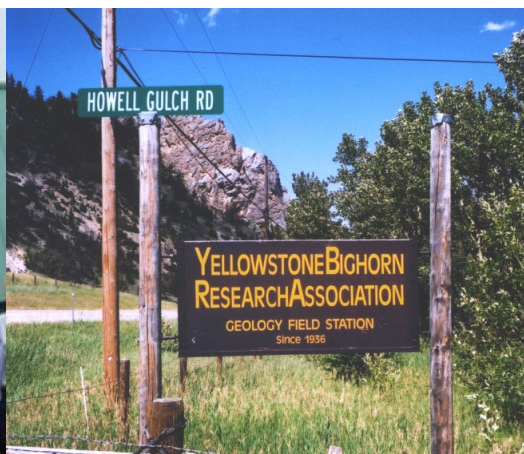




Annual Newsletter of the Yellowstone-Bighorn Research Association

Issue 11

Spring 2005



Clockwise: Council in front of Lodge after annual meeting; new camp sign and official designation of Howell Gulch Road; participants in the SIU Reunion 2003; Elk Basin oil field





From the President...

Letter from the President:

Springtime in Houston is just about over and now it is time for spring around the YBRA grounds. This past year has gone smoothly for the camp. The long-term legal battles are finally over as the last lawsuit was dropped. The land on the hill slope beneath the camp is for sale as two lots and not a subdivision. We hope that new owners will be good neighbors for years to come. Two other long-standing issues still needing to be addressed are a reliable water supply and the bridge over Rock Creek. The camp now needs someone to monitor the water supply on a daily basis and be sure it meets Montana health codes. The bridge continues to be held up by I-beams, tanks from railroad cars and cribbing for pilings. In order to solve these two problems, the camp needs additional capital.

Camp usage has been steady by groups from University of Pennsylvania, Southern Illinois University Carbondale, the Pennsylvania State University, and several paleontology groups including Washington University of St. Louis, Museum of Natural History in Cincinnati, and The New Jersey State Museum. As in the past, alumnae groups from various universities associated with the camp have used the facility. This coming year, 2006, will see this expand to include groups from Middlebury College and University of Montana-Billings. Sue Kaufman has led several women's health workshops for Red Lodge community. It is nice to see the facility well-used. However, there is a disheartening decrease in geology field camp enrollments. This is not a problem just for YBRA but the entire academic geologic community, which is seeing a decline in students interested in attending field camps. One solution to this problem is to modernize field camps to include more modern approaches such as incorporation of GIS and other computer techniques. In order to facilitate this, the YBRA council is considering how to fundraise to bring the YBRA facility including the classrooms into the 21st century.

Please consider stopping by the camp for a visit. Jeanette Reinhart enjoys seeing visitors. Better yet, plan to attend the work week and help us keep everything in working order.
Jinny Sisson

YBRA Summer Schedule 2005

May	Prescott College
June	Penn-YBRA Field Course 6/5-7/12 Penn State Field Course (6/10 - 6/23) SIU Field Course (6/25-8/2)
July	New Jersey Museum 7/17-7/29 Cincinnati Museum (7/25 - 8/14)
August	MSUB Billings (8/7-8/12) Red Lodge Womens Retreat (8/13 Middlebury College Alumni (8/14-8/20) Amherst Alumni (8/21-8/28) Work Week (8/29 - 9/2) Open House (to be announced)

Significant YBRA People

Officers

President: Virginia Sisson, Rice U
Vice President: Rich Fifarek, SIUC
Past President: Peter Crowley, Amherst
Secretary: Josh Smith, Washington U
Treasurer: Betsy Campen Billings, MT

Councilors

James "Bud" Alcock, Penn State-Ogontz
Russ Dutcher, Carbondale, IL
Don Fisher, Penn State
Bob Giegengack, U Penn
Laurel Goodell, Princeton
Kevin "Doc" Hoover, Red Lodge, MT
Kirk Johnson, Denver Mus. of Nat. & Science
Marv Kauffman, Sunset Beach, TX
Ben LePage
Jennifer Lindline, U Penn
John Marzolf, SIUC

Special Councilors (Emeritus)

Bill Bonini, Princeton
Gerry Brophy, Amherst
David "Duff" Gold, Penn State
John Utgaard, SIU

Archivist

Linda Dutcher, Carbondale, IL

Accountant and Member

Denny McGinnis

Newsletter Editors

Betsy Campen (Betsycampen@bresnan.net)
Kevin (Doc) Hoover (Dochoover@earthlink.net)

YBRA Camp Manager's Report

Last Fall, circumstances combined to leave a few of us in Camp much later than usual looking at some items needing attention. Painting and other maintenance work, begun during Work Week, was completed on Thom Library and Robinson, Dorf, Hayden and Rouse Cabins; but the major actions were directed to Foose Cabin and the porch of Fanshawe Lodge.

