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# Problems and Prospects of Interdisciplinary Philosophy of Science: A Report from the Workbench

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In this paper, we discuss the problems and prospects of interdisciplinary encounters between philosophy of science and the sciences, from the perspective of individual researchers as well as institutions. In the first Section we name some general problems concerning the possible points of interaction and the content of interdisciplinary research. In the second Section we compare the advantages and risks of interdisciplinarity for researchers and institutions. In the third Section we discuss interdisciplinary PhD programs, in particular concerning two main problems: increased workload and the quality of supervision. In the final Section 4, we look at interdisciplinary careers beyond the PhD.

Early-career philosophers of science often find themselves caught between a rock and a hard place, facing conflicting demands. While they have to meet the rigorous standards of a career in philosophy, they are at the same time expected to possess detailed knowledge of the sciences they study. By pulling in different directions, these two poles can be difficult to bridge. Interdisciplinarily engaged philosophers of science face not just an increased workload but also institutional conditions that are not always supportive for their engagement. For instance, while the need for interdisciplinary research is impressed upon young researchers by their advisers and by the subject matters of their research, universities and funding institutions, by contrast, still follow rather conservative and disciplinary policies when they fill positions or allocate funding.

In March 2013, the interdisciplinarity of philosophy of science and the resulting situation for early career researchers was the subject of a workshop and a panel discussion funded by the Andrea von Braun Foundation.<sup>2</sup> This paper takes up several of the issues that were controversially disputed at that event.

In this paper we assume that philosophy of science can be interdisciplinary in various senses (for elaboration, see Kaiser, Kronfeldner and Meunier<sup>1</sup>, forthc.; cf. Boden 1999). At issue here are the problems and prospects that arise with interdisciplinary forms of philosophy of science. As part of the analysis, we also examine the institutional and practical conditions for interdisciplinary engagement. After a brief discussion of general problems, the focus will be on problems and prospects in planning a career under these conditions.

More specifically, we address the following questions: What are the structural reasons for why interdisciplinarity in philosophy of science is often hampered in practice? How can early-career philosophers deal with the conflicting demands they face? Which job requirements arise from interdisciplinary research? In addressing these questions, we will use examples and points that are specific to the situation in Germany.

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<sup>1</sup> *Authors appear in alphabetic order.*

<sup>2</sup> *The title of the event was: „Caught between a rock and a hard place“: Prospects and problems of careers between philosophy and science. It took place in the context of the first conference of the German Society for Philosophy of Science (Gesellschaft für Wissenschaftsphilosophie) in Hanover, Germany. See <http://www.wissphil.de/index.php?site=gwp2013&subsite=panel> (last access August 6, 2013). We want to thank the Andrea von Braun Foundation, as well as the workshop participants and the panelists, who are listed on the above-mentioned page. We also want to thank the colleagues and students who organized the conference in Hannover and made it possible that the event could take place in such a facilitating setting. For proof-reading we thank Peta Hinton.*

## 1. General Impediments for Interdisciplinarity in Philosophy of Science

Though most philosophers of science acknowledge the interdisciplinary nature of their field and the need to engage with scientific knowledge, less agreement exists with respect to the selectivity of philosophy of science, questions of which parts of scientific knowledge or knowledge about scientific practice is of particular importance for a respective style of philosophy of science, and which role this knowledge should play in the development of a philosophical account. For instance, how to choose those parts of the particular sciences that lend themselves to philosophical approaches? And concerning general philosophy of science, how are philosophers supposed to pick out relevant information about sciences in general? A common strategy is to focus on paradigmatic (i.e., representative) examples and/or on instances of successful science. The role of such knowledge would be illustrative only. Yet, this does not solve the problem that there are different criteria to identify successful science. Furthermore, this paradigmatic- or winner-perspective might mischaracterize the process of scientific knowledge production.

Another problem concerns what to do when the traditions of philosophy and science (or of particular sciences) conflict, for instance, when there is incommensurability of perspectives between the disciplines regarding a common problem. Who has to move in order to create consistency or enable interaction? If there is a „corrective asymmetry,“ in the sense of Steel’s (2004) discussion of relations between disciplines, then just one of the conflicting parties would have to adapt (e.g., philosophy towards the sciences), rather than both adapting to each other.

These are general issues that address the impediments interdisciplinary research has to face and which gave rise to a separate branch of philosophy: philosophy of interdisciplinarity (see Andersen and Wagenknecht (2013) for an example of this branch and for a discussion of some of the impediments mentioned). Some problems that occur if interdisciplinary integration is aimed at are specific to philosophy of science (deriving from its reflectivity and/or normativity, see Kaiser, Kronfeldner and Meunier, *forthc.*), whereas the above-mentioned problems of selectivity and incommensurability are very similar in philosophy of science and other interdisciplinary fields.

