

# Quaternary Times

## 2010 Biennial Meeting

*University of Wyoming, Laramie, WY, August 12–16, 2010*



Photo by Jessica Blois

*Participants enjoying a post-meeting hike and BBQ at Vedauwoo Recreational Area, Medicine Bow National Forest.*

Roughly 140 participants descended on Laramie, WY, in mid-August for the 2010 Biennial meeting. The scientific program was organized into seven sessions with 27 speakers, all focused on the theme “Exploring the Pleistocene-Holocene Boundary in the Americas: From Molecules to Continents.” Meeting participants also attended the “Teaching Climate Change from the Geologic Record” workshop, learned about the surrounding natural

areas during pre- and post-meeting field trips, browsed more than 60 posters during the evening poster sessions, and danced to a great band at the general banquet.

You can find additional highlights from the meeting, in addition to meeting the Distinguished Career and Denise Gaudreau Award winners, inside the newsletter.

Many thanks to the local organizing committee and the scientific program chairs for organizing a great meeting!

### **AMQUA at Middle Age: Looking Backward and Moving Forward**

by STEVE JACKSON, PRESIDENT

The American Quaternary Association was formed in the late 1960s and had its first biennial meeting in 1970. More than 40 years later, AMQUA still “draws together persons of disparate disciplines who all have an interest in the totality of events in one particular segment of geologic time,” as AMQUA’s second president described it at the second biennial meeting.<sup>1</sup> AMQUA remains the only scientific organization embracing all of North America that is focused specifically on the Quaternary sciences.

AMQUA, as a 40-something organization, has reached middle age, which may also be an accurate descriptor of its average membership. In order to remain healthy, AMQUA must continue to draw membership from early-career scientists, including graduate students. And it must evolve and adapt to meet the changing needs of its membership and to address the critical scientific and societal challenges of our times.

Looking back at AMQUA’s early years, as reflected in the first few volumes of *Quaternary*  
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*Research*, I've been struck by the commitment of AMQUA's founding generation to issues of societal relevance. These early volumes included articles that spoke directly to implications of Quaternary history for climate-change forecasting, forest management, assessment of geological hazards, cultural adaptation to climate change, human effects on climate, and sea-level change. And Herb Wright addressed societal relevance explicitly in his 1972 AMQUA presidential address.<sup>1</sup>

Society and its concerns have changed considerably in the past 40 years, as have the Quaternary sciences. But Quaternary scientists continue in their commitment to public service, manifested in activities ranging from local outreach and education to leadership in international assessments of climate change and its impacts. Quaternary scientists have taken center stage in the global-change theater, driving discussions among resource managers and policymakers about megadrought susceptibility, abrupt climate change, novel and disappearing climates, non-stationarity, and risk of societal and ecological collapse.

The coming decade offers continued opportunities for the North American Quaternary community to advance its science and apply its knowledge. How do we foster recruitment and training of the interdisciplinary scientists needed to address emerging scientific opportunities and societal challenges? How can we engage more effectively with "science consumers"—the stakeholders, journalists, educators, resource managers, and policymakers who need sound scientific information and advice? What strategies can we pursue to recruit the next generation of Quaternary scientists into AMQUA and foster their participation at our meetings? What can AMQUA do more effectively to meet the changing needs of its membership? Can we leverage partnerships with other scientific communities and organizations to meet these challenges?

I am initiating a strategic-planning process that will help AMQUA move forward to address these and other issues over the next several years. This process will include gathering information and ideas; assessing strengths, weaknesses, opportunities, and threats; determining priorities and directions appropriate to AMQUA and its environment; identifying short- and long-range goals; and developing a plan for attaining those goals. The outcome will range from some minor adjustments to the status quo to a major overhaul of the organization. Most likely it'll be something in between. Regardless, AMQUA should emerge stronger from the process.

This planning process will be my top priority during my term as president, and it will proceed in stages. First, I'll be soliciting ideas and suggestions from both AMQUA Council members and the membership at large over the next few months. Second, based on the ideas and priorities identified by the membership and Council, I will work with Council members this fall to develop a draft Strategic Plan for AMQUA. After vetting and revision by the entire Council, the final Plan will be presented to the membership at the 2012 AMQUA Business Meeting in Duluth for discussion.

I recognize that the mere mention of strategic planning may send some readers running for the exits. I confess that earlier in my career I was skeptical, even cynical, about the term, having seen it applied to processes that devoured time and changed nothing. But I've also seen strategic planning drive important, positive changes in organizations, including my own university. I hope even the most skeptical among you will join in the process. We can build on the heritage of AMQUA's founders to keep the organization nimble, and adapt to the evolving needs of its membership, the science it aims to promote, and the society in which it is embedded.

