

# What's Left of Philosophy?

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**Abstract**—We continue our examination of the idea that there is a sub-discipline in philosophy of science, philosophy in science, whose researchers use philosophical tools to advance solutions to scientific problems. Rather, we propose that these tools are standard epistemic, cognitive, or intellectual tools at work in all rational activity, and therefore these researchers engage in scientific or metascientific research.

**Résumé**—Nous poursuivons notre examen de l'idée selon laquelle il existerait une sous-discipline en philosophie des sciences, la philosophie dans les sciences, dont les chercheurs utiliseraient des outils philosophiques pour proposer des solutions à des problèmes scientifiques. Nous soutenons plutôt l'idée que ces outils sont des outils épistémiques, cognitifs ou intellectuels standards, à l'œuvre dans toute activité rationnelle et que, par conséquent, ces chercheurs se consacrent à la recherche scientifique ou métascientifique.

In our article “When Philosophy is No Longer Philosophical” (Maurice 2022), we examined an idea defended by Pradeu, Lemoine, Khelifaoui and Gingras, according to which within the philosophy of science there is a philosophy *in science*, a philosophy that uses philosophical tools to tackle scientific problems and put forward scientifically relevant solutions (Pradeu *et al.* 2021). We then argued that these tools are standard epistemic, cognitive or intellectual tools at work in any rational activity and, consequently, that these researchers of philosophy *in science* are dedicated to scientific or metascientific research. While this 2021 article by Pradeu *et al.* served to define philosophy *in science* and identify philosophers who practice it, a new article by Pradeu, Laplane and thirty-six collaborators shows the usefulness of philosophy *in science* using cases

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drawn from cancer research (Pradeu *et al.* 2023). This research project to identify a philosophy *in science* begins with the publication in 2019 of “Why Science Needs Philosophy”, an article by Laplane, Mantovani, Pradeu and six collaborators (Laplane *et al.* 2019).

### **1] Critique of the Idea of Philosophy *in Sciences***

In our article entitled “When philosophy is no longer philosophical” (Maurice 2022), we examined the idea put forward by Pradeu *et al.* (Pradeu *et al.* 2021) that there is a sub-discipline in philosophy of science, called philosophy *in science*. Researchers in this sub-discipline would use philosophical tools to put forward solutions to scientific problems. However, I defended the idea that these tools are standard epistemic, cognitive or intellectual tools, used in any rational activity. Consequently, these researchers would be dedicated to scientific or metascientific research.

Of the 160 or so authors identified by Pradeu and colleagues as belonging to philosophy *in science*, we examined five. We have concluded that these thinkers no longer practice philosophy, at least not in the articles examined. The tools used by these authors are part of the standard ways of thinking not only in science, but also in any rational enterprise, such as technology, engineering, medicine, law, management, and so on. Thus, philosophy *in science* cannot exist if “philosophy” is seen as anything other than a synonym for “rational thought”. For this discipline to exist, it would be necessary to find authors who use exclusively philosophical tools or methods, supported by philosophical doctrines, to solve scientific problems and propose solutions that scientists consider useful for the advancement of science. Thinkers of philosophy *in science* practice rather a metascience and in some cases even a science.

A long extract from the introduction to the 2023 article sums up the authors’ conception of philosophy *in science* as set out in the 2019 and 2021 articles:

[From 2021 article] Conceptual clarification and interdisciplinary integration of methods and knowledge can [...] enrich our understanding of cancer and suggest new therapeutic avenues. [...] We argue that philosophy can contribute to this aim through its classic tools of conceptual clarification, critical assessment of scientific assumptions, analysis of argumentative consistency, formulation of new concepts, theories or research programs, and connection

between different disciplines. [New in 2023 article]. Note that (i) *philosophy here refers to a set of tools or methods*, rather than content (the idea is not to apply traditional ideas from philosophers to cancer, but to use philosophical methods); (ii) *we defend a pragmatic use of philosophy* with the clear intent of improving oncology; (iii) *these methods are also used by scientists*, especially conceptually inclined ones. [From 2019 article] So what we are describing here is ultimately a continuum of scientific contributions. Philosophers, because of their strong background in logic and argumentative reasoning, can operate the above tools with higher degrees of thoroughness and freedom. Scientists have better experimental skills and more expert knowledge in their area of specialization. This spectrum of skills makes the cooperation between these two communities particularly fruitful to build a theoretical oncology. (Pradeu et al. 2023, p. 3-4; italics ours)

