Science in the Wild

In popular culture there seem to be two kinds of scientists. The first are asocial with an encyclopaedic knowledge of procedures and theories that they can swiftly search and use in the pursuit of a solution. The second are the 'mad scientists' working outside the mainstream, breaking protocols and inventing new methods. The former is methodical and measured, the latter protean and risky.

The modern psychology undergraduate would be forgiven for thinking that the first caricature is closer to reality. Most BSc Psychology programmes offer a diet of research methods modules that teach statistical analyses in the context of tried and tested experimental paradigms. For example, a student will learn about ANOVA designs using a simple cognitive experiment and multiple regressions within the context of a battery of instruments and a measure of health behaviour. The lecturers use these lab classes because they will consistently deliver a result that can be interpreted and discussed – for the interpretation of an SPSS printout is the predominant learning outcome. At the end of the first two years a student is considered armed with a suitable array of tools to then proceed to a final year project. Inevitably the hope is that they will apply a reasonably sophisticated analysis to an experiment that they have designed under supervision. If successful, they then graduate.

The skills conveyed through the above practice are useful. But, let us be clear about what is not being taught. Students are not asked to think about a problem of psychology and work out a method for investigating this. So problems are not articulated and are not refined into a testable hypothesis, methods are not invented and thought through, the kind of data captured is not discussed for its merits and demerits, and a process of true experimentation with continuous tweaks is not undertaken. Finally, analysis is not seen as something to think about, but merely as something to apply. Students are instead asked to accept a set of methods and analyses and not to question their limitations. Our pedagogical model is one where the procedural nerd is Queen.

I would claim that without such engagement students might never have the opportunity to grapple with the core of their discipline. For example, psychology graduates should be able to discuss what behaviour is, and what it is for, from which they should have a sense of what can be measured and of the limitations of those measurements. These are the conceptual underpinnings of our

discipline, and the best way to understand their history and role is to have an opportunity to reinvent them and to play. And play is the nub of this. The second caricature is really that of the ludic scholar playing around with ideas and methods and running her career as a messy adventure of stumbling falls and surprising yields.

I inherited this concern, and a solution to it, from my father, David Dickins. For twenty years from 1979 he ran an animal behaviour field trip at the University of Liverpool on Lundy, an island of the north Devon coast. When I was qualified I helped him with this endeavour, and for the last several years I have been running a summer trip to the island with my own students and a small group of colleagues.

The field trip lasts for two weeks. Presently I take students who have just finished their second year and are looking to start work on their final year projects. However, I have also taken students just entering their second year and pursuing an optional module in animal behaviour over the fortnight. The occasional MSc and PhD student also attend, pursuing data for their theses. In total we bring up to 14 students and three staff.

The majority have never experienced fieldwork, which means bringing them up to speed fast. We have a series of exercises that run over three days. The first day is a long walk around the major field sites on the island where we stop and ask the students to make notes, draw maps and absorb their surroundings. We ask them general questions about what they are seeing and encourage free hypothesizing and discussion. Day two and three see the students focus on animals that particularly interested them, collecting more notes and also images whilst working in small groups, and bringing them back to the accommodation for discussion during dinner time seminars.

A lot of work is achieved during the seminars. My colleagues and I spend the day moving about between field sites and talking with the students as they work. We ask them questions and openly think about the possible answers and ways of finding out more. We then collate this information and use it to open up wider discussion back at the accommodation, which includes our own observations and questions. By the end of day three each student is inevitably very curious about a particular aspect of the behaviour they have been watching and from day four we ask them to start planning a project.

It is at this point that we do introduce some standard tools – the concepts of an ethogram and behavioural catalogue, of functional and motor descriptions of behaviour and of different sampling decisions. But we do not lecture the students on this, instead we introduce various questions and allow the students to think and to resolve. There are books and articles available, and we occasionally reference them, but our ambition is to free the students to explore and follow their own curiosity. We also model the behaviour by developing our own studies. This year a colleague raised a question about Wheatear calls to which we had no ready answer. We therefore designed a study that allowed us to collect data as we walked around the island each day and an answer began to take shape. That study will be pursued again next year with refinements.