<sup>1</sup>H.E. Wright, Jr. 1973. Quaternary science and public service. *Quaternary Research* 3:515–519.

## WELCOME TO THE AMQUA NEWSLETTER!

We have resurrected the AMQUA newsletter, to be published twice per year. This issue includes reports from the 2010 Biennial Meeting in Laramie, WY, and profiles of the Distinguished Career Awardees and the Denise Gaudreau Award winner. We also profile the AMQUA officers, and over the next few issues we will profile each AMQUA Councilor. Each issue will also include a message from the AMQUA president, graduate student research news, research reports, and any other news and notes of interest to AMQUA members.

We hope this newsletter will be a fun way for you to learn about the different activities undertaken by AMQUA members. We welcome you to use this newsletter to communicate your own ideas, notes, and research. Enjoy!

—Jessica Blois and Dolly Freidel, co-editors

### GRADUATE STUDENT CORNER: *Nancy Parker, University of Wisconsin-Madison*

As a geography graduate student at the University of Wisconsin-Madison, I've learned to plan and implement a two-year master's research project that will surely be valuable to me for the rest of my career. I am working in the Williams Lab at UW-Madison, where we want to know what, if anything, controls the representation of *Sporormiella* in modern and fossil lake sediments. *Sporormiella* is a fungus that fruits in the digestive system of herbivores, is excreted in dung, and is preserved in lake sediments. In lake cores in North America and elsewhere, the decline in the abundance of these spores tracks the megafaunal extinctions. When interpreting the fossil record, it is essential to know whether these spores are truly an indicator of megafaunal presence/absence. My contribution to the project focuses on using samples from modern

lake sediments to understand the controls on *Sporormiella* by examining *Sporormiella* representation across a modern aridity gradient and



Photo by Nancy Parker

*Sampling sediments during summer of 2010 at Lake George, MN.*

in different contexts (i.e., in different parts of lake basins, in lakes surrounded by cattle at different densities, etc.).

This project has proven challenging, especially since I had little experience in paleoecology literature or field/lab methods when I arrived at UW. Through my field and lab work and data synthesis, I now feel like I have a better understanding of the research process. Last summer, with the help of two undergraduate field assistants, I collected surface sediment samples from the center and margin of 32 lakes through South Dakota, Minnesota, and Wisconsin.

We arrived back in Madison in mid-June with over 60 samples of sediment. I spent the next two months in the lab, learning to process samples for pollen and then identify pollen

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## THE SNOWY RANGE: A SCENIC OVERVIEW OF PLEISTOCENE GLACIATION IN THE ROCKIES

BY DOLLY FREIDEL

A field trip to the Snowy Range section of the Wind River Mountains before AMQUA 2010 provided participants with an up-close encounter of some of the most dramatic Pleistocene glacial landforms in the Rockies. Led by University of Wyoming geologist Dr. Bryan Schuman, the group headed west from Laramie on Hwy 130, past Sheep Mountain and an eolian blowout valley near Centennial, climbing toward the mountains over Pinedale outwash deposits. On such a crystal-clear day, the views of the Wind River Range were spectacular.

Just as the highway began to wind up toward the mountains, we stopped to view the first moraines, identified as Bull Lake deposits (ois 6), on a low, gentle slope. Crystalline white quartzite blocks were exposed in the sparse grasses (photo at left). A subsequent stop led us to a younger Pinedale moraine (ois 2–4) where varved sediments from a meltwater pond had been laid up against the moraine. We also noted large patches in the forests of reddish-gold dead trees, the work of pine beetles that had spread dramatically during the past year.



Photo by Dolly Freidel

We continued toward the plateau-like uplands where Wisconsin glaciations had scoured older tills, leaving thin soils on which sparse, wind carved trees, and thin tundra-like grasses and mosses grow today. Here we reached the base of the Snowy Range at about 10,000 feet. The winds were freezing, even on this relatively mild August day. In the distance we could see kettle lakes that had formed in Pinedale outwash on the plateau (above).



Photo by Dolly Freidel

The abrupt, 1,000-foot upthrust of the Snowy Range, bedded white metaquartzite tilted to nearly vertical, seemed nearly close enough to touch, but was separated from our vantage point by steep talus slopes and fresh-looking moraines. The group walked north along the face to view one of the proglacial lakes at the foot of the mountain.



Photo by Dolly Freidel

This was the culmination of the day's sights, leaving us with plenty to contemplate on the ride home.

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grains and fungal spores at the microscope. I worked countless hours to get some initial results by mid-August for the AMQUA meeting in Laramie. The push was well worth it, as the poster session at the AMQUA meeting proved to be extremely helpful for brainstorming hypotheses and analyzing my initial results.

