



THE RED QUEEN AT THE WIKO;
LONG LIVE THE RED QUEEN!
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Catriona MacCallum has a background in both science and academic publishing. She grew up in Scotland and studied Zoology at Edinburgh University, remaining there to do a Ph.D. on the genetics and ecology of speciation. She continued with research in South Africa before returning to a teaching post in Edinburgh. In 1998, she decided she wanted to be more involved in science communication and joined the Elsevier journal *Trends in Ecology & Evolution* as Assistant Editor, becoming the sole Editor in 1999. She resigned to join the Public Library of Science, founded by the scientists Pat Brown, Mike Eisen and Harold Varmus, in July 2003 just before the launch of their first journal *PLoS Biology*. She works as a Senior Editor on this journal and advocates for open-access publishing. – Address: Public Library of Science, 7 Portugal Place, Cambridge, CB5 8AF, Great Britain. www.plos.org

“Now! Now!” cried the Queen. “Faster! Faster!” And they went so fast that at last they seemed to skim through the air, hardly touching the ground with their feet, till suddenly, just as Alice was getting quite exhausted, they stopped, and she found herself sitting on the ground, breathless and giddy. The Queen propped her against a tree, and said kindly, “You may rest a little now.”

Alice looked round her in great surprise. “Why, I do believe we’ve been under this tree all the time! Everything’s just as it was!”

“Of course it is,” said the Queen: “what would you have it?”

“Well, in our country,” said Alice, still panting a little, “you’d generally get to somewhere else – if you ran very fast for a long time, as we’ve been doing.”

“A slow sort of country!” said the Queen. “Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”

(Lewis Carroll. *Through the Looking-Glass and What Alice Found There*)

There is a famous hypothesis in evolutionary biology based on this scenario between Alice and the Red Queen, which is typically used to explain the coevolutionary “arms race” that occurs between parasites and their hosts (as well as other interactions such as those between predator and prey). The idea of selection for recurring adaptation and counter-adaptation is straightforward; the parasite and host just go round in evolutionary circles – each forever changing but neither gaining the upper hand for any length of time, even if the sophistication of their weapons increases.

That the Red Queen was also operating at the Wiko first became apparent when I realised that the projects I came armed with at the outset continually changed shape, yet barely diminished in size. Of course, this is true of most research and scientists: ideas propagate ideas. Even a published paper, the seemingly finished product of much hard work, is usually just one step forward. But I began to realise that such dynamics were equally true of the extraordinary group of people gathered together in the confined space of the Wiko. The ritual colloquia on Tuesdays provided the formal arena, but each day ideas abutted ideas and a rich diversity of academic subjects, intellectual traditions and personalities clashed or coalesced. In these recurring rounds of cultural comparison and competition, adaptation and counter-adaptation, even those seemingly impervious to change could not remain untouched for long.

Aspects of my new environment delighted and bemused me in equal measure. As a professional science editor, my usual daily routine involves reading and evaluating potentially cutting-edge papers about any and all aspects of ecology and evolution. Although I love the science, my broader interest is in science communication. In this regard, I found discussions after the colloquiums very curious. I am certainly not the first biologist to bring this up (just glance through previous issues of the *Jahrbuch*), but the realisation that the typically short and direct question of a natural scientist could be seen as naïve at best and rude at worst soon dawned on me. I also learnt that the way one argued a point could be more important than the evidence in support of it, and that something explained simply and clearly could be seen as not sufficiently scholarly. As an editor in the life sciences, I also found it curious that in the humanities previous authors or deceased scholars are so often quoted in the present tense, almost as if they were still among us, whereas natural scientists always use the past tense for things past, in the hope, as was Alice’s expectation, that things have moved a bit farther.

At a smaller scale, Red Queen dynamics were also part of our *Schwerpunkt*. I was invited to come to the Wiko to join Randolph Nesse’s group on evolution and medicine. Although

we were all biologists, our backgrounds were very different: physicians, basic researchers (but different sub-disciplines), editors and sometimes a combination of these. Even though some of us had met briefly before coming to Berlin, we did not know each other personally, and new members with a range of interests joined our group throughout the year. Our aim was to explore the intersection of evolution and medicine, to learn from each other and to come up with strategies that would help stimulate an understanding of how evolutionary thinking could provide a framework for treating health and disease.

There are several highly established sub-disciplines for which evolutionary research is directly relevant to medical research and public health, in particular the more molecular-based fields such as human genetics and genomics, infectious disease and ageing, as well as evolutionary psychology and evolutionary anthropology. Our Tuesday discussion meetings roamed this landscape – from the evolutionary origins of disease, to pharmacogenomics, depression, nutrition, cancer and medical education. Within all of these fields, communication among researchers is (reasonably) effective, yet there is surprisingly little interaction between fields and often a distinct lack of medical understanding on the part of evolutionary biologists and vice versa. One project we initiated – an experimental interdisciplinary publication – was aimed at breaking down these barriers. As Bob Perlman pointed out, such barriers potentially extend even to language: evolutionary biologists focus on conflict, competition and variation (as indicated by my opening paragraph), whereas the medical and public health community centres on cooperation and the identity of a normal genotype/phenotype.

