



1957 photo courtesy of New Mexico Tech archives

In Memory of Christina Lochman-Balk

1907–2006

Christina Lochman-Balk was an eminent Cambrian geologist and paleontologist and respected teacher. She died March 8, 2006, in Santa Fe, New Mexico, at the age of 98. At a time when very few young women were encouraged to continue their education past high school, Christina Lochman received both B.A. and M.A. degrees from Smith College, Northampton, Massachusetts. In 1933 she received her Ph.D. degree in paleontology from Johns Hopkins University in Baltimore, Maryland.

She held teaching positions at Mount Holyoke women's college (1935–1947) in South Hadley, Massachusetts, and at the University of Chicago (1947). She and her husband, Robert Balk, moved to Socorro, New Mexico, in 1952 where he had accepted a position with the State Bureau of Mines and Mineral Resources, a division of the New Mexico Institute of Mining and Technology. Following his tragic death in February 1955 in an airplane crash, Christina joined the bureau as a stratigraphic geologist and worked in the Capitol Dome area of the Florida Mountains. In January 1957 she transferred to the college division and a teaching position in the geology department, which she held for many years. Clay T. Smith, her colleague at New Mexico Tech, said that because she was a world-renowned trilobite expert, she immediately made the department world famous. "In addition to being a world-famous paleontologist, she could teach any courses offered in the department including optical mineralogy if necessary. The addition of Dr. Balk helped enable the department to increase the graduate offerings to a Ph.D. in Earth Sciences."

Christina was a pioneer in the male-dominated field of geology. Her research in Cambrian–Ordovician paleontology, shallow marine carbonates, and Paleozoic stratigraphy as well as her teaching career spanned more than 40 years. Colleagues and students admired Christina's brilliant intellect, indomitable spirit, physical stamina, warm personality, and great sense of humor.

"Christina was a major player in Cambrian paleontology of Laurentia in the middle third of the 20th century (1936 to 1968)," said A. R. (Pete) Palmer, Institute for Cambrian Studies, Boulder, Colorado:

She started her studies of Cambrian trilobites—that's the part with which I am most familiar—in the mid-1930s, encouraged by Josiah Bridge of the USGS as a counter-force to the dubious works of Charles E. Resser, at the U.S. National Museum (Smithsonian) who was the heir to the Cambrian work of Charles D. Walcott, the dominant figure in Cambrian geology of the early twentieth century. Most of her work dealt with descriptions of trilobite faunas of Late Cambrian age in Missouri, Texas, Montana, Wyoming, Idaho, and Newfoundland. In addition, she made a significant contribution to studies of the Lower Cambrian faunas of the Taconic region in New York, and to Lower and Middle Cambrian faunas from the Caborca region of Mexico.

As a result of her early work, she was invited to become a major contributor to the first edition of the trilobite volume in the *Treatise on invertebrate paleontology* published in 1959. Related to that work, she published a number of analyses and revisions of Cambrian trilobite taxonomy in the late 1940s and 1950s as well as a major summary paper, with James L. Wilson, on *Cambrian biostratigraphy of North America* in 1958.

In addition to her personal legacy, Christina supervised the post-doctoral work of William H. Fritz who went on to a significant career with the Geological Survey of Canada as the principal contributor to studies of Lower Cambrian trilobites and regional Lower Cambrian stratigraphy in the Canadian Cordillera. She also had a long collaboration with C-H Hu, subsequently a professor at Taiwan Normal University, on trilobite faunas of the northern Rocky Mountain region.

In 1960 Christina became the advisor to William H. Fritz while he produced a manuscript on Middle Cambrian trilobites that was sponsored by the National Science Foundation post-doctoral research fund:

It was the start of a special relationship that was intended to

last for a year and a half, but in fact never terminated. From the time of our arrival in Socorro, Christina included me and my wife, Judie, in her various circles of faculty, students, and friends. Judie and I had heard that the institute, being isolated in a little town, had its share of eccentrics, individualists, egotists, etc., and we enjoyed being part of that mix. Christina was welcome everywhere, and could be located by the sound of her laughter, or as the short, energetic member in a group, the one broadly gesturing with her hands. Elsewhere people knew of her whereabouts by the presence of her pickup truck. It was not the newest but usually the largest on the road. Male drivers, especially those who tended to be a bit "pushy," respected that truck.

Dr. Gerardo Gross, who came to New Mexico Tech in 1960 as a research geophysicist, recalled a field trip that November to the northern Franklin and southern San Andres Mountains, which was organized by the Roswell Geological Society:

That's where I first got acquainted more closely with Christina....The second-day field trip led by Frank Kottlowski and Roy Foster...covered Hembrillo Canyon in the San Andres Mountains. I stuck to Christina who raced from outcrop to outcrop (I had trouble following her) and explained the stratigraphy and fossils to me. She introduced the first biology courses at Tech (the biology department did not yet exist) because she recognized the need of a biology background for sedimentary geologists.