After seven long months of lab work, I finally finished processing and counting pollen and am now in the middle of data analysis and synthesis. Interestingly, percent abundance of *Sporormiella* at the center of lakes shows a

negative correlation with mean annual precipitation and seasonal precipitation. No other variable is significantly correlated with *Sporormiella* at the lake center, and no variables explain *Sporormiella* percentage or concentration at the margins of lakes. It will be interesting to further investigate these results and the apparent control that precipitation/moisture has on the relative abundance of *Sporormiella*. As I work to wrap up my project and graduate in May, my research brings up as many additional questions as it answers and I hope it opens the door for related studies in the future.



## AMQUA COUNCIL MEMBER PROFILES

Each issue, we will profile several of the current AMQUA Council members, starting with the officers this issue: President Steve Jackson, President-Elect Arthur Bettis, Treasurer Brian Carter, and Secretary Colin Long.

### STEVE JACKSON PRESIDENT

Dr. Stephen Jackson studies the effects of environmental change on forests, woodlands, and wetlands. A native of



southern Illinois, he studied botany and geology

at Southern Illinois University at Carbondale, and received a Ph.D. in Ecology and Evolutionary Biology from Indiana University in 1983. He was a National Science Foundation Post-Doctoral Fellow in Environmental Biology in residence at Brown University, and is currently Professor of Botany and Director of the Program in Ecology at the University of Wyoming. He has served on numerous scientific advisory panels and editorial boards, most recently *Ecosystems*, *Frontiers in Ecology & Environment*, and *Trends in Ecology and Evolution*. He has published more than 85 scientific papers and numerous editorials, book reviews, and commentaries. He is a 2006 Fellow of the Aldo Leopold Leadership Program in Environmental Sciences, and a 2009 Fellow of the American

Association for the Advancement of Science.

Dr. Jackson's research employs tree-rings, fossil rodent-middens, and sediments from lakes and bogs to investigate how past climatic changes and human activities have affected species distributions, biodiversity, and ecosystem properties. His study sites range from wilderness areas in the Rocky Mountain and upper Great Lakes regions to agricultural landscapes in the Southeast and urban/industrial settings in the Midwest. He is committed to applying long-term perspectives to inform environmental policy, management, and forecasting.

### ARTHUR BETTIS PRESIDENT-ELECT

Dr. E. Arthur (Art) Bettis III is an associate professor in the Department of Geoscience at the University of Iowa in Iowa City. His teaching and research concern sedimentological, stratigraphical, pedological, and geochemical approaches to Quaternary landscape evolution. He pursues interests in the long-term behavior of eolian, fluvial, and glacial systems and the impact of



human activities on the landscape. His recent research involves the *Homo erectus* peopling and occupation of island Southeast Asia, stratigraphic and sedimentological studies of Midcontinent U.S. loess depositional systems, and the application of alluvial lithostratigraphy in stream management and restoration. Bettis serves on the U.S. National Committee for the International Quaternary Association and the North American Stratigraphic Commission, and has served on the Management Boards of AMQUA and GSA's QG&G Division and as Editor-in-Chief for *Geoarchaeology: An International Journal*. Dr. Bettis also teaches Environmental Science, is the Academic Coordinator of the Environmental Science Program, and is a member of the University's Sustainability Committee. Before joining the faculty of the U. of Iowa, he was employed as a research geologist and supervisor of the Environmental Geology Section of the Iowa Geological Survey. He lives in Iowa City with his wife, Brenda Nations, and two sons, and he occupies his "down" time fishing and assisting with natural area restoration efforts.

## BRIAN CARTER TREASURER

Dr. Brian J. Carter received degrees from Rutgers University (New Jersey) and The Pennsylvania State University in environmental science, and plant and soil sciences. He has been professor of Plant, Soil, and Environmental Sciences at Oklahoma State University since 1982. Professor Carter teaches freshman- through graduate-level courses concerning the basic principles of environmental science, soil genesis and morphology, and soil classification and mapping, and is the Director of the Undergraduate Program in Environmental Sciences. Dr. Carter works closely with the Oklahoma Department of Environmental Quality (DEQ) to implement a soil-profile evaluation, training, and state certification program for private-



sector and DEQ personnel. This education program improves environmental quality through better identification of soil limitations and potential for on-site residential and small public waste treatment, recycling, and land management. Research interests across Oklahoma include soil formation, soil mapping and classification, geoarchaeology, and geomorphology. Direct field identification of soil properties and the impact these soil properties have on environmental sustainability and quality are the key aspects of Dr. Carter's teaching and research program. Environmental work also involves the reclamation of saline-sodic soils, discoveries of the natural history of landscape change through soil formation and classification, and the impact of soil environments on the peopling of Oklahoma over the last 15,000 years.