Outside the *Schwerpunkt*, I started research for my book about evolution for children and have Paul Schmid-Hempel to thank for giving me the inspiration for some of the chapters. Given my other projects, I didn't get nearly as far with this as I had hoped.

I spent much of the year reading and researching the rapid changes that are occurring in scholarly communication, particularly as it relates to the life sciences and the move towards open-access publishing, of which I am a part. It was especially pleasing to be able to do this at the *Wiko*, where the Berlin Declaration on Open Access was formulated and where Larry Lessig developed ideas about the Creative Commons (<http://creativecommons.org/>). Open-access publishing is not only about making the literature freely available to read but also about removing permission barriers around that information and treating knowledge as a public good. It is this crucial latter aspect that can stimulate innovation. During my year, I gave several talks in and around Berlin about this and have been invited back for more. I also attended a Max Planck workshop at the Institute for the History of

Science about the relationship of museum collections to scholars and publishing. It was revealing to me how much the humanities are engaged with the same issues of intellectual freedom as we are in the life sciences (e. g. see <http://openhumanitiespress.org/> and <http://echo.mpiwg-berlin.mpg.de>). Conversations with the forward-thinking Gesine Bottomley, who is initiating the Wiko digital repository, reinforced this, while Permanent Fellow Raghavendra Gadagkar also challenged my preconceived ideas about open-access having a natural home in countries such as India – a discussion we are continuing.

Yet it is not just the environment at the Wiko that challenges you to adapt your thinking. The Wiko has a powerful and enigmatic partner in its host city Berlin. Berlin confronts its history in an almost brutal way: there are constant reminders – at least of National Socialism – from the *Stolpersteine* to *Gleis 17* at our local S-Bahn as well as exhibitions about the GDR period. The contrast with other cities is stark. Contemporary Berlin with its three great opera houses and world-class museums also captivated my partner Peter and me. We walked all over the city, never tiring of the sense of space and efficiency. Other weekends we spent exploring the surrounding towns, villages and countryside. East German countryside is a revelation for biologists, as there are extensive remnants of undisturbed, almost pre-industrial farmland still inhabited by Great Bustards, Common Cranes and White Storks, long since vanished in the West.

And, like Alice at the start of this essay, I also literally ran throughout the year. Working at the Wiko also gives you the Grunewald – a large, ever-changing expanse of mixed deciduous and evergreen forest on the doorstep, replete with boars and woodpeckers. My aim was to exercise my body as well as my brain (which had the welcome side-effect that I could eat more of the wonderful food that the Wiko provided). I also had the encouragement and company of my much more experienced running partners, Bob Perlman and Fe Hentschke. The “forest talk” I had with Fe also opened my eyes to many of the other projects at the Wiko and every Thursday I learned as much from her about trans-regional studies as I did about how to pace myself during the Berlin half-marathon she and Bob persuaded me to enter.

The other constant of my year was the German language. I knew no German at the beginning so took the intensive course (which is a huge help). I wrestled with the grammar, like numerous others before me (read Mark Twain if you are intending to learn), but loved the complexity and subtlety of thought and its logic (and the numerous frustrating exceptions). Eva was enormously patient and encouraging, as were many of the staff, in trying to nurture my understanding and I was pleased with my progress by the end of the year,

although I craved the fluency that would have enabled me to talk some sense with ease. Alas, older brains are not so flexible and I could only envy the Fellows' children, who soaked up the language like a sponge. But I was sorry that the language issue created such a barrier at the Wiko and wished there had been more leadership about this. The Fellows and their spouses came armed with diverse languages – an array of Indian languages, Arabic, Afrikaans, French and Swedish, besides the English that all natural scientists worldwide use daily as their *lingua franca*. That so many were trying to learn German, no matter how badly, should have been a cause of celebration, not division.

Towards the end of the year, Mark Thomas gave a talk on the evolution of culture in which he provided evidence that a crucial factor in the transmission of a particular intellectual or practical skill was likely to be the size of the group. The harder the skill, the larger the group required for it to persist. Those from the developing countries occasionally talked about their “third world” table and how it was difficult to make an impact on the overtly Western tradition of scholarship around them. I also think there were not enough natural scientists to engage constructively with the ideas of the wonderfully creative minds we had around us. But this is not a complaint, just a call for more institutions like the Wiko, where the Red Queen and Alice are invited to stay.