually beneficial committee between the two organizations. The intent of this committee is to share expertise in preservation and stewardship of the area's resources. The **Committee's** mission statement reflects our responsibility to preserving the natural resources, artifacts, and environment of *Dinosaur Ridge* and the *Parfet Prehistoric Preserve* in Golden. In this definition, "*Dinosaur Ridge*" has been loosely defined as the hogback between the I-70 road cut to the north to the US Highway 285 road cut to the south. Aware that some of the land in this area falls under private ownership, the **Preservation Committee** will meet with interested parties who desire to work with us on issues such as structural stability and protection from natural and human elements. The principles of the **Preservation Committee** are, in relative priority order of consideration:

- 1) That no harm be done to the resources preserved,
- 2) that the selected preservation treatments are reversible, and
- 3) that preservation will be undertaken with the intent of allowing the resource to function in an educational manner (*in situ* when possible).

The next step for the **Preservation Committee** is a resource inventory (including concerns at the main tracksite on Dinosaur Ridge, the dinosaur bone quarries, and the resources at Fossil Trace), then addressing the preservation needs for each item. From the inventory, we expect to generate a prioritized list of action items for which we will seek funding to alleviate or avoid potential problems.

If you have any comments or concerns that you would like the **Preservation Committee** to address, please pass them along to **Sam Bartlett**.

## Friends of Dinosaur Ridge Annual Report 2003

### Membership

Many thanks to the new and renewing members of the Friends of Dinosaur Ridge!

Also, thank you to our Dinosaur Discovery Day sponsors for 2003:

- Andrews & Anderson Architects PC,
- Bandimere Speedway,
- Newmont Mining Company,
- Kerr McGee,
- Rocky Mountain Corporation,
- Fort Restaurant,
- Rocky Mountain Association of Geologists,
- Homebuilders Association of Metro Denver,
- Greater Denver Area Gem & Mineral Council.

The Friends of Dinosaur Ridge and the Morrison Natural History Museum will soon (anticipated launch date of April 1, 2004) announce a new option for new and renewing members. Joint memberships between the Friends of Dinosaur Ridge and the Morrison Natural History Museum will include all of the current membership benefits at a reduced cost. A joint membership for an individual will cost \$25.00, which is a \$5.00 savings over purchasing the memberships separately. A joint membership for family level members will cost \$40.00, which is a \$10.00 savings over purchasing the memberships separately. Show your support for both institutions by purchasing a joint membership!

### **Membership Benefits for the Friends of Dinosaur Ridge:**

#### Individual Level:

- 10% discount in the Friends of Dinosaur Ridge Gift Shop
- 10% discount to the Rock Out for the Ridge Dinner
- 3 Ridge Reports, the newsletter of the Friends of Dinosaur Ridge
- Annual Report
- One free Pancake Breakfast before one of our Dinosaur Discovery Day programs
- An invitation to our Annual Meeting.

### Family Level:

- Individual Level benefits, plus
- 10% discount for the Dinosaur Ridge Summer Science Day Camp
- 3 more free Pancake Breakfasts
- 1 Friends of Dinosaur Ridge Yardstick

### Dinosaur Ridge Summer Science Day Camps

Registration forms and informational brochures for this summer's camp program offered by FODR are available now from the **Dinosaur Ridge Visitors Center** and online at [www.dinoridge.org/activity.htm](http://www.dinoridge.org/activity.htm). The **Summer Camps** are science oriented and explore paleontology, archaeology, biology, and ecology. Camp sessions consist of no more than 13 campers between the ages of 10 and 13, and are led by a staff of professional science educators. Each week-long camp is held from 9:00am to 3:00pm and costs \$160.00 per child.

The Friends offer two camps. The **Level I** camp focuses on paleontology, geology, and ecology. Activities include measuring dinosaur footprints, learning excavation techniques, and field trips to local organizations such as the **Morrison Natural History Museum** or the **Ice Core laboratory** at the **US Geological Survey**. There are two sessions of the **Level I** camp: July 12-16 and July 19-23.

The **Level II** camp is for those who have completed the **Level I** camp, or have equivalent experience. The camp focuses on human evolution, primate studies, advanced geologic techniques, and more field trips. There is one session of the **Level II** camp, which runs from July 26-30.

### Friends of Dinosaur Ridge Annual Meeting

The Friends of Dinosaur Ridge invite their members to the **FODR Annual Meeting** on Wednesday, March 17, 2004. The meeting will be held the **Dinosaur Ridge Visitors Center** from 6:00pm to 7:00pm. **FODR** members are encouraged to express their thoughts and concerns, either verbally or in a written format, during the open house. The **Friends of Dinosaur Ridge** will provide snacks and beverages. Members are also invited to stay for the **Friends of Dinosaur Ridge's** regularly scheduled **Board of Directors** meeting, which will follow at 7:00 p.m.

## Publications Committee Report

by *Martin Lockley (Chair)*

The Dinosaur Ridge "publishing house" has had another busy year with the reprinting of the fully revised guide to *the Fossil Footprints of the Dinosaur Ridge and Fossil Trace Areas*. The second edition of this publication incorporates all of the new finds from **Fossil Trace Golf Course** in Golden, which opened in summer 2003. The publication was a joint project of the *Friends, CU Denver and the City of Golden (Parks and Recreation Dept.)*. The guide appears in the new color format, and was made possible by sponsorship from **Golden** (\$5,000), the **CU Denver Trackers** (\$1,765) and **AAPG** (\$1,000).

We have also put another publication (the sixth) into the final layout stage. This is the *Trailwalkers Guide to the Denver Foothills*, by geologist **Harald Drewes** and botanist **John Townrow**. This guide subtitled "the natural history of the area where the plains meet the mountains" will help the hiker appreciate the geology, landscape features and vegetation on two trails around, **Green Mountain**, two on **Dinosaur Ridge** and one through **Matthews/Winter Park**. The guide includes many illustrations and a colorful geological map, produced with the help of **Tim Connors, Andy Taylor and Chris Carroll**. The guide should soon go to press with sponsorship from **RMAG** (\$2,500) and **AIPG** (\$1,500).