## COLIN LONG SECRETARY

Dr. Colin Long (Ph.D. University of Oregon) is an

assistant professor in the Department of Geography and Urban Planning at the University of Wisconsin Oshkosh. His research centers on understanding the connections between climate, vegetation, and disturbances. His current projects examine the impact that fire and tephra deposition have had on forest development in the Cascades Range of the Pacific Northwest. Dr. Long is also examining the impact that drought conditions have had on past fire regimes in mesic forests and grasslands of the Great Lakes region. He teaches courses in biogeography, long-term environmental change, and environmental policy and science, and has published his work in *Quaternary Research*, *Journal of Quaternary Science*, and *The Holocene*, among others.



## NOTICES

### 2012 BIENNIAL MEETING

Steve Colman, at the University of Minnesota, Duluth, has agreed to host the 2012 Biennial Meeting. Stay tuned for updates as details for the meeting are nailed down.

### NEOTOMA DATABASE

If you plan to submit data to the Neotoma database, draft text has been crafted for NSF Data Management Plans. See [www.neotomadb.org](http://www.neotomadb.org) for additional details.

**DISTINGUISHED CAREER AWARD 2009: PETER BIRKELAND**

Dr. Peter W. Birkeland received the 2009 Distinguished Career Award from the American Quaternary Association, nominated by Daniel Muhs and Donald Rodbell. His distinguished career is characterized by remarkable achievements in three broad-reaching areas. Dr. Birkeland is (1) a scholar of outstanding accomplishment in Quaternary research, (2) the author of three editions (spanning three decades) of an enormously influential text on soil geomorphology, and (3) a devoted educator of undergraduate and graduate students, many of whom have gone on to leadership positions in Quaternary science in academia, industry, and government.

*Research*

Dr. Birkeland has been a prolific researcher for more than four decades. His research has been geographically broad and has generated a steady stream of publications, commonly with his students. His main area of research is soil geomorphology—the application of pedology to address landform evolution. However, this work also has tremendous importance to Quaternary stratigraphic, neotectonic, and paleoclimatic problems.

Dr. Birkeland's work in soil geomorphology and soil stratigraphy has evolved over the past four decades. His early work used soils to develop a relative-age framework for glacial deposits in the Sierra Nevada, and that framework challenged some of the established concepts of glacial stratigraphy. He extended this work into the Great Basin and was a pioneer in the use of soils to correlate events between mountain ranges and adjacent basins. He was also one of the first to use soil clay mineralogy to interpret paleoclimate in this climatically sensitive region. After moving to Colorado, he used a similar approach to understanding the much-less-studied glacial stratigraphy of the Rocky Mountains.



Photo by Daniel Muhs

Here, too, much of his detailed work challenged the few existing stratigraphic frameworks then available, and he provided the first firm basis for correlation between mountain ranges. His students in those early years were an energetic bunch that spread out from Boulder all over the west to view landscapes with new eyes. Their perspective was based firmly in traditional field work in stratigraphy and geomorphology but had the added dimension of the importance of that magical rind on the surface of every landform that could tell them so much about landscape evolution.

In the 1980s and 1990s, Dr. Birkeland's work evolved into a global view of soil genesis and landscape evolution. His own studies and those of his students took him to Arctic Canada, Peru, New Zealand, China, Israel, and various South Pacific islands. His work on soil genesis became multidimensional, with new studies showing how soils evolve not only over time, but on different landform positions over time and in wildly diverse climates, from polar to tropical. By this

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time, many geomorphologists and Quaternary stratigraphers had been inspired by Dr. Birkeland's holistic view of pedology and began applying his approach in their own studies of landscape evolution. Studies of soil genesis and the use of soils in paleoclimatology, geomorphology, and Quaternary stratigraphy have exploded in the past two decades, and Dr. Birkeland is largely responsible for this rich period in the history of pedology.

### *Publications*

While Dr. Birkeland has amassed dozens of publications in many of the most highly regarded journals, such as *Quaternary Research*, *Geological Society of America Bulletin*, *Geology*, *Catena*, *Geoderma*, and *Geomorphology*, undoubtedly his most lasting accomplishments are the three editions of his ground-breaking books on the application of soils to geomorphology. Until the publication of the first edition of *Pedology, Weathering, and Geomorphological Research* in 1974, there was only a handful of Earth scientists who used or even bothered to notice soils within Quaternary deposits, on landforms and at archaeological sites. Soil science at that time was largely within the domain of agronomy departments. Pedology—the study of soils in their natural field settings—was typically an underfunded, understaffed subdepartment of most agronomy departments, and most pedology courses at agricultural schools emphasized the importance of pedology in soil surveys and as a necessary part of crop science. With the publication of *Pedology, Weathering, and Geomorphological Research*, Dr. Birkeland brought new excitement to the use of soils in understanding stratigraphic breaks, ages of landforms, paleoclimate and overall landscape evolution.

