

## Comment

### Why we need more thought

**Nigel Sanitt**

*All science undergraduates should do at least one philosophy course as part of their curriculum to augment their communication skills. This article sets out the arguments and the wider benefits for students of such courses.*

Thinking critically is at the heart of science, and at the heart of the relationship between science and society. This skill, which in its more abstract form could be labelled “philosophical”, is often viewed by scientists as not particularly germane to the practice of science, and more particularly irrelevant to the practice of science at the research level. The effects of this apathy towards philosophy are not immediately apparent, but are nevertheless pernicious. There is, I believe, an intellectual impoverishment and accompanying economic impoverishment that gently insinuate themselves within the scientific community, and then spill out into society at large. Philosophical awareness is a necessary skill in science and I believe its acquisition should be at the undergraduate level - all science undergraduates should have at least one philosophy course as part of their curriculum.

The arguments in favour of introducing science students to a humanities course at the undergraduate level, which covers philosophy, critical thinking, ethics and professional issues - or whatever soubriquet is employed - are well rehearsed. The first group of arguments start with the premise that science is one type of intellectual pursuit, which interacts within itself and with other areas, as part of an inclusive whole. Philosophical training is then seen as a counterweight to overspecialisation, over-compartmentalisation and ivory-tower mentality. It also blurs the distinction at the interfaces between science and other disciplines. We may have moved away from C.P. Snow’s “two cultures”, but bifurcation has become fragmentation and a holistic approach is still important.

A second group of arguments focuses on the intellectual tools used by or lacking in scientists. Naïve, woolly thinking, or just plain illogicality, is as prevalent among scientists as anyone else; economy of thought and a better understanding of concepts, methods and the nature of science is an ongoing process, which requires educational training as well as common sense.

A third group of arguments comes under the general rubric of communication. We expect physicians to be able to talk to their patients; we also expect them to communicate with other physicians and health workers. The language they use may be quite different, depending on which group they are communicating with. On the other hand, there are many in the field of medicine, (including patients), who do not feel that there is sufficient training in communication skills for doctors. For physicians read scientists and the situation is much worse. It is not just a question of improving essay-writing skills, but also reading, note taking, rhetorical and media skills. The labour market both within science and outside requires of its students this type of training.

There is a fourth group of arguments, which I want to stress in this article, and that is at the level of advanced research within science. The two questions, which I believe both have positive answers, are: “Can philosophical training help students who go on to do advanced scientific research?” and “Can this type of training be of such importance, as to significantly affect the quality of research and its benefit to science?” I do not pretend to embark on an exhaustive overview of research activity, but there are various stages of research, which can be loosely brought together under various headings.

The initial stage in any research is: “finding a problem”. This phase encompasses a multitude of layers (and sins). Certainly, reading round a subject and zooming in on a specific problem is the ideal, but if the field of view is narrowed too quickly, a researcher may end up in a cul-de-sac with an insoluble problem. Just the “right” amount of focus is called for, striking a balance between fixing on a particular topic, and leaving enough room to manoeuvre to a slightly different area if initial workings prove untenable. If this makes the initial stage of research sound more like an art than a science then so be it - it is.

Next is the “handle” stage, which immediately follows and is intimately connected to the initial stage. Looking back on successful research, it usually turns out that there would have been more than one and often several points of entry to a problem area. Finding the most efficient and presumably easiest way in to a problem is thus of paramount importance. Again the art of research comes to the fore.

At the next stage some would argue that what happens is “real” science rather than “introductory” craft. This stage is the “actual” research work, which may find its way into the literature. But even here amongst the dials and the data handling, critical assessment and rigorous questioning is the order of the day: dealing with co-authors, finding ideas, and not to mention problem management when things go wrong. Original ideas are not to be found in the library - libraries are full of other people’s original ideas.

The final stage of “writing up” is much more than just putting pen to paper. The researcher has to employ presentation and communication skills coupled with interpersonal skills dealing with co-authors, referees, editors, conference organisers, grant awarding authorities, the media and many others.

I have, of course, accentuated the art and craft aspects of research under the broad aegis of philosophy. Granted, some would say these aspects of research are present and are important, but as with most craft skills are best acquired by training on the job - common sense and experience are not qualities learnt in college courses. I am reminded here of the philosopher Karl Popper’s autobiographical recollection when he was an apprentice cabinetmaker, his first job. His desk construction skills never reached the heights of satisfaction he would have liked, but he learnt most of his philosophy through the long discussions he had with the master craftsman and amateur philosopher to whom he was apprenticed.

We have a glorious attitude in the UK to the amateur, which sometimes goes too far in embracing makeshift, journeyman inefficiency, rather than encouraging serious training. The “professional” amateur has an important place in science as in other areas, but that does not mean that vital aspects of the scientific enterprise should be compromised by lack of sufficient training. “Philosophical” training of the type I suggest would enhance and broaden the university science curriculum, and particularly help just those science researchers of the future who would otherwise miss out on a proper grounding of their subject.

How often do we hear the cry from scientists: “We need more data”, and how rarely: “We need more thought”.

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