*The Dinosaur Ridge catalog of guidebook publications is as follows with new format guides in bold print:*

- 1) **A Field Guide to Dinosaur Ridge. 2001 (3<sup>rd</sup> edition, 1st ed. 1990, 2<sup>nd</sup> ed. 1995)**
- 2) **Fossil Footprints of the Dinosaur Ridge and Fossil Trace Areas 2003 (2<sup>nd</sup> edition, 1st ed. 1994)**
- 3) The Archaeology of the Dinosaur Ridge Area, 1994 (1st edition)
- 4) The Historic Quarries of the Dinosaur Ridge Area, 2002 (1st edition)
- 5) **A Guide to the Fossil Footprints of the World 2002 (1<sup>st</sup> edition)**
- 6) **Trailwalkers Guide to the Denver Foothills (in production for 2004)**

*The following guidebook-style publications are tentatively planned for the future:*

- (a) The ecology of the Dinosaur Ridge Area
- (b) A guide to the Triceratops Trail at Parfet Prehistoric Preserve
- (c) The 20<sup>th</sup> Century History of the Dinosaur Ridge area
- (d) The paleontology of the Dinosaur Ridge Area

The **Dinosaur Ridge** field guide series has been moderately successful over the years. With several guides in their second or third editions, we estimate that more than 30, 000 copies have been printed. Last year about 2000 guides were sold (retail and wholesale). Allowing for various factors such as the increase in variety of guides available over the years, this figure is about average for the 14 years since the publication of the first guide.

There are other publications, not in the guidebook series, that should also be mentioned. These include the *Friends of Dinosaur Ridge 1989-1999: an Oral History*, by **Rudi Hartmann**, and the *Mountain Geologist* special volume **Dinosaur Ridge: Celebrating a decade of**

**discovery**, which sold 69 copies, and the geological yardstick which sold 2,408 copies. This proves that low-price items sell well. Free brochures are even cheaper, but even these have associated costs. We therefore thank the **Greater Denver Area Gem and Mineral Council** for their sponsorship (at the \$1,000 level) of the production and printing of 15,000 **Triceratops Trail brochures**.

Members of the publications committee during 2003 included **Martin Lockley (Chair), Joe Tempel, Kevin Black, Jan Jacobs, Pete Modreski, Andy Taylor and Sally White**. **Kevin Black** is retiring from the committee this year (2004) and we plan to welcome **Rudi Hartmann** in his place.

## Education Committee Report by Norb Cygan

**E**ducation is a primary mission of the Friends. Under that banner, our many dedicated and talented volunteers concluded another out-standing year of helping students and the general public understand the story of dinosaurs, Dinosaur Ridge, and the history of Earth. In this issue, you will read in other columns about the work of our guides, classroom speakers and summer camp teachers. **Matt Carey's** report provides in greater detail about many of the educational activities at the Ridge

In April, **Bob Raynolds, Jeff Stephenson, and Matt Carey** with the assistance of **T. Caneer, Sam Bartlett, and Duff Kerr** conducted training sessions for new volunteer guides. Six new guides were added to the cadre for school tours and other activities.

Two training classes were conducted by **Pete Modreski and Norb Cygan** for K-12 teachers enrolled in the *Colorado School of Mines Continuing Education Program*. **Pete** also taught a class and led a field trip for teachers attending the *Mining Association* summer program. The **Education Committee** is exploring new methods and new institutions through which we can offer new teacher training classes.

*Fireside Chats* were again well received and had large numbers of attendees. In February our own **Dr. Bob Raynolds** related the story of his trip into central Bolivia with **NASA** scientists to look for evidence of a meteor crater and present day environments similar to those evidenced in the rocks of the Ridge.

In March, the presentation by **Dr. Christine Turner Peterson** of the interpretation of the environment of deposition of the *Morrison Formation* engendered much discussion and interest. We are hoping she will return soon as data from new studies becomes available.

**Matt Mossbrucker**, of the *Morrison Natural History Museum* presented a program on the dinosaurs of the Morrison area and especially his work on *Quarry #10* right next to the town of Morrison. We hope to hear more from him in the coming year. Also in May, **Dr. Mike Kohl**, of *Clemson University*, took us along the trail recreating a nature-exploring trip by *Arthur Lakes*. **Mike's** talk included beautifully illustrated drawings and early photos.

The Fall series began in October with **Dr. James Fassett**, **USGS**, showing evidence that many types of dinosaurs survived the impact. The audience although not all believers in this theory enjoyed and appreciated his step-by-step lines of evidence leading to his hypothesis that dinosaurs did survive the impact. In November, **Dr. Doug Nichols**, **USGS** in Denver provided many lines of evidence to show that dinosaurs did not survive the meteor impact. Our members enjoyed these talks and indicated they would like to hear more such talks discussing opposing views of geologic theories.

A tour and detailed study of the marine units on Dinosaur Ridge was led by **Betty Rall** and **Norb Cygan** for *Denver's Ocean Journey* volunteers. This was organized in turn for the *Ocean Journey* volunteers

who hosted an earlier tour for **FODR** members. **Curtis Elder** led a tour *up Bear Creek Canyon* which was enthusiastically received. More tours of these types are proposed for the future.

**Sue Jansen** and her troop of senior *Girl Scouts* built a demonstration model of a river and tidal bay system next to the barn. It was created to demonstrate high and low tides, environments of deposition and erosion in the river system of the *Jurassic* rocks on the Ridge, and the tidal deposits containing dinosaur footprints and log imprints on the *Cretaceous* side of the Ridge. Only a few demonstrations have been shown to staff members of the *Denver Zoo*, teachers, and certain classes that have enough time for the study. We thank the *Scouts* for the great job they did in creating this model and it is intended to make more use of it during the coming year. We will prepare an instructional pamphlet for guides in the use of this model.

The **Education Committee** has made a series of recommendations to be implemented in the near future. We feel that the recruitment of more tour guides is an important step towards the continuance of our fine education program. Therefore, a new committee has been formed under the leadership of **Sam Bartlett** to recruit and train additional tour guides. Along with recruiting tour guides, we need to cultivate more volunteers to give classroom and other outside presentations.

The **Education Committee** recommends continuation of the summer camp as part of our educational mission at the Ridge even

## Friends of Dinosaur Ridge Annual Report 2003

though the summer camps do not always bring additional revenue in for the Ridge. We've been approached to fund university research at the Ridge but the **Committee** feels the Ridge is not in a financial situation to do so at this time. However we should encourage research through collaboration and grants from other organizations. We hope to initiate a seminar and field trip series as a fundraiser. We must, however, publicize these trips and seminars.

**T. Caneer** and **Sam Bartlett** are coordinating a program to add the

*Parfet* site as part of, or a separate program for the school tours.

The **Committee** is exploring new ways to use the *Turner Fund* and the *Denver Foundation Grant* to provide more free and reduced-rate tours for schools. We also must better publicize the availability of our tours.

