Naturalizing *Aprioristic* Metaphysics

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ABSTRACT

The question about the relationship between metaphysics and (philosophy of) science is especially pressing for those of us who hold that metaphysics is an *a priori* discipline. The purpose of this paper is to examine the challenge for *aprioristic* metaphysics that emerges from recent literature, most forcefully presented by Ladyman and Ross. First, the Ladyman-Ross challenge will be analyzed with regard to their critique of the use of armchair intuitions and pseudo-scientific thought experiments in metaphysics. The upshot of this discussion is that they have somewhat misrepresented the methodology of *aprioristic* metaphysics. In the remainder of the paper a more charitable methodology of *aprioristic* metaphysics will be sketched and it will be suggested that even an *aprioristic* metaphysics can be reconciled with (philosophy of) science.

1. The Ladyman-Ross Challenge for *Aprioristic* Metaphysics

Certain loud voices have recently made demands for a 'naturalized metaphysics', that is, metaphysics that can be reconciled with natural science, or better, metaphysics that is based on natural science. Perhaps the loudest of these voices is *Every Thing Must Go* (2007) by James Ladyman and Don Ross, or they at least take the demand to its logical conclusion. However, concerns over the relationship between metaphysics and science are all over the literature now; this is one important aspect of the methodological scrutiny that analytic metaphysics has become under (cf. Chalmers *et al*. 2009). In this paper I will examine the methodological challenge that metaphysics faces. Since Ladyman and Ross have put forward some of the most demanding criteria for a scientifically respetacble metaphysical theory, I will focus on their account.

My hypothesis is that metaphysics and science are continuous, but I do not mean this in the sense that they would both have the exact same agenda. Rather, I mean that we could not really do one without the other, that is, we could not get very far in our inquiry into the nature of reality with just one of these disciplines. Because of this, it might be better to say that metaphysics and science *complement* each other (cf. Lowe (In press)). In fact, this idea goes back all the way to Aristotle:

> There is a science which investigates being as being and the attributes which belong to this in virtue of its own nature. Now this is not the same as any of the so-called special sciences; for none of these others deals generally with being as being. They cut off a part of being and investigate the attributes of this part – this is what mathematical sciences for instance do. Now since we are seeking the first principles and the highest causes, clearly there must be some thing to which these belong in virtue of its own nature. (Aristotle, *Metaphysics* 1003a22–28.)

So, metaphysics is the study of being as it is in itself, whereas the special sciences investigate only a part of that being. But how well does this view sit with contemporary science? Not very well, if Ladyman and Ross are right. They begin their book with a brief critique of metaphysics which sweeps over contemporary analytic metaphysics. Their primary criticism is that metaphysics suffers from a lack of scientific rigour and is in fact very badly informed of the latest developments in science. The result is a domestication of certain aspects of contemporary science at best, pseudo-scientific mumbo-jumbo at worst. Instead, Ladyman and Ross call for naturalized metaphysics – metaphysics which is based on science.

The main problem that Ladyman and Ross raise for the prospect of reconciling metaphysics with natural science is that this type of 'neo-scholastic metaphysics', as they call it, gives priority to *a priori*, armchair intuitions and ignores the fact that recent empirical results show the natural world to be much more complicated than our armchair intuitions might suggest. It is difficult to deny this: many philosophical thought experiments involve physics, but the physics in question is generally that of 'microbangings', based on a obsolete model of Newtonian physics which is incorrectly applied on the level of fundamental physics. As Ladyman and Ross observe, such an approach is apt to produce silly results; even if Newtonian physics is sufficient in everyday contexts, it is not suitable for the purposes of such generalizations that we hope to make in metaphysics (2007: 23 ff.). Indeed, if metaphysics concerns the fundamental structure of reality, then it should surely work closely with fundamental physics.

