



REFLECTIONS
GERALD S. WILKINSON

Gerald (Jerry) Wilkinson is Professor of Biology at the University of Maryland, College Park. He received a B.S. in Zoology at the University of California, Davis in 1977 and a Ph.D. in Biology at the University of California, San Diego in 1984. After postdoctoral fellowship experiences at the Universities of Sussex, Edinburgh, and Colorado, he became an Assistant Professor in 1987 at College Park. With over 115 publications in animal behavior, genetics, and evolution, his work has addressed a range of topics including reciprocity, communication, sexual selection, genomic conflict, speciation, longevity, and the evolution of language. Much of this work addresses the inherent tension between cooperation and conflict on different levels of biological organization from genes to various organisms, including several species of bats and stalk-eyed flies. Jerry received a Searle Scholar Award from the Chicago Community Trust and the Quest Award from the Animal Behavior Society and is an elected Fellow of both the Animal Behavior Society and the American Association for the Advancement of Science. – Address: Department of Biology, University of Maryland, College Park, MD 20742, USA.
E-mail: wilkinso@umd.edu

Before coming to the Wiko, I was chair of my department for four years. While I was not eager to be an administrator, I felt an obligation to give back to the institution that had helped me advance my career. I also thought that I might be able to make changes that would improve the lives of faculty, staff, and students. Within a month of my taking the job, the state (and therefore university) budget declined precipitously and I was told to decrease our \$5M department budget by 8%. That might not seem too bad, except that

almost all of those funds were used for salaries. Fortunately, a couple people decided to retire around the same time, and after some creative reassignment of duties as well as some new fundraising activities, I managed to avoid letting anyone go. But, that was just the beginning of four years of administrative challenges, which always seemed to arrive without warning. By year four, after three different deans and too many additional fires to enumerate, I was eager for a break and an opportunity to spend more time thinking about science, something that I found I had little time to do as department chair.

When I arrived at the Wiko, I planned to finish several papers that required additional analysis and writing, which I had been unable to find the time to do. I also hoped to develop some new research ideas that might attract federal research support. While I didn't get as much done as I hoped, I did manage to complete (with prior students, current postdocs, or collaborators) five papers, four of which have been published (Reinhardt et al. 2014, Rose et al., 2014, Wright et al. 2014, Wilkinson et al. 2014) and one of which is in review (Baker et al.). An additional paper was initiated during a workshop held at Wiko in May (Wilkinson et al. in review;) and drafts of two other papers were started at Wiko (Aktipis et al. in review; Boddy et al. in review). These latter two papers have been submitted for publication in a special issue of the *Philosophical Transactions of the Royal Society* on comparative oncology, something I certainly did not anticipate doing when I arrived in Berlin. I also made some progress in developing new research ideas related to my original Wiko proposal. My collaborators and I submitted three pre-proposals to the National Science Foundation in January and were pleased to be invited to submit full proposals in late July for two of them.

In addition to working on papers and proposals, I felt fortunate to be invited to participate in several workshops and meetings as well as give seminars and discuss research with students and faculty at a number of institutions during my stay at the Wiko. In addition to my Wiko colloquium, I gave seminars at three institutions in Germany: the Max Planck Institute for Evolutionary Biology in Plön, the University of Bielefeld, and the Ludwig-Maximilians University in Munich. I also gave seminars at the University of Bern, Switzerland, the University of Vienna, Austria, and the University of California, San Diego. In the fall I gave a talk about the potential for consciousness in bats and participated in a three-day meeting titled "The Emergence of Consciousness in Animal and Human Behavior: From Genetics to Cognition", which was organized by the Jean-Marie Delwart Foundation in Brussels, Belgium. At the very end of my stay I gave a talk on bat cooperation and participated in a three-day workshop titled "Social Evolution: Merits

and Limitations of Inclusive Fitness Theory”, held at Arolla in the Swiss Alps and organized by the doctoral program in Ecology and Evolution, which involves a collaborative network of universities in Switzerland. In addition to these invited presentations, I co-organized a workshop at the Wiko, titled “Mind the Gap: Closing the Gulf between Genomic and Phenotypic Studies of Sexual Selection”, which was attended by 15 people, and I co-organized a three-week course on Animal Communication with two past Wiko Fellows, Uli Schnitzler and Cindy Moss, which was attended by six graduate students from the University of Tübingen and six graduate students from the University of Maryland. This intensive course involved one week of lectures and student presentations at the Wiko in January and two weeks of field projects be conducted on Barro Colorado Island, Panama, in August.