This is no mean feat. The authors reduce philosophy *in science* to a set of tools or methods. Not only do the authors empty philosophy of its content, but they evacuate all philosophical methods except those that have the merit of being methods also used by scientists. The authors claim to defend a pragmatic use of philosophy. But what else? Why this conception of philosophy rather than another? In fact, Pradeu, Laplane and their collaborators make no pronouncement on the nature of philosophy. They take it for granted that philosophy *in science* is a branch of philosophy of science, which is itself a branch of philosophy. Philosophy *in science* is associated with philosophy of science by a tenuous link, a link the authors describe as pragmatic, since they propose to use “philosophical” approaches and methods common to philosophy and science. Philosophy *in science* therefore has no specific content or object of study. It is merely a set of so-called philosophical methods, although the authors acknowledge that these are also methods used by scientists (Pradeu *et al.* 2021).

Let's return to a thesis supported in the 2021 article. The existence of this philosophy in science demonstrates “the existence of a methodological continuity from science to philosophy *of science*” (Pradeu et al. 2021; italics ours). As formulated, the statement is false. The authors have succeeded in demonstrating a methodological continuity between science and philosophy *in science*, but not between science and philosophy *of science*. In the latter case, if the

authors see continuity, it's because they have decreed that philosophy *in* science is a branch of philosophy *of* science. Since there is indeed a methodological continuity between science and philosophy *in* science, and if the latter is conceived as a branch of the philosophy *of* science, then a continuity is established between science and the philosophy *of* science, and since the latter is conceived as a branch of philosophy, then there is also continuity between science and philosophy tout court. But why should philosophy *in* science be a branch of philosophy *of* science? This conception of philosophy *in* science as a branch of philosophy *of* science is based on weak links. Philosophy *in* science has no proper philosophical content, goal or object of study. All it shares with philosophy is a small set of conceptual tools, none of which are unique to philosophy. If we remove the methods, objects and objectives that are properly philosophical, and keep only what is common to all rational activity, what's left of philosophy?

The authors are right to describe this continuity as methodological, since the very practice of philosophy in science “presupposes a distinction between philosophical problems and scientific problems” (Sober 2022), or, in our view, metascientific problems are not the same as scientific problems. And if the problems are different, it's because the objects studied are different. And if the objects are different, the objectives will not be the same. On the other hand, certain methods and tools, especially conceptual ones, may be common to philosophy in science (metascience) and science, hence this methodological continuity, which applies to all rational activities.

However, the aim of philosophy in science as stated by the authors is problematic: to use philosophical tools to produce scientific knowledge rather than knowledge about science (Pradeu et al. 2021). Firstly, the tools in question are not specific to philosophy, but are tools shared by all rational activity, including science. Secondly, isn't the production of scientific knowledge the objective of the sciences? If philosophers in science use tools that are not specific to philosophy, and if they produce authentically scientific knowledge, aren't they ultimately practicing a science?

To claim that philosophy in science is a branch of the philosophy of science is unreasonable, since no philosophical doctrine underlies the research carried out by the thinkers associated with philosophy in science, insofar as a philosophy of science, to be philosophical,

must support a philosophical doctrine that orients its questioning of science. What remains of philosophy if we cut out its methods, its objects of study and its distinctive aspirations, and retain only the universal foundation of all rational thought?

## 2] Sober and the Philosophy *in* Science

Sober is associated with philosophy in science by Pradeu and his colleagues (Pradeu *et al.* 2021)<sup>2</sup>. He is one of those rare philosophers of science to propose scientific solutions to scientific problems using philosophical tools. Sober, in his article “Philosophy in Science: Some Personal Reflections” (Sober 2022), looks back on his experience as a practitioner of philosophy *in* science to offer his thoughts and recommendations, as well as to warn philosophers about the possible adverse consequences on their careers if they choose to practice philosophy *in* science.

