UW paleobotanist featured in provocative film

Botany professor Ellen Currano, who also has an appointment in UW's Department of Geology and Geophysics, is featured in a new-film (released March 2017) titled, *The Bearded Lady Project: Challenging the Face of Science*. The seeds for the film were planted when Ellen and one of her collaborators, Lexi Jamieson Marsh, joked that being successful in paleontology would be much easier with facial hair. As a budding scientist and science filmmaker, respectively, both Ellen and Lexi had observed that famous paleontologists were often grizzled or bearded men, carrying a pickax, facing the elements and moving boulders. But, as Ellen says, "After further reflection about the sciences in general, the joke turned serious and *The Bearded Lady Project* was born."

In this issue

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Working with fine arts photographer Kelsey Vance and other collaborators, interviews were filmed with Ellen and other female paleontologists. This included, of course, filming and taking portraits of "bearded" women in their field, laboratory, museum, and classroom settings. In addition to the film, a traveling exhibit of photographs is now on tour (currently in UW's Geology Museum). It features 40 enlarged black and white portraits of female scientists—all donning beards and shot in a style that emulates historical portraits of prominent paleontologists, most of whom were male.

The premier of *The Bearded Lady Project: Challenging the Face of Science* attracted a large Laramie audience and caught the attention of Carolyn Gramling, a reporter for *Science* magazine. During interviews by Gramling, Lexi Marsh described how she was thoroughly impressed with her friend Ellen's professional success, but was "shocked" over dinner to learn that Ellen also had felt gender discrimination. She described how the idea of attaching a beard to our faces was a "2 a.m. moment of inspiration . . . a testament to Ellen's humor."

Gramling also asked how the film had been received. Marsh said the film is "weird and quirky enough" that it stimulates discussion better than asking about gender discrimination outright. "That's what art does really well—everyone will read into this in a different way." She added, some men asked, "Why does my colleague whom I respect feel the need to wear a fake beard? There's this slow understanding that there are issues at play that aren't being discussed and acknowledged."

Ellen's film career has just started; her award-winning success as a paleobotanist and classroom teacher has been noted in previous issues of our newsletter.

Greetings from the department head

The theme of my message is *coping with turbulence*. Turbulence in the atmosphere serves to dissipate excess heat and transfer chemical substances to and from organisms and the surrounding environment. That sounds great! But turbulence at a major research university has a different feel for sure. The University of Wyoming is going through some financial and organizational turbulence at present, and our department is learning how to cope. A major impact of the financial downturn in Wyoming is that faculty and staff positions released from folks who have left or retired are generally not being replaced. The department is shrinking a bit. This coming academic year we will be down to 14 faculty, compared to 19 at our zenith in 2013 when I started as department head.

Notably this last year Indy Burke and Bill Lauenroth took new positions at Yale University. Their departure represents a great loss. We are all being stretched to maintain our departmental commitments to excellence in research and teaching. However we were fortunate to complete the search for an ecological and evolutionary modeler before the start of the financial tightening last year. I am pleased to report that Dr. Daniel Laughlin from the University of Waikato in New Zealand will join our faculty this coming August. I am also quite hopeful that our dean and provost will approve our request to search for a new director of the Rocky Mountain Herbarium. Fingers crossed!

So while *turbulent* seems to be the best term to describe the current state at UW, our department is coping. Our successes reflect well on the excellent faculty, staff and students we have attracted to UW Botany. That is a source of great pride and bodes well for the future.

David Williams
Professor and Head

The Rocky Mountain Herbarium is one of the best

Founded in 1893 and housed on the third floor of the Aven Nelson Building, the Rocky Mountain Herbarium now contains 1.3 million specimens. The herbarium, fondly known as the RM, has the largest collection of Rocky Mountain plants anywhere in the world and is ranked in the top two percent of the world's herbaria.

Aven Nelson started the herbarium soon after becoming one of UW's first faculty members in 1887. It grew steadily over the years and became well known as an important research collection in the western states. In 1977 the RM had about 300,000 specimens, but when Professor Emeritus Ron Hartman retired last year the collection had increased to well over a million—the result of a prodigious amount of fieldwork and taxonomic research by Ron and his associates, namely RM Manager Burrell "Ernie" Nelson and 50 graduate students. For his leadership role, Ron was awarded the Distinguished Service Award of the American Society of Plant Taxonomists.

