Sweetness and

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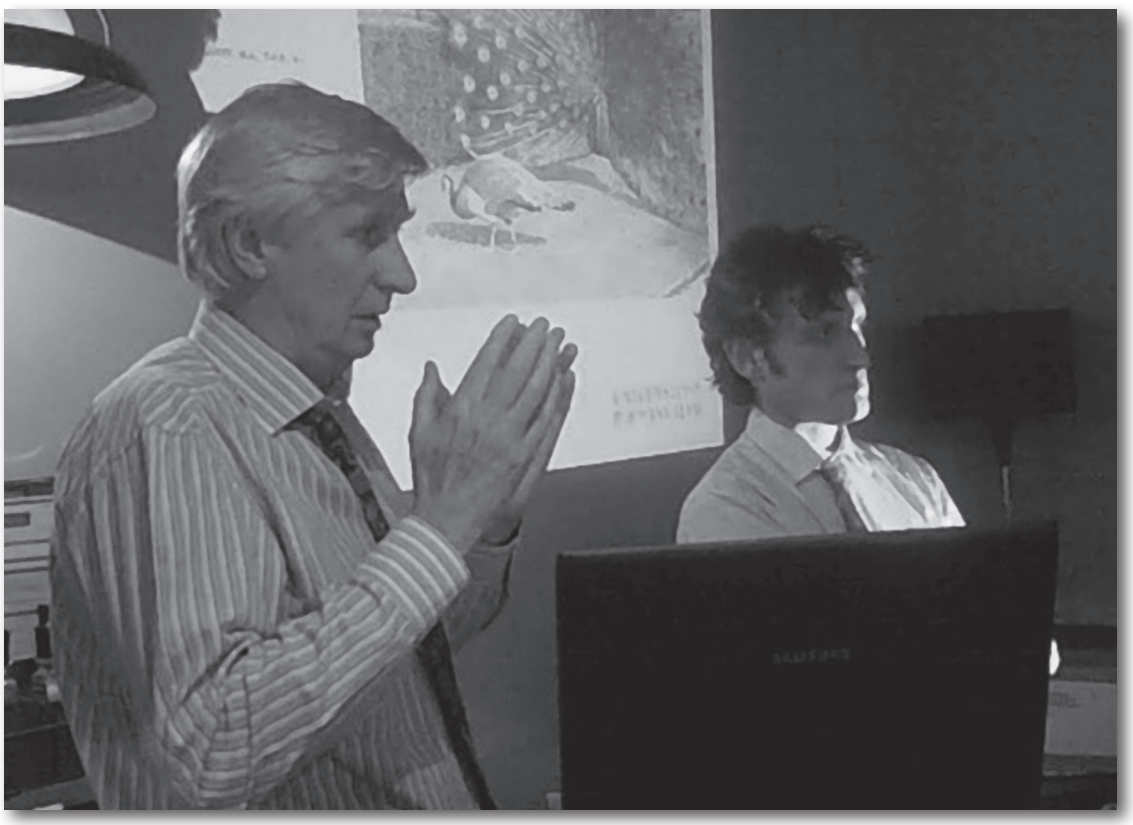
One day after Darwin's Birthday I travelled to Shrewsbury to contribute to the Darwin Festival, organised by the Shropshire Wild life trust, representing both the University of Birmingham and the Society for Experimental Biology. I was booked to deliver two sessions; a talk about Darwin and a *Café scientifique* on the evolution of complexity.

It's a lesson never to agree to something too far in advance. A few days before the event, I thought I'd better see what I'd agreed to do. Far from being my off-the-shelf dour historical description of the development of evolutionary thought, my billing indicated that the speaker (me) was "a flamboyant, inspirational scientist from Birmingham University" (one out of three!) and that the audience would find out what it's like to "be a scientist and learn about evolution and the world of science". The thought of a dissatisfied audience spurred me into thinking how I could even come close to matching the publicity: I have to talk about Darwin, be interesting and bring in some aspects of research. In the great traditions of scrapheap challenge I took two rusting hulks of presentations, cut them in half and welded them together.

The first talk I used was a 'Plants and Pressure' presentation. Here, the audience interact by having their lung pressure measured (and get sprayed in fizzy cola as measuring the pressure in a drink bottle went wrong). The talk built up the idea that pressures in animals are low while those in plants are much higher. It then went on to consider the highest pressures in plants (around 40 bars since you ask). These pressures are



John Newbury (left) and Jeremy Pritchard presenting at the Darwin Festival in Shrewsbury

light

found in the phloem. This transport channel is exploited by aphids, introduced as the mosquito of the plant world.

Cunningly using the glue of Darwin's wide interests that range from plants (*The Power of Movement in Plants*, *On the various contrivances by which British and foreign orchids are fertilised by insects* etc) to animals (*The Descent of Man, and Selection in Relation to Sex*) I was able to use bits of a second talk on human evolution to complete the presentation. The 'Human Evolution' talk started with washing machines, moved through ladders, family trees and then used Fernando Torres to introduce bipedalism in humans. The audience were encouraged to measure their own humero-femoral index, and reassuringly, only a small proportion of the audience proved to have characteristics of brachiators!

In the final demonstration a small child was drowned (well, dunked). This was a positive for me since normally when visiting schools the health and safety issues do not allow the students to take part. However, with the parents in charge as opposed to teachers, a willing young volunteer was chaperoned to the front by his mother. In this experiment the heart rate of the volunteer is measured while they immerse their head in a bowl of cold water. If the dive response is present then the heart rate immediately slows. I'm pleased to say that my enthusiastic helper showed a classic and clear response.

After a short break it was time for the second event. A quick check of what was advertised was not reassuring. Apparently I was to deliver a lively evening of evolutionary chat covering randomness, Boeing 747s and Kylie Minogue. I had recruited my friend and colleague, Professor John Newbury of the University of Worcester and Chair of the Biochemical Education Committee to ride shotgun on this one, and it was as well I did as over 70 people crowded expectantly into the coffee bar.

We started outlining the principles of evolution and the absence of direction in the evolutionary process. A frequent criticism of evolution is that complexity cannot arise from chance events. If a wind blows through a scrap yard it cannot form a Boeing 747. This is of course true; however, while Natural Selection has a random component, namely genetic

Charles Darwin

mutation, whether an organism survives depends on which variation it possesses. As Dawkins concisely states: "Evolution is the non random survival of randomly varying replicators."

Using the analogy of the crossword puzzle, where having some of the letters is better than having no letters, we argued that 'perfection' is not the inevitable outcome of evolution, all that is needed is that the previous stage is better (fitter) than the previous; one more letter increases the chance of successfully completing a clue.

As the evening went on audience interaction increased and some excellent discussion developed, particularly around the issue of whether any mutations are in fact advantageous. It turned out that some contributors had more than a curiosity-driven interest in the subject, instead coming along with a ready-made belief position. It's always difficult to have evidence-based discussion from such a position, but we tried our best.

After two and a half hours it was all over, different from a lecture but more stimulating (and stressful!). I think Darwin would also have approved of this evening, and he would have had a shorter journey home. ■