In his introductory paragraph, Sober notes that the idea of philosophy *in* science rests on a distinction between philosophical and scientific problems, since after all, if philosophers who practice this form of philosophy attempt to solve scientific problems, it is because these problems are not philosophical. Consequently, Sober also argues that the main objective and the way of evaluating their respective theories are not identical in science and philosophy. However, “the fact that this pattern has exceptions opens the door to PinS [philosophy in science]”. Thus, *exceptionally*, “conceptual analysis and attention to arguments (the philosopher’s bailiwick) can do good work in science”<sup>3</sup>.

There’s a problem with this formulation. Sober sees philosophy *in* science as an exception in the philosophical landscape. He admits a difference in nature between philosophy and science, but philosophy *in* science would transgress its philosophical nature to produce scientific results albeit with tools that would be the prerogative of

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<sup>2</sup> Note that Sober is also one of the co-authors of the article “Why Science Needs Philosophy” (Laplaine *et al.* 2019), with, among others, Laplaine and Pradeu, the first article in a series of three (so far) from this research project of a defense of the usefulness of philosophy in science and the identification of philosophers who practice a particular form of philosophy that would produce scientific knowledge using philosophical tools.

<sup>3</sup> Sober also defends a partial naturalization of philosophy: “And scientific observations, along with the scientific theories that those observations justify, can do good work in philosophy, thus giving rise to SinP (= science in philosophy)”.

philosophers. It may be exceptional for philosophers, and even philosophers of science, to contribute to the resolution of a scientific problem, but it's not exceptional for scientists to use conceptual analysis and pay attention to arguments, even if in a less sophisticated way than philosophers. These are tools or approaches that can be found in any rational discourse, including scientific discourse. By way of example, we need only mention the debate that has been going on for the past twenty years in connection with the reproducibility crisis. This is a methodological crisis in science, concerning the difficulty of reproducing the results of a large number of scientific studies. Few philosophers are involved in resolving this crisis, and, more importantly, the scientists who are involved do, of course, use "philosophical tools". Sober's conception of philosophy *in* science is therefore incoherent. He cannot argue for a difference in nature between philosophy and science and then make an exception for philosophy in science. The philosophy *in* science practiced by the thinkers discovered by Pradeu and his colleagues, the philosophy *in* science practiced by Sober, and the metascience practiced by the thinkers involved in resolving the reproducibility crisis all make use of tools common to all rational endeavors. The exceptional thing about philosophy *in* science is that thinkers in this discipline are paid by philosophy departments rather than science departments, even though they are working on scientific or metascientific problems. So why treat philosophy *in* science as an exception within philosophy, instead of seeing it as a scientific or metascientific discipline rather than a philosophical one?

Despite this inconsistency in the way philosophy is conceived, Sober, like Bunge, does not hesitate to take the side of science and criticize the way philosophers study and analyze science. Let's look at an example from Sober's article. To illustrate his journey as a philosopher *in* science, Sober presents five scientific controversies in which he has taken part. One of these concerns the unit of selection problem, which is characterized as follows: "The unit of selection problem concerns the question of which biological entities are susceptible to natural selection." (Martens & Merlin 2021).

In 1966, George C. Williams published *Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought*, in which he puts forward several arguments against the group selection hypothesis, i.e., the possibility that natural selection can be exerted on groups and not just on individuals or genes. Sober reports

one of Williams' arguments in the following way: "Only genes can be units of selection (organisms can't, and neither can groups) because a gene can exist through numerous generations whereas an organism or a group usually has a much shorter lifespan." (Sober 2022) Sober then appeals to the type-token distinction to show the weakness of this argument: "the type/token distinction helps shows that the argument is flawed. Gene *tokens* are evanescent, but gene *types* can be exemplified over long stretches of time; the same can be said of organism and group tokens and organism and group types." (Sober 2022; italics by Sober)

In other words, Williams confuses the concrete object with the set to which we assign it, which is fallacious reasoning. Here, just like an organism or a group (e.g., a biopopulation), a particular gene has a lifespan, but the classes into which we place genes, organisms and groups have no "lifespan" because they are constructs that serve, along with many others, to represent the world to us. In general, the clarification exercise will not provide an immediate solution to a problem, but it should enable progress towards its resolution. The scientific debate on selection units will not be closed by a conceptual clarification, but this clarification will enable us to eliminate reasoning deemed to be erroneous, thus clarifying the terms of the debate, and this acquired precision sometimes leads to a re-orientation of the debate.