The acquisition of so many specimens in such a short time has led to the need for assistance. This led to the establishment of a corps of volunteer helpers known as Friends of the RM. Formed in October 2015 to raise awareness of the RM through public events and activities, the volunteers have now logged more than 5,000 hours towards processing a backlog of some 300,000 identified specimens. The labels have been printed but the specimens must be mounted so they can be studied without damage for the next century or more—just as Aven Nelson's specimens have been. Charmaine Delmatier, one of Ron's former students and coordinator of the Friends, says more help is needed, adding "You don't have to be a botanist to volunteer. We train you and you get to pick your own hours."

In Memoriam: Martha Christensen (1932-2017)

by Dennis Knight

Former students, colleagues, conservationists, and many friends were saddened to learn that UW Professor Emerita Martha Christensen passed away on March 19th in Madison, Wisconsin. She was 85 and fully enjoying her retirement years, driving her elderly friends to their appointments in her solar-powered Chevrolet Volt, entertaining visitors with her easy laugh and warm interest in their activities, joining friends on frequent bird-watching trips, and serving on an advisory board for the University of Wisconsin Arboretum. Martha retired from our department in 1989, but she continued to study her incomparable collection of soil micro-fungi with the support of the Pfizer Corporation and the National Science Foundation. Her last publication, in 2011, was titled, *Soil fungi: a new perspective*. In 2013 she received the prestigious Johanna Westerdijk Award from the Westerdijk Fungal Biodiversity Institute of the Royal Netherlands Academy of Arts and Sciences.

Martha came to the University of Wyoming in 1963 after receiving her Ph.D. in fungal ecology at the University of Wisconsin-Madison. She was the first woman to join the Botany Department faculty. In the first year she taught mycology, dendrology, plant morphology, and general botany. There was essentially no time for research during those early years, but Martha's persistence and abilities led to her being elected president of the Mycological Society of America in 1988. Other honors included "Woman of the Year" from the University of Wyoming Student Association (1971), the William A. Weston Award for Teaching Excellence from the Mycological Society of America (1991), and the Outstanding Former Faculty Award from the UW College of Arts and Sciences (1997). She was a generous supporter of our department, initiating endowments for the H.T. Northen Summer Fellowship and the C.L. Porter Summer Fellowship.

A world-renowned expert on *Penicillium* and *Aspergillus*, Martha examined soil micro-fungi in different types of soils and in different kinds of plant communities, finding many new species. She also studied mycorrhizal fungi, the fungal diseases of honey bees and bats, microbial sources of ice nuclei in clouds, fungi as indicators of past environments, and the fungal component of soil crusts in deserts. Supported by numerous grants, she published over 60 research papers and served as a mentor for 22 graduate students. Her students (listed below) were employed by Humboldt State University, Northern Arizona University, San Diego State University, University of California-Riverside, University of Colorado, University of South Florida, University of Wyoming, Coors Brewing Company, Scotts Lawn Care, and various community colleges, public schools, businesses and consulting firms.

Martha had a way with words. In an essay published in 2011, she described an experience that occurred when she delivered her collection of fungal isolates to a world-class depository in the Netherlands (Centraalbureau voor Schimelcultures). For the first two sentences she wrote, “New habitats create new species, I declared—as though it was a newly discovered phenomenon. My host remained quiet for a moment, and that in part may explain why I remember the occasion so well.”

As another example: “I was hired [at UW] after Dr. Bill Solheim [her predecessor in mycology] heard me give a talk on *Mortierella vinacea*—a beautiful little fungus that lives and works in forest soils. Perhaps I had an edge over the other applicants because I played the viola. The Solheims and Northens liked classical music and apparently there were only three other violists in Laramie at the time! At the first orchestra rehearsal, I was seated in the first chair! Music at UW was fun for me during the next 30 years.”

Martha had a deep interest in classical music, playing in orchestras wherever she lived. And, to the delight of everyone, she played tunes on an ordinary saw at Botany Department parties.

Aside from fungi and music, Martha was an avid outdoors person, backpacking into wilderness areas and taking bird-watching trips to Africa, South America, Australia and Europe. With frequent letters to the editor and reviews of National Forest management plans, she was admired for her tenacity in keeping land managers honest about their management decisions. In one of her letters about forest management she quoted Goethe (1749-1832), who wrote, “Nothing is more terrible than ignorance in action.” In another she urged readers to ask for the protection of all remaining roadless and wilderness areas in our national forests.