Nothing that has been said so far is particularly controversial, or at least so I would like to think. Most metaphysicians have come to realize that they have to be scientifically informed, and many of us would readily admit that we are not quite as scientifically informed as we perhaps ought to be. But the question of methodology is still entirely open: assuming that we *are* scientifically informed, how should we proceed? What is the role of metaphysics in the study of the fundamental structure of reality and how much does it have in common with natural science? One obvious

methodological difference would seem to be that metaphysics is commonly considered to be an *a priori* discipline, starting from armchair intuitions rather than empirical experiments. Ladyman and Ross take issue with this approach.

Let us start with armchair intuitions. Ladyman and Ross (2007: 10–15) give a number of examples of metaphysical, armchair intuitions which seem to be blatantly incorrect from a scientific point of view. Indeed, it is easy to find such examples, in metaphysics and science alike – just consider the fact that Newton devoted more time to alchemy than any other area of research and apparently thought that this work was highly important. Intuitions are clearly not very trustworthy, but does this mean that armchair reasoning is completely worthless? Even Ladyman and Ross do not go as far as to claim this, for they admit that it is often said of 'a good physicist that he or she has sound physical intuition' (2007: 15). But the use of the word 'intuition' is supposedly different in this case, as it refers to 'the experienced practitioner's trained ability to see at a glance how their abstract theoretical structure probably – in advance of essential careful checking – maps onto a problem space' (ibid.). There is of course an on-going debate in metaphysics about the nature and role of intuitions, but I believe that this description is entirely accurate for the metaphysician's use of the term as well, contrary to what Ladyman and Ross claim. Is it not the case that a metaphysician's intuition is exactly a preliminary judgement about how a certain abstract theoretical structure probably maps onto a problem space?

Ladyman and Ross further distance metaphysicians' intuitions from those of scientists' by pointing out that the previous are often taken as evidence whereas the latter are only heuristically valuable, but this is certainly not a commonly accepted view. In fact, my own view is that intuitions are, for the most part, misleading, exactly because the problem space is generally much more complicated than one first assumes. Regardless, certain very experienced practitioners both in science and in metaphysics may use intuitions as a good heuristic tool. The intuitions themselves are at best only *prima facie* evidence: careful study, or in some cases empirical research, is required

before they can be accepted. But it is certainly a naïve view of metaphysics to assume that metaphysicians simply take their intuitions at face value and leave it at that – generally a book-length study follows!

Since intuitions are a controversial subject in any case, perhaps we might be better off talking about *a priori* inquiry in general, as most proponents of (neo-)Aristotelian metaphysics at least contend that some kind of *a priori* inquiry is possible. One account about the role of this inquiry comes from E. J. Lowe (1998, 2006), who suggests that metaphysics studies the realm of metaphysical possibility – the space of the possible fundamental structures of reality – but we also need empirical science to determine which of the possible structures corresponds with actual reality. This is a very Aristotelian conception of metaphysics: metaphysics studies the fundamental structure of reality, possibility strictly in virtue of being qua being, but we need the the special sciences to determine how this structure is reflected in the actual reality. Ladyman and Ross are aware of this general understanding of metaphysics and in fact claim to endorse the idea that the goal of metaphysics is to unify the special sciences, but:

> [W]e differ with Lowe on how this task is to be accomplished, because we deny that a priori inquiry can reveal what is metaphysically possible. Philosophers have often regarded as impossible states of affairs that science has come to entertain. For example, metaphysicians confidently pronounced that non-Euclidean geometry is impossible as a model of physical space, that it is impossible that there not be deterministic causation, that non-absolute time is impossible, and so on. Physicists learned to be comfortable with each of these ideas, along with others that confound the expectations of common sense more profoundly. (Ladyman and Ross 2007: 16-17.)