## 2. The Institutional and the Individual Perspective

Interdisciplinarity and disciplinarity are not in contradiction. Indeed, interdisciplinary research obviously presupposes the existence of disciplines. Nevertheless, the aims of single disciplines and interdisciplinary fields do not necessarily match, and the practices of institutions (universities, funding bodies, policy makers) and the needs of individual researchers are not always in perfect accord.

For institutions the advantage of interdisciplinary research lies in its promise to fulfill societies' demands to understand and handle complex and multifaceted phenomena such as climate change or the production of scientific knowledge, for that matter. Yet, a small department might not be able to hire people with interdisciplinary profiles since they will struggle to have enough people to cover their own discipline in its entirety, which they usually have to do, at least in Germany. Thus in the case of philosophy of science, a structural reason for why more conservative decisions (i.e., decisions against increasing interdisciplinarity) are made at the level of universities and departments may be that philosophy departments are often quite small.

Furthermore, a general problem consists in the necessity to foresee the need for interdisciplinary approaches before these have proven to successfully address a problem, especially because a phenomenon might only appear as multifaceted once it has been addressed from various perspectives. It is difficult to predict the outcome of interdisciplinary research and to evaluate the methods and concepts suggested in interdisciplinary proposals, as well as the competences of those who put forward such projects (Hornbostel and Olbrecht 2007, Huutoniemi 2010).

For an individual researcher the advantage of interdisciplinary research is the possibility to generate innovative results, that is, results that are not only new, but of a new type. The dangers lie in having insufficient knowledge in at least some of the involved fields, in needing too much time to produce results, as well as in not fitting institutional schemes. In sum, interdisciplinarity requires the investment of additional resources while from the perspective of individual researchers as well as of institutions it is difficult to determine under which circumstances and to what extent these additional costs are worthwhile.

Interdisciplinarity is thus a risk, and it needs structures that support risk-taking profiles and that provide a robust foothold for such enterprises. Current funding – it seems to us – is often not very robust (and is thus unpredictable in itself) and rather risk-averse. Finally, more radical changes in perspective and shifts from one discipline to another seem to be impeded because it is almost impossible to achieve funding for a project that involves aspects that have little to do with the applicant's previous research (since for a successful application one would usually need relevant publications in all covered fields). Thus, funding and institutional structures should follow a principle of robust support and risk promotion.

### 3. Interdisciplinary PhD Programs

At first glance, the PhD level seems particularly suited for interdisciplinary research. Before that stage, in their basic training, students might want to specialize in one discipline, and

afterward, professors might be committed to the disciplinary identities of the departments in which they are employed (more on interdisciplinarity at later stages in Section 4). PhD researchers, by contrast, are required to perform original research and at the same time enjoy (still) relative independence in their work.

In Germany doctoral level study and research is increasingly organized in structured programs (as opposed to the „individual doctorates“ that used to be common in the past) and many of them have an interdisciplinary profile. Such programs harbor chances as well as risks for those who host them as well as for the individual PhD candidates (see Hornbostel 2009).

On the side of the chances for early-career scholars, interdisciplinary PhD programs can function as zones of transition for researchers who wish to change fields, for instance, graduates from the natural sciences who wish to switch to the humanities or the social sciences (in the other direction the boundary seems to be less permeable). They can apply for and contribute to the program with their expertise in their former discipline and accumulate expertise, contacts, and publications necessary for further employments in the new field during the course of the program.

Concerning the risks, there are two major considerations: the extended workload and the quality of supervision. First, interdisciplinary PhD projects create problems for PhD candidates in that they produce a double workload. Students are expected to possess detailed knowledge in all fields involved in the interdisciplinary framework, and while they will bring with them expertise in at least one field, they have to acquire much basic knowledge about the other field(s) involved in parallel to their actual thesis-relevant research. This is a difficult task, especially given that in structured PhD programs in Germany candidates are typically expected to finish their thesis within three years.

The management of workload seems to require that the PhD candidate's engagement with the new science (say, the engagement of a philosopher with biology) be tailored to the needs arising from the individual research project. Interdisciplinary research projects are extremely idiosyncratic because, in the best case, they develop a new intersection between fields. Furthermore, they might change significantly during the time of their development because it might only become clear in the course of the project where such fruitful intersections lie. Somehow in contradiction to this, structured PhD programs tend to be regulated in many respects, and if they have an interdisciplinary profile they might install rigid schemes of interdisciplinary training and exchange (critics often point out the increasingly school-like character of PhD programs, in particular with respect to their restructuring in the context of the so-called Bologna-process). Given the different types of interdisciplinary relations (see Kaiser, Kronfeldner, and Meunier, *forthc.*), as well as the idiosyncratic and dynamic charac-

ter of such projects, such rigidity should be avoided. Instead, interdisciplinary programs, while providing opportunities for interdisciplinary training and spaces for various forms of interdisciplinary exchange, should adopt a principle of flexible form and ratio of interdisciplinary engagement for the PhD candidates.