Note that the type-token distinction, or, to put it another way, the class-object distinction, can be applied to any type of discourse. In logic and mathematics, objects are not concrete, but they can be arranged in sets (in type). And in law, laws can be classified. In fact, even in unstructured discourse, such as we use in our daily lives, we make use of this distinction, often clumsily.

In the context of the factual sciences, the distinction, or rather the type-token dichotomy, to which Sober appeals in order to reveal fallacious reasoning in Williams, is one of many ways of expressing the general dichotomy between conceptual representation and concrete reality. In other words, the tokens at issue in the debate on units of selection are concrete objects (gene, organism, biopopulation) that are part of reality, whereas types are classes or sets, hence abstractions, fictions in Bunge's terms. This allows Sober to assert that tokens (concrete objects) are evanescent, while types (classes) are exemplified over long periods of time (as long as we

place objects in a class, that class exists for us, even if the objects have ceased to exist). Williams therefore confused the tokens of concrete objects with the classes in which we can place them. He reasoned about genes as a class, while at the same time reasoning about organisms and biopulations as concrete objects.

The distinction between representation and reality is elementary, but not always easy to apply. Reification and ideaefication are widespread phenomena. We reify an idea if we treat it as a thing, i.e., as a concrete object endowed with energy and subject to natural laws, or if we treat it as a real but non-concrete object, and we ideaefy a thing if we treat it as an idea, i.e., as an ideal or formal object no longer subject to the laws that apply to material entities (Bunge 2003)<sup>4</sup>. In any case, this distinction is used by everyone, in every circumstance, albeit often awkwardly, i.e., without realizing that sometimes we are reifying and sometimes we are ideaefying. On the other hand, among philosophers, reification and ideaefication can be intentional, in particular the reification that conceives an idea as having an existence of its own, even if this existence is not concrete. For example, Plato sees types as transcendent autonomous objects, Forms or Ideas, and Aristotle sees them as autonomous but immanent objects, Forms or Essences. Whether found in Plato, Aristotle or any other philosopher, reification and ideaefication are sophisms that Sober does not hesitate to exploit in his criticism of Williams.

Interestingly, Sober illustrates his point using the type/token dichotomy, even though he downplays the scope and power of this conceptual tool. On the other hand, Mario Bunge does not hesitate to elevate the type/token or representation/reality or fictional/real or concept/thing dichotomy to the rank of methodological axiom (Bunge 1977, pp. 117-118). This dichotomy conditions all Bunge's thinking. It implies, among other things, ceasing to accord an ontic value to logic and mathematics, as philosophers do. In themselves, logic and mathematics have no factual or concrete scope, and

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<sup>4</sup> Bunge's characterization of reification is broader than the usual one: "The treatment of a property, relation, process, or idea as if it were a thing". Thus, concrete properties, concrete relations and concrete processes are not to be confused with concrete objects, which are endowed with properties, relate to each other and participate in processes. In other words, just as we must not treat an idea as if it were an object, we must not treat a property, a relation, a fact, an event or a process as if they were objects.



therefore no ontic value in metascience. Philosophers grant them an ontic value because they are said to have a factual scope insofar as concrete objects are made up of logical and mathematical properties. However, we have no reason to believe that the objects of the world possess logical or mathematical properties. A planet is not a mathematical sphere. We use logic and mathematics to help us represent the world, and this representation is a construction, whereas the world is a given. The world is a given for the factual sciences, the set of logical and mathematical objects is a given for logic and mathematics, and the set of constructs of the factual sciences is a given for the metasciences.

Sober is among the philosophers *in science* identified by Pradeu and his colleagues, as he adheres to the dichotomy between representation and reality. In other words, he recognizes the world as an objective reality studied by the factual sciences. This position manifests itself in his advice and recommendations to future practitioners of philosophy *in science*, which in turn constitute critiques of philosophy itself. Let's limit ourselves here to quoting the main piece of advice Sober offers:

[...] there is a broader remark that is as obvious as it is important: you've got to understand the science you are taking as your subject. If the science makes use of probability, you need to understand enough about probability to follow what is going on. Taking a course in pure mathematics is probably not the best thing to do here, *nor are most philosophy of probability course what you need*; it would be better to attend a methods course in the science in question. (Sober 2022, italics ours)