Foose Cabin has a number of problems which need to be addressed. A new subfloor had been installed recently in the bathroom, but it was lacking the finished floor. We were able to get the new floor covering in place. At the end of last summer, it was also noted that the porcelain toilet fixture was damaged and needed repair. That was also attended to last fall.

Foose Cabin also has a number of major and minor exterior problems that need our immediate attention. Occupants and inspectors alike have noted the twisting and separating of logs on the exterior that has been taking place over a long period. In the opinion of Jack Owen, who did the excellent repair work on the logs of Fanshawe Lodge, this twisting is not related to movement of the foundation since it is poured concrete. Rather, he attributes it to moisture that is getting in between the logs. The original asphalt chinking has shrunk away from the logs allowing this to happen. To stop this action, Jack recommends removal of the old chinking and installation of the same type of flexible chinking which he used on the Lodge. Jack also pointed out that the three logs immediately above the decking are beginning to rot because of the snow that sits against them during the winter. He recommends that we "paint" Foose Cabin in order to prevent further deterioration. This could be done with a heavy bodied stain in a color similar to the original color still to be seen on upper parts of the building.

YBRA must get to this repair of the bottom logs if for no other reason than preparation for painting and/or log oiling of the deck supports and deck surface. These items are also in serious need of attention. In addition, all the window frames need repainting. It is my opinion that we should concentrate on Foose Cabin during Work Week and at any other opportunity we have during the upcoming summer.

The Fanshawe Lodge porch has already been the subject of several discussions at YBRA Council and Annual Meetings. Built in the 1934-1936 period, 20 feet of it was blown off in late December of 1937 along with the kitchen chimney. The porch floor was also replaced in May and June of 1938 (at a

phenomenal cost of \$65.00)! The porch has served us well as a gathering place for 66 years, but many of the supporting logs and floor boards are deteriorating. This is another high priority need for Camp.

Determining the mechanics of and materials for such repairs is no small task! Fortunately, Jack Owen has come to the rescue again! He has available most of the long, supporting logs required to replace the original sills and they have been reserved for us. The search for new porch flooring is ongoing. By having Jack begin the work as the weather allows before Camp opens this spring, we are hoping to minimize the impact on summer activities.

These two major projects, especially the lodge porch, will require significant financial commitments on the part of YBRA. Contributions to either effort in the form of money and/or time would therefore be greatly appreciated! We hope our members will consider a financial contribution to the work when they return their proxies this year and perhaps a visit during Work Week, (or possibly even another time when space is available at Camp). As in other years, we offer free room and board to members and their families who volunteer their labor during that period. Please feel free to contact me if you wish to further discuss these matters.

Russ Dutcher, Camp Manager

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Check out our website at
[HTTP://www.ybra.org](http://www.ybra.org)

Memories of Red Lodge and YBRA

by Michele Page, daughter of Pete and Dottie Foose

In the summer of 2002 our family returned to Red Lodge and the YBRA camp to fulfill our mother's wish to have her ashes spread amongst the wildflowers at the point—where years earlier we had gathered to spread my fathers ashes. As we drove to the camp the smells of sage brush and the dusty road, the penetrating dry heat, the sound of aspen leaves rustling in the wind overwhelmed me with a flood of memories, confusing the present with the past.

The camp was just as I remembered. The small family cabins, the washroom, and the lodge — the center of activity with its large kitchen and eating area at one end and the living area with old chairs arranged around one of the two huge stone fireplaces at the other. This is where we used to heat bricks and wrap them in newspaper to put in the foot of our sleeping bags on cold nights. The cabins nestled among the pine trees were built by Roy Wadsworth, a true Montana mountain man, well over six feet tall, lean and muscular, even when I knew him forty five years ago, when he was in his sixties. I remember his huge hands, toughened and scarred by years of hard work. Alone, he had felled the trees and built the cabins with their rough fitting doors and unfinished interiors.

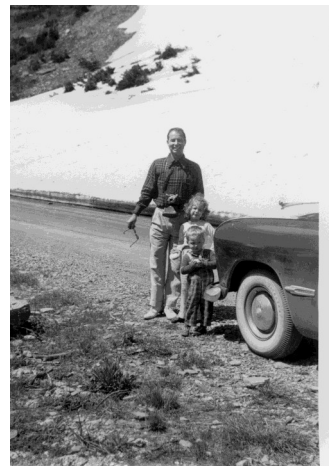
This is where our family would come each summer for six to eight weeks. Mom would set up housekeeping in one of these cabins while Dad went into the field for days at a time to teach his students. It was our summer home.

