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ARTICLE

What Prospects for a *General* Philosophy of Science?

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An obvious feature of the development of the philosophy of science during the past decades is an increasing specialization and fragmentation. Before the 1970s, philosophy of science was a small discipline with a limited number of journals, edited volumes and monographs. Since then, journals and books have multiplied, and have focused on ever more specific subjects, disciplines and methods. Quite a few journals address particular subjects or disciplines, such as the *Journal of critical realism* or *Biology and philosophy*. Another journal, *Studies in history and philosophy of science*, engendered two daughter journals, one on modern physics and one on the biological and biomedical sciences. Furthermore, many of the recent journals, such as the *Journal of agricultural and environmental ethics*, are more or less interdisciplinary. As to books, an exemplary illustration of increased specialization is the recent Elsevier Handbook series *The philosophy of science*, which at the moment includes fifteen huge volumes on a diversity of topics (such as ecology, information and logic), disciplines (for instance, engineering sciences, mathematics, and anthropology and sociology), and methods (including logical, historical and computational methods). Moreover, had the series been conceived by a European board, it might have included further volumes, for example on hermeneutics or the philosophy of history (given the more comprehensive notions of *'wetenschap'*, *'Wissenschaft'*, and the like, which in contrast to the notion of 'science' include the humanities).

Another sign (or a consequence) of increased specialization is the reduced impact of philosophy of science outside the sphere of its direct practitioners. In the past, quite a few scientists and educated members of the general public had some knowledge of the general insights of the prominent philosophers of science. In his opening speech to the 2009 conference of the European Philosophy of Science Association, the rector of VU University Amsterdam, a professor in medical science, mentioned Popper as a philosopher who is still well known among practising scientists. But where are the Poppers, or the Kuhns and the Feyerabends, of today? Typically enough, a Dutch author of widely read books on philosophical topics, recently characterized philosophy of science as 'the Siberia of philosophy'.

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Quite a few philosophers will add that these features of contemporary philosophy of science are not just facts but desirable facts, which have been brought about for good reasons. After all, they say, there are systematic, philosophical arguments in favour of the strong focus on the distinct practices of the sciences (twice in the plural). Post-Kuhnians claim that science cannot be understood from an armchair perspective: philosophy of science needs to attend to the details of the historical practices of the scientists. Naturalists question the distinction between philosophy and science. They argue that understanding scientific activities, such as observation or theoretical reasoning, needs to be based on the specific results of the cognitive sciences. Postmodernists put forward fundamental critiques of general epistemologies of science, of universal theories of rationality, and of comprehensive scientific methodologies. Instead of constructing inadequate 'grand narratives', they advocate highlighting the basic disunity of the sciences. Related to this is the anti-reductionist criticism of the contrast between physics as the fundamental, general science and the so-called special sciences, such as biology, geology, psychology, and the like. Philosophy of physics, it is claimed, is not, and has never been, identical to general philosophy of science.

Other philosophers, however, may question the dominance of specialization and especially the arguments supporting it. First, it is not the case that general topics are no longer addressed in the philosophy of science. Well-known examples that have been discussed in detail include experimentation, theory and evidence, explanation, realism, reductionism, and science and values. In addition, these philosophers might argue, in-depth accounts of such topics do not require less but rather more general philosophy of science.