One very unanticipated outcome of my Wiko experience was getting involved with the Cancer Evolution Focus Group. When members of that group mentioned to me that it would be interesting to see if cancer-like phenomena are present in different lineages that have independently evolved multicellularity, I realized that my background in organismal evolution might be useful, so I offered to help. This led to some extensive literature searches, followed by group meetings to share findings and eventually joint writing sessions. These meetings and discussions made us realize that the evolution of extreme traits, the emphasis of my focus group, could have some interesting consequences for the evolution of cancer. This led to a second collaboration that eventually included Hanna Kokko, who, shortly after she arrived in May, came up with a nice theoretical framework that links these two seemingly unrelated phenomena. Perhaps the best part of these interactions was that I genuinely enjoyed both the people and the issues. Science can sometimes get tedious. This was fun.

A second unanticipated aspect of my Wiko experience was getting to know the wonderful and engaging group of Life Sciences Fellows, several of whom became active participants in our Focus Group on extreme traits. While these Fellows were at an earlier stage of their careers, they were uniformly bright, articulate, and well-read. Consequently, it was extremely easy to treat them as peers and involve them in activities. For example, in the fall, Seth Barribeau regularly came to our focus group meetings (which were run much like a journal club) and helped plan the spring workshop. He, Elena Arriero, and Andy Higginson then all came back in the spring for the workshop that we organized and all three have been actively involved in writing the resulting paper. Their participation helped to keep the workshop discussions on track and undoubtedly was good for

them, since they had the opportunity to meet several senior members in the field, as well as discuss currently contentious issues. In addition to these three, Natasha Mhatre generously gave a wonderful lecture in our class on Animal Communication, which the students and organizers enjoyed and appreciated. I also enjoyed discussing the challenges of starting a lab as a new faculty member, something both Seth and Kasia Bieszczad will be doing soon.

Finally, a third aspect of the Wiko experience that I truly enjoyed was listening to and learning from my Co-Fellows each week during and after colloquia. To my chagrin, I realized that I had never heard a non-science talk in my academic career before the Wiko. I presume there must be worthwhile seminars in other departments, but I am at a large university where there are far more science talks every week than I could possibly attend, let alone those from outside the sciences. So, the first few Tuesdays were eye-opening. I discovered I was generally intrigued and fascinated by what each person had to say. I suspect I failed to understand aspects of some talks, but I felt like I usually understood the approach and the issues. It was fascinating to see the similarities and differences between disciplines, including those between biology and sociology, but also between sociology and history, or even different epochs in history, literature, or music. It was intriguing to hear people from different fields describe when they thought modernity began. I felt like I gained an appreciation of the challenges and virtues of the fields represented by Fellows in our class.

While the Wiko certainly gave me ample time to read, write, and think about the science that I had hoped to pursue, I was pleasantly surprised that it also provided much, much more. As someone who typically eats a sandwich by himself at his desk for lunch, I was unsure whether I would enjoy having a large meal every day and be forced to talk to people I did not know and whose fields were distant from my own. My concern did not last long. Lunchtime conversations were invariably engaging and often spanned a wide range of topics. The wide range of the Fellows' ages (from recent Ph.D. to recent retirement), gender, nationality, discipline, and interest made every table a unique and fascinating experience. As time went on, I discovered that I was getting to know and like the Fellows in our class far better than most people I have been around. Consequently, I began socializing on the weekend or in the evening with various combinations of Fellows. I think I heard more concerts and saw more football games (thanks of course to the World Cup) than I had in the preceding ten years!