Days began with the 6:50 bell ringing throughout the camp letting everyone know that breakfast was in ten minutes. Washing was put off until later as we jumped out of bed, threw on our clothes, and ran from our cabin to the lodge. The long tables, set the night before by the women of the camp, were laden with boxes of cereal, plates of eggs and bacon, toast, and jugs of milk. Each table had a designated person who brought food from the kitchen to the table and then cleared. By 7:30 breakfast was over, lunches were packed for the field and the vans had departed with instructors and students heading out to Elk Basin or one of the many geologic sites of study.

For us children, once the students had gone into the field, camp belonged to us. Days blended into one another and we created our own pleasures. One year I discovered two large baskets filled with Saturday Evening Post magazines underneath the long trestle table in the lodge. That year I spent every morning reading the stories, studying the illustrations and doing the crossword puzzles. I remember doing a rough count of the number of stories there would be to read if I read all the magazines in the baskets — and being reassured that even if I tried, I probably could not finish them all that summer. Days would end with the evening meal prepared by Jeanette, Roy Wadsworth's daughter and camp cook. After dinner, the students would go off to study and once it was dark we would find our way to our cabins by flashlight and seek warmth in our sleeping bags.

During those long peaceful days we children were left to entertain ourselves, although there were some activities organized by the wives of the professors. Mrs. John Maxwell and Mrs. Bill Bonini helped us gather and press wildflowers. Mom would give piano and voice lessons. There were trips to the See'em Alive Zoo where we could pet goats, chase chickens and watch the deer and one mangy buffalo in a corral as well as go on trail rides through the hills and pastures around Red Lodge. On very hot days, there might be an excursion to the town pool and a dime to buy a package of Milk Duds. Every couple of weeks we would go into town to see a movie and sometimes there would be a quarter to go to the drug store and buy a soda or a paperback book off of the rotating bookrack. I especially loved our weekly trips to the Carnegie Library at the end of Broadway. The library with its tall ceilings and filtered sunlight from shuttered windows was cool and quiet and smelled of old magazines and ancient books. It was here that I would stock up on Nancy Drew stories, biographies and Poirot mysteries. And, there was endless time for games of all kinds, including the ever popular Kick-The-Can, which we loved to play right outside the door to the lodge as students were coming to dinner.

There were other events that punctuated those leisurely unstructured days of summer. Every August the Red Lodge community, comprised of children of immigrants from a variety of countries, celebrated the "Festival of Nations". There were programs and concerts during the week with singing and dancing and storytelling and wonderful food. I especially remember Mother singing songs from Carmen to great applause. And there was the Rodeo, which Dad eagerly looked forward to each year, which always took place during the week of July 4th. On what was usually a hot dusty day, we would all go up to the parade grounds, located on a bluff overlooking the town. We would eat hot dogs, drink cokes, and watch cowboys from near and far ride the bucking horses and Brahma bulls, rope calves and perform rope tricks, while Hank Williams' songs blared on the loudspeaker.



*Pete Foose at the Beartooth Pass
with Mike and Michele*

There were also visits to the Kane's beautiful ranch and to Al and Helen Weaver. Al, who I remember as always being a old man, was a friend of Jeremiah Johnson in the early days of Red Lodge, when he was sheriff - long after he came down from the mountains. Al had endless stories to tell of life in the old west - which seemed a long time ago to a little girl but was in fact merely five or six decades before.

When I was twelve years old we moved from Lancaster, Pennsylvania to Palo Alto, California. For two more summers our family made the trip to Red Lodge, but Dad's career was expanding and opportunities resulted in summers in Europe and other locations. He would often go to Red Lodge by himself to teach for two weeks, but the family no longer accompanied him.

And so we grew up - and Red Lodge became a place of our past. Mom and Dad still went to Y.B.R.A. every year for a month to six weeks while Dad taught. They loved their time there. They visited friends in town, gave lectures, went to the Rodeo and enjoyed the students. Mom put on programs at the local church and nursing home, and they had plenty of time together uninterrupted by telephone calls and scheduled obligations. When the family came to visit there were picnics at the Rosebud Creek, trips to town to celebrate the Fourth of July and to dance in the "safe" bars, dinner at Piney Dell, and campfires and singing at the Point where on a clear night we could see the lights of Billings, 60 miles away. There was always time for a game of horseshoes below the lodge porch and a quiet read in front of the fireplace. The camp never changed. And, although we were all getting older, life at the camp seemed timeless.

