



ENDE DER UMLEITUNG  
CYNTHIA F. MOSS

---

Cynthia Moss is Professor of Psychology, Affiliate Professor of Biology, and Member of the Institute for Systems Research at the University of Maryland in College Park. In her research, she uses the echolocating bat as a model system to explore the dynamic interplay between auditory information processing, adaptive motor behavior, spatial perception, memory, and attention. She received a B.S. from the University of Massachusetts, Amherst in 1979 and a Ph.D. from Brown University in 1986. She was a NATO Postdoctoral Fellow at the University of Tübingen (1985–1987) and a Research Fellow at Brown University (1987–1989) before accepting a faculty appointment at Harvard University, beginning in 1989. At Harvard, Moss received the Phi Beta Kappa teaching award (1992) and was named the Morris Kahn Associate Professor (1994). She was an NSF Young Investigator 1992–1998. In 1995, Moss moved to the University of Maryland, where she has served as the Director of the Neuroscience and Cognitive Science Program and co-director of an NIH Training Program in Neuroethology. She is a member of the Society for Neuroscience, the Acoustical Society of America, International Society for Neuroethology, and the Association for Research in Otolaryngology. Moss was elected a Fellow of the Acoustical Society of America in 2001. – Address: Department of Psychology, University of Maryland, College Park, MD 20742-4411, USA. E-mail: [cmoss@psyc.umd.edu](mailto:cmoss@psyc.umd.edu).

The announcement on the M19 bus, headed back to the Wiko, was the signal that the next stop was ours: *Hasensprung. Ende der Umleitung*, end of the detour. It became so familiar over the course of 11 months that we hardly noticed it, even when the recording continued for a few days after the standard bus route down Koenigsallee was restored in

July. The end of the detour coincided with the end of the Wiko year, and as such, *das Ende der Umleitung* took on a new meaning. In fact, multiple meanings in different contexts: Departure from the ordinary. Digression. Alternate route. Fork. Circumnavigation.

*Departure from the ordinary:* It's a challenge to move a family of five, enroll the kids in school, help them find their way in a new environment and establish new friendships. All of this went exceptionally well for us, assisted for sure by the fact that this was our second time in Berlin and at the Wissenschaftskolleg. Most important for our departure from the ordinary was the generous support of the fellow services, reception, computer, household, and library staff at the Wissenschaftskolleg. It was both astounding and comforting to find so many familiar faces from our stay in 2000–2001 and to learn to know many new ones this year. We also felt the sad absence of Herr Riedel.

Our two boys went to the Kennedy School in Zehlendorf, where they had fabulous experiences, both academically and personally. One highlight of the year at the Kennedy School was the high school graduation ceremony, where our older son Jack marched, and where Thomas Quasthoff, an extraordinary (in the truest sense of the word) bass-baritone singer, gave a powerful speech with the message, “Do what you love!” Coming from a man who had overcome obstacles that most of us will never know, this speech was not only meaningful for the graduating seniors, but for everyone in the audience. It's also one of the amazing opportunities at Wiko, to take a detour to do what you love.

*Digression:* Living in the extraordinary city of Berlin exceeded all of our expectations. During this year, we enjoyed theater, ballet, opera, jazz, and blues. Having older kids this time around in Berlin also led us to new adventures, such as Tacheles and all-night Döner Kebap restaurants. Although much in Berlin was familiar to us, a lot has changed over eight years. The center of the city has truly shifted to Mitte district, construction around Potsdamer Platz is mostly completed, more beach bars have popped up along the Spree, Kaiser's on the Ku'damm is open until *midnight*. In addition, we experienced the demolition of the Palast der Republik and a new home for the Egyptian collection.

*German language course:* Other memorable digressions included German lessons, which enriched my experience not only through learning the language, but also through my classmates, a Russian historian/biographer/violinist, a philosopher/Wittgenstein scholar, a medieval historian, and my long-time friend and colleague in the field of bat echolocation. This class also offered tours of the city, films, museum visits, and barhopping, all organized by our dear teacher, Eva.

*Wiño Lunches and Dinners:* At home, I rarely find time for lunch. Typically at around 4 p.m. when hunger pangs prevent me from working, I run to the vending machine for a candy bar or, if I can afford the extra ten minutes, to the food co-op in the building next door for a sandwich. Here, the luxury of a three-course midday meal, mixed with conversations ranging from modern music to the evolution of deception, offered enriching digressions that certainly influenced my thinking, but the relevance and direction of this influence may take some time to fully digest. Dinners were even more so, punctuated by too much wine, which erased the guilt of indulgence.

*Tuesday seminars:* Once a week, an intellectual digression into a new field. At my home university, I interact with people from all different disciplines, but I don't have the opportunity to really learn about the problems that historians study, the issues that philosophers tackle, the approaches lawyers take to integrate theory with practice, the way literary scholars analyze text, and so on. I also learned a great deal from talks by Fellows in fields closer to my own, in Psychology, Biology, and Computer Science. The weekly seminars opened up many new worlds to me, and only time will tell where this may lead.