The **Education Committee** program includes input from many hard working and dedicated people. Almost every member at *Dinosaur Ridge* is actively involved in some aspect of our educational programs and many members and volunteers have been involved in actually

carrying out these programs. **Education Committee** members active in the planning and administration of the educational program are:

**Norb Cygan, Chairman; Kathleen McCoy, Sam Bartlett, Betty Rall, Elmo Brown, Joe Tempel, Beth Simmons, T. Caneer, Patty Jones, Susan Landon, Matt Carey, Tom Moglestad, Pete Modreski, Roger Bennett, Jeff Stephenson, Chris Carroll, Curtis Elder, Harald Drewes, Sally White, Duff Kerr, Bob Raynolds, and DuWayne Ebertowski.**

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### Membership Committee

*by Marjorie MacLachlan*

**Friends of Dinosaur Ridge welcomes the following who have joined FODR since our fall 2003 Ridge Report.**

- |  |  |
|--|--|
| <input type="checkbox"/> Peter Barkmann, Conifer, CO         | <input type="checkbox"/> Nancy Lund, Lakewood, CO          |
| <input type="checkbox"/> Stanley Balducci, Mechanisville, VA | <input type="checkbox"/> Chip Parfet, Golden, CO           |
| <input type="checkbox"/> Alan Beshany, Lakewood, CO          | <input type="checkbox"/> Cynthia Tammy, Golden, CO         |
| <input type="checkbox"/> Jeanne Burks, Denver, CO            | <input type="checkbox"/> Steven Toot, Erie, CO             |
| <input type="checkbox"/> Jim Cappa, Conifer, CO              | <input type="checkbox"/> Doug Vandegraff, Herndon, VA      |
| <input type="checkbox"/> Jill Carlson, Parker, CO            | <input type="checkbox"/> Story Warren, Olympia, WA         |
| <input type="checkbox"/> John Keller, Denver, CO             | <input type="checkbox"/> M.W. Wilson, Colorado Springs, CO |
| <input type="checkbox"/> Laura Kelly, Denver, CO             |  |

**Last year FODR had 250 members; 31 of them were new members. We hope to increase both of these numbers in 2004.**

**Friends of Dinosaur Ridge Annual Report 2003**

<b>Dinosaur Ridge Presentations in 2003</b>					
<b>DATE of talk</b>	<b>SPEAKER</b>	<b>SCHOOL or ORGANIZATION</b>	<b>Place of talk</b>	<b>Attendees</b>	<b>GRADE</b>
1/1/03	Unknown	Columbine Elementary	Longmont		1st Grade
1/13/03	Joe Tempel	Lakewood Women's Club	Clements Senior Center	30	Retired women
1/17/03	Joe Tempel	Littleton Gem&Mineral Club	Littleton Community Center	35	
1/21/03	Joe Tempel	Foothills Rotary Club	Warren Tech High School	27	adults
Jan-Feb 2003	Elmo Brown Ed Post	Kaiser Elem.	Off campus (museums)	4	5th Grade
2/10/03	Norb Cygan	Doull Elementary	DPS	60	2nd Grade
4/10/03	Norb Cygan	Munroe School	Monroe School	142	5 presentations
4/10/03	Ken Holmes	Powderhorn Elem	Bowles and C-470	200	k-6
4/24/03	Joe Tempel	Jeffco Retired Teachers	Quality Inn, Lakewood	250	
4/25/03	Unknown	Logan School			
5/2/03	Harold Drewes Pete Modreski	Hoff Elementary	Keenesburg	180	k-6
5/12/03	Beth	Jeffco Cultural Alliance	City of Golden		
6/24/03	Norb Cygan	DC Kid Summer Days		24	5-13 yrs old
7/10/03	Joe Tempel	Flatiron Gem and Mineral Club	Boulder	40	NREL contact
8/8/03	Joe Tempel	N.Jeffco Rock/Min club		25	
Sept 03	Norb Cygan	Parker School	Parker		3rd
10/1/03	John Kelly Norb Cygan	Lasley Elementary Science Fair	Lakewood	100	1-6 grade
9/1/03-12/1/03	Joe and co.	Dinosaur World Tour	Denver	200K	all
10/6/03	Norb Cygan	NE Elementary	Douglas Co	27	4th grade
10/28/03	Norb Cygan	Ellis Elem	Denver	54	2nd grade, 2 talks
10/29/03	Norb Cygan	Pioneer Elem.	Douglas Co	25	2nd grade
12/8/03	Norb Cygan	Willow Creek Elementary	Dry Creek and Yosemite	12	1-3rd grade
12/15/03	Norb Cygan	Willow Creek Elementary	Dry Creek and Yosemite	17	4-6th grade

## Preservation Committee Report

### Committee Members

*Sam Bartlett, Chair*

*Matt Mossbrucker, Matt Carey, Greg MacDonald  
Betty Rall, T. Caneer, Bob Bakker, Jeff Stephenson*

Start up year for the **Preservation Committee** was 2003. The committee was initiated in the fall of that year to address several ongoing preservation needs and to fulfill the portion of our mission statement, which deals with protection of the natural resources on Dinosaur Ridge. The **Committee** was formed jointly between the **Friends of Dinosaur Ridge (FODR)** and the **Morrison Natural History Museum (MNHM)** to work closely together to preserve the natural resources of the overall hogback in the area of Morrison. This and other joint committees will assist both **FODR** and **MNHM** with their programs in many ways including pooling of resources and expertise, mutual support of common goals, and looking to the overall needs of the organizations and in fulfilling the joint **MOU** with the Town of Morrison.

The first formal meeting of the **Preservation Committee** was held on January 22, 2004 at the **Natural History Museum** to organize, review ongoing projects, and identify goals that we can start budgeting and pursuing in the coming year. At this meeting, attended by **Matt Mossbrucker, Sally White, Joe Tempel, Matt Carey, Betty Rall, T. Caneer and Sam Bartlett**, we confirmed that our preservation goals were mutual and could be successfully accomplished through joint efforts. We were able to layout our mission and a process for accomplishing the mutual goals and tasks. We were also able to devise a preliminary list of short, mid, and long-range projects/goals towards preservation of the resources on

**Dinosaur Ridge** and the **Parfet Prehistoric Preserve (PPP)**. Our mission was to preserve the natural resources, artifacts, and the environment of **Dinosaur Ridge** and **PPP**. We liberally interpreted our area of concern to include the entire hogback from the I-70 roadcut to the US 85 roadcut at Turkey Creek, as well as the natural resources at the **Fossil Trace Golf Course**.

**Preservation Committee** membership is open to all **FODR** and **MNHM** members, and anyone else having an interest in the preservation issues and needs in the Dinosaur Ridge area. In addition, we will keep the local, county and state agencies apprised of our actions and will seek their advice and expertise on preservation issues. It was decided the **Committee** will act on a consensus of its members, and will act through the Boards of both parent organizations for approval and funding in accordance with our draft **MOU**.

The **Committee** sees structural stability, preservation and protection from the environment (in-situ whenever possible), security, public safety and environmental protection in the areas of concern as the needs to be addressed. In this regard, the following policies regarding preservation methods were adopted:

1. No harm will be done to the items to be preserved.
2. The preservation treatments selected can be undone.
3. Preservation will be performed in such a manner that will allow the preserved item to be used for educational purposes.