Martha was a generous member and leader of numerous conservation organizations, and she was featured in the book, *Ahead of Their Time: Wyoming Voices for Wilderness*. Her family suggests that memorials be sent to The Nature Conservancy or the Wyoming Outdoor Council.

A scholarship fund in Martha’s name will soon be announced, and a memorial event for Martha is scheduled for Friday, September 15, 2017 at 4 pm in the Berry Biodiversity Conservation Center. For further details contact dtuthill@uwyo.edu.

Martha is survived by her twin brother, Dr. James Christensen, and his wife Carol of North Liberty, Iowa, and two nieces and a nephew and their families. An obituary can be found at http://www.laramieboomerang.com/obituaries/dr-marthachristensen/article_6c16bb60-0f7d-11e7-91c2-47a51d696959.html.

Students receiving their M.S. or Ph.D. degrees with Martha: Jack States, Kum Hung Lee, Daniel Dolenc, Darwin Davidson, Maron Davis, Anthony Panalsek, Arla Scarborough, Andra Cassidy, James Halfpenny, William Shelby, Richard Fresh, Celeste Lupi, Dennis Clarke, Phoebe Holzinger, Robert Brown, Michael Allen, Beverly DeVore, Joan Rose, Terry Henkel, Peter Stahl, Julie Hicks, and Dorothy Tuthill.

UW botany professor makes big splash

Catherine “Katie” Wagner, an evolutionary biologist, joined our department in 2015 after earning her Ph.D. at Cornell and working as a post-doctoral research associate in Switzerland. During this time she became involved with a study of how more than 500 species of fish evolved in a mere 15,000 years in East Africa’s Lake Victoria region. Katie says this is “one of the most spectacular examples of the evolution of modern diversity.”

Katie Wagner, Jimena Benavides, Brittany Nordberg, and Jessica Rick on Lake Tanganyika

Katie and her collaborators in Switzerland demonstrated for the first time that the rapid evolution of Lake Victoria cichlids—brightly colored, perch-like fish—was facilitated by hybridization between two distantly related cichlid species from the Upper Nile and Congo drainage systems. While the precise course of events is yet to be reconstructed, it is clear that, after a dry period, Lake Victoria filled up again about 15,000 years ago. Descendants of the genetically diverse hybrid population colonized the lake and, within the evolutionarily short period of several thousand years, diverged to form hundreds of new cichlid species, each with somewhat different specializations—some scraping algae from rocks while others fed on plankton, cracked open snail shells, foraged for insect larvae, or preyed on other fish. The results have been compared to the rapid evolution of finches on the Galapagos Islands, as described by Charles Darwin.

The uniqueness of the cichlids became obvious when the investigators found that 40 species of other fish that colonized Lake Victoria at the same time have barely changed since then.

The study involved sequencing over 3 million sites in the genome of 100 cichlid species, a task that would not have been feasible ten years ago. The discovery that the ancestor of the Lake Victoria cichlids was actually a hybrid of two species from different parts of Africa makes this remarkable example of adaptive radiation easier to understand, Katie says.

Katie’s research earned her the 2015 Theodosius Dobzhansky Prize, awarded by the Society for the Study of Evolution to an outstanding young evolutionary biologist. News of her cichlid research was published in *Scientific American* and her papers have been published in *Nature*, *Evolution and Molecular Ecology*, and other prominent journals. In her lab, Katie uses population genetic, genomic, phylogenetic, and comparative methods to study diversification, from speciation processes to macro-evolutionary patterns of biodiversity.

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The Wyoming Apple Project

Dr. Steve Miller

Botany professor Steve Miller has been on a quest to locate and save the kinds of apples planted in Wyoming orchards as far back as the 1800s. Sometimes referred to as “sweet apples,” these trees were a convenient food source and some have continued to provide fruit for over a century. Unfortunately, the names of the specific cultivars are not well known.

Steve’s approach is to use molecular techniques for identifying the cultivars and to graft their shoots onto new rootstocks. Eventually he hopes that historic orchards around the state can be restored, such as the one at the Central Wyoming College Field Station in Lander.

There is currently great interest in restoring old apple trees to productivity and establishing new orchards, as heritage fruit is popular at farmers markets and for hard cider production. Steve and his associates are providing information on which cultivars are best for Wyoming’s various climatic regions.

This research is funded by the Wyoming Department of Agriculture Specialty Crops Program and the UW Agricultural Experiment Station. Additional information can be found in the article published by the Wyoming Livestock Roundup.