The second problem concerning risk that arises for early-career researchers, as well as for institutions hosting interdisciplinary programs, is how to find appropriate advisers and collaborators for an interdisciplinary PhD project. Even if there are advisers from every discipline involved in the interdisciplinary project, it is still possible that none of them has an expertise in the genuinely interdisciplinary aspects of the project, or with interdisciplinary work and its strategies and pitfalls in general. In addition, senior researchers might have limited interest in functioning as advisers or collaborators because they do not see the direct benefit of the work for their own research. A senior scientist, for instance, will have less interest than a senior philosopher in a philosophical analysis of a concept that the scientist uses on a daily basis without any problems, despite the ambiguity in the concept viewed in a broader and philosophical context. With respect to this point, interdisciplinary programs need to provide incentives for senior researchers to engage with interdisciplinary doctoral projects even if they cannot see direct benefit. To put it differently, interdisciplinary programs in philosophy of science should acknowledge a principle of asymmetry with respect to the benefit of interdisciplinary engagement of PhD students and their collaborators from different disciplines.

#### **4. Interdisciplinarity Beyond the PhD**

As mentioned in the beginning, one of the major risks for young researchers in pursuing research in an interdisciplinary field is that, although it seems to be the case that interdisciplinarity is called for and promoted on the level of education, and especially on the PhD level, there are not many permanent positions with an interdisciplinary profile. Hence, researchers with an interdisciplinary career either will do worse in the long run, or they are forced to choose one discipline as their focus.

For institutions such as universities and funding bodies, one problem with permanent interdisciplinary positions can be that – as mentioned before – the form and success of interdisciplinary research is difficult to anticipate and evaluate, and fruitful interdisciplinary constellations can change quickly. Therefore, it is difficult to establish interdisciplinary positions with a predetermined content. If, however, thematically open interdisciplinary professorships, for instance, are awarded on the basis of promising proposals, they are still difficult to locate in the standard structures of a typical university, at least in Germany.

Given that the success of interdisciplinary projects (as opposed to disciplinary „normal science“) is difficult to predict, but nevertheless desirable and worthy of promotion because of



the promise of interdisciplinarity to generate synergistic effects between fields of knowledge or even new types of knowledge, results and competences, institutions often seem to follow a pragmatic approach. A common strategy is to rely on existing disciplinary structures, but provide incentives for senior researchers to engage in interdisciplinary projects or collaborations from the vantage point of their clearly defined disciplinary identities. While also supporting interdisciplinary graduate education, the „German Universities Excellence Initiative“, for instance, seems to be based on the idea of linking existing disciplines on the level of senior research (Clusters of Excellence), rather than implementing genuinely interdisciplinary positions or departments, although within Clusters of Excellence there seems to emerge a tendency for cross-disciplinary hiring in order to create mediating positions (Sondermann et al. 2008, 91).

## 5. Conclusions and Outlook

Interdisciplinary initiatives often falsely assume that interdisciplinary exchange always is, or should be, equally useful for all sides involved. However, different benefits for the involved disciplines, or one-sided benefits, should be seen as an acceptable outcome of interdisciplinarity (principle of asymmetry with respect to the benefit of interdisciplinary engagement).

A major problem for institutions in implementing interdisciplinarity is to predict where fruitful interdisciplinary fields will emerge and to evaluate proposals and results. The latter is difficult since potential referees are unlikely to have the same interdisciplinary profile as the researchers evaluated. One strategy is to take the principle of robust support and risk promoting seriously. Universities could, for instance, foster interdisciplinary exchange of existing disciplines by creating permanent positions with an emphasis on interdisciplinary collaboration, without setting up interdisciplinary departments. The advantage of this approach to interdisciplinarity is that it exploits the full potential of new interdisciplinary fields or even creates new interdisciplinary connections by supporting new interdisciplinary research personas as they might arise from interdisciplinary PhD programs, without creating a scheme that is too rigid and thus promotes risk-averse approaches again.

If early-career researchers adapt to the current overall situation in their career planning by maintaining a home in a traditional discipline, the advantage is that a self-made interdisciplinary network on the basis of institutional incentives for exchange and collaboration from inside a discipline can be more easily adjusted and reorganized according to the unpredictable opportunities or disappointments that come with interdisciplinary research, than it would be possible in a preconceived institutionalized interdisciplinary structure. On the other hand, such an arrangement can also deprive a researcher from the necessary resources that can only be provided by a full-blown interdisciplinary infrastructure.

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