**One of the first tasks to be undertaken will be an inventory of the preservation and prioritization of these needs. A preservation plan will be devised for each preservation project that will include the following elements, as needed:**

- 1) Research, including available resources.
- 2) Sources.
- 3) Available studies and the achievability of selected methods in relation to the contemplated project.
- 4) Funding; testing of applicable preservation methods.
- 5) Application inspection and quality control.
- 6) Monitoring of the results, including long-term monitoring
- 7) Display requirements and recommendations for the completed preservation project.
- 8) In-situ safety of the preserved item.

The following items were initially identified as preservation goals.

(Further goals and projects will undoubtedly be identified following the initial inventory and prioritization.)

Short Term goals:

- (a) Inventory and prioritize preservation needs.
- (b) Install additional posts and stabilize the shale at the bulge-site.
- (c) Cover the electric conduit at the track-site.
- (d) Remove vegetation at the track-site.
- (e) Scale rocks at the track, bone-sites and PPP.
- (f) Control erosion above the Hadrosaur pit at PPP and the Allosaur boulder.
- (g) Continue Vinac applications, highlight bones and protect from elements/potential vandalism.
- (h) Devise more permanent markings at the track-site for enhanced viewing.
- (i) Research preservation methods for the tracks at Dino Ridge and PPP.
- (j) Research potential permanent cover for the track-site.
- (k) Explore ways to secure the bone- site from vandalism.
- (l) Control drainage at PPP;
- (m) Apply for WIPS Grant.
- (n) Use GPS at the track-site.

Mid-range goals

- (a) Stabilize Quarry #10.
- (b) Covers over tracks/fronds at PPP.

Long-term goals

- (a) Install permanent cover over the track-site.
- (b) Apply for NSF grant for the comprehensive plan.

The **Preservation Committee** is addressing the following:

- 1) The boulder with teeth and potential skull/jaw has been moved from the bone-site to MNHM for safekeeping and dental work. Upon completion, display requirements will be determined with the intention of loaning the display back to FODR for presentation.
- 2) Work continues at Quarry #10 to excavate and preserve archeological artifacts before excavation at the back of the original quarry proceeds. Stability, safety and display issues will be discussed as progress is made.
- 3) Presentation of the boulder with Allosaur vertebrae at the Visitors Center is in progress. The first applications of Vinac have been accomplished with more needed over time. **Dr. Bob Bakker** has given us insight into preservation and enhancement. Relief/highlighting of the bones will be undertaken this year (hopefully in conjunction with 3D days). We still need to determine the best long-range display and protection methods for this item.
- 4) The cementation research project for tracks is still in the planning stage. We are awaiting an updated proposal from the **Kansas Geological Survey (KGS)**.

The next formal meeting of the **Preservation Committee** will be held in mid-March 2004. We need to complete/resurrect group inventory lists for Dinosaur Ridge, MNHM and PPP for prioritization by the **Committee**. When the lists are provided, we will take a series of field trips to review and enhance the lists in preparation for prioritization. In the meantime, we will continue the on-going projects, present our list of goals and await further projects that may arise. If you would like to be a part of this new committee,

please contact **Matt Carey, Sally White** or **Sam Bartlett**.

In summary, flexibility will be the key attribute of the **Preservation Committee**. Many of the issues requiring attention will arise quickly and will require the hurried consensus of the committee members to deal with these issues in a timely manner. At the same time, we will need to focus on short-to long-term goals to ensure that our natural resources will be preserved for the enjoyment of future generations.

## VISITOR CENTER GIFT SHOP

by Roger Bennett

We completed another very successful year in the gift shop significantly passing the previous years sales. However, we can't expect this type of increase each year. We are getting to the point now where we need more visitors to pass through the gift shop. So, continue to send and bring all your friends out to see the Ridge and visit the gift shop. We continue to add new and unusual items so visit us frequently to see what is new. Many are one of a kind mineral specimens and fossils so it is first come first served. If you are looking for anything in particular, let me know so I can search for you. Also, we are receptive to new ideas or items you may find elsewhere that you think might be good for us to carry. No guarantees but I am always open to new things.

The **Davidson's - Jack, Barbara, and Brian** continue to help in the gift shop. Since **Brian** started working part time at The Fort Restaurant, we added **Tom Moklestad** to our staff. He has been a great help with new ideas as well as helping **Matt Carey** on various projects. **Tom** has also participated as a guide on the Ridge as well.

The Dig Pit, which isn't totally complete yet, still attracted several kids and their parents this fall. We think this will be a great attraction. We will soon be renting the new descriptive CD to visitors for a better explanation of the Ridge. Hopefully this educational tool will be appreciated by many of our visitors. We are looking forward to another great year with new and exciting things on the horizon so come see us!

## Bone Wars

### The Excavation and Celebrity of Andrew Carnegie's Dinosaur

By Tom Rhea

A Review

By Sam Bartlett

In a recent lecture, **Tom Rhea** told us that in order to understand **Bone Wars**, we needed to understand the cast of characters involved. This could also be said for the history of paleontology as a whole. The cast of characters in **Bone Wars** was extensive and included many of the prominent paleontologists of the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, following the first wave of western paleontologists lead by **O.C. Marsh** and **E.D. Cope**.

**Andrew Carnegie**, a Scottish immigrant, was one of the Robber Barons who made his fortune in steel. At the time of the **Bone Wars**, Carnegie was in the process of liquidating his vast holdings and becoming a mega-philanthropist. An article about *Diplodocus* in the **New York Journal and Advertiser** instigated his quest for the world's largest dinosaur to install in his museum being constructed in Pittsburgh. The dinosaur, when found, was named *Diplodocus carnegii* in his honor and he proceeded to have casts

made and distributed to the royalty of Europe. He believed that through his personal diplomacy he could get the European heads-of-state to keep communicating with each other, and thus through open communication could avoid disastrous wars. To this end he built The Hague in Belgium. When WW I broke out in spite of his efforts, Carnegie was devastated.

**William Jacob Holland** was hand picked by Carnegie to head the Carnegie Museum and thus became the leader and autocrat of the crew that excavated and promoted *Diplodocus carnegii*. Holland was the driving force behind *Diplodocus carnegii*, being ever eager to please his boss and friend; but his short temper often resulted in the feuds that became the "bone wars." However, most of these feuds were short and eventually overcome, thus being less "wars" than small "skirmishes." Holland was an accomplished linguist, minister, a renowned lepidopterist, an amateur

painter who illustrated his own butterfly publications and finally a paleontologist. It seems that he was also a good miniaturist. In later life, Holland was responsible for assembling and presenting the castings to the various heads-of-state of the western world. As a result, he was showered with honors, gifts and medals. Being somewhat less than modest, after each trip, Holland would paint each new medal in detail on a previously completed portrait of himself.