Dad was ill the last couple years of his life. I will never know how they managed the trip, but somehow, in 1994, Mom drove Dad all the way to Red Lodge. He wanted to go back so badly and Mother was determined to make it possible. Two days after their arrival, we received a phone call from Mom. Dad had reacted badly to the altitude and they were coming home. Dad died two months later. Mother never recovered. Her companion of 52 years was gone and the love and patterns of years together was broken - and so was she. Confusion and anger overwhelmed her. She died quietly on New Year's Eve, 2001.



Dottie Foose sings an aria from Carmen at the Festival of Nations celebration

THANKS JEANETTE!

During the 2005 Annual Meeting of YBRA, **Jeanette Reinhart** will become the second recipient of the **Russ Dutcher Award For Distinguished Service**. The award was created in 2002 by the YBRA Council and was presented to its namesake, Russ Dutcher. Not intended for annual or even regular bestowal, the purpose of the Award is to acknowledge the prolonged, loyal and trustworthy service and dedication individuals to YBRA and its continuing welfare.

Jeanette Reinhart represents just such notable service! She celebrated her 25th year of association with the Camp in 2003. In 1972, she started as a kitchen helper hired by Frank and Barbara Parks. She then worked intermittently with Joyce Neibauer who promoted her to assistant cook, taking over on Joyce's days off.

Upon Joyce's retirement in 1984, Jeanette took over the responsibility permanently in 1985. Jeanette has managed the kitchen and living spaces efficiently, as well as creatively. However, as anyone who has been associated with YBRA will tell you, this is not the whole story. She has befriended student and faculty alike, catering to their individual needs and helping them to contend with problems that are special to living and studying on the side of a mountain in Montana. Among other roles, Jeanette has also been an effective and influential recruiter, teacher and supervisor for her often young and inexperienced staff. It is with much gratitude and our sincere thanks that we recognize Jeanette Reinhart for her distinguished work for YBRA and present her with this award for outstanding service!



of

Yellowstone: Home to Geologic Enigmas and a Supervolcano

by Jinny Sisson

Many think of Yellowstone as home to benign geothermal features such as Old Faithful and pastoral herds of elk and buffalo. However, much of the park has a history wrapped in volcanoes, making it a wonderful place for generations of YBRA geologists, biologists, and environmental scientists.

By the time you read this, the April 10th BBC docudrama on Yellowstone will have aired on public TV. This show even attracted the attention of national magazines such as Newsweek. I have read that the show has good science as well as a superb dramatization of what may occur if the region experiences a major eruption as it did 2 million years ago when the Huckleberry Ridge Tuff was deposited. This supervolcano (one that erupts more than 1000 cubic kilometers of magma) created an ash plume that sent ash as far south as Texas and out into the Atlantic Ocean to the east. This was possibly the largest explosive eruption that has ever occurred. So, if Yellowstone does erupt again in a similar manner, it will be disastrous for many.

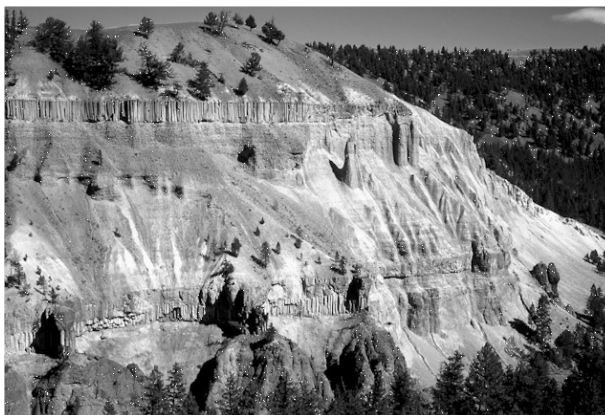
The ultimate source of the heat to melt Yellowstone magmas from the mantle and crust is an enigma. For many years, it has been postulated that there is a mantle plume or hotspot. Evidence for this includes a series of basalt and rhyolite that gets progressively older towards Washington near the Columbia plateau. Some of these include the basalts that make up the Beaverhead near Dillon Montana where many geology field camps spend time mapping basement and other rocks. However, recent seismic tomography and a realization that this age progression is not the only one, calls into question this interpretation. The Newbury volcanics trend from northeast to southwest instead of west to east as does Yellowstone. This has led some to propose that Yellowstone represents a mantle hot mush zone instead of a hot spot.

Another series of older volcanic rocks can be seen in the lahar deposits with abundant fossilized trees on Specimen Ridge (a locality thoroughly described by Erling Dorf). This series is enigmatic in that their composition suggests they erupted above a subduction zone, but the nearest coast at the time was way to the west. Some suggest that this may represent a very flat subduction zone, and others suggest that they may represent products of localized rifts.