Christina recognized that geology was a non-traditional career choice for women, and she made a special point to encourage her female students. In the summer of 1936 Jane Matteson, a young geology graduate from Bryn Mawr, accompanied a slightly older Christina Lochman as her field assistant to the Bridger Range between Bozeman and Livingston in southwestern Montana. Jane's job was to help find and collect fossil trilobites, carry them out, and label them. When in camp her job was to cook and wash dishes as well. "The rocks that contained the trilobites formed the cliffs high in the mountains," Jane remembers. "We often began the morning by climbing 1,000 feet. By the end of the summer I had tons of fossils to wrap for shipment back east." This was during the Depression, and the field experience and camp food were payment enough for a young, aspiring geologist. Jane continued her education at Smith College in 1937, earned an M.S. degree in Rocky Mountain stratigraphy, and made a number of contributions to Wyoming geology.

Rena M. Bonem, professor and director of undergraduate studies in geology at Baylor University, recalled doing field work for her masters degree on Early Cambrian faunas in southwestern Montana with Christina 34 years later in 1970. "I remember hiking through the fields (some occupied by bulls) and mountains of Montana back 5 miles to a remote outcrop where there was a block whose surface was covered by trilobites. We carefully removed the entire surface and placed it in our backpacks. On the way back out, I thought I was going to die, and Dr. Balk just kept going. She finally stopped to take a break about a mile from her truck, and when I tried to stop, she said I could keep moving. I explained that I needed a break too, and she understood."

Rena recalled that field work meant returning hot and hungry to a camp without facilities. "It was over 100 degrees during the

day, and I asked if I could swim in the creek (it was so clear and blue and inviting); she said 'sure, go ahead.' What I forgot was that it was glacial melt water! I never got out of the water so fast in my life. All the time she was laughing." Camping with Christina also included her great tuna-macaroni casserole cooked on a Coleman stove and a day off to visit Glacier National Park.

Christina is remembered locally for befriending a great many of Socorro's cats. Rena remembered caring for 36 Siamese cats while Christina went to the International Geological Congress in Prague in late August 1968; however, as the first day of the technical sessions was to begin the Soviet Union invaded Czechoslovakia. "I still have an image in my mind of her stopping Russian tanks and telling them that she needed to get back to her cats because she had a novice cat sitter at home." Allan Sanford, who was a neighbor and professor of geophysics at New Mexico Tech, explained how she kept them all fed. "When the Rio Grande dried up nearly every summer in the early 1970s, we would recover from potholes a large number of carp that Christina would freeze and use as cat food.

Christina has a special place in New Mexico Tech's history, whether it's when she dyed her hair green for St. Pat's day or when a few students jokingly asked her to drop them off at the Owl Bar after a "sed.-strat." (sedimentation-stratigraphy) field trip to Carthage on a very hot day, and she did, saying with a chuckle, "Have a good time boys." Her six-hour finals for "sed.-strat." class were legendary. Christina had a rule that no one could turn in a test without answering every question. When one student answered a 10-point question "God did it!" Christina deducted nine points along with the comment, "What method did he use?"

In 1964 Christina established the Robert Balk Fellowship in memory of her husband to support research in geology. In 1986 she established the Christina Lochman-Balk Fellowship in stratigraphy, sedimentary geology, and paleontology to provide financial support for graduate students pursuing M.S. and Ph.D. degrees through the department. In 1996 she was awarded the President's Citation from The Paleontological Society for her distinguished accomplishments, and she was elected as a Fellow in the American Association for the Advancement of Science.

Christina moved from Socorro in 1993 to a retirement home in Santa Fe. Bill Fritz visited her in 1996. "She was making the most of her time by delivering free informational tours around the establishment."

On my last visit in 2001, I learned from the nurse that she tired easily, and I should limit my stay to under an hour. Fortunately I had brought a number of trilobite pictures mounted on plates for publication. Most of them were new, and we fell into an animated discussion as to their systematic position, their age within the Cambrian, and their living environment. When it was nearly time for me to go, Christina raised her index finger and wagged it my direction, just as she had done so many times in the past when she wished to make an important point. She then said, "You have to start getting this into the press right away." I countered by saying, "Well I am a long way from my home in Canada, and I am on my vacation." Her parting shot was, "Well then, hurry up with your vacation."

—Jane C. Love
Managing Editor



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1996 photo courtesy of William H. Fritz

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