John Bell Hatcher was an up and coming paleontological star, who studied under O.C. Marsh, and supplied the science and technological expertise to this team. Hatcher was responsible for excavating and publishing the monograph introducing the first full look at *Diplodocus carnegii*, thus setting in motion the fame of this distinguished dinosaur. Unfortunately, Hatcher died early of typhoid fever before the castings were complete. Hatcher's confidence, brilliance and knowledge were so secure that he was one of the very few that dared to criticize O.C. Marsh while he was still alive.

William Harlow Reed we know from his earlier days collecting fossils with Arthur Lakes at Como Bluff. Reed, the most colorful of the characters, started the hunt for *Diplodocus carnegii* by getting his picture, a *Diplodocus* femur and a drawing published in the *New York Journal and Advertiser* that Andrew Carnegie first read. Reed worked at the University of Wyoming; but was enticed to work for Holland in locating a suitable *Diplodocus* skeleton. However after the hiring of Hatcher, with his education and more scientific methods, Reed with his lack of education and old methods of collecting eventually had to go. Reed ended his days at the University of Wyoming as a professor of paleontology.

Jacob L. Wortman was another young, rising star in the paleontology profession. Wortman started by collecting and preparing fossils for E.D. Cope; but was not allowed to publish and eventually departed for the American Museum in New York, where Holland recruited him to replace Reed and lead the field expedition for *Diplodocus carnegii*. Unfortunately, a later argument with Holland over a publication suggesting that the bones might actually belong to a *Barosaurus* led to his firing. Wortman went on to the Peabody Museum at Yale and quit after 2 years to become a rancher and fossil collector in Nebraska, where he could make more money.

Arthur S Coggshall was in charge of the details of the mold making, plaster casting and display of the famous *Diplodocus carnegii*. Coggshall was one of the most skilled fossil preparators at the New York American Museum of Natural History and left with Wortman to find and prepare *Diplodocus carnegii*. Coggshall stayed with the project at least until the last "official" cast was erected in Mexico City in 1930.

There were a total of 12 castings made of *Diplodocus carnegii* and the set of molds eventually made their way to the Utah Field House of Natural History in Vernal in 1957, where the first outdoor setting was created. Later when the concrete cast started to deteriorate, the castings were used to make new molds and the current skeleton was constructed indoors.

As with most well told stories, this one takes a circuitous path to the finish. *Bone Wars* wanders back through some of the *Iguanodon* history by way of a connection with the famous Belgium paleontologist Louis Dollo. It seems that Dollo made the first request for a cast of *Diplodocus carnegii*, thus starting the casting process. More importantly, Dollo spent over 25 years carefully studying the *Iguanodon* skeletons removed from the coalmines near Bernissart Belgium in 1878. More interestingly however, Dollo was among the first to erect complete dinosaur skeletons (*Iguanodon*, of course) to become permanent exhibits in, of all places, a church. This must have made the Reverend William Buckland and the rest of the early biblical-paleontologists roll over in their graves.

Although the author meanders at times from the straight-line story, *Bone Wars* is well written and, as well as being a great story, is very readable. The book includes various photos and illustrations that add to the substance and feel of the story being told. As Tom Rhea said, he is not a paleontologist; but loves to hang out with paleontologists. This respect shows in the way the book is written. *Bone Wars* helps to fill in the chapter on paleontological history following the Marsh/Cope era. *Bone Wars* is highly recommended for those interested in the history of paleontology in the West.

*Bone Wars, The Excavation and Celebrity of Andrew Carnegie's Dinosaur*; By Tom Rhea; 2001; University of Pittsburgh Press; Pittsburgh, PA. 269 pp; \$25.00

## Guides Corner

by Sam Bartlett

**Matt Carey** has announced the Dinosaur Discover Days (3D) schedule for 2004. They will be held May 8<sup>th</sup>, June 5<sup>th</sup>, July 3<sup>rd</sup>, August 7<sup>th</sup>, September 4<sup>th</sup> and October 2<sup>nd</sup>. Some new activities and adventures have been planned as part of the 3D day experience, so please mark your calendars and plan to join us on these exciting days.

The number of tours and presentations to schoolchildren are down again when compared with last year. However, the overall number of visitors to the Visitors Center is up substantially. Also, the number of self guided tours and the number of visitors to the hogback appears to be up, although we cannot accurately track these numbers. The newly completed structure at the "Bulges" site should enhance this stop by allowing the participants to sit and contemplate somewhere besides on the dirt.

The really good news is that the "Dig Pit" with the *Edmontosaurus* "bones" is nearly complete and will become the basis of another tour for the younger children, as well as an overall attraction for youngsters of all ages. In this way, we can offer a tour that is better adapted to the learning skills of children up to the third grade that will encourage them to better enjoy their visit to Dinosaur Ridge, and that will enhance their learning of paleontology at the same time. The "Dig Pit" will also give the teachers a better way to integrate the Dinosaur Ridge experience into their curriculum. **Matt Carey** has compiled a notebook with teaching points for the "Dig Pit" and as the guides start to include this tour, a separate training class will be provided before letting a whole busload of little kids loose in the sand box.

**Matt** hopes to eventually have notebooks for all of the current and proposed tour stops on Dinosaur Ridge to provide background information for teachers and guides and to provide more varied opportunities for the students. To further vary and enhance the educational experience for initial and returning tours, we are also looking into incorporating tours of the *Parfet Prehistoric Preserve (Fossil Trace)* into the overall tour program for students.

Speaking of teachers, the Education Committee has completed a two-part video for teachers planning tours to Dinosaur Ridge. The first 30-minute segment is entitled "*Making the Most of Your Visit to Dinosaur Ridge*" and is designed to acquaint the teacher and students with the Ridge tour process before the

scheduled tour. The second 45-minute segment is entitled "*Additional Teacher Resources*" and is intended to augment the first segment by giving the teacher further information on the geologic resources at Dinosaur Ridge. This video should help the guides by having the teachers somewhat knowledgeable about the Ridge before their tour, thus allowing them to better integrate the Ridge into their overall teaching plan, and to be better able to choose stops and emphasize information to be included in the tour.

With the expanded and enhanced tours at the Ridge, we hope to increase first-time as well as repeat tours thereby getting us back on track to increase tour attendance. In order to reach these goals of expanded tours and increased attendance, we also need to increase the number of guides/volunteers. So, in parallel with expanding and increasing the tours on the Ridge, we are initiating a subcommittee of the Education Committee to explore ways of increasing the number of volunteers and to improve the retention of those volunteers. So far, the Volunteer Subcommittee consists of **Pete Modreski, Chris Carroll, Norb Cygan, Matt Carey and Sam Bartlett**. If you would like to be a part of this effort to recruit and retain volunteers, please contact **Matt Carey** or **Sam Bartlett**.