This is all that Ladyman and Ross say against the possibility of *a priori* inquiry into metaphysical possibility, so it is this critique that we must repel if we hope to defend *aprioristic* metaphysics. However, I think that what we have here is a very uncharitable interpretation of Lowe's analysis of the methodology of metaphysics. This is because Ladyman and Ross seem to assume that our epistemic access to metaphysical possibility has to be infallible. While the infallibility of *a priori* inquiry may have been a doctrine of Cartesian metaphysics, it is most certainly not a doctrine of Aristotelian metaphysics. Hence, it is true that metaphysicians, like scientists, make mistakes. Kant held that non-Euclidean geometry is impossible, but physics soon showed that not only is it possible, but actual. In fact, in non-Euclidean geometry we have a good case study about how *a priori* inquiry can indeed reveal what is metaphysically possible. For if we look at the historical facts, it was not empirical inquiry that revealed the possibility of non-Euclidean geometry, but mathematical and thus, we might argue, *a priori* inquiry: the mathematicians Gauss, Lobachevski and Riemann developed alternative, non-Euclidean geometries which replace the controversial parallel postulate of Euclidean geometry with an alternative axiom. This way we get a number of possible geometries, although we know that only one of them can be actual. Kant did make a mistake, but the mistake was not due to a flaw in the methodology of *a priori* inquiry, but rather a failure to grasp the possibility of alternative geometries. The lesson that we should take from this is that the space of metaphysical possibilities reached by *a priori* means is revisable, quite similarly to empirical results which can be revised in the light of new empirical data.

In fact, the methodological similarities between science and metaphysics are much greater than this. Consider armchair intuitions again. As we saw, Ladyman and Ross acknowledge that something like intuitions are used in science as well, although merely as a heuristic tool. Let us imagine a situation where a scientist uses her intuition to come up with a scenario that might explain some empirical data, a new model about, say, gravity. The first thing that she is likely to do

is to formulate the model suggested by her intuition with mathematical rigour, which will enable her to determine whether the model is consistent. Sometimes models based on such 'hunches' turn out to be inconsistent, but if this is the case, the error can be spotted early on, certainly before any empirical tests need to be performed. So far, this story is not very far from how a metaphysician would proceed. The metaphysician is perhaps unlikely to use mathematics to model the insight in question, but logic and other means of careful analysis would certainly be in the metaphysician's toolbox. It seems to me that both of these activities are *a priori* activities, since no empirical element is present, but I do not want to dwell on the question of whether mathematics for instance is *a priori* or not. It is sufficient to note that the scientist and the metaphysician proceed from intuitions to detailed models in a similar manner – both use their intuitions merely as a heuristic tool, and both acknowledge the fallibility of this heuristic tool.

It is the next stage of the story which one might expect to demonstrate the superiority of empirical science over armchair metaphysics, namely the empirical experiments that the scientist can design and use to test the validity of the original intuition. The model, if it is consistent, will only provide proof of the *possibility* of a correspondence with the actual reality, and only an empirical experiment can reveal which model reflects the actual structure of reality. Of course, this empirical element is also available for the metaphysician, but only insofar as her model makes testable predictions. Because *aprioristic* metaphysics rarely makes such predictions, Ladyman and Ross think that it should not be taken seriously. In fact, they think that the value of metaphysical claims is very limited indeed:

> Any new metaphysical claim that is to be taken seriously should be motivated by, and only by, the service it would perform, if true, in showing how two or more specific scientific hypotheses jointly explain more than the sum of what is explained by the two hypotheses taken separately, where a 'scientific hypothesis' is understood as an

hypothesis that is taken seriously by institutionally *bona fide* current science. (Ladyman and Ross 2007: 30.)

This 'Principle of Naturalistic Closure' would seem to reduce metaphysics merely to the task of unifying scientific hypotheses. But this ignores a crucial element of the story: metaphysical inquiry is required in order to produce scientific hypotheses in the first place. We have seen that, on the face of it, the process by which metaphysicians and scientists proceed from intuitions to models of reality is rather similar, specifically, it appears to be non-empirical. Moreover, these models ought to be not just formally consistent, but also consistent with current empirical data. Metaphysicians should of course be familiar with this empirical data, but the core of the matter concerns the nature of the reasoning process which leads to the formulation of a scientific hypothesis. This process is fallible, but it fulfils all the essential elements of *metaphysical* inquiry. If this is correct, then our attention should not be directed towards the question of whether metaphysics can be naturalized, but rather what the metaphysical foundations of natural science are.