By the end of day six the students are ready to start running their research project. Each night we discuss their progress in the group, as well as offering one-to-one supervision, and various issues and oversights get adjusted as a result. By day nine the students have accepted that they have an imperfect design but also that they understand why it is limited and how it could be improved in the future. Their reports will reflect these insights along with the method they in fact undertook and, of course, the analysis and interpretation. As the second week continues the discussions in the evening tend to become more theoretical and this affords the team an opportunity to begin introducing core ideas in behavioural biology in order to make sense of some of the student observations, which in turn helps in refining methods. The key is to fit the learning to the students' own curiosity, giving them a context that they understand and that they can use to scaffold their own development.

All of the above can be included in any kind of fieldwork, but it does take a good deal of organizing to successfully liberate students in this way. The first issue is establishing a venue. I was fortunate as my father introduced me to Lundy, but before I began seriously running trips again I went to the island and checked the sites for animals and for access with a mind to writing a risk assessment for the university. It is essential to plan how you are going to move students around your space, for this reason, but also in order to predict the kinds of questions that will arise, not that you will ever have perfect information. It is also important to talk to local custodians of your site. In my case that is the warden and the general manager of the island. But if you are planning a trip to a museum or a zoo then talk to the educational teams they have. They often provide very useful

insights, and can also offer you some extra help. Moreover, as we are finding on Lundy, you can also help them. The data that students collect can be an efficient way to keep track of various developments across a large site.

Once your site is organized, and you have a good sense of what can be done, you need to recruit students and galvanize the group. If a trip is residential, as Lundy is, this is very important. Two weeks away, working hard in varying weather conditions, with people not very well known to you can be tough. In order to bring the group together my colleagues and I organize a couple of meetings prior to leaving the island. This will include a trip to Richmond to 'get our eye in' but mainly to get the students talking to each other and sharing their anxieties and excitement about the trip. So we make it as social as possible and conclude with a seminar in the pub. We also all go out for a meal in Ilfracombe the night before we sail and it is my policy not to talk science but simply to have a pleasant evening learning about the students. Running a shared cooking and cleaning rota on the island further enforces this – the academic staff do their share of this and we team ourselves with students in order to break down barriers to free thinking. The strategy is to increase the opportunities for social contact, share the essential tasks and labour, but maintain a clear line of authority around food budgets and any minor disputes that break out about hogging the clothesline and so forth. In this way we effectively simulate kinship cues and work better together. I have noticed that these effects continue after the trip and that there is a group of previous Lundy students who have maintained contact long since graduation.

The most significant obstacle to fieldwork is cost. This has been a challenge every year, although I have been lucky in receiving support from the universities I have worked for which does reduce the student contribution. However, as the financial systems change in universities, in response to cuts and fees, it is increasingly difficult to justify what are seen as extra-curricular activities available only to a few students. There are answers to this. First, I always plan an alternative option for students who are not able to attend. I have located a number of sites for such work around London for students with disabilities and also sites that are free to work in, only requiring tube or bus transportation to get to. Second, I am of the view that all lecturers should be thinking of broadening the experiential diet of their students, taking them beyond the classroom and beyond the restrictions of the traditional curriculum. The more of this available, then the less inequitable my trips will seem. Indeed, this criticism is a cost of the founder effect in teaching. Finally, the creation of wild scientists is an obligation

for gatekeepers of any discipline. We should be actively pursuing ways in which to liberate the scientific imaginations in our care. It will be good for us too.

Many of my Lundy students have gone on to postgraduate work, but not all. However, the majority of these students have all reported that their days doing science in the wild helped them to better understand what the discipline was about. This could be a consequence of a self-selected sample – these students volunteered to have this experience and may somehow be different from others. But I have no real reason to doubt their claim to have gained. I also know that science is not practiced as it is generally preached, and we need to address that if we hope to produce competent, enthusiastic and excited postgraduate candidates and future innovators.