### **Mary Anning, the Heroine of Paleontology.**

In the early 19<sup>th</sup> Century when paleontology was just becoming a science, most fossils were collected as curiosities to sell to tourists. **Mary Anning** could often be seen with her father, **Richard Anning**, along the treacherous shores of Lyme Bay collecting "sea lilies" (crinoids), "snakestone" (ammonites), "verteberries" (vertebrae) and other curiosities to sell. One night in 1810 when returning from fossil collecting her father, who supplemented his meager income as a carpenter by selling fossils, strayed off the path and fell over the dangerous cliff and eventually succumbed to his injuries. Mary was left at the tender age of ten to continue in her father's footsteps, collecting and selling fossils. Since the Anning family was extremely poor, she was forced to quit school and become the principal breadwinner through her fossil collecting efforts. Along the way, Mary became one of the best-known collectors of scientific fossils.

Mary Anning was a born paleontological collector and had the uncanny ability to gently remove a

very large fossil intact from its entombing rock. She was paid well for her large specimens but as we know, large dinosaur/reptile fossils are few and far between. Thus, As attested to by her father's death, fossil collecting along the shores of Lyme Bay was an extremely dangerous occupation. Mary was able to adapt to the dangerous conditions and collected fossils almost daily until she died of cancer at the age of forty-seven. To protect herself from falling rocks, she characteristically wore a man's large top-hat that could absorb the impact of a rock falling from the cliffs above, and Mary's mother often inserted a flower into the hatband to give it a somewhat more feminine appearance. Mary must have been a sight in her long full skirt, heavy coat and man's top hat digging in the rocks while trying to avoid the incoming tide. Drawings of Mary Anning made throughout her lifetime often show her in this curious field garb.



Sketch of Mary in her "garb."

Mary never married, instead she continued the excavation and study of fossils and geology as her life's work becoming one of the first persons to make a living of collecting fossils. Through her dedicated collecting, She enjoyed the friendship and respect of the famous early paleontologists, notably William Buckland who became her mentor and benefactor. Many of the fossils that she collected are still exhibited and studied in the museums of England. Among Mary's many important fossil discoveries throughout her lifetime of collecting were *Ichthyosaurus platyodon*, the first Plesiosaur to be found in England, *Pterodactylus macronyx* and numerous other important Mesozoic fossils.

Mary spent her entire life in Lyme Regis on the south coast of England collecting fossils and studying geology. Upon her death in 1847, Mary was buried in the Lyme churchyard by the sea at the summit of the disintegrating Church Cliff where she made most of her discoveries while dodging the falling rocks.

Mary spent all of her life in poverty, always dreaming of visiting the finest museums in London where her fossils were displayed and admired.

Mary was honored by the early fellows of geology with a stained glass window in the parish church showing her tending to the poor and healing the sick. The inscription reads "*This window is sacred to the memory of Mary Anning of this parish in commemoration of her usefulness in furthering the science of geology, as also of her benevolence of heart and integrity of life.*"

Mary Anning was one of the first in a long tradition of amateur paleontologist whose findings have both raised and answered the important questions about our earth and our heritage. Truly, Mary Anning was regarded as a heroine by the greats of early geology and paleontology.

Further readings on the life of Mary Anning can be found in the two books used primarily for this article. The first source is *Mary Anning and the Sea Dragon*, by Jeanne Atkins, Farrar Straus Giroux, NY, 1999. This handsome children's book for group D readers is available in the Visitors Center gift shop whenever copies can be found. The second source is *Terrible Lizard*, by Deborah Cadbury, Henry Holt and Company, NY, 2000; which is a book reviewed by Betty Rall in a previous edition of the Ridge Report.



2003 Summer camp participants simulate a "dig" at the Dinosaur Ridge Visitors Center

## PARFET PREHISTORIC PRESERVE

by T Caneer

Most of you probably know by now that the *Parfet Prehistoric Preserve* is the official name for the area adjacent to the Golden *Fossil Trace Golf Course* that contains the fossils, which the Friends of Dinosaur Ridge have been concerned relative to preservation and access. The year 2003 has been a banner year in which we have completed many of our ultimate goals for preservation and access to the *Preserve*.

The **Golden City Council** did a praiseworthy thing when they allowed the **Friends of Dinosaur Ridge** to develop overall feasibility strategies for development of and access to the fossils and geological features in the area adjacent to the *Fossil Trace Golf Course*. Thank you **Golden City Council**. This area has been named the *Parfet Prehistoric Preserve* in honor of all of the **Parfets**, both past and present, who have cared for the fossils for more than 125 years. Under the guidance of **Joe Tempel**, a trail has been constructed on the Preserve by the **Boy Scouts** that passes in front of the various fossils and geological features. This trail has been named the *Triceratops Trail*. A special thanks to councilor **Marci Miller** who gave freely of her time and artistic talents to help develop posters and permanent explanatory signs along the *Trail*.



Boy Scouts constructing a trail to a fossil pit

There are many people to thank for this progress, but by far the person who deserves the greatest thanks is **Joe Tempel** Executive Director of Friends of Dinosaur Ridge. **Joe** has an amazing ability for recognizing problems, knowing how to fix them, and obtaining the resources to do so. For example, the *Triceratops Trail*

along which the various paleontological and geological features can be seen, needed grading, gravel, and labor. He put together a team consisting of **Chip Parfet** who handled the grading, the **Lafarge Company** who donated the gravel (probably ten to fifteen thousand dollars worth), **City of Golden** transported the gravel, and the **Boy Scouts** who spread it and did landscaping. **Joe** has done and will do more in the future relative to retaining walls, erosion control, sub-trails, etc.

**Joe Tempel** has the rare talent of being able to raise money or in-kind materials and services for various projects. He is an asset in the same league as all of the fossils and geological features.

What would we do without **Matt Carey**, FODR's Program Director? In addition to his Friends of Dinosaur Ridge duties, which takes 150% of his time, he also handled the logistics connected with the tours of the *Preserve*. This includes tour guide volunteers for stops along the *Triceratops Trail* and volunteers for duties at the entrance tent. **Matt** also handles the "who, when, what, and how's" that are associated with tours. Hats off to **Matt**.

We also owe special thanks to **Chip Parfet** and his ancestors for uncovering and preserving the fossils and who have shown an excellent stewardship of these fossils for the past 125 years. Thanks to **Chip** for allowing people to have access across his land and to allow them to descend into one of his pits in order to have a close-up view of his spectacular fossils. Also, for him using his equipment to do trail grading, earth moving, etc.

It is refreshing to see young people in the **Boy Scouts** who will tackle just about any job with enthusiasm and they will complete the job and do it well. At the *Parfet Prehistoric Preserve* alone, their help was quite varied and dealt with: trail building; erosion control; podium on which to mount permanent explanatory signs for self guided tours; split rail fences; safety net; etc. Thanks!