Sober illustrates his point by criticizing David Lewis's idea of the notion of parsimony in phylogenetics:

And still another philosophical pronouncement falls by the way once you look at science. This is the idea that the principle of parsimony has no justification. What is true is that it has no universal and unconditional justification. However, given assumptions that make sense in a given research context, justifications are often available. (Sober 2022)

Philosophers often seek knowledge that is universal and absolute, not contextual. Philosophers are not interested in the fact that the notion of parsimony varies from one scientific context to

another. And this is precisely one of the reasons why philosophy is neither a science nor a metascience. Philosophers are not interested in the scientific approach to knowledge of the world, nor in the metascientific approach to knowledge of science. Philosophers problematize scientific knowledge in such a particular way that the scientific context that justifies Perrin's demonstrations of the existence of the atom cannot serve as a context of justification. Something philosophical is missing. Thus, we witness sterile debates, even among scientific realists, on the existence or not of the atom, living cells, gravitational waves, stars and galaxies, etc., because philosophers are debating the best philosophical justification, a justification that can only be alien to scientific justifications.

At the end of his article, Sober issues the following warning to future philosophers *in science*:

[...] if you publish a paper in a science journal, your colleagues in philosophy who are not philosophers of science may dismiss it, thinking that what you've done is science, not philosophy. This might hurt your career. (Sober 2022)

We agree with the fellow philosophers mentioned in this passage. If a philosopher has succeeded in publishing an article in a scientific journal, there's a good chance that it's an article on methodology, metascience or philosophy *in science*. A discipline without philosophical content cannot present itself as a branch of philosophy. The object of study of a discipline is just as important, if not more important, than the methods used to study it. If the object of study consists of the products of science, such as concepts, statements, classifications, models and theories, not to mention the general postulates that science must uphold, even if only temporarily, then we are dealing with a metascience. And if a thinker tackles a factual scientific problem using primarily conceptual tools, then there may be a back-and-forth between science and metascience. The methodological continuity of which Pradeu and his colleagues are referring is therefore not between philosophy and science, but between metascience and science.

Sober's warning reminds us of an anecdote reported by Martin Mahner:

Bunge's status as an *enfant terrible* of philosophy was such an open secret that, when in 1992 I applied for a post-doc stipend to work

with him on the philosophy of biology, a well-known German philosopher considerately asked me during an interview whether I was aware of the problem that working with Bunge could be bad for my career. (Mahner 2021, p. 19)

The passage in question suggests that it is Bunge's reputation as an enfant terrible that could be detrimental to his students' careers. We don't deny that his independence of mind and provocative style may have something to do with it. However, we would argue that Bunge's main failing as a philosopher is that he is not a philosopher, even for the scientific realists who barely mention him. And not only is he not a philosopher, but he has also had the nerve to develop a vast system of metascientific thought that competes with philosophical doctrines, rather than simply being a philosopher of science.

### 3] Conclusion

The work of Pradeu, Laplane and their collaborators on identifying a group of thinkers who specialize in conceptual research to solve scientific problems is important, since it helps to answer the question "what is the use of philosophy in science?" Philosophy is of no use to science, although certain conceptual approaches associated with philosophy are extremely useful, even necessary, for the advancement of science. But these approaches are not unique to philosophy. All rational activity makes use of conceptual techniques and methods. And when these techniques and rational methods are used to tackle a scientific problem or to study science itself, it is science and metascience that we should be talking about, not philosophy. The criticism we can address to those who defend philosophy *in* science is that they perpetuate the myth that philosophy contributes to scientific knowledge.

The "philosophical" methods identified by the authors represent only a small fraction of the methods used by philosophical schools. The authors have retained only those methods used in all rational activities. Philosophy *in* science is thus an empty philosophical discipline or a non-philosophical discipline. It studies no philosophical object, and uses no method that is properly philosophical. If the objects of study and the methods are not philosophical, what about the objective of philosophy *in* science? The objective is stated explicitly by the authors: to use philosophical tools to produce scientific knowledge rather than knowledge about science (Pradeu et al.

2021). Clearly, this objective is not philosophical. What remains of philosophy within philosophy *in science*?

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