Consider the following four examples. In spite of its title, the *General philosophy of science* volume in the above-mentioned Handbook series does include two separate chapters on experimentation (one about experiments in physics and, to a lesser extent, biology and one about experiments in economics), but a comprehensive, overarching analysis of scientific experimentation is lacking. However, adding such a general analysis could have revealed significant similarities and dissimilarities between the disciplines under discussion. Next, consider the issue of scientific realism. Here, the realist position is often defined and defended in terms of truth. It should be obvious that such a definition and defense does not work on a Tarskian interpretation of truth (which is neutral on the realist issue) or on a relativist interpretation (which even leads to antirealism). Hence, a well-developed realist interpretation of scientific (or, for that matter, biological, psychological, etc.) truth needs to draw on general epistemological, semantic and ontological insights. In fact, however, such an interpretation is often absent or taken for granted in arguments for scientific realism. Another intriguing issue concerns the notion of 'theory' or '(theoretical) proposition'. As a matter of fact, quite a few philosophers of the special sciences who use these notions all the time, are also physicalists. This leads to the difficult ontological question whether physicalism can be compatible with a defensible account of what a scientific theory or proposition is. What kind of entity is a theory or proposition? Do theories or propositions exist, and if so, in which way? Again, philosophers of science rarely pose, let alone answer, such questions. Finally, in debates on science and values many philosophers of science advocate a distinction between the epistemic and the social. Often, while the former notion is explained in some detail, the latter is left unspecified as a rest category of the 'non-epistemic'; similarly, in these debates the notions of value, interest or ideology are frequently used as synonyms. However, from a more general philosophical perspective, using a fully unspecified notion of the social or simply identifying values, interests and ideologies is inappropriate. In sum, these examples show that a more sophisticated general philosophy of science, which also draws on insights from other

areas of philosophy such as metaphysics or social philosophy, is needed to improve arguments within more specialized debates.

Furthermore, the Kuhnian, naturalist, postmodernist and anti-reductionist arguments for the disunity of science may be revisited as well. It is often, or perhaps even always, the case that studies of concrete scientific practices are based on general interpretations, methods or principles. This implies, by the way, that a general philosophy of science does not necessarily presuppose the notion of a general science. Furthermore, a grand narrative or theory may well have a worthwhile normative significance, even if it does not generally apply to all scientific practices. For some examples, one may think of conceptualizing the history of science through a limited number of styles of reasoning, of the revival of a Mertonian ethos of science in view of the dramatically increased commodification of science, and of the widely acknowledged patterns of gender bias in past and current science. More generally, in 2012 the claim that the time for general ideologies and philosophies is definitively over because we have reached 'the end of history', looks itself already outdated. Apart from that, some grand narratives or theories have never been away, even at the high point of postmodernism. This applies in particular to the technocratic ideology of allegedly politically and morally neutral progress through the application of science and technology.

Finally, a more sustained study of general issues could increase the relevance of philosophy of science to broader audiences. Just think of the following issues that play an explicit role in topical, socio-cultural debates: demarcation (is central to the evolution versus intelligent design debate); the relationship between scientific and indigenous or experiential knowledge (a big issue in current controversies about medicine and health care); explanation or understanding/*verstehen* ('pills or talks' is a daily dilemma in the consultancy room of psychiatrists); a quantitative or a qualitative approach (a divide that still plays a big role in social science and the humanities, with a large impact on peer review processes); the position of science in relation to government and industry (a crucial issue in debates on academic freedom and the commodification of science); gender asymmetries in science and philosophy of science (relevant to science policy issues, and to the gender contrasts between philosophy of science and, for instance, science and technology studies).

What is the upshot of these two sets of arguments, one against and one in favour of a general philosophy of science?[1] Does increased study of general issues make sense? If yes, how can it be promoted? If no, does this imply an exclusive emphasis on local knowledge and local practices? Alternatively, are there reasons to reject the opposition between a general and a specialized philosophy of science right from the start? If so, what are the most fruitful ways of combining, or integrating, general and specific insights? The subsequent essays by three prominent contemporary philosophers of science offer distinct, thoughtful answers to questions like these. The floor is to Stathis Psillos, Hans-Jörg Rheinberger and Steve Fuller.

[1] From the discussion thus far, it will be clear that this question presupposes a broad conception of philosophy of science as including any significant philosophical engagement with the sciences. As such, it goes beyond the narrower conceptions that sometimes prevail in the institutional context of certain philosophy of science journals or associations. See, for instance, Radder (1996, 1997) for philosophical engagements with the history, sociology and ethics of science (including its many intersections with technology).

References

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