**Charlie Fagan**, Director of Parks, Recreation, and Golf, has been very helpful in consultation with and encouragement to the Friends of Dinosaur Ridge relative to the *Parfet Prehistoric Preserve*. A couple of examples--

### Friends of Dinosaur Ridge Annual Report 2003

**Charlie** arranged for quite a number of **Golden** city trucks to transport gravel from **Lafarge** to the *Preserve*. He also worked with us in identifying any safety problems relative to errant golf balls. Only one low risk area was found and a high and wide net that was constructed by the **Boy Scouts** negated it. Hats off to **Charlie**.

We are also grateful for all of the contributions (money, goods, and services) that were made by various organizations, industry, and individuals.

On the technical side, we were very fortunate to have had geological guidance from **Dr. Bob Weimer** and Track identification by **Dr. Martin Lockley**.

I am very proud of all of the people who volunteered to be tour guides, "tent workers" and other tasks on the days that *Parfet Prehistoric Park* was open for public tours. As far as I know all of you were affiliated with Friends of Dinosaur Ridge. You made it work!

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## In Memoriam

- ❖ **Henry Rackley**: Long time Dinosaur Discovery Day guide who often lectured at the Concretion stop on the Ridge. He was also a volunteer at the Denver Museum of Nature and Science.
- ❖ **Betty Goldman**: Long time supporter of Earth Science Education on Dinosaur Ridge
- ❖ **Rose Marie (Jinx) Murphy**: Retired scientific editor with the U. S. Geological Survey and dedicated guide for school groups visiting the Ridge.
- ❖ **Charles (Chuck) Pillmore**: Mapped the geology of New Mexico's Raton Basin where he also discovered one of the best footprints of Tyrannosaurus. He also led field trip for FODR members in SE Colorado and NE New Mexico.

### **Dr. Ralph Root** by *Beth Simmons*

On the verge of retirement from government service, **Dr. Ralph Root**, one of Dinosaur Ridge's greatest promoters, died from prostate cancer on January 15, 2004. Originally hailing from Erie, Pennsylvania, **Ralph** was trained in geology at *Allegheny College* in Meadville, Pennsylvania, earned his Master's at *Indiana University*, and his **Ph.D.** in remote sensing from *Colorado State University* at Fort Collins. Since locating in Colorado, he worked for thirty years for the *Park Service* and the *Geological Survey*, receiving a citation for those years of service just before he died.

His latest work involved mapping the encroachment of *Leafy Spurge* throughout the west. When he first joined the *Park Service*, he used remote sensing to map the geology of *Florissant Fossil Beds* and its buried fossil tree stumps. In 2004, the *Geological Survey* initiated a service award, the "**Ralph R. Root Award for Remote Sensing**" in his honor.

**Ralph** also taught **Physical Geology** courses at *Metropolitan State College of Denver* and *Colorado Christian University*. His 'Geology of Dinosaur Ridge' weekend class was a popular field course at CCU, and **Ralph** was often seen guiding his groups along the Ridge.

He likened the Ridge to the pages of a textbook, with each rock layer unfolding a different part of the story of the history of the earth as it erodes away. He delighted in introducing beginning geologists to the wonders contained within rocks.

**Ralph** was a devout **Christian**, active in the *Bear Creek Valley Evangelical Presbyterian Church* where he sang in the choir and often performed on the piano and organ. Very musically talented, he had trained himself to be a piano tuner, an excuse that allowed him to perform his magic on many instruments and their owners in the Lakewood area.

**Ralph** is survived by his wife **Charlotte**, two children **John** and **Rachel**, one granddaughter **Rory**, and a brother **Fred**.

## Morrison Natural History Museum News

by Sally White

**A**t its meeting on February 3rd, the *Morrison Board of Trustees* reluctantly accepted the resignation of **Dr. Richard Scott**, the *Morrison Museums'* first and only director, and unanimously approved the appointment of **Dr. Robert T. Bakker** as his replacement. Effective March 1st, 'Dr. Bob' will take on his expanded role at the *Natural History Museum*, which he has served as Curator of Paleontology since 2002. He will also direct *Morrison's Heritage Museum* and oversee plans to expand its operations this year. **Sally White** will continue as the Town's coordinator for the two museums.

In 1988, **Dick Scott**, a retired *USGS* paleobotanist, was the primary force behind development of the *Natural History Museum* and also served as the first president of the *Friends of Dinosaur Ridge*, whose original headquarters was at the *Museum*. During his tenure, the *Natural History Museum* has grown into a regional facility, bringing its "hands-on natural history" exhibits and programming to more than 10,000 visitors last year. In 1996, the *Museum* became a department of the Town of Morrison, and **Dick** has continued to represent the *Museum* and the *Friends'* interests in his long-term role as a Morrison Trustee. His appointment Tuesday night as **Director Emeritus** ensures that his advisory role will continue, even after his planned move to Indiana later this year. He will be sorely missed.

As Director, **Dr. Bakker** will provide valuable guidance to both the *Museums* and the *Friends* in paleontological matters, as well as helping Morrison implement a dinosaur theme for its downtown area. He will also serve as *Morrison's* representative on the *Dinosaur Ridge Consortium*, which was established to coordinate the *Friends'* activities with those of other institutions in the area.

"It's like coming home," **Dr. Bakker** said, recalling his undergraduate office in the basement of the *Peabody Museum at Yale University*, where dinosaur bones found in 1877 near Morrison and on the Ridge are stored. Several of these very bones are on display at the *Museum*, thanks to a loan from Yale that began in 1993. **Bakker** and the *Museum's* **Matt Mossbrucker** are also serving on the new joint *Friends-Museum Preservation Committee*, advising **FODR** on protection and preparation of fossil specimens on the Ridge and elsewhere, and they are also leading field investigations at Quarry 10 (Ajax Project).

### Morrison Natural History Museum logs record year, looks ahead to new challenges

With more than 10,000 visitors in 2003, the *Natural History Museum* marks the best year yet in its fourteen years of operation. *Museum* staff **Matt Mossbrucker** and **Anjanette Meyer** together handled more than 2913 extra "walk-in" visitors and 1035 additional people on group tours, for an overall increase of 62% over 2002. Revenues are also up substantially. **Mossbrucker** attributes part of the increase in drop-in visitors to expanded hours of operation this past year. The *Museum* is now open Tuesday through Saturday from 10 a.m. to 4 p.m., as well as Sunday afternoons. Mornings were previously reserved for tour groups, but opening earlier has enabled more area residents and seasonal visitors to take advantage of the small *Museum's* unique "up-close-and-personal" approach.

**Dr. Bakker** said, "With all the discouraging news about cultural institutions in recent months, we're delighted to be able to counter the trend. Personal attention to our visitors is one of our key strengths. The *Museum's* live native reptiles and amphibians also keep visitors coming back. The combination of live animals and real fossils is an important and very successful innovation that few museums have tried."

"Birthday parties have also been a real addition to our offerings," said **Mossbrucker**. "Last year we had forty-nine parties, up from just five in 2000. This increase has been entirely from word-of-mouth promotion."