In 1984 Dr. Birkeland synthesized many of the results that derived from the very researchers who

were so motivated by his first book. This masterful revision, titled *Soils and Geomorphology*, included expanded sections on the effect of climate change on soil development, the effect of topography on soil development, and the application of soils to the burgeoning field of tectonic geomorphology. Inclusion of the neotectonic aspect of soil research fueled a host of new studies—especially in the western U.S. but also around the world—aimed at estimating the repeat time of large-magnitude seismogenic faults. One testament to the significance of this book is that in 1988 it earned Dr. Birkeland the Kirk Bryan Award, which is given by the Quaternary Geology and Geomorphology Division of the Geologic Society of America to the author of the *most significant publication in the preceding four years*.

The third edition of *Soils and Geomorphology* is a capstone to Dr. Birkeland's impressive career. Expanded to be even more comprehensive and holistic than its predecessors, this edition provides the reader with a detailed overview of the myriad applications of soils to geomorphology and Quaternary science—all in a down-to-earth writing style that both invites new workers into the field and exudes the excitement of one of the most significant developments in geomorphology in the 20<sup>th</sup> century.

### *Teaching and Mentoring the Next Generation of Quaternary Scientists*

Few faculty members of any generation have had as profound an effect on their students as has Dr. Birkeland. He held high standards not only for academic performance and scientific rigor, but also for one's behavior in the community of Quaternary scientists. He was capable of simultaneously providing encouragement to those who lacked confidence and deflating those whose confidence was brimming over. He demanded that his students learn to write clearly and

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## DISTINGUISHED CAREER AWARD 2010: GEORGE FRISON

Professor George Carr Frison received the 2010 AMQUA Distinguished Career Award, nominated by Marcel Kornfeld and Mary Lou Larson. Dr. Frison has had an extraordinary, internationally recognized career as an archeologist. He has devoted his life to anthropological archeology and interdisciplinary studies of the archeological record. Dr. Frison has been an extraordinarily productive researcher, teacher of anthropology, and spokesperson for our discipline, and in the process he has strengthened the state and national archeological infrastructure, one of the pillars of Quaternary studies. He has participated in organizations from the local to the international scale, has been an officer of some of the most prestigious organizations, and has been an editor/associate editor of several state-of-the-art journals, including *Quaternary Research*. In 1997 he was elected member of the National Academy of Sciences. In the following several pages, we wish to summarize Professor Frison's accomplishments and contributions.

George Carr Frison was born in 1924 in the small town of Worland, Wyoming. An unremarkable childhood on the ranch outside of Tensleep, Wyoming, was punctuated by interest in remains left behind by Native Americans as well as paleontological specimens. In particular, as he herded cattle through the basins, foothills, and mountains of the Bighorns, he frequently came across a variety of archeological manifestations, from chipped and ground stone tools to rock shelters, rock art, scaffold burials, war lodges, and

other prehistoric facilities. At the time, the Crow from the Crow Reservation, just 100 miles to the north in Montana, would still occasionally visit the ranch and the surrounding area of the Bighorn Mountains, leaving a vivid picture of Native Americans in his mind. More than once, his grandfather took him to the ongoing nearby dinosaur excavation of Barnum Brown, who



encouraged him to pursue his interests. His destiny for the time being was, however, in the family business, until he attended the University of Wyoming in the fall of 1942. World War II cut his university training short, and in 1943 he joined the Navy, where he served in the amphibious forces of the South Pacific until his honorable discharge in 1946. Following WWII, Dr. Frison continued

ranching until 1962, when he returned to the University of Wyoming to continue his lifetime dream. However, even during his ranching years, Dr. Frison began his more-serious interest in archeology. He joined the Wyoming Archaeological Society and, with them, excavated some of the most significant rock shelters and other sites in the Bighorn region of the Rocky Mountains. Most importantly, Dr. Frison began as an amateur and never forgot his roots. Currently he is the grand old man of the Wyoming Archaeological Society, providing guidance and inspiration to avocational and professional members alike. During his career, he presented hundreds of programs, from Washington to California and from Mexico to Canada, educating the public about the past and its studies.

