FREEDOM AND CONSTRAINT AT THE WISSENSCHAFTSKOLLEG ZU BERLIN

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Is there such a thing as an academic who wants less freedom? There can't be – right? The Wiko is freedom; an academic "happy hunting ground", but without the inconvenience of death or Great Plains Native American afterlife beliefs. And there are the buildings, the surroundings, the history, the city, the staff, the catering, the colloquia, Thursday dinners, the freedom (did I mention the freedom?), and, of course, the Fellows. I want more free-

dom; I did before I went to the Wiko and I still do today. But I'm no longer convinced that I fully know how to use it. My time at the Wiko was a failure because I didn't spend more time talking to more Fellows, I didn't ask more questions in the colloquia, and I didn't exercise my freedom enough. Other than that, it was an enjoyable, productive and unforgettable experience.

In my time at the Wiko I mostly worked on 3 things:

Modelling the effects of demographic processes on the accumulation of culturally inherited skills. This project was mostly based on simulating key aspects of the transmission of learnt abilities and was aimed at explaining the Upper Palaeolithic Transition, sometimes referred to as beginnings of behavioural modernity. This critical stage in human evolution occurred around 40 to 50 thousand years ago in Europe and Western Asia, but – on current evidence – somewhat later in Southern and Eastern Asia and Australia. However, many of its features make transient appearances some 90 thousand years ago in sub-Saharan Africa, where we see the first art. It is associated with a package of increased cultural and technological complexity, including the appearance of advanced stone tools, bone and antler tools, new hunting technologies, body decoration and ornamentation, musical instruments, long-distance raw material exchange and art. I was interested in the extent to which migrational activity between separate human populations could determine the maintenance or loss of skills and technologies. A key finding is that Palaeolithic technology accumulates better in interconnected regions. Using genetic estimates of population density change over time, I found that the model I developed predicts the early appearance of behavioural modernity in Africa some 90 thousand years ago.

The co-evolution of lactase persistence and dairying in Europe. Lactase persistence – the ability to digest the milk sugar lactose as an adult – is common in people of European descent but, with the exception of some Middle Eastern, southern Asian and African pastoralist groups, is rare or absent in other parts of the World. Together with colleagues in Germany, I had previously shown that this genetic trait was rare in early Neolithic Europeans, indicating that it had been the target of very strong natural selection. Using computer simulations and newly developed statistical tools, I was able to infer that this trait, in co-evolution with the culture of dairying, originated around 7500 years ago among the progenitors of the first widespread farming culture of central and northern Europe, the *Linearbandkeramik* culture.

Working with my other Evolutionary Medicine colleagues (Randy Nesse, Catriona MacCallum, Bob Perlman, Carl Bergstrom, Dietrich Niethammer, Hans Biesalski, Raghavendra

Gadagkar and Peter Hammerstein) on developing the field. Evolutionary Medicine is a very young field that is still finding its identity. There is no doubt among evolutionary biologists that "evolutionary thinking" has the potential to influence medical practice and drive forward research in many directions. In my own area of research, human genetics, "evolutionary thinking" is already having a profound impact in, for example, understanding how genetic variation influences susceptibility to disease. With massive investments in initiatives such as the human genome project and the International HapMap Project, as well as orders-of-magnitude improvements in genotyping technologies over the last few years, there is no doubt in my mind that the impact of "evolutionary thinking" in medical genetics will increase. But there are many more ways that this mode of thinking can impact medicine. Have some medical conditions (neonatal jaundice, morning sickness, depression etc.) actually evolved to protect us against more serious, but mostly "hidden outcomes"? Are modern diseases like diabetes the result of a mismatch between an ancestral diet – to which we have evolved – and a modern, high-calorie diet? These are reasonable hypotheses, but a major problem that we identified is: What are the appropriate standards of evidence to support these hypotheses? Evolutionary mechanisms that are merely consistent with the presence of certain medical conditions are interesting, but this in itself is not sufficient evidence that we know why those medical conditions exist. The real problem is that, as with all cross-disciplinary fields, standards of evidence are shaped to the data available and the questions being asked. It maybe some time before widely accepted standards of evidence appear in Evolutionary Medicine. But that doesn't change the fact that it is a fascinating and diverse field with potentially breathtaking explanatory powers.

We spent much of our time discussing published studies. Sometimes we trashed them, sometimes we loved them, but mostly we argued our way through them; and always we taught each other new things – one of the great benefits of having such a diverse *Schwerpunkt*. We also organised a very successful workshop on Evolutionary Medicine with the generous help of the Wiko and Peter Hammerstein / The Institute of Theoretical Biology in Berlin. This workshop was a high point and generated lively discussion and the conviction that some really hot science was being done in the field. We also setup *The Evolution and Medicine Review*. When I say "we", I actually mean Catriona and Randy. I'm always happy to take credit for other peoples work, even if there is no justification for it at all.

There was much talk at the Wiko about the old "Two Cultures" thing. Having flipped through some Wiko "Jahrbuchs", I can see that this is hot topic. Well it seems to me that two [Cultures] is something of an underestimate. To put it in statistical terms, Mr. Snow's

categories explain only a fraction of the observed variance in the interests, debating styles, support criteria and sociability of the other Fellows. To me the most obvious dichotomy was in the use of the "see how much I know" (SHMIK) questions following presentations; it was as if some considered direct questions impolite. Other dichotomies (sit – stand, read – speak, quote – no quote) were present and have been explored in great detail by former Fellows, but to my relief there were enough Fellows who couldn't easily be categorised; may they live long and prosper.

I'm not going to generate an exhaustive list of thanks but I would like to acknowledge two groups of people in particular. Firstly, for being completely unable to find a dull subject for discussion, I'd like to thank the Evolutionary Medicine Focus Group. Secondly, those silver-tongued Cavaliers, the Philosophers. The major driving force for me wanting to learn new things is a fear of feeling stupid, and Philosophers always make me feel stupid. Thanks!