The *Museum* hosted 134 other group tours, most of which were school groups. Group tours provide about 50% of revenues generated on-site at the *Museum*. In 2004, the *Museum* wants to maintain this momentum, offering new exhibits and programs, while continuing its high level of service.

"We want to provide more kinds of educational programming, including events for families," **Mossbrucker** said. "Some of these will be developed in cooperation with the *Friends of Dinosaur Ridge* under the terms of a new *Memorandum of Understanding* outlining opportunities to enhance joint programming."

With **Dr. Bakker** on board, field trips to his dino digs at *Como Bluff, Wyoming*, are one of the program options under discussion.

Unfortunately, the *Museum* will be carrying on without **Anjie Meyer**, who has guided the *Museum's* *Member and Volunteer Programs* for the past year. She left to take a full-time position in late January. We wish her luck and hope she will miss us as much as we will miss her! She promises to be back every now and then.

## New Excursions on the Cretaceous Dinosaur Freeway

Martin Lockley<sup>1</sup> and Masaki Matsukawa<sup>2</sup>

<sup>1</sup> Department of Geology, University of Colorado at Denver, P.O. Box 173364, Denver, CO 80217-3364, USA <sup>2</sup> Department of Science Education, Tokyo Gakugei University, Tokyo, 184-8501, Japan

### Summary

When first defined the term Dinosaur Freeway was a popular label for what geologists have also called a "megatracksite." That is a "regionally extensive" surface or thin layer of strata that contains dinosaur tracks over a wide area on the order of 100 to 10,000 square miles or more. The Cretaceous or Dakota Dinosaur Freeway of the Colorado Front Range and southern High Plains is one of the largest and best-documented examples. When originally defined, it was measured at about 30,000 square miles, and it was shown that the same types of tracks occurred consistently, at the same levels, very near the top of

the Dakota Group, at about 25 sites throughout this vast area.

Recent discoveries have expanded our concept of the Cretaceous Dinosaur Freeway. It can now be described on the basis of at least 40 sites, which produce some new tracks types attributed to armored dinosaurs (ankylosaurs) and extend the freeway concept further to the south and east than previously reported. We can also refine our understanding of the stratigraphy of track bearing layers, and how they relate to the ancient river and coastal plain systems of the Western Interior Cretaceous Seaway.

**This article is dedicated to Mark Jones (1953-2003)  
a CU Denver graduate in Geology,  
and former dinosaur tracker on the Dinosaur Freeway**

### Introduction

#### Defining dinosaur freeways and considering possible migration routes.

The Dinosaur Freeway is perhaps something of a vague concept in the minds of most visitors to Dinosaur Ridge. Even professional geologists are uncertain of the precise meaning of the concept: therefore, let us define it. Dinosaur Freeway has the same meaning as "megatracksite" (all one word) which has the connotation of "big continuous tracksite" found all at one, well-defined, stratigraphic level. (It has nothing to do with the size of the tracks). The Cretaceous or Dakota Group Dinosaur Freeway got its nickname from the fact that the track-bearing outcrops are found in a belt which runs parallel to the C 470 ("Cretaceous 470") and I 25 freeways along the Colorado Front Range.

The Dinosaur Freeway is a "fun" concept that conjures up images of many dinosaurs roving all over Colorado. The concept was first presented in 1988 at the Geological Society of America Annual Meeting, in Denver (Jones, 1988; Lockley et al., 1988) and again at the Society of Vertebrate Paleontology Annual Meeting in 1989 (Lockley and Pittman, 1989). The idea grabbed people's attention and generated popular spin-off ideas about dinosaur migrations and coastal highways (Anon, 1988; Boling 1989; Von Pelt, 1988). One newspaper article led with the headline "Professor claims Colorado was trampled by Dinosaurs." By a strange coincidence, it was also becoming well known that the Front Range corridor was a migration route for

birds of prey. These descendents of dinosaurs and other avian species were following paths that may have been traveled 100 million years previously by dinosaurs.

The dinosaur migration theory has never been proven absolutely, but it is highly probable that large ornithopods, the most common forms on the Dinosaur Freeway

according to track evidence, were migratory. Some Cretaceous ornithopods are known to have ranged into the Cretaceous Arctic Circle presumably on a seasonal basis, and presumably they moved out again with the arrival of days of 24-hour darkness during winter.

### The global picture

In the 15 years since the Dinosaur Freeway (or megatracksite) concept first became enshrined in geological literature, there have been a total of 10 reports of megatracksites ranging in age from Triassic

to Cretaceous (see Table 1). Some of these contain only dinosaur tracks, but a few like the Triassic site in Germany, are pre-dinosaurian, revealing the tracks (known as *Rhynchosauroides*) of lizard like reptiles.

Megatracksite name, location and stratigraphy	Geologic age	Track types
Dakota Gp., Colorado	mid Cretaceous, Cenomanian	Ornithopods and theropods
<i>Cameros Basin, Spain</i>	<i>Lower Cretaceous</i>	<i>Various dinosaurs</i>
Upper Glen Rose Fm., Texas	Lr. Cretaceous, Albian	Sauropods and theropods
Lower Glen Rose Fm., Texas	Lr. Cretaceous, Albian	Sauropods and theropods
<i>Second, Switzerland</i>	<i>Late Jurassic, late Kimmeridgian</i>	<i>Sauropods and theropods</i>
<i>Soluthurn Lst, Switzerland</i>	<i>Late Jurassic, mid Kimmeridgian</i>	<i>Sauropods and theropods</i>
Moab Megatracksite, Entrada	Late Jurassic, Oxfordian	Theropods
Gypsum Springs Fm. Wyoming	Middle Jurassic	Theropods
Sundance Fm., Wyoming	Middle Jurassic	Theropods
<i>Muschelkalk, Germany</i>	<i>Middle Triassic</i>	<i>Lizard-like reptiles</i>

**Table 1: Ten reported Jurassic and Cretaceous megatracksites from North America and Europe, in order of ascending geological age. European sites are shown in italics**

Table 1 shows that there are now four megatracksites known from Europe and six from the USA. The Triassic and Jurassic sites known from Europe are small: i.e., on the order of a few hundred square miles. (The Cretaceous site in Spain is not well documented). The small size of European megatracksites is probably related to the

modern landscapes where they are found, which have much vegetation and few outcrops in comparison with the North American sites. The largest North American sites - from the Cretaceous of Colorado and Texas are at least on the order of 30,000-50,000 square miles in extent.

### What's new on the Cretaceous or Dakota Dinosaur Freeway?

At least 15 new sites have been reported on the Dakota Dinosaur Freeway since 1992, when the general scientific synthesis was presented (Lockley et al., 1992). This increase (from 25-40 sites)

represents an increase of about 60% in just over a decade. Some of the information from these new sites falls in the category of "more of the same" tracks types: i.e., more ornithopod tracks (*Caririchnium*) and