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## **Obituary: Dr. Bonnie Anne Blickstein Blackwell (1955 – 2021)**



**Dr. Bonnie Anne Blickstein Blackwell** 1955 – 2021

Bonnie Blackwell, geoarchaeologist extraordinare, died in New York, September 8, 2021, aged 66. She was born April 8, 1955, in the small town of Paris, Ontario. In an interview a few years ago she noted that her first four years of school were in a one-room schoolhouse! At the age of 11, she saw a program on Louis Leakey and decided to be an archaeologist. The many people who knew Bonnie will not be surprised that she never wavered from this goal. She received her B.A. in anthropology from McMaster University in 1978 and her M.Sc. in geology in 1980, studying U-Series dating under Prof. Henry Schwarcz. Henry tells the story of meeting her:

"When Bonnie Blackwell was a junior in anthropology at McMaster University in Hamilton, Ontario, Canada, I gave a talk in one of her classes on the use of uranium series dating in archaeology. Something clicked in Bonnie's head and she came to visit me in the Dept of Geology to see if she could do a bachelor's thesis on this topic. I had never supervised an undergrad before and especially one with so little background in science. But she jumped on the project of dating archaeological sites in Israel using samples I had collected, learned the techniques of U series dating and soon was a proficient and careful analyst. We wrote our first paper together in 1979 and she submitted a B.A. thesis about 150 pages long covering every historical aspect of the topic!"

Her Ph.D. from the University of Alberta in 1987 dealt with amino acid racemization. She then returned to McMaster

for post-doctoral work with Henry, at which time she began her research using electron spin resonance (ESR) as a dating technique. We met at a conference in 1993 and began to collaborate two years later.

Almost all of her professional work, including roughly 150 contributions to journals and books, many, many conference presentations, and several technical manuals, relates to ESR dating. Within that one must note that she studied a wide variety of materials and sites, and answered many different questions, not just "How old?". Her projects came from every continent except Antarctica. For most of them, she was both excavator and analyst. A complete description of all of them is beyond the scope of this memorial. They can be grouped in four major categories.

First are her studies in human evolution. These included early hominins in the South African Cradle of Humanity, and the Acheulian in India. She also looked at questions relevant to the "Out of Africa" hypothesis, showing the possibility that humans could have crossed what is now the desert because water was available, if not plentiful, in every period, both glacial and interglacial. A study of kangaroo teeth was relevant to the settling of Australia. Recently she was concentrating on the presence of Neanderthals in Europe. Her interest there began with the finding of a bone flute at Divje Babe in Slovenia which she dated to at least 60 ka. Other areas included Uzbekistan, where she showed that only ESR could explain the stratigraphy of a site with Neanderthal remains, and Russian caves. At the time of her death, she was



Bonnie and Joel with one of their student groups at Williams

involved in a long-term study of Serbian and other Balkan caves, many of which have evidence of human habitation.

Bonnie's geological training led to studies such as tectonic uplift in Turkey, where she identified a previously unknown fault, and sea level changes. The latter proved useful in numerous dating studies of corals, where the dating range comprised several MIS stages.

Not all dating studies revolve around paleoanthropology, or areas with evidence of human habitation; some relate more to paleontology. Bonnie looked at multiple sites predating any hominin presence. For example, she studied the Miocene in China, and the Villefranchian in Europe. By identifying species present she also provided insights into paleoclimate and climate change.

Bonnie's contributions to the theoretical underpinning of ESR dating provide the fourth major category. While most ESR studies use mammal teeth or mollusc shells, she asked whether other materials were suitable. For some of these, such as shark and crocodile teeth, the answer was a decisive "no". Bone also provided more problems than solutions. Others were more promising, such as barnacles and stalagmites. Then she spent many hours investigating uranium uptake and leaching in teeth, factors that have a major impact on ESR dating. She promoted the use of isochrons for difficult sites and difficult samples. Another problem for ESR dating is 'lumpy' or complex sites; here she developed techniques for quantifying and including sometimes as many as nine different sedimentary factors into an environmental dose rate.

Most of her professional life was as a public high school science teacher in New York City. No account of her contributions would be complete without noting her work mentoring high school students. For over 20 years she sought out promising students and gave them serious, publishable, projects. Many were from low-income, minority and immigrant backgrounds. In 1999, with my assistance, she became a research associate with the Williams College Chemistry Department. She then set up the RFK Science Institute to formalize this structure. Her students gave presentations not just at science fairs, but at professional meetings. As well as science fair awards, several students won recognition from the Westinghouse (later Siemens-Westinghouse, and then Intel) contest. Roughly a dozen were state finalists or national semi-finalists, and one was a national finalist. As well as teaching all of the 100+ students the basics of first-class scientific research, Bonnie counselled them on college applications, encouraging them (often successfully) to 'reach'. For years afterwards she would keep in contact and be available for advice.

Bonnie was a Fellow of both the Geological Society of America and the Geological Society of Canada. Over the years she was principal investigator or co-PI on NSF grants totaling roughly \$600,000. As well as her publications, she was sought after as a reviewer for professional journals.

Dr. Joel Blickstein, Bonnie's husband, was a partner and colleague in this work. When RFK students came to Williams, for example, Joel would help them run the ESR spectrometer, while Bonnie supervised calculations of results. Tragically, Joel died a week after Bonnie. Bonnie and Joel are survived by Joel's children, Jason and Tina, and their families.

Bonnie's energy and enthusiasm led to a significant body of work around issues of paleoanthropology, paleontology, and geology. It is clear that we have lost a voice that still had much to contribute to our understanding of the past.

Anne Skinner