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The next half-dozen years show the truly remarkable aspect of Dr. Frison's abilities. From 1962 to 1964 he attended the University of Wyoming, and he graduated with a B.S. in August of that year. He was awarded the Woodrow Wilson Fellowship for Graduate Study and attended the University of Michigan from 1964 to 1967 (MA 1965, Ph.D. 1967). Upon finishing his doctorate degree, he was appointed head of the newly formed Anthropology Department at the University of Wyoming, a department he would build from two to a half-dozen faculty over the next several years. By 1968 he was further appointed the first Wyoming State Archaeologist, and under his tutelage the Anthropology Department and the Office of Wyoming State Archaeologist's Office (OWSA, including in the beginning the State Historic Preservation Office-SHPO) were linked by state statute. Like the Anthropology Department, the OWSA grew to a significant organization through the 1970s. Both the OWSA and SHPO are now major organizational components of Wyoming archeology. The OWSA conducts archeological projects throughout the state and maintains a repository of more than five million artifacts, while SHPO contains records on nearly 80,000 archeological sites. A clear legacy of Dr. Frison's contribution is the regular incorporation of interdisciplinary analysis in the study of the archeological record by OWSA personnel. While research in Wyoming, and in particular at the University of Wyoming, is enhanced by the close association of these three entities, they would not exist in their current form without Dr. Frison's dedication to strengthening the state and national archeological infrastructure, and hence Quaternary studies.

While in the position of department head and state archeologist, Dr. Frison was elected to the board of the Plains Anthropological Society in 1972, and he served as the president of this

society in 1974. In 1981 he was elected president of the Society for American Archaeology; he served as president-elect from 1981 to 1983 and president from 1983 to 1985. He has been a recipient of many awards, including: Asa Hill Award of the Nebraska Historical Society, George Duke Humphrey Distinguished Faculty Award for research at the University of Wyoming, Distinguished Service Award of the Plains Anthropological Society, University of Wyoming Distinguished Former Faculty Award, Wyoming Archaeological Society Golden Trowel Award, and the Society for American Archaeology Lifetime Achievement Award. In 1997 he was elected member of the National Academy of Sciences, one of a few archeologists given this honor. Among his many accomplishments are two visits to Russia and the organization of several Russian-American symposia, events that contributed a great deal to Russian-American archeological cooperation and to closer ties between the two countries. Many American and Russian scholars have benefited as a direct result of Dr. Frison's contribution to this cooperative spirit.

Also while in the position of department head and state archeologist, Dr. Frison was able to carry on productive research throughout the state of Wyoming. The sites he excavated and published on are a veritable "Who's Who" of Northwest Plains prehistory. His investigations range from the first peoples of the Americas to the historic period forts, from open-air campsites to rock shelters, from domestic structures to hunting facilities, and much more. In addition, his research has not only concentrated on the archeological record, but has frequently included innovative experimental techniques. He is an expert flintknapper and has experimented with a variety of prehistoric stone tool replicas in butchering studies and projectile point penetration potential of bison and mammoth hide.

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## DENISE GAUDREAU AWARD FOR EXCELLENCE IN QUATERNARY STUDIES 2010: BETH CAISSIE

Beth Caissie was awarded the 2010 Denise Gaudreau Award for Excellence, nominated by her Ph.D. advisor Julie Brigham-Grette. Caissie started at UMass for a master's degree after finishing a BA in photography at Hampshire College and a BS in geology at the University of Alaska-Fairbanks (UAF).

At UAF, Caissie was described by faculty as an outstanding undergraduate student, one who had been selected for the extraordinary opportunity to spend a summer doing plant ecology in a remote camp in Chersky, Russia. She was also one of two undergraduates selected by the UAF faculty to participate in a 2003 expedition to study the volcanic history of Kamchatka. Hence, since her undergraduate days, she has been viewed by more than a few faculty as exceptional, someone who will make wise use of opportunities to grow academically.

Caissie's master's research was outstanding and focused on developing one of the first high-resolution records of the sea ice history of the Bering Sea over the past 20 ka. She now has a paper summarizing this work, published in 2010 in *Paleoceanography*. Her master's research was so highly regarded that in 2006, she was awarded the Geological Society of America's Howard Award, the most prestigious award given to a master's degree student by the Division of Quaternary Geology and Geomorphology. Caissie was *completely responsible* for independently researching and developing the idea of comparing alkenone abundance and sea surface-temperature estimates against the sea ice diatom stratigraphy as a means of strengthening our interpretation of the paleontology.