2. The Methodology of *Aprioristic* Metaphysics

Although the analysis of the methodology of *aprioristic* metaphysics suggested by Ladyman and Ross is flawed in its requirement for infallibilism, it does raise a point that must be addressed. This concerns the epistemology of metaphysics. Ladyman and Ross (2007: 16) refer to Ted Sider disapprovingly in this connection and point out that Sider's strategy to defend *a priori* metaphysics by claiming that the epistemological foundations of science and mathematics are equally mysterious is not convincing. Indeed, although I think that there will be an important overlap between the epistemological foundations of science and metaphysics, the problem seems to be more pressing for

the latter, since the empirical elements of science give it a rather more effective tool to spot errors than anything we have in metaphysics.

So, I acknowledge that there is a need for more work on the foundations of (*aprioristic*) metaphysics. Specifically, I think that we need an account of modal epistemology: how can we *reliably* inquire into the realm of metaphysical possibility given that we sometimes make mistakes? This problem is analogous to a more general debate in modal epistemology, namely the one concerning the link between conceivability and metaphysical possibility (cf. Gendler and Hawthorne 2002). Conceivability arguments are a familiar tool in metaphysics, yet it appears to be easy to conceive of metaphysically impossible things. At the very least, it appears that for something to be possible, it must also be conceivable (at least by an ideal conceiver), but although this is a necessary requirement for possibility, it is not sufficient. We seem to have a similar situation with regard to *a priori* access to metaphysical possibility. In fact, it may appear that these are one and the same problem, since conceivability is sometimes defined in terms of *a priori* reasoning. I think that this is misleading: it is a short step from conceivability to conceptual analysis, which is another typical way to understand what conceivability means – imaginability in terms of the definitions of concepts – but *a priori* access to metaphysical possibility cannot be based strictly on conceptual analysis because concepts do not give us access to being qua being; they concern merely a part of being, not the nature of reality in general.

Unfortunately Ladyman and Ross make the mistake of identifying metaphysical *a priori* inquiry with conceptual analysis. They claim that Lowe follows Frank Jackson and others 'in advocating the familiar methodology of reflecting on our concepts (conceptual analysis)' (2007: 16), and immediately ask how conceptual analysis could possibly reveal anything about the structure of reality. Well, this is a concern that a proponent of *aprioristic* metaphysics shares, moreover, it is the very reason why metaphysical *a priori* inquiry cannot be identified with conceptual analysis. It should also be noted that far from following Jackson, I believe that Lowe

would be as critical of Jackson's project as Ladyman and Ross themselves are. It is a mystery to me where they get the impression that metaphysics in this tradition has anything to do with conceptual analysis.

In any case, we do have to face the problem of modal epistemology. I believe that the groundwork for an appropriate account of modality to this end is due to Kit Fine's article 'Essence and Modality' (1994a), which helped to rejuvenate the Aristotelian idea that the notion of essence is more fundamental than that of modality and that the latter is grounded in the former. It is not possible to discuss all the details concerning this issue here, so instead I will attempt to motivate just one of the underlying ideas, namely, that possibility precedes actuality. This is effectively what Ladyman and Ross deny, as they are opposed to the idea that metaphysical *a priori* inquiry could reveal what is possible in advance of empirical research.

The idea of possibility preceding actuality is central especially in Lowe's work, as he considers it to form the basis for the possibility of metaphysics: 'In short, metaphysics itself is possible – indeed necessary – as a form of rational human inquiry because metaphysical possibility is an inescapable determinant of actuality' (Lowe 1998: 9).[1] So, metaphysics deals with possibilities – metaphysical possibilities – but is not able to determine what is actual without the help of empirical research. However, it is crucial for this account that empirical knowledge in itself is not able to determine what is actual either, for *a priori* inquiry is needed to delimit the space of possibilities from which the actual structure of reality can be identified by empirical means. Consequently, *a priori* inquiry is necessary and prior to knowledge about actuality because without this metaphysical delimitation of what is possible, the space of possibilities would be too vast to handle. So, it is this *a priori* delimitation of the space of possibilities which enables us to pick out just the genuine *metaphysical* possibilities from the enormous space of conceivable yet metaphysically impossible things.