Unfortunately, my wife was only able to spend three months in Berlin, but she came with the goal of seeing as many Rembrandt paintings as possible. So, while she was visiting, on many weekends we took trips to visit museums. She also accompanied me on seminar trips if there was an interesting museum nearby. Consequently, I ended up visiting a number of exceptional art museums in Amsterdam, Berlin, Brussels, Dresden, Hamburg, Leipzig, Munich, and Vienna. Before long, I found that I was looking for paintings by my own Dutch favorites (Hieronymus Bosch and Jan Vermeer) in addition to the French Impressionists that I have enjoyed since college. I also discovered other artists that I had not known (Max Liebermann, Isaac Israëls) but whose paintings seemed to resonate with me in ways that I can't completely explain. These museum visits, in combination with the Wiko colloquia, evening events, and concerts, provided me with opportunities to appreciate the arts and humanities in both academic and personal ways that I will not soon forget.

Reflecting on this past year makes me realize how unusual and extraordinary the Wiko experience is. But, having spent some time as an administrator, I know that such an experience is only possible if the organization is run well, the staff enjoy their jobs and are good at them, and there is a vision that is embraced by those at the Institute as well as those who support it. When I first arrived, I must admit to being somewhat perplexed as to what each staff person did, but as time went on and I witnessed the range of activities that occur every week, I gained a much better idea. Nevertheless, I remain amazed at how everything seemed to run so smoothly. In my experience, keeping 40 academics happy is no easy task. But, freedom, respect, and opportunity are critical. The Wiko staff have created just such an environment and I feel very lucky to have experienced it. I am tremendously grateful for having had the opportunity to be part of this remarkable family.

References

- Rose, E. G., Brand, C. L., and Wilkinson, G. S. (2014). "Rapid evolution of asymmetric reproductive incompatibilities in stalk-eyed flies." *Evolution* 68: 384–396 (10.1111/evo.12307)
- Wright, G. S., Chiu, C., Xian, W., Wilkinson, G. S., and Moss, C. F. (2014). "Social calls predict foraging success in big brown bats." *Current Biology* 24: 885–889 (10.1016/cub.2014.02.058)

- Reinhardt, J. A., Brand, C. L., Paczolt, K. A., Johns, P. M., Baker, R. H., and Wilkinson, G. S. (2014). "Meiotic drive impacts expression and evolution of X-linked genes in stalk-eyed flies." *PLoS Genetics* 10:e1004362 (10.1371/journal.pgen.1004362)
- Wilkinson, G. S., Christianson, S. J., Brand, C. L., Ru, G., and Shell, W. (2014). "Haldane's rule is linked to extraordinary sex ratios and sperm length in stalk-eyed flies." *Genetics* 198(3): 1167–81.
- Baker, R. H., Reinhardt, J. A., Narechania, A., Johns, P. M., and Wilkinson, G. S. (in review). "Abundant gene duplication and X-linkage among testes-expressed genes in stalk-eyed flies (*Diopsidae*)." *PLoS Genetics*.
- Wilkinson, G. S., Breden, F., Mank, J. E., Ritchie, M. R., Higginson, A., Radwan, J., Jacquierey, J., Salzburger, W., Arriero, E., Barribeau, S. M., Phillips, P. C., Renn, S. C. P, and Rowe, L. (in press). "The locus of sexual selection: Moving sexual selection studies into the post-genomics era." *Journal of Evolutionary Biology*.
- Aktipis, C. A., Boddy, A., Jansen, G., Hibner, U., Hochberg, M., Maley, C., and Wilkinson, G. S. (in review). "Cancer across life: Cooperation and cheating in multicellularity." *Philos. Trans. R. Soc. Lond.*
- Boddy, A., Kokko, H., Breden, F., Wilkinson, G. S., and Aktipis, C. A. (in review). "Cancer susceptibility and reproductive trade-offs: a model for the evolution of cancer defenses." *Philos. Trans. R. Soc. Lond.*