Many YBRA geology students have pondered the complex relationships of the igneous rocks at Tower Falls. Most drive by this exposure and notice the spectacular columnar joints next to the road as well as two additional exposures separated by rhyolite tuffs across the Yellowstone River. These sit above lahar deposits. The question is why does one side of the river have two basalts and the other side only one at a different height. This exercise illustrates that volcanics do not necessarily have the same behavior as clastic sediments. The ultimate solution to this exposure may require geochronology in addition to the field relationships our students will continue to study.

Much of the recent geologic research activity around Yellowstone investigates geomicrobiology looking at thermophilic bacteria in hot springs as well as how bacteria have controlled the geomorphology at Mammoth hot springs. Many of the bacteria survive in specific temperatures and geochemical niches. In some instances, this leads to very colorful displays as the waters cool.

Of course, one of the biggest enigmas is how after centuries, the plumbing system of the Upper Geyser Basin can recharge on such a regular basis to erupt every few hours. Recent Alaskan earthquakes briefly disturbed the geyser system, but it went back to its regular cycle with Old Faithful still dazzling all who see it.



Work Week 2005

This year's Work Week will be hosted by the F&M alumni. Dates are from Monday, August 29th to Friday, September 2nd. As always, room and meals are free to all participants. For more information, please contact Marv Kauffman (marvsuekauffman@hotmail.com).

Palisades Geology
By Marv Kauffman

The Palisades

The Palisades rock feature, forming the ridge crest around the northern edge of the Beartooth Mountains is made up of three geologic formations: the Bighorn Dolomite of Ordovician age, the Jefferson Limestone of Devonian age, and the Madison Limestone of Mississippian age.

Depositional Environment All of the formations named above are carbonates, either limestone or dolomite. That means they consist of grains, fragments of fossils, and precipitates all made of calcium carbonate and/or calcium-magnesium carbonate. All of these formations are of marine origin, having been deposited in ocean waters from near sea-level up to several hundred feet deep. Obviously they are no longer at sea level so they must have been lifted up to their present position.

Mountain Building

The Northern Rocky Mountains were lifted up during several episodes of mountain building. This mountain building was apparently caused by the interactions of what are called tectonic plates. The entire outer portion of the earth, including the crust and the outer part of the earth's mantle, behave as though the material is rigid. The earth is divided into a dozen or so major plates and about two dozen minor plates. As these plates move about on top of a less rigid, softer underpinning, they tend to run into other plates. When two plates collide something has to give. In many cases one of the plates is pushed up as the other plate glides underneath.

The most dramatic example of this is the Himalayan Mountains and Tibetan Plateau, raised to enormous heights as the Indian-Australian Plate crushed into and slid under the Asian Plate. A similar event occurred in the history of the Northern Rockies pushing up the Beartooth Mountains to heights not unlike those of the Himalayans today. Subsequent weathering and erosion have taken their toll on the Beartooth Mountains, reducing them to a considerably lower elevation than the Himalayans. During this episode, the rocks that now make up the Palisades, were pushed up from below sea level to heights as much as 20,000 feet above sea level. As they arose, they were warped from a horizontal to a nearly vertical attitude, with bedding dipping at a very steep angle. In fact the bedding was pushed up to vertical and then beyond vertical, so that they now dip in an overturned condition, back toward the south.

The uplift of the Beartooth Mountains occurred along a major thrust fault, which occurs along the north edge of the Palisades. A subsidiary thrust fault brings Precambrian rocks over rocks of younger age in several places in this region. As the thrusts moved forward, one part extended beyond the rocks on either side, producing "tear faults" along the margins of the forward moving portion. This motion produced the offset of the Palisades along the Willow Creek Fault, as well as several other tear faults. When driving along the Red Lodge Mountain ski road, one can observe this offset, where the Palisades seem to end abruptly just above the Palisades Campground. The extension of this same Palisades ridge can be seen offset much farther to the south of the West Fork of Rock Creek. It can then be followed past Rock Creek, at the Point of Rocks, offset again on the flanks of Mount Maurice, and then continuing south toward the Montana-Wyoming border near the Clark Fork Canyon.



YBRA Uplift 2005

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ATTN: Proxy Enclosed

In the summer of 2004 our family returned to camp again to celebrate the marriage of our daughter, Amanda. We walked to the Point once again and looked out across the meadow of wildflowers to the distant plains, knowing that the memories of this visit would be a new chapter in a book that is still being written.