1 It should be noted though that what follows is my own conception of the methodology of *aprioristic* metaphysics. It is inspired by the work of Fine and Lowe, but is not necessarily entirely faithful to either.

Consider the following statement, which is commonly thought to be metaphysically necessary: 'gold is the element with the atomic number 79'. If this statement is indeed metaphysically necessary, the necessity must be due to the nature of elementhood, that is, the atomic number is, by metaphysical necessity, associated with one and only one element (cf. Tahko 2009a). However, it is certainly *conceivable* that a different organization of subatomic particles would produce exactly the same characteristics that gold has, and indeed *be* gold to all ends and purposes. Examples like this are familiar from Putnam's Twin Earth scenarios, but they are generally considered not to entail metaphysical possibility. In any case, there is nothing contradictory in the scenario where the element with atomic number 78, for instance, has the characteristics that gold has instead of the ones that platinum has. Whether or not this element would be gold is the question that the Twin Earth scenarios are supposed to raise and the correct answer is typically considered to be that it would not be gold. Regardless of this, we can easily imagine a completely different organization of the fundamental physical constants and the laws of physics that would enable this possibility. The usual conclusion is that whatever the resulting element would be, it would not be gold as we know it. At best, it is an *epistemic* possibility that this element would be gold, but we would be making a metaphysical error if we thought that it could be the *same* gold that we know and value highly. In fact, there are infinitely many such conceivable scenarios, which are nevertheless metaphysically impossible. Due to our limited rational capabilities, it is impossible for us to consider all of these alternative scenarios – we have to delimit this space of possibilities somehow if we wish to make any progress in science. This is where *a priori* inquiry is required: the conclusion that the atomic number is a part of the essence of elements is the result of a combination of empirical research and a philosophical, *a priori* analysis of the different possible ways to interpret the empirical data.[2]

2 Although the atomic number is commonly accepted to be a part of the essence of elements, the issue is not as simple as it might seem; alternative accounts have been suggested. These different accounts may all be consistent and *a priori*, but only one of them, at most, is actual. See Hendry (2006) for further discussion about elementhood, specifically for one alternative account.

There is more to be said about the relationship between metaphysical *a priori* inquiry and empirical data. To emphasize that *a priori* inquiry is needed before empirical data becomes intelligible, let us consider another example, namely the basic thesis of the identity theory: brain states are mental states. This is of course an *a posteriori* identity claim and, I take it, currently its status is unsettled. Now, the question is: what sort of empirical information could verify this identity claim? We certainly have ample information about what happens in our brains, but not even many physicalists would claim that this is by any means enough to settle the debate. In fact, I think that it is fair to say that *no* amount of purely empirical information could settle the debate by itself, for otherwise the debate would perhaps be over already.[3] I do not wish to go into the literature about the 'explanatory gap' here, but the idea is that we lack sufficient information about the underlying *a priori identity*, namely, we do not know whether this identity holds or not. Note once again though that the understanding of *aprioricity* at hand here is not synonymous with conceptual analysis – this view is familiar from the work of Frank Jackson and others, but from my point of view the identification of *a priori* inquiry with conceptual analysis is a watered-down conception of the nature of *a priori* inquiry.