*Abschiedsfest:* A bonding experience with the other Fellows, spouses, kids, and, most importantly, the staff. We cooked, performed, danced, and danced, and danced.

*Alternate route:* Discussions and writing with the Scene Analysis Focus Group was hard work. Thinking is hard. Thinking outside of traditional molds is harder. This difficult task was great fun, however, because the members of our focus group worked very well together. Mike Lewicki, from Carnegie Mellon and now moving to Case Western Reserve, and Bruno Olshausen, from U.C. Berkeley, both computational neuroscientists, Annemarie Surlykke, a biologist from the University of Southern Denmark, and I constituted the Scene Analysis Focus Group. We brought to our group different skills, different ways of approaching scientific problems, and different areas of research expertise, but we also shared the view that one can learn a great deal about the analysis of natural scenes through close study of specialized animal systems. What perceptual problems do different animals have to solve in the natural environment? How have perceptual systems evolved to deal with different tasks? What is the role of movement in building a representation of the 3-D environment? These questions pressed us to develop a common framework to understand information processing and perception in the natural environment. We have written a draft of a *Brain and Behavioral Sciences* perspective that articulates our views on the analysis of natural scenes and suggests new approaches for making progress in addressing this problem. The format of *BBS*, which invites commentary from colleagues in

the field, will also allow us to engage a broad group of scientists in dialogue about the analysis of natural scenes.

*Forç:* In April 2009, our Focus Group held a workshop, *Analysis of Natural Scenes in Vision and Audition*, that involved a group of scientists from Europe and the U.S. Reinhart Meyer-Kalkus and Petria Saleh were key to the successful organization of this workshop. Each of the participants was invited to give two talks, one a provocative perspective on a particular problem in the field and the other a basic research talk with an emphasis on new data. In our workshop we covered a wide range of themes that spanned both vision and audition, and we considered unifying principles and elements involved in perceiving and organizing information from the outside world. A substantial amount of time was allocated for discussion of concrete problems, such as figure-ground segregation, the role of action in perception, the integration of signals over time and space, stream segregation, and motion. Discussion was so lively that we found it necessary to shorten our breaks and continue into the evening. Everyone left the workshop energized but also fully aware of how truly difficult our scientific problems are to effectively tackle.

*Circumnavigation:* Keeping my lab at Maryland going from afar. Not easy, but we still managed to get a handful of papers written and published. Many of these papers also benefited from the discussion and ideas that came out of interactions with the Scene Analysis Focus Group.

#### *Under review*

Ulanovsky, N. and C. F. Moss. "Dynamics of hippocampal spatial representation in echolocating bats." *Hippocampus*, submitted.

#### *Published*

Bohn, K., C. F. Moss, and G. Wilkinson. 2009. "Pup Guarding by Greater Spear-Nosed Bats." *Behavioral Ecology and Sociobiology* 4 May, DOI 10.1007/s00265-009-0776-8.

Chiu, C., W. Xian, and C. F. Moss. 2009. "Adaptive echolocation behavior in bats for the analysis of auditory scenes." *Journal of Experimental Biology* 212: 1392–1404.

Moss, C. F. 2009. "Echolocation." In *Sage Encyclopedia of Perception*, edited by Bruce Goldstein. Sage Publications, 2009, in press.

Ghose, K., J. D. Triblehorn, K. A. Bohn, D. Yager, and C. F. Moss. 2009. "Behavioral responses of big brown bats to dives by praying mantises." *Journal of Experimental Biology* 212: 693–703.

- Surlykke, A., K. Ghose, and C. F. Moss. 2008. "Acoustic scanning of natural scenes by echolocation in bats." *Journal of Experimental Biology* 212: 1011–1029.
- Chiu, C., W. Xian, and C. F. Moss. 2008. "Flying in silence: Echolocating bats cease vocalizing to avoid sonar jamming." *Proceedings of the National Academy of Sciences* 105(35): 13115–13120.
- Chiu, C. and C. F. Moss. 2008 "When echolocating bats do not echolocate." *Communicative and Integrative Biology* 1(2): 61–62.

*Ende der Umleitung?* As I wrap up my report, I ask myself, is this in fact *das Ende der Umleitung*? I think the answer is no. Moreover, I have come to believe that an Umleitung is a positive thing. For many, the term detour implies inconvenience, and it's easy to overlook the valuable aspects of departure from the ordinary, digression, alternate routes, forks, and even circumnavigation. I recognize the importance of this indefinite Umleitung for my research and personal life, and it may be the beginning of a longer detour. Most certainly, this year's Umleitung will lead to other branches of the detour, as our Scene Analysis Focus group finalizes our *Brain and Behavioral Sciences* paper and as the many friendships established continue in the years to come. For the Umleitung of 2008–2009, I am deeply grateful to the Wissenschaftskolleg zu Berlin and all of the people who shared in this year.

P.S. I am neither the first nor the last to resort to this simile, but I cannot help using it. The Wissenschaftskolleg zu Berlin is something quite close to paradise. The bird songs are an absolutely irrefutable proof of this.