Everything about Caissie is exceptional in the most positive way. She is an excellent writer and communicator, with a wide-ranging background in the geosciences, including field experience in remote regions as well as training in climatology, physical oceanography, and isotope geochemistry

with quantitative skills micropaleontology. Caissie learned marine diatom taxonomy from John Barron at the USGS in Menlo Park. She has also spent time learning from Connie Sancetta, who graciously gave Caissie literally a car full of books, references, reference slides, and raw unpublished data. Sancetta

hosted Caissie in her home for long sessions, discussing diatom ecology and applications. Caissie's professionalism in her contacts has been exemplary. She has also been a major player in STEM programs for middle school and high school teachers, being an innovator of classroom activities offered to teachers eager to incorporate polar climate change into their classrooms.

Denise Gaudreau and Beth Caissie would have had a lot in common, had they ever been given the chance to meet. Caissie is delightfully independent, with remarkable emotional maturity and stability—in fact, she is exactly the kind of person you would want to have with you in a remote, ice-based field camp or in tight quarters on a research ship. She has been an outstanding team player on numerous cruises to the Bering and Chukchi Seas. Scientific leaders like Jackie Grebmeier (head of the NSF OPP Shelf-Basin Initiative) and Christina Ravelo (chief of the recent Bering Sea IODP LEG) have sent me e-mails about her remarkable capacity as a scientist and team player.

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His research has always been interdisciplinary. During his career he continually collaborated with pedologists, stratigraphers, geologists, geomorphologists, geoarcheologists, palynologists, paleoclimatologists, and any other “ists” whose field would illuminate the interpretation of the past. His incorporation of landscape change, interpreted through geological studies around bison kill sites, was innovative and clarified the hunting and trapping strategies of prehistoric peoples on the Plains. Never, since the early studies, can archeologists ignore local physiographic features and geologic processes that modify such features, if they are to make proper interpretations of past human behavior.

Professor Frison has published more than a dozen books with major presses and 100 articles (many in major national and international journals, including *Science*), and presented well over 60 papers at national and international conferences. The most remarkable aspect of Dr. Frison’s career is that, in his retirement as Professor Emeritus, he continues to be a productive member of the profession, having published four books since that time. Left Coast Press is just now publishing the third revised edition of his classic book, *Prehistoric Hunters of the High Plains* (with a revised title: *Prehistoric Hunter-gatherers of the High Plains and Rockies*). He has received about \$1.5 million in research grants and contracts from the National Science Foundation, National Geographic Society, The Leakey Foundation, National Endowment for the Humanities, Wyoming Council for the Humanities, and various state and federal agencies. His book publications are among the most important contributions to North American Paleoindian prehistory, Northwest Plains prehistory, and bison bone midden studies. To mention a few, the Colby Site is the only early Paleoindian site with evidence of Clovis-period

food storage, Hanson is the only fully published Folsom locality of the Northern Plains region, and Hell Gap, the type site of three Paleoindian complexes, the most completely stratified North American Paleoindian site. A number of his publications report on state-of-the-art excavation and analysis of bison bone middens (e.g., Glenrock, Agate Basin, Mill Iron stretching from the Late Prehistoric to early Paleoindian periods). His two editions (1978 and 1991) of *Prehistoric Hunters of the High Plains* synthesize what is known about regional prehistory, and the upcoming edition brings the data presentation up to date.

The methods and theoretical concepts to which Dr. Frison has contributed include two of the primary artifact classes of hunter-gatherer archeology: chipped stone and bone. His contribution to the relation of artifact typology and function is summed up by his former teacher Arthur Jelinek’s naming of the “Frison effect,” the change in artifact type through resharpening. This very simple concept has had a profound influence on the way chipped-stone tools are conceptualized and analyzed in both Old and New Worlds. Dr. Frison’s contributions to stone tool analysis do not end there. He was a pioneer in experimental investigation of the effect of raw material on relative utility of tool edges, the interpretation of raw material nodules, and other aspects of stone-tool methodology. Professor Frison’s contribution to zooarcheology is even more significant. He used both his personal knowledge of cattle growth cycles and paleontological studies to develop methods for interpreting season of bison mortality. In the process, he collected hundreds of bison and cattle mandibles and skeletons, which serve students as comparative specimens and objects for further refinement of zooarcheological studies. These collections, along with others done in cooperation with the Wyoming Game and Fish

*continued on page 13*

*continued from page 12: George Frison*

Department and the US Fish and Wildlife Service, form the backbone of one of the best zooarcheological comparative collections in the region, if not the nation, with hundreds of species represented. The use of these collections extends beyond archeology, serving wildlife biologists, paleontologists, and regulatory agencies. Additionally, his interpretations of bison bone middens were the first to use ideas of bison populations and changes in population structure to understand when and how procurement of this resource would be most effective. His research resulted in more-effective methods of studying one of the best-known western Plains types of sites, bison bone middens. Significantly, these methods were adapted throughout the world by archeologists confronted with similar problems. In addition, Dr. Frison's earlier studies and interpretations of bone middens spurred much of the recent research on taphonomy.