So, although a central theme in the literature on the explanatory gap concerns the role of *a priori* conceptual analysis which is required to settle the status of the identity theory, this is not the idea that I am advocating. In fact, I think that the role of the *a priori* part in the mind-brain identity thesis is exactly the same as in the matter-energy (or better: mass-energy) identity thesis, to use an example also familiar from the explanatory gap literature. The *a priori* work required in the latter case does not concern an analysis of the *concepts* of 'mass' and 'energy', but rather the *natures* of mass and energy. Einstein's insight was that really we are only talking about the nature of one thing, namely energy; mass energy, which we observe as matter, is just one of many forms of energy. In the terminology of *aprioristic* metaphysics, it would appear to be a part of the essence of energy

3 Admittedly, especially some physicalists may think that the debate is indeed over, but given the number of articles and books that continue to be published on the issue, it appears that far from being over, the debate is in fact only heating up.

that it can exist in many forms, one of them being mass energy. Now, it is worth emphasizing here that when Einstein formulated special relativity, one consequence of which is the mass-energy equivalence, he certainly did not do this experimentally, but rather by carefully considering the different possibilities of the behaviour of objects travelling at speeds approaching the speed of light. Much of this work is of course mathematical, but whether or not we consider mathematics to constitute *a priori* work, there must be *something* that this mathematical work is based on as well – perhaps it could be described as an intuition in the sense that we introduced in the previous section.

Returning to the case of mind-brain identity, the upshot would seem to be that even the *possibility* of mind-brain identity has not been sufficiently characterized, nor, of course, has the possibility of mind-brain duality. The stalemate in contemporary philosophy of mind amounts to just this: the *a priori* delimitation of the different possibilities available in explaining consciousness has not been completed, at least not in sufficient detail to convince the majority of philosophers. Many philosophers are convinced that it is impossible to explain consciousness in terms of the physical, whereas others think that this is the *only* possible explanation. But since it seems to be very difficult to come to an agreement about which of these possibilities are genuine, the result is that we do not even know what sort of empirical information could verify or falsify the identity claim in question. It is possible that we already possess this empirical information, but as the *a priori* work concerning this debate has not been completed, the empirical information is of little use to us. The same, I think, is true of many other *a posteriori* identity claims, perhaps even of our previous example about elementhood.

More generally, this methodological picture suggests that the way in which we interpret and analyze empirical information is dependent on an *a priori* delimitation of what is possible. In some cases the *a priori* work has been done long ago, whereas some cases seem to elude definite *a priori* characterization rather effectively. There are plenty of examples of this in science as well: for instance, it appears that no amount of empirical information will settle the most important and most

difficult questions concerning quantum mechanics, such as whether the wavefunction has an objective existence or whether it is merely a mathematical convenience, or how the role of the observer should be accounted for in the universal wavefunction, or whether a realist or an anti-realist interpretation of quantum mechanics is correct; any attempt to address issues such as these will have to start from metaphysics.

Some difficult questions about the epistemic role of *a priori* inquiry remain. From what has been said above, it may still seem that we are dealing with some sort of mysterious rational intuition, since *a priori* inquiry provides the parameters for any interpretation of empirical data while also acting as a self-correcting form of inquiry. Even given fallibilism, the problem would appear to be the justification of the criteria used to evaluate *a priori* propositions. But here as well I believe that *aprioristic* metaphysics has a long tradition of research, for the notion of *ontological category*, which goes back to Aristotle, is central to the task of determining the criteria by which we judge both empirical and rational information. It should be emphasized though that this research goes hand in hand with empirical research. Certain *a priori* principles, such as the ones emerging from the categorical structure of reality, may be more fundamental, and it is perhaps with these principles that metaphysical inquiry begins. One of the obvious candidates for such a fundamental principle – one that Aristotle certainly considered to be fundamental – is the law of non-contradiction. Perhaps the law of non-contradiction could be self-evident enough to act as a foundational *a priori* principle, although even this is a question that requires further research.[4]

To conclude, advancements in science have not undermined the role of *aprioristic* metaphysics; its purpose is to provide a mapping of the initial limitations of any kind of rational inquiry. Without such a mapping it would be impossible to choose which of the infinitely many potential lines of research are feasible in the first place.

4 See Tahko (2009b) for discussion on the role of the law of non-contradiction.

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