During his career, Dr. Frison has taught thousands of undergraduate and graduate students. Many of them benefited simply by increasing their education and awareness of prehistory and Native Americans; others, however, went on to become professionals

in anthropology and other Quaternary sciences. Perhaps several dozen of the latter currently teach in universities, and some serve as department heads. Dozens of his master's degree students form the backbone of Plains archeology, working for various federal and state agencies as well as for private archeology contractors. His influence has been enormous. Dr. Frison consults with museums throughout the state of Wyoming and in the Rocky Mountain region on their displays, ensuring that archeology and other Quaternary sciences are accessible to people from all walks of life.

In summary, George Carr Frison's accomplishments are exceptional, long lasting and far reaching. This fact has already been acknowledged through his election to the National Academy of Sciences. His publication record, mentoring of students, service to the state (State Archeologist), regional (president, Plains Anthropological Society), national (president, SAA), and international (Russian-U.S. exchanges) levels, and his belief in the value of interdisciplinary anthropological archeology, deserve the recognition of the AMQUA Distinguished Career Award.

*continued from page 11: Beth Caissie*

Caissie is an outstanding student who has all the suitable qualities of a top-level Ph.D. student and is worthy of the honor that comes with the Gaudreau Award. She is responsible, self-motivated, resourceful, and curious. Motivation, in particular, is Caissie's unwritten middle name. Her determination, goal-oriented spirit, and future leadership qualities are outstanding within our discipline. And her research in developing paleo sea ice proxies for the Beringian region couldn't be more timely!

Beth Caissie is an outstanding ambassador of the Denise Gaudreau Award and she is perfectly positioned to make outstanding contributions to Quaternary science.

Read more about Caissie's research here:

<http://www.geo.umass.edu/grads/caissie/>



*continued from page 8: Peter Birkeland* efficiently, and his detailed editing of theses and manuscripts is famous in the field. Dr. Birkeland was committed to undergraduate education to an extent that is rare for a professor at a large research university such as the University of Colorado. His multiple editions of the introductory textbook *Putnam's Geology*, with colleague Dr. Edwin Larson, are a testament to his interest in fostering the next generation of earth scientists.

Dr. Birkeland took special interest in the development of his thesis students—as budding scientists and as people. He taught by example how to balance family and profession, research and teaching, and seriousness and fun. His zany antics and humor on field trips are legendary, and seemed to tell students not to take themselves too

seriously. “It is, after all,” he might have joked, “just a bunch of dirt.” Nearly a decade after his retirement, Dr. Birkeland still keeps track of his former students, even going so far as to drive to California to lecture to the class of an ailing former student.

In all, Dr. Birkeland has mentored numerous Ph.D. and MS students and has taught introductory geology to thousands of University of Colorado undergraduates over the years. Most of his graduate students have gone on to leadership positions in Quaternary science, either in academia, in government agencies, or in industry. All of his students note with pride that they were a Birkeland student, and many feel that they are standing on the shoulders of a giant—one who is eminently deserving of a Distinguished Career Award from AMQUA.

## COMMENTS ABOUT OR CONTRIBUTIONS TO THE NEWSLETTER?

The newsletter has been sent as both hard and electronic copies. To opt out of the hard copy, please send an e-mail to Jessica Blois ([blois@wisc.edu](mailto:blois@wisc.edu)).

If you have suggestions for content or something to contribute to the newsletter, be it a short announcement or a lengthier research report, please contact either Jessica Blois or Dolly Freidel.

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## PASSINGS

- Dr. James Bell Benedict (72), Colorado geologist and archaeologist, passed away March 3, 2011.
- The American Quaternary Association deeply regrets the recent loss of former AMQUA President Bill Farrand, who died of complications from surgery just as the Newsletter was going to press. We will provide an obituary and summary of Bill's contributions to the North American Quaternary community in the next issue.

<b>AMQUA OFFICERS AND COUNCILORS</b>
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**UPCOMING MEETINGS****June 17–21, 2011**

Evolution, Norman, OK

**July 20–27, 2011**

INQUA Congress, Bern, Switzerland

**August 7–12, 2011**

Ecological Society of America Annual Meeting, Austin, TX

**October 9–12, 2011**

Geological Society of America Annual Meeting, Minneapolis, MN

**November 2–5, 2011**

Society of Vertebrate Paleontologists Annual Meeting, Las Vegas, NV

**December 5–9, 2011**

American Geophysical Union Annual Meeting, San Francisco, CA

**Summer 2012**

American Quaternary Association Biennial Meeting, Duluth, MN

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